

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:

General Engineering Charleston SC		Chain of Custody/Analysis Request															COC/Lab Request #: 2018-1719 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		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"/>			MSGP-Hg	WSP-8260B-VOA	WSP-8270C-SVOA	WSP-8330B-NIMED HEXMOD	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-18-13	Feb 13 2018	11:44	W					1		1		1									
CAPA-18-14	Feb 13 2018	11:44	W		2	2	3	1	1		1		1	1							
CAPA-18-15	Feb 13 2018	11:44	W		2																
CAPA-18-3	Feb 13 2018	13:47	W					1		1		1									
CAPA-18-4	Feb 13 2018	13:47	W	1	2	2	3		1		1		1	1							
CAPA-18-5	Feb 13 2018	13:47	W																		
CAPA-18-7	Feb 13 2018	13:47	W		2																
CAPA-18-8	Feb 13 2018	13:47	W		2	2															
CAWA-18-63	Feb 13 2018	12:50	W					1		1		1									
CAWA-18-64	Feb 13 2018	12:50	W	1	2	2	3		1		1		1	1							
CAWA-18-65	Feb 13 2018	12:50	W																		
CAWA-18-114	Feb 13 2018	12:50	W		2																
CAWA-18-151309	Feb 13 2018	12:50	W					1		1		1									
CAWA-18-151310	Feb 13 2018	12:50	W	1	2	2	3		1		1		1	1							
Special Instructions:																					
Relinquished by: [Signature]				Print Name: [Signature]				Date/Time: 2/1/18 15:00				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: 11669

EVENT NAME: Water/CdV (TA-16 260, Feb Cr Monthly)
MY18 Q2

SAMPLE ID: CAPA-18-13

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	2/13/18	OK	FIELD MATRIX:	WS	OK
TIME COLLECTED (HH:MM):	1144		MEDIA:	OK	
PRS ID:	OK		SAMPLE TECH CODE:	PP	
LOCATION ID:	Paj bel S&N Anch E Basin conf		FIELD PREP:	F	
LOCATION TYPE:	OK		FIELD QC TYPE:	REG	
TOP DEPTH:	↓		SAMPLE USAGE:	INV	↓
BOTTOM DEPTH:	↓	↓	EXCAVATED:		YES / <u>NO</u> / NA

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
NA	WSP-All Metals	1 LITER POLY	1	HNO3 ICE	Y	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	Discharge Rate	_____	Dissolved Oxygen	_____
Groundwater Elevation	_____		Oxidation-Reduction Potential	_____	Period Purge Volume	_____
pH	_____		Purge Volume	_____	Specific Conductance	_____
Temperature	_____		Total Volume Pumped	_____	Turbidity	_____

COLLECTED BY (PRINT): M. Shendo, W. Sanchez

RELINQUISHED BY (Printed Name) (Signature)	Date/Time 2/13/18 11:53	RECEIVED BY (Printed Name) (Signature)	Date/Time 2/13/18 11:53
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11669

EVENT NAME: Water/CdV (TA-16 260, Feb Cr Monthly)
MY18 Q2

SAMPLE ID: CAPA-18-14

WORK ORDER:

	<u>AS PLANNED</u>	<u>AS COLLECTED</u>		<u>AS PLANNED</u>	<u>AS COLLECTED</u>
Date Collected (MM/DD/YYYY):	2/13/18	OK	FIELD MATRIX:	WS	OK
TIME COLLECTED (HH:MM):	1144		MEDIA:	OK	
PRS ID:	OK		SAMPLE TECH CODE:	PP	
LOCATION ID:	Paj bel S&N Anch E Basin conf		FIELD PREP:	UF	
LOCATION TYPE:	OK		FIELD QC TYPE:	REG	
TOP DEPTH:			SAMPLE USAGE:	INV	
BOTTOM DEPTH:			EXCAVATED:		YES / <u>NO</u> / NA

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
NA	WSP-8260B-VOA	40 ML SEPTUM AMBER GLASS	2	HCL	Y	NA
	WSP-8270C-SVOA	1 LITER AMBER GLASS	2	ICE		
	WSP-8330B-NMED HEXMOD	1 LITER AMBER GLASS	3	ICE		
	WSP-All Metals	1 LITER POLY	1	HNO3 ICE		
	WSP-CN(T)	250 ML POLY	1	NAOH		
	WSP-GrossA/B	1 LITER POLY	1	HNO3		
	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	1144	HH:MM	Discharge Rate	22.89	Dissolved Oxygen	10.71
Groundwater Elevation	NA		Oxidation-Reduction Potential	NA	Period Purge Volume	NA
pH	7.86		Purge Volume	NA	Specific Conductance	1425
Temperature	5.4		Total Volume Pumped	NA	Turbidity	7.7

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY**EVENT ID:** 11669**EVENT NAME:** Water/CdV (TA-16 260, Feb Cr Monthly)
MY18 Q2**SAMPLE ID:** CAPA-18-14**WORK ORDER:**

COLLECTED BY (PRINT): M. Shendley W. Sanchez

RELINQUISHED BY (Printed Name) <i>Allynn Stanfield</i> (Signature) <i>[Signature]</i>	Date/Time <i>2/13/18</i> <i>13:53</i>	RECEIVED BY (Printed Name) <i>[Signature]</i> (Signature) <i>[Signature]</i>	Date/Time <i>2/13/18</i> <i>13:53</i>
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11669

EVENT NAME: Water/CdV (TA-16 260, Feb Cr Monthly)
MY18 Q2

SAMPLE ID: CAPA-18-15

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	2/13/18	OK	FIELD MATRIX:	WS	OK
TIME COLLECTED (HH:MM):	1144		MEDIA:	OK	
PRS ID:	OK		SAMPLE TECH CODE:	AL 2/13/18 PP DC	
LOCATION ID:	Paj bel S&N Anch E Basin conf		FIELD PREP:	UF	
LOCATION TYPE:	OK		FIELD QC TYPE:	FTB	
TOP DEPTH:	↓	↓	SAMPLE USAGE:	QC	↓
BOTTOM DEPTH:			EXCAVATED:		YES / NO / NA

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
N/A	WSP-8260B- VOA	40 ML SEPTUM AMBER GLASS	3	HCL	Y	N/A

SAMPLE COMMENTS:

LOCATION COMMENTS:

FIELD PARAMETERS:

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

COLLECTED BY (PRINT):

Mo Shendo, W. Sanchez

RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time
Allison Starfield	2/13/18 1535	W. Sanchez	2/13/18 1535
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

LANL SMO Los Alamos NM						<h1 style="text-align: center;">Chain of Custody/Analysis Request</h1>																	COC/Lab Request #: 2018-1715 Page 1 of 1																			
Client Contact:						Lab Agreement #:			Site Name: Los Alamos National Laboratory																																	
						Project Number:			<div style="display: flex; justify-content: space-between;"><div>MSGP-Hg WSP-8260B-VOA WSP-8270C-SVOA WSP-8330B-NMED HEXMOD WSP-All Metals WSP-CN(T) WSP-EES-Br WSP-EES-Tracers WSP-GENINORG+PerChlorate WSP-GrossA/B WSP-LL-H-3 WSP-N15/O18-NO3 WSP-NH3+NO3/NO2+PO4 WSP-RAD WSP-TKN+TOC</div><div>Rad Screening Info:</div></div>																																	
						Analysis Turnaround Time:																				<div>Lab Reporting Limit Type: Method Detection Limit</div>																
						24 Hour - <input type="checkbox"/> Other - <input checked="" type="checkbox"/>																																				
						7 Days - <input type="checkbox"/>																																				
						14 Days - <input type="checkbox"/>																																				
						21 Days - <input type="checkbox"/>																																				
						28 Days - <input type="checkbox"/>																																				
Field Sample ID						Sample Date	Sample Time	Sample Matrix																																		
CAPA-18-3	Feb 13 2018	13:47	W					1					1			2	1																									
CAPA-18-7	Feb 13 2018	13:47	W																																							
CAPA-18-8	Feb 13 2018	13:47	W			2	2																																			
CAPA-18-4	Feb 13 2018	13:47	W	1	2	2	3		1					1	1				1	1																						
CAPA-18-5	Feb 13 2018	13:47	W									1	2																													
Special Instructions:																																										
Relinquished by: [Signature]						Print Name: Allizyn Stanfield						Date/Time: 2/13/18 1535						Received by: [Signature]						Print Name: [Signature]						Date/Time: 2/13/18 1535												
Relinquished by:						Print Name:						Date/Time:						Received by:						Print Name:						Date/Time:												
Relinquished by:						Print Name:						Date/Time:						Received by:						Print Name:						Date/Time:												

[illegible]

Shipping Classification Determination Checklist

Page 6 of 6

Sampling Plan ID/Name: 11669(R-47)COC: 2018-1719

TEST - Explosives	YES	NO	
Samples collected from a WFO area? (TAs -8, 9, 11, 16, 37, 14, 15, 36, 22, 39, 40, and 49)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Field Test for Explosives Results	YES	NO	NA
HE SPOT test result positive. If YES - Do not transport.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

TEST - Chemical Preservation	YES	NO	
Samples are chemically preserved?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
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.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

TEST - Field Screen	YES	NO			
The sample has field screening measurements of alpha and beta activity?	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
Sample Activity (dpm/100cm ²)	Shipment Activity (dpm*g/100cm ²)	Sampled Location	YES	NO	NA
Alpha detectable	AND Alpha ≥ 160,000	AT TA-1 and adjacent hillsides, TA-21, Acid Canyon, MDA C at TA-50, Area G at TA-54, TA-48, or TA-49	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Alpha ≥ 125	AND Alpha ≥ 1,250,000	AT other locations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Beta ≥ 1,500	AND Beta ≥ 15,000,000	AT any location	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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 <i>Radioactive Material, Excepted Package - Limited Quantity Material - UN2910</i> , based on field screening measurements of alpha and beta activity.					

TEST - Location	YES	NO		
Prior analytical measurements of radioactive isotopes are available?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
Sample Activity (pCi/g)	Shipment Activity (pCi)	YES	NO	NA
Am-241 ≥ 27 pCi/g	AND Am-241 ≥ 270,000 pCi Total	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Cs-137 ≥ 270 pCi/g	AND Cs-137 ≥ 270,000 pCi Total	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Pu-238 ≥ 27 pCi/g	AND Pu-238 ≥ 270,000 pCi Total	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Pu-239/240 ≥ 27 pCi/g	AND Pu-239/240 ≥ 270,000 pCi Total	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Th-228 ≥ 27 pCi/g	AND Th-228 ≥ 270,000 pCi Total	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
U-234 ≥ 270 pCi/g	AND U-234 ≥ 1,600,000,000 pCi Total	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
U-238 ≥ 270 pCi/g	AND U-238 ≥ unlimited	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
H-3 ≥ 27,000,000 pCi/g	AND H-3 ≥ 27,000,000,000 pCi Total	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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 <i>Radioactive Material, Excepted Package - Limited Quantity of Material - UN2910</i> , based on prior analytical measurements of radioactive isotopes.				

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

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

Hazard Assessment Completed	Date/Time
(Printed Name) <u>Tanner Bonham</u>	<u>2-13-2018</u>
(Signature) <u>[Signature]</u>	<u>2/13/18</u>

Hazard Assessment Reviewed	Date/Time
(Printed Name) <u>Shenwood</u>	<u>2/13/18</u>
(Signature) <u>[Signature]</u>	<u>1415</u>

Sampling Plan ID/Name: 11669 CR-18, Raj below S+N Ancho E Basin Confluence COC: 2018-1719

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

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

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

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

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

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

Hazard Assessment Completed By:	Date/Time
(Printed Name) <u>Allison Stanfield</u>	<u>2/13/18</u>
(Signature) <u>[Signature]</u>	<u>1535</u>

Hazard Assessment Reviewed By:	Date/Time
(Printed Name) <u>U. Liss-Hart</u>	<u>2/13/18</u>
(Signature) <u>[Signature]</u>	<u>1535</u>

Sampling Plan ID/Name: 11007 LR-18, 9aj below STN Ancho ^{2/13/13} _{Cont (Ver 1.2)})COC: 2018-1717

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


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

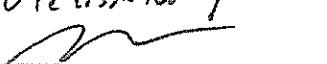
TEST - Field Screen			YES	NO
The sample has field screening measurements of alpha activity and beta activity?				<input checked="" type="checkbox"/>
Sample Activity (dpm/100cm ²)	Shipment Activity (dpm*g/100cm ²)	Sampled Location	YES	NO
Alpha detectable	AND Alpha $\geq 160,000$	AT TA-1 and adjacent hillsides,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

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

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

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

Hazard Assessment Completed By:	Date/Time
(Printed Name) <u>Allison Stanfield</u>	<u>2/13/13</u>
(Signature) 	<u>1535</u>

Hazard Assessment Reviewed By:	Date/Time
(Printed Name) <u>DeLiss-Clark</u>	<u>2/13/13</u>
(Signature) 	<u>1535</u>

DATA VALIDATION REPORT

Chain Of Custody No. 2018-1719

1. Distribution Of Samples In EDD.

SDG	Analytical Method	Regular Samples	Field Duplicates	Trip Blanks	Field Blanks	Equipment Blanks
443888	EPA:120.1	3	1			
443888	EPA:150.1	3	1			
443888	EPA:160.1	3	1			
443888	EPA:170.0	6	2	3	1	
443888	EPA:245.2	6	2			
443888	EPA:300.0	3	1			
443888	EPA:310.1	3	1			
443888	EPA:335.4	3	1			
443888	EPA:350.1	3	1			
443888	EPA:351.2	3	1			
443888	EPA:353.2	3	1			
443888	EPA:365.4	3	1			
443888	EPA:900	3	1			
443888	EPA:901.1	3	1			
443888	EPA:905.0	3	1			
443888	HASL-300:AM-241	3	1			
443888	HASL-300:ISOPU	3	1			
443888	HASL-300:ISOU	3	1			
443888	SM:A2340B	4	1			
443888	SW-846:6010C	4	1			
443888	SW-846:6020	4	1			
443888	SW-846:6850	3	1			
443888	SW-846:8260B	3	1	3	1	
443888	SW-846:8270D	3	1		1	
443888	SW-846:8330B	3	1			
443888	SW-846:9060	3	1			

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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
443888	EPA:120.1	1740142	1740142	3	1									1				2			
443888	EPA:150.1	1739668	1739668	3	1									1				1			
443888	EPA:160.1	1740461	1740461	3	1				1					1				1			
443888	EPA:170.0	NA	NA	6	2	3	1														
443888	EPA:245.2	1740556	1740554	6	2				1	1				1				1			
443888	EPA:300.0	1740343	1740343	3	1				1					1				1			
443888	EPA:310.1	1739667	1739667	3	1					1				1				1			
443888	EPA:335.4	1740052	1740051	3	1				1	1				1				1			
443888	EPA:350.1	1740091	1740090	3	1				1	1				1				1			
443888	EPA:351.2	1742072	1742071	3	1				1	1				1				1			
443888	EPA:353.2	1740472	1740472	3	1				1					1				1			
443888	EPA:365.4	1740095	1740094	3	1				1	1				1				1			
443888	EPA:900	1740250	1740250	3	1				1	1	1			1				1			
443888	EPA:901.1	1739683	1739683	3	1				1					1				1			
443888	EPA:905.0	1740247	1740247	3	1				1	1				1				1			
443888	HASL-300:AM-241	1739814	1739814	3	1				1					1				1			
443888	HASL-300:ISOPU	1739815	1739815	3	1				1					1				1			
443888	HASL-300:ISOU	1739816	1739816	3	1				1					1				1			
443888	SM:A2340B	1747163	1747163	4	1																
443888	SW-846:6010C	1739540	1739539	4	1				1	1				1				1			
443888	SW-846:6020	1739542	1739541	4	1				1	1				1				1			
443888	SW-846:6850	1739916	1739915	3	1				1	1	1			1							
443888	SW-846:8260B	1741056	1741056	3	1	3	1		1					2							
443888	SW-846:8270D	1739613	1739612	3	1		1		1	1	1			1							
443888	SW-846:8330B	1740143	1740139	3	1				1	1	1			1							
443888	SW-846:9060	1739763	1739763	3	1				1					1				1			

2. Distribution Of Analytes In EDD.

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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	CAPA-18-13	443888001	REG	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	CAPA-18-3	443888005	REG	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	CAWA-18-151309	443888014	FD	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	CAWA-18-45	1203974210	DUP	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	CAWA-18-50	1203974211	DUP	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	CAWA-18-63	443888010	REG	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	LCS	1203974209	LCS	0	0	1	0
EPA:150.1	GENERAL CHEMISTRY	CAPA-18-13	443888001	REG	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	CAPA-18-3	443888005	REG	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	CAWA-18-151309	443888014	FD	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	CAWA-18-3	1203972902	DUP	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	CAWA-18-63	443888010	REG	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	LCS	1203972901	LCS	0	0	1	0
EPA:160.1	GENERAL CHEMISTRY	CAPA-18-13	443888001	REG	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	CAPA-18-3	1203975032	DUP	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	CAPA-18-3	443888005	REG	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	CAWA-18-151309	443888014	FD	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	CAWA-18-63	443888010	REG	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	LCS	1203975030	LCS	0	0	1	0
EPA:160.1	GENERAL CHEMISTRY	MB	1203975029	MB	1	0	0	0
EPA:170.0	VOC	CAPA-18-13	443888001	REG	1	0	0	0
EPA:170.0	VOC	CAPA-18-14	443888002	REG	1	0	0	0
EPA:170.0	VOC	CAPA-18-15	443888004	FTB	1	0	0	0
EPA:170.0	VOC	CAPA-18-3	443888005	REG	1	0	0	0
EPA:170.0	VOC	CAPA-18-4	443888006	REG	1	0	0	0
EPA:170.0	VOC	CAPA-18-7	443888008	FTB	1	0	0	0
EPA:170.0	VOC	CAPA-18-8	443888009	FB	1	0	0	0
EPA:170.0	VOC	CAWA-18-114	443888013	FTB	1	0	0	0
EPA:170.0	VOC	CAWA-18-151309	443888014	FD	1	0	0	0
EPA:170.0	VOC	CAWA-18-151310	443888016	FD	1	0	0	0
EPA:170.0	VOC	CAWA-18-63	443888010	REG	1	0	0	0
EPA:170.0	VOC	CAWA-18-64	443888011	REG	1	0	0	0
EPA:245.2	INORGANIC	CAPA-18-13	1203975307	DUP	1	0	0	0
EPA:245.2	INORGANIC	CAPA-18-13	1203975308	MS	0	0	1	0
EPA:245.2	INORGANIC	CAPA-18-13	443888001	REG	1	0	0	0
EPA:245.2	INORGANIC	CAPA-18-14	443888002	REG	1	0	0	0
EPA:245.2	INORGANIC	CAPA-18-3	443888005	REG	1	0	0	0
EPA:245.2	INORGANIC	CAPA-18-4	443888007	REG	1	0	0	0
EPA:245.2	INORGANIC	CAWA-18-151309	443888014	FD	1	0	0	0

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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	CAWA-18-151310	443888016	FD	1	0	0	0
EPA:245.2	INORGANIC	CAWA-18-63	443888010	REG	1	0	0	0
EPA:245.2	INORGANIC	CAWA-18-64	443888012	REG	1	0	0	0
EPA:245.2	INORGANIC	LCS	1203975306	LCS	0	0	1	0
EPA:245.2	INORGANIC	MB	1203975305	MB	1	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAMO-18-10	1203974727	DUP	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAPA-18-13	443888001	REG	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAPA-18-3	443888005	REG	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAWA-18-151309	443888014	FD	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAWA-18-63	443888010	REG	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	LCS	1203974726	LCS	0	0	4	0
EPA:300.0	GENERAL CHEMISTRY	MB	1203974725	MB	4	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAPA-18-13	443888001	REG	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAPA-18-3	443888005	REG	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAWA-18-151309	1203972898	DUP	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAWA-18-151309	1203972900	MS	0	0	1	0
EPA:310.1	GENERAL CHEMISTRY	CAWA-18-151309	443888014	FD	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAWA-18-63	443888010	REG	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	LCS	1203972896	LCS	0	0	1	0
EPA:335.4	INORGANIC	CAPA-18-14	443888002	REG	1	0	0	0
EPA:335.4	INORGANIC	CAPA-18-4	443888007	REG	1	0	0	0
EPA:335.4	INORGANIC	CAWA-18-151310	443888016	FD	1	0	0	0
EPA:335.4	INORGANIC	CAWA-18-46	1203974006	DUP	1	0	0	0
EPA:335.4	INORGANIC	CAWA-18-46	1203974010	MS	0	0	1	0
EPA:335.4	INORGANIC	CAWA-18-64	443888012	REG	1	0	0	0
EPA:335.4	INORGANIC	LCS	1203974005	LCS	0	0	1	0
EPA:335.4	INORGANIC	MB	1203974004	MB	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAPA-18-13	443888001	REG	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAPA-18-3	443888005	REG	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAWA-18-151309	443888014	FD	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAWA-18-45	1203974093	DUP	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAWA-18-45	1203974095	MS	0	0	1	0
EPA:350.1	GENERAL CHEMISTRY	CAWA-18-63	443888010	REG	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	LCS	1203974092	LCS	0	0	1	0
EPA:350.1	GENERAL CHEMISTRY	MB	1203974091	MB	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAPA-18-14	443888002	REG	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAPA-18-4	443888007	REG	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAWA-18-151310	443888016	FD	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAWA-18-46	1203978460	DUP	1	0	0	0

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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	CAWA-18-46	1203978461	MS	0	0	1	0
EPA:351.2	GENERAL CHEMISTRY	CAWA-18-64	443888012	REG	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	LCS	1203978459	LCS	0	0	1	0
EPA:351.2	GENERAL CHEMISTRY	MB	1203978458	MB	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAPA-18-13	443888001	REG	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAPA-18-3	443888005	REG	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAWA-18-151309	443888014	FD	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAWA-18-63	443888010	REG	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAWA-18-9	1203975072	DUP	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	LCS	1203975071	LCS	0	0	1	0
EPA:353.2	GENERAL CHEMISTRY	MB	1203975070	MB	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAPA-18-13	443888001	REG	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAPA-18-3	443888005	REG	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAWA-18-151309	443888014	FD	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAWA-18-63	443888010	REG	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAWA-18-9	1203974106	DUP	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAWA-18-9	1203974108	MS	0	0	1	0
EPA:365.4	GENERAL CHEMISTRY	LCS	1203974104	LCS	0	0	1	0
EPA:365.4	GENERAL CHEMISTRY	MB	1203974103	MB	1	0	0	0
EPA:900	RAD	CAPA-18-14	443888002	REG	2	0	0	0
EPA:900	RAD	CAPA-18-4	443888007	REG	2	0	0	0
EPA:900	RAD	CAWA-18-151310	443888016	FD	2	0	0	0
EPA:900	RAD	CAWA-18-20	1203974522	DUP	2	0	0	0
EPA:900	RAD	CAWA-18-20	1203974523	MS	0	0	2	0
EPA:900	RAD	CAWA-18-20	1203974524	MSD	0	0	2	0
EPA:900	RAD	CAWA-18-64	443888012	REG	2	0	0	0
EPA:900	RAD	LCS	1203974525	LCS	0	0	2	0
EPA:900	RAD	MB	1203974521	MB	2	0	0	0
EPA:901.1	RAD	CAPA-18-14	1203972938	DUP	5	0	0	0
EPA:901.1	RAD	CAPA-18-14	443888002	REG	5	0	0	0
EPA:901.1	RAD	CAPA-18-4	443888007	REG	5	0	0	0
EPA:901.1	RAD	CAWA-18-151310	443888016	FD	5	0	0	0
EPA:901.1	RAD	CAWA-18-64	443888012	REG	5	0	0	0
EPA:901.1	RAD	LCS	1203972939	LCS	0	0	3	0
EPA:901.1	RAD	MB	1203972937	MB	5	0	0	0
EPA:905.0	RAD	CAPA-18-14	443888002	REG	1	0	0	0
EPA:905.0	RAD	CAPA-18-4	443888007	REG	1	0	0	0
EPA:905.0	RAD	CAWA-18-151310	443888016	FD	1	0	0	0
EPA:905.0	RAD	CAWA-18-46	1203974511	DUP	1	0	0	0

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DATA VALIDATION REPORT

Analytical Method	Analytical Method Category	Field Sample ID	Lab Sample ID	Sample Purpose	Target Analytes	Surrogates	Spiked Compounds	TICS
EPA:905.0	RAD	CAWA-18-46	1203974512	MS	0	0	1	0
EPA:905.0	RAD	CAWA-18-64	443888012	REG	1	0	0	0
EPA:905.0	RAD	LCS	1203974513	LCS	0	0	1	0
EPA:905.0	RAD	MB	1203974510	MB	1	0	0	0
HASL-300:AM-241	RAD	CAPA-18-14	1203973279	DUP	1	0	0	0
HASL-300:AM-241	RAD	CAPA-18-14	443888002	REG	1	0	0	0
HASL-300:AM-241	RAD	CAPA-18-4	443888007	REG	1	0	0	0
HASL-300:AM-241	RAD	CAWA-18-151310	443888016	FD	1	0	0	0
HASL-300:AM-241	RAD	CAWA-18-64	443888012	REG	1	0	0	0
HASL-300:AM-241	RAD	LCS	1203973280	LCS	0	0	1	0
HASL-300:AM-241	RAD	MB	1203973278	MB	1	0	0	0
HASL-300:ISOPU	RAD	CAPA-18-14	1203973282	DUP	2	0	0	0
HASL-300:ISOPU	RAD	CAPA-18-14	443888002	REG	2	0	0	0
HASL-300:ISOPU	RAD	CAPA-18-4	443888007	REG	2	0	0	0
HASL-300:ISOPU	RAD	CAWA-18-151310	443888016	FD	2	0	0	0
HASL-300:ISOPU	RAD	CAWA-18-64	443888012	REG	2	0	0	0
HASL-300:ISOPU	RAD	LCS	1203973283	LCS	0	0	1	0
HASL-300:ISOPU	RAD	MB	1203973281	MB	2	0	0	0
HASL-300:ISOU	RAD	CAPA-18-14	1203973285	DUP	3	0	0	0
HASL-300:ISOU	RAD	CAPA-18-14	443888002	REG	3	0	0	0
HASL-300:ISOU	RAD	CAPA-18-4	443888007	REG	3	0	0	0
HASL-300:ISOU	RAD	CAWA-18-151310	443888016	FD	3	0	0	0
HASL-300:ISOU	RAD	CAWA-18-64	443888012	REG	3	0	0	0
HASL-300:ISOU	RAD	LCS	1203973286	LCS	0	0	1	0
HASL-300:ISOU	RAD	MB	1203973284	MB	3	0	0	0
SM:A2340B	INORGANIC	CAPA-18-13	443888001	REG	1	0	0	0
SM:A2340B	INORGANIC	CAPA-18-14	443888002	REG	1	0	0	0
SM:A2340B	INORGANIC	CAPA-18-3	443888005	REG	1	0	0	0
SM:A2340B	INORGANIC	CAWA-18-151309	443888014	FD	1	0	0	0
SM:A2340B	INORGANIC	CAWA-18-63	443888010	REG	1	0	0	0
SW-846:6010C	INORGANIC	CAPA-18-13	1203972540	DUP	17	0	0	0
SW-846:6010C	INORGANIC	CAPA-18-13	1203972541	MS	0	0	17	0
SW-846:6010C	INORGANIC	CAPA-18-13	443888001	REG	17	0	0	0
SW-846:6010C	INORGANIC	CAPA-18-14	443888002	REG	16	0	0	0
SW-846:6010C	INORGANIC	CAPA-18-3	443888005	REG	17	0	0	0
SW-846:6010C	INORGANIC	CAWA-18-151309	443888014	FD	17	0	0	0
SW-846:6010C	INORGANIC	CAWA-18-63	443888010	REG	17	0	0	0
SW-846:6010C	INORGANIC	LCS	1203972539	LCS	0	0	17	0
SW-846:6010C	INORGANIC	MB	1203972538	MB	17	0	0	0

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DATA VALIDATION REPORT

Analytical Method	Analytical Method Category	Field Sample ID	Lab Sample ID	Sample Purpose	Target Analytes	Surrogates	Spiked Compounds	TICS
SW-846:6020	INORGANIC	CAPA-18-13	1203972549	DUP	11	0	0	0
SW-846:6020	INORGANIC	CAPA-18-13	1203972550	MS	0	0	11	0
SW-846:6020	INORGANIC	CAPA-18-13	443888001	REG	11	0	0	0
SW-846:6020	INORGANIC	CAPA-18-14	443888002	REG	11	0	0	0
SW-846:6020	INORGANIC	CAPA-18-3	443888005	REG	11	0	0	0
SW-846:6020	INORGANIC	CAWA-18-151309	443888014	FD	11	0	0	0
SW-846:6020	INORGANIC	CAWA-18-63	443888010	REG	11	0	0	0
SW-846:6020	INORGANIC	LCS	1203972548	LCS	0	0	11	0
SW-846:6020	INORGANIC	MB	1203972547	MB	11	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	CAPA-18-13	443888001	REG	1	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	CAPA-18-3	443888005	REG	1	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	CAWA-18-151309	443888014	FD	1	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	CAWA-18-63	443888010	REG	1	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	CAWA-18-9	1203973626	MS	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	CAWA-18-9	1203973627	MSD	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	LCS	1203973625	LCS	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	MB	1203973624	MB	1	0	0	0
SW-846:8260B	VOC	CAPA-18-14	443888002	REG	80	3	0	0
SW-846:8260B	VOC	CAPA-18-15	443888004	FTB	80	3	0	0
SW-846:8260B	VOC	CAPA-18-4	443888007	REG	80	3	0	0
SW-846:8260B	VOC	CAPA-18-7	443888008	FTB	80	3	0	0
SW-846:8260B	VOC	CAPA-18-8	443888009	FB	80	3	0	0
SW-846:8260B	VOC	CAWA-18-114	443888013	FTB	80	3	0	0
SW-846:8260B	VOC	CAWA-18-151310	443888016	FD	80	3	0	0
SW-846:8260B	VOC	CAWA-18-64	443888012	REG	80	3	0	0
SW-846:8260B	VOC	LCS	1203977905	LCS	0	3	70	0
SW-846:8260B	VOC	LCS	1203977906	LCS	0	3	10	0
SW-846:8260B	VOC	MB	1203977904	MB	80	3	0	0
SW-846:8270D	SVOC	CAPA-18-14	1203972712	MS	0	6	76	0
SW-846:8270D	SVOC	CAPA-18-14	1203972713	MSD	0	6	76	0
SW-846:8270D	SVOC	CAPA-18-14	443888002	REG	80	6	0	0
SW-846:8270D	SVOC	CAPA-18-4	443888007	REG	80	6	0	0
SW-846:8270D	SVOC	CAPA-18-8	443888009	FB	80	6	0	0
SW-846:8270D	SVOC	CAWA-18-151310	443888016	FD	80	6	0	0
SW-846:8270D	SVOC	CAWA-18-64	443888012	REG	80	6	0	0
SW-846:8270D	SVOC	LCS	1203972711	LCS	0	6	76	0
SW-846:8270D	SVOC	MB	1203972710	MB	80	6	0	0
SW-846:8330B	LCMS/MS HIGH	CAPA-18-14	1203974214	MS	0	1	23	0
SW-846:8330B	LCMS/MS HIGH	CAPA-18-14	1203974215	MSD	0	1	23	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-846:8330B	LCMS/MS HIGH	CAPA-18-14	443888003	REG	23	1	0	0
SW-846:8330B	LCMS/MS HIGH	CAPA-18-4	443888006	REG	23	1	0	0
SW-846:8330B	LCMS/MS HIGH	CAWA-18-151310	443888015	FD	23	1	0	0
SW-846:8330B	LCMS/MS HIGH	CAWA-18-64	443888011	REG	23	1	0	0
SW-846:8330B	LCMS/MS HIGH	LCS	1203974213	LCS	0	1	23	0
SW-846:8330B	LCMS/MS HIGH	MB	1203974212	MB	23	1	0	0
SW-846:9060	GENERAL CHEMISTRY	CAPA-18-14	443888002	REG	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	CAPA-18-4	443888007	REG	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	CAWA-18-151310	443888016	FD	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	CAWA-18-16	1203973206	DUP	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	CAWA-18-64	443888012	REG	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	LCS	1203973204	LCS	0	0	1	0
SW-846:9060	GENERAL CHEMISTRY	MB	1203973203	MB	1	0	0	0

3. Are any analytes missing?

No.

4. Were any holding times exceeded?

No.

5. Any contaminants in blanks?

Blank FS ID	Blank Lab Sample	Blank Type	Analytical Method	Sample	Parameter Name	Blank Lab Result	Lab Qualifier	Blank Lab Units	Blank Lab Detection Limit
MB	1203972538	METHOD BLANK	SW-846:6010C	W	Potassium	110	J	ug/L	150
MB	1203974103	METHOD BLANK	EPA:365.4	W	Total Phosphate as Phosphorus	0.035	J	mg/L	0.050
MB	1203975305	METHOD BLANK	EPA:245.2	W	Mercury	-0.073	J	ug/L	0.200
CAPA-18-15	443888004	TRIP BLANK	EPA:170.0	W	Temperature	2		Deg C	
CAPA-18-7	443888008	TRIP BLANK	EPA:170.0	W	Temperature	2		Deg C	
CAPA-18-8	443888009	FIELD BLANK	EPA:170.0	W	Temperature	2		Deg C	

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DATA VALIDATION REPORT

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
CAWA-18-114	443888013	TRIP BLANK	EPA:170.0	W	Temperature	2		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
CAPA-18-13	1203975305	METHOD BLANK	EPA:245.2	Mercury	-0.073	ug/L	0.067	U	0.200	N	5	100	Y
CAPA-18-14	1203975305	METHOD BLANK	EPA:245.2	Mercury	-0.073	ug/L	0.067	U	0.200	N	5	100	Y
CAPA-18-3	1203975305	METHOD BLANK	EPA:245.2	Mercury	-0.073	ug/L	0.067	U	0.200	N	5	100	Y
CAPA-18-4	1203975305	METHOD BLANK	EPA:245.2	Mercury	-0.073	ug/L	0.067	U	0.200	N	5	100	Y
CAWA-18-63	1203975305	METHOD BLANK	EPA:245.2	Mercury	-0.073	ug/L	0.067	U	0.200	N	5	100	Y
CAWA-18-64	1203975305	METHOD BLANK	EPA:245.2	Mercury	-0.073	ug/L	0.067	U	0.200	N	5	100	Y
CAWA-18-151309	1203975305	METHOD BLANK	EPA:245.2	Mercury	-0.073	ug/L	0.067	U	0.200	N	5	100	Y
CAWA-18-151310	1203975305	METHOD BLANK	EPA:245.2	Mercury	-0.073	ug/L	0.067	U	0.200	N	5	100	Y
CAPA-18-13	1203974103	METHOD BLANK	EPA:365.4	Total Phosphate as Phosphorus	0.035	mg/L	0.0698		0.050	Y	5	100	Y
CAPA-18-3	1203974103	METHOD BLANK	EPA:365.4	Total Phosphate as Phosphorus	0.035	mg/L	0.0476	J	0.050	Y	5	100	Y
CAWA-18-63	1203974103	METHOD BLANK	EPA:365.4	Total Phosphate as Phosphorus	0.035	mg/L	0.0533		0.050	Y	5	100	Y
CAWA-18-151309	1203974103	METHOD BLANK	EPA:365.4	Total Phosphate as Phosphorus	0.035	mg/L	0.0479	J	0.050	Y	5	100	Y
CAPA-18-13	1203972538	METHOD BLANK	SW-846:6010C	Potassium	110	ug/L	2290		150	Y	5	100	Y
CAPA-18-14	1203972538	METHOD BLANK	SW-846:6010C	Potassium	110	ug/L	2410		150	Y	5	100	Y
CAPA-18-3	1203972538	METHOD BLANK	SW-846:6010C	Potassium	110	ug/L	1140		150	Y	5	100	Y
CAWA-18-63	1203972538	METHOD BLANK	SW-846:6010C	Potassium	110	ug/L	1010		150	Y	5	100	Y
CAWA-18-151309	1203972538	METHOD BLANK	SW-846:6010C	Potassium	110	ug/L	932		150	Y	5	100	Y

6. Any surrogate recoveries outside the control limits?

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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.

Location ID	COC Number	Field Sample ID	Sample Purpose	Analysis Type Code	Analytical Suite	Analytical Method	Paramter Name	Lab Qualifier	Validation Qualifier	Validation Reason Codes	Detect Flag	Lab Result	Lab Units	Report Result	Report Units	Report MDA	Report Uncertainty	Lab Matrix	Sample Date	Percent	Analysis Lot ID	Validation Status Code	Use Flag
Paj bel S-N Anch E Basin	2018-1719	CAPA-18-13	REG	INIT	INORGANIC	SW-846:6010C	Potassium		J+	I4a	Y	2290	ug/L	2.29	mg/L			W	02/13/2018		1739540	VAL	Y
Paj bel S-N Anch E Basin	2018-1719	CAPA-18-13	REG	INIT	GENERAL CHEMISTRY	EPA:365.4	Total Phosphate as Phosphorus		U	I4	N	0.0698	mg/L	0.0698	mg/L			W	02/13/2018		1740095	VAL	Y
Paj bel S-N Anch E Basin	2018-1719	CAPA-18-14	REG	INIT	RAD	HASL-300:AM-241	Americium-241	U	U	R5	N	0.00486	pCi/L	0.00486	pCi/L	0.0411	0.00595	W	02/13/2018		1739814	VAL	Y
Paj bel S-N Anch E Basin	2018-1719	CAPA-18-14	REG	INIT	RAD	EPA:901.1	Cesium-137	U	U	R5	N	0.0473	pCi/L	0.0473	pCi/L	3.32	0.900	W	02/13/2018		1739683	VAL	Y

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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
Paj bel S-N Anch E Basin	2018-1719	CAPA-18-14	REG	INIT	RAD	EPA:901.1	Cobalt-60	U	U	R5	N	-0.599	pCi/L	-0.599	pCi/L	3.63	0.978	W	02/13/2018		1739683	VAL	Y
Paj bel S-N Anch E Basin	2018-1719	CAPA-18-14	REG	INIT	RAD	EPA:900	Gross alpha	U	U	R5	N	0.308	pCi/L	0.308	pCi/L	2.98	0.735	W	02/13/2018		1740250	VAL	Y
Paj bel S-N Anch E Basin	2018-1719	CAPA-18-14	REG	INIT	RAD	EPA:900	Gross beta	U	U	R5	N	2.22	pCi/L	2.22	pCi/L	2.48	0.821	W	02/13/2018		1740250	VAL	Y
Paj bel S-N Anch E Basin	2018-1719	CAPA-18-14	REG	INIT	RAD	EPA:901.1	Neptunium-237	U	U	R5	N	-0.926	pCi/L	-0.926	pCi/L	6.50	1.81	W	02/13/2018		1739683	VAL	Y
Paj bel S-N Anch E Basin	2018-1719	CAPA-18-14	REG	INIT	RAD	HASL-300:ISOPU	Plutonium-238	U	U	R5	N	0.00798	pCi/L	0.00798	pCi/L	0.0347	0.00798	W	02/13/2018		1739815	VAL	Y
Paj bel S-N Anch E Basin	2018-1719	CAPA-18-14	REG	INIT	RAD	HASL-300:ISOPU	Plutonium-239/240	U	U	R5	N	0.00000000166	pCi/L	0.00000000166	pCi/L	0.0279	0.00691	W	02/13/2018		1739815	VAL	Y
Paj bel S-N Anch E Basin	2018-1719	CAPA-18-14	REG	INIT	INORGANIC	SW-846:6010C	Potassium		J+	I4a	Y	2410	ug/L	2.41	mg/L			W	02/13/2018		1739540	VAL	Y
Paj bel S-N Anch E Basin	2018-1719	CAPA-18-14	REG	INIT	RAD	EPA:901.1	Potassium-40	U	U	R5	N	2.89	pCi/L	2.89	pCi/L	34.9	13.7	W	02/13/2018		1739683	VAL	Y
Paj bel S-N Anch E Basin	2018-1719	CAPA-18-14	REG	INIT	RAD	EPA:901.1	Sodium-22	U	U	R5	N	0.859	pCi/L	0.859	pCi/L	3.85	0.900	W	02/13/2018		1739683	VAL	Y
Paj bel S-N Anch E Basin	2018-1719	CAPA-18-14	REG	INIT	RAD	EPA:905.0	Strontium-90	U	U	R5	N	0.134	pCi/L	0.134	pCi/L	0.490	0.144	W	02/13/2018		1740247	VAL	Y
Paj bel S-N Anch E Basin	2018-1719	CAPA-18-14	REG	INIT	RAD	HASL-300:ISOU	Uranium-234	U	U	R5	N	0.0452	pCi/L	0.0452	pCi/L	0.173	0.0183	W	02/13/2018		1739816	VAL	Y
Paj bel S-N Anch E Basin	2018-1719	CAPA-18-14	REG	INIT	RAD	HASL-300:ISOU	Uranium-235/236	U	U	R5	N	0.0296	pCi/L	0.0296	pCi/L	0.0968	0.0135	W	02/13/2018		1739816	VAL	Y
Paj bel S-N Anch E Basin	2018-1719	CAPA-18-14	REG	INIT	RAD	HASL-300:ISOU	Uranium-238	U	U	R5	N	0.049	pCi/L	0.049	pCi/L	0.0877	0.0155	W	02/13/2018		1739816	VAL	Y
R-18	2018-1719	CAPA-18-3	REG	INIT	INORGANIC	SW-846:6010C	Potassium		J+	I4a	Y	1140	ug/L	1.14	mg/L			W	02/13/2018		1739540	VAL	Y
R-18	2018-1719	CAPA-18-3	REG	INIT	GENERAL CHEMISTRY	EPA:365.4	Total Phosphate as Phosphorus	U	U	I4	N	0.0476	mg/L	0.0476	mg/L			W	02/13/2018		1740095	VAL	Y
R-18	2018-1719	CAPA-18-4	REG	INIT	RAD	HASL-300:AM-241	Americium-241	U	U	R5	N	0.00654	pCi/L	0.00654	pCi/L	0.0368	0.00576	W	02/13/2018		1739814	VAL	Y
R-18	2018-1719	CAPA-18-4	REG	INIT	RAD	EPA:901.1	Cesium-137	U	U	R5	N	0.389	pCi/L	0.389	pCi/L	3.17	0.829	W	02/13/2018		1739683	VAL	Y
R-18	2018-1719	CAPA-18-4	REG	INIT	RAD	EPA:901.1	Cobalt-60	U	U	R5	N	-0.561	pCi/L	-0.561	pCi/L	3.64	0.987	W	02/13/2018		1739683	VAL	Y
R-18	2018-1719	CAPA-18-4	REG	INIT	RAD	EPA:900	Gross alpha	U	U	R5	N	0.245	pCi/L	0.245	pCi/L	1.87	0.479	W	02/13/2018		1740250	VAL	Y
R-18	2018-1719	CAPA-18-4	REG	INIT	RAD	EPA:900	Gross beta	U	U	R5	N	0.518	pCi/L	0.518	pCi/L	2.54	0.718	W	02/13/2018		1740250	VAL	Y
R-18	2018-1719	CAPA-18-4	REG	INIT	RAD	EPA:901.1	Neptunium-237	U	U	R5	N	-1.12	pCi/L	-1.12	pCi/L	7.03	1.96	W	02/13/2018		1739683	VAL	Y
R-18	2018-1719	CAPA-18-4	REG	INIT	RAD	HASL-300:ISOPU	Plutonium-238	U	U	R5	N	0.0113	pCi/L	0.0113	pCi/L	0.0328	0.00598	W	02/13/2018		1739815	VAL	Y
R-18	2018-1719	CAPA-18-4	REG	INIT	RAD	HASL-300:ISOPU	Plutonium-239/240	U	U	R5	N	-0.00378	pCi/L	-0.00378	pCi/L	0.0264	0.00654	W	02/13/2018		1739815	VAL	Y
R-18	2018-1719	CAPA-18-4	REG	INIT	RAD	EPA:901.1	Potassium-40	U	U	R5	N	-19.7	pCi/L	-19.7	pCi/L	47.2	15.3	W	02/13/2018		1739683	VAL	Y
R-18	2018-1719	CAPA-18-4	REG	INIT	RAD	EPA:901.1	Sodium-22	U	U	R5	N	-1.29	pCi/L	-1.29	pCi/L	3.21	1.04	W	02/13/2018		1739683	VAL	Y
R-18	2018-1719	CAPA-18-4	REG	INIT	RAD	EPA:905.0	Strontium-90	U	U	R5	N	0.358	pCi/L	0.358	pCi/L	0.465	0.151	W	02/13/2018		1740247	VAL	Y
R-18	2018-1719	CAPA-18-4	REG	INIT	RAD	HASL-300:ISOU	Uranium-235/236	U	U	R5	N	0.0117	pCi/L	0.0117	pCi/L	0.0894	0.0117	W	02/13/2018		1739816	VAL	Y
R-47	2018-1719	CAWA-18-151309	FD	INIT	INORGANIC	SW-846:6010C	Potassium		J+	I4a	Y	932	ug/L	0.932	mg/L			W	02/13/2018		1739540	VAL	Y
R-47	2018-1719	CAWA-18-151309	FD	INIT	GENERAL CHEMISTRY	EPA:365.4	Total Phosphate as Phosphorus	U	U	I4	N	0.0479	mg/L	0.0479	mg/L			W	02/13/2018		1740095	VAL	Y
R-47	2018-1719	CAWA-18-151310	FD	INIT	RAD	HASL-300:AM-241	Americium-241	U	U	R5	N	0.00415	pCi/L	0.00415	pCi/L	0.0351	0.00509	W	02/13/2018		1739814	VAL	Y
R-47	2018-1719	CAWA-18-151310	FD	INIT	RAD	EPA:901.1	Cesium-137	U	U	R5	N	1.12	pCi/L	1.12	pCi/L	4.12	1.05	W	02/13/2018		1739683	VAL	Y

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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-47	2018-1719	CAWA-18-151310	FD	INIT	RAD	EPA:901.1	Cobalt-60	U	U	R5	N	1.39	pCi/L	1.39	pCi/L	4.93	1.17	W	02/13/2018		1739683	VAL	Y
R-47	2018-1719	CAWA-18-151310	FD	INIT	RAD	EPA:900	Gross alpha	U	U	R5	N	0.531	pCi/L	0.531	pCi/L	2.13	0.587	W	02/13/2018		1740250	VAL	Y
R-47	2018-1719	CAWA-18-151310	FD	INIT	RAD	EPA:900	Gross beta	U	U	R5	N	0.0354	pCi/L	0.0354	pCi/L	2.81	0.762	W	02/13/2018		1740250	VAL	Y
R-47	2018-1719	CAWA-18-151310	FD	INIT	RAD	EPA:901.1	Neptunium-237	U	U	R5	N	1.1	pCi/L	1.1	pCi/L	7.99	2.13	W	02/13/2018		1739683	VAL	Y
R-47	2018-1719	CAWA-18-151310	FD	INIT	RAD	HASL-300:ISOPU	Plutonium-238	U	U	R5	N	0.00000000294	pCi/L	0.00000000294	pCi/L	0.034	0.00876	W	02/13/2018		1739815	VAL	Y
R-47	2018-1719	CAWA-18-151310	FD	INIT	RAD	HASL-300:ISOPU	Plutonium-239/240	U	U	R5	N	-0.00587	pCi/L	-0.00587	pCi/L	0.0274	0.00897	W	02/13/2018		1739815	VAL	Y
R-47	2018-1719	CAWA-18-151310	FD	INIT	RAD	EPA:901.1	Potassium-40	U	U	R5	N	18.5	pCi/L	18.5	pCi/L	37.1	16.7	W	02/13/2018		1739683	VAL	Y
R-47	2018-1719	CAWA-18-151310	FD	INIT	RAD	EPA:901.1	Sodium-22	U	U	R5	N	0.317	pCi/L	0.317	pCi/L	3.93	0.960	W	02/13/2018		1739683	VAL	Y
R-47	2018-1719	CAWA-18-151310	FD	INIT	RAD	EPA:905.0	Strontium-90	U	U	R5	N	0.0329	pCi/L	0.0329	pCi/L	0.485	0.132	W	02/13/2018		1740247	VAL	Y
R-47	2018-1719	CAWA-18-151310	FD	INIT	RAD	HASL-300:ISOU	Uranium-235/236	U	U	R5	N	0.0384	pCi/L	0.0384	pCi/L	0.0837	0.0138	W	02/13/2018		1739816	VAL	Y
R-47	2018-1719	CAWA-18-63	REG	INIT	INORGANIC	SW-846:6010C	Potassium		J+	I4a	Y	1010	ug/L	1.01	mg/L			W	02/13/2018		1739540	VAL	Y
R-47	2018-1719	CAWA-18-63	REG	INIT	GENERAL CHEMISTRY	EPA:365.4	Total Phosphate as Phosphorus		U	I4	N	0.0533	mg/L	0.0533	mg/L			W	02/13/2018		1740095	VAL	Y
R-47	2018-1719	CAWA-18-64	REG	INIT	RAD	HASL-300:AM-241	Americium-241	U	U	R5	N	0.0125	pCi/L	0.0125	pCi/L	0.0351	0.00657	W	02/13/2018		1739814	VAL	Y
R-47	2018-1719	CAWA-18-64	REG	INIT	RAD	EPA:901.1	Cesium-137	U	U	R5	N	0.357	pCi/L	0.357	pCi/L	4.79	1.35	W	02/13/2018		1739683	VAL	Y
R-47	2018-1719	CAWA-18-64	REG	INIT	RAD	EPA:901.1	Cobalt-60	U	U	R5	N	0.0225	pCi/L	0.0225	pCi/L	5.56	1.35	W	02/13/2018		1739683	VAL	Y
R-47	2018-1719	CAWA-18-64	REG	INIT	RAD	EPA:900	Gross alpha	U	U	R5	N	-0.0482	pCi/L	-0.0482	pCi/L	2.84	0.702	W	02/13/2018		1740250	VAL	Y
R-47	2018-1719	CAWA-18-64	REG	INIT	RAD	EPA:900	Gross beta	U	U	R5	N	-0.288	pCi/L	-0.288	pCi/L	2.58	0.672	W	02/13/2018		1740250	VAL	Y
R-47	2018-1719	CAWA-18-64	REG	INIT	RAD	EPA:901.1	Neptunium-237	U	U	R5	N	-4.18	pCi/L	-4.18	pCi/L	7.30	2.41	W	02/13/2018		1739683	VAL	Y
R-47	2018-1719	CAWA-18-64	REG	INIT	RAD	HASL-300:ISOPU	Plutonium-238	U	U	R5	N	0.00241	pCi/L	0.00241	pCi/L	0.0419	0.0087	W	02/13/2018		1739815	VAL	Y
R-47	2018-1719	CAWA-18-64	REG	INIT	RAD	HASL-300:ISOPU	Plutonium-239/240	U	U	R5	N	0.0121	pCi/L	0.0121	pCi/L	0.0338	0.008	W	02/13/2018		1739815	VAL	Y
R-47	2018-1719	CAWA-18-64	REG	INIT	RAD	EPA:901.1	Potassium-40	U	U	R5	N	-29.3	pCi/L	-29.3	pCi/L	70.0	20.3	W	02/13/2018		1739683	VAL	Y
R-47	2018-1719	CAWA-18-64	REG	INIT	RAD	EPA:901.1	Sodium-22	U	U	R5	N	0.347	pCi/L	0.347	pCi/L	6.65	1.71	W	02/13/2018		1739683	VAL	Y
R-47	2018-1719	CAWA-18-64	REG	INIT	RAD	EPA:905.0	Strontium-90	U	U	R5	N	0.113	pCi/L	0.113	pCi/L	0.464	0.131	W	02/13/2018		1740247	VAL	Y
R-47	2018-1719	CAWA-18-64	REG	INIT	RAD	HASL-300:ISOU	Uranium-235/236	U	U	R5	N	0.0145	pCi/L	0.0145	pCi/L	0.095	0.0103	W	02/13/2018		1739816	VAL	Y

Reason Code

Description

I4

the sample result is =<5x the concentration of related analyte in the method blank.

