



**SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY**

EVENT ID: 5701 EVENT NAME: LA/Pueblo (General Surveillance) Q3 MY2014  
Sampling Event\_Pueblo

SAMPLE ID: CAPU-14-79413 WORK ORDER:

	<u>AS PLANNED</u>	<u>AS COLLECTED</u>		<u>AS PLANNED</u>	<u>AS COLLECTED</u>
DATE COLLECTED (MM/DD/YYYY):		06/03/2014	FIELD MATRIX:	WG	ok
TIME COLLECTED (HH:MM):		1348	MEDIA:	UA	ok
PRS ID:		ok	SAMPLE TECH CODE:	UA	PC
LOCATION ID: R-4			FIELD PREP:	UF	ok
LOCATION TYPE:			FIELD QC TYPE:	PEB	
PORT: SINGLE COMPLETION			SAMPLE USAGE:	QC	

PRIORITY	ORDER	CONTAINER	# PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
ms	MSGP-Hg	1 LITER POLY	1 HNO3	Y	ms
	WSP-8011-EDB_DBCP	40 ML SEPTUM AMBER GLASS	2 Na2S2O3		
	WSP-8082-PCB	1 LITER AMBER GLASS	1 ICE 6/3/14		
	WSP-8260B-VOA	40 ML SEPTUM AMBER GLASS	2 HCL		
	WSP-8270C-SVOA	1 LITER AMBER GLASS	3 ICE 6/3/14		
	WSP-8310-PAH	1 LITER AMBER GLASS	2 ICE		
	WSP-8321A-NMED HEXP	1 LITER AMBER GLASS	2 ICE 6/3/14		
	WSP-All Metals	1 LITER POLY	1 HNO3 ICE		
	WSP-CN(T)	250 ML POLY	1 NAOH		
ok	WSP-GENINORG+PerChlorate	1 LITER POLY	1 ICE	Y	

Analyses continued on next page

## SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 5701 EVENT NAME: LA/Pueblo (General Surveillance) Q3 MY2014  
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SAMPLE ID: CAPU-14-79413 WORK ORDER:

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
NA	WSP-GrossA/B	1 LITER POLY	1	HNO3	Y	NA
	WSP-H-3	250 ML AMBER GLASS	1	ICE		
	WSP-LL-8081A-HCB	1 LITER AMBER GLASS	2	ICE		
	WSP-LL-8151A-PCP	1 LITER AMBER GLASS	2	ICE		
	WSP-LL-8260B	40 ML SEPTUM AMBER GLASS	2	HCL		
	WSP-LL-8270C	1 LITER AMBER GLASS	1	ICE		
	WSP-LL-H-3	1 LITER POLY	1	NONE		
	WSP-NH3+NO3/NO2+PO4	500 ML AMBER GLASS	1	H2SO4		
	WSP-RAD	1 GAL POLY	1	HNO3		
✓	WSP-TKN+TOC	500 ML AMBER GLASS	1	H2SO4	✓	✓

## SAMPLE COMMENTS:

NA

## LOCATION COMMENTS:

NA

## FIELD PARAMETERS:

JS 6/3/17 NA

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

## COLLECTED BY (PRINT)

A.V. g. l

RELINQUISHED BY (Printed Name) Andrew Stucke (Signature)	Date/Time 6/3/17 1430	RECEIVED BY (Printed Name) M. M. M. (Signature)	Date/Time 6/3/17 1430
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date 05/30/2014

**SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY**

EVENT ID: 5701 EVENT NAME: LA/Pueblo (General Surveillance) Q3 MY2014  
 Sampling Event\_Pueblo

SAMPLE ID: CAPU-14-79414 WORK ORDER:

	<u>AS PLANNED</u>	<u>AS COLLECTED</u>		<u>AS PLANNED</u>	<u>AS COLLECTED</u>
DATE COLLECTED (MM/DD/YYYY):		06/03/2014	FIELD MATRIX:	WG	ok
TIME COLLECTED (HH:MM):		1148	MEDIA:	UA	ok
PRS ID:		ok	SAMPLE TECH CODE:	UA	DC
LOCATION ID: R-4		ok	FIELD PREP:	UF	ok
LOCATION TYPE:		ok	FIELD QC TYPE:	FB	ok
PORT: SINGLE COMPLETION		ok	SAMPLE USAGE:	QC	ok

PRIORITY	ORDER	CONTAINER	# PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
ms	WSP-8011-EDB_DBCP	40 ML SEPTUM AMBER GLASS	2 Na2S2O3	Y	ms
	WSP-8082-PCB	1 LITER AMBER GLASS	1 ICE 6/3/14		
	WSP-8260B-VOA	40 ML SEPTUM AMBER GLASS	2 HCL		
	WSP-8270C-SVOA	1 LITER AMBER GLASS	1 ICE 6/3/14		
	WSP-8310-PAH	1 LITER AMBER GLASS	2 ICE		
	WSP-LL-8081A-HCB	1 LITER AMBER GLASS	2 ICE		
	WSP-LL-8151A-PCP	1 LITER AMBER GLASS	2 ICE		
	WSP-LL-8260B	40 ML SEPTUM AMBER GLASS	2 HCL		
	WSP-LL-8270C	1 LITER AMBER GLASS	1 ICE		

Analyses continued on next page



## SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 5701 EVENT NAME: LA/Pueblo (General  
Surveillance) Q3 MY2014  
Sampling Event\_Pueblo

SAMPLE ID: CAPU-14-79414 WORK ORDER:

SAMPLE COMMENTS:

LOCATION COMMENTS:

FIELD PARAMETERS:

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

COLLECTED BY (PRINT) *A. S. Jackson*

RELINQUISHED BY (Printed Name) <i>Sydney Stahl</i> (Signature) <i>[Signature]</i>	Date/Time 6/3/14 1430	RECEIVED BY (Printed Name) <i>R. H. Matz</i> (Signature) <i>[Signature]</i>	Date/Time 6/3/14 1430
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date 05/30/2014

**SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY**

EVENT ID: 5701 EVENT NAME: LA/Pueblo (General Surveillance) Q3 MY2014  
 Sampling Event\_Pueblo

SAMPLE ID: CAPU-14-79415 WORK ORDER:

	<u>AS PLANNED</u>	<u>AS COLLECTED</u>		<u>AS PLANNED</u>	<u>AS COLLECTED</u>
DATE COLLECTED (MM/DD/YYYY):		06/03/2014	FIELD MATRIX:	WG	
TIME COLLECTED (HH:MM):		1148	MEDIA:	UA	
PRS ID:		ok	SAMPLE TECH CODE:	UA	GSP
LOCATION ID: R-4			FIELD PREP:	UF	ok
LOCATION TYPE:			FIELD QC TYPE:	FD	
PORT: SINGLE COMPLETION		✓	SAMPLE USAGE:	QC	

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
MA	MSGP-Hg	1 LITER POLY	1	HNO3	Y	MA
	WSP-8011-EDB_DBCP	40 ML SEPTUM AMBER GLASS	2	Na2S2O3		
	WSP-8260B-VOA	40 ML SEPTUM AMBER GLASS	2	HCL		
	WSP-8270C-SVOA	1 LITER AMBER GLASS	2	ICE 6/3/14		
	WSP-8310-PAH	1 LITER AMBER GLASS	2	ICE		
	WSP-CN(T)	250 ML POLY	1	NAOH		
	WSP-GrossA/B	1 LITER POLY	1	HNO3		
	WSP-LL-8081A-HCB	1 LITER AMBER GLASS	2	ICE		
	WSP-LL-8151A-PCP	1 LITER AMBER GLASS	2	ICE		
✓	WSP-LL-8260B	40 ML SEPTUM AMBER GLASS	2	HCL	Y	✓

Analyses continued on next page

## SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 5701

EVENT NAME: LA/Pueblo (General  
Surveillance) Q3 MY2014  
Sampling Event\_Pueblo

SAMPLE ID: CAPU-14-79415

WORK ORDER:

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
ms	WSP-LL-8270C	1 LITER AMBER GLASS	1	ICE	Y	ms
J	WSP-RAD	1 GAL POLY	1	HNO3	J	J
J	WSP-TKN+TOC	500 ML AMBER GLASS	1	H2SO4	J	J

SAMPLE COMMENTS:

LOCATION COMMENTS:

FIELD PARAMETERS:

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

COLLECTED BY (PRINT) J.V.g.1

RELINQUISHED BY (Printed Name) <i>J.V.g.1</i> (Signature) <i>J.V.g.1</i>	Date/Time 6/3/14 1430	RECEIVED BY (Printed Name) <i>M. Martin</i> (Signature) <i>M. Martin</i>	Date/Time 6/3/14 1430
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date 05/30/2014

## SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 5701 EVENT NAME: LA/Pueblo (General Surveillance) Q3 MY2014  
Sampling Event\_Pueblo  
SAMPLE ID: CAPU-14-79416 WORK ORDER:

	<u>AS PLANNED</u>	<u>AS COLLECTED</u>		<u>AS PLANNED</u>	<u>AS COLLECTED</u>
DATE COLLECTED (MM/DD/YYYY):		06/03/2014	FIELD MATRIX:	WG	ok
TIME COLLECTED (HH:MM):		1148	MEDIA:	UA	ok
PRS ID:		ok	SAMPLE TECH CODE:	UA	GSP
LOCATION ID: R-4		ok	FIELD PREP:	F	ok
LOCATION TYPE:		ok	FIELD QC TYPE:	FD	ok
PORT: SINGLE COMPLETION		ok	SAMPLE USAGE:	QC	ok

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

SAMPLE COMMENTS:

LOCATION COMMENTS:

FIELD PARAMETERS:

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

COLLECTED BY (PRINT)

RELINQUISHED BY (Printed Name) (Signature)	Date/Time 6/3/14 1430	RECEIVED BY (Printed Name) (Signature)	Date/Time 6/3/14 1430
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date 05/30/2014

## SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 5701 EVENT NAME: LA/Pueblo (General Surveillance) Q3 MY2014  
Sampling Event\_Pueblo

SAMPLE ID: CAPU-14-79420 WORK ORDER:

	<u>AS PLANNED</u>	<u>AS COLLECTED</u>		<u>AS PLANNED</u>	<u>AS COLLECTED</u>
DATE COLLECTED (MM/DD/YYYY):		06/03/2014	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):		1121	MEDIA:	UA	↓
PRS ID:		OK	SAMPLE TECH CODE:	UA	DC
LOCATION ID: R-24		↓	FIELD PREP:	UF	OK
LOCATION TYPE:		↓	FIELD QC TYPE:	FTB	↓
PORT: SINGLE COMPLETION		↓	SAMPLE USAGE:	QC	

PRIORITY	ORDER	CONTAINER	# PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
NA	WSP-8011-EDB_DBCP	40 ML SEPTUM AMBER GLASS	2 DE 6/3/14 1 HCL	Y	NA
↓	WSP-LL-8260B	40 ML SEPTUM AMBER GLASS	1 HCL DE 6/3/14	↓	↓

SAMPLE COMMENTS: NA

LOCATION COMMENTS: NA

## FIELD PARAMETERS:

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

COLLECTED BY (PRINT) D. Fellenz

RELINQUISHED BY (Printed Name) Maurice Lando (Signature) <i>Maurice Lando</i>	Date/Time 6/3/14 1230	RECEIVED BY (Printed Name) S. Sherwood (Signature) <i>S. Sherwood</i>	Date/Time 6/3/14 1230
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date 05/30/2014

## SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 5701

EVENT NAME:

LA/Pueblo (General  
Surveillance) Q3 MY2014  
Sampling Event\_Pueblo

SAMPLE ID: CAPU-14-79423

WORK ORDER:

	<u>AS PLANNED</u>	<u>AS COLLECTED</u>		<u>AS PLANNED</u>	<u>AS COLLECTED</u>
DATE COLLECTED (MM/DD/YYYY):		06/03/2014	FIELD MATRIX:	WG	ok
TIME COLLECTED (HH:MM):		1448	MEDIA:	UA	J
PRS ID:		ok	SAMPLE TECH CODE:	UA	PC
LOCATION ID: R-4		J	FIELD PREP:	UF	ok
LOCATION TYPE:		J	FIELD QC TYPE:	FTB	J
PORT: SINGLE COMPLETION		J	SAMPLE USAGE:	QC	J

PRIORITY	ORDER	CONTAINER	# PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
J	WSP-8011-EDB_DBCP	40 ML SEPTUM AMBER GLASS	2 N28203 HCl	J Y	MS
J	WSP-8260B-VOA	40 ML SEPTUM AMBER GLASS	1 HCL	J	J
J	WSP-LL-8260B	40 ML SEPTUM AMBER GLASS	2 HCL	J	J

SAMPLE COMMENTS:

LOCATION COMMENTS:

FIELD PARAMETERS:

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

COLLECTED BY (PRINT)

RELINQUISHED BY (Printed Name) (Signature)	Date/Time 6/3/14 1430	RECEIVED BY (Printed Name) (Signature)	Date/Time 6/3/14 1430
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date 05/30/2014

**SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY**

EVENT ID: 5701 EVENT NAME: LA/Pueblo (General Surveillance) Q3 MY2014  
 SAMPLE ID: CAPU-14-79428 WORK ORDER: NA  
 Sampling Event\_Pueblo

	<u>AS PLANNED</u>	<u>AS COLLECTED</u>		<u>AS PLANNED</u>	<u>AS COLLECTED</u>
DATE COLLECTED (MM/DD/YYYY):		06/03/2014	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):		1121	MEDIA:	UA	↓
PRS ID:		OK	SAMPLE TECH CODE:	UA	GSP
LOCATION ID: R-24		↓	FIELD PREP:	UF	OK
LOCATION TYPE: MON		↓	FIELD QC TYPE: REG		↓
PORT: SINGLE COMPLETION		↓	SAMPLE USAGE: INV		↓

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
NA	MSGP-Hg	1 LITER POLY	1	HNO3	Y	NA
↓	WSP-8011-EDB_DBCP	40 ML SEPTUM AMBER GLASS	2	Na2S2O3	↓	↓
↓	WSP-8310-PAH	1 LITER AMBER GLASS	2	ICE	↓	↓
↓	WSP-CN(T)	250 ML POLY	1	NAOH	↓	↓
↓	WSP-GrossA/B	1 LITER POLY	1	HNO3	↓	↓
↓	WSP-LL-8081A-HCB	1 LITER AMBER GLASS	2	ICE	↓	↓
↓	WSP-LL-8151A-PCP	1 LITER AMBER GLASS	2	ICE	↓	↓
↓	WSP-LL-8260B	40 ML SEPTUM AMBER GLASS	2	HCL	↓	↓
↓	WSP-LL-8270C	1 LITER AMBER GLASS	1	ICE	↓	↓
↓	WSP-RAD	1 GAL POLY	1	HNO3	↓	↓

Analyses continued on next page

## SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 5701

EVENT NAME: LA/Pueblo (General  
Surveillance) Q3 MY2014  
Sampling Event\_Pueblo

SAMPLE ID: CAPU-14-79428

WORK ORDER: NA

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
NA	WSP-TKN+TOC	500 ML AMBER GLASS	1	H2SO4	Y	NA

SAMPLE COMMENTS: Sampled within 50' of running diesel generator.

LOCATION COMMENTS: NA

## FIELD PARAMETERS:

Dissolved Oxygen 3.03 mg/L      Flow (in gpm) 4.48 GPM      Oxidation-Reduction Potential 86.7 mV  
pH 7.87 SU      Specific Conductance 259 uS/cm      Temperature 29.37 deg C  
Turbidity 2.3 NTU

COLLECTED BY (PRINT) M. Shendo

RELINQUISHED BY (Printed Name) Maurice Shendo (Signature) <i>Maurice Shendo</i>	Date/Time 6/3/14 1230	RECEIVED BY (Printed Name) J. Sherwood (Signature) <i>J. Sherwood</i>	Date/Time 6/3/14 1230
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date 05/30/2014



**SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY**

EVENT ID: 5701 EVENT NAME: LA/Pueblo (General Surveillance) Q3 MY2014  
 SAMPLE ID: CAPU-14-79431 WORK ORDER: NA  
 Sampling Event\_Pueblo

	<u>AS PLANNED</u>	<u>AS COLLECTED</u>		<u>AS PLANNED</u>	<u>AS COLLECTED</u>
DATE COLLECTED (MM/DD/YYYY):		06/03/2014	FIELD MATRIX:	WG	
TIME COLLECTED (HH:MM):		1148	MEDIA:	UA	
PRS ID:			SAMPLE TECH CODE:	UA	
LOCATION ID: R-4			FIELD PREP:	UF	
LOCATION TYPE: MON			FIELD QC TYPE:	REG	
PORT: SINGLE COMPLETION			SAMPLE USAGE:	INV	

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
NA	MSGP-Hg	1 LITER POLY	1	HNO3	Y	NA
	WSP-8011-EDB_DBCP	40 ML SEPTUM AMBER GLASS	2	Na2S2O3		
	WSP-8260B-VOA	40 ML SEPTUM AMBER GLASS	2	HCL		
	WSP-8270C-SVOA	1 LITER AMBER GLASS	3	ICE A-4 GSM		
	WSP-8310-PAH	1 LITER AMBER GLASS	2	ICE		
	WSP-CN(T)	250 ML POLY	1	NAOH		
	WSP-GrossA/B	1 LITER POLY	1	HNO3		
	WSP-LL-8081A-HCB	1 LITER AMBER GLASS	2	ICE		
	WSP-LL-8151A-PCP	1 LITER AMBER GLASS	2	ICE		
	WSP-LL-8260B	40 ML SEPTUM AMBER GLASS	2	HCL		

Analyses continued on next page

## SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 5701

EVENT NAME: LA/Pueblo (General  
Surveillance) Q3 MY2014  
Sampling Event\_Pueblo

SAMPLE ID: CAPU-14-79431

WORK ORDER: NA

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
MS	WSP-LL-8270C	1 LITER AMBER GLASS	1	ICE	Y	MS
J	WSP-RAD	1 GAL POLY	1	HNO3	J	J
J	WSP-TKN+TOC	500 ML AMBER GLASS	1	H2SO4	J	J

## SAMPLE COMMENTS:

## LOCATION COMMENTS:

## FIELD PARAMETERS:

mb  
sampled within 40' of diesel generator

Dissolved Oxygen 3.60 mg/L Flow (in gpm) 3.49 GPM Oxidation-Reduction Potential 45.6 mV  
pH 8.13 SU Specific Conductance 192 uS/cm Temperature 25.58 deg C  
Turbidity 0.14 NTU

## COLLECTED BY (PRINT)

RELINQUISHED BY (Printed Name) (Signature)	Date/Time 6/3/14 1430	RECEIVED BY (Printed Name) (Signature)	Date/Time 6/3/14 1430
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date 05/30/2014

## SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 5701 EVENT NAME: LA/Pueblo (General Surveillance) Q3 MY2014  
 Sampling Event\_Pueblo  
 SAMPLE ID: CAPU-14-79436 WORK ORDER: NA

	<u>AS PLANNED</u>	<u>AS COLLECTED</u>		<u>AS PLANNED</u>	<u>AS COLLECTED</u>
DATE COLLECTED (MM/DD/YYYY):		06/03/2014	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):		1121	MEDIA:	UA	↓
PRS ID:		OK	SAMPLE TECH CODE:	UA	GSP
LOCATION ID: R-24		↓	FIELD PREP:	F	OK
LOCATION TYPE: MON		↓	FIELD QC TYPE: REG		↓
PORT: SINGLE COMPLETION		↓	SAMPLE USAGE: INV		↓

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

SAMPLE COMMENTS: NA

LOCATION COMMENTS: NA

## FIELD PARAMETERS:

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

COLLECTED BY (PRINT) M. Shando

RELINQUISHED BY (Printed Name) <i>Maurice Shando</i> (Signature) <i>Maurice Shando</i>	Date/Time 6/3/14 1230	RECEIVED BY (Printed Name) <i>SP - Sherwood</i> (Signature) <i>Sherwood</i>	Date/Time 6/3/14 1230
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date 05/30/2014

## SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 5701 EVENT NAME: LA/Pueblo (General Surveillance) Q3 MY2014  
 Sampling Event\_Pueblo  
 SAMPLE ID: CAPU-14-79439 WORK ORDER: NA

	<u>AS PLANNED</u>	<u>AS COLLECTED</u>		<u>AS PLANNED</u>	<u>AS COLLECTED</u>
DATE COLLECTED (MM/DD/YYYY):		06/03/2014	FIELD MATRIX:	WG	
TIME COLLECTED (HH:MM):		1148	MEDIA:	UA	
PRS ID:			SAMPLE TECH CODE:	UA	GSP
LOCATION ID: R-4			FIELD PREP:	F	
LOCATION TYPE: MON			FIELD QC TYPE: REG		
PORT: SINGLE COMPLETION			SAMPLE USAGE: INV		

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

SAMPLE COMMENTS:

LOCATION COMMENTS:

FIELD PARAMETERS:

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

COLLECTED BY (PRINT)

RELINQUISHED BY (Printed Name)	Signature	Date/Time	RECEIVED BY (Printed Name)	Signature	Date/Time
RELINQUISHED BY (Printed Name)	Signature	Date/Time	RECEIVED BY (Printed Name)	Signature	Date/Time

Report Date 05/30/2014

## DATA VALIDATION REPORT

Chain Of Custody No. 2014-3494

### 1. Distribution Of Samples In EDD.

SDG	Analytical Method	Regular Samples	Field Duplicates	Trip Blanks	Field Blanks	Equipment Blanks
354157	SW-846:8310		1			

SDG	Analytical Method	Analysis Lot ID	Prep Lot ID	Regular Samples	Field Duplicates	Trip Blanks	Field Blanks	Equipment Blanks	Method Blanks	Matrix Spikes	Matrix Spike Dups	Analytical Spikes	Post-Digestion Spikes	Lab Control Samples	Lab Control Sample Dups	Blank Spike	Blank Spike Dups	Lab Duplicates	Storage Blanks	Preparation Blanks	Reagent Blanks
354157	SW-846:8310	1410224	1410220		1				1					1	1						

### 2. Distribution Of Analytes In EDD.

Analytical Method	Analytical Method Category	Field Sample ID	Lab Sample ID	Sample Purpose	Target Analytes	Surrogates	Spiked Compounds	TICS
SW-846:8310	SVOC	CAPU-14-79415	354157001	FD	18	1	0	0
SW-846:8310	SVOC	LCS	1203144953	LCS	0	1	18	0
SW-846:8310	SVOC	LCSD	1203144954	LCSD	0	1	18	0
SW-846:8310	SVOC	MB	1203144952	MB	18	1	0	0

### 3. Are any analytes missing?

No.