I4a

The affected analytes are considered estimated and biased high because this analyte was identified in the method blank but was >5x

J_LAB

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

Only results shown in Section 13 'Display Flagged Data' are current as of this report generation. All other sections are valid for the date the COC data was inserted into EIM, and may have changed due to data updates in the intervening time.

DATA VALIDATION REPORT

Reason Code

Description

NQ	The analytical laboratory did not qualify the analyte as not detected and/or any other standard qualfire. The analyte is detected in the sample.
R5	Analyte is not detected because the amount reported is less than the MDC.
U_LAB	The analytical laboratory qualified the analyte as not detected.

14. Usable Result Count.

Field Sample ID	Location ID	Sample Purpose	Analytical Method	No. Unuseable Records	Total Records
CAPA-18-13	Paj bel S-N Anch E Basin	REG	EPA:120.1	0	1
CAPA-18-13	Paj bel S-N Anch E Basin	REG	EPA:150.1	0	1
CAPA-18-13	Paj bel S-N Anch E Basin	REG	EPA:160.1	0	1
CAPA-18-13	Paj bel S-N Anch E Basin	REG	EPA:170.0	0	1
CAPA-18-13	Paj bel S-N Anch E Basin	REG	EPA:245.2	0	1
CAPA-18-13	Paj bel S-N Anch E Basin	REG	EPA:300.0	0	4
CAPA-18-13	Paj bel S-N Anch E Basin	REG	EPA:310.1	0	2
CAPA-18-13	Paj bel S-N Anch E Basin	REG	EPA:350.1	0	1
CAPA-18-13	Paj bel S-N Anch E Basin	REG	EPA:353.2	0	1
CAPA-18-13	Paj bel S-N Anch E Basin	REG	EPA:365.4	0	1
CAPA-18-13	Paj bel S-N Anch E Basin	REG	SM:A2340B	0	1
CAPA-18-13	Paj bel S-N Anch E Basin	REG	SW-846:6010C	0	17
CAPA-18-13	Paj bel S-N Anch E Basin	REG	SW-846:6020	0	11
CAPA-18-13	Paj bel S-N Anch E Basin	REG	SW-846:6850	0	1
CAPA-18-14	Paj bel S-N Anch E Basin	REG	EPA:170.0	0	1
CAPA-18-14	Paj bel S-N Anch E Basin	REG	EPA:245.2	0	1
CAPA-18-14	Paj bel S-N Anch E Basin	REG	EPA:335.4	0	1
CAPA-18-14	Paj bel S-N Anch E Basin	REG	EPA:351.2	0	1
CAPA-18-14	Paj bel S-N Anch E Basin	REG	EPA:900	0	2
CAPA-18-14	Paj bel S-N Anch E Basin	REG	EPA:901.1	0	5
CAPA-18-14	Paj bel S-N Anch E Basin	REG	EPA:905.0	0	1
CAPA-18-14	Paj bel S-N Anch E Basin	REG	HASL-300:AM-241	0	1
CAPA-18-14	Paj bel S-N Anch E Basin	REG	HASL-300:ISOPU	0	2
CAPA-18-14	Paj bel S-N Anch E Basin	REG	HASL-300:ISOU	0	3
CAPA-18-14	Paj bel S-N Anch E Basin	REG	SM:A2340B	0	1
CAPA-18-14	Paj bel S-N Anch E Basin	REG	SW-846:6010C	0	16
CAPA-18-14	Paj bel S-N Anch E Basin	REG	SW-846:6020	0	11
CAPA-18-14	Paj bel S-N Anch E Basin	REG	SW-846:8260B	0	80

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DATA VALIDATION REPORT

Field Sample ID	Location ID	Sample Purpose	Analytical Method	No. Unuseable Records	Total Records
CAPA-18-14	Paj bel S-N Anch E Basin	REG	SW-846:8270D	0	80
CAPA-18-14	Paj bel S-N Anch E Basin	REG	SW-846:8330B	0	23
CAPA-18-14	Paj bel S-N Anch E Basin	REG	SW-846:9060	0	1
CAPA-18-15	Paj bel S-N Anch E Basin	FTB	EPA:170.0	0	1
CAPA-18-15	Paj bel S-N Anch E Basin	FTB	SW-846:8260B	0	80
CAPA-18-3	R-18	REG	EPA:120.1	0	1
CAPA-18-3	R-18	REG	EPA:150.1	0	1
CAPA-18-3	R-18	REG	EPA:160.1	0	1
CAPA-18-3	R-18	REG	EPA:170.0	0	1
CAPA-18-3	R-18	REG	EPA:245.2	0	1
CAPA-18-3	R-18	REG	EPA:300.0	0	4
CAPA-18-3	R-18	REG	EPA:310.1	0	2
CAPA-18-3	R-18	REG	EPA:350.1	0	1
CAPA-18-3	R-18	REG	EPA:353.2	0	1
CAPA-18-3	R-18	REG	EPA:365.4	0	1
CAPA-18-3	R-18	REG	SM:A2340B	0	1
CAPA-18-3	R-18	REG	SW-846:6010C	0	17
CAPA-18-3	R-18	REG	SW-846:6020	0	11
CAPA-18-3	R-18	REG	SW-846:6850	0	1
CAPA-18-4	R-18	REG	EPA:170.0	0	1
CAPA-18-4	R-18	REG	EPA:245.2	0	1
CAPA-18-4	R-18	REG	EPA:335.4	0	1
CAPA-18-4	R-18	REG	EPA:351.2	0	1
CAPA-18-4	R-18	REG	EPA:900	0	2
CAPA-18-4	R-18	REG	EPA:901.1	0	5
CAPA-18-4	R-18	REG	EPA:905.0	0	1
CAPA-18-4	R-18	REG	HASL-300:AM-241	0	1
CAPA-18-4	R-18	REG	HASL-300:ISOPU	0	2
CAPA-18-4	R-18	REG	HASL-300:ISOU	0	3
CAPA-18-4	R-18	REG	SW-846:8260B	0	80
CAPA-18-4	R-18	REG	SW-846:8270D	0	80
CAPA-18-4	R-18	REG	SW-846:8330B	0	23
CAPA-18-4	R-18	REG	SW-846:9060	0	1
CAPA-18-7	R-18	FTB	EPA:170.0	0	1
CAPA-18-7	R-18	FTB	SW-846:8260B	0	80
CAPA-18-8	R-18	FB	EPA:170.0	0	1

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DATA VALIDATION REPORT

Field Sample ID	Location ID	Sample Purpose	Analytical Method	No. Unuseable Records	Total Records
CAPA-18-8	R-18	FB	SW-846:8260B	0	80
CAPA-18-8	R-18	FB	SW-846:8270D	0	80
CAWA-18-114	R-47	FTB	EPA:170.0	0	1
CAWA-18-114	R-47	FTB	SW-846:8260B	0	80
CAWA-18-151309	R-47	FD	EPA:120.1	0	1
CAWA-18-151309	R-47	FD	EPA:150.1	0	1
CAWA-18-151309	R-47	FD	EPA:160.1	0	1
CAWA-18-151309	R-47	FD	EPA:170.0	0	1
CAWA-18-151309	R-47	FD	EPA:245.2	0	1
CAWA-18-151309	R-47	FD	EPA:300.0	0	4
CAWA-18-151309	R-47	FD	EPA:310.1	0	2
CAWA-18-151309	R-47	FD	EPA:350.1	0	1
CAWA-18-151309	R-47	FD	EPA:353.2	0	1
CAWA-18-151309	R-47	FD	EPA:365.4	0	1
CAWA-18-151309	R-47	FD	SM:A2340B	0	1
CAWA-18-151309	R-47	FD	SW-846:6010C	0	17
CAWA-18-151309	R-47	FD	SW-846:6020	0	11
CAWA-18-151309	R-47	FD	SW-846:6850	0	1
CAWA-18-151310	R-47	FD	EPA:170.0	0	1
CAWA-18-151310	R-47	FD	EPA:245.2	0	1
CAWA-18-151310	R-47	FD	EPA:335.4	0	1
CAWA-18-151310	R-47	FD	EPA:351.2	0	1
CAWA-18-151310	R-47	FD	EPA:900	0	2
CAWA-18-151310	R-47	FD	EPA:901.1	0	5
CAWA-18-151310	R-47	FD	EPA:905.0	0	1
CAWA-18-151310	R-47	FD	HASL-300:AM-241	0	1
CAWA-18-151310	R-47	FD	HASL-300:ISOPU	0	2
CAWA-18-151310	R-47	FD	HASL-300:ISOU	0	3
CAWA-18-151310	R-47	FD	SW-846:8260B	0	80
CAWA-18-151310	R-47	FD	SW-846:8270D	0	80
CAWA-18-151310	R-47	FD	SW-846:8330B	0	23
CAWA-18-151310	R-47	FD	SW-846:9060	0	1
CAWA-18-63	R-47	REG	EPA:120.1	0	1
CAWA-18-63	R-47	REG	EPA:150.1	0	1
CAWA-18-63	R-47	REG	EPA:160.1	0	1
CAWA-18-63	R-47	REG	EPA:170.0	0	1

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DATA VALIDATION REPORT

Field Sample ID	Location ID	Sample Purpose	Analytical Method	No. Unuseable Records	Total Records
CAWA-18-63	R-47	REG	EPA:245.2	0	1
CAWA-18-63	R-47	REG	EPA:300.0	0	4
CAWA-18-63	R-47	REG	EPA:310.1	0	2
CAWA-18-63	R-47	REG	EPA:350.1	0	1
CAWA-18-63	R-47	REG	EPA:353.2	0	1
CAWA-18-63	R-47	REG	EPA:365.4	0	1
CAWA-18-63	R-47	REG	SM:A2340B	0	1
CAWA-18-63	R-47	REG	SW-846:6010C	0	17
CAWA-18-63	R-47	REG	SW-846:6020	0	11
CAWA-18-63	R-47	REG	SW-846:6850	0	1
CAWA-18-64	R-47	REG	EPA:170.0	0	1
CAWA-18-64	R-47	REG	EPA:245.2	0	1
CAWA-18-64	R-47	REG	EPA:335.4	0	1
CAWA-18-64	R-47	REG	EPA:351.2	0	1
CAWA-18-64	R-47	REG	EPA:900	0	2
CAWA-18-64	R-47	REG	EPA:901.1	0	5
CAWA-18-64	R-47	REG	EPA:905.0	0	1
CAWA-18-64	R-47	REG	HASL-300:AM-241	0	1
CAWA-18-64	R-47	REG	HASL-300:ISOPU	0	2
CAWA-18-64	R-47	REG	HASL-300:ISOU	0	3
CAWA-18-64	R-47	REG	SW-846:8260B	0	80
CAWA-18-64	R-47	REG	SW-846:8270D	0	80
CAWA-18-64	R-47	REG	SW-846:8330B	0	23
CAWA-18-64	R-47	REG	SW-846:9060	0	1

March 14, 2018

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: 443888
SDG: 2018-1719

Dear Ms. Patel:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the following analytical results for the sample(s) we received on February 15, 2018, and analyzed for Explosives by LCMSMS, 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,


Brielle Luthman for
Valerie Davis
Project Manager

Chain of Custody: 2018-1719
Enclosures



ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)
LANL- WQH Water Samples
Work Order #: 443888
SDG: 2018-1719

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Case Narrative

**Case Narrative for
ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)
LANL- WQH Water Samples
Workorder #: 443888
SDG # : 2018-1719**

March 14, 2018

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 February 15, 2018 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>
443888001	CAPA-18-13
443888002	CAPA-18-14
443888003	CAPA-18-14
443888004	CAPA-18-15
443888005	CAPA-18-3
443888006	CAPA-18-4
443888007	CAPA-18-4
443888008	CAPA-18-7
443888009	CAPA-18-8
443888010	CAWA-18-63
443888011	CAWA-18-64
443888012	CAWA-18-64
443888013	CAWA-18-114
443888014	CAWA-18-151309
443888015	CAWA-18-151310
443888016	CAWA-18-151310

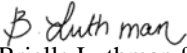
Case Narrative

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

Data Package

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


Brielle Luthman for
Valerie Davis
Project Manager

List of current GEL Certifications as of 14 March 2018

State	Certification
Alaska	17-018
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	LA180011
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	T104704235-18-13
Utah NELAP	SC000122017-25
Vermont	VT87156
Virginia NELAP	460202
Washington	C780
West Virginia	997404

Chain of Custody and Supporting Documentation

443888

General Engineering		Chain of Custody/Analysis Request										COC/Lab Request #: 2018-1719 Page 1 of 1							
Client Contact:		Lab Agreement #:		Site Name: Los Alamos National Laboratory															
Project Number: ADEP		Analysis Turnaround Time:		Sample Date		Sample Time		Sample Matrix		Rad Screening Info:									
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"/>		Lab Reporting Limit Type: Method Detection Limit									
Field Sample ID	Sample Date	Sample Time	Sample Matrix	MSGP-Hg	WSP-8260B-VOA	WSP-8270C-SVOA	WSP-8330B-NMED HEXMOD	WSP-All Metals	WSP-CN(T)	WSP-GENINORG+Perchlorate	WSP-GrossA/B	WSP-NH3+NO3/NO2+PO4	WSP-RAD	WSP-TKN+TOC					
CAPA-18-13	Feb 13 2018	11:44	W					1	1	1		1							
CAPA-18-14	Feb 13 2018	11:44	W		2	2	3	1	1		1		1	1					
CAPA-18-15	Feb 13 2018	11:44	W		2														
CAPA-18-3	Feb 13 2018	13:47	W					1		1		1							
CAPA-18-4	Feb 13 2018	13:47	W	1	2	2	3		1		1		1	1					
CAPA-18-5	Feb 13 2018	13:47	W																
CAPA-18-7	Feb 13 2018	13:47	W		2														
CAPA-18-8	Feb 13 2018	13:47	W		2	2													
CAWA-18-63	Feb 13 2018	12:50	W					1		1		1							
CAWA-18-64	Feb 13 2018	12:50	W	1	2	2	3		1		1		1	1					
CAWA-18-65	Feb 13 2018	12:50	W																
CAWA-18-114	Feb 13 2018	12:50	W		2														
CAWA-18-151309	Feb 13 2018	12:50	W					1		1		1							
CAWA-18-151310	Feb 13 2018	12:50	W	1	2	2	3		1		1		1	1					

Special Instructions:

Relinquished by: *Patricia Oselt*Print Name: *Patricia Oselt*Date/Time: *2/13/18 15:00*Received by: *[Signature]*Print Name: *Ben Worsham*Date/Time: *2/15/18 09:20*

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 RECEIPT & REVIEW FORM

Client: <u>ESHL</u>		SDG/AR/COC/Work Order: <u>443888</u>	
Received By: <u>ZKW</u>		Date Received: <u>2/15/18</u>	
Carrier and Tracking Number		Circle Applicable: FedEx Express FedEx Ground UPS Field Services Courier Other <u>5908 1783 5040-3C</u> <u>5908 1783 5050-3C</u> <u>5908 1783 5028-20C</u> <u>5908 1783 5061-22</u> <u>5908 1783 5039-2C</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> <u>CPM</u> mR/Hr Classified as: Rad 1 Rad 2 Rad 3	
Is package, COC, and/or Samples marked HAZ?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	If yes, select Hazards below, and contact the GEL Safety Group. PCB's Flammable Foreign Soil RCRA Asbestos Beryllium Other: _____	

Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1 Shipping containers received intact and sealed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2 Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3 Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Preservation Method: Wet Ice Ice Packs 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 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? <u>2/15/18</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected: <u>-151172 has a collect date of 2/12/18 on sample</u>
11 Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected: _____
12 Are sample containers identifiable as GEL provided?	<input type="checkbox"/>	<input 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):

PM (or PMA) review: Initials TMC Date 2/20/18 Page 1 of 1

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

SHIP DATE: 14FEB18
ACTWGT: 51.0 LB MAN
CAD: 0014176/CAFE2916

LOS ALAMOS, NM 87545
UNITED STATES US

BILL SENDER

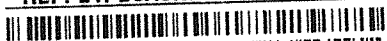
D VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

3c

CHARLESTON SC 29407

(843) 566-8171

REF: 21PDOASRGW04BAGWE0



FedEx
Express



JT1513150613010V

3 of 3
MPS# 5908 1783 5040
0263

Mstr# 5908 1783 5028

0201

THU - 15 FEB 10:30A
PRIORITY OVERNIGHT

X7 RBWA

29407
SC-US CHS



Part # 155148V-434 RIT2 EXP 02/18 **

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

SHIP DATE: 14FEB18
ACTWGT: 48.0 LB MAN
CAD: 0014176/CAFE2916

LOS ALAMOS, NM 87545
UNITED STATES US

BILL SENDER

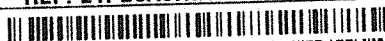
TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

2c

CHARLESTON SC 29407

(843) 566-8171

REF: 21PDOASRGW04BAGWE0



FedEx
Express



JT1513150613010V

2 of 3
MPS# 5908 1783 5039
0263

Mstr# 5908 1783 5028

0201

THU - 15 FEB 10:30A
PRIORITY OVERNIGHT

X7 RBWA

29407
SC-US CHS



Part # 155148V-434 RIT2 EXP 02/18 **

862E/022T/13085

SHIP DATE: 14FEB18
ACTWGT: 42.0 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

D VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

2c

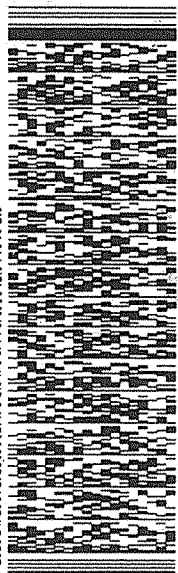
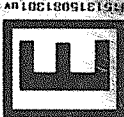
CHARLESTON SC 29407

(843) 566-8171

REF: 3N030ATT47100TMANT



FedEx
Express

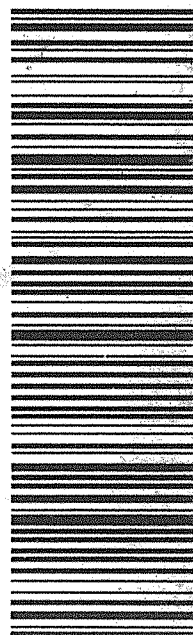


THU - 15 FEB 10:30A
PRIORITY OVERNIGHT

TRK# 5908 1783 5061
0201

X7 RBWA

29407
SC-US CHS



SHIP DATE: 14FEB18
ACTWGT: 50.0 LB MAN
CAD: 0014176/CAFE2916

ORIGIN ID:SAFA (505) 665-9966

KEITH GREENE
LOS ALAMOS NATL LAB
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545
UNITED STATES US

BILL SENDER

TO VALERIE DAVIS

GENERAL ENGINEERING LAB

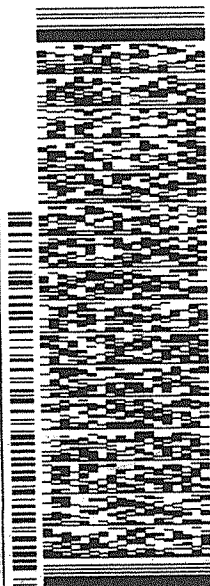
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 566-8171

REF: 21PD0ASRGW04BAGWEO

FedEx
Express

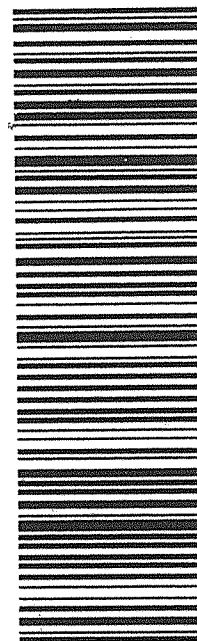


THU - 15 FEB 10:30A
PRIORITY OVERNIGHT

1 of 3
TRK# 5908 1783 5028
I0201

MASTER

X7 RBWA
29407
SC-US CHS



Part # 156148V-434 R1T2 EXP 02/18 ***

ORIGIN ID:SAFA (505) 665-9966

SHIP DATE: 14FEB18
ACTWGT: 49.0 LB MAN
CAD: 0014176/CAFE2916

KEITH GREENE
LOS ALAMOS NATL LAB
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545
UNITED STATES US

BILL SENDER

TO VALERIE DAVIS

GENERAL ENGINEERING LAB

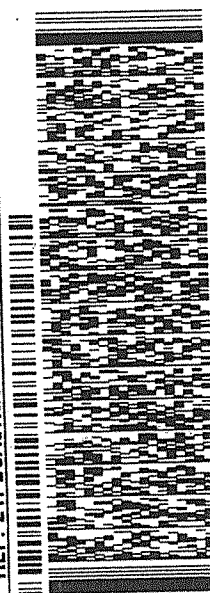
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 566-8171

REF: 21PD0ASRGW04BAGWEO

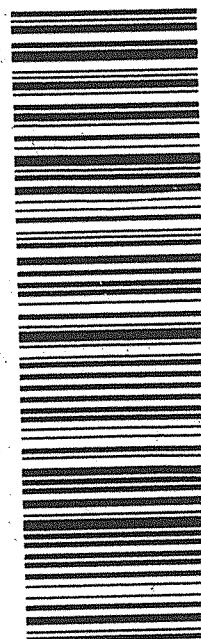
FedEx
Express



THU - 15 FEB 10:30A
PRIORITY OVERNIGHT

TRK# 5908 1783 5050
I0201

X7 RBWA
29407
SC-US CHS



Part # 156148V-434 R1T2 EXP 02/18 ***

FZ 0
RT 0

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 #: 2018-1719
Work Order #: 443888**

Method/Analysis Information

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

Analytical Method: SW-846:8260B

Analytical Batch
Number: 1741056

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
443888002	CAPA-18-14
443888004	CAPA-18-15
443888007	CAPA-18-4
443888008	CAPA-18-7
443888009	CAPA-18-8
443888012	CAWA-18-64
443888013	CAWA-18-114
443888016	CAWA-18-151310
1203976517	443888009(CAPA-18-8) Post Spike (PS)
1203976518	443888009(CAPA-18-8) Post Spike (PS)
1203976521	443888009(CAPA-18-8) Post Spike Duplicate (PSD)
1203976522	443888009(CAPA-18-8) Post Spike Duplicate (PSD)
1203977904	Method Blank (MB)
1203977905	Laboratory Control Sample (LCS)
1203977906	Laboratory Control Sample (LCS)

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 443888009 (CAPA-18-8) 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 1203977904 (MB), 443888002 (CAPA-18-14), 443888004 (CAPA-18-15), 443888007 (CAPA-18-4), 443888008 (CAPA-18-7), 443888009 (CAPA-18-8), 443888012 (CAWA-18-64), 443888013 (CAWA-18-114) and 443888016 (CAWA-18-151310) 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
VOA9.I	Agilent 6890/5973 GC/MS w/ OI Eclipse/Archon Autosampler	HP6890/HP5973	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: 2018-1719 GEL Work Order: 443888

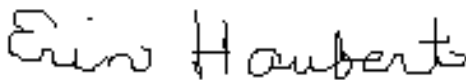
The Qualifiers in this report are defined as follows:

- * 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: Erin Haubert

Date: 13 MAR 2018

Title: Data Validator

Sample Data Summary

Volatile
Certificate of Analysis
Sample Summary

Page 1 of 3

SDG Number: 2018-1719

Lab Sample ID: 443888002

Date Collected: 02/13/2018 11:44

Date Received: 02/15/2018 09:05

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1741056

Inst: VOA9.I

Dilution: 1

Run Date: 02/23/2018 15:08

Analyst: RXY1

Purge Vol: 5 mL

Prep Date: 02/23/2018 15:08

Data File: 022318V9\9G513.D

Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	0.300	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	0.300	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	0.300	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	0.300	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	0.300	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	0.300	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	0.500	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	0.300	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	0.300	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	0.300	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
78-93-3	2-Butanone	U	1.50	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene	U	0.300	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	0.300	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	1.50	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene	U	0.300	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	0.300	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	1.50	ug/L	1.50	5.00
67-64-1	Acetone	J	1.95	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: 2018-1719

Lab Sample ID: 443888002

Date Collected: 02/13/2018 11:44

Date Received: 02/15/2018 09:05

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1741056

Inst: VOA9.I

Dilution: 1

Run Date: 02/23/2018 15:08

Analyst: RXY1

Purge Vol: 5 mL

Prep Date: 02/23/2018 15:08

Data File: 022318V9\9G513.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

Page 3 of 3

SDG Number: 2018-1719

Lab Sample ID: 443888002

Date Collected: 02/13/2018 11:44

Date Received: 02/15/2018 09:05

Matrix: W

Client: ARSL004

Project: ESHL00114

Client ID: CAPA-18-14

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1741056

Inst: VOA9.I

Dilution: 1

Run Date: 02/23/2018 15:08

Analyst: RXY1

Purge Vol: 5 mL

Prep Date: 02/23/2018 15:08

Column: DB-624

Data File: 022318V9\9G513.D

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	52.1	50.0	ug/L 104	(71%-134%)
Bromofluorobenzene	52.6	50.0	ug/L 105	(70%-131%)
Toluene-d8	53.6	50.0	ug/L 107	(74%-124%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown siloxane	12.292	5.71	ug/L	0	J
	unknown siloxane	14.651	9.67	ug/L	0	J

Volatile
Certificate of Analysis
Sample Summary

Page 1 of 3

SDG Number: 2018-1719

Lab Sample ID: 443888004

Date Collected: 02/13/2018 11:44

Date Received: 02/15/2018 09:05

Matrix: W

Client: ARSL004

Project: ESHL00114

Client ID: CAPA-18-15

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1741056

Inst: VOA9.I

Dilution: 1

Run Date: 02/23/2018 13:43

Analyst: RXY1

Purge Vol: 5 mL

Prep Date: 02/23/2018 13:43

Data File: 022318V9\9G510.D

Column: DB-624

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

Volatile
Certificate of Analysis
Sample Summary

Page 2 of 3

SDG Number: 2018-1719

Lab Sample ID: 443888004

Date Collected: 02/13/2018 11:44

Date Received: 02/15/2018 09:05

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1741056

Inst: VOA9.I

Dilution: 1

Run Date: 02/23/2018 13:43

Analyst: RXY1

Purge Vol: 5 mL

Prep Date: 02/23/2018 13:43

Data File: 022318V9\9G510.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

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SDG Number: 2018-1719

Lab Sample ID: 443888004

Date Collected: 02/13/2018 11:44

Date Received: 02/15/2018 09:05

Matrix: W

Client: ARSL004

Project: ESHL00114

Client ID: CAPA-18-15

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1741056

Inst: VOA9.I

Dilution: 1

Run Date: 02/23/2018 13:43

Analyst: RXY1

Purge Vol: 5 mL

Prep Date: 02/23/2018 13:43

Column: DB-624

Data File: 022318V9\9G510.D

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	51.4	50.0	ug/L 103	(71%-134%)
Bromofluorobenzene	52.0	50.0	ug/L 104	(70%-131%)
Toluene-d8	53.6	50.0	ug/L 107	(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: 2018-1719

Lab Sample ID: 443888007

Date Collected: 02/13/2018 13:47

Date Received: 02/15/2018 09:05

Matrix: W

Client: ARSL004

Project: ESHL00114

Client ID: CAPA-18-4

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1741056

Inst: VOA9.I

Dilution: 1

Run Date: 02/23/2018 15:36

Analyst: RXY1

Purge Vol: 5 mL

Prep Date: 02/23/2018 15:36

Data File: 022318V9\9G514.D

Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	0.300	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	0.300	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	0.300	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	0.300	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	0.300	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	0.300	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	0.500	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	0.300	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	0.300	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	0.300	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
78-93-3	2-Butanone	U	1.50	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene	U	0.300	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	0.300	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	1.50	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene	U	0.300	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	0.300	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	1.50	ug/L	1.50	5.00
67-64-1	Acetone	J	2.40	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: 2018-1719

Lab Sample ID: 443888007

Date Collected: 02/13/2018 13:47

Date Received: 02/15/2018 09:05

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1741056

Inst: VOA9.I

Dilution: 1

Run Date: 02/23/2018 15:36

Analyst: RXY1

Purge Vol: 5 mL

Prep Date: 02/23/2018 15:36

Data File: 022318V9\9G514.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**

Page 3 of 3

SDG Number: 2018-1719

Lab Sample ID: 443888007

Date Collected: 02/13/2018 13:47

Date Received: 02/15/2018 09:05

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Client ID: CAPA-18-4

Inst: VOA9.I

Dilution: 1

Batch ID: 1741056

Run Date: 02/23/2018 15:36

Analyst: RXY1

Purge Vol: 5 mL

Prep Date: 02/23/2018 15:36

Data File: 022318V9\9G514.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	52.5	50.0	ug/L 105	(71%-134%)
Bromofluorobenzene	52.3	50.0	ug/L 105	(70%-131%)
Toluene-d8	54.7	50.0	ug/L 109	(74%-124%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown siloxane	12.292	9.2	ug/L	0	J
	unknown siloxane	14.652	18	ug/L	0	J
	unknown siloxane	16.62	6.2	ug/L	0	J

Volatile
Certificate of Analysis
Sample Summary

Page 1 of 3

SDG Number: 2018-1719

Lab Sample ID: 443888008

Date Collected: 02/13/2018 13:47

Date Received: 02/15/2018 09:05

Matrix: W

Client: ARSL004

Project: ESHL00114

Client ID: CAPA-18-7

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1741056

Inst: VOA9.I

Dilution: 1

Run Date: 02/23/2018 14:11

Analyst: RXY1

Purge Vol: 5 mL

Prep Date: 02/23/2018 14:11

Data File: 022318V9\9G511.D

Column: DB-624

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

Volatile
Certificate of Analysis
Sample Summary

Page 2 of 3

SDG Number: 2018-1719

Lab Sample ID: 443888008

Date Collected: 02/13/2018 13:47

Date Received: 02/15/2018 09:05

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1741056

Inst: VOA9.I

Dilution: 1

Run Date: 02/23/2018 14:11

Analyst: RXY1

Purge Vol: 5 mL

Prep Date: 02/23/2018 14:11

Data File: 022318V9\9G511.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**

Page 3 of 3

SDG Number: 2018-1719

Lab Sample ID: 443888008

Date Collected: 02/13/2018 13:47

Date Received: 02/15/2018 09:05

Matrix: W

Client: ARSL004

Project: ESHL00114

Client ID: CAPA-18-7

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1741056

Inst: VOA9.I

Dilution: 1

Run Date: 02/23/2018 14:11

Analyst: RXY1

Purge Vol: 5 mL

Prep Date: 02/23/2018 14:11

Column: DB-624

Data File: 022318V9\9G511.D

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	51.5	50.0	ug/L 103	(71%-134%)
Bromofluorobenzene	51.9	50.0	ug/L 104	(70%-131%)
Toluene-d8	52.8	50.0	ug/L 106	(74%-124%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown siloxane	14.651	5.95	ug/L	0	J

Volatile
Certificate of Analysis
Sample Summary

Page 1 of 3

SDG Number: 2018-1719

Lab Sample ID: 443888009

Date Collected: 02/13/2018 13:47

Date Received: 02/15/2018 09:05

Matrix: W

Client: ARSL004

Project: ESHL00114

Client ID: CAPA-18-8

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1741056

Inst: VOA9.I

Dilution: 1

Run Date: 02/23/2018 16:05

Analyst: RXY1

Purge Vol: 5 mL

Prep Date: 02/23/2018 16:05

Data File: 022318V9\9G515.D

Column: DB-624

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

Volatile
Certificate of Analysis
Sample Summary

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SDG Number: 2018-1719

Lab Sample ID: 443888009

Date Collected: 02/13/2018 13:47

Date Received: 02/15/2018 09:05

Matrix: W

Client: ARSL004

Method: SW-846:8260B

Project: ESHL00114

SOP Ref: GL-OA-E-038

Batch ID: 1741056

Inst: VOA9.I

Dilution: 1

Run Date: 02/23/2018 16:05

Analyst: RXY1

Purge Vol: 5 mL

Prep Date: 02/23/2018 16:05

Data File: 022318V9\9G515.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**

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SDG Number: 2018-1719

Lab Sample ID: 443888009

Date Collected: 02/13/2018 13:47

Date Received: 02/15/2018 09:05

Matrix: W

Client: ARSL004

Project: ESHL00114

Client ID: CAPA-18-8

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1741056

Inst: VOA9.I

Dilution: 1

Run Date: 02/23/2018 16:05

Analyst: RXY1

Purge Vol: 5 mL

Prep Date: 02/23/2018 16:05

Column: DB-624

Data File: 022318V9\9G515.D

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	52.5	50.0	ug/L 105	(71%-134%)
Bromofluorobenzene	51.2	50.0	ug/L 102	(70%-131%)
Toluene-d8	53.2	50.0	ug/L 106	(74%-124%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown siloxane	12.292	8.42	ug/L	0	J
	unknown siloxane	14.652	17.7	ug/L	0	J
	unknown siloxane	16.62	5.56	ug/L	0	J

Volatile
Certificate of Analysis
Sample Summary

Page 1 of 3

SDG Number: 2018-1719

Lab Sample ID: 443888012

Date Collected: 02/13/2018 12:50

Date Received: 02/15/2018 09:05

Matrix: W

Client ID: CAWA-18-64

Batch ID: 1741056

Run Date: 02/23/2018 16:33

Prep Date: 02/23/2018 16:33

Data File: 022318V9\9G516.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA9.I

Analyst: RXY1

Project: ESHL00114

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

Column: DB-624

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

Volatile
Certificate of Analysis
Sample Summary

Page 2 of 3

SDG Number: 2018-1719

Lab Sample ID: 443888012

Date Collected: 02/13/2018 12:50

Date Received: 02/15/2018 09:05

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1741056

Inst: VOA9.I

Dilution: 1

Run Date: 02/23/2018 16:33

Analyst: RXY1

Purge Vol: 5 mL

Prep Date: 02/23/2018 16:33

Data File: 022318V9\9G516.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

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SDG Number: 2018-1719

Lab Sample ID: 443888012

Date Collected: 02/13/2018 12:50

Date Received: 02/15/2018 09:05

Matrix: W

Client: ARSL004

Project: ESHL00114

Client ID: CAWA-18-64

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1741056

Inst: VOA9.I

Dilution: 1

Run Date: 02/23/2018 16:33

Analyst: RXY1

Purge Vol: 5 mL

Prep Date: 02/23/2018 16:33

Column: DB-624

Data File: 022318V9\9G516.D

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	52.3	50.0	ug/L 105	(71%-134%)
Bromofluorobenzene	53.6	50.0	ug/L 107	(70%-131%)
Toluene-d8	53.9	50.0	ug/L 108	(74%-124%)

Tentatively Identified Compound Summary

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

Volatile
Certificate of Analysis
Sample Summary

Page 1 of 3

SDG Number: 2018-1719

Lab Sample ID: 443888013

Date Collected: 02/13/2018 12:50

Date Received: 02/15/2018 09:05

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1741056

Inst: VOA9.I

Dilution: 1

Run Date: 02/23/2018 14:40

Analyst: RXY1

Purge Vol: 5 mL

Prep Date: 02/23/2018 14:40

Data File: 022318V9\9G512.D

Column: DB-624

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

Volatile
Certificate of Analysis
Sample Summary

Page 2 of 3

SDG Number: 2018-1719

Lab Sample ID: 443888013

Date Collected: 02/13/2018 12:50

Date Received: 02/15/2018 09:05

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1741056

Inst: VOA9.I

Dilution: 1

Run Date: 02/23/2018 14:40

Analyst: RXY1

Purge Vol: 5 mL

Prep Date: 02/23/2018 14:40

Data File: 022318V9\9G512.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**

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SDG Number: 2018-1719

Lab Sample ID: 443888013

Date Collected: 02/13/2018 12:50

Date Received: 02/15/2018 09:05

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1741056

Inst: VOA9.I

Dilution: 1

Run Date: 02/23/2018 14:40

Analyst: RXY1

Purge Vol: 5 mL

Prep Date: 02/23/2018 14:40

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	52.3	50.0	ug/L 105	(71%-134%)
Bromofluorobenzene	52.3	50.0	ug/L 105	(70%-131%)
Toluene-d8	54.7	50.0	ug/L 109	(74%-124%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown siloxane	12.292	10.5	ug/L	0	J
	unknown siloxane	14.651	16.2	ug/L	0	J

Volatile
Certificate of Analysis
Sample Summary

Page 1 of 3

SDG Number: 2018-1719

Lab Sample ID: 443888016

Date Collected: 02/13/2018 12:50

Date Received: 02/15/2018 09:05

Matrix: W

Client ID: CAWA-18-151310

Batch ID: 1741056

Run Date: 02/23/2018 17:01

Prep Date: 02/23/2018 17:01

Data File: 022318V9\9G517.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA9.I

Analyst: RXY1

Project: ESHL00114

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	0.300	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	0.300	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	0.300	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	0.300	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	0.300	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	0.300	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	0.500	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	0.300	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	0.300	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	0.300	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
78-93-3	2-Butanone	U	1.50	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene	U	0.300	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	0.300	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	1.50	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene	U	0.300	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	0.300	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	1.50	ug/L	1.50	5.00
67-64-1	Acetone	J	1.72	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: 2018-1719

Lab Sample ID: 443888016

Date Collected: 02/13/2018 12:50

Date Received: 02/15/2018 09:05

Matrix: W

Client ID: CAWA-18-151310

Batch ID: 1741056

Run Date: 02/23/2018 17:01

Prep Date: 02/23/2018 17:01

Data File: 022318V9\9G517.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA9.I

Analyst: RXY1

Project: ESHL00114

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

Column: DB-624

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

Volatile
Certificate of Analysis
Sample Summary

Page 3 of 3

SDG Number: 2018-1719

Lab Sample ID: 443888016

Date Collected: 02/13/2018 12:50

Date Received: 02/15/2018 09:05

Matrix: W

Client: ARSL004

Project: ESHL00114

Client ID: CAWA-18-151310

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1741056

Inst: VOA9.I

Dilution: 1

Run Date: 02/23/2018 17:01

Analyst: RXY1

Purge Vol: 5 mL

Prep Date: 02/23/2018 17:01

Column: DB-624

Data File: 022318V9\9G517.D

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	53.0	50.0	ug/L 106	(71%-134%)
Bromofluorobenzene	53.3	50.0	ug/L 107	(70%-131%)
Toluene-d8	53.5	50.0	ug/L 107	(74%-124%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown siloxane	12.292	5.77	ug/L	0	J
	unknown siloxane	14.651	11.2	ug/L	0	J

Quality Control Summary

Volatile
Surrogate Recovery Report

Page 1 of 1

SDG Number: 2018-1719**Matrix Type: LIQUID**

Sample ID	Client ID	DCED4 %REC	TOL %REC	BFB %REC
1203977905	LCS for batch 1741056	99	106	106
1203977906	LCS for batch 1741056	89	108	104
1203977904	MB for batch 1741056	103	107	105
443888004	CAPA-18-15	103	107	104
443888008	CAPA-18-7	103	106	104
443888013	CAWA-18-114	105	109	105
443888002	CAPA-18-14	104	107	105
443888007	CAPA-18-4	105	109	105
443888009	CAPA-18-8	105	106	102
443888012	CAWA-18-64	105	108	107
443888016	CAWA-18-151310	106	107	107
1203976517	CAPA-18-8PS	103	107	103
1203976521	CAPA-18-8PSD	99	105	102
1203976518	CAPA-18-8PS	101	108	104
1203976522	CAPA-18-8PSD	101	107	104