### 4. Were any holding times exceeded?

No.

### 5. Any contaminants in blanks?

No.

## DATA VALIDATION REPORT

6. Any surrogate recoveries outside the control limits?

No.

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

No.

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

LCS Lab Sample	LCSD Lab	Analytical Method	Parameter Name	Lab Lot ID	Analysis	Sample Matrix	LCS Spike Recovery	LCSD Spike Recovery	Upper Limit	Lower Limit	Upper Rejection Limit	Lower Rejection Limit	RPD	RPD Limit
1203144953	1203144954	SW-846:8310	Benzo(a)anthracene	1410220	08-13-2014	W	74	92	130	70		10	22	20
1203144953	1203144954	SW-846:8310	Benzo(a)pyrene	1410220	08-13-2014	W	74	92	130	70		10	21	20
1203144953	1203144954	SW-846:8310	Benzo(b)fluoranthene	1410220	08-13-2014	W	73	90	130	70		10	21	20
1203144953	1203144954	SW-846:8310	Benzo(k)fluoranthene	1410220	08-13-2014	W	78	97	130	70		10	21	20
1203144953	1203144954	SW-846:8310	Chrysene	1410220	08-13-2014	W	79	97	130	70		10	21	20
1203144953	1203144954	SW-846:8310	Fluoranthene	1410220	08-13-2014	W	69	85	130	70		10	21	20
1203144953	1203144954	SW-846:8310	Fluorene	1410220	08-13-2014	W	70	85	130	62		10	21	20
1203144953	1203144954	SW-846:8310	Pyrene	1410220	08-13-2014	W	73	90	130	70		10	21	20

9. Any Field Duplicate RPDs outside the desired limits?

No.

10. Any Lab Duplicate RPDs outside the desired limits?

No.

## DATA VALIDATION REPORT

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	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-4	2014-3494	CAPU-14-79415	FD	RE	SVOC	SW-846:8310	Fluoranthene	U	UU	SV12a	N	0.0526	ug/L	0.0526	ug/L			W	06/03/2014		1410224	VAL	Y

### Reason Code

### Description

SV12a

The LCS percent recovery was < the LAL but >10%. Follow the external laboratory limits located within the associated data package.

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
CAPU-14-79415	R-4	FD	SW-846:8310	0	18

## DATA VALIDATION REPORT

Chain Of Custody No. 2014-3494

### 1. Distribution Of Samples In EDD.

SDG	Analytical Method	Regular Samples	Field Duplicates	Trip Blanks	Field Blanks	Equipment Blanks
350053	EPA:120.1	2	1			
350053	EPA:150.1	2	1			
350053	EPA:160.1	2	1			
350053	EPA:245.2	4	2			
350053	EPA:300.0	2	1			
350053	EPA:310.1	2	1			
350053	EPA:335.4	2	1			
350053	EPA:350.1	2	1			
350053	EPA:351.2	2	1			
350053	EPA:353.2	2	1			
350053	EPA:365.4	2	1			
350053	EPA:900	2	1			
350053	EPA:901.1	2	1			
350053	EPA:905.0	2	1			
350053	EPA:906.0					
350053	HASL-300:AM-241	2	1			
350053	HASL-300:ISOPU	2	1			
350053	HASL-300:ISOU	2	1			
350053	SM:A2340B	2	1			
350053	SW-846:6010C	2	1			
350053	SW-846:6020	2	1			
350053	SW-846:6850	2	1			
350053	SW-846:8011	2	1	2	1	
350053	SW-846:8081B	2	1		1	
350053	SW-846:8082				1	
350053	SW-846:8151A	2	1		1	
350053	SW-846:8260B	2	1	2	1	
350053	SW-846:8270D	2	1		1	
350053	SW-846:8310	2	1		1	
350053	SW-846:8321A_MOD					
350053	SW-846:9060	2	1			



# DATA VALIDATION REPORT

SDG	Analytical Method	Analysis Lot ID	Prep Lot ID	Regular Samples	Field Duplicates	Trip Blanks	Field Blanks	Equipment Blanks	Method Blanks	Matrix Spikes	Matrix Spike Dups	Analytical Spikes	Post-Digestion Spikes	Lab Control Samples	Lab Control Sample Dups	Blank Spike	Blank Spike Dups	Lab Duplicates	Storage Blanks	Preparation Blanks	Reagent Blanks
350053	EPA:120.1	1397102	1397102	2	1									1			1				
350053	EPA:150.1	1395344	1395344	2	1									1			1				
350053	EPA:160.1	1394315	1394315	2	1				1					1			1				
350053	EPA:245.2	1396344	1396342	4	2				1	2				1			2				
350053	EPA:300.0	1393647	1393647	2	1				1					1			1				
350053	EPA:310.1	1396238	1396238	2	1				2	1				2	2		1				
350053	EPA:335.4	1393812	1393811	2	1				1	1				1			1				
350053	EPA:350.1	1394294	1394293	2	1				1	2				1			2				
350053	EPA:351.2	1394292	1394290	2	1				1	2				1			2				
350053	EPA:353.2	1394285	1394285	2	1				1					1			2				
350053	EPA:365.4	1394297	1394295	2	1				1	1				1			1				
350053	EPA:900	1395947	1395947	2	1				1	1	1			1			1				
350053	EPA:901.1	1393862	1393862	2	1				1					1			1				
350053	EPA:905.0	1395946	1395946	2	1				1	1				1			1				
350053	EPA:906.0	1396341	1396341						1	1				1			1				
350053	HASL-300:AM-241	1393676	1393676	2	1				1					1			1				
350053	HASL-300:ISOPU	1393681	1393681	2	1				1					1			1				
350053	HASL-300:ISOU	1393680	1393680	2	1				1					1			1				
350053	SM:A2340B	1399077	1399077	2	1																
350053	SW-846:6010C	1393740	1393739	2	1				1	1				1			1				
350053	SW-846:6020	1393764	1393763	2	1				1	1				1			1				
350053	SW-846:6850	1394191	1394190	2	1				1	1	1			1							
350053	SW-846:8011	1393888	1393887	2	1	2	1		1					1	1						
350053	SW-846:8081B	1394113	1394107	2	1		1		1	1				1	1						
350053	SW-846:8082	1395486	1395480				1		1	1	1			1							
350053	SW-846:8151A	1394530	1394525	2	1		1		1	1				1	1						
350053	SW-846:8260B	1396094	1396094	2	1	2	1		2					4							
350053	SW-846:8270D	1393520	1393519	2	1		1		1	1	1			1							
350053	SW-846:8310	1394138	1394132	2	1		1		1	1				1	1						
350053	SW-846:8321A_MOD	1394380	1394379						1	1	1			1							

## DATA VALIDATION REPORT

SDG	Analytical Method	Analysis Lot ID	Prep Lot ID	Regular Samples	Field Duplicates	Trip Blanks	Field Blanks	Equipment Blanks	Method Blanks	Matrix Spikes	Matrix Spike Dups	Analytical Spikes	Post-Digestion Spikes	Lab Control Samples	Lab Control Sample Dups	Blank Spike	Blank Spike Dups	Lab Duplicates	Storage Blanks	Preparation Blanks	Reagent Blanks
350053	SW-846:9060	1394347	1394347	2	1				1					1			3				

### 2. Distribution Of Analytes In EDD.

Analytical Method	Analytical Method Category	Field Sample ID	Lab Sample ID	Sample Purpose	Target Analytes	Surrogates	Spiked Compounds	TICS
EPA:120.1	GENERAL CHEMISTRY	CAPU-14-79413	350053019	PEB	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	CAPU-14-79416	350053033	FD	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	CAPU-14-79436	350053006	REG	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	CAPU-14-79439	1203112083	DUP	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	CAPU-14-79439	350053014	REG	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	LCS	1203112084	LCS	0	0	1	0
EPA:150.1	GENERAL CHEMISTRY	CAPU-14-79413	350053019	PEB	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	CAPU-14-79416	350053033	FD	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	CAPU-14-79434	1203107683	DUP	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	CAPU-14-79436	350053006	REG	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	CAPU-14-79439	350053014	REG	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	LCS	1203107686	LCS	0	0	1	0
EPA:160.1	GENERAL CHEMISTRY	CAPU-14-79413	1203104927	DUP	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	CAPU-14-79413	350053019	PEB	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	CAPU-14-79416	350053033	FD	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	CAPU-14-79436	350053006	REG	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	CAPU-14-79439	350053014	REG	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	LCS	1203104929	LCS	0	0	1	0
EPA:160.1	GENERAL CHEMISTRY	MB	1203104926	MB	1	0	0	0
EPA:245.2	INORGANIC	CAPU-14-79413	350053019	PEB	1	0	0	0
EPA:245.2	INORGANIC	CAPU-14-79415	350053030	FD	1	0	0	0
EPA:245.2	INORGANIC	CAPU-14-79416	350053033	FD	1	0	0	0
EPA:245.2	INORGANIC	CAPU-14-79428	1203110257	DUP	1	0	0	0
EPA:245.2	INORGANIC	CAPU-14-79428	1203110258	MS	0	0	1	0
EPA:245.2	INORGANIC	CAPU-14-79428	350053003	REG	1	0	0	0
EPA:245.2	INORGANIC	CAPU-14-79431	350053011	REG	1	0	0	0
EPA:245.2	INORGANIC	CAPU-14-79436	350053006	REG	1	0	0	0
EPA:245.2	INORGANIC	CAPU-14-79439	350053014	REG	1	0	0	0
EPA:245.2	INORGANIC	LCS	1203110253	LCS	0	0	1	0

# DATA VALIDATION REPORT

Analytical Method	Analytical Method Category	Field Sample ID	Lab Sample ID	Sample Purpose	Target Analytes	Surrogates	Spiked Compounds	TICS
EPA:245.2	INORGANIC	MB	1203110252	MB	1	0	0	0
EPA:245.2	INORGANIC	WSTMO-14-75612	1203110254	DUP	1	0	0	0
EPA:245.2	INORGANIC	WSTMO-14-75612	1203110255	MS	0	0	1	0
EPA:300.0	GENERAL CHEMISTRY	CAPU-14-79413	350053019	PEB	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAPU-14-79416	1203103275	DUP	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAPU-14-79416	350053033	FD	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAPU-14-79436	350053006	REG	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAPU-14-79439	350053014	REG	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	LCS	1203103277	LCS	0	0	4	0
EPA:300.0	GENERAL CHEMISTRY	MB	1203103274	MB	4	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAPU-14-79413	350053019	PEB	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAPU-14-79416	350053033	FD	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAPU-14-79436	350053006	REG	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAPU-14-79439	1203109963	DUP	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAPU-14-79439	1203109965	MS	0	0	1	0
EPA:310.1	GENERAL CHEMISTRY	CAPU-14-79439	350053014	REG	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	LCS	1203109966	LCS	0	0	1	0
EPA:310.1	GENERAL CHEMISTRY	LCS	1203109967	LCS	0	0	1	0
EPA:310.1	GENERAL CHEMISTRY	LCSD	1203109968	LCSD	0	0	1	0
EPA:310.1	GENERAL CHEMISTRY	LCSD	1203109969	LCSD	0	0	1	0
EPA:310.1	GENERAL CHEMISTRY	MB	1203109960	MB	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	MB	1203109961	MB	2	0	0	0
EPA:335.4	GENERAL CHEMISTRY	CAPU-14-79413	350053019	PEB	1	0	0	0
EPA:335.4	GENERAL CHEMISTRY	CAPU-14-79415	350053030	FD	1	0	0	0
EPA:335.4	GENERAL CHEMISTRY	CAPU-14-79428	1203103654	DUP	1	0	0	0
EPA:335.4	GENERAL CHEMISTRY	CAPU-14-79428	1203103657	MS	0	0	1	0
EPA:335.4	GENERAL CHEMISTRY	CAPU-14-79428	350053003	REG	1	0	0	0
EPA:335.4	GENERAL CHEMISTRY	CAPU-14-79431	350053011	REG	1	0	0	0
EPA:335.4	GENERAL CHEMISTRY	LCS	1203103660	LCS	0	0	1	0
EPA:335.4	GENERAL CHEMISTRY	MB	1203103653	MB	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAPU-14-79413	350053019	PEB	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAPU-14-79416	350053033	FD	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAPU-14-79435	1203107049	DUP	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAPU-14-79435	1203107050	MS	0	0	1	0
EPA:350.1	GENERAL CHEMISTRY	CAPU-14-79436	350053006	REG	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAPU-14-79437	1203104864	DUP	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAPU-14-79437	1203104865	MS	0	0	1	0
EPA:350.1	GENERAL CHEMISTRY	CAPU-14-79439	350053014	REG	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	LCS	1203104861	LCS	0	0	1	0
EPA:350.1	GENERAL CHEMISTRY	MB	1203104860	MB	1	0	0	0

## DATA VALIDATION REPORT

Analytical Method	Analytical Method Category	Field Sample ID	Lab Sample ID	Sample Purpose	Target Analytes	Surrogates	Spiked Compounds	TICS
EPA:351.2	GENERAL CHEMISTRY	CAPU-14-79413	350053019	PEB	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAPU-14-79415	350053030	FD	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAPU-14-79427	1203106955	DUP	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAPU-14-79427	1203106956	MS	0	0	1	0
EPA:351.2	GENERAL CHEMISTRY	CAPU-14-79428	350053003	REG	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAPU-14-79429	1203104858	DUP	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAPU-14-79429	1203104859	MS	0	0	1	0
EPA:351.2	GENERAL CHEMISTRY	CAPU-14-79431	350053011	REG	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	LCS	1203104857	LCS	0	0	1	0
EPA:351.2	GENERAL CHEMISTRY	MB	1203104856	MB	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAPU-14-79413	350053019	PEB	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAPU-14-79416	350053033	FD	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAPU-14-79434	1203104835	DUP	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAPU-14-79435	1203107052	DUP	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAPU-14-79436	350053006	REG	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAPU-14-79439	350053014	REG	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	LCS	1203104840	LCS	0	0	1	0
EPA:353.2	GENERAL CHEMISTRY	MB	1203104833	MB	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAPU-14-79413	350053019	PEB	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAPU-14-79416	350053033	FD	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAPU-14-79436	350053006	REG	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAPU-14-79439	350053014	REG	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	LCS	1203104876	LCS	0	0	1	0
EPA:365.4	GENERAL CHEMISTRY	MB	1203104869	MB	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	WST09-14-74376	1203104870	DUP	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	WST09-14-74376	1203104873	MS	0	0	1	0
EPA:900	RAD	BDW08-14-79467	1203109196	DUP	2	0	0	0
EPA:900	RAD	BDW08-14-79467	1203109197	MS	0	0	2	0
EPA:900	RAD	BDW08-14-79467	1203109198	MSD	0	0	2	0
EPA:900	RAD	CAPU-14-79413	350053019	PEB	2	0	0	0
EPA:900	RAD	CAPU-14-79415	350053030	FD	2	0	0	0
EPA:900	RAD	CAPU-14-79428	350053003	REG	2	0	0	0
EPA:900	RAD	CAPU-14-79431	350053011	REG	2	0	0	0
EPA:900	RAD	LCS	1203109199	LCS	0	0	2	0
EPA:900	RAD	MB	1203109195	MB	2	0	0	0
EPA:901.1	RAD	CAPU-14-79413	350053019	PEB	5	0	0	0
EPA:901.1	RAD	CAPU-14-79415	350053030	FD	5	0	0	0
EPA:901.1	RAD	CAPU-14-79428	1203103778	DUP	5	0	0	0
EPA:901.1	RAD	CAPU-14-79428	350053003	REG	5	0	0	0
EPA:901.1	RAD	CAPU-14-79431	350053011	REG	5	0	0	0

## DATA VALIDATION REPORT

Analytical Method	Analytical Method Category	Field Sample ID	Lab Sample ID	Sample Purpose	Target Analytes	Surrogates	Spiked Compounds	TICS
EPA:901.1	RAD	LCS	1203103779	LCS	0	0	3	0
EPA:901.1	RAD	MB	1203103777	MB	5	0	0	0
EPA:905.0	RAD	CAPU-14-79413	350053019	PEB	1	0	0	0
EPA:905.0	RAD	CAPU-14-79415	350053030	FD	1	0	0	0
EPA:905.0	RAD	CAPU-14-79427	1203109192	DUP	1	0	0	0
EPA:905.0	RAD	CAPU-14-79427	1203109193	MS	0	0	1	0
EPA:905.0	RAD	CAPU-14-79428	350053003	REG	1	0	0	0
EPA:905.0	RAD	CAPU-14-79431	350053011	REG	1	0	0	0
EPA:905.0	RAD	LCS	1203109194	LCS	0	0	1	0
EPA:905.0	RAD	MB	1203109191	MB	1	0	0	0
EPA:906.0	RAD	CAPU-14-79413	350053019	PEB	1	0	0	0
EPA:906.0	RAD	LCS	1203110251	LCS	0	0	1	0
EPA:906.0	RAD	MB	1203110248	MB	1	0	0	0
EPA:906.0	RAD	WSTMO-14-75612	1203110249	DUP	1	0	0	0
EPA:906.0	RAD	WSTMO-14-75612	1203110250	MS	0	0	1	0
HASL-300:AM-241	RAD	CAPU-14-79413	350053019	PEB	1	0	0	0
HASL-300:AM-241	RAD	CAPU-14-79415	350053030	FD	1	0	0	0
HASL-300:AM-241	RAD	CAPU-14-79428	1203103310	DUP	1	0	0	0
HASL-300:AM-241	RAD	CAPU-14-79428	350053003	REG	1	0	0	0
HASL-300:AM-241	RAD	CAPU-14-79431	350053011	REG	1	0	0	0
HASL-300:AM-241	RAD	LCS	1203103311	LCS	0	0	1	0
HASL-300:AM-241	RAD	MB	1203103309	MB	1	0	0	0
HASL-300:ISOPU	RAD	CAPU-14-79413	350053019	PEB	2	0	0	0
HASL-300:ISOPU	RAD	CAPU-14-79415	350053030	FD	2	0	0	0
HASL-300:ISOPU	RAD	CAPU-14-79428	1203103316	DUP	2	0	0	0
HASL-300:ISOPU	RAD	CAPU-14-79428	350053003	REG	2	0	0	0
HASL-300:ISOPU	RAD	CAPU-14-79431	350053011	REG	2	0	0	0
HASL-300:ISOPU	RAD	LCS	1203103317	LCS	0	0	1	0
HASL-300:ISOPU	RAD	MB	1203103315	MB	2	0	0	0
HASL-300:ISOU	RAD	CAPU-14-79413	350053019	PEB	3	0	0	0
HASL-300:ISOU	RAD	CAPU-14-79415	350053030	FD	3	0	0	0
HASL-300:ISOU	RAD	CAPU-14-79428	1203103313	DUP	3	0	0	0
HASL-300:ISOU	RAD	CAPU-14-79428	350053003	REG	3	0	0	0
HASL-300:ISOU	RAD	CAPU-14-79431	350053011	REG	3	0	0	0
HASL-300:ISOU	RAD	LCS	1203103314	LCS	0	0	1	0
HASL-300:ISOU	RAD	MB	1203103312	MB	3	0	0	0
SM:A2340B	INORGANIC	CAPU-14-79413	350053019	PEB	1	0	0	0
SM:A2340B	INORGANIC	CAPU-14-79416	350053033	FD	1	0	0	0
SM:A2340B	INORGANIC	CAPU-14-79436	350053006	REG	1	0	0	0
SM:A2340B	INORGANIC	CAPU-14-79439	350053014	REG	1	0	0	0

# DATA VALIDATION REPORT

Analytical Method	Analytical Method Category	Field Sample ID	Lab Sample ID	Sample Purpose	Target Analytes	Surrogates	Spiked Compounds	TICS
SW-846:6010C	INORGANIC	CAPU-14-79413	350053019	PEB	17	0	0	0
SW-846:6010C	INORGANIC	CAPU-14-79416	350053033	FD	17	0	0	0
SW-846:6010C	INORGANIC	CAPU-14-79436	1203103480	DUP	17	0	0	0
SW-846:6010C	INORGANIC	CAPU-14-79436	1203103481	MS	0	0	17	0
SW-846:6010C	INORGANIC	CAPU-14-79436	350053006	REG	17	0	0	0
SW-846:6010C	INORGANIC	CAPU-14-79439	350053014	REG	17	0	0	0
SW-846:6010C	INORGANIC	LCS	1203103479	LCS	0	0	17	0
SW-846:6010C	INORGANIC	MB	1203103478	MB	17	0	0	0
SW-846:6020	INORGANIC	CAPU-14-79413	350053019	PEB	11	0	0	0
SW-846:6020	INORGANIC	CAPU-14-79416	350053033	FD	11	0	0	0
SW-846:6020	INORGANIC	CAPU-14-79436	1203103528	DUP	11	0	0	0
SW-846:6020	INORGANIC	CAPU-14-79436	1203103529	MS	0	0	11	0
SW-846:6020	INORGANIC	CAPU-14-79436	350053006	REG	11	0	0	0
SW-846:6020	INORGANIC	CAPU-14-79439	350053014	REG	11	0	0	0
SW-846:6020	INORGANIC	LCS	1203103527	LCS	0	0	11	0
SW-846:6020	INORGANIC	MB	1203103526	MB	11	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	CAPU-14-79413	350053019	PEB	1	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	CAPU-14-79416	350053033	FD	1	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	CAPU-14-79436	1203104532	MS	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	CAPU-14-79436	1203104533	MSD	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	CAPU-14-79436	350053006	REG	1	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	CAPU-14-79439	350053014	REG	1	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	LCS	1203104531	LCS	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	MB	1203104530	MB	1	0	0	0
SW-846:8011	VOC	CAPU-14-79413	350053015	PEB	2	1	0	0
SW-846:8011	VOC	CAPU-14-79414	350053022	FB	2	1	0	0
SW-846:8011	VOC	CAPU-14-79415	350053028	FD	2	1	0	0
SW-846:8011	VOC	CAPU-14-79420	350053007	FTB	2	1	0	0
SW-846:8011	VOC	CAPU-14-79423	350053034	FTB	2	1	0	0
SW-846:8011	VOC	CAPU-14-79428	350053001	REG	2	1	0	0
SW-846:8011	VOC	CAPU-14-79431	350053009	REG	2	1	0	0
SW-846:8011	VOC	LCS	1203103869	LCS	0	1	2	0
SW-846:8011	VOC	LCSD	1203103870	LCSD	0	1	2	0
SW-846:8011	VOC	MB	1203103868	MB	2	1	0	0
SW-846:8081B	PESTPCB	CAPU-14-79413	350053017	PEB	1	2	0	0
SW-846:8081B	PESTPCB	CAPU-14-79414	350053024	FB	1	2	0	0
SW-846:8081B	PESTPCB	CAPU-14-79415	350053031	FD	1	2	0	0
SW-846:8081B	PESTPCB	CAPU-14-79428	350053004	REG	1	2	0	0
SW-846:8081B	PESTPCB	CAPU-14-79429	1203104376	MS	0	2	1	0
SW-846:8081B	PESTPCB	CAPU-14-79431	350053012	REG	1	2	0	0