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

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SDG Number: 2018-1719

Sample Type: Post Spike

Client ID: CAPA-18-8PS

Matrix: W

Lab Sample ID 1203976517

Instrument: VOA9.I

Analysis Date: 02/23/2018 19:22

Dilution: 1

Analyst: RXY1

Purge Vol: 5 mL

Batch ID: 1741056

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	107	107	59-132
75-05-8	PS Acetonitrile	1250	0.00 U	1300	104	56-131
67-64-1	PS Acetone	250	0.00 U	203	81	25-155
74-88-4	PS Iodomethane	250	0.00 U	215	86	66-133
75-15-0	PS Carbon disulfide	250	0.00 U	240	96	61-141
108-05-4	PS Vinyl acetate	250	0.00 U	269	108	48-133
78-93-3	PS 2-Butanone	250	0.00 U	242	97	25-143
108-10-1	PS 4-Methyl-2-pentanone	250	0.00 U	270	108	61-127
591-78-6	PS 2-Hexanone	250	0.00 U	262	105	33-138
75-71-8	PS Dichlorodifluoromethane	50.0	0.00 U	59.7	119	33-164
74-87-3	PS Chloromethane	50.0	0.00 U	62.7	125	53-139
75-01-4	PS Vinyl chloride	50.0	0.00 U	61.5	123	58-140
74-83-9	PS Bromomethane	50.0	0.00 U	54.3	109	59-146
75-00-3	PS Chloroethane	50.0	0.00 U	58.4	117	65-129
75-69-4	PS Trichlorofluoromethane	50.0	0.00 U	54.5	109	65-141
60-29-7	PS Ethyl ether	50.0	0.00 U	54.1	108	69-127
75-35-4	PS 1,1-Dichloroethylene	50.0	0.00 U	51.8	104	59-130
75-09-2	PS Methylene chloride	50.0	0.00 U	47.3	95	62-123
1634-04-4	PS tert-Butyl methyl ether	50.0	0.00 U	48.8	98	69-132
156-60-5	PS trans-1,2-Dichloroethylene	50.0	0.00 U	52.7	105	65-127
75-34-3	PS 1,1-Dichloroethane	50.0	0.00 U	52.8	106	67-127
156-59-2	PS cis-1,2-Dichloroethylene	50.0	0.00 U	53.1	106	69-127

Volatile
Quality Control Summary
Spike Recovery Report

Page 2 of 8

SDG Number: 2018-1719

Sample Type: Post Spike

Client ID: CAPA-18-8PS

Matrix: W

Lab Sample ID 1203976517

Instrument: VOA9.I

Analysis Date: 02/23/2018 19:22

Dilution: 1

Analyst: RXY1

Purge Vol: 5 mL

Batch ID: 1741056

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
594-20-7	PS 2,2-Dichloropropane	50.0	0.00 U	49.9	100	66-137
74-97-5	PS Bromochloromethane	50.0	0.00 U	46.5	93	71-130
67-66-3	PS Chloroform	50.0	0.00 U	50.4	101	71-129
71-55-6	PS 1,1,1-Trichloroethane	50.0	0.00 U	50.5	101	69-139
563-58-6	PS 1,1-Dichloropropene	50.0	0.00 U	50.3	101	67-130
56-23-5	PS Carbon tetrachloride	50.0	0.00 U	49.9	100	66-143
107-06-2	PS 1,2-Dichloroethane	50.0	0.00 U	52.6	105	69-130
71-43-2	PS Benzene	50.0	0.00 U	50.5	101	66-125
79-01-6	PS Trichloroethylene	50.0	0.00 U	50.3	101	65-131
78-87-5	PS 1,2-Dichloropropane	50.0	0.00 U	52.2	104	67-127
74-95-3	PS Dibromomethane	50.0	0.00 U	49.3	99	72-129
75-27-4	PS Bromodichloromethane	50.0	0.00 U	52.6	105	70-138
10061-01-5	PS cis-1,3-Dichloropropylene	50.0	0.00 U	51.0	102	70-134
108-88-3	PS Toluene	50.0	0.00 U	52.7	105	60-126
10061-02-6	PS trans-1,3-Dichloropropylene	50.0	0.00 U	56.9	114	69-135
79-00-5	PS 1,1,2-Trichloroethane	50.0	0.00 U	55.0	110	66-125
142-28-9	PS 1,3-Dichloropropane	50.0	0.00 U	53.7	107	67-124
127-18-4	PS Tetrachloroethylene	50.0	0.00 U	49.3	99	60-130
124-48-1	PS Dibromochloromethane	50.0	0.00 U	54.5	109	68-143
106-93-4	PS 1,2-Dibromoethane	50.0	0.00 U	53.0	106	71-127
108-90-7	PS Chlorobenzene	50.0	0.00 U	51.0	102	64-124
100-41-4	PS Ethylbenzene	50.0	0.00 U	52.6	105	61-130

Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2018-1719

Sample Type: Post Spike

Client ID: CAPA-18-8PS

Matrix: W

Lab Sample ID 1203976517

Instrument: VOA9.I

Analysis Date: 02/23/2018 19:22

Dilution: 1

Analyst: RXY1

Purge Vol: 5 mL

Batch ID: 1741056

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	52.1	104	62-131
100-42-5	PS Styrene	50.0	0.00 U	52.3	105	59-135
75-25-2	PS Bromoform	50.0	0.00 U	47.4	95	64-138
98-82-8	PS Isopropylbenzene	50.0	0.00 U	54.0	108	55-133
79-34-5	PS 1,1,2,2-Tetrachloroethane	50.0	0.00 U	57.3	115	62-129
96-18-4	PS 1,2,3-Trichloropropane	50.0	0.00 U	54.8	110	70-124
108-86-1	PS Bromobenzene	50.0	0.00 U	50.0	100	62-124
103-65-1	PS n-Propylbenzene	50.0	0.00 U	54.3	109	50-133
108-67-8	PS 1,3,5-Trimethylbenzene	50.0	0.00 U	55.3	111	53-135
95-49-8	PS 2-Chlorotoluene	50.0	0.00 U	52.8	106	56-128
106-43-4	PS 4-Chlorotoluene	50.0	0.00 U	53.1	106	53-130
98-06-6	PS tert-Butylbenzene	50.0	0.00 U	54.4	109	55-135
95-63-6	PS 1,2,4-Trimethylbenzene	50.0	0.00 U	53.8	108	53-132
135-98-8	PS sec-Butylbenzene	50.0	0.00 U	55.6	111	50-138
99-87-6	PS 4-Isopropyltoluene	50.0	0.00 U	54.4	109	49-138
541-73-1	PS 1,3-Dichlorobenzene	50.0	0.00 U	49.6	99	56-126
106-46-7	PS 1,4-Dichlorobenzene	50.0	0.00 U	50.3	101	55-125
104-51-8	PS n-Butylbenzene	50.0	0.00 U	55.0	110	43-142
96-12-8	PS 1,2-Dibromo-3-chloropropane	50.0	0.00 U	45.7	91	62-141
87-68-3	PS Hexachlorobutadiene	50.0	0.00 U	54.4	109	40-147
91-20-3	PS Naphthalene	50.0	0.00 U	54.6	109	62-134
87-61-6	PS 1,2,3-Trichlorobenzene	50.0	0.00 U	52.3	105	52-135

Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2018-1719

Sample Type: Post Spike

Client ID: CAPA-18-8PS

Matrix: W

Lab Sample ID 1203976517

Instrument: VOA9.I

Analysis Date: 02/23/2018 19:22

Dilution: 1

Analyst: RXY1

Purge Vol: 5 mL

Batch ID: 1741056

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	52.2	104	50-133
630-20-6	PS	1,1,1,2-Tetrachloroethane	50.0	0.00	U	56.6	113	71-133
95-50-1	PS	1,2-Dichlorobenzene	50.0	0.00	U	49.7	99	60-125
71-36-3	PS	n-Butyl alcohol	5000	0.00	U	5840	117	60-140

Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2018-1719

Sample Type: Post Spike Duplicate

Client ID: CAPA-18-8PSD

Matrix: W

Lab Sample ID 1203976521

Instrument: VOA9.I

Analysis Date: 02/23/2018 19:50

Dilution: 1

Analyst: RXY1

Purge Vol: 5 mL

Batch ID: 1741056

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	111	111	59-132	4	0-20
75-05-8	PSD Acetonitrile	1250	0.00 U	1320	106	56-131	2	0-20
67-64-1	PSD Acetone	250	0.00 U	207	83	25-155	2	0-20
74-88-4	PSD Iodomethane	250	0.00 U	220	88	66-133	3	0-20
75-15-0	PSD Carbon disulfide	250	0.00 U	240	96	61-141	0	0-20
108-05-4	PSD Vinyl acetate	250	0.00 U	275	110	48-133	2	0-20
78-93-3	PSD 2-Butanone	250	0.00 U	249	100	25-143	3	0-20
108-10-1	PSD 4-Methyl-2-pentanone	250	0.00 U	282	113	61-127	4	0-20
591-78-6	PSD 2-Hexanone	250	0.00 U	268	107	33-138	2	0-20
75-71-8	PSD Dichlorodifluoromethane	50.0	0.00 U	62.0	124	33-164	4	0-20
74-87-3	PSD Chloromethane	50.0	0.00 U	63.2	126	53-139	1	0-20
75-01-4	PSD Vinyl chloride	50.0	0.00 U	63.7	127	58-140	3	0-20
74-83-9	PSD Bromomethane	50.0	0.00 U	55.6	111	59-146	2	0-20
75-00-3	PSD Chloroethane	50.0	0.00 U	60.0	120	65-129	3	0-20
75-69-4	PSD Trichlorofluoromethane	50.0	0.00 U	56.5	113	65-141	4	0-20
60-29-7	PSD Ethyl ether	50.0	0.00 U	56.6	113	69-127	4	0-20
75-35-4	PSD 1,1-Dichloroethylene	50.0	0.00 U	52.5	105	59-130	1	0-20
75-09-2	PSD Methylene chloride	50.0	0.00 U	48.4	97	62-123	2	0-20
1634-04-4	PSD tert-Butyl methyl ether	50.0	0.00 U	50.8	102	69-132	4	0-20
156-60-5	PSD trans-1,2-Dichloroethylene	50.0	0.00 U	53.7	107	65-127	2	0-20
75-34-3	PSD 1,1-Dichloroethane	50.0	0.00 U	54.2	108	67-127	3	0-20
156-59-2	PSD cis-1,2-Dichloroethylene	50.0	0.00 U	54.4	109	69-127	2	0-20

Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2018-1719

Sample Type: Post Spike Duplicate

Client ID: CAPA-18-8PSD

Matrix: W

Lab Sample ID 1203976521

Instrument: VOA9.I

Analysis Date: 02/23/2018 19:50

Dilution: 1

Analyst: RXY1

Purge Vol: 5 mL

Batch ID: 1741056

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 51.5	103	66-137	3	0-20
74-97-5	PSD Bromochloromethane	50.0	0.00	U 48.6	97	71-130	4	0-20
67-66-3	PSD Chloroform	50.0	0.00	U 51.7	103	71-129	3	0-20
71-55-6	PSD 1,1,1-Trichloroethane	50.0	0.00	U 51.6	103	69-139	2	0-20
563-58-6	PSD 1,1-Dichloropropene	50.0	0.00	U 51.9	104	67-130	3	0-20
56-23-5	PSD Carbon tetrachloride	50.0	0.00	U 51.2	102	66-143	3	0-20
107-06-2	PSD 1,2-Dichloroethane	50.0	0.00	U 53.8	108	69-130	2	0-20
71-43-2	PSD Benzene	50.0	0.00	U 51.9	104	66-125	3	0-20
79-01-6	PSD Trichloroethylene	50.0	0.00	U 52.4	105	65-131	4	0-20
78-87-5	PSD 1,2-Dichloropropane	50.0	0.00	U 53.7	107	67-127	3	0-20
74-95-3	PSD Dibromomethane	50.0	0.00	U 51.0	102	72-129	3	0-20
75-27-4	PSD Bromodichloromethane	50.0	0.00	U 54.4	109	70-138	3	0-20
10061-01-5	PSD cis-1,3-Dichloropropylene	50.0	0.00	U 53.2	106	70-134	4	0-20
108-88-3	PSD Toluene	50.0	0.00	U 55.1	110	60-126	4	0-20
10061-02-6	PSD trans-1,3-Dichloropropylene	50.0	0.00	U 59.5	119	69-135	5	0-20
79-00-5	PSD 1,1,2-Trichloroethane	50.0	0.00	U 57.2	114	66-125	4	0-20
142-28-9	PSD 1,3-Dichloropropane	50.0	0.00	U 55.5	111	67-124	3	0-20
127-18-4	PSD Tetrachloroethylene	50.0	0.00	U 51.5	103	60-130	4	0-20
124-48-1	PSD Dibromochloromethane	50.0	0.00	U 57.5	115	68-143	5	0-20
106-93-4	PSD 1,2-Dibromoethane	50.0	0.00	U 55.2	110	71-127	4	0-20
108-90-7	PSD Chlorobenzene	50.0	0.00	U 53.0	106	64-124	4	0-20
100-41-4	PSD Ethylbenzene	50.0	0.00	U 54.3	109	61-130	3	0-20

Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2018-1719

Sample Type: Post Spike Duplicate

Client ID: CAPA-18-8PSD

Matrix: W

Lab Sample ID 1203976521

Instrument: VOA9.I

Analysis Date: 02/23/2018 19:50

Dilution: 1

Analyst: RXY1

Purge Vol: 5 mL

Batch ID: 1741056

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 54.6	109	62-131	5	0-20
100-42-5	PSD Styrene	50.0	0.00	U 54.1	108	59-135	3	0-20
75-25-2	PSD Bromoform	50.0	0.00	U 50.6	101	64-138	7	0-20
98-82-8	PSD Isopropylbenzene	50.0	0.00	U 56.9	114	55-133	5	0-20
79-34-5	PSD 1,1,2,2-Tetrachloroethane	50.0	0.00	U 60.0	120	62-129	5	0-20
96-18-4	PSD 1,2,3-Trichloropropane	50.0	0.00	U 57.1	114	70-124	4	0-20
108-86-1	PSD Bromobenzene	50.0	0.00	U 52.5	105	62-124	5	0-20
103-65-1	PSD n-Propylbenzene	50.0	0.00	U 56.5	113	50-133	4	0-20
108-67-8	PSD 1,3,5-Trimethylbenzene	50.0	0.00	U 57.7	115	53-135	4	0-20
95-49-8	PSD 2-Chlorotoluene	50.0	0.00	U 55.2	110	56-128	4	0-20
106-43-4	PSD 4-Chlorotoluene	50.0	0.00	U 55.1	110	53-130	4	0-20
98-06-6	PSD tert-Butylbenzene	50.0	0.00	U 57.9	116	55-135	6	0-20
95-63-6	PSD 1,2,4-Trimethylbenzene	50.0	0.00	U 56.2	112	53-132	4	0-20
135-98-8	PSD sec-Butylbenzene	50.0	0.00	U 58.4	117	50-138	5	0-20
99-87-6	PSD 4-Isopropyltoluene	50.0	0.00	U 56.9	114	49-138	5	0-20
541-73-1	PSD 1,3-Dichlorobenzene	50.0	0.00	U 51.5	103	56-126	4	0-20
106-46-7	PSD 1,4-Dichlorobenzene	50.0	0.00	U 52.7	105	55-125	5	0-20
104-51-8	PSD n-Butylbenzene	50.0	0.00	U 56.9	114	43-142	3	0-20
96-12-8	PSD 1,2-Dibromo-3-chloropropane	50.0	0.00	U 49.7	99	62-141	8	0-20
87-68-3	PSD Hexachlorobutadiene	50.0	0.00	U 58.9	118	40-147	8	0-20
91-20-3	PSD Naphthalene	50.0	0.00	U 59.8	120	62-134	9	0-20
87-61-6	PSD 1,2,3-Trichlorobenzene	50.0	0.00	U 58.4	117	52-135	11	0-20

Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2018-1719

Sample Type: Post Spike Duplicate

Client ID: CAPA-18-8PSD

Matrix: W

Lab Sample ID 1203976521

Instrument: VOA9.I

Analysis Date: 02/23/2018 19:50

Dilution: 1

Analyst: RXY1

Purge Vol: 5 mL

Batch ID: 1741056

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 56.1	112	50-133	7	0-20
630-20-6	PSD 1,1,1,2-Tetrachloroethane	50.0	0.00	U 59.5	119	71-133	5	0-20
95-50-1	PSD 1,2-Dichlorobenzene	50.0	0.00	U 51.9	104	60-125	4	0-20
71-36-3	PSD n-Butyl alcohol	5000	0.00	U 6070	121	60-140	4	0-20

Volatile
Quality Control Summary
Spike Recovery Report

Page 1 of 2

SDG Number: 2018-1719

Sample Type: Post Spike

Client ID: CAPA-18-8PS

Matrix: W

Lab Sample ID 1203976518

Instrument: VOA9.I

Analysis Date: 02/23/2018 20:18

Dilution: 1

Analyst: RXY1

Purge Vol: 5 mL

Batch ID: 1741056

CAS No		Parmname	Amount Added ug/L	Sample Conc. ug/L		Spike Conc. ug/L	Recovery %	Acceptance Limits
107-02-8	PS	Acrolein	250	0.00	U	250	100	49-141
76-13-1	PS	Trichlorotrifluoroethane	250	0.00	U	251	101	57-149
107-05-1	PS	Allyl chloride	250	0.00	U	256	103	54-128
107-13-1	PS	Acrylonitrile	250	0.00	U	268	107	59-129
107-12-0	PS	Propionitrile	250	0.00	U	262	105	58-131
126-98-7	PS	Methacrylonitrile	250	0.00	U	268	107	59-134
80-62-6	PS	Methyl methacrylate	250	0.00	U	251	100	62-135
97-63-2	PS	Ethyl methacrylate	250	0.00	U	266	106	60-136
78-83-1	PS	Isobutyl alcohol	2500	0.00	U	2580	103	60-143
126-99-8	PS	2-Chloro-1,3-butadiene	50.0	0.00	U	49.7	99	63-146

Volatile
Quality Control Summary
Spike Recovery Report

Page 2 of 2

SDG Number: 2018-1719

Sample Type: Post Spike Duplicate

Client ID: CAPA-18-8PSD

Matrix: W

Lab Sample ID 1203976522

Instrument: VOA9.I

Analysis Date: 02/23/2018 20:46

Dilution: 1

Analyst: RXY1

Purge Vol: 5 mL

Batch ID: 1741056

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	269	108	49-141	7	0-20
76-13-1	PSD	Trichlorotrifluoroethane	250	0.00	U	262	105	57-149	4	0-20
107-05-1	PSD	Allyl chloride	250	0.00	U	270	108	54-128	5	0-20
107-13-1	PSD	Acrylonitrile	250	0.00	U	293	117	59-129	9	0-20
107-12-0	PSD	Propionitrile	250	0.00	U	280	112	58-131	7	0-20
126-98-7	PSD	Methacrylonitrile	250	0.00	U	288	115	59-134	7	0-20
80-62-6	PSD	Methyl methacrylate	250	0.00	U	267	107	62-135	6	0-20
97-63-2	PSD	Ethyl methacrylate	250	0.00	U	281	112	60-136	5	0-20
78-83-1	PSD	Isobutyl alcohol	2500	0.00	U	2770	111	60-143	7	0-20
126-99-8	PSD	2-Chloro-1,3-butadiene	50.0	0.00	U	51.7	103	63-146	4	0-20

Volatile
Quality Control Summary
Spike Recovery Report

Page 1 of 4

SDG Number: 2018-1719

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1741056

Matrix: GROUND WATER

Lab Sample ID 1203977905

Instrument: VOA9.I

Analysis Date: 02/23/2018 11:50

Dilution: 1

Analyst: RXY1

Purge Vol: 5 mL

Batch ID: 1741056

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	106	106	71-127
75-05-8	LCS Acetonitrile	1250	0.0	1160	93	61-125
67-64-1	LCS Acetone	250	0.0	302	121	48-157
74-88-4	LCS Iodomethane	250	0.0	211	84	72-128
75-15-0	LCS Carbon disulfide	250	0.0	228	91	69-138
108-05-4	LCS Vinyl acetate	250	0.0	266	106	67-125
78-93-3	LCS 2-Butanone	250	0.0	278	111	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	303	121	56-140
75-71-8	LCS Dichlorodifluoromethane	50.0	0.0	56.2	112	40-160
74-87-3	LCS Chloromethane	50.0	0.0	57.5	115	58-135
75-01-4	LCS Vinyl chloride	50.0	0.0	57.2	114	65-137
74-83-9	LCS Bromomethane	50.0	0.0	50.1	100	63-137
75-00-3	LCS Chloroethane	50.0	0.0	53.4	107	69-129
75-69-4	LCS Trichlorofluoromethane	50.0	0.0	51.9	104	69-138
60-29-7	LCS Ethyl ether	50.0	0.0	50.4	101	72-125
75-35-4	LCS 1,1-Dichloroethylene	50.0	0.0	50.0	100	66-126
75-09-2	LCS Methylene chloride	50.0	0.0	45.6	91	68-119
1634-04-4	LCS tert-Butyl methyl ether	50.0	0.0	47.7	95	76-128
156-60-5	LCS trans-1,2-Dichloroethylene	50.0	0.0	50.7	101	71-124
75-34-3	LCS 1,1-Dichloroethane	50.0	0.0	50.5	101	73-123
156-59-2	LCS cis-1,2-Dichloroethylene	50.0	0.0	50.8	102	75-123

Volatile
Quality Control Summary
Spike Recovery Report

Page 2 of 4

SDG Number: 2018-1719

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1741056

Matrix: GROUND WATER

Lab Sample ID 1203977905

Instrument: VOA9.I

Analysis Date: 02/23/2018 11:50

Dilution: 1

Analyst: RXY1

Purge Vol: 5 mL

Batch ID: 1741056

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	52.2	104	72-138
74-97-5	LCS Bromochloromethane	50.0	0.0	45.4	91	76-125
67-66-3	LCS Chloroform	50.0	0.0	48.4	97	76-123
71-55-6	LCS 1,1,1-Trichloroethane	50.0	0.0	48.8	98	74-136
563-58-6	LCS 1,1-Dichloropropene	50.0	0.0	50.1	100	72-129
56-23-5	LCS Carbon tetrachloride	50.0	0.0	49.1	98	72-140
107-06-2	LCS 1,2-Dichloroethane	50.0	0.0	49.4	99	74-122
71-43-2	LCS Benzene	50.0	0.0	49.3	99	72-121
79-01-6	LCS Trichloroethylene	50.0	0.0	50.1	100	74-125
78-87-5	LCS 1,2-Dichloropropane	50.0	0.0	50.1	100	73-121
74-95-3	LCS Dibromomethane	50.0	0.0	47.6	95	78-123
75-27-4	LCS Bromodichloromethane	50.0	0.0	51.4	103	77-131
10061-01-5	LCS cis-1,3-Dichloropropylene	50.0	0.0	51.5	103	78-131
108-88-3	LCS Toluene	50.0	0.0	51.9	104	71-121
10061-02-6	LCS trans-1,3-Dichloropropylene	50.0	0.0	57.3	115	78-131
79-00-5	LCS 1,1,2-Trichloroethane	50.0	0.0	52.7	105	74-118
142-28-9	LCS 1,3-Dichloropropane	50.0	0.0	50.6	101	74-118
127-18-4	LCS Tetrachloroethylene	50.0	0.0	50.5	101	69-129
124-48-1	LCS Dibromochloromethane	50.0	0.0	54.2	108	76-137
106-93-4	LCS 1,2-Dibromoethane	50.0	0.0	51.7	103	78-122
108-90-7	LCS Chlorobenzene	50.0	0.0	50.5	101	74-120
100-41-4	LCS Ethylbenzene	50.0	0.0	51.6	103	73-125

Volatile
Quality Control Summary
Spike Recovery Report

Page 3 of 4

SDG Number: 2018-1719

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1741056

Matrix: GROUND WATER

Lab Sample ID 1203977905

Instrument: VOA9.I

Analysis Date: 02/23/2018 11:50

Dilution: 1

Analyst: RXY1

Purge Vol: 5 mL

Batch ID: 1741056

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	51.3	103	74-126
100-42-5	LCS Styrene	50.0	0.0	51.5	103	72-130
75-25-2	LCS Bromoform	50.0	0.0	47.7	95	72-136
98-82-8	LCS Isopropylbenzene	50.0	0.0	53.9	108	70-130
79-34-5	LCS 1,1,2,2-Tetrachloroethane	50.0	0.0	54.7	109	70-126
96-18-4	LCS 1,2,3-Trichloropropane	50.0	0.0	52.6	105	74-122
108-86-1	LCS Bromobenzene	50.0	0.0	50.5	101	74-120
103-65-1	LCS n-Propylbenzene	50.0	0.0	54.4	109	67-128
108-67-8	LCS 1,3,5-Trimethylbenzene	50.0	0.0	54.4	109	70-129
95-49-8	LCS 2-Chlorotoluene	50.0	0.0	52.7	105	71-124
106-43-4	LCS 4-Chlorotoluene	50.0	0.0	53.3	107	69-125
98-06-6	LCS tert-Butylbenzene	50.0	0.0	55.0	110	72-130
95-63-6	LCS 1,2,4-Trimethylbenzene	50.0	0.0	53.3	107	70-126
135-98-8	LCS sec-Butylbenzene	50.0	0.0	55.0	110	70-131
99-87-6	LCS 4-Isopropyltoluene	50.0	0.0	54.5	109	71-131
541-73-1	LCS 1,3-Dichlorobenzene	50.0	0.0	49.9	100	72-121
106-46-7	LCS 1,4-Dichlorobenzene	50.0	0.0	51.2	102	71-120
104-51-8	LCS n-Butylbenzene	50.0	0.0	54.7	109	68-134
96-12-8	LCS 1,2-Dibromo-3-chloropropane	50.0	0.0	46.1	92	68-141
87-68-3	LCS Hexachlorobutadiene	50.0	0.0	56.0	112	72-136
91-20-3	LCS Naphthalene	50.0	0.0	55.2	110	72-132
87-61-6	LCS 1,2,3-Trichlorobenzene	50.0	0.0	55.9	112	70-130

Volatile
Quality Control Summary
Spike Recovery Report

Page 4 of 4

SDG Number: 2018-1719

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1741056

Matrix: GROUND WATER

Lab Sample ID 1203977905

Instrument: VOA9.I

Analysis Date: 02/23/2018 11:50

Dilution: 1

Analyst: RXY1

Purge Vol: 5 mL

Batch ID: 1741056

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	56.0	112	71-129
630-20-6	LCS 1,1,1,2-Tetrachloroethane	50.0	0.0	54.6	109	79-127
95-50-1	LCS 1,2-Dichlorobenzene	50.0	0.0	49.1	98	74-120
71-36-3	LCS n-Butyl alcohol	5000	0.0	5200	104	63-138

Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2018-1719

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1741056

Matrix: GROUND WATER

Lab Sample ID 1203977906

Instrument: VOA9.I

Analysis Date: 02/23/2018 12:46

Dilution: 1

Analyst: RXY1

Purge Vol: 5 mL

Batch ID: 1741056

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	175	70	60-140
76-13-1	LCS	Trichlorotrifluoroethane	250	0.0	258	103	61-148
107-05-1	LCS	Allyl chloride	250	0.0	256	102	59-125
107-13-1	LCS	Acrylonitrile	250	0.0	179	72	65-122
107-12-0	LCS	Propionitrile	250	0.0	166	67	64-124
126-98-7	LCS	Methacrylonitrile	250	0.0	188	75	64-126
80-62-6	LCS	Methyl methacrylate	250	0.0	185	74	69-127
97-63-2	LCS	Ethyl methacrylate	250	0.0	214	86	66-130
78-83-1	LCS	Isobutyl alcohol	2500	0.0	1670	67	65-135
126-99-8	LCS	2-Chloro-1,3-butadiene	50.0	0.0	51.4	103	66-147

Method Blank Summary

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SDG Number:	2018-1719	Client:	ARSL004	Matrix:	GROUND WATER
Client ID:	MB for batch 1741056	Instrument ID:	VOA9.I	Data File:	022318V9\9G509B.D
Lab Sample ID:	1203977904	Prep Date:	02/23/2018 13:15	Analyzed:	02/23/18 13:15
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 1741056	1203977905	022318V9\9G506L.D	02/23/18	1150
02 LCS for batch 1741056	1203977906	022318V9\9G508L.D	02/23/18	1246
03 CAPA-18-15	443888004	022318V9\9G510.D	02/23/18	1343
04 CAPA-18-7	443888008	022318V9\9G511.D	02/23/18	1411
05 CAWA-18-114	443888013	022318V9\9G512.D	02/23/18	1440
06 CAPA-18-14	443888002	022318V9\9G513.D	02/23/18	1508
07 CAPA-18-4	443888007	022318V9\9G514.D	02/23/18	1536
08 CAPA-18-8	443888009	022318V9\9G515.D	02/23/18	1605
09 CAWA-18-64	443888012	022318V9\9G516.D	02/23/18	1633
10 CAWA-18-151310	443888016	022318V9\9G517.D	02/23/18	1701
11 CAPA-18-8PS	1203976517	022318V9\9G522.D	02/23/18	1922
12 CAPA-18-8PSD	1203976521	022318V9\9G523.D	02/23/18	1950
13 CAPA-18-8PS	1203976518	022318V9\9G524.D	02/23/18	2018
14 CAPA-18-8PSD	1203976522	022318V9\9G525.D	02/23/18	2046

Quality Control Data

Volatile
Certificate of Analysis
Sample Summary

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SDG Number: 2018-1719
Lab Sample ID: 1203976517
Client Sample: QC for batch 1741056
Client ID: CAPA-18-8PS
Batch ID: 1741056
Run Date: 02/23/2018 19:22
Prep Date: 02/23/2018 19:22
Data File: 022318V9\9G522.D

Date Collected: 02/13/2018 13:47
Date Received: 02/15/2018 09:05
Client: ARSL004
Method: SW-846:8260B
Inst: VOA9.I
Analyst: RXY1

Column: DB-624

Matrix: W

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

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane		56.6	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		57.3	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane		55.0	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane		52.8	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene		51.8	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene		50.3	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene		52.3	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane		54.8	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene		52.2	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene		53.8	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane		45.7	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane		53.0	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene		49.7	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane		52.6	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane		52.2	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene		55.3	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene		49.6	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane		53.7	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene		50.3	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane		49.9	ug/L	0.300	1.00
78-93-3	2-Butanone		242	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		52.8	ug/L	0.300	1.00
591-78-6	2-Hexanone		262	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene		53.1	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene		54.4	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone		270	ug/L	1.50	5.00
67-64-1	Acetone		203	ug/L	1.50	10.0
75-05-8	Acetonitrile		1300	ug/L	8.00	25.0
107-02-8	Acrolein	U	1.50	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	1.50	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	1.50	ug/L	1.50	5.00
71-43-2	Benzene		50.5	ug/L	0.300	1.00
108-86-1	Bromobenzene		50.0	ug/L	0.300	1.00
74-97-5	Bromochloromethane		46.5	ug/L	0.300	1.00
75-27-4	Bromodichloromethane		52.6	ug/L	0.300	1.00
75-25-2	Bromoform		47.4	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

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SDG Number: 2018-1719
Lab Sample ID: 1203976517
Client Sample: QC for batch 1741056
Client ID: CAPA-18-8PS
Batch ID: 1741056
Run Date: 02/23/2018 19:22
Prep Date: 02/23/2018 19:22
Data File: 022318V9\9G522.D

Date Collected: 02/13/2018 13:47
Date Received: 02/15/2018 09:05
Client: ARSL004
Method: SW-846:8260B
Inst: VOA9.I
Analyst: RXY1

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		54.3	ug/L	0.300	1.00
75-15-0	Carbon disulfide		240	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride		49.9	ug/L	0.300	1.00
108-90-7	Chlorobenzene		51.0	ug/L	0.300	1.00
75-00-3	Chloroethane		58.4	ug/L	0.300	1.00
67-66-3	Chloroform		50.4	ug/L	0.300	1.00
74-87-3	Chloromethane		62.7	ug/L	0.300	1.00
124-48-1	Dibromochloromethane		54.5	ug/L	0.300	1.00
74-95-3	Dibromomethane		49.3	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane		59.7	ug/L	0.300	1.00
60-29-7	Ethyl ether		54.1	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	1.50	ug/L	1.50	5.00
100-41-4	Ethylbenzene		52.6	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene		54.4	ug/L	0.300	1.00
74-88-4	Iodomethane		215	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	15.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene		54.0	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		47.3	ug/L	1.00	10.0
91-20-3	Naphthalene		54.6	ug/L	0.300	1.00
107-12-0	Propionitrile	U	1.50	ug/L	1.50	5.00
100-42-5	Styrene		52.3	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene		49.3	ug/L	0.300	1.00
108-88-3	Toluene		52.7	ug/L	0.300	1.00
79-01-6	Trichloroethylene		50.3	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		269	ug/L	1.50	5.00
75-01-4	Vinyl chloride		61.5	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene		53.1	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene		51.0	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes		107	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol		5840	ug/L	15.0	50.0
104-51-8	n-Butylbenzene		55.0	ug/L	0.300	1.00
103-65-1	n-Propylbenzene		54.3	ug/L	0.300	1.00
95-47-6	o-Xylene		52.1	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene		55.6	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

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SDG Number:	2018-1719	Date Collected:	02/13/2018 13:47	Matrix:	W
Lab Sample ID:	1203976517	Date Received:	02/15/2018 09:05		
Client Sample:	QC for batch 1741056	Client:	ARSL004	Project:	QC
Client ID:	CAPA-18-8PS	Method:	SW-846:8260B	SOP Ref:	GL-OA-E-038
Batch ID:	1741056	Inst:	VOA9.I	Dilution:	1
Run Date:	02/23/2018 19:22	Analyst:	RXY1	Purge Vol:	5 mL
Prep Date:	02/23/2018 19:22				
Data File:	022318V9\9G522.D	Column:	DB-624		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
1634-04-4	tert-Butyl methyl ether		48.8	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene		54.4	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene		52.7	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene		56.9	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	51.5	50.0	ug/L	103	(71%-134%)
Bromofluorobenzene	51.7	50.0	ug/L	103	(70%-131%)
Toluene-d8	53.3	50.0	ug/L	107	(74%-124%)

Volatile
Certificate of Analysis
Sample Summary

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SDG Number: 2018-1719
Lab Sample ID: 1203976518
Client Sample: QC for batch 1741056
Client ID: CAPA-18-8PS
Batch ID: 1741056
Run Date: 02/23/2018 20:18
Prep Date: 02/23/2018 20:18
Data File: 022318V9\9G524.D

Date Collected: 02/13/2018 13:47
Date Received: 02/15/2018 09:05
Client: ARSL004
Method: SW-846:8260B
Inst: VOA9.I
Analyst: RXY1

Column: DB-624

Matrix: W

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

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	0.300	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	0.300	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	0.300	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	0.300	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	0.300	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	0.300	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	0.500	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	0.300	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	0.300	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	0.300	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
78-93-3	2-Butanone	U	1.50	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene		49.7	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		250	ug/L	1.50	5.00
107-13-1	Acrylonitrile		268	ug/L	1.50	5.00
107-05-1	Allyl chloride		256	ug/L	1.50	5.00
71-43-2	Benzene	U	0.300	ug/L	0.300	1.00
108-86-1	Bromobenzene	U	0.300	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	0.300	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	U	0.300	ug/L	0.300	1.00
75-25-2	Bromoform	U	0.300	ug/L	0.300	1.00

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Sample Summary

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SDG Number: 2018-1719
Lab Sample ID: 1203976518
Client Sample: QC for batch 1741056
Client ID: CAPA-18-8PS
Batch ID: 1741056
Run Date: 02/23/2018 20:18
Prep Date: 02/23/2018 20:18
Data File: 022318V9\9G524.D

Date Collected: 02/13/2018 13:47
Date Received: 02/15/2018 09:05
Client: ARSL004
Method: SW-846:8260B
Inst: VOA9.I
Analyst: RXY1

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		266	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		2580	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	0.300	ug/L	0.300	1.00
126-98-7	Methacrylonitrile		268	ug/L	1.50	5.00
80-62-6	Methyl methacrylate		251	ug/L	1.50	5.00
75-09-2	Methylene chloride	U	1.00	ug/L	1.00	10.0
91-20-3	Naphthalene	U	0.300	ug/L	0.300	1.00
107-12-0	Propionitrile		262	ug/L	1.50	5.00
100-42-5	Styrene	U	0.300	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	0.300	ug/L	0.300	1.00
108-88-3	Toluene	U	0.300	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	0.300	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	0.300	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane		251	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	1.50	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	0.300	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	0.300	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	0.300	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	0.300	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	15.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	0.300	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	0.300	ug/L	0.300	1.00
95-47-6	o-Xylene	U	0.300	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	0.300	ug/L	0.300	1.00

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SDG Number:	2018-1719	Date Collected:	02/13/2018 13:47	Matrix:	W
Lab Sample ID:	1203976518	Date Received:	02/15/2018 09:05		
Client Sample:	QC for batch 1741056	Client:	ARSL004	Project:	QC
Client ID:	CAPA-18-8PS	Method:	SW-846:8260B	SOP Ref:	GL-OA-E-038
Batch ID:	1741056	Inst:	VOA9.I	Dilution:	1
Run Date:	02/23/2018 20:18	Analyst:	RXY1	Purge Vol:	5 mL
Prep Date:	02/23/2018 20:18				
Data File:	022318V9\9G524.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	50.3	50.0	ug/L	101	(71%-134%)
Bromofluorobenzene	51.8	50.0	ug/L	104	(70%-131%)
Toluene-d8	53.9	50.0	ug/L	108	(74%-124%)

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Sample Summary

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SDG Number: 2018-1719
Lab Sample ID: 1203976521
Client Sample: QC for batch 1741056
Client ID: CAPA-18-8PSD
Batch ID: 1741056
Run Date: 02/23/2018 19:50
Prep Date: 02/23/2018 19:50
Data File: 022318V9\9G523.D

Date Collected: 02/13/2018 13:47
Date Received: 02/15/2018 09:05
Client: ARSL004
Method: SW-846:8260B
Inst: VOA9.I
Analyst: RXY1

Column: DB-624

Matrix: W

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

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane		59.5	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane		51.6	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane		60.0	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane		57.2	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane		54.2	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene		52.5	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene		51.9	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene		58.4	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane		57.1	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene		56.1	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene		56.2	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane		49.7	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane		55.2	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene		51.9	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane		53.8	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane		53.7	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene		57.7	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene		51.5	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane		55.5	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene		52.7	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane		51.5	ug/L	0.300	1.00
78-93-3	2-Butanone		249	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		55.2	ug/L	0.300	1.00
591-78-6	2-Hexanone		268	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene		55.1	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene		56.9	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone		282	ug/L	1.50	5.00
67-64-1	Acetone		207	ug/L	1.50	10.0
75-05-8	Acetonitrile		1320	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		51.9	ug/L	0.300	1.00
108-86-1	Bromobenzene		52.5	ug/L	0.300	1.00
74-97-5	Bromochloromethane		48.6	ug/L	0.300	1.00
75-27-4	Bromodichloromethane		54.4	ug/L	0.300	1.00
75-25-2	Bromoform		50.6	ug/L	0.300	1.00

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Sample Summary

SDG Number: 2018-1719	Date Collected: 02/13/2018 13:47	Matrix: W
Lab Sample ID: 1203976521	Date Received: 02/15/2018 09:05	
Client Sample: QC for batch 1741056	Client: ARSL004	Project: QC
Client ID: CAPA-18-8PSD	Method: SW-846:8260B	SOP Ref: GL-OA-E-038
Batch ID: 1741056	Inst: VOA9.I	Dilution: 1
Run Date: 02/23/2018 19:50	Analyst: RXY1	Purge Vol: 5 mL
Prep Date: 02/23/2018 19:50		
Data File: 022318V9\9G523.D	Column: DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane		55.6	ug/L	0.300	1.00
75-15-0	Carbon disulfide		240	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride		51.2	ug/L	0.300	1.00
108-90-7	Chlorobenzene		53.0	ug/L	0.300	1.00
75-00-3	Chloroethane		60.0	ug/L	0.300	1.00
67-66-3	Chloroform		51.7	ug/L	0.300	1.00
74-87-3	Chloromethane		63.2	ug/L	0.300	1.00
124-48-1	Dibromochloromethane		57.5	ug/L	0.300	1.00
74-95-3	Dibromomethane		51.0	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane		62.0	ug/L	0.300	1.00
60-29-7	Ethyl ether		56.6	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	1.50	ug/L	1.50	5.00
100-41-4	Ethylbenzene		54.3	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene		58.9	ug/L	0.300	1.00
74-88-4	Iodomethane		220	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	15.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene		56.9	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	1.50	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	1.50	ug/L	1.50	5.00
75-09-2	Methylene chloride		48.4	ug/L	1.00	10.0
91-20-3	Naphthalene		59.8	ug/L	0.300	1.00
107-12-0	Propionitrile	U	1.50	ug/L	1.50	5.00
100-42-5	Styrene		54.1	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene		51.5	ug/L	0.300	1.00
108-88-3	Toluene		55.1	ug/L	0.300	1.00
79-01-6	Trichloroethylene		52.4	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane		56.5	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	2.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate		275	ug/L	1.50	5.00
75-01-4	Vinyl chloride		63.7	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene		54.4	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene		53.2	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes		111	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol		6070	ug/L	15.0	50.0
104-51-8	n-Butylbenzene		56.9	ug/L	0.300	1.00
103-65-1	n-Propylbenzene		56.5	ug/L	0.300	1.00
95-47-6	o-Xylene		54.6	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene		58.4	ug/L	0.300	1.00

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Sample Summary**

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SDG Number:	2018-1719	Date Collected:	02/13/2018 13:47	Matrix:	W
Lab Sample ID:	1203976521	Date Received:	02/15/2018 09:05		
Client Sample:	QC for batch 1741056	Client:	ARSL004	Project:	QC
Client ID:	CAPA-18-8PSD	Method:	SW-846:8260B	SOP Ref:	GL-OA-E-038
Batch ID:	1741056	Inst:	VOA9.I	Dilution:	1
Run Date:	02/23/2018 19:50	Analyst:	RXY1	Purge Vol:	5 mL
Prep Date:	02/23/2018 19:50				
Data File:	022318V9\9G523.D	Column:	DB-624		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
1634-04-4	tert-Butyl methyl ether		50.8	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene		57.9	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene		53.7	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene		59.5	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	49.7	50.0	ug/L	99	(71%-134%)
Bromofluorobenzene	51.2	50.0	ug/L	102	(70%-131%)
Toluene-d8	52.7	50.0	ug/L	105	(74%-124%)

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Sample Summary

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SDG Number: 2018-1719
Lab Sample ID: 1203976522
Client Sample: QC for batch 1741056
Client ID: CAPA-18-8PSD
Batch ID: 1741056
Run Date: 02/23/2018 20:46
Prep Date: 02/23/2018 20:46
Data File: 022318V9\9G525.D

Date Collected: 02/13/2018 13:47
Date Received: 02/15/2018 09:05
Client: ARSL004
Method: SW-846:8260B
Inst: VOA9.I
Analyst: RXY1

Column: DB-624

Matrix: W

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

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	0.300	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	0.300	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	0.300	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	0.300	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	0.300	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	0.300	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	0.500	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	0.300	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	0.300	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	0.300	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
78-93-3	2-Butanone	U	1.50	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene		51.7	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		269	ug/L	1.50	5.00
107-13-1	Acrylonitrile		293	ug/L	1.50	5.00
107-05-1	Allyl chloride		270	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
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Sample Summary

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SDG Number: 2018-1719
Lab Sample ID: 1203976522
Client Sample: QC for batch 1741056
Client ID: CAPA-18-8PSD
Batch ID: 1741056
Run Date: 02/23/2018 20:46
Prep Date: 02/23/2018 20:46
Data File: 022318V9\9G525.D

Date Collected: 02/13/2018 13:47
Date Received: 02/15/2018 09:05
Client: ARSL004
Method: SW-846:8260B
Inst: VOA9.I
Analyst: RXY1

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		281	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		2770	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	0.300	ug/L	0.300	1.00
126-98-7	Methacrylonitrile		288	ug/L	1.50	5.00
80-62-6	Methyl methacrylate		267	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		280	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		262	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	1.50	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	0.300	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	0.300	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	0.300	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	0.300	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	15.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	0.300	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	0.300	ug/L	0.300	1.00
95-47-6	o-Xylene	U	0.300	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	0.300	ug/L	0.300	1.00

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Sample Summary

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SDG Number:	2018-1719	Date Collected:	02/13/2018 13:47	Matrix:	W
Lab Sample ID:	1203976522	Date Received:	02/15/2018 09:05		
Client Sample:	QC for batch 1741056	Client:	ARSL004	Project:	QC
Client ID:	CAPA-18-8PSD	Method:	SW-846:8260B	SOP Ref:	GL-OA-E-038
Batch ID:	1741056	Inst:	VOA9.I	Dilution:	1
Run Date:	02/23/2018 20:46	Analyst:	RXY1	Purge Vol:	5 mL
Prep Date:	02/23/2018 20:46				
Data File:	022318V9\9G525.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	50.5	50.0	ug/L 101	(71%-134%)
Bromofluorobenzene	52.1	50.0	ug/L 104	(70%-131%)
Toluene-d8	53.6	50.0	ug/L 107	(74%-124%)

Volatile
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Sample Summary

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SDG Number: 2018-1719

Lab Sample ID: 1203977904

Client Sample: QC for batch 1741056

Client ID: MB for batch 1741056

Batch ID: 1741056

Run Date: 02/23/2018 13:15

Prep Date: 02/23/2018 13:15

Data File: 022318V9\9G509B.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA9.I

Analyst: RXY1

Column: DB-624

Matrix: GROUND 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

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Sample Summary

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SDG Number: 2018-1719

Lab Sample ID: 1203977904

Client Sample: QC for batch 1741056

Client ID: MB for batch 1741056

Batch ID: 1741056

Run Date: 02/23/2018 13:15

Prep Date: 02/23/2018 13:15

Data File: 022318V9\9G509B.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA9.I

Analyst: RXY1

Column: DB-624

Matrix: GROUND 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
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Sample Summary

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SDG Number: 2018-1719

Lab Sample ID: 1203977904

Client Sample: QC for batch 1741056

Client ID: MB for batch 1741056

Batch ID: 1741056

Run Date: 02/23/2018 13:15

Prep Date: 02/23/2018 13:15

Data File: 022318V9\9G509B.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA9.I

Analyst: RXY1

Column: DB-624

Matrix: GROUND 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	51.4	50.0	ug/L 103	(71%-134%)
Bromofluorobenzene	52.6	50.0	ug/L 105	(70%-131%)
Toluene-d8	53.4	50.0	ug/L 107	(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
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Sample Summary

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SDG Number: 2018-1719

Lab Sample ID: 1203977905

Client Sample: QC for batch 1741056

Client ID: LCS for batch 1741056

Batch ID: 1741056

Run Date: 02/23/2018 11:50

Prep Date: 02/23/2018 11:50

Data File: 022318V9\9G506L.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA9.I

Analyst: RXY1

Column: DB-624

Matrix: GROUND 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		54.6	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane		48.8	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane		54.7	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane		52.7	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane		50.5	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		50.1	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene		55.9	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane		52.6	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene		56.0	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene		53.3	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane		46.1	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane		51.7	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene		49.1	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane		49.4	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane		50.1	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene		54.4	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene		49.9	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane		50.6	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene		51.2	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane		52.2	ug/L	0.300	1.00
78-93-3	2-Butanone		278	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		52.7	ug/L	0.300	1.00
591-78-6	2-Hexanone		303	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene		53.3	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene		54.5	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone		260	ug/L	1.50	5.00
67-64-1	Acetone		302	ug/L	1.50	10.0
75-05-8	Acetonitrile		1160	ug/L	8.00	25.0
107-02-8	Acrolein	U	1.50	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	1.50	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	1.50	ug/L	1.50	5.00
71-43-2	Benzene		49.3	ug/L	0.300	1.00
108-86-1	Bromobenzene		50.5	ug/L	0.300	1.00
74-97-5	Bromochloromethane		45.4	ug/L	0.300	1.00
75-27-4	Bromodichloromethane		51.4	ug/L	0.300	1.00
75-25-2	Bromoform		47.7	ug/L	0.300	1.00

Volatile
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Sample Summary

SDG Number: 2018-1719
Lab Sample ID: 1203977905
Client Sample: QC for batch 1741056
Client ID: LCS for batch 1741056
Batch ID: 1741056
Run Date: 02/23/2018 11:50
Prep Date: 02/23/2018 11:50
Data File: 022318V9\9G506L.D

Client: ARSL004
Method: SW-846:8260B
Inst: VOA9.I
Analyst: RXY1

Column: DB-624

Matrix: GROUND 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		50.1	ug/L	0.300	1.00
75-15-0	Carbon disulfide		228	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride		49.1	ug/L	0.300	1.00
108-90-7	Chlorobenzene		50.5	ug/L	0.300	1.00
75-00-3	Chloroethane		53.4	ug/L	0.300	1.00
67-66-3	Chloroform		48.4	ug/L	0.300	1.00
74-87-3	Chloromethane		57.5	ug/L	0.300	1.00
124-48-1	Dibromochloromethane		54.2	ug/L	0.300	1.00
74-95-3	Dibromomethane		47.6	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane		56.2	ug/L	0.300	1.00
60-29-7	Ethyl ether		50.4	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	1.50	ug/L	1.50	5.00
100-41-4	Ethylbenzene		51.6	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene		56.0	ug/L	0.300	1.00
74-88-4	Iodomethane		211	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	15.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene		53.9	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		45.6	ug/L	1.00	10.0
91-20-3	Naphthalene		55.2	ug/L	0.300	1.00
107-12-0	Propionitrile	U	1.50	ug/L	1.50	5.00
100-42-5	Styrene		51.5	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene		50.5	ug/L	0.300	1.00
108-88-3	Toluene		51.9	ug/L	0.300	1.00
79-01-6	Trichloroethylene		50.1	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane		51.9	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	2.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate		266	ug/L	1.50	5.00
75-01-4	Vinyl chloride		57.2	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene		50.8	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene		51.5	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes		106	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol		5200	ug/L	15.0	50.0
104-51-8	n-Butylbenzene		54.7	ug/L	0.300	1.00
103-65-1	n-Propylbenzene		54.4	ug/L	0.300	1.00
95-47-6	o-Xylene		51.3	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene		55.0	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

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SDG Number:	2018-1719	Matrix:	GROUND WATER
Lab Sample ID:	1203977905		
Client Sample:	QC for batch 1741056	Client:	ARSL004
Client ID:	LCS for batch 1741056	Method:	SW-846:8260B
Batch ID:	1741056	Inst:	VOA9.I
Run Date:	02/23/2018 11:50	Analyst:	RXY1
Prep Date:	02/23/2018 11:50		
Data File:	022318V9\9G506L.D	Column:	DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
1634-04-4	tert-Butyl methyl ether		47.7	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene		55.0	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		57.3	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	49.5	50.0	ug/L	99	(71%-134%)
Bromofluorobenzene	52.8	50.0	ug/L	106	(70%-131%)
Toluene-d8	52.9	50.0	ug/L	106	(74%-124%)

Volatile
Certificate of Analysis
Sample Summary

Page 1 of 3

SDG Number: 2018-1719

Lab Sample ID: 1203977906

Client Sample: QC for batch 1741056

Client ID: LCS for batch 1741056

Batch ID: 1741056

Run Date: 02/23/2018 12:46

Prep Date: 02/23/2018 12:46

Data File: 022318V9\9G508L.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA9.I

Analyst: RXY1

Column: DB-624

Matrix: GROUND 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		51.4	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	0.300	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	1.50	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene	U	0.300	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	0.300	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	1.50	ug/L	1.50	5.00
67-64-1	Acetone	U	1.50	ug/L	1.50	10.0
75-05-8	Acetonitrile	U	8.00	ug/L	8.00	25.0
107-02-8	Acrolein		175	ug/L	1.50	5.00
107-13-1	Acrylonitrile		179	ug/L	1.50	5.00
107-05-1	Allyl chloride		256	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: 2018-1719

Lab Sample ID: 1203977906

Client Sample: QC for batch 1741056

Client ID: LCS for batch 1741056

Batch ID: 1741056

Run Date: 02/23/2018 12:46

Prep Date: 02/23/2018 12:46

Data File: 022318V9\9G508L.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA9.I

Analyst: RXY1

Column: DB-624

Matrix: GROUND 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		214	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		1670	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	0.300	ug/L	0.300	1.00
126-98-7	Methacrylonitrile		188	ug/L	1.50	5.00
80-62-6	Methyl methacrylate		185	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		166	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		258	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:	2018-1719	Matrix:	GROUND WATER
Lab Sample ID:	1203977906		
Client Sample:	QC for batch 1741056	Client:	ARSL004
Client ID:	LCS for batch 1741056	Method:	SW-846:8260B
Batch ID:	1741056	Inst:	VOA9.I
Run Date:	02/23/2018 12:46	Analyst:	RXY1
Prep Date:	02/23/2018 12:46		
Data File:	022318V9\9G508L.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	44.5	50.0	ug/L 89	(71%-134%)
Bromofluorobenzene	51.8	50.0	ug/L 104	(70%-131%)
Toluene-d8	54.2	50.0	ug/L 108	(74%-124%)

Semi-Volatile Analysis

Case Narrative

**GC/MS Semivolatile
Technical Case Narrative
ARS International, LLC (ARSL)
SDG #: 2018-1719
Work Order #: 443888**

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:	1739613
Prep Batch Number:	1739612

Sample Analysis

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

Sample ID	Client ID
443888002	CAPA-18-14
443888007	CAPA-18-4
443888009	CAPA-18-8
443888012	CAWA-18-64
443888016	CAWA-18-151310
1203972710	Method Blank (MB)
1203972711	Laboratory Control Sample (LCS)
1203972712	443888002(CAPA-18-14) Matrix Spike (MS)
1203972713	443888002(CAPA-18-14) 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# 40.

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

Calibration Information

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

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

Initial Calibration

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

CCV Requirements

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

Quality Control (QC) Information

Method Blank (MB) Statement

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

Surrogate Recoveries

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

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

QC Sample Designation

Sample 443888002 (CAPA-18-14) 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

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

Miscellaneous Information:

Manual Integrations

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

TIC Comment

Tentatively identified compounds (TIC) were requested for samples 443888002 (CAPA-18-14), 443888007 (CAPA-18-4), 443888009 (CAPA-18-8), 443888012 (CAWA-18-64) and 443888016 (CAWA-18-151310) 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: 2018-1719 GEL Work Order: 443888

The Qualifiers in this report are defined as follows:

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

Review/Validation

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

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

Signature: 

Name: Barbara Bailey

Date: 14 MAR 2018

Title: Data Validator

Sample Data Summary

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

Page 1 of 3

SDG Number: 2018-1719

Lab Sample ID: 443888002

Date Collected: 02/13/2018 11:44

Date Received: 02/15/2018 09:05

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW846 3510C/8270D

SOP Ref: GL-OA-E-009

Inst: MSD4.I

Dilution: 1

Batch ID: 1739613

Analyst: JMB3

Inj. Vol: 1 uL

Run Date: 02/16/2018 16:45

Prep Date: 02/16/2018 07:00

Aliquot: 1000 mL

Final Volume: 1 mL

Data File: s021618.B\s4b1615.D

Column: DB-5ms

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

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

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SDG Number: 2018-1719

Lab Sample ID: 443888002

Date Collected: 02/13/2018 11:44

Date Received: 02/15/2018 09:05

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW846 3510C/8270D

SOP Ref: GL-OA-E-009

Inst: MSD4.I

Dilution: 1

Batch ID: 1739613

Analyst: JMB3

Inj. Vol: 1 uL

Run Date: 02/16/2018 16:45

Aliquot: 1000 mL

Final Volume: 1 mL

Prep Date: 02/16/2018 07:00

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	1.00

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

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SDG Number: 2018-1719
Lab Sample ID: 443888002

Client ID: CAPA-18-14
Batch ID: 1739613
Run Date: 02/16/2018 16:45
Prep Date: 02/16/2018 07:00
Data File: s021618.B\s4b1615.D

Date Collected: 02/13/2018 11:44
Date Received: 02/15/2018 09:05
Client: ARSL004
Method: SW846 3510C/8270D
Inst: MSD4.I
Analyst: JMB3
Aliquot: 1000 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	3.70	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	41.1	100	ug/L	41	(32%-124%)
2-Fluorobiphenyl	25.5	50.0	ug/L	51	(32%-112%)
2-Fluorophenol	29.3	100	ug/L	29	(15%-88%)
Nitrobenzene-d5	26.5	50.0	ug/L	53	(36%-115%)
Phenol-d5	21.4	100	ug/L	21	(15%-91%)
p-Terphenyl-d14	35.3	50.0	ug/L	71	(36%-121%)

Tentatively Identified Compound Summary

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

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

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SDG Number: 2018-1719

Lab Sample ID: 443888007

Date Collected: 02/13/2018 13:47

Date Received: 02/15/2018 09:05

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW846 3510C/8270D

SOP Ref: GL-OA-E-009

Inst: MSD4.I

Dilution: 1

Batch ID: 1739613

Analyst: JMB3

Inj. Vol: 1 uL

Run Date: 02/16/2018 18:09

Aliquot: 970 mL

Final Volume: 1 mL

Prep Date: 02/16/2018 07:00

Column: DB-5ms

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

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

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SDG Number: 2018-1719

Lab Sample ID: 443888007

Date Collected: 02/13/2018 13:47

Date Received: 02/15/2018 09:05

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW846 3510C/8270D

SOP Ref: GL-OA-E-009

Inst: MSD4.I

Dilution: 1

Batch ID: 1739613

Run Date: 02/16/2018 18:09

Analyst: JMB3

Inj. Vol: 1 uL

Prep Date: 02/16/2018 07:00

Aliquot: 970 mL

Final Volume: 1 mL

Data File: s021618.B\s4b1618.D

Column: DB-5ms

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

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

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SDG Number: 2018-1719

Lab Sample ID: 443888007

Date Collected: 02/13/2018 13:47

Date Received: 02/15/2018 09:05

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW846 3510C/8270D

SOP Ref: GL-OA-E-009

Client ID: CAPA-18-4

Inst: MSD4.I

Dilution: 1

Batch ID: 1739613

Run Date: 02/16/2018 18:09

Analyst: JMB3

Inj. Vol: 1 uL

Prep Date: 02/16/2018 07:00

Aliquot: 970 mL

Final Volume: 1 mL

Data File: s021618.B\s4b1618.D

Column: DB-5ms

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
2,4,6-Tribromophenol	95.1	103	ug/L	92 (32%-124%)
2-Fluorobiphenyl	37.7	51.5	ug/L	73 (32%-112%)
2-Fluorophenol	43.1	103	ug/L	42 (15%-88%)
Nitrobenzene-d5	40.2	51.5	ug/L	78 (36%-115%)
Phenol-d5	29.2	103	ug/L	28 (15%-91%)
p-Terphenyl-d14	48.2	51.5	ug/L	93 (36%-121%)

Tentatively Identified Compound Summary

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

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

Page 1 of 3

SDG Number: 2018-1719

Lab Sample ID: 443888009

Date Collected: 02/13/2018 13:47

Date Received: 02/15/2018 09:05

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW846 3510C/8270D

SOP Ref: GL-OA-E-009

Inst: MSD4.I

Dilution: 1

Batch ID: 1739613

Analyst: JMB3

Inj. Vol: 1 uL

Run Date: 02/16/2018 18:37

Aliquot: 950 mL

Final Volume: 1 mL

Prep Date: 02/16/2018 07:00

Column: DB-5ms

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
95-94-3	1,2,4,5-Tetrachlorobenzene	U	3.16	ug/L	3.16	10.5
120-82-1	1,2,4-Trichlorobenzene	U	3.16	ug/L	3.16	10.5
95-50-1	1,2-Dichlorobenzene	U	3.16	ug/L	3.16	10.5
122-66-7	Azobenzene	U	3.16	ug/L	3.16	10.5
	<i>1,2-Diphenylhydrazine</i>					
541-73-1	1,3-Dichlorobenzene	U	3.16	ug/L	3.16	10.5
106-46-7	1,4-Dichlorobenzene	U	3.16	ug/L	3.16	10.5
123-91-1	1,4-Dioxane	U	3.16	ug/L	3.16	10.5
90-12-0	1-Methylnaphthalene	U	0.316	ug/L	0.316	1.05
58-90-2	2,3,4,6-Tetrachlorophenol	U	3.16	ug/L	3.16	10.5
95-95-4	2,4,5-Trichlorophenol	U	3.16	ug/L	3.16	10.5
88-06-2	2,4,6-Trichlorophenol	U	3.16	ug/L	3.16	10.5
120-83-2	2,4-Dichlorophenol	U	3.16	ug/L	3.16	10.5
105-67-9	2,4-Dimethylphenol	U	3.16	ug/L	3.16	10.5
51-28-5	2,4-Dinitrophenol	U	5.26	ug/L	5.26	21.1
121-14-2	2,4-Dinitrotoluene	U	3.16	ug/L	3.16	10.5
606-20-2	2,6-Dinitrotoluene	U	3.16	ug/L	3.16	10.5
91-58-7	2-Chloronaphthalene	U	0.432	ug/L	0.432	1.05
95-57-8	2-Chlorophenol	U	3.16	ug/L	3.16	10.5
534-52-1	2-Methyl-4,6-dinitrophenol	U	3.16	ug/L	3.16	10.5
91-57-6	2-Methylnaphthalene	U	0.316	ug/L	0.316	1.05
88-75-5	2-Nitrophenol	U	3.16	ug/L	3.16	10.5
91-94-1	3,3'-Dichlorobenzidine	U	3.16	ug/L	3.16	10.5
101-55-3	4-Bromophenylphenylether	U	3.16	ug/L	3.16	10.5
59-50-7	Parachlorometa cresol	U	3.16	ug/L	3.16	10.5
	<i>4-Chloro-3-methylphenol</i>					
106-47-8	4-Chloroaniline	U	3.47	ug/L	3.47	10.5
7005-72-3	4-Chlorophenylphenylether	U	3.16	ug/L	3.16	10.5
100-02-7	4-Nitrophenol	U	3.16	ug/L	3.16	10.5
83-32-9	Acenaphthene	U	0.316	ug/L	0.316	1.05
208-96-8	Acenaphthylene	U	0.316	ug/L	0.316	1.05
62-53-3	Aniline	U	4.42	ug/L	4.42	10.5
120-12-7	Anthracene	U	0.316	ug/L	0.316	1.05
1912-24-9	Atrazine	U	3.16	ug/L	3.16	10.5
92-87-5	Benzidine	U	4.11	ug/L	4.11	10.5
56-55-3	Benzo(a)anthracene	U	0.316	ug/L	0.316	1.05
50-32-8	Benzo(a)pyrene	U	0.316	ug/L	0.316	1.05
205-99-2	Benzo(b)fluoranthene	U	0.316	ug/L	0.316	1.05
191-24-2	Benzo(ghi)perylene	U	0.316	ug/L	0.316	1.05

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

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SDG Number: 2018-1719
Lab Sample ID: 443888009

Client ID: CAPA-18-8
Batch ID: 1739613
Run Date: 02/16/2018 18:37
Prep Date: 02/16/2018 07:00
Data File: s021618.B\s4b1619.D

Date Collected: 02/13/2018 13:47
Date Received: 02/15/2018 09:05
Client: ARSL004
Method: SW846 3510C/8270D
Inst: MSD4.I
Analyst: JMB3
Aliquot: 950 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	0.316	ug/L	0.316	1.05
65-85-0	Benzoic acid	U	6.32	ug/L	6.32	21.1
100-51-6	Benzyl alcohol	U	3.16	ug/L	3.16	10.5
85-68-7	Butylbenzylphthalate	U	3.16	ug/L	3.16	10.5
218-01-9	Chrysene	U	0.316	ug/L	0.316	1.05
84-74-2	Di-n-butylphthalate	U	3.16	ug/L	3.16	10.5
117-84-0	Di-n-octylphthalate	U	3.16	ug/L	3.16	10.5
53-70-3	Dibenzo(a,h)anthracene	U	0.316	ug/L	0.316	1.05
132-64-9	Dibenzofuran	U	3.16	ug/L	3.16	10.5
84-66-2	Diethylphthalate	U	3.16	ug/L	3.16	10.5
131-11-3	Dimethylphthalate	U	3.16	ug/L	3.16	10.5
88-85-7	Dinoseb	U	3.16	ug/L	3.16	10.5
122-39-4	Diphenylamine	U	3.16	ug/L	3.16	10.5
206-44-0	Fluoranthene	U	0.316	ug/L	0.316	1.05
86-73-7	Fluorene	U	0.316	ug/L	0.316	1.05
118-74-1	Hexachlorobenzene	U	3.16	ug/L	3.16	10.5
87-68-3	Hexachlorobutadiene	U	3.16	ug/L	3.16	10.5
77-47-4	Hexachlorocyclopentadiene	U	3.16	ug/L	3.16	10.5
67-72-1	Hexachloroethane	U	3.16	ug/L	3.16	10.5
193-39-5	Indeno(1,2,3-cd)pyrene	U	0.316	ug/L	0.316	1.05
78-59-1	Isophorone	U	3.68	ug/L	3.68	10.5
62-75-9	N-Methyl-N-nitrosomethylamine	U	3.16	ug/L	3.16	10.5
924-16-3	N-Nitrosodi-n-butylamine	U	3.16	ug/L	3.16	10.5
55-18-5	N-Nitrosodiethylamine	U	3.16	ug/L	3.16	10.5
621-64-7	N-Nitrosodi-n-propylamine	U	3.16	ug/L	3.16	10.5
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine	U	3.16	ug/L	3.16	10.5
91-20-3	Naphthalene	U	0.316	ug/L	0.316	1.05
98-95-3	Nitrobenzene	U	3.16	ug/L	3.16	10.5
608-93-5	Pentachlorobenzene	U	3.16	ug/L	3.16	10.5
87-86-5	Pentachlorophenol	U	3.16	ug/L	3.16	10.5
85-01-8	Phenanthrene	U	0.316	ug/L	0.316	1.05
108-95-2	Phenol	U	3.16	ug/L	3.16	10.5
129-00-0	Pyrene	U	0.316	ug/L	0.316	1.05
110-86-1	Pyridine	U	3.16	ug/L	3.16	10.5
108-60-1	bis(2-Chloro-1-methylethyl)ether	U	3.16	ug/L	3.16	10.5
111-91-1	bis(2-Chloroethoxy)methane	U	3.16	ug/L	3.16	10.5
111-44-4	bis(2-Chloroethyl) ether	U	3.16	ug/L	3.16	10.5
117-81-7	bis(2-Ethylhexyl)phthalate	U	3.16	ug/L	3.16	1.05

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

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SDG Number: 2018-1719
Lab Sample ID: 443888009

Client ID: CAPA-18-8
Batch ID: 1739613
Run Date: 02/16/2018 18:37
Prep Date: 02/16/2018 07:00
Data File: s021618.B\s4b1619.D

Date Collected: 02/13/2018 13:47
Date Received: 02/15/2018 09:05
Client: ARSL004
Method: SW846 3510C/8270D
Inst: MSD4.I
Analyst: JMB3
Aliquot: 950 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	3.89	ug/L	3.89	10.5
99-09-2	3-Nitroaniline	U	3.16	ug/L	3.16	10.5
	<i>m</i> -Nitroaniline					
95-48-7	o-Cresol	U	3.16	ug/L	3.16	10.5
88-74-4	2-Nitroaniline	U	3.16	ug/L	3.16	10.5
	<i>o</i> -Nitroaniline					
100-01-6	4-Nitroaniline	U	3.16	ug/L	3.16	10.5
	<i>p</i> -Nitroaniline					

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	90.8	105	ug/L	86	(32%-124%)
2-Fluorobiphenyl	39.4	52.6	ug/L	75	(32%-112%)
2-Fluorophenol	44.0	105	ug/L	42	(15%-88%)
Nitrobenzene-d5	39.6	52.6	ug/L	75	(36%-115%)
Phenol-d5	29.6	105	ug/L	28	(15%-91%)
p-Terphenyl-d14	49.9	52.6	ug/L	95	(36%-121%)

Tentatively Identified Compound Summary

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

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

Page 1 of 3

SDG Number: 2018-1719
Lab Sample ID: 443888012

Client ID: CAWA-18-64
Batch ID: 1739613
Run Date: 02/16/2018 19:05
Prep Date: 02/16/2018 07:00
Data File: s021618.B\s4b1620.D

Date Collected: 02/13/2018 12:50
Date Received: 02/15/2018 09:05
Client: ARSL004
Method: SW846 3510C/8270D
Inst: MSD4.I
Analyst: JMB3
Aliquot: 970 mL
Column: DB-5ms

Matrix: W

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

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

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

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SDG Number: 2018-1719
Lab Sample ID: 443888012

Client ID: CAWA-18-64
Batch ID: 1739613
Run Date: 02/16/2018 19:05
Prep Date: 02/16/2018 07:00
Data File: s021618.B\s4b1620.D

Date Collected: 02/13/2018 12:50
Date Received: 02/15/2018 09:05
Client: ARSL004
Method: SW846 3510C/8270D
Inst: MSD4.I
Analyst: JMB3
Aliquot: 970 mL
Column: DB-5ms

Matrix: W

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

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

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

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SDG Number: 2018-1719
Lab Sample ID: 443888012

Client ID: CAWA-18-64
Batch ID: 1739613
Run Date: 02/16/2018 19:05
Prep Date: 02/16/2018 07:00
Data File: s021618.B\s4b1620.D

Date Collected: 02/13/2018 12:50
Date Received: 02/15/2018 09:05
Client: ARSL004
Method: SW846 3510C/8270D
Inst: MSD4.I
Analyst: JMB3
Aliquot: 970 mL
Column: DB-5ms

Matrix: W

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

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

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	95.9	103	ug/L	93	(32%-124%)
2-Fluorobiphenyl	42.2	51.5	ug/L	82	(32%-112%)
2-Fluorophenol	45.9	103	ug/L	45	(15%-88%)
Nitrobenzene-d5	42.6	51.5	ug/L	83	(36%-115%)
Phenol-d5	31.0	103	ug/L	30	(15%-91%)
p-Terphenyl-d14	52.9	51.5	ug/L	103	(36%-121%)

Tentatively Identified Compound Summary

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

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

Page 1 of 3

SDG Number: 2018-1719

Lab Sample ID: 443888016

Date Collected: 02/13/2018 12:50

Date Received: 02/15/2018 09:05

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW846 3510C/8270D

SOP Ref: GL-OA-E-009

Inst: MSD4.I

Dilution: 1

Batch ID: 1739613

Run Date: 02/16/2018 19:33

Analyst: JMB3

Inj. Vol: 1 uL

Prep Date: 02/16/2018 07:00

Aliquot: 970 mL

Final Volume: 1 mL

Data File: s021618.B\s4b1621.D

Column: DB-5ms

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

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

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SDG Number: 2018-1719

Lab Sample ID: 443888016

Date Collected: 02/13/2018 12:50

Date Received: 02/15/2018 09:05

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW846 3510C/8270D

SOP Ref: GL-OA-E-009

Inst: MSD4.I

Dilution: 1

Batch ID: 1739613

Analyst: JMB3

Inj. Vol: 1 uL

Run Date: 02/16/2018 19:33

Prep Date: 02/16/2018 07:00

Aliquot: 970 mL

Final Volume: 1 mL

Data File: s021618.B\s4b1621.D

Column: DB-5ms

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

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

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SDG Number: 2018-1719
Lab Sample ID: 443888016

Client ID: CAWA-18-151310
Batch ID: 1739613
Run Date: 02/16/2018 19:33
Prep Date: 02/16/2018 07:00
Data File: s021618.B\s4b1621.D

Date Collected: 02/13/2018 12:50
Date Received: 02/15/2018 09:05
Client: ARSL004
Method: SW846 3510C/8270D
Inst: MSD4.I
Analyst: JMB3
Aliquot: 970 mL
Column: DB-5ms

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

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

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	84.5	103	ug/L	82	(32%-124%)
2-Fluorobiphenyl	40.9	51.5	ug/L	79	(32%-112%)
2-Fluorophenol	46.1	103	ug/L	45	(15%-88%)
Nitrobenzene-d5	40.4	51.5	ug/L	78	(36%-115%)
Phenol-d5	30.9	103	ug/L	30	(15%-91%)
p-Terphenyl-d14	53.7	51.5	ug/L	104	(36%-121%)

Tentatively Identified Compound Summary

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

Quality Control Summary

Semi-Volatile
Surrogate Recovery Report

Page 1 of 1

SDG Number: 2018-1719**Matrix Type: LIQUID**

Sample ID	Client ID	2FP %REC	PHL %REC	NBZ %REC	FBP %REC	TBP %REC	TPH %REC
1203972710	MB for batch 1739612	40	26	74	72	86	98
1203972711	LCS for batch 1739612	46	30	80	82	95	93
443888002	CAPA-18-14	29	21	53	51	41	71
1203972712	CAPA-18-14MS	54	46	71	72	84	86
1203972713	CAPA-18-14MSD	55	48	76	76	88	95
443888007	CAPA-18-4	42	28	78	73	92	93
443888009	CAPA-18-8	42	28	75	75	86	95
443888012	CAWA-18-64	45	30	83	82	93	103
443888016	CAWA-18-151310	45	30	78	79	82	104

Surrogate**Acceptance Limits**

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

* Recovery outside Acceptance Limits

Column to be used to flag recovery values

D Sample Diluted

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 1 of 4

SDG Number: 2018-1719

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1739612

Matrix: WATER

Lab Sample ID 1203972711

Instrument: MSD4.I

Analysis Date: 02/16/2018 16:17

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1739612

Inj. Vol: 1 uL

Batch ID: 1739613

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	23.1	46	30-88
110-86-1	LCS Pyridine	50.0	0.0	27.6	55	27-89
62-53-3	LCS Aniline	50.0	0.0	41.3	83	49-112
108-95-2	LCS Phenol	50.0	0.0	15.8	32	16-82
111-44-4	LCS bis(2-Chloroethyl) ether	50.0	0.0	39.1	78	51-111
95-57-8	LCS 2-Chlorophenol	50.0	0.0	37.1	74	49-105
541-73-1	LCS 1,3-Dichlorobenzene	50.0	0.0	30.6	61	37-95
106-46-7	LCS 1,4-Dichlorobenzene	50.0	0.0	30.6	61	38-96
95-50-1	LCS 1,2-Dichlorobenzene	50.0	0.0	31.6	63	39-97
108-60-1	LCS bis(2-Chloro-1-methylethyl)ether	50.0	0.0	39.0	78	44-123
100-51-6	LCS Benzyl alcohol	50.0	0.0	37.9	76	44-102
95-48-7	LCS o-Cresol	50.0	0.0	34.9	70	41-101
65794-96-9	LCS m,p-Cresols	50.0	0.0	34.3	69	43-102
621-64-7	LCS N-Nitrosodi--n-propylamine N-Nitrosodipropylamine	50.0	0.0	41.7	83	54-115
67-72-1	LCS Hexachloroethane	50.0	0.0	28.9	58	36-96
98-95-3	LCS Nitrobenzene	50.0	0.0	38.9	78	53-115
78-59-1	LCS Isophorone	50.0	0.0	37.2	74	56-117
88-75-5	LCS 2-Nitrophenol	50.0	0.0	42.2	84	51-113
105-67-9	LCS 2,4-Dimethylphenol	50.0	0.0	36.0	72	51-104
111-91-1	LCS bis(2-Chloroethoxy)methane	50.0	0.0	38.6	77	55-114
120-83-2	LCS 2,4-Dichlorophenol	50.0	0.0	39.8	80	53-109
65-85-0	LCS Benzoic acid	100	0.0	35.3	35	21-74

Semi-Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2018-1719

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1739612

Matrix: WATER

Lab Sample ID 1203972711

Instrument: MSD4.I

Analysis Date: 02/16/2018 16:17

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1739612

Inj. Vol: 1 uL

Batch ID: 1739613

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	59.4	119	65-136
87-68-3	LCS Hexachlorobutadiene	50.0	0.0	31.2	62	35-98
59-50-7	LCS Parachlorometa cresol 4-Chloro-3-methylphenol	50.0	0.0	41.8	84	55-115
91-57-6	LCS 2-Methylnaphthalene	50.0	0.0	33.9	68	42-103
91-20-3	LCS Naphthalene	50.0	0.0	33.8	68	44-102
90-12-0	LCS 1-Methylnaphthalene	50.0	0.0	35.3	71	45-108
77-47-4	LCS Hexachlorocyclopentadiene	50.0	0.0	26.3	53	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	43.6	87	55-116
91-58-7	LCS 2-Chloronaphthalene	50.0	0.0	36.5	73	44-107
88-74-4	LCS 2-Nitroaniline o-Nitroaniline	50.0	0.0	46.5	93	53-121
99-09-2	LCS 3-Nitroaniline m-Nitroaniline	50.0	0.0	59.3	119	61-139
131-11-3	LCS Dimethylphthalate	50.0	0.0	45.3	91	60-122
606-20-2	LCS 2,6-Dinitrotoluene	50.0	0.0	42.7	85	59-122
121-14-2	LCS 2,4-Dinitrotoluene	50.0	0.0	45.8	92	57-124
208-96-8	LCS Acenaphthylene	50.0	0.0	40.3	81	50-113
83-32-9	LCS Acenaphthene	50.0	0.0	42.2	84	49-112
51-28-5	LCS 2,4-Dinitrophenol	50.0	0.0	45.9	92	34-122
132-64-9	LCS Dibenzofuran	50.0	0.0	42.7	85	50-111
58-90-2	LCS 2,3,4,6-Tetrachlorophenol	50.0	0.0	44.9	90	54-122
84-66-2	LCS Diethylphthalate	50.0	0.0	46.3	93	57-122
100-02-7	LCS 4-Nitrophenol	50.0	0.0	13.8	28	15-137

Semi-Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2018-1719

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1739612

Matrix: WATER

Lab Sample ID 1203972711

Instrument: MSD4.I

Analysis Date: 02/16/2018 16:17

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1739612

Inj. Vol: 1 uL

Batch ID: 1739613

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	41.1	82	52-114
7005-72-3	LCS 4-Chlorophenylphenylether	50.0	0.0	43.7	87	52-121
100-01-6	LCS 4-Nitroaniline	50.0	0.0	48.2	96	44-137
	<i>p</i> -Nitroaniline					
534-52-1	LCS 2-Methyl-4,6-dinitrophenol	50.0	0.0	47.0	94	45-124
122-39-4	LCS Diphenylamine	50.0	0.0	42.4	85	55-113
122-66-7	LCS Azobenzene	50.0	0.0	41.1	82	53-115
	<i>1,2-Diphenylhydrazine</i>					
101-55-3	LCS 4-Bromophenylphenylether	50.0	0.0	41.2	82	54-116
118-74-1	LCS Hexachlorobenzene	50.0	0.0	42.1	84	54-115
87-86-5	LCS Pentachlorophenol	50.0	0.0	53.6	107	41-116
85-01-8	LCS Phenanthrene	50.0	0.0	41.3	83	55-110
120-12-7	LCS Anthracene	50.0	0.0	41.3	83	56-112
84-74-2	LCS Di-n-butylphthalate	50.0	0.0	46.3	93	57-123
206-44-0	LCS Fluoranthene	50.0	0.0	42.9	86	54-118
129-00-0	LCS Pyrene	50.0	0.0	41.7	83	49-121
85-68-7	LCS Butylbenzylphthalate	50.0	0.0	46.5	93	52-125
117-81-7	LCS bis(2-Ethylhexyl)phthalate	50.0	0.0	47.8	96	52-125
56-55-3	LCS Benzo(a)anthracene	50.0	0.0	42.2	84	57-112
218-01-9	LCS Chrysene	50.0	0.0	42.5	85	58-117
117-84-0	LCS Di-n-octylphthalate	50.0	0.0	47.2	94	50-129
205-99-2	LCS Benzo(b)fluoranthene	50.0	0.0	41.5	83	41-118
207-08-9	LCS Benzo(k)fluoranthene	50.0	0.0	43.6	87	42-121
50-32-8	LCS Benzo(a)pyrene	50.0	0.0	41.9	84	40-118

Semi-Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2018-1719

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1739612

Matrix: WATER

Lab Sample ID 1203972711

Instrument: MSD4.I

Analysis Date: 02/16/2018 16:17

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1739612

Inj. Vol: 1 uL

Batch ID: 1739613

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	41.4	83	34-125
53-70-3	LCS Dibenzo(a,h)anthracene	50.0	0.0	42.0	84	38-129
191-24-2	LCS Benzo(ghi)perylene	50.0	0.0	41.0	82	33-131
123-91-1	LCS 1,4-Dioxane	50.0	0.0	27.3	55	38-78
930-55-2	LCS N-Nitrosopyrrolidine	50.0	0.0	39.8	80	54-113
95-94-3	LCS 1,2,4,5-Tetrachlorobenzene	50.0	0.0	37.6	75	44-102
1912-24-9	LCS Atrazine	50.0	0.0	49.9	100	60-131
92-87-5	LCS Benzidine	100	0.0	72.4	72	20-144
91-94-1	LCS 3,3'-Dichlorobenzidine	50.0	0.0	42.7	85	43-127
120-82-1	LCS 1,2,4-Trichlorobenzene	50.0	0.0	32.7	65	39-99

Semi-Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2018-1719

Sample Type: Matrix Spike

Client ID: CAPA-18-14MS

Matrix: W

Lab Sample ID 1203972712

Instrument: MSD4.I

Analysis Date: 02/16/2018 17:13

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1739612

Inj. Vol: 1 uL

Batch ID: 1739613

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
62-75-9	MS N-Methyl-N-nitrosomethylamine	119	0.00 U	63.2	53	25-106
110-86-1	MS Pyridine	119	0.00 U	64.0	54	24-93
62-53-3	MS Aniline	119	0.00 U	85.8	72	37-113
108-95-2	MS Phenol	119	0.00 U	56.3	47	23-82
111-44-4	MS bis(2-Chloroethyl) ether	119	0.00 U	80.8	68	39-114
95-57-8	MS 2-Chlorophenol	119	0.00 U	77.9	65	37-108
541-73-1	MS 1,3-Dichlorobenzene	119	0.00 U	61.7	52	27-97
106-46-7	MS 1,4-Dichlorobenzene	119	0.00 U	63.1	53	28-97
95-50-1	MS 1,2-Dichlorobenzene	119	0.00 U	64.6	54	28-99
108-60-1	MS bis(2-Chloro-1-methylethyl)ether	119	0.00 U	80.3	67	32-127
100-51-6	MS Benzyl alcohol	119	0.00 U	90.1	76	37-116
95-48-7	MS o-Cresol	119	0.00 U	82.5	69	34-109
65794-96-9	MS m,p-Cresols	119	0.00 U	89.3	75	36-120
621-64-7	MS N-Nitrosodi--n-propylamine <i>N-Nitrosodipropylamine</i>	119	0.00 U	89.1	75	42-118
67-72-1	MS Hexachloroethane	119	0.00 U	58.1	49	29-94
98-95-3	MS Nitrobenzene	119	0.00 U	81.5	68	38-123
78-59-1	MS Isophorone	119	0.00 U	79.6	67	43-120
88-75-5	MS 2-Nitrophenol	119	0.00 U	84.5	71	39-115
105-67-9	MS 2,4-Dimethylphenol	119	0.00 U	76.8	65	39-107
111-91-1	MS bis(2-Chloroethoxy)methane	119	0.00 U	81.6	69	42-118
120-83-2	MS 2,4-Dichlorophenol	119	0.00 U	84.7	71	40-111
65-85-0	MS Benzoic acid	238	0.00 U	157	66	17-95

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 2 of 8

SDG Number: 2018-1719

Sample Type: Matrix Spike

Client ID: CAPA-18-14MS

Matrix: W

Lab Sample ID 1203972712

Instrument: MSD4.I

Analysis Date: 02/16/2018 17:13

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1739612

Inj. Vol: 1 uL

Batch ID: 1739613

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
106-47-8	MS 4-Chloroaniline	119	0.00 U	130	109	44-138
87-68-3	MS Hexachlorobutadiene	119	0.00 U	60.9	51	26-98
59-50-7	MS Parachlorometa cresol 4-Chloro-3-methylphenol	119	0.00 U	94.8	80	41-122
91-57-6	MS 2-Methylnaphthalene	119	0.00 U	70.8	59	29-109
91-20-3	MS Naphthalene	119	0.00 U	69.6	58	31-108
90-12-0	MS 1-Methylnaphthalene	119	0.00 U	73.2	62	33-112
77-47-4	MS Hexachlorocyclopentadiene	119	0.00 U	53.9	45	26-79
88-06-2	MS 2,4,6-Trichlorophenol	119	0.00 U	87.6	74	39-124
95-95-4	MS 2,4,5-Trichlorophenol	119	0.00 U	90.9	76	42-120
91-58-7	MS 2-Chloronaphthalene	119	0.00 U	75.0	63	29-113
88-74-4	MS 2-Nitroaniline o-Nitroaniline	119	0.00 U	104	87	41-121
99-09-2	MS 3-Nitroaniline m-Nitroaniline	119	0.00 U	132	110	42-144
131-11-3	MS Dimethylphthalate	119	0.00 U	97.2	82	45-128
606-20-2	MS 2,6-Dinitrotoluene	119	0.00 U	91.8	77	46-124
121-14-2	MS 2,4-Dinitrotoluene	119	0.00 U	99.3	83	45-125
208-96-8	MS Acenaphthylene	119	0.00 U	83.9	70	35-120
83-32-9	MS Acenaphthene	119	0.00 U	85.8	72	35-117
51-28-5	MS 2,4-Dinitrophenol	119	0.00 U	104	88	27-122
132-64-9	MS Dibenzofuran	119	0.00 U	88.7	75	38-113
58-90-2	MS 2,3,4,6-Tetrachlorophenol	119	0.00 U	93.0	78	40-128
84-66-2	MS Diethylphthalate	119	0.00 U	98.3	83	43-127
100-02-7	MS 4-Nitrophenol	119	0.00 U	60.6	51	17-85

Semi-Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2018-1719

Sample Type: Matrix Spike

Client ID: CAPA-18-14MS

Matrix: W

Lab Sample ID 1203972712

Instrument: MSD4.I

Analysis Date: 02/16/2018 17:13

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1739612

Inj. Vol: 1 uL

Batch ID: 1739613

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
86-73-7	MS Fluorene	119	0.00 U	86.5	73	39-117
7005-72-3	MS 4-Chlorophenylphenylether	119	0.00 U	89.4	75	39-121
100-01-6	MS 4-Nitroaniline	119	0.00 U	107	90	30-133
534-52-1	MS 2-Methyl-4,6-dinitrophenol	119	0.00 U	99.3	83	32-126
122-39-4	MS Diphenylamine	119	0.00 U	88.9	75	37-118
122-66-7	MS Azobenzene	119	0.00 U	86.5	73	38-120
101-55-3	MS 4-Bromophenylphenylether	119	0.00 U	86.6	73	39-121
118-74-1	MS Hexachlorobenzene	119	0.00 U	89.3	75	40-118
87-86-5	MS Pentachlorophenol	119	0.00 U	112	94	35-121
85-01-8	MS Phenanthrene	119	0.00 U	88.5	74	40-115
120-12-7	MS Anthracene	119	0.00 U	88.9	75	38-120
84-74-2	MS Di-n-butylphthalate	119	0.00 U	97.0	81	41-128
206-44-0	MS Fluoranthene	119	0.00 U	92.1	77	41-119
129-00-0	MS Pyrene	119	0.00 U	94.4	79	35-128
85-68-7	MS Butylbenzylphthalate	119	0.00 U	100	84	40-129
117-81-7	MS bis(2-Ethylhexyl)phthalate	119	0.00 U	94.3	79	38-131
56-55-3	MS Benzo(a)anthracene	119	0.00 U	89.4	75	39-120
218-01-9	MS Chrysene	119	0.00 U	91.4	77	41-124
117-84-0	MS Di-n-octylphthalate	119	0.00 U	90.4	76	37-134
205-99-2	MS Benzo(b)fluoranthene	119	0.00 U	87.5	74	31-122
207-08-9	MS Benzo(k)fluoranthene	119	0.00 U	90.8	76	33-123
50-32-8	MS Benzo(a)pyrene	119	0.00 U	87.9	74	32-118

Semi-Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2018-1719

Client ID: CAPA-18-14MS

Lab Sample ID 1203972712

Instrument: MSD4.I

Analyst: JMB3

Inj. Vol: 1 uL

Sample Type: Matrix Spike

Matrix: W

Analysis Date: 02/16/2018 17:13

Dilution: 1

Prep Batch ID:1739612

Batch ID: 1739613

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	119	0.00 U	88.4	74	27-121
53-70-3	MS Dibenzo(a,h)anthracene	119	0.00 U	91.0	76	30-125
191-24-2	MS Benzo(ghi)perylene	119	0.00 U	88.2	74	24-126
123-91-1	MS 1,4-Dioxane	119	0.00 U	70.6	59	24-110
930-55-2	MS N-Nitrosopyrrolidine	119	0.00 U	92.6	78	47-119
95-94-3	MS 1,2,4,5-Tetrachlorobenzene	119	0.00 U	73.6	62	32-101
1912-24-9	MS Atrazine	119	0.00 U	105	88	42-129
92-87-5	MS Benzidine	238	0.00 U	64.2	27	15-130
91-94-1	MS 3,3'-Dichlorobenzidine	119	0.00 U	84.4	71	34-124
120-82-1	MS 1,2,4-Trichlorobenzene	119	0.00 U	66.0	55	26-102

Semi-Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2018-1719

Sample Type: Matrix Spike Duplicate

Client ID: CAPA-18-14MSD

Matrix: W

Lab Sample ID 1203972713

Instrument: MSD4.I

Analysis Date: 02/16/2018 17:41

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1739612

Inj. Vol: 1 uL

Batch ID: 1739613

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits	
62-75-9	MSD N-Methyl-N-nitrosomethylamine	119	0.00	U	65.9	55	25-106	4	0-30
110-86-1	MSD Pyridine	119	0.00	U	66.9	56	24-93	5	0-30
62-53-3	MSD Aniline	119	0.00	U	91.6	77	37-113	7	0-30
108-95-2	MSD Phenol	119	0.00	U	59.7	50	23-82	6	0-30
111-44-4	MSD bis(2-Chloroethyl) ether	119	0.00	U	89.6	75	39-114	10	0-30
95-57-8	MSD 2-Chlorophenol	119	0.00	U	84.5	71	37-108	8	0-30
541-73-1	MSD 1,3-Dichlorobenzene	119	0.00	U	68.8	58	27-97	11	0-30
106-46-7	MSD 1,4-Dichlorobenzene	119	0.00	U	69.9	59	28-97	10	0-30
95-50-1	MSD 1,2-Dichlorobenzene	119	0.00	U	71.1	60	28-99	10	0-30
108-60-1	MSD bis(2-Chloro-1-methylethyl)ether	119	0.00	U	89.2	75	32-127	11	0-30
100-51-6	MSD Benzyl alcohol	119	0.00	U	98.9	83	37-116	9	0-30
95-48-7	MSD o-Cresol	119	0.00	U	90.1	76	34-109	9	0-30
65794-96-9	MSD m,p-Cresols	119	0.00	U	96.5	81	36-120	8	0-30
621-64-7	MSD N-Nitrosodi--n-propylamine N-Nitrosodipropylamine	119	0.00	U	100	84	42-118	12	0-30
67-72-1	MSD Hexachloroethane	119	0.00	U	65.3	55	29-94	12	0-30
98-95-3	MSD Nitrobenzene	119	0.00	U	89.2	75	38-123	9	0-30
78-59-1	MSD Isophorone	119	0.00	U	86.7	73	43-120	9	0-30
88-75-5	MSD 2-Nitrophenol	119	0.00	U	93.1	78	39-115	10	0-30
105-67-9	MSD 2,4-Dimethylphenol	119	0.00	U	82.3	69	39-107	7	0-30
111-91-1	MSD bis(2-Chloroethoxy)methane	119	0.00	U	89.7	75	42-118	9	0-30
120-83-2	MSD 2,4-Dichlorophenol	119	0.00	U	90.7	76	40-111	7	0-30
65-85-0	MSD Benzoic acid	238	0.00	U	155	65	17-95	1	0-30