# DATA VALIDATION REPORT

Analytical Method	Analytical Method Category	Field Sample ID	Lab Sample ID	Sample Purpose	Target Analytes	Surrogates	Spiked Compounds	TICS
SW-846:8081B	PESTPCB	LCS	1203104375	LCS	0	2	1	0
SW-846:8081B	PESTPCB	LCSD	1203104384	LCSD	0	2	1	0
SW-846:8081B	PESTPCB	MB	1203104374	MB	1	2	0	0
SW-846:8082	PESTPCB	BDW08-14-79467	1203108031	MS	0	2	2	0
SW-846:8082	PESTPCB	BDW08-14-79467	1203108032	MSD	0	2	2	0
SW-846:8082	PESTPCB	CAPU-14-79413	350053020	PEB	8	2	0	0
SW-846:8082	PESTPCB	CAPU-14-79414	350053026	FB	8	2	0	0
SW-846:8082	PESTPCB	LCS	1203108030	LCS	0	2	2	0
SW-846:8082	PESTPCB	MB	1203108029	MB	8	2	0	0
SW-846:8151A	HERB	CAPU-14-79413	350053018	PEB	1	1	0	0
SW-846:8151A	HERB	CAPU-14-79414	350053025	FB	1	1	0	0
SW-846:8151A	HERB	CAPU-14-79415	350053032	FD	1	1	0	0
SW-846:8151A	HERB	CAPU-14-79427	1203105476	MS	0	1	1	0
SW-846:8151A	HERB	CAPU-14-79428	350053005	REG	1	1	0	0
SW-846:8151A	HERB	CAPU-14-79431	350053013	REG	1	1	0	0
SW-846:8151A	HERB	LCS	1203105475	LCS	0	1	1	0
SW-846:8151A	HERB	LCSD	1203105478	LCSD	0	1	1	0
SW-846:8151A	HERB	MB	1203105474	MB	1	1	0	0
SW-846:8260B	VOC	CAPU-14-79413	350053019	PEB	78	3	0	0
SW-846:8260B	VOC	CAPU-14-79414	350053027	FB	78	3	0	0
SW-846:8260B	VOC	CAPU-14-79415	350053030	FD	78	3	0	0
SW-846:8260B	VOC	CAPU-14-79420	350053008	FTB	78	3	0	0
SW-846:8260B	VOC	CAPU-14-79423	350053035	FTB	78	3	0	0
SW-846:8260B	VOC	CAPU-14-79428	350053003	REG	78	3	0	0
SW-846:8260B	VOC	CAPU-14-79431	350053011	REG	78	3	0	0
SW-846:8260B	VOC	LCS	1203109630	LCS	0	3	68	0
SW-846:8260B	VOC	LCS	1203109631	LCS	0	3	10	0
SW-846:8260B	VOC	LCS	1203109632	LCS	0	3	68	0
SW-846:8260B	VOC	LCS	1203109633	LCS	0	3	10	0
SW-846:8260B	VOC	MB	1203109624	MB	78	3	0	0
SW-846:8260B	VOC	MB	1203109625	MB	78	3	0	0
SW-846:8270D	SVOC	CAPU-14-79413	350053019	PEB	60	6	0	0
SW-846:8270D	SVOC	CAPU-14-79414	350053027	FB	60	6	0	0
SW-846:8270D	SVOC	CAPU-14-79415	350053030	FD	60	6	0	0
SW-846:8270D	SVOC	CAPU-14-79428	350053003	REG	60	6	0	0
SW-846:8270D	SVOC	CAPU-14-79431	350053011	REG	60	6	0	0
SW-846:8270D	SVOC	LCS	1203102909	LCS	0	6	56	0
SW-846:8270D	SVOC	MB	1203102908	MB	60	6	0	0
SW-846:8270D	SVOC	WST09-14-79994	1203102910	MS	0	6	56	0
SW-846:8270D	SVOC	WST09-14-79994	1203102911	MSD	0	6	56	0

## DATA VALIDATION REPORT

Analytical Method	Analytical Method Category	Field Sample ID	Lab Sample ID	Sample Purpose	Target Analytes	Surrogates	Spiked Compounds	TICS
SW-846:8310	SVOC	CAPU-14-79413	350053016	PEB	18	1	0	0
SW-846:8310	SVOC	CAPU-14-79414	350053023	FB	18	1	0	0
SW-846:8310	SVOC	CAPU-14-79415	350053029	FD	18	1	0	0
SW-846:8310	SVOC	CAPU-14-79428	350053002	REG	18	1	0	0
SW-846:8310	SVOC	CAPU-14-79429	1203104428	MS	0	1	18	0
SW-846:8310	SVOC	CAPU-14-79431	350053010	REG	18	1	0	0
SW-846:8310	SVOC	LCS	1203104427	LCS	0	1	18	0
SW-846:8310	SVOC	LCSD	1203104430	LCSD	0	1	18	0
SW-846:8310	SVOC	MB	1203104426	MB	18	1	0	0
SW-846:8321A_MOD	LCMS/MS HIGH	CAPU-14-79413	350053021	PEB	20	2	0	0
SW-846:8321A_MOD	LCMS/MS HIGH	CAWA-14-79408	1203105144	MS	0	2	20	0
SW-846:8321A_MOD	LCMS/MS HIGH	CAWA-14-79408	1203105145	MSD	0	2	20	0
SW-846:8321A_MOD	LCMS/MS HIGH	LCS	1203105143	LCS	0	2	20	0
SW-846:8321A_MOD	LCMS/MS HIGH	MB	1203105142	MB	20	2	0	0
SW-846:9060	GENERAL CHEMISTRY	CAPU-14-79413	350053019	PEB	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	CAPU-14-79415	1203105823	DUP	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	CAPU-14-79415	350053030	FD	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	CAPU-14-79427	1203105822	DUP	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	CAPU-14-79428	350053003	REG	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	CAPU-14-79431	350053011	REG	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	LCS	1203105826	LCS	0	0	1	0
SW-846:9060	GENERAL CHEMISTRY	MB	1203105820	MB	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	VS-R28-V2-79984	1203112489	DUP	1	0	0	0

3. Are any analytes missing?

No.

4. Were any holding times exceeded?

No.

5. Any contaminants in blanks?



## 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
MB	1203104856	METHOD BLANK	EPA:351.2	W	Total Kjeldahl Nitrogen	0.0621	J	mg/L	0.100

Field Sample ID	Blank Lab	Blank Type	Analytical Method	Parameter Name	Blank Lab Result	Blank Lab Units	Lab Result	Lab Qualifier	Lab Detection Limit	Detect Flag	Detect to Nondetect Factor	Detect to Estimated Factor	Use Factors
CAPU-14-79428	1203104856	METHOD BLANK	EPA:351.2	Total Kjeldahl Nitrogen	0.0621	mg/L	0.064	J	0.100	Y	5	100	Y
CAPU-14-79431	1203104856	METHOD BLANK	EPA:351.2	Total Kjeldahl Nitrogen	0.0621	mg/L	0.0658	J	0.100	Y	5	100	Y

6. Any surrogate recoveries outside the control limits?

Field Sample ID	Lab Sample ID	Analytical Method	Parameter Name	Analysis Lot ID	Analysis Date	Spike Recovery	Upper Limit	Lower Limit	Rejection Limit
BDW08-14-79467	1203108031	SW-846:8082	4cmx	1395486	06-16-2014	42	120	45	10

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

Field Sample ID	MS Lab Sample ID	MSD Lab Sample ID	Analytical Method	Parameter Name	Analysis Lot ID	Analysis Date	Sample Matrix	MS Spike Recovery	MSD Spike Recovery	MS Upper Limit	MS Lower Limit	MS Reject Limit	RPD	RPD Limit
WST09-14-74376	1203104873		EPA:365.4	Total Phosphate as Phosphorus	1394295	06-11-2014	W	173		134	64	10		

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

## DATA VALIDATION REPORT

LCS Lab Sample	LCSD Lab	Analytical Method	Parameter Name	Lab Lot ID	Analysis	Sample Matrix	LCS Spike Recovery	LCSD Spike Recovery	Upper Limit	Lower Limit	Upper Rejection Limit	Lower Rejection Limit	RPD	RPD Limit
1203105143		SW-846:8321A_MOD	Tetryl	1394379	07-09-2014	W	54		120	65		10		

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	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-4	2014-3494	CAPU-14-79413	PEB	INIT	RAD	HASL-300:AM-241	Americium-241	U	U	R5	N	-.00533	pCi/L	-.00533	pCi/L	0.0461	0.00753	W	06/03/2014		1393676	VAL	Y
R-4	2014-3494	CAPU-14-79413	PEB	INIT	RAD	EPA:901.1	Cesium-137	U	U	R5	N	.197	pCi/L	.197	pCi/L	8.20	2.18	W	06/03/2014		1393862	VAL	Y
R-4	2014-3494	CAPU-14-79413	PEB	INIT	RAD	EPA:901.1	Cobalt-60	U	U	R5	N	2.29	pCi/L	2.29	pCi/L	8.32	1.76	W	06/03/2014		1393862	VAL	Y
R-4	2014-3494	CAPU-14-79413	PEB	INIT	RAD	EPA:900	Gross alpha	U	U	R5	N	-.352	pCi/L	-.352	pCi/L	1.21	0.331	W	06/03/2014		1395947	VAL	Y
R-4	2014-3494	CAPU-14-79413	PEB	INIT	RAD	EPA:900	Gross beta	U	U	R5	N	-.321	pCi/L	-.321	pCi/L	1.39	0.406	W	06/03/2014		1395947	VAL	Y
R-4	2014-3494	CAPU-14-79413	PEB	INIT	RAD	EPA:901.1	Neptunium-237	U	U	R5	N	6.4	pCi/L	6.4	pCi/L	13.9	3.54	W	06/03/2014		1393862	VAL	Y
R-4	2014-3494	CAPU-14-79413	PEB	INIT	RAD	HASL-300:ISOPU	Plutonium-238	U	U	R5	N	.00568	pCi/L	.00568	pCi/L	0.0313	0.00803	W	06/03/2014		1393681	VAL	Y