Semi-Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2018-1719

Sample Type: Matrix Spike Duplicate

Client ID: CAPA-18-14MSD

Matrix: W

Lab Sample ID 1203972713

Instrument: MSD4.I

Analysis Date: 02/16/2018 17:41

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1739612

Inj. Vol: 1 uL

Batch ID: 1739613

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	119	0.00 U	141	119	44-138	9	0-30
87-68-3	MSD Hexachlorobutadiene	119	0.00 U	69.1	58	26-98	13	0-30
59-50-7	MSD Parachlorometa cresol 4-Chloro-3-methylphenol	119	0.00 U	103	86	41-122	8	0-30
91-57-6	MSD 2-Methylnaphthalene	119	0.00 U	79.8	67	29-109	12	0-30
91-20-3	MSD Naphthalene	119	0.00 U	77.9	65	31-108	11	0-30
90-12-0	MSD 1-Methylnaphthalene	119	0.00 U	83.1	70	33-112	13	0-30
77-47-4	MSD Hexachlorocyclopentadiene	119	0.00 U	59.3	50	26-79	10	0-30
88-06-2	MSD 2,4,6-Trichlorophenol	119	0.00 U	92.5	78	39-124	5	0-30
95-95-4	MSD 2,4,5-Trichlorophenol	119	0.00 U	93.2	78	42-120	3	0-30
91-58-7	MSD 2-Chloronaphthalene	119	0.00 U	81.1	68	29-113	8	0-30
88-74-4	MSD 2-Nitroaniline o-Nitroaniline	119	0.00 U	111	93	41-121	7	0-30
99-09-2	MSD 3-Nitroaniline m-Nitroaniline	119	0.00 U	148	125	42-144	12	0-30
131-11-3	MSD Dimethylphthalate	119	0.00 U	104	87	45-128	7	0-30
606-20-2	MSD 2,6-Dinitrotoluene	119	0.00 U	98.9	83	46-124	7	0-30
121-14-2	MSD 2,4-Dinitrotoluene	119	0.00 U	107	90	45-125	7	0-30
208-96-8	MSD Acenaphthylene	119	0.00 U	90.2	76	35-120	7	0-30
83-32-9	MSD Acenaphthene	119	0.00 U	92.2	77	35-117	7	0-30
51-28-5	MSD 2,4-Dinitrophenol	119	0.00 U	110	93	27-122	6	0-30
132-64-9	MSD Dibenzofuran	119	0.00 U	96.3	81	38-113	8	0-30
58-90-2	MSD 2,3,4,6-Tetrachlorophenol	119	0.00 U	96.9	81	40-128	4	0-30
84-66-2	MSD Diethylphthalate	119	0.00 U	105	88	43-127	6	0-30
100-02-7	MSD 4-Nitrophenol	119	0.00 U	64.5	54	17-85	6	0-30

Semi-Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2018-1719

Sample Type: Matrix Spike Duplicate

Client ID: CAPA-18-14MSD

Matrix: W

Lab Sample ID 1203972713

Instrument: MSD4.I

Analysis Date: 02/16/2018 17:41

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1739612

Inj. Vol: 1 uL

Batch ID: 1739613

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	119	0.00 U	92.7	78	39-117	7	0-30
7005-72-3	MSD 4-Chlorophenylphenylether	119	0.00 U	96.1	81	39-121	7	0-30
100-01-6	MSD 4-Nitroaniline <i>p</i> -Nitroaniline	119	0.00 U	121	102	30-133	12	0-30
534-52-1	MSD 2-Methyl-4,6-dinitrophenol	119	0.00 U	103	87	32-126	4	0-30
122-39-4	MSD Diphenylamine	119	0.00 U	93.3	78	37-118	5	0-30
122-66-7	MSD Azobenzene <i>1,2-Diphenylhydrazine</i>	119	0.00 U	92.3	78	38-120	6	0-30
101-55-3	MSD 4-Bromophenylphenylether	119	0.00 U	92.4	78	39-121	6	0-30
118-74-1	MSD Hexachlorobenzene	119	0.00 U	94.3	79	40-118	5	0-30
87-86-5	MSD Pentachlorophenol	119	0.00 U	115	97	35-121	3	0-30
85-01-8	MSD Phenanthrene	119	0.00 U	93.6	79	40-115	6	0-30
120-12-7	MSD Anthracene	119	0.00 U	93.9	79	38-120	6	0-30
84-74-2	MSD Di-n-butylphthalate	119	0.00 U	101	85	41-128	4	0-30
206-44-0	MSD Fluoranthene	119	0.00 U	97.5	82	41-119	6	0-30
129-00-0	MSD Pyrene	119	0.00 U	101	85	35-128	7	0-30
85-68-7	MSD Butylbenzylphthalate	119	0.00 U	107	90	40-129	6	0-30
117-81-7	MSD bis(2-Ethylhexyl)phthalate	119	0.00 U	97.2	82	38-131	3	0-30
56-55-3	MSD Benzo(a)anthracene	119	0.00 U	94.2	79	39-120	5	0-30
218-01-9	MSD Chrysene	119	0.00 U	95.0	80	41-124	4	0-30
117-84-0	MSD Di-n-octylphthalate	119	0.00 U	90.8	76	37-134	0	0-30
205-99-2	MSD Benzo(b)fluoranthene	119	0.00 U	97.5	82	31-122	11	0-30
207-08-9	MSD Benzo(k)fluoranthene	119	0.00 U	101	85	33-123	11	0-30
50-32-8	MSD Benzo(a)pyrene	119	0.00 U	94.1	79	32-118	7	0-30

Semi-Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2018-1719

Sample Type: Matrix Spike Duplicate

Client ID: CAPA-18-14MSD

Matrix: W

Lab Sample ID 1203972713

Instrument: MSD4.I

Analysis Date: 02/16/2018 17:41

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1739612

Inj. Vol: 1 uL

Batch ID: 1739613

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
193-39-5	MSD Indeno(1,2,3-cd)pyrene	119	0.00	U 90.4	76	27-121	2	0-30
53-70-3	MSD Dibenzo(a,h)anthracene	119	0.00	U 91.2	77	30-125	0	0-30
191-24-2	MSD Benzo(ghi)perylene	119	0.00	U 90.0	76	24-126	2	0-30
123-91-1	MSD 1,4-Dioxane	119	0.00	U 73.0	61	24-110	3	0-30
930-55-2	MSD N-Nitrosopyrrolidine	119	0.00	U 102	86	47-119	9	0-30
95-94-3	MSD 1,2,4,5-Tetrachlorobenzene	119	0.00	U 81.3	68	32-101	10	0-30
1912-24-9	MSD Atrazine	119	0.00	U 110	92	42-129	4	0-30
92-87-5	MSD Benzidine	238	0.00	U 79.1	33	15-130	21	0-30
91-94-1	MSD 3,3'-Dichlorobenzidine	119	0.00	U 87.8	74	34-124	4	0-30
120-82-1	MSD 1,2,4-Trichlorobenzene	119	0.00	U 73.6	62	26-102	11	0-30

Method Blank Summary

Page 1 of 1

SDG Number:	2018-1719	Client:	ARSL004	Matrix:	WATER
Client ID:	MB for batch 1739612	Instrument ID:	MSD4.I	Data File:	s021618.B\s4b1613.D
Lab Sample ID:	1203972710	Prep Date:	02/16/2018 07:00	Analyzed:	02/16/18 15:49
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 1739612	1203972711	s021618.B\s4b1614.D	02/16/18	1617
02 CAPA-18-14	443888002	s021618.B\s4b1615.D	02/16/18	1645
03 CAPA-18-14MS	1203972712	s021618.B\s4b1616.D	02/16/18	1713
04 CAPA-18-14MSD	1203972713	s021618.B\s4b1617.D	02/16/18	1741
05 CAPA-18-4	443888007	s021618.B\s4b1618.D	02/16/18	1809
06 CAPA-18-8	443888009	s021618.B\s4b1619.D	02/16/18	1837
07 CAWA-18-64	443888012	s021618.B\s4b1620.D	02/16/18	1905
08 CAWA-18-151310	443888016	s021618.B\s4b1621.D	02/16/18	1933

Quality Control Data

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

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SDG Number: 2018-1719
Lab Sample ID: 1203972710
Client Sample: QC for batch 1739612
Client ID: MB for batch 1739612
Batch ID: 1739613
Run Date: 02/16/2018 15:49
Prep Date: 02/16/2018 07:00
Data File: s021618.B\s4b1613.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	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: 2018-1719

Lab Sample ID: 1203972710

Client Sample: QC for batch 1739612

Client ID: MB for batch 1739612

Batch ID: 1739613

Run Date: 02/16/2018 15:49

Prep Date: 02/16/2018 07:00

Data File: s021618.B\s4b1613.D

Client: ARSL004

Method: SW846 3510C/8270D

Inst: MSD4.I

Analyst: JMB3

Aliquot: 1000 mL

Column: DB-5ms

Matrix: WATER

Project: QC

SOP Ref: GL-OA-E-009

Dilution: 1

Inj. Vol: 1 uL

Final Volume: 1 mL

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

Semi-Volatile
Certificate of Analysis
Sample Summary

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SDG Number: 2018-1719
Lab Sample ID: 1203972710
Client Sample: QC for batch 1739612
Client ID: MB for batch 1739612
Batch ID: 1739613
Run Date: 02/16/2018 15:49
Prep Date: 02/16/2018 07:00
Data File: s021618.B\s4b1613.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	U	3.70	ug/L	3.70	10.0
99-09-2	3-Nitroaniline	U	3.00	ug/L	3.00	10.0
	<i>m</i> -Nitroaniline					
95-48-7	o-Cresol	U	3.00	ug/L	3.00	10.0
88-74-4	2-Nitroaniline	U	3.00	ug/L	3.00	10.0
	<i>o</i> -Nitroaniline					
100-01-6	4-Nitroaniline	U	3.00	ug/L	3.00	10.0
	<i>p</i> -Nitroaniline					

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	85.6	100	ug/L	86	(32%-124%)
2-Fluorobiphenyl	36.2	50.0	ug/L	72	(32%-112%)
2-Fluorophenol	39.8	100	ug/L	40	(15%-88%)
Nitrobenzene-d5	37.1	50.0	ug/L	74	(36%-115%)
Phenol-d5	26.2	100	ug/L	26	(15%-91%)
p-Terphenyl-d14	48.9	50.0	ug/L	98	(36%-121%)

Tentatively Identified Compound Summary

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

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

Page 1 of 3

SDG Number: 2018-1719

Lab Sample ID: 1203972711

Client Sample: QC for batch 1739612

Client ID: LCS for batch 1739612

Batch ID: 1739613

Run Date: 02/16/2018 16:17

Prep Date: 02/16/2018 07:00

Data File: s021618.B\s4b1614.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		37.6	ug/L	3.00	10.0
120-82-1	1,2,4-Trichlorobenzene		32.7	ug/L	3.00	10.0
95-50-1	1,2-Dichlorobenzene		31.6	ug/L	3.00	10.0
122-66-7	Azobenzene		41.1	ug/L	3.00	10.0
	<i>1,2-Diphenylhydrazine</i>					
541-73-1	1,3-Dichlorobenzene		30.6	ug/L	3.00	10.0
106-46-7	1,4-Dichlorobenzene		30.6	ug/L	3.00	10.0
123-91-1	1,4-Dioxane		27.3	ug/L	3.00	10.0
90-12-0	1-Methylnaphthalene		35.3	ug/L	0.300	1.00
58-90-2	2,3,4,6-Tetrachlorophenol		44.9	ug/L	3.00	10.0
95-95-4	2,4,5-Trichlorophenol		43.6	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		39.8	ug/L	3.00	10.0
105-67-9	2,4-Dimethylphenol		36.0	ug/L	3.00	10.0
51-28-5	2,4-Dinitrophenol		45.9	ug/L	5.00	20.0
121-14-2	2,4-Dinitrotoluene		45.8	ug/L	3.00	10.0
606-20-2	2,6-Dinitrotoluene		42.7	ug/L	3.00	10.0
91-58-7	2-Chloronaphthalene		36.5	ug/L	0.410	1.00
95-57-8	2-Chlorophenol		37.1	ug/L	3.00	10.0
534-52-1	2-Methyl-4,6-dinitrophenol		47.0	ug/L	3.00	10.0
91-57-6	2-Methylnaphthalene		33.9	ug/L	0.300	1.00
88-75-5	2-Nitrophenol		42.2	ug/L	3.00	10.0
91-94-1	3,3'-Dichlorobenzidine		42.7	ug/L	3.00	10.0
101-55-3	4-Bromophenylphenylether		41.2	ug/L	3.00	10.0
59-50-7	Parachlorometa cresol		41.8	ug/L	3.00	10.0
	<i>4-Chloro-3-methylphenol</i>					
106-47-8	4-Chloroaniline		59.4	ug/L	3.30	10.0
7005-72-3	4-Chlorophenylphenylether		43.7	ug/L	3.00	10.0
100-02-7	4-Nitrophenol		13.8	ug/L	3.00	10.0
83-32-9	Acenaphthene		42.2	ug/L	0.300	1.00
208-96-8	Acenaphthylene		40.3	ug/L	0.300	1.00
62-53-3	Aniline		41.3	ug/L	4.20	10.0
120-12-7	Anthracene		41.3	ug/L	0.300	1.00
1912-24-9	Atrazine		49.9	ug/L	3.00	10.0
92-87-5	Benzidine		72.4	ug/L	3.90	10.0
56-55-3	Benzo(a)anthracene		42.2	ug/L	0.300	1.00
50-32-8	Benzo(a)pyrene		41.9	ug/L	0.300	1.00
205-99-2	Benzo(b)fluoranthene		41.5	ug/L	0.300	1.00
191-24-2	Benzo(ghi)perylene		41.0	ug/L	0.300	1.00

**Semi-Volatile
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Sample Summary**

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SDG Number: 2018-1719
Lab Sample ID: 1203972711
Client Sample: QC for batch 1739612
Client ID: LCS for batch 1739612
Batch ID: 1739613
Run Date: 02/16/2018 16:17
Prep Date: 02/16/2018 07:00
Data File: s021618.B\s4b1614.D

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

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

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
207-08-9	Benzo(k)fluoranthene		43.6	ug/L	0.300	1.00
65-85-0	Benzoic acid		35.3	ug/L	6.00	20.0
100-51-6	Benzyl alcohol		37.9	ug/L	3.00	10.0
85-68-7	Butylbenzylphthalate		46.5	ug/L	3.00	10.0
218-01-9	Chrysene		42.5	ug/L	0.300	1.00
84-74-2	Di-n-butylphthalate		46.3	ug/L	3.00	10.0
117-84-0	Di-n-octylphthalate		47.2	ug/L	3.00	10.0
53-70-3	Dibenzo(a,h)anthracene		42.0	ug/L	0.300	1.00
132-64-9	Dibenzofuran		42.7	ug/L	3.00	10.0
84-66-2	Diethylphthalate		46.3	ug/L	3.00	10.0
131-11-3	Dimethylphthalate		45.3	ug/L	3.00	10.0
88-85-7	Dinoseb	U	3.00	ug/L	3.00	10.0
122-39-4	Diphenylamine		42.4	ug/L	3.00	10.0
206-44-0	Fluoranthene		42.9	ug/L	0.300	1.00
86-73-7	Fluorene		41.1	ug/L	0.300	1.00
118-74-1	Hexachlorobenzene		42.1	ug/L	3.00	10.0
87-68-3	Hexachlorobutadiene		31.2	ug/L	3.00	10.0
77-47-4	Hexachlorocyclopentadiene		26.3	ug/L	3.00	10.0
67-72-1	Hexachloroethane		28.9	ug/L	3.00	10.0
193-39-5	Indeno(1,2,3-cd)pyrene		41.4	ug/L	0.300	1.00
78-59-1	Isophorone		37.2	ug/L	3.50	10.0
62-75-9	N-Methyl-N-nitrosomethylamine		23.1	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		41.7	ug/L	3.00	10.0
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine		39.8	ug/L	3.00	10.0
91-20-3	Naphthalene		33.8	ug/L	0.300	1.00
98-95-3	Nitrobenzene		38.9	ug/L	3.00	10.0
608-93-5	Pentachlorobenzene	U	3.00	ug/L	3.00	10.0
87-86-5	Pentachlorophenol		53.6	ug/L	3.00	10.0
85-01-8	Phenanthrene		41.3	ug/L	0.300	1.00
108-95-2	Phenol		15.8	ug/L	3.00	10.0
129-00-0	Pyrene		41.7	ug/L	0.300	1.00
110-86-1	Pyridine		27.6	ug/L	3.00	10.0
108-60-1	bis(2-Chloro-1-methylethyl)ether		39.0	ug/L	3.00	10.0
111-91-1	bis(2-Chloroethoxy)methane		38.6	ug/L	3.00	10.0
111-44-4	bis(2-Chloroethyl) ether		39.1	ug/L	3.00	10.0
117-81-7	bis(2-Ethylhexyl)phthalate		47.8	ug/L	3.00	1.00

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Sample Summary**

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SDG Number: 2018-1719
Lab Sample ID: 1203972711
Client Sample: QC for batch 1739612
Client ID: LCS for batch 1739612
Batch ID: 1739613
Run Date: 02/16/2018 16:17
Prep Date: 02/16/2018 07:00
Data File: s021618.B\s4b1614.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		34.3	ug/L	3.70	10.0
99-09-2	3-Nitroaniline		59.3	ug/L	3.00	10.0
	<i>m-Nitroaniline</i>					
95-48-7	o-Cresol		34.9	ug/L	3.00	10.0
88-74-4	2-Nitroaniline		46.5	ug/L	3.00	10.0
	<i>o-Nitroaniline</i>					
100-01-6	4-Nitroaniline		48.2	ug/L	3.00	10.0
	<i>p-Nitroaniline</i>					

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	94.8	100	ug/L	95	(32%-124%)
2-Fluorobiphenyl	40.8	50.0	ug/L	82	(32%-112%)
2-Fluorophenol	45.6	100	ug/L	46	(15%-88%)
Nitrobenzene-d5	39.8	50.0	ug/L	80	(36%-115%)
Phenol-d5	29.8	100	ug/L	30	(15%-91%)
p-Terphenyl-d14	46.6	50.0	ug/L	93	(36%-121%)

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

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SDG Number: 2018-1719
Lab Sample ID: 1203972712
Client Sample: QC for batch 1739612
Client ID: CAPA-18-14MS
Batch ID: 1739613
Run Date: 02/16/2018 17:13
Prep Date: 02/16/2018 07:00
Data File: s021618.B\s4b1616.D

Date Collected: 02/13/2018 11:44
Date Received: 02/15/2018 09:05
Client: ARSL004
Method: SW846 3510C/8270D
Inst: MSD4.I
Analyst: JMB3
Aliquot: 420 mL
Column: DB-5ms

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

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
95-94-3	1,2,4,5-Tetrachlorobenzene		73.6	ug/L	7.14	23.8
120-82-1	1,2,4-Trichlorobenzene		66.0	ug/L	7.14	23.8
95-50-1	1,2-Dichlorobenzene		64.6	ug/L	7.14	23.8
122-66-7	Azobenzene		86.5	ug/L	7.14	23.8
	<i>1,2-Diphenylhydrazine</i>					
541-73-1	1,3-Dichlorobenzene		61.7	ug/L	7.14	23.8
106-46-7	1,4-Dichlorobenzene		63.1	ug/L	7.14	23.8
123-91-1	1,4-Dioxane		70.6	ug/L	7.14	23.8
90-12-0	1-Methylnaphthalene		73.2	ug/L	0.714	2.38
58-90-2	2,3,4,6-Tetrachlorophenol		93.0	ug/L	7.14	23.8
95-95-4	2,4,5-Trichlorophenol		90.9	ug/L	7.14	23.8
88-06-2	2,4,6-Trichlorophenol		87.6	ug/L	7.14	23.8
120-83-2	2,4-Dichlorophenol		84.7	ug/L	7.14	23.8
105-67-9	2,4-Dimethylphenol		76.8	ug/L	7.14	23.8
51-28-5	2,4-Dinitrophenol		104	ug/L	11.9	47.6
121-14-2	2,4-Dinitrotoluene		99.3	ug/L	7.14	23.8
606-20-2	2,6-Dinitrotoluene		91.8	ug/L	7.14	23.8
91-58-7	2-Chloronaphthalene		75.0	ug/L	0.976	2.38
95-57-8	2-Chlorophenol		77.9	ug/L	7.14	23.8
534-52-1	2-Methyl-4,6-dinitrophenol		99.3	ug/L	7.14	23.8
91-57-6	2-Methylnaphthalene		70.8	ug/L	0.714	2.38
88-75-5	2-Nitrophenol		84.5	ug/L	7.14	23.8
91-94-1	3,3'-Dichlorobenzidine		84.4	ug/L	7.14	23.8
101-55-3	4-Bromophenylphenylether		86.6	ug/L	7.14	23.8
59-50-7	Parachlorometa cresol		94.8	ug/L	7.14	23.8
	<i>4-Chloro-3-methylphenol</i>					
106-47-8	4-Chloroaniline		130	ug/L	7.86	23.8
7005-72-3	4-Chlorophenylphenylether		89.4	ug/L	7.14	23.8
100-02-7	4-Nitrophenol		60.6	ug/L	7.14	23.8
83-32-9	Acenaphthene		85.8	ug/L	0.714	2.38
208-96-8	Acenaphthylene		83.9	ug/L	0.714	2.38
62-53-3	Aniline		85.8	ug/L	10.0	23.8
120-12-7	Anthracene		88.9	ug/L	0.714	2.38
1912-24-9	Atrazine		105	ug/L	7.14	23.8
92-87-5	Benzidine		64.2	ug/L	9.29	23.8
56-55-3	Benzo(a)anthracene		89.4	ug/L	0.714	2.38
50-32-8	Benzo(a)pyrene		87.9	ug/L	0.714	2.38
205-99-2	Benzo(b)fluoranthene		87.5	ug/L	0.714	2.38
191-24-2	Benzo(ghi)perylene		88.2	ug/L	0.714	2.38

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Sample Summary**

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SDG Number: 2018-1719
Lab Sample ID: 1203972712
Client Sample: QC for batch 1739612
Client ID: CAPA-18-14MS
Batch ID: 1739613
Run Date: 02/16/2018 17:13
Prep Date: 02/16/2018 07:00
Data File: s021618.B\s4b1616.D

Date Collected: 02/13/2018 11:44
Date Received: 02/15/2018 09:05
Client: ARSL004
Method: SW846 3510C/8270D
Inst: MSD4.I
Analyst: JMB3
Aliquot: 420 mL
Column: DB-5ms

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

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
207-08-9	Benzo(k)fluoranthene		90.8	ug/L	0.714	2.38
65-85-0	Benzoic acid		157	ug/L	14.3	47.6
100-51-6	Benzyl alcohol		90.1	ug/L	7.14	23.8
85-68-7	Butylbenzylphthalate		100	ug/L	7.14	23.8
218-01-9	Chrysene		91.4	ug/L	0.714	2.38
84-74-2	Di-n-butylphthalate		97.0	ug/L	7.14	23.8
117-84-0	Di-n-octylphthalate		90.4	ug/L	7.14	23.8
53-70-3	Dibenzo(a,h)anthracene		91.0	ug/L	0.714	2.38
132-64-9	Dibenzofuran		88.7	ug/L	7.14	23.8
84-66-2	Diethylphthalate		98.3	ug/L	7.14	23.8
131-11-3	Dimethylphthalate		97.2	ug/L	7.14	23.8
88-85-7	Dinoseb	U	7.14	ug/L	7.14	23.8
122-39-4	Diphenylamine		88.9	ug/L	7.14	23.8
206-44-0	Fluoranthene		92.1	ug/L	0.714	2.38
86-73-7	Fluorene		86.5	ug/L	0.714	2.38
118-74-1	Hexachlorobenzene		89.3	ug/L	7.14	23.8
87-68-3	Hexachlorobutadiene		60.9	ug/L	7.14	23.8
77-47-4	Hexachlorocyclopentadiene		53.9	ug/L	7.14	23.8
67-72-1	Hexachloroethane		58.1	ug/L	7.14	23.8
193-39-5	Indeno(1,2,3-cd)pyrene		88.4	ug/L	0.714	2.38
78-59-1	Isophorone		79.6	ug/L	8.33	23.8
62-75-9	N-Methyl-N-nitrosomethylamine		63.2	ug/L	7.14	23.8
924-16-3	N-Nitrosodi-n-butylamine	U	7.14	ug/L	7.14	23.8
55-18-5	N-Nitrosodiethylamine	U	7.14	ug/L	7.14	23.8
621-64-7	N-Nitrosodi-n-propylamine		89.1	ug/L	7.14	23.8
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine		92.6	ug/L	7.14	23.8
91-20-3	Naphthalene		69.6	ug/L	0.714	2.38
98-95-3	Nitrobenzene		81.5	ug/L	7.14	23.8
608-93-5	Pentachlorobenzene	U	7.14	ug/L	7.14	23.8
87-86-5	Pentachlorophenol		112	ug/L	7.14	23.8
85-01-8	Phenanthrene		88.5	ug/L	0.714	2.38
108-95-2	Phenol		56.3	ug/L	7.14	23.8
129-00-0	Pyrene		94.4	ug/L	0.714	2.38
110-86-1	Pyridine		64.0	ug/L	7.14	23.8
108-60-1	bis(2-Chloro-1-methylethyl)ether		80.3	ug/L	7.14	23.8
111-91-1	bis(2-Chloroethoxy)methane		81.6	ug/L	7.14	23.8
111-44-4	bis(2-Chloroethyl) ether		80.8	ug/L	7.14	23.8
117-81-7	bis(2-Ethylhexyl)phthalate		94.3	ug/L	7.14	2.38

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Sample Summary**

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SDG Number: 2018-1719
Lab Sample ID: 1203972712
Client Sample: QC for batch 1739612
Client ID: CAPA-18-14MS
Batch ID: 1739613
Run Date: 02/16/2018 17:13
Prep Date: 02/16/2018 07:00
Data File: s021618.B\s4b1616.D

Date Collected: 02/13/2018 11:44
Date Received: 02/15/2018 09:05
Client: ARSL004
Method: SW846 3510C/8270D
Inst: MSD4.I
Analyst: JMB3
Aliquot: 420 mL
Column: DB-5ms

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

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
65794-96-9	m,p-Cresols		89.3	ug/L	8.81	23.8
99-09-2	3-Nitroaniline		132	ug/L	7.14	23.8
	<i>m-Nitroaniline</i>					
95-48-7	o-Cresol		82.5	ug/L	7.14	23.8
88-74-4	2-Nitroaniline		104	ug/L	7.14	23.8
	<i>o-Nitroaniline</i>					
100-01-6	4-Nitroaniline		107	ug/L	7.14	23.8
	<i>p-Nitroaniline</i>					

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	200	238	ug/L	84	(32%-124%)
2-Fluorobiphenyl	85.5	119	ug/L	72	(32%-112%)
2-Fluorophenol	128	238	ug/L	54	(15%-88%)
Nitrobenzene-d5	84.1	119	ug/L	71	(36%-115%)
Phenol-d5	111	238	ug/L	46	(15%-91%)
p-Terphenyl-d14	103	119	ug/L	86	(36%-121%)

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

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SDG Number: 2018-1719
Lab Sample ID: 1203972713
Client Sample: QC for batch 1739612
Client ID: CAPA-18-14MSD
Batch ID: 1739613
Run Date: 02/16/2018 17:41
Prep Date: 02/16/2018 07:00
Data File: s021618.B\s4b1617.D

Date Collected: 02/13/2018 11:44
Date Received: 02/15/2018 09:05
Client: ARSL004
Method: SW846 3510C/8270D
Inst: MSD4.I
Analyst: JMB3
Aliquot: 420 mL
Column: DB-5ms

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

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
95-94-3	1,2,4,5-Tetrachlorobenzene		81.3	ug/L	7.14	23.8
120-82-1	1,2,4-Trichlorobenzene		73.6	ug/L	7.14	23.8
95-50-1	1,2-Dichlorobenzene		71.1	ug/L	7.14	23.8
122-66-7	Azobenzene		92.3	ug/L	7.14	23.8
	<i>1,2-Diphenylhydrazine</i>					
541-73-1	1,3-Dichlorobenzene		68.8	ug/L	7.14	23.8
106-46-7	1,4-Dichlorobenzene		69.9	ug/L	7.14	23.8
123-91-1	1,4-Dioxane		73.0	ug/L	7.14	23.8
90-12-0	1-Methylnaphthalene		83.1	ug/L	0.714	2.38
58-90-2	2,3,4,6-Tetrachlorophenol		96.9	ug/L	7.14	23.8
95-95-4	2,4,5-Trichlorophenol		93.2	ug/L	7.14	23.8
88-06-2	2,4,6-Trichlorophenol		92.5	ug/L	7.14	23.8
120-83-2	2,4-Dichlorophenol		90.7	ug/L	7.14	23.8
105-67-9	2,4-Dimethylphenol		82.3	ug/L	7.14	23.8
51-28-5	2,4-Dinitrophenol		110	ug/L	11.9	47.6
121-14-2	2,4-Dinitrotoluene		107	ug/L	7.14	23.8
606-20-2	2,6-Dinitrotoluene		98.9	ug/L	7.14	23.8
91-58-7	2-Chloronaphthalene		81.1	ug/L	0.976	2.38
95-57-8	2-Chlorophenol		84.5	ug/L	7.14	23.8
534-52-1	2-Methyl-4,6-dinitrophenol		103	ug/L	7.14	23.8
91-57-6	2-Methylnaphthalene		79.8	ug/L	0.714	2.38
88-75-5	2-Nitrophenol		93.1	ug/L	7.14	23.8
91-94-1	3,3'-Dichlorobenzidine		87.8	ug/L	7.14	23.8
101-55-3	4-Bromophenylphenylether		92.4	ug/L	7.14	23.8
59-50-7	Parachlorometa cresol		103	ug/L	7.14	23.8
	<i>4-Chloro-3-methylphenol</i>					
106-47-8	4-Chloroaniline		141	ug/L	7.86	23.8
7005-72-3	4-Chlorophenylphenylether		96.1	ug/L	7.14	23.8
100-02-7	4-Nitrophenol		64.5	ug/L	7.14	23.8
83-32-9	Acenaphthene		92.2	ug/L	0.714	2.38
208-96-8	Acenaphthylene		90.2	ug/L	0.714	2.38
62-53-3	Aniline		91.6	ug/L	10.0	23.8
120-12-7	Anthracene		93.9	ug/L	0.714	2.38
1912-24-9	Atrazine		110	ug/L	7.14	23.8
92-87-5	Benzidine		79.1	ug/L	9.29	23.8
56-55-3	Benzo(a)anthracene		94.2	ug/L	0.714	2.38
50-32-8	Benzo(a)pyrene		94.1	ug/L	0.714	2.38
205-99-2	Benzo(b)fluoranthene		97.5	ug/L	0.714	2.38
191-24-2	Benzo(ghi)perylene		90.0	ug/L	0.714	2.38

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

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SDG Number: 2018-1719
Lab Sample ID: 1203972713
Client Sample: QC for batch 1739612
Client ID: CAPA-18-14MSD
Batch ID: 1739613
Run Date: 02/16/2018 17:41
Prep Date: 02/16/2018 07:00
Data File: s021618.B\s4b1617.D

Date Collected: 02/13/2018 11:44
Date Received: 02/15/2018 09:05
Client: ARSL004
Method: SW846 3510C/8270D
Inst: MSD4.I
Analyst: JMB3
Aliquot: 420 mL
Column: DB-5ms

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

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
207-08-9	Benzo(k)fluoranthene		101	ug/L	0.714	2.38
65-85-0	Benzoic acid		155	ug/L	14.3	47.6
100-51-6	Benzyl alcohol		98.9	ug/L	7.14	23.8
85-68-7	Butylbenzylphthalate		107	ug/L	7.14	23.8
218-01-9	Chrysene		95.0	ug/L	0.714	2.38
84-74-2	Di-n-butylphthalate		101	ug/L	7.14	23.8
117-84-0	Di-n-octylphthalate		90.8	ug/L	7.14	23.8
53-70-3	Dibenzo(a,h)anthracene		91.2	ug/L	0.714	2.38
132-64-9	Dibenzofuran		96.3	ug/L	7.14	23.8
84-66-2	Diethylphthalate		105	ug/L	7.14	23.8
131-11-3	Dimethylphthalate		104	ug/L	7.14	23.8
88-85-7	Dinoseb	U	7.14	ug/L	7.14	23.8
122-39-4	Diphenylamine		93.3	ug/L	7.14	23.8
206-44-0	Fluoranthene		97.5	ug/L	0.714	2.38
86-73-7	Fluorene		92.7	ug/L	0.714	2.38
118-74-1	Hexachlorobenzene		94.3	ug/L	7.14	23.8
87-68-3	Hexachlorobutadiene		69.1	ug/L	7.14	23.8
77-47-4	Hexachlorocyclopentadiene		59.3	ug/L	7.14	23.8
67-72-1	Hexachloroethane		65.3	ug/L	7.14	23.8
193-39-5	Indeno(1,2,3-cd)pyrene		90.4	ug/L	0.714	2.38
78-59-1	Isophorone		86.7	ug/L	8.33	23.8
62-75-9	N-Methyl-N-nitrosomethylamine		65.9	ug/L	7.14	23.8
924-16-3	N-Nitrosodi-n-butylamine	U	7.14	ug/L	7.14	23.8
55-18-5	N-Nitrosodiethylamine	U	7.14	ug/L	7.14	23.8
621-64-7	N-Nitrosodi-n-propylamine		100	ug/L	7.14	23.8
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine		102	ug/L	7.14	23.8
91-20-3	Naphthalene		77.9	ug/L	0.714	2.38
98-95-3	Nitrobenzene		89.2	ug/L	7.14	23.8
608-93-5	Pentachlorobenzene	U	7.14	ug/L	7.14	23.8
87-86-5	Pentachlorophenol		115	ug/L	7.14	23.8
85-01-8	Phenanthrene		93.6	ug/L	0.714	2.38
108-95-2	Phenol		59.7	ug/L	7.14	23.8
129-00-0	Pyrene		101	ug/L	0.714	2.38
110-86-1	Pyridine		66.9	ug/L	7.14	23.8
108-60-1	bis(2-Chloro-1-methylethyl)ether		89.2	ug/L	7.14	23.8
111-91-1	bis(2-Chloroethoxy)methane		89.7	ug/L	7.14	23.8
111-44-4	bis(2-Chloroethyl) ether		89.6	ug/L	7.14	23.8
117-81-7	bis(2-Ethylhexyl)phthalate		97.2	ug/L	7.14	2.38

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

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SDG Number: 2018-1719
Lab Sample ID: 1203972713
Client Sample: QC for batch 1739612
Client ID: CAPA-18-14MSD
Batch ID: 1739613
Run Date: 02/16/2018 17:41
Prep Date: 02/16/2018 07:00
Data File: s021618.B\s4b1617.D

Date Collected: 02/13/2018 11:44
Date Received: 02/15/2018 09:05
Client: ARSL004
Method: SW846 3510C/8270D
Inst: MSD4.I
Analyst: JMB3
Aliquot: 420 mL
Column: DB-5ms

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

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
65794-96-9	m,p-Cresols		96.5	ug/L	8.81	23.8
99-09-2	3-Nitroaniline		148	ug/L	7.14	23.8
	<i>m-Nitroaniline</i>					
95-48-7	o-Cresol		90.1	ug/L	7.14	23.8
88-74-4	2-Nitroaniline		111	ug/L	7.14	23.8
	<i>o-Nitroaniline</i>					
100-01-6	4-Nitroaniline		121	ug/L	7.14	23.8
	<i>p-Nitroaniline</i>					

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	210	238	ug/L	88	(32%-124%)
2-Fluorobiphenyl	90.3	119	ug/L	76	(32%-112%)
2-Fluorophenol	131	238	ug/L	55	(15%-88%)
Nitrobenzene-d5	90.9	119	ug/L	76	(36%-115%)
Phenol-d5	115	238	ug/L	48	(15%-91%)
p-Terphenyl-d14	113	119	ug/L	95	(36%-121%)

Perchlorates by LCMSMS Analysis

Case Narrative

**Perchlorates by LCMSMS
Technical Case Narrative
ARS International, LLC (ARSL)
SDG #: 2018-1719
Work Order #: 443888**

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: 1739916

Prep Batch Number: 1739915

Sample Analysis

Sample ID	Client ID
443888001	443888001 (CAPA-18-13)
443888005	443888005 (CAPA-18-3)
443888010	443888010 (CAWA-18-63)
443888014	443888014 (CAWA-18-151309)
1203973628	Interference Check Sample (ICS)
1203973624	Method Blank (MB)
1203973625	Laboratory Control Sample (LCS)
1203973626	443786001(CAWA-18-9) Matrix Spike (MS)
1203973627	443786001(CAWA-18-9) 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 443786001 (CAWA-18-9) was chosen for matrix spike and matrix spike duplicate analysis.

Matrix Spike (MS) Recovery Statement

One or more of the required spiking analytes were not within the acceptance limits in 1203973626 (CAWA-18-9MS). The non-conforming recoveries are attributed to the background concentration of Perchlorate in the parent sample, 2018-1697 (CAWA-18-9).

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

QC 1203973625 (LCS) was re-analyzed due to non-conforming spike recoveries. The re-analysis met acceptance criteria and were reported.

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: 2018-1719 GEL Work Order: 443888

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: 21 FEB 2018

Title: Group Leader

Sample Data Summary

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: SW846 6850 ModifiedMatrix: WATERExtraction Batch ID: 1739915Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAPA-18-13Date Received: 15-FEB-18GEL Job No (SDG): 2018-1719GEL Sample ID: 443888001Date Filtered: 16-FEB-18Injection 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	0.173	ug/L	J	1	16-FEB-18 21:09	per0216037a
	Perchlorate Isotope Ratio			2.64			1	16-FEB-18 21:09	per0216037a
14797-73-0	Perchlorate-101	.05	.2	0.193	ug/L	J	1	16-FEB-18 21:09	per0216037a
	Perchlorate-O(18)			0.484	ug/L		1	16-FEB-18 21:09	per0216037a

^ 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: 1739915Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAPA-18-3Date Received: 15-FEB-18GEL Job No (SDG): 2018-1719GEL Sample ID: 443888005Date Filtered: 16-FEB-18Injection 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	0.250	ug/L		1	16-FEB-18 21:17	per0216038a
	Perchlorate Isotope Ratio			3.12			1	16-FEB-18 21:17	per0216038a
14797-73-0	Perchlorate-101	.05	.2	0.236	ug/L		1	16-FEB-18 21:17	per0216038a
	Perchlorate-O(18)			0.477	ug/L		1	16-FEB-18 21:17	per0216038a

^ 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: 1739915Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAWA-18-63Date Received: 15-FEB-18GEL Job No (SDG): 2018-1719GEL Sample ID: 443888010Date Filtered: 16-FEB-18Injection 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	0.249	ug/L		1	16-FEB-18 21:25	per0216039a
	Perchlorate Isotope Ratio			3.09			1	16-FEB-18 21:25	per0216039a
14797-73-0	Perchlorate-101	.05	.2	0.237	ug/L		1	16-FEB-18 21:25	per0216039a
	Perchlorate-O(18)			0.465	ug/L		1	16-FEB-18 21:25	per0216039a

^ 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: 1739915Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAWA-18-151309Date Received: 15-FEB-18GEL Job No (SDG): 2018-1719GEL Sample ID: 443888014Date Filtered: 16-FEB-18Injection 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	0.275	ug/L		1	16-FEB-18 21:33	per0216040a
	Perchlorate Isotope Ratio			3.32			1	16-FEB-18 21:33	per0216040a
14797-73-0	Perchlorate-101	.05	.2	0.244	ug/L		1	16-FEB-18 21:33	per0216040a
	Perchlorate-O(18)			0.461	ug/L		1	16-FEB-18 21:33	per0216040a

^ 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): 2018-1719

Extract Batch Code: 1739915

Date Filtered: 16-FEB-18

Matrix: WATER

Sample ID: 1203973625

Analyte^	True	Found	Units	%Rec	Q	Control Limits
Perchlorate	0.200	.196	ug/L	98		85 - 115
Perchlorate Isotope Ratio		3.03				-
Perchlorate-101	0.200	.19	ug/L	95		85 - 115
Perchlorate-O(18)		.485	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): 2018-1719

Extract Batch Code: 1739915

Date Extracted: 16-FEB-18

GEL MS/PS ID: 1203973626

Client ID: CAWA-18-9

GEL MSD/PSD ID: 1203973627

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	0.588	ug/L	0.726	69 *	.787	99	8	30	75 - 125
Perchlorate Isotope Ratio	0	3.00		2.9		3.02		4		-
Perchlorate-101	0.200	0.576	ug/L	0.737	80	.764	94	4	30	75 - 125
Perchlorate-O(18)	0	0.497	ug/L	0.502		.484		4		-

^ 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: 1739915Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

MBDate Received: 16-FEB-18GEL Job No (SDG): 2018-1719GEL Sample ID: 1203973624Date Filtered: 16-FEB-18Injection 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	16-FEB-18 19:10	per0216022a
	Perchlorate Isotope Ratio						1	16-FEB-18 19:10	per0216022a
14797-73-0	Perchlorate-101	.05	.2	0.050	ug/L	U	1	16-FEB-18 19:10	per0216022a
	Perchlorate-O(18)			0.481	ug/L		1	16-FEB-18 19:10	per0216022a

^ 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: 1739915Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

LCSDate Received: 16-FEB-18GEL Job No (SDG): 2018-1719GEL Sample ID: 1203973625Date Filtered: 16-FEB-18Injection 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	0.196	ug/L	J	1	19-FEB-18 15:48	per0216047a
	Perchlorate Isotope Ratio			3.03			1	19-FEB-18 15:48	per0216047a
14797-73-0	Perchlorate-101	.05	.2	0.190	ug/L	J	1	19-FEB-18 15:48	per0216047a
	Perchlorate-O(18)			0.485	ug/L		1	19-FEB-18 15:48	per0216047a

^ 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: 1739915Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

ICS

Date Received:

GEL Job No (SDG): 2018-1719GEL Sample ID: 1203973628Date Filtered: 16-FEB-18Injection 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	0.222	ug/L		1	16-FEB-18 19:26	per0216024a
	Perchlorate Isotope Ratio			3.18			1	16-FEB-18 19:26	per0216024a
14797-73-0	Perchlorate-101	.05	.2	0.205	ug/L		1	16-FEB-18 19:26	per0216024a
	Perchlorate-O(18)			0.483	ug/L		1	16-FEB-18 19:26	per0216024a

^ 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: 1739915Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAWA-18-9MSDate Received: 14-FEB-18GEL Job No (SDG): 2018-1719GEL Sample ID: 1203973626Date Filtered: 16-FEB-18Injection 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	0.726	ug/L		1	16-FEB-18 19:42	per0216026a
	Perchlorate Isotope Ratio			2.9			1	16-FEB-18 19:42	per0216026a
14797-73-0	Perchlorate-101	.05	.2	0.737	ug/L		1	16-FEB-18 19:42	per0216026a
	Perchlorate-O(18)			0.502	ug/L		1	16-FEB-18 19:42	per0216026a

^ 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: 1739915Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAWA-18-9MSDDate Received: 14-FEB-18GEL Job No (SDG): 2018-1719GEL Sample ID: 1203973627Date Filtered: 16-FEB-18Injection 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	0.787	ug/L		1	16-FEB-18 19:50	per0216027a
	Perchlorate Isotope Ratio			3.02			1	16-FEB-18 19:50	per0216027a
14797-73-0	Perchlorate-101	.05	.2	0.764	ug/L		1	16-FEB-18 19:50	per0216027a
	Perchlorate-O(18)			0.484	ug/L		1	16-FEB-18 19:50	per0216027a

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

*Concentration =

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

Explosives by LCMSMS Analysis

Case Narrative

**Explosives by LCMSMS
Technical Case Narrative
ARS International, LLC (ARSL)
SDG #: 2018-1719
Work Order #: 443888**

Method/Analysis Information

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

Analytical Method: SW846 3535A/8330B

Prep Method: SW846 3535A

Analytical Batch Number: 1740143

Prep Batch Number: 1740139

Sample Analysis

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

Sample ID	Client ID
443888003	CAPA-18-14
443888006	CAPA-18-4
443888011	CAWA-18-64
443888015	CAWA-18-151310
1203974212	Method Blank (MB)
1203974213	Laboratory Control Sample (LCS)
1203974214	443888003(CAPA-18-14) Matrix Spike (MS)
1203974215	443888003(CAPA-18-14) Matrix Spike Duplicate (MSD)

Preparation/Analytical Method Verification

SOP Reference

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

Calibration Information

Initial Calibration

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

Calibration Verification Standard Requirements

All associated calibration verification standards (ICV and CCV) for this analysis met the acceptance criteria.