# DATA VALIDATION REPORT

	Location ID	COC Number	Field Sample ID	Sample Purpose	Analysis Type Code	Analytical Suite	Analytical Method	Parameter Name	Lab Qualifier	Validation Qualifier	Validation Reason Codes	Detect Flag	Lab Result	Lab Units	Report Result	Report Units	Report MDA	Report Uncertainty	Lab Matrix	Sample Date	Percent	Analysis Lot ID	Validation Status Code	Use Flag
R-4	2014-3494	CAPU-14-79413	PEB	INIT	RAD		HASL-300:ISOPU	Plutonium-239/240	U	U	R5	N	.0199	pCi/L	.0199	pCi/L	0.0517	0.011	W	06/03/2014	1393681	VAL	Y	
R-4	2014-3494	CAPU-14-79413	PEB	INIT	RAD		EPA:901.1	Potassium-40	U	U	R5	N	-12.3	pCi/L	-12.3	pCi/L	110	29.2	W	06/03/2014	1393862	VAL	Y	
R-4	2014-3494	CAPU-14-79413	PEB	INIT	RAD		EPA:901.1	Sodium-22	U	U	R5	N	-.544	pCi/L	-.544	pCi/L	5.68	1.40	W	06/03/2014	1393862	VAL	Y	
R-4	2014-3494	CAPU-14-79413	PEB	INIT	RAD		EPA:905.0	Strontium-90	U	U	R5	N	.38	pCi/L	.38	pCi/L	0.474	0.152	W	06/03/2014	1395946	VAL	Y	
R-4	2014-3494	CAPU-14-79413	PEB	INIT	LCMS/MS HIGH EXPLOSIVES	SW-846:8321A MOD	Tetryl		U	UJ	HE12a	N	0.529	ug/L	0.529	ug/L			W	06/03/2014	1394380	VAL	Y	
R-4	2014-3494	CAPU-14-79413	PEB	INIT	RAD		EPA:906.0	Tritium	U	U	R5	N	-40.7	pCi/L	-40.7	pCi/L	173	44.7	W	06/03/2014	1396341	VAL	Y	
R-4	2014-3494	CAPU-14-79413	PEB	INIT	RAD		HASL-300:ISOU	Uranium-234	U	U	R5	N	.00315	pCi/L	.00315	pCi/L	0.0814	0.00944	W	06/03/2014	1393680	VAL	Y	
R-4	2014-3494	CAPU-14-79413	PEB	INIT	RAD		HASL-300:ISOU	Uranium-235/236	U	U	R5	N	.00389	pCi/L	.00389	pCi/L	0.0682	0.00673	W	06/03/2014	1393680	VAL	Y	
R-4	2014-3494	CAPU-14-79413	PEB	INIT	RAD		HASL-300:ISOU	Uranium-238	U	U	R5	N	-.00315	pCi/L	-.00315	pCi/L	0.0457	0.00703	W	06/03/2014	1393680	VAL	Y	
R-4	2014-3494	CAPU-14-79415	FD	INIT	RAD		HASL-300:AM-241	Americium-241	U	U	R5	N	.00616	pCi/L	.00616	pCi/L	0.0533	0.00754	W	06/03/2014	1393676	VAL	Y	
R-4	2014-3494	CAPU-14-79415	FD	INIT	SVOC		SW-846:8310	Benzo(k)fluoranthene	J	R	SV19	Y	0.0102	ug/L	0.0102	ug/L			W	06/03/2014	1394138	VAL	Y	
R-4	2014-3494	CAPU-14-79415	FD	INIT	RAD		EPA:901.1	Cesium-137	U	U	R5	N	1	pCi/L	1	pCi/L	5.75	1.53	W	06/03/2014	1393862	VAL	Y	
R-4	2014-3494	CAPU-14-79415	FD	INIT	RAD		EPA:901.1	Cobalt-60	U	U	R5	N	1.81	pCi/L	1.81	pCi/L	5.83	1.29	W	06/03/2014	1393862	VAL	Y	
R-4	2014-3494	CAPU-14-79415	FD	INIT	RAD		EPA:900	Gross alpha	U	U	R5	N	.503	pCi/L	.503	pCi/L	2.31	0.682	W	06/03/2014	1395947	VAL	Y	
R-4	2014-3494	CAPU-14-79415	FD	INIT	RAD		EPA:901.1	Neptunium-237	U	U	R5	N	.67	pCi/L	.67	pCi/L	10.5	2.86	W	06/03/2014	1393862	VAL	Y	
R-4	2014-3494	CAPU-14-79415	FD	INIT	RAD		HASL-300:ISOPU	Plutonium-238	U	U	R5	N	.00425	pCi/L	.00425	pCi/L	0.0235	0.00521	W	06/03/2014	1393681	VAL	Y	
R-4	2014-3494	CAPU-14-79415	FD	INIT	RAD		HASL-300:ISOPU	Plutonium-239/240	U	U	R5	N	.0213	pCi/L	.0213	pCi/L	0.0387	0.00737	W	06/03/2014	1393681	VAL	Y	
R-4	2014-3494	CAPU-14-79415	FD	INIT	RAD		EPA:901.1	Potassium-40	U	U	R5	N	-1.58	pCi/L	-1.58	pCi/L	73.0	18.0	W	06/03/2014	1393862	VAL	Y	
R-4	2014-3494	CAPU-14-79415	FD	INIT	SVOC		SW-846:8310	Pyrene	J	R	SV19	Y	0.0187	ug/L	0.0187	ug/L			W	06/03/2014	1394138	VAL	Y	
R-4	2014-3494	CAPU-14-79415	FD	INIT	RAD		EPA:901.1	Sodium-22	U	U	R5	N	-.655	pCi/L	-.655	pCi/L	5.19	1.71	W	06/03/2014	1393862	VAL	Y	
R-4	2014-3494	CAPU-14-79415	FD	INIT	RAD		EPA:905.0	Strontium-90	U	U	R5	N	-.187	pCi/L	-.187	pCi/L	0.495	0.117	W	06/03/2014	1395946	VAL	Y	
R-4	2014-3494	CAPU-14-79415	FD	INIT	RAD		HASL-300:ISOU	Uranium-235/236	U	U	R5	N	.0182	pCi/L	.0182	pCi/L	0.0639	0.0109	W	06/03/2014	1393680	VAL	Y	
R-24	2014-3494	CAPU-14-79428	REG	INIT	RAD		HASL-300:AM-241	Americium-241	U	U	R5	N	0	pCi/L	0	pCi/L	0.0461	0.00654	W	06/03/2014	1393676	VAL	Y	
R-24	2014-3494	CAPU-14-79428	REG	INIT	RAD		EPA:901.1	Cesium-137	U	U	R5	N	-3.13	pCi/L	-3.13	pCi/L	4.69	1.70	W	06/03/2014	1393862	VAL	Y	
R-24	2014-3494	CAPU-14-79428	REG	INIT	RAD		EPA:901.1	Cobalt-60	U	U	R5	N	-.0249	pCi/L	-.0249	pCi/L	5.30	1.71	W	06/03/2014	1393862	VAL	Y	
R-24	2014-3494	CAPU-14-79428	REG	INIT	RAD		EPA:900	Gross alpha	U	U	R5	N	.935	pCi/L	.935	pCi/L	1.84	0.558	W	06/03/2014	1395947	VAL	Y	
R-24	2014-3494	CAPU-14-79428	REG	INIT	RAD		EPA:901.1	Neptunium-237	U	U	R5	N	-1.21	pCi/L	-1.21	pCi/L	9.06	2.79	W	06/03/2014	1393862	VAL	Y	
R-24	2014-3494	CAPU-14-79428	REG	INIT	RAD		HASL-300:ISOPU	Plutonium-238	U	U	R5	N	-.00592	pCi/L	-.00592	pCi/L	0.0327	0.00725	W	06/03/2014	1393681	VAL	Y	
R-24	2014-3494	CAPU-14-79428	REG	INIT	RAD		HASL-300:ISOPU	Plutonium-239/240	U	U	R5	N	.0385	pCi/L	.0385	pCi/L	0.0539	0.0122	W	06/03/2014	1393681	VAL	Y	
R-24	2014-3494	CAPU-14-79428	REG	INIT	RAD		EPA:901.1	Potassium-40	U	U	R5	N	27.2	pCi/L	27.2	pCi/L	48.1	19.3	W	06/03/2014	1393862	VAL	Y	
R-24	2014-3494	CAPU-14-79428	REG	INIT	RAD		EPA:901.1	Sodium-22	U	U	R5	N	1.53	pCi/L	1.53	pCi/L	5.23	1.19	W	06/03/2014	1393862	VAL	Y	
R-24	2014-3494	CAPU-14-79428	REG	INIT	RAD		EPA:905.0	Strontium-90	U	U	R5	N	-.112	pCi/L	-.112	pCi/L	0.475	0.119	W	06/03/2014	1395946	VAL	Y	

## DATA VALIDATION REPORT

	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	Defect 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-24	2014-3494	CAPU-14-79428	REG	INIT	GENERAL CHEMISTRY	EPA:351.2	Total Kjeldahl Nitrogen	J	U	14	N	0.064	mg/L	0.064	mg/L					W	06/03/2014		1394292	VAL	Y	
R-24	2014-3494	CAPU-14-79428	REG	INIT	RAD	HASL-300:ISOU	Uranium-235/236	U	U	R5	N	.03	pCi/L	.03	pCi/L	0.0658	0.0119			W	06/03/2014		1393680	VAL	Y	
R-4	2014-3494	CAPU-14-79431	REG	INIT	RAD	HASL-300:AM-241	Americium-241	U	U	R5	N	-.00275	pCi/L	-.00275	pCi/L	0.0476	0.00476			W	06/03/2014		1393676	VAL	Y	
R-4	2014-3494	CAPU-14-79431	REG	INIT	RAD	EPA:901.1	Cesium-137	U	U	R5	N	.845	pCi/L	.845	pCi/L	5.12	1.57			W	06/03/2014		1393862	VAL	Y	
R-4	2014-3494	CAPU-14-79431	REG	INIT	RAD	EPA:901.1	Cobalt-60	U	U	R5	N	3.71	pCi/L	3.71	pCi/L	7.29	1.52			W	06/03/2014		1393862	VAL	Y	
R-4	2014-3494	CAPU-14-79431	REG	INIT	RAD	EPA:900	Gross alpha	U	U	R5	N	1.9	pCi/L	1.9	pCi/L	2.17	0.685			W	06/03/2014		1395947	VAL	Y	
R-4	2014-3494	CAPU-14-79431	REG	INIT	RAD	EPA:901.1	Neptunium-237	U	U	R5	N	1.34	pCi/L	1.34	pCi/L	11.4	3.09			W	06/03/2014		1393862	VAL	Y	
R-4	2014-3494	CAPU-14-79431	REG	INIT	RAD	HASL-300:ISOPU	Plutonium-238	U	U	R5	N	-.0096	pCi/L	-.0096	pCi/L	0.0212	0.00576			W	06/03/2014		1393681	VAL	Y	
R-4	2014-3494	CAPU-14-79431	REG	INIT	RAD	HASL-300:ISOPU	Plutonium-239/240	U	U	R5	N	-.00768	pCi/L	-.00768	pCi/L	0.035	0.0112			W	06/03/2014		1393681	VAL	Y	
R-4	2014-3494	CAPU-14-79431	REG	INIT	RAD	EPA:901.1	Potassium-40	U	U	R5	N	14.8	pCi/L	14.8	pCi/L	78.6	18.3			W	06/03/2014		1393862	VAL	Y	
R-4	2014-3494	CAPU-14-79431	REG	INIT	RAD	EPA:901.1	Sodium-22	U	U	R5	N	.582	pCi/L	.582	pCi/L	5.11	1.48			W	06/03/2014		1393862	VAL	Y	
R-4	2014-3494	CAPU-14-79431	REG	INIT	RAD	EPA:905.0	Strontium-90	U	U	R5	N	.334	pCi/L	.334	pCi/L	0.493	0.155			W	06/03/2014		1395946	VAL	Y	
R-4	2014-3494	CAPU-14-79431	REG	INIT	GENERAL CHEMISTRY	EPA:351.2	Total Kjeldahl Nitrogen	J	U	14	N	0.0658	mg/L	0.0658	mg/L					W	06/03/2014		1394292	VAL	Y	
R-4	2014-3494	CAPU-14-79431	REG	INIT	RAD	HASL-300:ISOU	Uranium-235/236	U	U	R5	N	.0182	pCi/L	.0182	pCi/L	0.064	0.00966			W	06/03/2014		1393680	VAL	Y	

### Reason Code

### Description

HE12a	The LCS percent recovery was < the Lower Acceptance Limit but >10%. Follow the external laboratory limits.
14	the sample result is =<5x the concentration of related analyte in the method blank.
J_LAB	The analytical laboratory qualified the detected result as estimated (J) because the result was less the PQL but greater than the MDL
NQ	The analytical laboratory did not qualify the analyte as not detected and/or any other standard qualifire. The analyte is detected in the sample.
R5	Analyte is not detected because the amount reported is less than the MDC.
SV19	The LANL project chemist identified quality deficiencies in the reported data that requires further qualification. This code can only be used and/or under advisement by the LANL project chemist.
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
CAPU-14-79413	R-4	PEB	EPA:120.1	0	1

## DATA VALIDATION REPORT

Field Sample ID	Location ID	Sample Purpose	Analytical Method	No. Unuseable Records	Total Records
CAPU-14-79413	R-4	PEB	EPA:150.1	0	1
CAPU-14-79413	R-4	PEB	EPA:160.1	0	1
CAPU-14-79413	R-4	PEB	EPA:245.2	0	1
CAPU-14-79413	R-4	PEB	EPA:300.0	0	4
CAPU-14-79413	R-4	PEB	EPA:310.1	0	2
CAPU-14-79413	R-4	PEB	EPA:335.4	0	1
CAPU-14-79413	R-4	PEB	EPA:350.1	0	1
CAPU-14-79413	R-4	PEB	EPA:351.2	0	1
CAPU-14-79413	R-4	PEB	EPA:353.2	0	1
CAPU-14-79413	R-4	PEB	EPA:365.4	0	1
CAPU-14-79413	R-4	PEB	EPA:900	0	2
CAPU-14-79413	R-4	PEB	EPA:901.1	0	5
CAPU-14-79413	R-4	PEB	EPA:905.0	0	1
CAPU-14-79413	R-4	PEB	EPA:906.0	0	1
CAPU-14-79413	R-4	PEB	HASL-300:AM-241	0	1
CAPU-14-79413	R-4	PEB	HASL-300:ISOPU	0	2
CAPU-14-79413	R-4	PEB	HASL-300:ISOU	0	3
CAPU-14-79413	R-4	PEB	SM:A2340B	0	1
CAPU-14-79413	R-4	PEB	SW-846:6010C	0	17
CAPU-14-79413	R-4	PEB	SW-846:6020	0	11
CAPU-14-79413	R-4	PEB	SW-846:6850	0	1
CAPU-14-79413	R-4	PEB	SW-846:8011	0	2
CAPU-14-79413	R-4	PEB	SW-846:8081B	0	1
CAPU-14-79413	R-4	PEB	SW-846:8082	0	8
CAPU-14-79413	R-4	PEB	SW-846:8151A	0	1
CAPU-14-79413	R-4	PEB	SW-846:8260B	0	78
CAPU-14-79413	R-4	PEB	SW-846:8270D	0	60
CAPU-14-79413	R-4	PEB	SW-846:8310	0	18
CAPU-14-79413	R-4	PEB	SW-846:8321A_MOD	0	20
CAPU-14-79413	R-4	PEB	SW-846:9060	0	1
CAPU-14-79414	R-4	FB	SW-846:8011	0	2
CAPU-14-79414	R-4	FB	SW-846:8081B	0	1
CAPU-14-79414	R-4	FB	SW-846:8082	0	8
CAPU-14-79414	R-4	FB	SW-846:8151A	0	1
CAPU-14-79414	R-4	FB	SW-846:8260B	0	78
CAPU-14-79414	R-4	FB	SW-846:8270D	0	60
CAPU-14-79414	R-4	FB	SW-846:8310	0	18

## DATA VALIDATION REPORT

Field Sample ID	Location ID	Sample Purpose	Analytical Method	No. Unuseable Records	Total Records
CAPU-14-79415	R-4	FD	EPA:245.2	0	1
CAPU-14-79415	R-4	FD	EPA:335.4	0	1
CAPU-14-79415	R-4	FD	EPA:351.2	0	1
CAPU-14-79415	R-4	FD	EPA:900	0	2
CAPU-14-79415	R-4	FD	EPA:901.1	0	5
CAPU-14-79415	R-4	FD	EPA:905.0	0	1
CAPU-14-79415	R-4	FD	HASL-300:AM-241	0	1
CAPU-14-79415	R-4	FD	HASL-300:ISOPU	0	2
CAPU-14-79415	R-4	FD	HASL-300:ISOU	0	3
CAPU-14-79415	R-4	FD	SW-846:8011	0	2
CAPU-14-79415	R-4	FD	SW-846:8081B	0	1
CAPU-14-79415	R-4	FD	SW-846:8151A	0	1
CAPU-14-79415	R-4	FD	SW-846:8260B	0	78
CAPU-14-79415	R-4	FD	SW-846:8270D	0	60
CAPU-14-79415	R-4	FD	SW-846:8310	0	18
CAPU-14-79415	R-4	FD	SW-846:9060	0	1
CAPU-14-79416	R-4	FD	EPA:120.1	0	1
CAPU-14-79416	R-4	FD	EPA:150.1	0	1
CAPU-14-79416	R-4	FD	EPA:160.1	0	1
CAPU-14-79416	R-4	FD	EPA:245.2	0	1
CAPU-14-79416	R-4	FD	EPA:300.0	0	4
CAPU-14-79416	R-4	FD	EPA:310.1	0	2
CAPU-14-79416	R-4	FD	EPA:350.1	0	1
CAPU-14-79416	R-4	FD	EPA:353.2	0	1
CAPU-14-79416	R-4	FD	EPA:365.4	0	1
CAPU-14-79416	R-4	FD	SM:A2340B	0	1
CAPU-14-79416	R-4	FD	SW-846:6010C	0	17
CAPU-14-79416	R-4	FD	SW-846:6020	0	11
CAPU-14-79416	R-4	FD	SW-846:6850	0	1
CAPU-14-79420	R-24	FTB	SW-846:8011	0	2
CAPU-14-79420	R-24	FTB	SW-846:8260B	0	78
CAPU-14-79423	R-4	FTB	SW-846:8011	0	2
CAPU-14-79423	R-4	FTB	SW-846:8260B	0	78
CAPU-14-79428	R-24	REG	EPA:245.2	0	1
CAPU-14-79428	R-24	REG	EPA:335.4	0	1
CAPU-14-79428	R-24	REG	EPA:351.2	0	1
CAPU-14-79428	R-24	REG	EPA:900	0	2

# DATA VALIDATION REPORT

Field Sample ID	Location ID	Sample Purpose	Analytical Method	No. Unuseable Records	Total Records
CAPU-14-79428	R-24	REG	EPA:901.1	0	5
CAPU-14-79428	R-24	REG	EPA:905.0	0	1
CAPU-14-79428	R-24	REG	HASL-300:AM-241	0	1
CAPU-14-79428	R-24	REG	HASL-300:ISOPU	0	2
CAPU-14-79428	R-24	REG	HASL-300:ISOU	0	3
CAPU-14-79428	R-24	REG	SW-846:8011	0	2
CAPU-14-79428	R-24	REG	SW-846:8081B	0	1
CAPU-14-79428	R-24	REG	SW-846:8151A	0	1
CAPU-14-79428	R-24	REG	SW-846:8260B	0	78
CAPU-14-79428	R-24	REG	SW-846:8270D	0	60
CAPU-14-79428	R-24	REG	SW-846:8310	0	18
CAPU-14-79428	R-24	REG	SW-846:9060	0	1
CAPU-14-79431	R-4	REG	EPA:245.2	0	1
CAPU-14-79431	R-4	REG	EPA:335.4	0	1
CAPU-14-79431	R-4	REG	EPA:351.2	0	1
CAPU-14-79431	R-4	REG	EPA:900	0	2
CAPU-14-79431	R-4	REG	EPA:901.1	0	5
CAPU-14-79431	R-4	REG	EPA:905.0	0	1
CAPU-14-79431	R-4	REG	HASL-300:AM-241	0	1
CAPU-14-79431	R-4	REG	HASL-300:ISOPU	0	2
CAPU-14-79431	R-4	REG	HASL-300:ISOU	0	3
CAPU-14-79431	R-4	REG	SW-846:8011	0	2
CAPU-14-79431	R-4	REG	SW-846:8081B	0	1
CAPU-14-79431	R-4	REG	SW-846:8151A	0	1
CAPU-14-79431	R-4	REG	SW-846:8260B	0	78
CAPU-14-79431	R-4	REG	SW-846:8270D	0	60
CAPU-14-79431	R-4	REG	SW-846:8310	0	18
CAPU-14-79431	R-4	REG	SW-846:9060	0	1
CAPU-14-79436	R-24	REG	EPA:120.1	0	1
CAPU-14-79436	R-24	REG	EPA:150.1	0	1
CAPU-14-79436	R-24	REG	EPA:160.1	0	1
CAPU-14-79436	R-24	REG	EPA:245.2	0	1
CAPU-14-79436	R-24	REG	EPA:300.0	0	4
CAPU-14-79436	R-24	REG	EPA:310.1	0	2
CAPU-14-79436	R-24	REG	EPA:350.1	0	1
CAPU-14-79436	R-24	REG	EPA:353.2	0	1
CAPU-14-79436	R-24	REG	EPA:365.4	0	1

## DATA VALIDATION REPORT

Field Sample ID	Location ID	Sample Purpose	Analytical Method	No. Unuseable Records	Total Records
CAPU-14-79436	R-24	REG	SM:A2340B	0	1
CAPU-14-79436	R-24	REG	SW-846:6010C	0	17
CAPU-14-79436	R-24	REG	SW-846:6020	0	11
CAPU-14-79436	R-24	REG	SW-846:6850	0	1
CAPU-14-79439	R-4	REG	EPA:120.1	0	1
CAPU-14-79439	R-4	REG	EPA:150.1	0	1
CAPU-14-79439	R-4	REG	EPA:160.1	0	1
CAPU-14-79439	R-4	REG	EPA:245.2	0	1
CAPU-14-79439	R-4	REG	EPA:300.0	0	4
CAPU-14-79439	R-4	REG	EPA:310.1	0	2
CAPU-14-79439	R-4	REG	EPA:350.1	0	1
CAPU-14-79439	R-4	REG	EPA:353.2	0	1
CAPU-14-79439	R-4	REG	EPA:365.4	0	1
CAPU-14-79439	R-4	REG	SM:A2340B	0	1
CAPU-14-79439	R-4	REG	SW-846:6010C	0	17
CAPU-14-79439	R-4	REG	SW-846:6020	0	11
CAPU-14-79439	R-4	REG	SW-846:6850	0	1





July 02, 2014

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

Re: LANL-WQH Groundwater Samples  
Work Order: 350053  
SDG: 2014-3494

Dear Mr. Greene:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the following analytical results for the sample(s) we received on June 05, 2014, and analyzed for Explosives by LCMSMS, GC Semivolatile Herbicide, GC Semivolatile PCB, GC Semivolatile Pesticide, GC/MS Semivolatile, GC/MS Volatile, General Chemistry, HPLC Polynuclear Aromatic Hydrocarbon, 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,

Hope Taylor for  
Valerie Davis  
Project Manager

Purchase Order: 63641-10  
Chain of Custody: 2014-3494  
Enclosures



**ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)**  
**LANL-WQH Groundwater Samples**  
**Work Order #: 350053**  
**SDG: 2014-3494**