Calibration Blank Requirements

All initial and continuing calibration blanks (ICB and CCB) bracketing the analyses associated with this batch

for this analysis were within acceptance criteria. Due to software limitations, the CCBs and/or the ICBs may have a concentration for target analytes in the Found column. These values should be zero.

CRI Requirements

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

Quality Control (QC) Information

Method Blank (MB) Statement

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

Surrogate Recoveries

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

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries were within the established acceptance limits.

QC Sample Designation

Client sample 443888003 (CAPA-18-14) was chosen for matrix spike and matrix spike duplicate analysis.

Matrix Spike (MS) Recovery Statement

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

MS/MSD Relative Percent Difference (RPD) Statement

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

Internal Standard (ISTD) Acceptance

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

Technical Information

Holding Time Specifications

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

Preparation/Analytical Method Verification

All procedures were performed as stated in the SOP.

Sample Dilutions

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

Sample Re-extraction/Re-analysis

Re-extractions or re-analyses were not required in this SDG in this analytical batch for this analysis.

Miscellaneous Information

Manual Integrations

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

Additional Comments

Due to software limitations, all initial calibration blanks must be designated as XIB001 in order for the forms to be correct. Due to software limitations, file extensions such as DL, RE, etc. may not appear on the generated forms and/or raw data. Relative Retention Time (RRT) is used by the laboratory to establish peak identity. The RRT of each target analyte is calculated using the retention time of the corresponding internal standard. The RRT of each analyte in a sample must be within 2.0 of the analyte's calculated RRT in the ICV.

System Configuration

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

Electronic Packaging Comment

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

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

Chromatographic Columns

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

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

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

Certification Statement

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

GEL LABORATORIES LLC

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

Qualifier Definition Report for

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

Client SDG: 2018-1719 GEL Work Order: 443888

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 FEB 2018

Title: Group Leader

Sample Data Summary

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAPA-18-14

Lab Code: GEL

GEL Job No (SDG) 2018-1719

Matrix: WATER

GEL Sample ID: 443888003

Sample Amount 920 mL

Date Received: 15-FEB-18

Moisture: .

Extraction Batch ID: 1740139

Extraction Type Sol Exchange

Date Extracted: 19-FEB-18

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0219026.wiff

Date Analyzed: 20-FEB-18 07:37

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
118-96-7	2,4,6-Trinitrotoluene	.087	U	0.087	0.272
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
121-14-2	2,4-Dinitrotoluene	.087	U	0.087	0.272
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
13980-04-6	TNX	.087	U	0.087	0.272
<i>13980-04-6</i>	<i>TNX</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	.087	U	0.087	0.272
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	.087	U	0.087	0.272
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
479-45-8	Tetryl	.087	U	0.087	0.543
<i>479-45-8</i>	<i>Tetryl</i>				
5755-27-1	MNX	.087	U	0.087	0.272
<i>5755-27-1</i>	<i>MNX</i>				
606-20-2	2,6-Dinitrotoluene	.087	U	0.087	0.272
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
80251-29-2	DNX	.087	U	0.087	0.272
<i>80251-29-2</i>	<i>DNX</i>				
98-95-3	Nitrobenzene	.087	U	0.087	0.272
<i>98-95-3</i>	<i>Nitrobenzene</i>				
99-08-1	m-Nitrotoluene	.087	U	0.087	0.272
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				
99-35-4	1,3,5-Trinitrobenzene	.087	U	0.087	0.272
<i>99-35-4</i>	<i>1,3,5-Trinitrobenzene</i>				
99-65-0	m-Dinitrobenzene	.087	U	0.087	0.272
<i>99-65-0</i>	<i>m-Dinitrobenzene</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAPA-18-14

Lab Code: GEL

GEL Job No (SDG) 2018-1719

Matrix: WATER

GEL Sample ID: 443888003

Sample Amount 920 mL

Date Received: 15-FEB-18

Moisture: .

Extraction Batch ID: 1740139

Extraction Type Sol Exchange

Date Extracted: 19-FEB-18

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
88-72-2	o-Nitrotoluene	.0891	U	0.0891	0.272
88-72-2	<i>o-Nitrotoluene</i>				
121-82-4	RDX	.0903	J	0.087	0.272
121-82-4	<i>RDX</i>				
78-11-5	PETN	.109	U	0.109	0.543
78-11-5	<i>PETN</i>				
2691-41-0	HMX	.116	J	0.087	0.272
2691-41-0	<i>HMX</i>				
99-99-0	p-Nitrotoluene	.163	U	0.163	0.543
99-99-0	<i>p-Nitrotoluene</i>				
3058-38-6	TATB	.326	U	0.326	1.09
3058-38-6	<i>TATB</i>				
618-87-1	3,5-Dinitroaniline	.326	U	0.326	1.09
618-87-1	<i>3,5-Dinitroaniline</i>				
78-30-8	tris(o-cresyl) phosphate	.326	U	0.326	1.09
78-30-8	<i>tris(o-cresyl) phosphate</i>				
59229-75-3	2,6-Diamino-4-nitrotoluene	.543	U	0.543	2.72
59229-75-3	<i>2,6-Diamino-4-nitrotoluene</i>				
6629-29-4	2,4-Diamino-6-nitrotoluene	.543	U	0.543	2.72
6629-29-4	<i>2,4-Diamino-6-nitrotoluene</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAPA-18-4

Lab Code: GEL

GEL Job No (SDG) 2018-1719

Matrix: WATER

GEL Sample ID: 443888006

Sample Amount 940 mL

Date Received: 15-FEB-18

Moisture: .

Extraction Batch ID: 1740139

Extraction Type Sol Exchange

Date Extracted: 19-FEB-18

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0219029.wiff

Date Analyzed: 20-FEB-18 09:23

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
118-96-7	2,4,6-Trinitrotoluene	.0851	U	0.0851	0.266
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
121-14-2	2,4-Dinitrotoluene	.0851	U	0.0851	0.266
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
13980-04-6	TNX	.0851	U	0.0851	0.266
<i>13980-04-6</i>	<i>TNX</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	.0851	U	0.0851	0.266
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
2691-41-0	HMX	.0851	U	0.0851	0.266
<i>2691-41-0</i>	<i>HMX</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	.0851	U	0.0851	0.266
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
479-45-8	Tetryl	.0851	U	0.0851	0.532
<i>479-45-8</i>	<i>Tetryl</i>				
5755-27-1	MNX	.0851	U	0.0851	0.266
<i>5755-27-1</i>	<i>MNX</i>				
606-20-2	2,6-Dinitrotoluene	.0851	U	0.0851	0.266
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
80251-29-2	DNX	.0851	U	0.0851	0.266
<i>80251-29-2</i>	<i>DNX</i>				
98-95-3	Nitrobenzene	.0851	U	0.0851	0.266
<i>98-95-3</i>	<i>Nitrobenzene</i>				
99-08-1	m-Nitrotoluene	.0851	U	0.0851	0.266
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				
99-35-4	1,3,5-Trinitrobenzene	.0851	U	0.0851	0.266
<i>99-35-4</i>	<i>1,3,5-Trinitrobenzene</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAPA-18-4

Lab Code: GEL

GEL Job No (SDG) 2018-1719

Matrix: WATER

GEL Sample ID: 443888006

Sample Amount 940 mL

Date Received: 15-FEB-18

Moisture: .

Extraction Batch ID: 1740139

Extraction Type Sol Exchange

Date Extracted: 19-FEB-18

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
99-65-0	m-Dinitrobenzene	.0851	U	0.0851	0.266
99-65-0	<i>m-Dinitrobenzene</i>				
88-72-2	o-Nitrotoluene	.0872	U	0.0872	0.266
88-72-2	<i>o-Nitrotoluene</i>				
78-11-5	PETN	.106	U	0.106	0.532
78-11-5	<i>PETN</i>				
99-99-0	p-Nitrotoluene	.16	U	0.160	0.532
99-99-0	<i>p-Nitrotoluene</i>				
3058-38-6	TATB	.319	U	0.319	1.06
3058-38-6	<i>TATB</i>				
618-87-1	3,5-Dinitroaniline	.319	U	0.319	1.06
618-87-1	<i>3,5-Dinitroaniline</i>				
78-30-8	tris(o-cresyl) phosphate	.319	U	0.319	1.06
78-30-8	<i>tris(o-cresyl) phosphate</i>				
59229-75-3	2,6-Diamino-4-nitrotoluene	.532	U	0.532	2.66
59229-75-3	<i>2,6-Diamino-4-nitrotoluene</i>				
6629-29-4	2,4-Diamino-6-nitrotoluene	.532	U	0.532	2.66
6629-29-4	<i>2,4-Diamino-6-nitrotoluene</i>				
121-82-4	RDX	3.33		0.0851	0.266
121-82-4	<i>RDX</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-18-64

Lab Code: GEL

GEL Job No (SDG) 2018-1719

Matrix: WATER

GEL Sample ID: 443888011

Sample Amount 900 mL

Date Received: 15-FEB-18

Moisture: .

Extraction Batch ID: 1740139

Extraction Type Sol Exchange

Date Extracted: 19-FEB-18

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0219030.wiff

Date Analyzed: 20-FEB-18 09:59

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
118-96-7	2,4,6-Trinitrotoluene	.0889	U	0.0889	0.278
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
121-14-2	2,4-Dinitrotoluene	.0889	U	0.0889	0.278
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
121-82-4	RDX	.0889	U	0.0889	0.278
<i>121-82-4</i>	<i>RDX</i>				
13980-04-6	TNX	.0889	U	0.0889	0.278
<i>13980-04-6</i>	<i>TNX</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	.0889	U	0.0889	0.278
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
2691-41-0	HMX	.0889	U	0.0889	0.278
<i>2691-41-0</i>	<i>HMX</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	.0889	U	0.0889	0.278
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
479-45-8	Tetryl	.0889	U	0.0889	0.556
<i>479-45-8</i>	<i>Tetryl</i>				
5755-27-1	MNX	.0889	U	0.0889	0.278
<i>5755-27-1</i>	<i>MNX</i>				
606-20-2	2,6-Dinitrotoluene	.0889	U	0.0889	0.278
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
80251-29-2	DNX	.0889	U	0.0889	0.278
<i>80251-29-2</i>	<i>DNX</i>				
98-95-3	Nitrobenzene	.0889	U	0.0889	0.278
<i>98-95-3</i>	<i>Nitrobenzene</i>				
99-08-1	m-Nitrotoluene	.0889	U	0.0889	0.278
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-18-64

Lab Code: GEL

GEL Job No (SDG) 2018-1719

Matrix: WATER

GEL Sample ID: 443888011

Sample Amount 900 mL

Date Received: 15-FEB-18

Moisture: .

Extraction Batch ID: 1740139

Extraction Type Sol Exchange

Date Extracted: 19-FEB-18

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
99-35-4	1,3,5-Trinitrobenzene	.0889	U	0.0889	0.278
99-35-4	1,3,5-Trinitrobenzene				
99-65-0	m-Dinitrobenzene	.0889	U	0.0889	0.278
99-65-0	m-Dinitrobenzene				
88-72-2	o-Nitrotoluene	.0911	U	0.0911	0.278
88-72-2	o-Nitrotoluene				
78-11-5	PETN	.111	U	0.111	0.556
78-11-5	PETN				
99-99-0	p-Nitrotoluene	.167	U	0.167	0.556
99-99-0	p-Nitrotoluene				
3058-38-6	TATB	.333	U	0.333	1.11
3058-38-6	TATB				
618-87-1	3,5-Dinitroaniline	.333	U	0.333	1.11
618-87-1	3,5-Dinitroaniline				
78-30-8	tris(o-cresyl) phosphate	.333	U	0.333	1.11
78-30-8	tris(o-cresyl) phosphate				
59229-75-3	2,6-Diamino-4-nitrotoluene	.556	U	0.556	2.78
59229-75-3	2,6-Diamino-4-nitrotoluene				
6629-29-4	2,4-Diamino-6-nitrotoluene	.556	U	0.556	2.78
6629-29-4	2,4-Diamino-6-nitrotoluene				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-18-151310

Lab Code: GEL

GEL Job No (SDG) 2018-1719

Matrix: WATER

GEL Sample ID: 443888015

Sample Amount 920 mL

Date Received: 15-FEB-18

Moisture: .

Extraction Batch ID: 1740139

Extraction Type Sol Exchange

Date Extracted: 19-FEB-18

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0219031.wiff

Date Analyzed: 20-FEB-18 10:34

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
118-96-7	2,4,6-Trinitrotoluene	.087	U	0.087	0.272
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
121-14-2	2,4-Dinitrotoluene	.087	U	0.087	0.272
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
121-82-4	RDX	.087	U	0.087	0.272
<i>121-82-4</i>	<i>RDX</i>				
13980-04-6	TNX	.087	U	0.087	0.272
<i>13980-04-6</i>	<i>TNX</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	.087	U	0.087	0.272
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
2691-41-0	HMX	.087	U	0.087	0.272
<i>2691-41-0</i>	<i>HMX</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	.087	U	0.087	0.272
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
479-45-8	Tetryl	.087	U	0.087	0.543
<i>479-45-8</i>	<i>Tetryl</i>				
5755-27-1	MNX	.087	U	0.087	0.272
<i>5755-27-1</i>	<i>MNX</i>				
606-20-2	2,6-Dinitrotoluene	.087	U	0.087	0.272
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
80251-29-2	DNX	.087	U	0.087	0.272
<i>80251-29-2</i>	<i>DNX</i>				
98-95-3	Nitrobenzene	.087	U	0.087	0.272
<i>98-95-3</i>	<i>Nitrobenzene</i>				
99-08-1	m-Nitrotoluene	.087	U	0.087	0.272
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-18-151310

Lab Code: GEL

GEL Job No (SDG) 2018-1719

Matrix: WATER

GEL Sample ID: 443888015

Sample Amount 920 mL

Date Received: 15-FEB-18

Moisture: .

Extraction Batch ID: 1740139

Extraction Type Sol Exchange

Date Extracted: 19-FEB-18

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
99-35-4	1,3,5-Trinitrobenzene	.087	U	0.087	0.272
99-35-4	1,3,5-Trinitrobenzene				
99-65-0	m-Dinitrobenzene	.087	U	0.087	0.272
99-65-0	m-Dinitrobenzene				
88-72-2	o-Nitrotoluene	.0891	U	0.0891	0.272
88-72-2	o-Nitrotoluene				
78-11-5	PETN	.109	U	0.109	0.543
78-11-5	PETN				
99-99-0	p-Nitrotoluene	.163	U	0.163	0.543
99-99-0	p-Nitrotoluene				
3058-38-6	TATB	.326	U	0.326	1.09
3058-38-6	TATB				
618-87-1	3,5-Dinitroaniline	.326	U	0.326	1.09
618-87-1	3,5-Dinitroaniline				
78-30-8	tris(o-cresyl) phosphate	.326	U	0.326	1.09
78-30-8	tris(o-cresyl) phosphate				
59229-75-3	2,6-Diamino-4-nitrotoluene	.543	U	0.543	2.72
59229-75-3	2,6-Diamino-4-nitrotoluene				
6629-29-4	2,4-Diamino-6-nitrotoluene	.543	U	0.543	2.72
6629-29-4	2,4-Diamino-6-nitrotoluene				

Quality Control Summary

High Explosives Surrogate Recovery Summary**Lab Name:** GEL Laboratories LLC**GEL Job No (SDG):** 2018-1719**Lab Code:** GEL**HPLC Column:** Ultracarb Phenomenex 5u ODS (20)

Lab Sample ID	Client Sample ID	DNT	QC Limits	Flg
443888003	CAPA-18-14	102	55 - 115	
443888006	CAPA-18-4	98	55 - 115	
443888011	CAWA-18-64	100	55 - 115	
443888015	CAWA-18-151310	91	55 - 115	
1203974212	MB for batch 1740139	96	55 - 115	
1203974213	LCS for batch 1740139	91	55 - 115	
1203974214	CAPA-18-14MS	88	55 - 115	
1203974215	CAPA-18-14MSD	97	55 - 115	

DNT = 3,4-Dinitrotoluene

3B
High Explosives LCS/LCS Duplicate Summary

Lab Name: GEL Laboratories LLC

Client ID: LCS

Lab Code: GEL

GEL Job No (SDG) 2018-1719

Extract Batch Code: 1740139

Date Extracted: 19-FEB-18

GEL LCS ID: 1203974213

GEL LCSDUP ID: .

Analysis Date/Time: 20-FEB-18 07:01

DUP Analysis Date/Time:

Reporting Units: ug/L

QC Type: LCS/LCSD

Compound	Spike Added	LCS Conc	LCS Rec #	LCSD Conc	LCSD Rec #	RPD #	RPD	Recovery Limits
4-Amino-2,6-dinitrotoluene	5	5	100					74 - 116
DNX	5	4.04	81					65 - 113
HMX	5	4.53	91					58 - 113
MNX	5	4.1	82					66 - 114
Nitrobenzene	5	4.03	81					64 - 115
PETN	5	5.12	102					57 - 126
RDX	5	4.61	92					64 - 117
TATB	3	3	100					47 - 135
TNX	5	3.65	73					51 - 110
Tetryl	5	5.6	112					55 - 122
m-Dinitrobenzene	5	4.51	90					74 - 117
m-Nitrotoluene	5	5	100					66 - 114
o-Nitrotoluene	5	4.96	99					64 - 115
p-Nitrotoluene	5	4.94	99					66 - 127
tris(o-cresyl) phosphate	5	3.62	72					43 - 104
1,3,5-Trinitrobenzene	5	4.8	96					70 - 110
2,4,6-Trinitrotoluene	5	4.91	98					69 - 113
2,4-Diamino-6-nitrotoluene	5	4.18	84					50 - 121
2,4-Dinitrotoluene	5	4.91	98					71 - 110
2,6-Diamino-4-nitrotoluene	5	4.18	84					53 - 127
2,6-Dinitrotoluene	5	4.76	95					72 - 105
2-Amino-4,6-dinitrotoluene	5	5.02	100					70 - 112
3,5-Dinitroaniline	5	4.56	91					70 - 121

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

* Values outside of QC limits

3
High Explosives MS/MSD Summary

Lab Name: GEL Laboratories LLC

Client ID: CAPA-18-14

Lab Code: GEL

GEL Job No (SDG) 2018-1719

Extract Batch Code: 1740139

Date Extracted: 19-FEB-18

GEL Spike ID: 1203974214

GEL SpikeDup ID: 1203974215

Analysis Date/Time: 20-FEB-18 08:12

MSD Analysis Date/Time: 20-FEB-18 08:48

Reporting Units: ug/L

QC Type: MS/MSD

Compound	Spike Added	Sample Conc	MS Conc	MS Rec #	MSD Conc	MSD Rec #	RPD #	RPD Limit	Rec Limits
m-Dinitrobenzene	5.26316	0	5.23	99	5.3	101	1	30	74 - 117
m-Nitrotoluene	5.26316	0	4.99	95	4.89	93	2	30	59 - 120
o-Nitrotoluene	5.26316	0	4.6	87	5.18	98	12	30	56 - 119
p-Nitrotoluene	5.26316	0	4.74	90	5.07	96	7	30	61 - 129
tris(o-cresyl) phosphate	5.26316	0	3.42	65	3.57	68	4	30	38 - 105
Tetryl	5.26316	0	6.15	117	6.65	126	8	30	50 - 126
1,3,5-Trinitrobenzene	5.26316	0	5.15	98	5.51	105	7	30	67 - 111
2,4,6-Trinitrotoluene	5.26316	0	4.76	90	5.01	95	5	30	66 - 112
2,4-Diamino-6-nitrotoluene	5.26316	0	5.41	103	5.19	99	4	30	50 - 121
2,4-Dinitrotoluene	5.26316	0	5.27	100	5.47	104	4	30	69 - 113
2,6-Diamino-4-nitrotoluene	5.26316	0	4.65	88	4.41	84	5	30	53 - 127
2,6-Dinitrotoluene	5.26316	0	5.27	100	5.5	105	4	30	70 - 106
2-Amino-4,6-dinitrotoluene	5.26316	0	5.15	98	5.64	107	9	30	67 - 115
3,5-Dinitroaniline	5.26316	0	4.75	90	5.1	97	7	30	70 - 121
4-Amino-2,6-dinitrotoluene	5.26316	0	5.05	96	5.25	100	4	30	65 - 120
DNX	5.26316	0	4.64	88	4.99	95	7	30	53 - 124
HMX	5.26316	.116	5.18	96	5.24	97	1	30	44 - 128
MXN	5.26316	0	4.58	87	4.63	88	1	30	60 - 121
Nitrobenzene	5.26316	0	4.81	91	4.91	93	2	30	62 - 116
PETN	5.26316	0	5.09	97	5.21	99	2	30	51 - 131
RDX	5.26316	.0903	5.09	95	5.46	102	7	30	57 - 125
TATB	3.15789	0	2.98	94	3.12	99	5	30	38 - 149
TNX	5.26316	0	4.25	81	4.49	85	5	30	46 - 120

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

Quality Control Data

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: MB for batch 1740139

Lab Code: GEL

GEL Job No (SDG) 2018-1719

Matrix: WATER

GEL Sample ID: 1203974212

Sample Amount 1000 mL

Date Received: 15-FEB-18

Moisture: .

Extraction Batch ID: 1740139

Extraction Type Sol Exchange

Date Extracted: 19-FEB-18

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0219024.wiff

Date Analyzed: 20-FEB-18 06:26

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
118-96-7	2,4,6-Trinitrotoluene	.08	U	0.080	0.250
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
121-14-2	2,4-Dinitrotoluene	.08	U	0.080	0.250
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
121-82-4	RDX	.08	U	0.080	0.250
<i>121-82-4</i>	<i>RDX</i>				
13980-04-6	TNX	.08	U	0.080	0.250
<i>13980-04-6</i>	<i>TNX</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	.08	U	0.080	0.250
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
2691-41-0	HMX	.08	U	0.080	0.250
<i>2691-41-0</i>	<i>HMX</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	.08	U	0.080	0.250
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
479-45-8	Tetryl	.08	U	0.080	0.500
<i>479-45-8</i>	<i>Tetryl</i>				
5755-27-1	MNX	.08	U	0.080	0.250
<i>5755-27-1</i>	<i>MNX</i>				
606-20-2	2,6-Dinitrotoluene	.08	U	0.080	0.250
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
80251-29-2	DNX	.08	U	0.080	0.250
<i>80251-29-2</i>	<i>DNX</i>				
98-95-3	Nitrobenzene	.08	U	0.080	0.250
<i>98-95-3</i>	<i>Nitrobenzene</i>				
99-08-1	m-Nitrotoluene	.08	U	0.080	0.250
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: MB for batch 1740139

Lab Code: GEL

GEL Job No (SDG) 2018-1719

Matrix: WATER

GEL Sample ID: 1203974212

Sample Amount 1000 mL

Date Received: 15-FEB-18

Moisture: .

Extraction Batch ID: 1740139

Extraction Type Sol Exchange

Date Extracted: 19-FEB-18

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
99-35-4	1,3,5-Trinitrobenzene	.08	U	0.080	0.250
99-35-4	1,3,5-Trinitrobenzene				
99-65-0	m-Dinitrobenzene	.08	U	0.080	0.250
99-65-0	m-Dinitrobenzene				
88-72-2	o-Nitrotoluene	.082	U	0.082	0.250
88-72-2	o-Nitrotoluene				
78-11-5	PETN	.1	U	0.100	0.500
78-11-5	PETN				
99-99-0	p-Nitrotoluene	.15	U	0.150	0.500
99-99-0	p-Nitrotoluene				
3058-38-6	TATB	.3	U	0.300	1.00
3058-38-6	TATB				
618-87-1	3,5-Dinitroaniline	.3	U	0.300	1.00
618-87-1	3,5-Dinitroaniline				
78-30-8	tris(o-cresyl) phosphate	.3	U	0.300	1.00
78-30-8	tris(o-cresyl) phosphate				
59229-75-3	2,6-Diamino-4-nitrotoluene	.5	U	0.500	2.50
59229-75-3	2,6-Diamino-4-nitrotoluene				
6629-29-4	2,4-Diamino-6-nitrotoluene	.5	U	0.500	2.50
6629-29-4	2,4-Diamino-6-nitrotoluene				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: LCS for batch 1740139

Lab Code: GEL

GEL Job No (SDG) 2018-1719

Matrix: WATER

GEL Sample ID: 1203974213

Sample Amount 1000 mL

Date Received: 15-FEB-18

Moisture: .

Extraction Batch ID: 1740139

Extraction Type Sol Exchange

Date Extracted: 19-FEB-18

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0219025.wiff

Date Analyzed: 20-FEB-18 07:01

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
3058-38-6	TATB	3		0.300	1.00
<i>3058-38-6</i>	<i>TATB</i>				
78-30-8	tris(o-cresyl) phosphate	3.62		0.300	1.00
<i>78-30-8</i>	<i>tris(o-cresyl) phosphate</i>				
13980-04-6	TNX	3.65		0.080	0.250
<i>13980-04-6</i>	<i>TNX</i>				
98-95-3	Nitrobenzene	4.03		0.080	0.250
<i>98-95-3</i>	<i>Nitrobenzene</i>				
80251-29-2	DNX	4.04		0.080	0.250
<i>80251-29-2</i>	<i>DNX</i>				
5755-27-1	MNX	4.1		0.080	0.250
<i>5755-27-1</i>	<i>MNX</i>				
59229-75-3	2,6-Diamino-4-nitrotoluene	4.18		0.500	2.50
<i>59229-75-3</i>	<i>2,6-Diamino-4-nitrotoluene</i>				
6629-29-4	2,4-Diamino-6-nitrotoluene	4.18		0.500	2.50
<i>6629-29-4</i>	<i>2,4-Diamino-6-nitrotoluene</i>				
99-65-0	m-Dinitrobenzene	4.51		0.080	0.250
<i>99-65-0</i>	<i>m-Dinitrobenzene</i>				
2691-41-0	HMX	4.53		0.080	0.250
<i>2691-41-0</i>	<i>HMX</i>				
618-87-1	3,5-Dinitroaniline	4.56		0.300	1.00
<i>618-87-1</i>	<i>3,5-Dinitroaniline</i>				
121-82-4	RDX	4.61		0.080	0.250
<i>121-82-4</i>	<i>RDX</i>				
606-20-2	2,6-Dinitrotoluene	4.76		0.080	0.250
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: LCS for batch 1740139

Lab Code: GEL

GEL Job No (SDG) 2018-1719

Matrix: WATER

GEL Sample ID: 1203974213

Sample Amount 1000 mL

Date Received: 15-FEB-18

Moisture: .

Extraction Batch ID: 1740139

Extraction Type Sol Exchange

Date Extracted: 19-FEB-18

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
99-35-4	1,3,5-Trinitrobenzene	4.8		0.080	0.250
<i>99-35-4</i>	<i>1,3,5-Trinitrobenzene</i>				
118-96-7	2,4,6-Trinitrotoluene	4.91		0.080	0.250
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
121-14-2	2,4-Dinitrotoluene	4.91		0.080	0.250
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
99-99-0	p-Nitrotoluene	4.94		0.150	0.500
<i>99-99-0</i>	<i>p-Nitrotoluene</i>				
88-72-2	o-Nitrotoluene	4.96		0.082	0.250
<i>88-72-2</i>	<i>o-Nitrotoluene</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	5		0.080	0.250
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
99-08-1	m-Nitrotoluene	5		0.080	0.250
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	5.02		0.080	0.250
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
78-11-5	PETN	5.12		0.100	0.500
<i>78-11-5</i>	<i>PETN</i>				
479-45-8	Tetryl	5.6		0.080	0.500
<i>479-45-8</i>	<i>Tetryl</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAPA-18-14(443888003MS)MS

Lab Code: GEL

GEL Job No (SDG) 2018-1719

Matrix: WATER

GEL Sample ID: 1203974214

Sample Amount 950 mL

Date Received: 15-FEB-18

Moisture: .

Extraction Batch ID: 1740139

Extraction Type Sol Exchange

Date Extracted: 19-FEB-18

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0219027.wiff

Date Analyzed: 20-FEB-18 08:12

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
3058-38-6	TATB	2.98		0.316	1.05
<i>3058-38-6</i>	<i>TATB</i>				
78-30-8	tris(o-cresyl) phosphate	3.42		0.316	1.05
<i>78-30-8</i>	<i>tris(o-cresyl) phosphate</i>				
13980-04-6	TNX	4.25		0.0842	0.263
<i>13980-04-6</i>	<i>TNX</i>				
5755-27-1	MNX	4.58		0.0842	0.263
<i>5755-27-1</i>	<i>MNX</i>				
88-72-2	o-Nitrotoluene	4.6		0.0863	0.263
<i>88-72-2</i>	<i>o-Nitrotoluene</i>				
80251-29-2	DNX	4.64		0.0842	0.263
<i>80251-29-2</i>	<i>DNX</i>				
59229-75-3	2,6-Diamino-4-nitrotoluene	4.65		0.526	2.63
<i>59229-75-3</i>	<i>2,6-Diamino-4-nitrotoluene</i>				
99-99-0	p-Nitrotoluene	4.74		0.158	0.526
<i>99-99-0</i>	<i>p-Nitrotoluene</i>				
618-87-1	3,5-Dinitroaniline	4.75		0.316	1.05
<i>618-87-1</i>	<i>3,5-Dinitroaniline</i>				
118-96-7	2,4,6-Trinitrotoluene	4.76		0.0842	0.263
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
98-95-3	Nitrobenzene	4.81		0.0842	0.263
<i>98-95-3</i>	<i>Nitrobenzene</i>				
99-08-1	m-Nitrotoluene	4.99		0.0842	0.263
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	5.05		0.0842	0.263
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAPA-18-14(443888003MS)MS

Lab Code: GEL

GEL Job No (SDG) 2018-1719

Matrix: WATER

GEL Sample ID: 1203974214

Sample Amount 950 mL

Date Received: 15-FEB-18

Moisture: .

Extraction Batch ID: 1740139

Extraction Type Sol Exchange

Date Extracted: 19-FEB-18

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
121-82-4 <i>121-82-4</i>	RDX <i>RDX</i>	5.09		0.0842	0.263
78-11-5 <i>78-11-5</i>	PETN <i>PETN</i>	5.09		0.105	0.526
35572-78-2 <i>35572-78-2</i>	2-Amino-4,6-dinitrotoluene <i>2-Amino-4,6-dinitrotoluene</i>	5.15		0.0842	0.263
99-35-4 <i>99-35-4</i>	1,3,5-Trinitrobenzene <i>1,3,5-Trinitrobenzene</i>	5.15		0.0842	0.263
2691-41-0 <i>2691-41-0</i>	HMX <i>HMX</i>	5.18		0.0842	0.263
99-65-0 <i>99-65-0</i>	m-Dinitrobenzene <i>m-Dinitrobenzene</i>	5.23		0.0842	0.263
121-14-2 <i>121-14-2</i>	2,4-Dinitrotoluene <i>2,4-Dinitrotoluene</i>	5.27		0.0842	0.263
606-20-2 <i>606-20-2</i>	2,6-Dinitrotoluene <i>2,6-Dinitrotoluene</i>	5.27		0.0842	0.263
6629-29-4 <i>6629-29-4</i>	2,4-Diamino-6-nitrotoluene <i>2,4-Diamino-6-nitrotoluene</i>	5.41		0.526	2.63
479-45-8 <i>479-45-8</i>	Tetryl <i>Tetryl</i>	6.15		0.0842	0.526

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAPA-18-14(443888003MSD)MSD

Lab Code: GEL

GEL Job No (SDG) 2018-1719

Matrix: WATER

GEL Sample ID: 1203974215

Sample Amount 950 mL

Date Received: 15-FEB-18

Moisture: .

Extraction Batch ID: 1740139

Extraction Type Sol Exchange

Date Extracted: 19-FEB-18

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0219028.wiff

Date Analyzed: 20-FEB-18 08:48

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
3058-38-6	TATB	3.12		0.316	1.05
<i>3058-38-6</i>	<i>TATB</i>				
78-30-8	tris(o-cresyl) phosphate	3.57		0.316	1.05
<i>78-30-8</i>	<i>tris(o-cresyl) phosphate</i>				
59229-75-3	2,6-Diamino-4-nitrotoluene	4.41		0.526	2.63
<i>59229-75-3</i>	<i>2,6-Diamino-4-nitrotoluene</i>				
13980-04-6	TNX	4.49		0.0842	0.263
<i>13980-04-6</i>	<i>TNX</i>				
5755-27-1	MNX	4.63		0.0842	0.263
<i>5755-27-1</i>	<i>MNX</i>				
99-08-1	m-Nitrotoluene	4.89		0.0842	0.263
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				
98-95-3	Nitrobenzene	4.91		0.0842	0.263
<i>98-95-3</i>	<i>Nitrobenzene</i>				
80251-29-2	DNX	4.99		0.0842	0.263
<i>80251-29-2</i>	<i>DNX</i>				
118-96-7	2,4,6-Trinitrotoluene	5.01		0.0842	0.263
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
99-99-0	p-Nitrotoluene	5.07		0.158	0.526
<i>99-99-0</i>	<i>p-Nitrotoluene</i>				
618-87-1	3,5-Dinitroaniline	5.1		0.316	1.05
<i>618-87-1</i>	<i>3,5-Dinitroaniline</i>				
88-72-2	o-Nitrotoluene	5.18		0.0863	0.263
<i>88-72-2</i>	<i>o-Nitrotoluene</i>				
6629-29-4	2,4-Diamino-6-nitrotoluene	5.19		0.526	2.63
<i>6629-29-4</i>	<i>2,4-Diamino-6-nitrotoluene</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAPA-18-14(443888003MSD)MSD

Lab Code: GEL

GEL Job No (SDG) 2018-1719

Matrix: WATER

GEL Sample ID: 1203974215

Sample Amount 950 mL

Date Received: 15-FEB-18

Moisture: .

Extraction Batch ID: 1740139

Extraction Type Sol Exchange

Date Extracted: 19-FEB-18

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
78-11-5	PETN	5.21		0.105	0.526
<i>78-11-5</i>	<i>PETN</i>				
2691-41-0	HMX	5.24		0.0842	0.263
<i>2691-41-0</i>	<i>HMX</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	5.25		0.0842	0.263
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
99-65-0	m-Dinitrobenzene	5.3		0.0842	0.263
<i>99-65-0</i>	<i>m-Dinitrobenzene</i>				
121-82-4	RDX	5.46		0.0842	0.263
<i>121-82-4</i>	<i>RDX</i>				
121-14-2	2,4-Dinitrotoluene	5.47		0.0842	0.263
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
606-20-2	2,6-Dinitrotoluene	5.5		0.0842	0.263
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
99-35-4	1,3,5-Trinitrobenzene	5.51		0.0842	0.263
<i>99-35-4</i>	<i>1,3,5-Trinitrobenzene</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	5.64		0.0842	0.263
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
479-45-8	Tetryl	6.65		0.0842	0.526
<i>479-45-8</i>	<i>Tetryl</i>				

Explosives Initial Calibration Blank

Lab Name: GEL Laboratories LLCGEL Job No(SDG): 2018-1719Lab Code: GELLab Sample ID: XIBLK01Analysis Date: 19-FEB-18 16:48GEL Data File: EXP0219001.wiffInstrument ID: LCMSMS5Column: Ultracarb Phenomenex 5u ODS (20)

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

Explosives Initial Calibration Blank

Lab Name: GEL Laboratories LLCGEL Job No(SDG): 2018-1719Lab Code: GELLab Sample ID: XIBLK01Analysis Date: 19-FEB-18 17:24GEL Data File: EXP0219002.wiffInstrument ID: LCMSMS5Column: Ultracarb Phenomenex 5u ODS (20)

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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2018-1719

Lab Code: GEL

Lab Sample ID: XIBLK02

Analysis Date: 19-FEB-18 22:08

GEL Data File: EXP0219010.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2018-1719

Lab Code: GEL

Lab Sample ID: XIBLK03

Analysis Date: 20-FEB-18 00:30

GEL Data File: EXP0219014.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2018-1719

Lab Code: GEL

Lab Sample ID: XIBLK04

Analysis Date: 20-FEB-18 04:03

GEL Data File: EXP0219020.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2018-1719

Lab Code: GEL

Lab Sample ID: XIBLK05

Analysis Date: 20-FEB-18 05:15

GEL Data File: EXP0219022.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2018-1719

Lab Code: GEL

Lab Sample ID: XIBLK06

Analysis Date: 20-FEB-18 11:10

GEL Data File: EXP0219032.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2018-1719

Lab Code: GEL

Lab Sample ID: XIBLK07

Analysis Date: 20-FEB-18 12:21

GEL Data File: EXP0219034.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

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

Metals Analysis

Case Narrative

Metals
Technical Case Narrative
ARS International, LLC (ARSL)
SDG #: 2018-1719
Work Order #: 443888

Sample ID	Client ID
443888001	CAPA-18-13
443888002	CAPA-18-14
443888005	CAPA-18-3
443888007	CAPA-18-4
443888010	CAWA-18-63
443888012	CAWA-18-64
443888014	CAWA-18-151309
443888016	CAWA-18-151310
1203972538	Method Blank (MB) ICP
1203972539	Laboratory Control Sample (LCS)
1203972542	443888001(CAPA-18-13L) Serial Dilution (SD)
1203972540	443888001(CAPA-18-13D) Sample Duplicate (DUP)
1203972541	443888001(CAPA-18-13S) Matrix Spike (MS)
1203972547	Method Blank (MB) ICP-MS
1203972548	Laboratory Control Sample (LCS)
1203972551	443888001(CAPA-18-13L) Serial Dilution (SD)
1203972549	443888001(CAPA-18-13D) Sample Duplicate (DUP)
1203972550	443888001(CAPA-18-13S) Matrix Spike (MS)
1203975305	Method Blank (MB) CVAA
1203975306	Laboratory Control Sample (LCS)
1203975309	443888001(CAPA-18-13L) Serial Dilution (SD)
1203975307	443888001(CAPA-18-13D) Sample Duplicate (DUP)
1203975308	443888001(CAPA-18-13S) Matrix Spike (MS)

Sample Analysis

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

Method/Analysis Information

Analytical Batch:	1739540, 1739542 and 1740556
Prep Batch :	1739539, 1739541 and 1740554
Standard Operating Procedures:	GL-MA-E-013 REV# 30, GL-MA-E-006 REV# 14, GL-MA-E-014 REV# 32 and GL-MA-E-010 REV# 36
Analytical Method:	SW846 3005A/6010C, SW846 3005A/6020A and EPA 245.2 1974
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 Metals analysis-ICP was performed on a P E 5300 Optima radial/axial-viewing inductively coupled plasma atomic emission spectrometer. The instrument is equipped with an ESI SC-FAST introduction, cyclonic spray chamber, and yttrium or scandium internal standard.

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

The Metals analysis - ICPMS was performed on a PerkinElmer NexION 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 sodium and zinc on samples #443888001, 443888002 and 443888005. Client sample concentrations were less than the MDL or greater than two times the PQL; therefore the data were not adversely affected. 443888001 (CAPA-18-13), 443888002 (CAPA-18-14), 443888005 (CAPA-18-3), 443888010 (CAWA-18-63) and 443888014 (CAWA-18-151309)-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: 443888001 (CAPA-18-13)-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

Additional comments were not required for this SDG.

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: 2018-1719 GEL Work Order: 443888

The Qualifiers in this report are defined as follows:

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

Review/Validation

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

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

Signature:



Name: Nik-Cole Elmore

Date: 14 MAR 2018

Title: Data Validator

Sample Data Summary

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-1719**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 443888001**BASIS:** As Received**DATE COLLECTED** 13-FEB-18**CLIENT ID:** CAPA-18-13**LEVEL:** Low**DATE RECEIVED** 15-FEB-18**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	02/21/18 11:41	022118W3-5	1740556

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-1719

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 443888001

BASIS: As Received

DATE COLLECTED 13-FEB-18

CLIENT ID: CAPA-18-13

LEVEL: Low

DATE RECEIVED 15-FEB-18

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	1050	ug/L		68	200	200	1	P	HSC	03/07/18 14:30	030718-1	1739540
7440-36-0	Antimony	1	ug/L	U	1	3	3	1	MS	BAJ	02/27/18 21:36	180227-4	1739542
7440-38-2	Arsenic	2.29	ug/L	J	2	5	5	1	MS	BAJ	02/27/18 21:36	180227-4	1739542
7440-39-3	Barium	38.5	ug/L		1	5	5	1	P	HSC	03/07/18 14:30	030718-1	1739540
7440-41-7	Beryllium	1	ug/L	U	1	5	5	1	P	HSC	03/07/18 14:30	030718-1	1739540
7440-42-8	Boron	15	ug/L	U	15	50	50	1	P	HSC	03/07/18 14:30	030718-1	1739540
7440-43-9	Cadmium	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	02/27/18 21:36	180227-4	1739542
7440-70-2	Calcium	10300	ug/L		50	200	200	1	P	HSC	03/07/18 14:30	030718-1	1739540
7440-47-3	Chromium	3	ug/L	U	3	10	10	1	MS	BAJ	02/27/18 21:36	180227-4	1739542
7440-48-4	Cobalt	1	ug/L	U	1	5	5	1	P	HSC	03/07/18 14:30	030718-1	1739540
7440-50-8	Copper	3	ug/L	U	3	10	10	1	P	HSC	03/07/18 14:30	030718-1	1739540
7439-89-6	Iron	494	ug/L		30	100	100	1	P	HSC	03/07/18 14:30	030718-1	1739540
7439-92-1	Lead	0.50	ug/L	U	0.5	2	2	1	MS	BAJ	02/27/18 21:36	180227-4	1739542
7439-95-4	Magnesium	3280	ug/L		110	300	300	1	P	HSC	03/07/18 14:30	030718-1	1739540
7439-96-5	Manganese	2.2	ug/L	J	2	10	10	1	P	HSC	03/07/18 14:30	030718-1	1739540
7439-98-7	Molybdenum	0.741	ug/L		0.2	0.5	0.5	1	MS	BAJ	02/27/18 21:36	180227-4	1739542
7440-02-0	Nickel	1.78	ug/L	J	0.6	2	2	1	MS	BAJ	02/27/18 21:36	180227-4	1739542
7440-09-7	Potassium	2290	ug/L		50	150	150	1	P	HSC	03/07/18 14:30	030718-1	1739540
7782-49-2	Selenium	2	ug/L	U	2	5	5	1	MS	BAJ	02/27/18 21:36	180227-4	1739542
7631-86-9	Silica	30000	ug/L		53	213	213	1	P	HSC	03/07/18 14:30	030718-1	1739540
7440-22-4	Silver	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	02/27/18 21:36	180227-4	1739542
7440-23-5	Sodium	11400	ug/L		100	300	300	1	P	HSC	03/07/18 14:30	030718-1	1739540
7440-24-6	Strontium	67.9	ug/L		1	5	5	1	P	HSC	03/07/18 14:30	030718-1	1739540
7440-28-0	Thallium	0.60	ug/L	U	0.6	2	2	1	MS	BAJ	02/27/18 21:36	180227-4	1739542
7440-31-5	Tin	2.5	ug/L	U	2.5	10	10	1	P	HSC	03/07/18 14:30	030718-1	1739540
7440-61-1	Uranium	0.067	ug/L	U	0.067	0.2	0.2	1	MS	BAJ	02/27/18 21:36	180227-4	1739542
7440-62-2	Vanadium	1.85	ug/L	J	1	5	5	1	P	HSC	03/07/18 14:30	030718-1	1739540
7440-66-6	Zinc	3.3	ug/L	U	3.3	10	10	1	P	HSC	03/08/18 14:08	030818-2	1739540

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-1719**CONTRACT:** ESHL00114**METHOD TYPE:****SAMPLE ID:** 443888001**BASIS:** As Received**DATE COLLECTED** 13-FEB-18**CLIENT ID:** CAPA-18-13**LEVEL:** Low**DATE RECEIVED** 15-FEB-18**MATRIX:** W**%SOLIDS:** 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
	Hardness as CaCO3	39.3	mg/L		0.453	1.24	1.24	1		NOR1	03/14/18 13:11		1747163

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1739540	1739539	SW846 3005A	50	mL	50	mL	02/15/18	JXM8
1739542	1739541	SW846 3005A	50	mL	50	mL	02/15/18	JXM8
1740556	1740554	EPA 245.1/245.2 Prep	20	mL	20	mL	02/20/18	AXS5

***Analytical Methods:**

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

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-1719**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 443888002**BASIS:** As Received**DATE COLLECTED** 13-FEB-18**CLIENT ID:** CAPA-18-14**LEVEL:** Low**DATE RECEIVED** 15-FEB-18**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	02/21/18 11:49	022118W3-5	1740556

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-1719

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 443888002

BASIS: As Received

DATE COLLECTED 13-FEB-18

CLIENT ID: CAPA-18-14

LEVEL: Low

DATE RECEIVED 15-FEB-18

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	1540	ug/L		68	200	200	1	P	HSC	03/07/18 14:18	030718-1	1739540
7440-36-0	Antimony	1	ug/L	U	1	3	3	1	MS	BAJ	02/27/18 22:02	180227-4	1739542
7440-38-2	Arsenic	2.38	ug/L	J	2	5	5	1	MS	BAJ	02/27/18 22:02	180227-4	1739542
7440-39-3	Barium	41	ug/L		1	5	5	1	P	HSC	03/07/18 14:18	030718-1	1739540
7440-41-7	Beryllium	1	ug/L	U	1	5	5	1	P	HSC	03/07/18 14:18	030718-1	1739540
7440-42-8	Boron	15	ug/L	U	15	50	50	1	P	HSC	03/07/18 14:18	030718-1	1739540
7440-43-9	Cadmium	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	02/27/18 22:02	180227-4	1739542
7440-70-2	Calcium	10400	ug/L		50	200	200	1	P	HSC	03/07/18 14:18	030718-1	1739540
7440-47-3	Chromium	3	ug/L	U	3	10	10	1	MS	BAJ	02/27/18 22:02	180227-4	1739542
7440-48-4	Cobalt	1	ug/L	U	1	5	5	1	P	HSC	03/07/18 14:18	030718-1	1739540
7440-50-8	Copper	3	ug/L	U	3	10	10	1	P	HSC	03/07/18 14:18	030718-1	1739540
7439-89-6	Iron	760	ug/L		30	100	100	1	P	HSC	03/07/18 14:18	030718-1	1739540
7439-92-1	Lead	0.550	ug/L	J	0.5	2	2	1	MS	BAJ	02/27/18 22:02	180227-4	1739542
7439-95-4	Magnesium	3300	ug/L		110	300	300	1	P	HSC	03/07/18 14:18	030718-1	1739540
7439-96-5	Manganese	4.17	ug/L	J	2	10	10	1	P	HSC	03/07/18 14:18	030718-1	1739540
7439-98-7	Molybdenum	0.704	ug/L		0.2	0.5	0.5	1	MS	BAJ	02/27/18 22:02	180227-4	1739542
7440-02-0	Nickel	2.13	ug/L		0.6	2	2	1	MS	BAJ	02/27/18 22:02	180227-4	1739542
7440-09-7	Potassium	2410	ug/L		50	150	150	1	P	HSC	03/07/18 14:18	030718-1	1739540
7782-49-2	Selenium	2	ug/L	U	2	5	5	1	MS	BAJ	02/27/18 22:02	180227-4	1739542
7440-22-4	Silver	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	02/27/18 22:02	180227-4	1739542
7440-23-5	Sodium	11800	ug/L		100	300	300	1	P	HSC	03/07/18 14:18	030718-1	1739540
7440-24-6	Strontium	72.5	ug/L		1	5	5	1	P	HSC	03/07/18 14:18	030718-1	1739540
7440-28-0	Thallium	0.60	ug/L	U	0.6	2	2	1	MS	BAJ	02/27/18 22:02	180227-4	1739542
7440-31-5	Tin	2.5	ug/L	U	2.5	10	10	1	P	HSC	03/07/18 14:18	030718-1	1739540
7440-61-1	Uranium	0.067	ug/L	U	0.067	0.2	0.2	1	MS	BAJ	02/27/18 22:02	180227-4	1739542
7440-62-2	Vanadium	2.88	ug/L	J	1	5	5	1	P	HSC	03/07/18 14:18	030718-1	1739540
7440-66-6	Zinc	3.3	ug/L	U	3.3	10	10	1	P	HSC	03/08/18 13:56	030818-2	1739540

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-1719**CONTRACT:** ESHL00114**METHOD TYPE:****SAMPLE ID:** 443888002**BASIS:** As Received**DATE COLLECTED** 13-FEB-18**CLIENT ID:** CAPA-18-14**LEVEL:** Low**DATE RECEIVED** 15-FEB-18**MATRIX:** W**%SOLIDS:** 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
	Hardness as CaCO3	39.5	mg/L		0.453	1.24	1.24	1		NOR1	03/14/18 13:11		1747163

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1739540	1739539	SW846 3005A	50	mL	50	mL	02/15/18	JXM8
1739542	1739541	SW846 3005A	50	mL	50	mL	02/15/18	JXM8
1740556	1740554	EPA 245.1/245.2 Prep	20	mL	20	mL	02/20/18	AXS5

***Analytical Methods:**

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

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-1719**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 443888005**BASIS:** As Received**DATE COLLECTED** 13-FEB-18**CLIENT ID:** CAPA-18-3**LEVEL:** Low**DATE RECEIVED** 15-FEB-18**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	02/21/18 11:51	022118W3-5	1740556

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-1719

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 443888005

BASIS: As Received

DATE COLLECTED 13-FEB-18

CLIENT ID: CAPA-18-3

LEVEL: Low

DATE RECEIVED 15-FEB-18

MATRIX: W

%SOLIDS: 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7429-90-5	Aluminum	68	ug/L	U	68	200	200	1	P	HSC	03/07/18 14:21	030718-1	1739540
7440-36-0	Antimony	1	ug/L	U	1	3	3	1	MS	BAJ	02/27/18 22:06	180227-4	1739542
7440-38-2	Arsenic	2	ug/L	U	2	5	5	1	MS	BAJ	02/27/18 22:06	180227-4	1739542
7440-39-3	Barium	19.5	ug/L		1	5	5	1	P	HSC	03/07/18 14:21	030718-1	1739540
7440-41-7	Beryllium	1	ug/L	U	1	5	5	1	P	HSC	03/07/18 14:21	030718-1	1739540
7440-42-8	Boron	15	ug/L	U	15	50	50	1	P	HSC	03/07/18 14:21	030718-1	1739540
7440-43-9	Cadmium	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	02/27/18 22:06	180227-4	1739542
7440-70-2	Calcium	9630	ug/L		50	200	200	1	P	HSC	03/07/18 14:21	030718-1	1739540
7440-47-3	Chromium	3	ug/L	U	3	10	10	1	MS	BAJ	02/27/18 22:06	180227-4	1739542
7440-48-4	Cobalt	1	ug/L	U	1	5	5	1	P	HSC	03/07/18 14:21	030718-1	1739540
7440-50-8	Copper	3	ug/L	U	3	10	10	1	P	HSC	03/07/18 14:21	030718-1	1739540
7439-89-6	Iron	30	ug/L	U	30	100	100	1	P	HSC	03/07/18 14:21	030718-1	1739540
7439-92-1	Lead	0.50	ug/L	U	0.5	2	2	1	MS	BAJ	02/27/18 22:06	180227-4	1739542
7439-95-4	Magnesium	3260	ug/L		110	300	300	1	P	HSC	03/07/18 14:21	030718-1	1739540
7439-96-5	Manganese	2	ug/L	U	2	10	10	1	P	HSC	03/07/18 14:21	030718-1	1739540
7439-98-7	Molybdenum	0.546	ug/L		0.2	0.5	0.5	1	MS	BAJ	02/27/18 22:06	180227-4	1739542
7440-02-0	Nickel	0.813	ug/L	J	0.6	2	2	1	MS	BAJ	02/27/18 22:06	180227-4	1739542
7440-09-7	Potassium	1140	ug/L		50	150	150	1	P	HSC	03/07/18 14:21	030718-1	1739540
7782-49-2	Selenium	2	ug/L	U	2	5	5	1	MS	BAJ	02/27/18 22:06	180227-4	1739542
7631-86-9	Silica	56900	ug/L		53	213	213	1	P	HSC	03/07/18 14:21	030718-1	1739540
7440-22-4	Silver	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	02/27/18 22:06	180227-4	1739542
7440-23-5	Sodium	7900	ug/L		100	300	300	1	P	HSC	03/07/18 14:21	030718-1	1739540
7440-24-6	Strontium	48.8	ug/L		1	5	5	1	P	HSC	03/07/18 14:21	030718-1	1739540
7440-28-0	Thallium	0.60	ug/L	U	0.6	2	2	1	MS	BAJ	02/27/18 22:06	180227-4	1739542
7440-31-5	Tin	2.5	ug/L	U	2.5	10	10	1	P	HSC	03/07/18 14:21	030718-1	1739540
7440-61-1	Uranium	0.371	ug/L		0.067	0.2	0.2	1	MS	BAJ	02/27/18 22:06	180227-4	1739542
7440-62-2	Vanadium	3.13	ug/L	J	1	5	5	1	P	HSC	03/07/18 14:21	030718-1	1739540
7440-66-6	Zinc	3.3	ug/L	U	3.3	10	10	1	P	HSC	03/08/18 13:59	030818-2	1739540

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-1719**CONTRACT:** ESHL00114**METHOD TYPE:****SAMPLE ID:** 443888005**BASIS:** As Received**DATE COLLECTED** 13-FEB-18**CLIENT ID:** CAPA-18-3**LEVEL:** Low**DATE RECEIVED** 15-FEB-18**MATRIX:** W**%SOLIDS:** 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
	Hardness as CaCO3	37.5	mg/L		0.453	1.24	1.24	1		NOR1	03/14/18 13:11		1747163

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1739540	1739539	SW846 3005A	50	mL	50	mL	02/15/18	JXM8
1739542	1739541	SW846 3005A	50	mL	50	mL	02/15/18	JXM8
1740556	1740554	EPA 245.1/245.2 Prep	20	mL	20	mL	02/20/18	AXS5

***Analytical Methods:**

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

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-1719**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 443888007**BASIS:** As Received**DATE COLLECTED** 13-FEB-18**CLIENT ID:** CAPA-18-4**LEVEL:** Low**DATE RECEIVED** 15-FEB-18**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	02/21/18 11:53	022118W3-5	1740556

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1740556	1740554	EPA 245.1/245.2 Prep	20	mL	20	mL	02/20/18	AXS5

***Analytical Methods:**

AV EPA 245.2 1974

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-1719**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 443888010**BASIS:** As Received**DATE COLLECTED** 13-FEB-18**CLIENT ID:** CAWA-18-63**LEVEL:** Low**DATE RECEIVED** 15-FEB-18**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	02/21/18 11:54	022118W3-5	1740556

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-1719

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 443888010

BASIS: As Received

DATE COLLECTED 13-FEB-18

CLIENT ID: CAWA-18-63

LEVEL: Low

DATE RECEIVED 15-FEB-18

MATRIX: W

%SOLIDS: 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7429-90-5	Aluminum	68	ug/L	U	68	200	200	1	P	HSC	03/07/18 14:24	030718-1	1739540
7440-36-0	Antimony	1	ug/L	U	1	3	3	1	MS	BAJ	02/27/18 22:09	180227-4	1739542
7440-38-2	Arsenic	2	ug/L	U	2	5	5	1	MS	BAJ	02/27/18 22:09	180227-4	1739542
7440-39-3	Barium	13.1	ug/L		1	5	5	1	P	HSC	03/07/18 14:24	030718-1	1739540
7440-41-7	Beryllium	1	ug/L	U	1	5	5	1	P	HSC	03/07/18 14:24	030718-1	1739540
7440-42-8	Boron	15	ug/L	U	15	50	50	1	P	HSC	03/07/18 14:24	030718-1	1739540
7440-43-9	Cadmium	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	02/27/18 22:09	180227-4	1739542
7440-70-2	Calcium	9550	ug/L		50	200	200	1	P	HSC	03/07/18 14:24	030718-1	1739540
7440-47-3	Chromium	3	ug/L	U	3	10	10	1	MS	BAJ	02/27/18 22:09	180227-4	1739542
7440-48-4	Cobalt	1	ug/L	U	1	5	5	1	P	HSC	03/07/18 14:24	030718-1	1739540
7440-50-8	Copper	3	ug/L	U	3	10	10	1	P	HSC	03/07/18 14:24	030718-1	1739540
7439-89-6	Iron	30	ug/L	U	30	100	100	1	P	HSC	03/07/18 14:24	030718-1	1739540
7439-92-1	Lead	0.50	ug/L	U	0.5	2	2	1	MS	BAJ	02/27/18 22:09	180227-4	1739542
7439-95-4	Magnesium	2990	ug/L		110	300	300	1	P	HSC	03/07/18 14:24	030718-1	1739540
7439-96-5	Manganese	2	ug/L	U	2	10	10	1	P	HSC	03/07/18 14:24	030718-1	1739540
7439-98-7	Molybdenum	0.547	ug/L		0.2	0.5	0.5	1	MS	BAJ	02/27/18 22:09	180227-4	1739542
7440-02-0	Nickel	0.749	ug/L	J	0.6	2	2	1	MS	BAJ	02/27/18 22:09	180227-4	1739542
7440-09-7	Potassium	1010	ug/L		50	150	150	1	P	HSC	03/07/18 14:24	030718-1	1739540
7782-49-2	Selenium	2	ug/L	U	2	5	5	1	MS	BAJ	02/27/18 22:09	180227-4	1739542
7631-86-9	Silica	57800	ug/L		53	213	213	1	P	HSC	03/07/18 14:24	030718-1	1739540
7440-22-4	Silver	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	02/27/18 22:09	180227-4	1739542
7440-23-5	Sodium	8680	ug/L		100	300	300	1	P	HSC	03/07/18 14:24	030718-1	1739540
7440-24-6	Strontium	48	ug/L		1	5	5	1	P	HSC	03/07/18 14:24	030718-1	1739540
7440-28-0	Thallium	0.60	ug/L	U	0.6	2	2	1	MS	BAJ	02/27/18 22:09	180227-4	1739542
7440-31-5	Tin	2.5	ug/L	U	2.5	10	10	1	P	HSC	03/07/18 14:24	030718-1	1739540
7440-61-1	Uranium	0.374	ug/L		0.067	0.2	0.2	1	MS	BAJ	02/27/18 22:09	180227-4	1739542
7440-62-2	Vanadium	2.64	ug/L	J	1	5	5	1	P	HSC	03/07/18 14:24	030718-1	1739540
7440-66-6	Zinc	5.58	ug/L	J	3.3	10	10	1	P	HSC	03/09/18 07:08	030918-3	1739540

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-1719**CONTRACT:** ESHL00114**METHOD TYPE:****SAMPLE ID:** 443888010**BASIS:** As Received**DATE COLLECTED** 13-FEB-18**CLIENT ID:** CAWA-18-63**LEVEL:** Low**DATE RECEIVED** 15-FEB-18**MATRIX:** W**%SOLIDS:** 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
	Hardness as CaCO3	36.2	mg/L		0.453	1.24	1.24	1		NOR1	03/14/18 13:11		1747163

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1739540	1739539	SW846 3005A	50	mL	50	mL	02/15/18	JXM8
1739542	1739541	SW846 3005A	50	mL	50	mL	02/15/18	JXM8
1740556	1740554	EPA 245.1/245.2 Prep	20	mL	20	mL	02/20/18	AXS5

***Analytical Methods:**

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

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-1719**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 443888012**BASIS:** As Received**DATE COLLECTED** 13-FEB-18**CLIENT ID:** CAWA-18-64**LEVEL:** Low**DATE RECEIVED** 15-FEB-18**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	02/21/18 11:59	022118W3-5	1740556

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1740556	1740554	EPA 245.1/245.2 Prep	20	mL	20	mL	02/20/18	AXS5

***Analytical Methods:**

AV EPA 245.2 1974

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-1719**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 443888014**BASIS:** As Received**DATE COLLECTED** 13-FEB-18**CLIENT ID:** CAWA-18-151309**LEVEL:** Low**DATE RECEIVED** 15-FEB-18**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	02/21/18 12:01	022118W3-5	1740556

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-1719

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 443888014

BASIS: As Received

DATE COLLECTED 13-FEB-18

CLIENT ID: CAWA-18-151309

LEVEL: Low

DATE RECEIVED 15-FEB-18

MATRIX: W

%SOLIDS: 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7429-90-5	Aluminum	68	ug/L	U	68	200	200	1	P	HSC	03/07/18 14:27	030718-1	1739540
7440-36-0	Antimony	1	ug/L	U	1	3	3	1	MS	BAJ	02/27/18 22:12	180227-4	1739542
7440-38-2	Arsenic	2	ug/L	U	2	5	5	1	MS	BAJ	02/27/18 22:12	180227-4	1739542
7440-39-3	Barium	13.2	ug/L		1	5	5	1	P	HSC	03/07/18 14:27	030718-1	1739540
7440-41-7	Beryllium	1	ug/L	U	1	5	5	1	P	HSC	03/07/18 14:27	030718-1	1739540
7440-42-8	Boron	15	ug/L	U	15	50	50	1	P	HSC	03/07/18 14:27	030718-1	1739540
7440-43-9	Cadmium	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	02/27/18 22:12	180227-4	1739542
7440-70-2	Calcium	9500	ug/L		50	200	200	1	P	HSC	03/07/18 14:27	030718-1	1739540
7440-47-3	Chromium	3	ug/L	U	3	10	10	1	MS	BAJ	02/27/18 22:12	180227-4	1739542
7440-48-4	Cobalt	1	ug/L	U	1	5	5	1	P	HSC	03/07/18 14:27	030718-1	1739540
7440-50-8	Copper	3	ug/L	U	3	10	10	1	P	HSC	03/07/18 14:27	030718-1	1739540
7439-89-6	Iron	30	ug/L	U	30	100	100	1	P	HSC	03/07/18 14:27	030718-1	1739540
7439-92-1	Lead	0.50	ug/L	U	0.5	2	2	1	MS	BAJ	02/27/18 22:12	180227-4	1739542
7439-95-4	Magnesium	2930	ug/L		110	300	300	1	P	HSC	03/07/18 14:27	030718-1	1739540
7439-96-5	Manganese	2	ug/L	U	2	10	10	1	P	HSC	03/07/18 14:27	030718-1	1739540
7439-98-7	Molybdenum	0.726	ug/L		0.2	0.5	0.5	1	MS	BAJ	02/27/18 22:12	180227-4	1739542
7440-02-0	Nickel	0.727	ug/L	J	0.6	2	2	1	MS	BAJ	02/27/18 22:12	180227-4	1739542
7440-09-7	Potassium	932	ug/L		50	150	150	1	P	HSC	03/07/18 14:27	030718-1	1739540
7782-49-2	Selenium	2	ug/L	U	2	5	5	1	MS	BAJ	02/27/18 22:12	180227-4	1739542
7631-86-9	Silica	57300	ug/L		53	213	213	1	P	HSC	03/07/18 14:27	030718-1	1739540
7440-22-4	Silver	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	02/27/18 22:12	180227-4	1739542
7440-23-5	Sodium	8120	ug/L		100	300	300	1	P	HSC	03/07/18 14:27	030718-1	1739540
7440-24-6	Strontium	46.5	ug/L		1	5	5	1	P	HSC	03/07/18 14:27	030718-1	1739540
7440-28-0	Thallium	0.60	ug/L	U	0.6	2	2	1	MS	BAJ	02/27/18 22:12	180227-4	1739542
7440-31-5	Tin	2.5	ug/L	U	2.5	10	10	1	P	HSC	03/07/18 14:27	030718-1	1739540
7440-61-1	Uranium	0.366	ug/L		0.067	0.2	0.2	1	MS	BAJ	02/27/18 22:12	180227-4	1739542
7440-62-2	Vanadium	2.42	ug/L	J	1	5	5	1	P	HSC	03/07/18 14:27	030718-1	1739540
7440-66-6	Zinc	6.06	ug/L	J	3.3	10	10	1	P	HSC	03/09/18 07:11	030918-3	1739540

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-1719**CONTRACT:** ESHL00114**METHOD TYPE:****SAMPLE ID:** 443888014**BASIS:** As Received**DATE COLLECTED** 13-FEB-18**CLIENT ID:** CAWA-18-151309**LEVEL:** Low**DATE RECEIVED** 15-FEB-18**MATRIX:** W**%SOLIDS:** 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
	Hardness as CaCO3	35.8	mg/L		0.453	1.24	1.24	1		NOR1	03/14/18 13:11		1747163

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1739540	1739539	SW846 3005A	50	mL	50	mL	02/15/18	JXM8
1739542	1739541	SW846 3005A	50	mL	50	mL	02/15/18	JXM8
1740556	1740554	EPA 245.1/245.2 Prep	20	mL	20	mL	02/20/18	AXS5

***Analytical Methods:**

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

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-1719**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 443888016**BASIS:** As Received**DATE COLLECTED** 13-FEB-18**CLIENT ID:** CAWA-18-151310**LEVEL:** Low**DATE RECEIVED** 15-FEB-18**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	02/21/18 12:03	022118W3-5	1740556

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1740556	1740554	EPA 245.1/245.2 Prep	20	mL	20	mL	02/20/18	AXS5

***Analytical Methods:**

AV EPA 245.2 1974

Quality Control Summary

METALS
-3b-
PREPARATION BLANK SUMMARY

SDG NO. 2018-1719

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>
1203972538								
	Aluminum	68	ug/L	+/-200	U	P	68	200
	Barium	1	ug/L	+/-5	U	P	1	5
	Beryllium	1	ug/L	+/-5	U	P	1	5
	Boron	15	ug/L	+/-50	U	P	15	50
	Calcium	50	ug/L	+/-200	U	P	50	200
	Cobalt	1	ug/L	+/-5	U	P	1	5
	Copper	3	ug/L	+/-10	U	P	3	10
	Iron	30	ug/L	+/-100	U	P	30	100
	Magnesium	110	ug/L	+/-300	U	P	110	300
	Manganese	2	ug/L	+/-10	U	P	2	10
	Potassium	110	ug/L	+/-150	J	P	50	150
	Silica	53	ug/L	+/-213	U	P	53	213
	Sodium	100	ug/L	+/-300	U	P	100	300
	Strontium	1	ug/L	+/-5	U	P	1	5
	Tin	2.5	ug/L	+/-10	U	P	2.5	10
	Vanadium	1	ug/L	+/-5	U	P	1	5
	Zinc	3.3	ug/L	+/-10	U	P	3.3	10
1203972547								
	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
1203975305								
	Mercury	-0.073	ug/L	+/-0.2	J	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. 2018-1719 Client ID: CAPA-18-13S

Contract: ESHL00114 Level: Low

Matrix: WATER % Solids:

Sample ID: 443888001 Spike ID: 1203972541

<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>
Tin	ug/L	75-125	484		2.5	U	500	96.8		P
Vanadium	ug/L	75-125	486		1.85	J	500	96.8		P
Zinc	ug/L	75-125	443		3.3	U	500	88.2		P
Aluminum	ug/L	75-125	6080		1050		5000	101		P
Barium	ug/L	75-125	505		38.5		500	93.3		P
Beryllium	ug/L	75-125	483		1	U	500	96.5		P
Boron	ug/L	75-125	508		15	U	500	99.5		P
Calcium	ug/L	75-125	15200		10300		5000	97		P
Cobalt	ug/L	75-125	480		1	U	500	95.9		P
Copper	ug/L	75-125	487		3	U	500	97.3		P
Iron	ug/L	75-125	5450		494		5000	99.1		P
Magnesium	ug/L	75-125	8350		3280		5000	101		P
Manganese	ug/L	75-125	481		2.2	J	500	95.8		P
Potassium	ug/L	75-125	7100		2290		5000	96.3		P
Silica	ug/L	75-125	40700		30000		10700	100		P
Sodium	ug/L	75-125	15800		11400		5000	89.6		P
Strontium	ug/L	75-125	552		67.9		500	96.7		P

*Analytical Methods:

P SW846 3005A/6010C

METALS

-5a-

Matrix Spike Summary

SDG NO. 2018-1719 **Client ID:** CAPA-18-13S

Contract: ESHL00114 **Level:** Low

Matrix: WATER **% Solids:**

Sample ID: 443888001 **Spike ID:** 1203972550

<u>Analyte</u>	<u>Units</u>	<u>Acceptance Limit</u>	<u>Spiked Result</u>	<u>C</u>	<u>Sample Result</u>	<u>C</u>	<u>Spike Added</u>	<u>% Recovery</u>	<u>Qual</u>	<u>M*</u>
Antimony	ug/L	75-125	49.6		1	U	50	98.5		MS
Arsenic	ug/L	75-125	51.8		2.29	J	50	99		MS
Cadmium	ug/L	75-125	50.4		0.3	U	50	101		MS
Chromium	ug/L	75-125	52.7		3	U	50	102		MS
Lead	ug/L	75-125	47.9		0.5	U	50	95.1		MS
Molybdenum	ug/L	75-125	52.6		0.741		50	104		MS
Nickel	ug/L	75-125	55.2		1.78	J	50	107		MS
Selenium	ug/L	75-125	50.7		2	U	50	101		MS
Silver	ug/L	75-125	52.7		0.3	U	50	105		MS
Thallium	ug/L	75-125	46.7		0.6	U	50	93.4		MS
Uranium	ug/L	75-125	47.6		0.067	U	50	95.1		MS

*Analytical Methods:

MS SW846 3005A/6020A

METALS

-5a-

Matrix Spike Summary

SDG NO. 2018-1719 Client ID: CAPA-18-13S

Contract: ESHL00114 Level: Low

Matrix: WATER % Solids:

Sample ID: 443888001 Spike ID: 1203975308

<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	2.06		0.067	U	2	103		AV

*Analytical Methods:

AV EPA 245.1/245.2

Metals
-6-
Duplicate Sample Summary

SDG No.: 2018-1719

Lab Code: GEL

Contract: ESHL00114

Client ID: CAPA-18-13D

Matrix: WATER

Level: Low

Sample ID: 443888001

Duplicate ID: 1203972540

Percent Solids for Dup: N/A

Analyte	Units	Acceptance Limit	Sample Result	C	Duplicate Result	C	RPD	Qual	M*
Aluminum	ug/L	+/-20%	1050		1000		4.86		P
Barium	ug/L	+/-20%	38.5		38.5		.0676		P
Beryllium	ug/L		1 U		1 U				P
Boron	ug/L		15 U		15 U				P
Calcium	ug/L	+/-20%	10300		10300		.661		P
Cobalt	ug/L		1 U		1 U				P
Copper	ug/L		3 U		3 U				P
Iron	ug/L	+/-100	494		476		3.75		P
Magnesium	ug/L	+/-20%	3280		3200		2.52		P
Manganese	ug/L	+/-10	2.2 J		2.22 J		.922		P
Potassium	ug/L	+/-20%	2290		2300		.519		P
Silica	ug/L	+/-20%	30000		29700		1.1		P
Sodium	ug/L	+/-20%	11400		11100		2.24		P
Strontium	ug/L	+/-20%	67.9		68.7		1.23		P
Tin	ug/L		2.5 U		2.5 U				P
Vanadium	ug/L	+/-5	1.85 J		2.4 J		26.1		P
Zinc	ug/L		3.3 U		3.3 U				P

*Analytical Methods:

P SW846 3005A/6010C

Metals
–6–
Duplicate Sample Summary

SDG No.: 2018–1719

Lab Code: GEL

Contract: ESHL00114

Client ID: CAPA–18–13D

Matrix: WATER

Level: Low

Sample ID: 443888001

Duplicate ID: 1203972549

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	2.29 J		2.5 J		8.93		MS
Cadmium	ug/L		0.3 U		0.3 U				MS
Chromium	ug/L		3 U		3 U				MS
Lead	ug/L		0.5 U		0.5 U				MS
Molybdenum	ug/L	+/- .5	0.741		0.68		8.59		MS
Nickel	ug/L	+/-2	1.78 J		1.84 J		3.2		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		0.067 U		0.067 U				MS

*Analytical Methods:

MS SW846 3005A/6020A

Metals
–6–
Duplicate Sample Summary

SDG No.: 2018–1719**Lab Code:** GEL**Contract:** ESHL00114**Client ID:** CAPA–18–13D**Matrix:** WATER**Level:** Low**Sample ID:** 443888001**Duplicate ID:** 1203975307**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. 2018-1719

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>
1203972539								
	Vanadium	ug/L	500	495		99	80-120	P
	Zinc	ug/L	500	463		92.6	80-120	P
	Aluminum	ug/L	5000	5010		100	80-120	P
	Barium	ug/L	500	493		98.6	80-120	P
	Beryllium	ug/L	500	489		97.8	80-120	P
	Boron	ug/L	500	512		102	80-120	P
	Calcium	ug/L	5000	4960		99.2	80-120	P
	Cobalt	ug/L	500	494		98.8	80-120	P
	Copper	ug/L	500	496		99.2	80-120	P
	Iron	ug/L	5000	5020		100	80-120	P
	Magnesium	ug/L	5000	5190		104	80-120	P
	Manganese	ug/L	500	498		99.7	80-120	P
	Potassium	ug/L	5000	4910		98.1	80-120	P
	Silica	ug/L	10700	10100		94.8	80-120	P
	Sodium	ug/L	5000	5480		110	80-120	P
	Strontium	ug/L	500	505		101	80-120	P
	Tin	ug/L	500	490		97.9	80-120	P

*Analytical Methods:

P SW846 3005A/6010C

METALS

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Laboratory Control Sample Summary

SDG NO. 2018-1719

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>
1203972548								
	Antimony	ug/L	50	48.4		96.9	80-120	MS
	Arsenic	ug/L	50	48		96.1	80-120	MS
	Cadmium	ug/L	50	49.3		98.6	80-120	MS
	Chromium	ug/L	50	50.9		102	80-120	MS
	Lead	ug/L	50	49.4		98.7	80-120	MS
	Molybdenum	ug/L	50	49.2		98.3	80-120	MS
	Nickel	ug/L	50	51.1		102	80-120	MS
	Selenium	ug/L	50	49		97.9	80-120	MS
	Silver	ug/L	50	50.2		100	80-120	MS
	Thallium	ug/L	50	47.3		94.5	80-120	MS
	Uranium	ug/L	50	46.9		93.8	80-120	MS

*Analytical Methods:

MS SW846 3005A/6020A

METALS

-7-

Laboratory Control Sample Summary

SDG NO. 2018-1719

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>
1203975306	Mercury	ug/L	2	2.07		104	85-115	AV

*Analytical Methods:

AV EPA 245.1/245.2

METALS

-9-

Serial Dilution Sample Summary

SDG NO. 2018-1719

Client ID: CAPA-18-13L

Contract: ESHL00114

Matrix: LIQUID

Level: Low

Sample ID: 443888001

Serial Dilution ID: 1203972542

<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	1050		1080		2.692			P
Barium	38.5		39.5		2.504			P
Beryllium	1	U	5	U				P
Boron	15	U	75	U				P
Calcium	10300		9930		3.774		10	P
Cobalt	1	U	5	U				P
Copper	3	U	15	U				P
Iron	494		490	J	.709			P
Magnesium	3280		3260		.519			P
Manganese	2.2	J	10	U	113.514			P
Potassium	2290		2190		4.377			P
Silica	30000		29600		1.362		10	P
Sodium	11400		12300		8.228		10	P
Strontium	67.9		66.5		1.96		10	P
Tin	2.5	U	12.5	U				P
Vanadium	1.85	J	5	U	123.43			P
Zinc	3.3	U	17	J				P

*Analytical Methods:

P SW846 3005A/6010C

METALS

-9-

Serial Dilution Sample Summary

SDG NO. 2018-1719 **Client ID:** CAPA-18-13L

Contract: ESHL00114

Matrix: LIQUID **Level:** Low

Sample ID: 443888001 **Serial Dilution ID:** 1203972551

<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	2.29	J	10	U	50			MS
Cadmium	.3	U	1.5	U				MS
Chromium	3	U	15	U				MS
Lead	.5	U	2.5	U				MS
Molybdenum	.741		1	U	1.215			MS
Nickel	1.78	J	3	U	20.37			MS
Selenium	2	U	10	U				MS
Silver	.3	U	1.5	U				MS
Thallium	.6	U	3	U				MS
Uranium	.067	U	.335	U				MS

*Analytical Methods:

MS SW846 3005A/6020A

METALS

-9-

Serial Dilution Sample Summary

SDG NO. 2018-1719 **Client ID:** CAPA-18-13L**Contract:** ESHL00114**Matrix:** LIQUID **Level:** Low**Sample ID:** 443888001 **Serial Dilution ID:** 1203975309

<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 #: 2018-1719
Work Order #: 443888**

Method/Analysis Information

Product: Carbon and Total Organic

Analytical Batch: 1739763

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
443888002	CAPA-18-14
443888007	CAPA-18-4
443888012	CAWA-18-64
443888016	CAWA-18-151310
1203973203	Method Blank (MB)
1203973204	Laboratory Control Sample (LCS)
1203973206	443794002(CAWA-18-16) Sample Duplicate (DUP)
1203973209	443794002(CAWA-18-16) 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 443794002 (CAWA-18-16) was selected for QC analysis.

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

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Preservation/Integrity

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

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

Miscellaneous Information**Additional Comments**

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

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

Method/Analysis Information

Product:	Cyanide and Total		
Analytical Batch:	1740052	Method:	WSP-CN(T)
Prep Batch :	1740051	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
443888002	CAPA-18-14
443888007	CAPA-18-4
443888012	CAWA-18-64
443888016	CAWA-18-151310
1203974004	Method Blank (MB)
1203974005	Laboratory Control Sample (LCS)
1203974006	443786015(CAWA-18-46) Sample Duplicate (DUP)
1203974010	443786015(CAWA-18-46) Matrix Spike (MS)

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

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-095 REV# 21.

Preparation/Analytical Method Verification

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

Calibration Information

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

Initial Calibration

All initial calibration requirements have been met for this SDG.

Continuing Calibration Blanks

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

Y Intercept Rule

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

Quality Control (QC) Information

Method Blank (MB) Statement

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Sample 443786015 (CAWA-18-46) 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: Ion Chromatography

Analytical Batch: 1740343

Method: WSP-ANIONS

Sample Analysis

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

Sample ID	Client ID
443888001	CAPA-18-13
443888005	CAPA-18-3
443888010	CAWA-18-63
443888014	CAWA-18-151309
1203974725	Method Blank (MB)
1203974726	Laboratory Control Sample (LCS)
1203974727	444026007(CAMO-18-10) Sample Duplicate (DUP)
1203974728	444026007(CAMO-18-10) Post Spike (PS)

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

SOP Reference

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

Preparation/Analytical Method Verification

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

Calibration Information

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

Initial Calibration

All initial calibration requirements have been met for this SDG.

Continuing Calibration Blanks

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

Calibration Verification Information (CCV)

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

Y Intercept Rule

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

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

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Sample 444026007 (CAMO-18-10) was selected for QC analysis.

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

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Dilutions

The following sample 443888001 (CAPA-18-13) was diluted because target analyte concentrations exceeded the calibration range. Dilutions may be required for many reasons, including to minimize matrix interferences or to bring over range target analyte concentrations into the linear calibration range.

Analyte	443888 001
Chloride	2X

Sample Re-analysis

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

Miscellaneous Information**Manual Integrations**

Samples 1203974727 (CAMO-18-10DUP), 1203974728 (CAMO-18-10PS), 443888001 (CAPA-18-13), 443888005 (CAPA-18-3), 443888010 (CAWA-18-63) and 443888014 (CAWA-18-151309) were manually integrated to correctly position the baseline as set in the calibration standards.

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

Method/Analysis Information

Product:	Ammonia Nitrogen		
Analytical Batch:	1740091	Method:	NH3
Prep Batch :	1740090	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
443888001	CAPA-18-13
443888005	CAPA-18-3
443888010	CAWA-18-63
443888014	CAWA-18-151309
1203974091	Method Blank (MB)
1203974092	Laboratory Control Sample (LCS)
1203974093	443786014(CAWA-18-45) Sample Duplicate (DUP)
1203974095	443786014(CAWA-18-45) Matrix Spike (MS)

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

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-106 REV# 10.

Preparation/Analytical Method Verification

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

Calibration Information

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

Initial Calibration

All initial calibration requirements have been met for this SDG.

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 443786014 (CAWA-18-45) 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, Ammonia	1203974095 (CAWA-18-45MS)	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

Samples 1203974093 (CAWA-18-45DUP), 1203974095 (CAWA-18-45MS), 443888001 (CAPA-18-13), 443888005

(CAPA-18-3), 443888010 (CAWA-18-63) and 443888014 (CAWA-18-151309) were re-analyzed due to CCV failure. The reanalysis data with passing instrument QC was reported.

Miscellaneous Information

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

Method/Analysis Information

Product:	Total Kjeldahl Nitrogen		
Analytical Batch:	1742072	Method:	TKN
Prep Batch :	1742071	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
443888002	CAPA-18-14
443888007	CAPA-18-4
443888012	CAWA-18-64
443888016	CAWA-18-151310
1203978458	Method Blank (MB)
1203978459	Laboratory Control Sample (LCS)
1203978460	443786015(CAWA-18-46) Sample Duplicate (DUP)
1203978461	443786015(CAWA-18-46) Matrix Spike (MS)

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

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-104 REV# 15.

Preparation/Analytical Method Verification

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

Calibration Information

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

Initial Calibration

All initial calibration requirements have been met for this SDG.

Calibration Verification Information

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

Continuing Calibration Blanks

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

Calibration Verification Information (CCV)

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

Y Intercept Rule

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

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

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Sample 443786015 (CAWA-18-46) 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: Nitrate Nitrite by Cadmium Reduction

Analytical Batch: 1740472

Method: NO3NO2

Sample Analysis

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

Sample ID	Client ID
443888001	CAPA-18-13
443888005	CAPA-18-3
443888010	CAWA-18-63
443888014	CAWA-18-151309
1203975070	Method Blank (MB)
1203975071	Laboratory Control Sample (LCS)
1203975072	443786001(CAWA-18-9) Sample Duplicate (DUP)
1203975074	443786001(CAWA-18-9) Post Spike (PS)

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

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-128 REV# 10.

Preparation/Analytical Method Verification

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

Calibration Information

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

Initial Calibration

All initial calibration requirements have been met for this SDG.

Calibration Verification Information

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

Continuing Calibration Blanks

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

Calibration Verification Information (CCV)

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

Y Intercept Rule

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

Quality Control (QC) Information

Method Blank (MB) Statement

The 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 443786001 (CAWA-18-9) 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 spike recovery falls outside of the GEL acceptance limits but within the client specified limits.

Analyte	Sample	Value
Nitrogen, Nitrate/Nitrite	1203975074 (CAWA-18-9PS)	121 * (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 following samples 1203975072 (CAWA-18-9DUP) and 1203975074 (CAWA-18-9PS) were diluted because target analyte concentrations exceeded the calibration range. Dilutions may be required for many reasons, including to minimize matrix interferences or to bring over range target analyte concentrations into the linear calibration range.

Sample Re-analysis

Sample 1203975071 (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:	Total Phosphorus		
Analytical Batch:	1740095	Method:	PO4
Prep Batch :	1740094	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
443888001	CAPA-18-13
443888005	CAPA-18-3
443888010	CAWA-18-63
443888014	CAWA-18-151309
1203974103	Method Blank (MB)
1203974104	Laboratory Control Sample (LCS)
1203974106	443786001(CAWA-18-9) Sample Duplicate (DUP)
1203974108	443786001(CAWA-18-9) Matrix Spike (MS)

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

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-103 REV# 11.

Preparation/Analytical Method Verification

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

Calibration Information

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

Initial Calibration

All initial calibration requirements have been met for this SDG.

Continuing Calibration Blanks

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

Calibration Verification Information (CCV)

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

acceptance limits.

Y Intercept Rule

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

Quality Control (QC) Information

Method Blank (MB) Statement

The 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 443786001 (CAWA-18-9) was selected for QC analysis.

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

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Preservation/Integrity

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

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

Miscellaneous Information

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

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

Method/Analysis Information

Product: Solids and Total Dissolved

Analytical Batch: 1740461

Method: TDS

Sample Analysis

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

Sample ID	Client ID
443888001	CAPA-18-13
443888005	CAPA-18-3
443888010	CAWA-18-63
443888014	CAWA-18-151309
1203975029	Method Blank (MB)
1203975030	Laboratory Control Sample (LCS)
1203975032	443888005(CAPA-18-3) 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 443888005 (CAPA-18-3) 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: Specific Conductivity

Analytical Batch: 1740142

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
443888001	CAPA-18-13
443888005	CAPA-18-3
443888010	CAWA-18-63
443888014	CAWA-18-151309
1203974209	Laboratory Control Sample (LCS)
1203974210	443786014(CAWA-18-45) Sample Duplicate (DUP)
1203974211	443794005(CAWA-18-50) 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# 16.

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 Scientific Orion Star A212 Conductivity Meter.

Initial Calibration

All initial calibration requirements have been met for this SDG.

Initial Standardization

The titrant was properly standardized

Quality Control (QC) Information

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Samples 443786014 (CAWA-18-45) and 443794005 (CAWA-18-50) were selected for QC analysis.

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

Miscellaneous Information

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

Method/Analysis Information

Product: pH

Analytical Batch: 1739668 **Method:** PH

Sample Analysis

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

Sample ID	Client ID
443888001	CAPA-18-13
443888005	CAPA-18-3
443888010	CAWA-18-63
443888014	CAWA-18-151309
1203972901	Laboratory Control Sample (LCS)
1203972902	443549001(CAWA-18-3) 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# 23.

Preparation/Analytical Method Verification

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

Calibration Information

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

Initial Calibration

All initial calibration requirements have been met for this SDG.

Initial Standardization

The titrant was properly standardized

Quality Control (QC) Information

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Sample 443549001 (CAWA-18-3) was selected for QC analysis.

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

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

Sample	Analyte	Value
1203972902 (CAWA-18-3DUP)	pH	Received 10-FEB-18, out of holding 08-FEB-18
443888001 (CAPA-18-13)	pH	Received 15-FEB-18, out of holding 13-FEB-18
443888005 (CAPA-18-3)	pH	Received 15-FEB-18, out of holding 13-FEB-18
443888010 (CAWA-18-63)	pH	Received 15-FEB-18, out of holding 13-FEB-18
443888014 (CAWA-18-151309)	pH	Received 15-FEB-18, out of holding 13-FEB-18

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

Miscellaneous Information**Additional Comments**

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

Method/Analysis Information

Product: Alkalinity

Analytical Batch: 1739667 **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
443888001	CAPA-18-13
443888005	CAPA-18-3
443888010	CAWA-18-63
443888014	CAWA-18-151309
1203972896	Laboratory Control Sample (LCS)
1203972898	443888014(CAWA-18-151309) Sample Duplicate (DUP)
1203972900	443888014(CAWA-18-151309) 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 443888014 (CAWA-18-151309) was selected for QC analysis.

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

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

Miscellaneous Information

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

Certification Statement

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

GEL LABORATORIES LLC

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

Qualifier Definition Report for

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

Client SDG: 2018-1719 GEL Work Order: 443888

The Qualifiers in this report are defined as follows:

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

Review/Validation

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

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

Signature:



Name: Kristen Mizzell

Date: 01 MAR 2018

Title: Team Leader

Sample Data Summary

GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: March 1, 2018

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: 2018-1719

Client Sample ID: CAPA-18-13
Sample ID: 443888001
Matrix: W
Collect Date: 13-FEB-18 11:44
Receive Date: 15-FEB-18
Collector: Client

Project: ESHL00114
Client ID: ARSL004

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
WSP-ANIONS "As Received"												
Bromide	U	ND	0.067	0.200	mg/L		1	MAR1	02/19/18	1703	1740343	1
Fluoride		0.112	0.033	0.100	mg/L		1					
Sulfate		6.58	0.133	0.400	mg/L		1					
Chloride		13.8	0.134	0.400	mg/L		2	MAR1	02/20/18	1315	1740343	2
Nutrient Analysis												
NH3 "As Received"												
Nitrogen, Ammonia		0.0634	0.017	0.050	mg/L	1.00	1	KLP1	02/19/18	1252	1740091	3
NO3NO2 "As Received"												
Nitrogen, Nitrate/Nitrite		0.120	0.017	0.050	mg/L		1	KLP1	02/21/18	1136	1740472	4
PO4 "As Received"												
Phosphorus, Total as P		0.0698	0.020	0.050	mg/L	1.00	1	KLP1	02/20/18	1147	1740095	5
Solids Analysis												
TDS "As Received"												
Total Dissolved Solids		124	3.40	14.3	mg/L			KLP1	02/20/18	1352	1740461	6
Titration and Ion Analysis												
EPA 310.1 Total Alkalinity "As Received"												
Alkalinity, Total as CaCO3		41.6	1.45	4.00	mg/L			RXB5	02/17/18	1320	1739667	7
Carbonate alkalinity (CaCO3)	U	ND	1.45	4.00	mg/L							
EPA120.1 Specific Conductivity "As Received"												
Conductivity		149	1.00	1.00	umhos/cm		1	HXC1	02/20/18	1256	1740142	8
PH "As Received"												
pH at Temp 16.5C	H	7.78	0.010	0.100	SU		1	RXB5	02/17/18	1318	1739668	9

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 350.1 Prep	EPA 350.1 Ammonia Nitrogen Prep	AXH3	02/19/18	0734	1740090
EPA 365.4 Prep	EPA 365.4 Phosphorus, Total in liquid PR	AXH3	02/20/18	0900	1740094

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Certificate of Analysis

Report Date: March 1, 2018

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: 2018-1719

Client Sample ID: CAPA-18-13
Sample ID: 443888001

Project: ESHL00114
Client ID: ARSL004

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

Notes:

Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Lc/LC: Critical Level

PF: Prep Factor

RL: Reporting Limit

SQL: Sample Quantitation Limit

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: March 1, 2018

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: 2018-1719

Client Sample ID: CAPA-18-14
Sample ID: 443888002
Matrix: W
Collect Date: 13-FEB-18 11:44
Receive Date: 15-FEB-18
Collector: Client

Project: ESHL00114
Client ID: ARSL004

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Carbon Analysis												
SW 9060 Total Organic Carbon "As Received"												
Total Organic Carbon Average		2.36	0.330	1.00	mg/L		1	TSM	02/17/18	2214	1739763	1
Flow Injection Analysis												
WSP-CN(T) "As Received"												
Cyanide, Total	U	ND	1.67	5.00	ug/L	1.00	1	AXH3	02/19/18	1045	1740052	2
Nutrient Analysis												
TKN "As Received"												
Nitrogen, Total Kjeldahl		0.121	0.033	0.100	mg/L	1.00	1	KLP1	02/28/18	1354	1742072	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 335.4	EPA 335.4 Total Cyanide	AXH3	02/19/18	0930	1740051
EPA 351.2 Prep	EPA 351.2 Total Kjeldahl Nitrogen Prep	AXH3	02/27/18	1000	1742071

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: March 1, 2018

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: 2018-1719

Client Sample ID: CAPA-18-3
Sample ID: 443888005
Matrix: W
Collect Date: 13-FEB-18 13:47
Receive Date: 15-FEB-18
Collector: Client

Project: ESHL00114
Client ID: ARSL004

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
WSP-ANIONS "As Received"												
Bromide	U	ND	0.067	0.200	mg/L		1	MAR1	02/19/18	1734	1740343	1
Chloride		1.37	0.067	0.200	mg/L		1					
Fluoride	J	0.089	0.033	0.100	mg/L		1					
Sulfate		2.10	0.133	0.400	mg/L		1					
Nutrient Analysis												
NH3 "As Received"												
Nitrogen, Ammonia	J	0.0496	0.017	0.050	mg/L	1.00	1	KLP1	02/19/18	1252	1740091	2
NO3NO2 "As Received"												
Nitrogen, Nitrate/Nitrite		0.606	0.017	0.050	mg/L		1	KLP1	02/21/18	1137	1740472	3
PO4 "As Received"												
Phosphorus, Total as P	J	0.0476	0.020	0.050	mg/L	1.00	1	KLP1	02/20/18	1148	1740095	4
Solids Analysis												
TDS "As Received"												
Total Dissolved Solids		117	3.40	14.3	mg/L			KLP1	02/20/18	1352	1740461	5
Titration and Ion Analysis												
EPA 310.1 Total Alkalinity "As Received"												
Alkalinity, Total as CaCO3		53.6	1.45	4.00	mg/L			RXB5	02/17/18	1322	1739667	6
Carbonate alkalinity (CaCO3)	U	ND	1.45	4.00	mg/L							
EPA120.1 Specific Conductivity "As Received"												
Conductivity		117	1.00	1.00	umhos/cm		1	HXC1	02/20/18	1257	1740142	7
PH "As Received"												
pH at Temp 15.9C	H	7.81	0.010	0.100	SU		1	RXB5	02/17/18	1320	1739668	8

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 350.1 Prep	EPA 350.1 Ammonia Nitrogen Prep	AXH3	02/19/18	0734	1740090
EPA 365.4 Prep	EPA 365.4 Phosphorus, Total in liquid PR	AXH3	02/20/18	0900	1740094

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Certificate of Analysis

Report Date: March 1, 2018

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: 2018-1719

Client Sample ID: CAPA-18-3
Sample ID: 443888005

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: March 1, 2018

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: 2018-1719

Client Sample ID: CAPA-18-4
Sample ID: 443888007
Matrix: W
Collect Date: 13-FEB-18 13:47
Receive Date: 15-FEB-18
Collector: Client

Project: ESHL00114
Client ID: ARSL004

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Carbon Analysis												
SW 9060 Total Organic Carbon "As Received"												
Total Organic Carbon Average	J	0.369	0.330	1.00	mg/L		1	TSM	02/17/18	2253	1739763	1
Flow Injection Analysis												
WSP-CN(T) "As Received"												
Cyanide, Total	U	ND	1.67	5.00	ug/L	1.00	1	AXH3	02/19/18	1046	1740052	2
Nutrient Analysis												
TKN "As Received"												
Nitrogen, Total Kjeldahl	U	ND	0.033	0.100	mg/L	1.00	1	KLP1	02/28/18	1355	1742072	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 335.4	EPA 335.4 Total Cyanide	AXH3	02/19/18	0930	1740051
EPA 351.2 Prep	EPA 351.2 Total Kjeldahl Nitrogen Prep	AXH3	02/27/18	1000	1742071

The following Analytical Methods were performed:

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

Notes:

Column headers are defined as follows:

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

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: March 1, 2018

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: 2018-1719

Client Sample ID: CAWA-18-63
Sample ID: 443888010
Matrix: W
Collect Date: 13-FEB-18 12:50
Receive Date: 15-FEB-18
Collector: Client

Project: ESHL00114
Client ID: ARSL004

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
WSP-ANIONS "As Received"												
Bromide	U	ND	0.067	0.200	mg/L		1	MAR1	02/19/18	1804	1740343	1
Chloride		1.41	0.067	0.200	mg/L		1					
Fluoride	J	0.0944	0.033	0.100	mg/L		1					
Sulfate		1.47	0.133	0.400	mg/L		1					
Nutrient Analysis												
NH3 "As Received"												
Nitrogen, Ammonia	J	0.0358	0.017	0.050	mg/L	1.00	1	KLP1	02/19/18	1253	1740091	2
NO3NO2 "As Received"												
Nitrogen, Nitrate/Nitrite		0.288	0.017	0.050	mg/L		1	KLP1	02/21/18	1138	1740472	3
PO4 "As Received"												
Phosphorus, Total as P		0.0533	0.020	0.050	mg/L	1.00	1	KLP1	02/20/18	1153	1740095	4
Solids Analysis												
TDS "As Received"												
Total Dissolved Solids		103	3.40	14.3	mg/L			KLP1	02/20/18	1352	1740461	5
Titration and Ion Analysis												
EPA 310.1 Total Alkalinity "As Received"												
Alkalinity, Total as CaCO3		53.0	1.45	4.00	mg/L			RXB5	02/17/18	1327	1739667	6
Carbonate alkalinity (CaCO3)	U	ND	1.45	4.00	mg/L							
EPA120.1 Specific Conductivity "As Received"												
Conductivity		110	1.00	1.00	umhos/cm		1	HXC1	02/20/18	1258	1740142	7
PH "As Received"												
pH at Temp 17.2C	H	7.45	0.010	0.100	SU		1	RXB5	02/17/18	1323	1739668	8

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 350.1 Prep	EPA 350.1 Ammonia Nitrogen Prep	AXH3	02/19/18	0734	1740090
EPA 365.4 Prep	EPA 365.4 Phosphorus, Total in liquid PR	AXH3	02/20/18	0900	1740094

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Certificate of Analysis

Report Date: March 1, 2018

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: 2018-1719

Client Sample ID: CAWA-18-63
Sample ID: 443888010

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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Report Date: March 1, 2018

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Los Alamos, New Mexico 87545

Contact: Ms. Nita Patel

Client SDG: 2018-1719

Project: LANL- WQH Water Samples

Client Sample ID: CAWA-18-64

Project: ESHL00114

Sample ID: 443888012

Client ID: ARSL004

Matrix: W

Collect Date: 13-FEB-18 12:50

Receive Date: 15-FEB-18

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	0.356	0.330	1.00	mg/L		1	TSM	02/17/18	2333	1739763	1
Flow Injection Analysis												
WSP-CN(T) "As Received"												
Cyanide, Total	U	ND	1.67	5.00	ug/L	1.00	1	AXH3	02/19/18	1047	1740052	2
Nutrient Analysis												
TKN "As Received"												
Nitrogen, Total Kjeldahl	U	ND	0.033	0.100	mg/L	1.00	1	KLP1	02/28/18	1356	1742072	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 335.4	EPA 335.4 Total Cyanide	AXH3	02/19/18	0930	1740051
EPA 351.2 Prep	EPA 351.2 Total Kjeldahl Nitrogen Prep	AXH3	02/27/18	1000	1742071

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: March 1, 2018

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: 2018-1719

Client Sample ID: CAWA-18-151309
Sample ID: 443888014
Matrix: W
Collect Date: 13-FEB-18 12:50
Receive Date: 15-FEB-18
Collector: Client

Project: ESHL00114
Client ID: ARSL004

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
WSP-ANIONS "As Received"												
Bromide	U	ND	0.067	0.200	mg/L		1	MAR1	02/19/18	1835	1740343	1
Chloride		1.41	0.067	0.200	mg/L		1					
Fluoride		0.142	0.033	0.100	mg/L		1					
Sulfate		1.51	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	02/19/18	1254	1740091	2
NO3NO2 "As Received"												
Nitrogen, Nitrate/Nitrite		0.286	0.017	0.050	mg/L		1	KLP1	02/21/18	1140	1740472	3
PO4 "As Received"												
Phosphorus, Total as P	J	0.0479	0.020	0.050	mg/L	1.00	1	KLP1	02/20/18	1154	1740095	4
Solids Analysis												
TDS "As Received"												
Total Dissolved Solids		124	3.40	14.3	mg/L			KLP1	02/20/18	1352	1740461	5
Titration and Ion Analysis												
EPA 310.1 Total Alkalinity "As Received"												
Alkalinity, Total as CaCO3		53.8	1.45	4.00	mg/L			RXB5	02/17/18	1331	1739667	6
Carbonate alkalinity (CaCO3)	U	ND	1.45	4.00	mg/L							
EPA120.1 Specific Conductivity "As Received"												
Conductivity		109	1.00	1.00	umhos/cm		1	HXC1	02/20/18	1258	1740142	7
PH "As Received"												
pH at Temp 17.4C	H	7.39	0.010	0.100	SU		1	RXB5	02/17/18	1327	1739668	8

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 350.1 Prep	EPA 350.1 Ammonia Nitrogen Prep	AXH3	02/19/18	0734	1740090
EPA 365.4 Prep	EPA 365.4 Phosphorus, Total in liquid PR	AXH3	02/20/18	0900	1740094

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Certificate of Analysis

Report Date: March 1, 2018

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: 2018-1719

Client Sample ID: CAWA-18-151309
Sample ID: 443888014

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: March 1, 2018

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

Los Alamos, New Mexico 87545

Contact: Ms. Nita Patel

Client SDG: 2018-1719

Project: LANL- WQH Water Samples

Client Sample ID: CAWA-18-151310

Project: ESHL00114

Sample ID: 443888016

Client ID: ARSL004

Matrix: W

Collect Date: 13-FEB-18 12:50

Receive Date: 15-FEB-18

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	0.383	0.330	1.00	mg/L		1	TSM	02/18/18	0013	1739763	1
Flow Injection Analysis												
WSP-CN(T) "As Received"												
Cyanide, Total	U	ND	1.67	5.00	ug/L	1.00	1	AXH3	02/19/18	1052	1740052	2
Nutrient Analysis												
TKN "As Received"												
Nitrogen, Total Kjeldahl	U	ND	0.033	0.100	mg/L	1.00	1	KLP1	02/28/18	1357	1742072	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 335.4	EPA 335.4 Total Cyanide	AXH3	02/19/18	0930	1740051
EPA 351.2 Prep	EPA 351.2 Total Kjeldahl Nitrogen Prep	AXH3	02/27/18	1000	1742071

The following Analytical Methods were performed:

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

Notes:

Column headers are defined as follows:

DF: Dilution Factor

Lc/LC: Critical Level

DL: Detection Limit

PF: Prep Factor

MDA: Minimum Detectable Activity

RL: Reporting Limit

MDC: Minimum Detectable Concentration

SQL: Sample Quantitation Limit

Quality Control Summary

GEL LABORATORIES LLC

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QC Summary

Report Date: March 1, 2018

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

Contact: Ms. Nita Patel

Workorder: 443888

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Carbon Analysis											
Batch	1739763										
QC1203973206	443794002	DUP									
Total Organic Carbon Average		1.71		1.76	mg/L	2.83	^	(+/-1.00)	TSM	02/17/18	16:36
QC1203973204	LCS										
Total Organic Carbon Average	10.0			10.7	mg/L			(80%-120%)		02/17/18	11:11
QC1203973203	MB										
Total Organic Carbon Average			U	ND	mg/L					02/17/18	11:02
QC1203973209	443794002	PS									
Total Organic Carbon Average	10.0	1.71		13.1	mg/L			(75%-125%)		02/17/18	17:16
Flow Injection Analysis											
Batch	1740052										
QC1203974006	443786015	DUP									
Cyanide, Total		U	ND	U	ND	ug/L	N/A		AXH3	02/19/18	10:40
QC1203974005	LCS										
Cyanide, Total	50.0			48.8	ug/L			(90%-110%)		02/19/18	10:24
QC1203974004	MB										
Cyanide, Total			U	ND	ug/L					02/19/18	10:23
QC1203974010	443786015	MS									
Cyanide, Total	100	U	ND	105	ug/L			(90%-110%)		02/19/18	10:41
Ion Chromatography											
Batch	1740343										
QC1203974727	444026007	DUP									
Bromide		U	ND	U	ND	mg/L	N/A		MAR1	02/19/18	22:12

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QC Summary

Workorder: 443888

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Ion Chromatography											
Batch	1740343										
Chloride		4.24		4.25	mg/L	0.313		(0%-20%)	MAR1	02/19/18	22:12
Fluoride		0.373		0.354	mg/L	5.25	^	(+/-0.100)			
Sulfate		5.05		5.15	mg/L	1.82		(0%-20%)			
QC1203974726 LCS											
Bromide	1.25			1.27	mg/L		102	(80%-120%)		02/19/18	16:32
Chloride	5.00			4.70	mg/L		94.1	(80%-120%)			
Fluoride	2.50			2.41	mg/L		96.5	(80%-120%)			
Sulfate	10.0			9.71	mg/L		97.1	(80%-120%)			
QC1203974725 MB											
Bromide			U	ND	mg/L					02/19/18	16:01
Chloride			U	ND	mg/L						
Fluoride			U	ND	mg/L						
Sulfate			U	ND	mg/L						
QC1203974728 444026007 PS											
Bromide	1.25	U	ND	1.30	mg/L		99.6	(75%-125%)		02/19/18	22:43
Chloride	5.00		4.24	9.58	mg/L		107	(75%-125%)			
Fluoride	2.50		0.373	2.84	mg/L		98.5	(75%-125%)			
Sulfate	10.0		5.05	15.2	mg/L		101	(75%-125%)			

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QC Summary

Workorder: 443888

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Nutrient Analysis											
Batch	1740091										
QC1203974093	443786014	DUP									
Nitrogen, Ammonia		U	ND	J	0.0461	mg/L	200		KLP1	02/19/18	12:47
QC1203974092	LCS										
Nitrogen, Ammonia	1.00				1.02	mg/L	102	(90%-110%)		02/19/18	12:48
QC1203974091	MB										
Nitrogen, Ammonia			U	ND	mg/L					02/19/18	12:13
QC1203974095	443786014	MS									
Nitrogen, Ammonia	1.00	U	ND		1.12	mg/L	111 *	(90%-110%)		02/19/18	12:48
Batch	1740095										
QC1203974106	443786001	DUP									
Phosphorus, Total as P			0.0757		0.0776	mg/L	2.48 ^	(+/-0.050)	KLP1	02/20/18	11:40
QC1203974104	LCS										
Phosphorus, Total as P	1.00				1.06	mg/L	106	(80%-124%)		02/20/18	11:20
QC1203974103	MB										
Phosphorus, Total as P			J	0.035	mg/L					02/20/18	11:19
QC1203974108	443786001	MS									
Phosphorus, Total as P	1.00		0.0757		1.10	mg/L	102	(63%-139%)		02/20/18	11:41
Batch	1740472										
QC1203975072	443786001	DUP									
Nitrogen, Nitrate/Nitrite			2.00		1.76	mg/L	12.5	(0%-20%)	KLP1	02/21/18	11:22
QC1203975071	LCS										
Nitrogen, Nitrate/Nitrite	1.00				1.07	mg/L	107	(90%-110%)		02/21/18	14:27
QC1203975070	MB										
Nitrogen, Nitrate/Nitrite			U	ND	mg/L					02/21/18	11:13

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QC Summary

Workorder: 443888

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Nutrient Analysis											
Batch	1740472										
QC1203975074	443786001	PS									
Nitrogen, Nitrate/Nitrite	1.00	0.399		1.61	mg/L		121 *	(90%-110%)	KLP1	02/21/18	11:23
Batch	1742072										
QC1203978460	443786015	DUP									
Nitrogen, Total Kjeldahl		U	ND	U	ND	mg/L	N/A		KLP1	02/28/18	13:47
QC1203978459	LCS										
Nitrogen, Total Kjeldahl	1.00			1.05	mg/L		105	(90%-110%)		02/28/18	13:43
QC1203978458	MB										
Nitrogen, Total Kjeldahl			U	ND	mg/L					02/28/18	13:42
QC1203978461	443786015	MS									
Nitrogen, Total Kjeldahl	1.00	U	ND	1.02	mg/L		101	(90%-110%)		02/28/18	13:48
Solids Analysis											
Batch	1740461										
QC1203975032	443888005	DUP									
Total Dissolved Solids			117	116	mg/L	1.23		(0%-5%)	KLP1	02/20/18	13:52
QC1203975030	LCS										
Total Dissolved Solids	300			299	mg/L		99.5	(95%-105%)		02/20/18	13:52
QC1203975029	MB										
Total Dissolved Solids			U	ND	mg/L					02/20/18	13:52
Titration and Ion Analysis											
Batch	1739667										
QC1203972898	443888014	DUP									
Alkalinity, Total as CaCO3			53.8	52.6	mg/L	2.26		(0%-20%)	RXB5	02/17/18	13:32
Carbonate alkalinity (CaCO3)		U	ND	U	ND	mg/L	N/A				

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QC Summary

Workorder: 443888

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Titration and Ion Analysis											
Batch	1739667										
QC1203972896	LCS										
Alkalinity, Total as CaCO3	100			107	mg/L		107	(90%-110%)	RXB5	02/17/18	12:33
QC1203972900	443888014	MS									
Alkalinity, Total as CaCO3	100	53.8		157	mg/L		103	(80%-120%)		02/17/18	13:43
Batch	1739668										
QC1203972902	443549001	DUP									
pH		H	7.75	H	7.74	SU	0.129	(0%-5%)	RXB5	02/17/18	12:41
QC1203972901	LCS										
pH	7.00			6.99	SU		99.9	(99%-101%)		02/17/18	12:24
Batch	1740142										
QC1203974210	443786014	DUP									
Conductivity			109		110	umhos/cm	0.917	(0%-10%)	HXC1	02/20/18	12:52
QC1203974211	443794005	DUP									
Conductivity			465		463	umhos/cm	0.409	(0%-10%)		02/20/18	12:55
QC1203974209	LCS										
Conductivity	1410			1400	umhos/cm		99.4	(95%-105%)		02/20/18	12:40

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

GEL LABORATORIES LLC

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QC Summary

Workorder: 443888

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

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

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

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

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

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

Radiological Analysis

Case Narrative

**Radiochemistry
Technical Case Narrative
ARS International, LLC (ARSL)
SDG #: 2018-1719
Work Order #: 443888**

Method/Analysis Information

Product: Alphaspec Am241 Liquid

Analytical Method: HASL-300:AM-241

Analytical Batch Number: 1739814

Sample ID	Client ID
443888002	CAPA-18-14
443888007	CAPA-18-4
443888012	CAWA-18-64
443888016	CAWA-18-151310
1203973278	Method Blank (MB)
1203973280	Laboratory Control Sample (LCS)
1203973279	443888002(CAPA-18-14) 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 February 2018.

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 1203973278 (MB) and 1203973280 (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 (See Below) result is greater than 1.65 times the CSU but less than the MDC.

Sample	Analyte	Value
1203973278 (MB)	Americium-241	Blank result > 1.65 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: 443888002 (CAPA-18-14). The QC was from ARSL work order 443888.

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: ISOPU
Analytical Method: HASL-300:ISOPU
Analytical Batch Number: 1739815

Sample ID	Client ID
443888002	CAPA-18-14
443888007	CAPA-18-4
443888012	CAWA-18-64
443888016	CAWA-18-151310
1203973281	Method Blank (MB)
1203973283	Laboratory Control Sample (LCS)
1203973282	443888002(CAPA-18-14) 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 February 2018.

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 1203973281 (MB) and 1203973283 (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 (See Below) result is greater than the decision level but less than the MDC.

Sample	Analyte	Value
1203973281 (MB)	Plutonium-239/240	Blank result > DL

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: 443888002 (CAPA-18-14). The QC was from ARSL work order 443888.

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: IsoU
Analytical Method: HASL-300:ISOU
Analytical Batch Number: 1739816

Sample ID	Client ID
443888002	CAPA-18-14
443888007	CAPA-18-4
443888012	CAWA-18-64
443888016	CAWA-18-151310
1203973284	Method Blank (MB)
1203973286	Laboratory Control Sample (LCS)
1203973285	443888002(CAPA-18-14) 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 February 2018.

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 1203973284 (MB) and 1203973286 (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 (See Below) result is greater than 1.65 times the CSU but less than the MDC.

Sample	Analyte	Value
1203973284 (MB)	Uranium-235/236 and Uranium-238	Blank result > 1.65 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: 443888002 (CAPA-18-14). The QC was from ARSL work order 443888.

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: **Gammasec**

Analytical Method: EPA:901.1

Analytical Batch Number: 1739683

Sample ID	Client ID
443888002	CAPA-18-14
443888007	CAPA-18-4
443888012	CAWA-18-64
443888016	CAWA-18-151310
1203972937	Method Blank (MB)
1203972939	Laboratory Control Sample (LCS)
1203972938	443888002(CAPA-18-14) 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, January 2018, May 2017 and 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

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: 443888002 (CAPA-18-14). The QC was from ARSL work order 443888.

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.

Additional Identified Radionuclides

No additional radionuclides were added.

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

Manual qualifiers were not required.

Method/Analysis Information

Product: GFPC, Sr90, liquid

Analytical Method: EPA:905.0

Analytical Batch Number: 1740247

Sample ID	Client ID
443888002	CAPA-18-14
443888007	CAPA-18-4
443888012	CAWA-18-64
443888016	CAWA-18-151310
1203974510	Method Blank (MB)

1203974513	Laboratory Control Sample (LCS)
1203974511	443786015(CAWA-18-46) Sample Duplicate (DUP)
1203974512	443786015(CAWA-18-46) 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 1203974510 (MB) and 1203974513 (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: 443786015 (CAWA-18-46). The QC was from ARSL work order 443786.

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

Samples 443888007 (CAPA-18-4), 443888012 (CAWA-18-64) and 443888016 (CAWA-18-151310) were recounted due to results more negative than the three sigma TPU. The second counts are 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, 1203974512 (CAWA-18-46MS), 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:	1740250

Sample ID	Client ID
443888002	CAPA-18-14
443888007	CAPA-18-4
443888012	CAWA-18-64
443888016	CAWA-18-151310
1203974521	Method Blank (MB)
1203974525	Laboratory Control Sample (LCS)
1203974522	443786010(CAWA-18-20) Sample Duplicate (DUP)
1203974523	443786010(CAWA-18-20) Matrix Spike (MS)
1203974524	443786010(CAWA-18-20) 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 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 1203974521 (MB) and 1203974525 (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.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

Designated QC

The following sample was used for QC: 443786010 (CAWA-18-20). The QC was from ARSL work order 443786.

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 reprep 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 1203974522 (CAWA-18-20DUP) was recounted due to high MDC. 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, 1203974523 (CAWA-18-20MS) and 1203974524 (CAWA-18-20MSD), 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

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Qualifier Definition Report for

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

Client SDG: 2018-1719 GEL Work Order: 443888

The Qualifiers in this report are defined as follows:

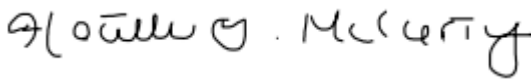
- * A quality control analyte recovery is outside of specified acceptance criteria
- ** Analyte is a Tracer compound
- U Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.

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: 06 MAR 2018

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: March 6, 2018

Client Sample ID: CAPA-18-14
Sample ID: 443888002
Matrix: W
Collect Date: 13-FEB-18
Receive Date: 15-FEB-18
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	0.00486	+/-0.00595	0.0411	0.0172	+/-0.00595	0.050	pCi/L			EXC2	02/20/18	1328	1739814	1
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ISOPU "As Received"

Plutonium-238	U	0.00798	+/-0.00798	0.0347	0.0146	+/-0.00799	0.050	pCi/L			EXC2	02/20/18	1328	1739815	2
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Plutonium-239/240	U	1.66E-09	+/-0.00691	0.0279	0.0113	+/-0.00691	0.050	pCi/L							
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IsoU "As Received"

Uranium-234	U	0.0452	+/-0.0183	0.173	0.081	+/-0.0186	1.00	pCi/L			EXC2	02/20/18	1556	1739816	3
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Uranium-235/236	U	0.0296	+/-0.0135	0.0968	0.0417	+/-0.0136	1.00	pCi/L							
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Uranium-238	U	0.049	+/-0.0155	0.0877	0.0385	+/-0.0157	0.500	pCi/L							
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Rad Gamma Spec Analysis

Gammasespec "As Received"

Cesium-137	U	0.0473	+/-0.900	3.32	1.47	+/-0.900	8.00	pCi/L			BSW1	02/16/18	0731	1739683	4
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Cobalt-60	U	-0.599	+/-0.978	3.63	1.54	+/-0.988	8.00	pCi/L							
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Neptunium-237	U	-0.926	+/-1.81	6.50	3.00	+/-1.83		pCi/L							
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Potassium-40	U	2.89	+/-13.7	34.9	14.6	+/-13.7		pCi/L							
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Sodium-22	U	0.859	+/-0.900	3.85	1.65	+/-0.923		pCi/L							
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Rad Gas Flow Proportional Counting

GFPC, Sr90, liquid "As Received"

Strontium-90	U	0.134	+/-0.144	0.490	0.229	+/-0.145	0.500	pCi/L			KSD1	02/21/18	1438	1740247	5
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WSP-GrossA/B "As Received"

Beta	U	2.22	+/-0.821	2.48	1.09	+/-0.843	3.00	pCi/L			BXG2	02/28/18	0843	1740250	6
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Alpha	U	0.308	+/-0.735	2.98	1.12	+/-0.735	3.00	pCi/L			BXG2	02/28/18	1208	1740250	7
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The following Analytical Methods were performed

Method	Description
1	HASL-300:AM-241
2	HASL-300:ISOPU
3	HASL-300:ISOU
4	EPA:901.1
5	EPA:905.0
6	EPA 900.0/SW846 9310
7	EPA 900.0/SW846 9310

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Americium-243 Tracer	Alphaspec Am241 Liquid "As Received"	1739814	86.6	(50%-105%)
Plutonium-242 Tracer	ISOPU "As Received"	1739815	93.3	(50%-105%)
Uranium-232 Tracer	IsoU "As Received"	1739816	77.1	(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-18-14

Sample ID: 443888002

Project: ESHL00114

Client ID: ARSL004

Report Date: March 6, 2018

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"							1740247	102	(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: CAPA-18-4
Sample ID: 443888007
Matrix: W
Collect Date: 13-FEB-18
Receive Date: 15-FEB-18
Collector: Client

Project: ESHL00114
Client ID: ARSL004

Report Date: March 6, 2018

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	0.00654	+/-0.00576	0.0368	0.0155	+/-0.00577	0.050	pCi/L			EXC2	02/20/18	1328	1739814	1
<i>ISOPU "As Received"</i>															
Plutonium-238	U	0.0113	+/-0.00598	0.0328	0.0139	+/-0.00599	0.050	pCi/L			EXC2	02/20/18	1328	1739815	2
Plutonium-239/240	U	-0.00378	+/-0.00654	0.0264	0.0107	+/-0.00655	0.050	pCi/L							
<i>IsoU "As Received"</i>															
Uranium-234		0.248	+/-0.0324	0.160	0.0748	+/-0.0351	1.00	pCi/L			EXC2	02/20/18	1556	1739816	3
Uranium-235/236	U	0.0117	+/-0.0117	0.0894	0.0385	+/-0.0117	1.00	pCi/L							
Uranium-238		0.156	+/-0.0248	0.081	0.0355	+/-0.0261	0.500	pCi/L							
Rad Gamma Spec Analysis															
<i>Gammaspex "As Received"</i>															
Cesium-137	U	0.389	+/-0.829	3.17	1.40	+/-0.834	8.00	pCi/L			BSW1	02/16/18	0731	1739683	4
Cobalt-60	U	-0.561	+/-0.987	3.64	1.54	+/-0.995	8.00	pCi/L							
Neptunium-237	U	-1.12	+/-1.96	7.03	3.26	+/-1.98		pCi/L							
Potassium-40	U	-19.7	+/-15.3	47.2	20.8	+/-16.0		pCi/L							
Sodium-22	U	-1.29	+/-1.04	3.21	1.34	+/-1.08		pCi/L							
Rad Gas Flow Proportional Counting															
<i>GFPC, Sr90, liquid "As Received"</i>															
Strontium-90	U	0.358	+/-0.151	0.465	0.199	+/-0.153	0.500	pCi/L			KSD1	02/22/18	0732	1740247	5
<i>WSP-GrossA/B "As Received"</i>															
Beta	U	0.518	+/-0.718	2.54	1.11	+/-0.719	3.00	pCi/L			BXG2	02/28/18	0839	1740250	6
Alpha	U	0.245	+/-0.479	1.87	0.724	+/-0.479	3.00	pCi/L			BXG2	02/28/18	1210	1740250	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"	1739814	80.5	(50%-105%)
Plutonium-242 Tracer		ISOPU "As Received"	1739815	81.4	(50%-105%)
Uranium-232 Tracer		IsoU "As Received"	1739816	80.8	(50%-105%)
Strontium Carrier		GFPC, Sr90, liquid "As Received"	1740247	105	(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-18-4

Sample ID: 443888007

Project: ESHL00114

Client ID: ARSL004

Report Date: March 6, 2018

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: CAWA-18-64

Sample ID: 443888012

Matrix: W

Collect Date: 13-FEB-18

Receive Date: 15-FEB-18

Collector: Client

Report Date: March 6, 2018

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	0.0125	+/-0.00657	0.0351	0.0147	+/-0.00659	0.050	pCi/L			EXC2	02/20/18	1328	1739814	1
<i>ISOPU "As Received"</i>															
Plutonium-238	U	0.00241	+/-0.0087	0.0419	0.0177	+/-0.0087	0.050	pCi/L			EXC2	02/20/18	1328	1739815	2
Plutonium-239/240	U	0.0121	+/-0.008	0.0338	0.0136	+/-0.00802	0.050	pCi/L							
<i>IsoU "As Received"</i>															
Uranium-234		0.299	+/-0.0374	0.170	0.0795	+/-0.041	1.00	pCi/L			EXC2	02/20/18	1556	1739816	3
Uranium-235/236	U	0.0145	+/-0.0103	0.095	0.0409	+/-0.0103	1.00	pCi/L							
Uranium-238		0.126	+/-0.0243	0.0861	0.0377	+/-0.0253	0.500	pCi/L							
Rad Gamma Spec Analysis															
<i>Gammasespec "As Received"</i>															
Cesium-137	U	0.357	+/-1.35	4.79	2.05	+/-1.35	8.00	pCi/L			BSW1	02/16/18	0732	1739683	4
Cobalt-60	U	0.0225	+/-1.35	5.56	2.24	+/-1.35	8.00	pCi/L							
Neptunium-237	U	-4.18	+/-2.41	7.30	3.24	+/-2.60		pCi/L							
Potassium-40	U	-29.3	+/-20.3	70.0	29.6	+/-21.5		pCi/L							
Sodium-22	U	0.347	+/-1.71	6.65	2.81	+/-1.71		pCi/L							
Rad Gas Flow Proportional Counting															
<i>GFPC, Sr90, liquid "As Received"</i>															
Strontium-90	U	0.113	+/-0.131	0.464	0.201	+/-0.132	0.500	pCi/L			KSD1	02/22/18	0733	1740247	5
<i>WSP-GrossA/B "As Received"</i>															
Beta	U	-0.288	+/-0.672	2.58	1.13	+/-0.672	3.00	pCi/L			BXG2	02/28/18	0839	1740250	6
Alpha	U	-0.0482	+/-0.702	2.84	1.16	+/-0.703	3.00	pCi/L			BXG2	02/28/18	1210	1740250	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"	1739814	86.5	(50%-105%)
Plutonium-242 Tracer		ISOPU "As Received"	1739815	72.5	(50%-105%)
Uranium-232 Tracer		IsoU "As Received"	1739816	87	(50%-105%)
Strontium Carrier		GFPC, Sr90, liquid "As Received"	1740247	102	(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: CAWA-18-64

Sample ID: 443888012

Report Date: March 6, 2018

Project: ESHL00114

Client ID: ARSL004

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: CAWA-18-151310

Sample ID: 443888016

Matrix: W

Collect Date: 13-FEB-18

Receive Date: 15-FEB-18

Collector: Client

Report Date: March 6, 2018

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	0.00415	+/-0.00509	0.0351	0.0147	+/-0.00509	0.050	pCi/L			EXC2	02/20/18	1328	1739814	1
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ISOPU "As Received"

Plutonium-238	U	2.94E-09	+/-0.00876	0.034	0.0144	+/-0.00876	0.050	pCi/L			EXC2	02/20/18	1328	1739815	2
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Plutonium-239/240	U	-0.00587	+/-0.00897	0.0274	0.011	+/-0.00897	0.050	pCi/L							
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IsoU "As Received"

Uranium-234		0.270	+/-0.0318	0.149	0.0701	+/-0.0349	1.00	pCi/L			EXC2	02/20/18	1556	1739816	3
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Uranium-235/236	U	0.0384	+/-0.0138	0.0837	0.0361	+/-0.014	1.00	pCi/L							
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Uranium-238		0.137	+/-0.0228	0.0759	0.0333	+/-0.0239	0.500	pCi/L							
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Rad Gamma Spec Analysis

Gammasespec "As Received"

Cesium-137	U	1.12	+/-1.05	4.12	1.85	+/-1.08	8.00	pCi/L			BSW1	02/16/18	0732	1739683	4
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Cobalt-60	U	1.39	+/-1.17	4.93	2.15	+/-1.21	8.00	pCi/L							
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Neptunium-237	U	1.10	+/-2.13	7.99	3.72	+/-2.15		pCi/L							
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Potassium-40	U	18.5	+/-16.7	37.1	15.4	+/-16.7		pCi/L							
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Sodium-22	U	0.317	+/-0.960	3.93	1.66	+/-0.963		pCi/L							
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Rad Gas Flow Proportional Counting

GFPC, Sr90, liquid "As Received"

Strontium-90	U	0.0329	+/-0.132	0.485	0.213	+/-0.132	0.500	pCi/L			KSD1	02/22/18	0733	1740247	5
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WSP-GrossA/B "As Received"

Beta	U	0.0354	+/-0.762	2.81	1.24	+/-0.762	3.00	pCi/L			BXG2	02/28/18	0843	1740250	6
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Alpha	U	0.531	+/-0.587	2.13	0.852	+/-0.588	3.00	pCi/L			BXG2	02/28/18	1210	1740250	7
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The following Analytical Methods were performed

Method	Description
1	HASL-300:AM-241
2	HASL-300:ISOPU
3	HASL-300:ISOU
4	EPA:901.1
5	EPA:905.0
6	EPA 900.0/SW846 9310
7	EPA 900.0/SW846 9310

Surrogate/Tracer	Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Americium-243 Tracer		Alphaspec Am241 Liquid "As Received"	1739814	85.1	(50%-105%)
Plutonium-242 Tracer		ISOPU "As Received"	1739815	85	(50%-105%)
Uranium-232 Tracer		IsoU "As Received"	1739816	86	(50%-105%)
Strontium Carrier		GFPC, Sr90, liquid "As Received"	1740247	90.7	(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: CAWA-18-151310

Sample ID: 443888016

Report Date: March 6, 2018

Project: ESHL00114

Client ID: ARSL004

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: March 6, 2018

Page 1 of 6

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

Los Alamos, New Mexico

Contact: Ms. Nita Patel

Workorder: 443888

Parmname	NOM	Sample	Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time
Rad Alpha Spec											
Batch	1739814										
QC1203973279	443888002	DUP									
Americium-241	U	0.00486	U	0.013	pCi/L	0.337		(0-1)	EXC2	02/20/18	13:28
	Uncert:	+/-0.00595		+/-0.00614							
	TPU:	+/-0.00595		+/-0.00617							
**Americium-243 Tracer	2.62	2.27		2.21	pCi/L		84.4	(50%-105%)			
	Uncert:	+/-0.0796		+/-0.075							
	TPU:	+/-0.143		+/-0.138							
QC1203973280	LCS										
Americium-241	1.97			1.91	pCi/L		96.8	(80%-120%)	EXC2	02/20/18	13:28
	Uncert:			+/-0.0604							
	TPU:			+/-0.105							
**Americium-243 Tracer	2.10			1.83	pCi/L		87.4	(50%-105%)			
	Uncert:			+/-0.0633							
	TPU:			+/-0.114							
QC1203973278	MB										
Americium-241			U	0.0115	pCi/L				EXC2	02/20/18	13:28
	Uncert:			+/-0.00543							
	TPU:			+/-0.00546							
**Americium-243 Tracer	2.10			1.80	pCi/L		85.7	(50%-105%)			
	Uncert:			+/-0.0633							
	TPU:			+/-0.114							
Batch	1739815										
QC1203973282	443888002	DUP									
Plutonium-238	U	0.00798	U	0.0151	pCi/L	0.359		(0-1)	EXC2	02/20/18	13:28
	Uncert:	+/-0.00798		+/-0.0101							
	TPU:	+/-0.00799		+/-0.0101							
Plutonium-239/240	U	1.66E-09	U	0.00757	pCi/L	0.0484		(0-1)			
	Uncert:	+/-0.00691		+/-0.0091							
	TPU:	+/-0.00691		+/-0.0091							
**Plutonium-242 Tracer	2.47	2.31		2.17	pCi/L		87.7	(50%-105%)			
	Uncert:	+/-0.0706		+/-0.0794							
	TPU:	+/-0.122		+/-0.132							
QC1203973283	LCS										
Plutonium-238			U	0.00893	pCi/L			(80%-120%)	EXC2	02/20/18	13:28
	Uncert:			+/-0.0122							
	TPU:			+/-0.0122							
Plutonium-239/240	1.98			2.03	pCi/L		103	(80%-120%)			
	Uncert:			+/-0.0605							
	TPU:			+/-0.104							
**Plutonium-242 Tracer	1.98			1.79	pCi/L		90.5	(50%-105%)			
	Uncert:			+/-0.0597							
	TPU:			+/-0.101							

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QC Summary

Workorder: 443888

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Parmname	NOM	Sample	Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time
Rad Alpha Spec											
Batch	1739815										
QC1203973281	MB										
Plutonium-238			U	0.00901	pCi/L				EXC2	02/20/18	13:28
				Uncert:							
				+/-0.0166							
				TPU:							
				+/-0.0166							
Plutonium-239/240			U	0.0144	pCi/L						
				Uncert:							
				+/-0.00919							
				TPU:							
				+/-0.00921							
**Plutonium-242 Tracer	1.98			1.81	pCi/L		91.6	(50%-105%)			
				Uncert:							
				+/-0.0603							
				TPU:							
				+/-0.102							
Batch	1739816										
QC1203973285	443888002	DUP									
Uranium-234		U	0.0452	U	0.0273	pCi/L	0.248	(0-1)	EXC2	02/20/18	15:56
				Uncert:							
				+/-0.0183							
				TPU:							
				+/-0.0186							
Uranium-235/236		U	0.0296	U	0.0254	pCi/L	0.0791	(0-1)			
				Uncert:							
				+/-0.0135							
				TPU:							
				+/-0.0136							
Uranium-238		U	0.049	U	0.0228	pCi/L	0.46	(0-1)			
				Uncert:							
				+/-0.0155							
				TPU:							
				+/-0.0157							
**Uranium-232 Tracer	2.61	2.01		1.92	pCi/L		73.4	(50%-105%)			
				Uncert:							
				+/-0.103							
				TPU:							
				+/-0.175							
QC1203973286	LCS										
Uranium-234				2.65	pCi/L				EXC2	02/20/18	15:56
				Uncert:							
				+/-0.0841							
				TPU:							
				+/-0.161							
Uranium-235/236				0.177	pCi/L						
				Uncert:							
				+/-0.0244							
				TPU:							
				+/-0.0261							
Uranium-238	2.70			2.72	pCi/L		101	(80%-120%)			
				Uncert:							
				+/-0.0853							
				TPU:							
				+/-0.165							
**Uranium-232 Tracer	2.09			1.87	pCi/L		89.6	(50%-105%)			
				Uncert:							
				+/-0.0752							
				TPU:							
				+/-0.132							
QC1203973284	MB										
Uranium-234			U	0.0156	pCi/L				EXC2	02/20/18	15:56
				Uncert:							
				+/-0.0118							
				TPU:							
				+/-0.0119							
Uranium-235/236			U	0.019	pCi/L						
				Uncert:							
				+/-0.0102							
				TPU:							
				+/-0.0102							
Uranium-238			U	0.0232	pCi/L						
				Uncert:							
				+/-0.00896							
				TPU:							
				+/-0.00905							

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QC Summary

Workorder: 443888

Page 3 of 6

Parmname	NOM	Sample	Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time
Rad Alpha Spec											
Batch	1739816										
**Uranium-232 Tracer	2.09			1.71	pCi/L		81.8	(50%-105%)			
	Uncert:			+/-0.0787							
	TPU:			+/-0.136							
Rad Gamma Spec											
Batch	1739683										
QC1203972938	443888002	DUP									
Cesium-137	U	0.0473	U	-1.93	pCi/L	0.548		(0-1)	BSW1	02/16/18	10:40
	Uncert:	+/-0.900		+/-0.780							
	TPU:	+/-0.900		+/-0.901							
Cobalt-60	U	-0.599	U	-0.0408	pCi/L	0.146		(0-1)			
	Uncert:	+/-0.978		+/-0.920							
	TPU:	+/-0.988		+/-0.920							
Neptunium-237	U	-0.926	U	0.241	pCi/L	0.164		(0-1)			
	Uncert:	+/-1.81		+/-1.72							
	TPU:	+/-1.83		+/-1.72							
Potassium-40	U	2.89	U	-7.24	pCi/L	0.188		(0-1)			
	Uncert:	+/-13.7		+/-13.2							
	TPU:	+/-13.7		+/-13.3							
Sodium-22	U	0.859	U	-0.0347	pCi/L	0.26		(0-1)			
	Uncert:	+/-0.900		+/-0.796							
	TPU:	+/-0.923		+/-0.797							
QC1203972939	LCS										
Americium-241	34300			36000	pCi/L		105	(80%-120%)	BSW1	02/16/18	10:02
	Uncert:			+/-326							
	TPU:			+/-1420							
Cesium-137	12900			13600	pCi/L		105	(80%-120%)			
	Uncert:			+/-172							
	TPU:			+/-596							
Cobalt-60	10900			11500	pCi/L		106	(80%-120%)			
	Uncert:			+/-178							
	TPU:			+/-503							
Neptunium-237			U	-20.6	pCi/L						
	Uncert:			+/-51.8							
	TPU:			+/-52.0							
Potassium-40			U	54.1	pCi/L						
	Uncert:			+/-106							
	TPU:			+/-106							
Sodium-22			U	-3.15	pCi/L						
	Uncert:			+/-20.0							
	TPU:			+/-20.0							
QC1203972937	MB										
Cesium-137			U	-1.92	pCi/L				BSW1	02/16/18	08:59
	Uncert:			+/-1.24							
	TPU:			+/-1.32							
Cobalt-60			U	0.569	pCi/L						
	Uncert:			+/-1.36							

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QC Summary

Workorder: 443888

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Parmname	NOM	Sample	Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time
Rad Gamma Spec											
Batch	1739683										
Neptunium-237	TPU:			+/-1.37							
			U	0.322	pCi/L						
	Uncert:			+/-1.79							
Potassium-40	TPU:			+/-1.79							
			U	-29.1	pCi/L						
	Uncert:			+/-16.6							
Sodium-22	TPU:			+/-18.0							
			U	-1.84	pCi/L						
	Uncert:			+/-1.03							
	TPU:			+/-1.12							
Rad Gas Flow											
Batch	1740247										
QC1203974511	443786015	DUP									
Strontium-90	U	0.387	U	-0.164	pCi/L	0.963		(0-1)	KSD1	02/21/18	14:36
	Uncert:	+/-0.154		+/-0.129							
	TPU:	+/-0.157		+/-0.129							
**Strontium Carrier	4.30	3.80		3.80	mg		88.4	(50%-105%)			
QC1203974513	LCS										
Strontium-90	23.5			20.7	pCi/L		87.7	(80%-120%)	KSD1	02/21/18	14:37
	Uncert:			+/-0.634							
	TPU:			+/-1.77							
**Strontium Carrier	4.30			3.90	mg		90.7	(50%-105%)			
QC1203974510	MB										
Strontium-90			U	-0.317	pCi/L				KSD1	02/21/18	14:36
	Uncert:			+/-0.0703							
	TPU:			+/-0.0703							
**Strontium Carrier	4.30			4.40	mg		102	(50%-105%)			
QC1203974512	443786015	MS									
Strontium-90	236	U	0.387	197	pCi/L		83.5	(75%-125%)	KSD1	02/21/18	14:36
	Uncert:		+/-0.154	+/-5.84							
	TPU:		+/-0.157	+/-16.8							
**Strontium Carrier	4.30	3.80		4.30	mg		100	(50%-105%)			
Batch	1740250										
QC1203974522	443786010	DUP									
Alpha	U	1.03	U	0.779	pCi/L	0.111		(0-1)	BXG2	02/28/18	17:03
	Uncert:	+/-0.728		+/-0.375							
	TPU:	+/-0.733		+/-0.381							
Beta		4.74		3.53	pCi/L	0.329		(0-1)		02/28/18	08:44
	Uncert:	+/-0.896		+/-0.801							
	TPU:	+/-0.983		+/-0.854							
QC1203974525	LCS										
Alpha	12.1			11.5	pCi/L		95	(80%-120%)	BXG2	02/28/18	12:05
	Uncert:			+/-0.571							
	TPU:			+/-1.16							
Beta	47.1			47.3	pCi/L		101	(80%-120%)		02/28/18	08:44

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Parmname	NOM	Sample	Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time
Rad Gas Flow											
Batch	1740250										
		Uncert:		+/-0.865							
		TPU:		+/-4.04							
QC1203974521	MB										
Alpha			U	-0.0381	pCi/L				BXG2	02/28/18	12:11
		Uncert:		+/-0.0114							
		TPU:		+/-0.0116							
Beta			U	0.154	pCi/L					02/28/18	08:44
		Uncert:		+/-0.122							
		TPU:		+/-0.123							
QC1203974523	443786010	MS									
Alpha	483	U	1.03	504	pCi/L		104	(75%-125%)	BXG2	02/28/18	12:05
		Uncert:		+/-0.728							
		TPU:		+/-0.733							
Beta	1880		4.74	1940	pCi/L		103	(75%-125%)		02/28/18	08:44
		Uncert:		+/-0.896							
		TPU:		+/-0.983							
QC1203974524	443786010	MSD									
Alpha	483	U	1.03	426	pCi/L	0.414	88.2	(0-1)	BXG2	02/28/18	12:05
		Uncert:		+/-0.728							
		TPU:		+/-0.733							
Beta	1880		4.74	1760	pCi/L	0.276	93.4	(0-1)		02/28/18	08:44
		Uncert:		+/-0.896							
		TPU:		+/-0.983							

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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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.