## Table of Contents

Case Narrative.....	1
Chain of Custody and Supporting Documentation.....	5
Data Review Qualifier Flag Definition Sheet.....	13
Volatile Analysis.....	16
Case Narrative.....	17
Sample Data Summary.....	23
Quality Control Summary.....	45
Quality Control Data.....	69
Miscellaneous.....	100
Semi-Volatile Analysis.....	102
Case Narrative.....	103
Sample Data Summary.....	109
Quality Control Summary.....	120
Quality Control Data.....	132
Miscellaneous.....	141
HPLC Polynuclear Aromatic Hydrocarbon Analysis.....	143
Sample Data Summary.....	150
QC Summary.....	156
QC Data.....	162
Perchlorates by LCMSMS Analysis.....	167

Case Narrative.....	168
Sample Data Summary.....	174
Quality Control Summary.....	179
Quality Control Data.....	182
Explosives by LCMSMS Analysis.....	188
Case Narrative.....	189
Sample Data Summary.....	197
Quality Control Summary.....	201
Quality Control Data.....	207
Miscellaneous.....	231
Pesticide Analysis.....	233
Case Narrative.....	234
Sample Data Summary.....	242
Quality Control Summary.....	255
Quality Control Data.....	265
PCB Analysis.....	273
Case Narrative.....	274
Sample Data Summary.....	280
Quality Control Summary.....	283
Quality Control Data.....	289
Herbicide Analysis.....	292

Case Narrative.....	293
Sample Data Summary.....	299
Quality Control Summary.....	305
Quality Control Data.....	311
Metals Analysis.....	316
Case Narrative.....	317
Sample Data Summary.....	323
Quality Control Summary.....	340
General Chem Analysis.....	354
Case Narrative.....	355
Sample Data Summary.....	386
Quality Control Summary.....	399
Miscellaneous.....	405
Radiological Analysis.....	412
Sample Data Summary.....	426
Quality Control Data.....	435

# Case Narrative

**Case Narrative for  
ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)  
LANL-WQH Groundwater Samples  
Workorder #: 350053  
SDG # : 2014-3494**

**July 02, 2014**

**Laboratory Identification:**

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

**Summary**

**Sample receipt** The samples arrived at GEL Laboratories LLC, Charleston, South Carolina on June 05, 2014 for analysis. Please see attached email for discrepancies. The samples were screened according to GEL Standard Operating Procedure. All sample containers arrived without any visible signs of tampering or breakage. Containers were checked for pH, where appropriate, and matched the preservative as documented on the accompanying chain of custody. Shipping container temperature was within specification (0 - 6C). Shipping container temperatures were checked, documented, and within specifications. There are no additional comments concerning sample receipt.

**Sample Identification** The laboratory received the following samples:

<b><u>Laboratory ID</u></b>	<b><u>Client ID</u></b>
350053001	CAPU-14-79428
350053002	CAPU-14-79428
350053003	CAPU-14-79428
350053004	CAPU-14-79428
350053005	CAPU-14-79428
350053006	CAPU-14-79436
350053007	CAPU-14-79420
350053008	CAPU-14-79420
350053009	CAPU-14-79431
350053010	CAPU-14-79431
350053011	CAPU-14-79431
350053012	CAPU-14-79431
350053013	CAPU-14-79431
350053014	CAPU-14-79439
350053015	CAPU-14-79413
350053016	CAPU-14-79413
350053017	CAPU-14-79413
350053018	CAPU-14-79413
350053019	CAPU-14-79413
350053020	CAPU-14-79413
350053021	CAPU-14-79413
350053022	CAPU-14-79414
350053023	CAPU-14-79414
350053024	CAPU-14-79414

350053025	CAPU-14-79414
350053026	CAPU-14-79414
350053027	CAPU-14-79414
350053028	CAPU-14-79415
350053029	CAPU-14-79415
350053030	CAPU-14-79415
350053031	CAPU-14-79415
350053032	CAPU-14-79415
350053033	CAPU-14-79416
350053034	CAPU-14-79423
350053035	CAPU-14-79423

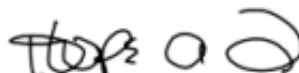
### **Case Narrative**

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 Semivolatile Herbicide, GC Semivolatile PCB, GC Semivolatile Pesticide, GC/MS Semivolatile, GC/MS Volatile, General Chemistry, HPLC Polynuclear Aromatic Hydrocarbon, 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.



Hope Taylor for  
Valerie Davis  
Project Manager



**List of current GEL Certifications as of 02 July 2014**

<b>State</b>	<b>Certification</b>
Alaska	UST-110
Arkansas	88-0651
CLIA	42D0904046
California NELAP	01151CA
Colorado	SC00012
Connecticut	PH-0169
Delaware	SC000122013-10
DoD ELAP/ ISO17025 A2LA	2567.01
Florida NELAP	E87156
Foreign Soils Permit	P330-12-00283, P330-12-00284
Georgia	SC00012
Georgia SDWA	967
Hawaii	SC000122013-10
Idaho Chemistry	SC00012
Idaho Radiochemistry	SC00012
Illinois NELAP	200029
Indiana	C-SC-01
Kansas NELAP	E-10332
Kentucky	90129
Louisiana NELAP	03046 (AI33904)
Louisiana SDWA	LA130005
Maryland	270
Massachusetts	M-SC012
Michigan	9976
Mississippi	SC000122013-10
Nebraska	NE-OS-26-13
Nevada	SC000122014-1
New Hampshire NELAP	2054
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
Oklahoma	9904
Pennsylvania NELAP	68-00485
Plant Material Permit	PDEP-12-00260
South Carolina Chemistry	10120001
South Carolina GVL	23611001
South Carolina Radiochemi	10120002
Tennessee	TN 02934
Texas NELAP	T104704235-14-9
Utah NELAP	SC000122014-12
Vermont	VT87156
Virginia NELAP	460202
Washington	C780-12
Wisconsin	999887790

# **Chain of Custody and Supporting Documentation**

General Engineering Laboratories, Inc., Charleston, SC  
2040 Savage Rd  
Charleston SC 29407

# Chain of Custody/Analysis Request

COC/Lab Request #:  
2014-3494  
Page 1 of 1

Client Contact:

Lab Agreement #: 126310011

Site Name: Los Alamos National Laboratory

Project Number:

Analysis Turnaround Time:

24 Hour - ☐ Other - ☐  
7 Day - ☐  
14 Day - ☐  
21 Day - ☐  
28 Day - ☒

Field Sample ID

Sample Date

Sample Time

Sample Matrix

MSGP-Hg

WSP-8011-EDB\_DBCP

WSP-8082-PCB

WSP-8260B-VOA

WSP-8270C-SVOA

WSP-8310-PAH

WSP-8321A-NMED HEXP

WSP-All Metals

WSP-CN(T)

WSP-GENINORG+Perchlorate

WSP-GrossA/B

WSP-H-3

WSP-LL-8081A-HCB

WSP-LL-8151A-PCP

WSP-LL-8260B

WSP-LL-8270C

WSP-NH3+NO3/NO2+PO4

WSP-RAD

WSP-TKN+TOC

Special Instructions:

Relinquished by:

Relinquished by:

Relinquished by:

Print Name:

Print Name:

Print Name:

Date/Time:

Date/Time:

Date/Time:

Received by:

Received by:

Received by:

Print Name:

Print Name:

Print Name:

Date/Time:

Date/Time:

Date/Time:

## SAMPLE RECEIPT &amp; REVIEW FORM

Client: <u>LANL</u>		SDG/AR/COC/Work Order: <u>2014-3494</u>	
Received By: <u>P. Went</u>		Date Received: <u>6-5-14</u>	
Suspected Hazard Information	Yes	No	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.
COC/Samples marked as radioactive?		X	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): <u>00 PM</u>
Classified Radioactive II or III by RSO?		X	If yes, Were swipes taken of sample containers < action levels?
COC/Samples marked containing PCBs?		X	
Package, COC, and/or Samples marked as beryllium or asbestos containing?		X	If yes, samples are to be segregated as Safety Controlled Samples, and opened by the GEL Safety Group.
Shipped as a DOT Hazardous?		X	Hazard Class Shipped: UN#:
Samples identified as Foreign Soil?		X	

Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1 Shipping containers received intact and sealed?	X			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2 Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	X			Preservation Method: Ice bags <u>Blue ice</u> Dry ice <u>None</u> Other (describe) *all temperatures are recorded in Celsius <u>2-5, 23</u>
2a Daily check performed and passed on IR temperature gun?	X			Temperature Device Serial #: Secondary Temperature Device Serial # (If Applicable): <u>130462966</u>
3 Chain of custody documents included with shipment?	X			
4 Sample containers intact and sealed?	X			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
5 Samples requiring chemical preservation at proper pH?	X			Sample ID's, containers affected and observed pH: If Preservation added Lot#:
6 VOA vials free of headspace (defined as < 6mm bubble)?	X			Sample ID's and containers affected:
7 Are Encore containers present?			X	(If yes, immediately deliver to Volatiles laboratory)
8 Samples received within holding time?	X			ID's and tests affected:
9 Sample ID's on COC match ID's on bottles?	X			Sample ID's and containers affected:
10 Date & time on COC match date & time on bottles?	X			Sample ID's affected:
11 Number of containers received match number indicated on COC?			X	Sample ID's affected: <u>SEE MORE BELOW</u> <u>CAPU-14-79414 rec'd (1) 8270c instead of (4)</u>
12 Are sample containers identifiable as GEL provided?			X	
13 COC form is properly signed in relinquished/received sections?	X			
14 Carrier and tracking number.	X			Circle Applicable: FedEx Air FedEx Ground UPS Field Services Courier Other <u>5908 1777 1251</u> <u>5908 1777 1230</u> <u>5908 1777 1262</u> <u>5908 1777 1240</u> <u>5908 1777 1229</u> <u>5908 1777 1218</u> <u>5908 1777 1300</u>

Comments (Use Continuation Form if needed): CAPU-14-79420 Rec'd (1) 8011 (1) 8260B instead of (2) etc.  
CAPU-14-79423 Rec'd (2) 8260B instead of (4). (1) 8011-EDB instead of (2).  
CAPU-14-79413 Rec'd (0) PCB, (1) HEP. Instead of (3). (2) 8270c instead of (4).  
CAPU-14-79415, 79431 rec'd (3) 8270c instead of (4) CAPU-14-79414 rec'd (1) PCB instead (3)

PM (or PMA) review: Initials

HA

Date

060514

Page

1 of 1

RE: Sample receipt issue from 06/05/14

**Subject:** RE: Sample receipt issue from 06/05/14  
**From:** "Greene, Keith R" <kgreene@lanl.gov>  
**Date:** 6/6/2014 9:40 AM  
**To:** Pat Dent <Pat.Dent@gel.com>  
**CC:** "team.davis" <team.davis@gel.com>, "LANL@amrad.com" <LANL@amrad.com>, "Patel, Nita" <npatel@lanl.gov>

Please use one of the svoc bottles for this test

---

**From:** Pat Dent [mailto:Pat.Dent@gel.com]  
**Sent:** Friday, June 06, 2014 6:44 AM  
**To:** Greene, Keith R  
**Cc:** team.davis; LANL@amrad.com; Patel, Nita  
**Subject:** Sample receipt issue from 06/05/14

RN#2014-3494  
CAPU-14-79420 lab received 1-8011-EDB & 1-8260b container chain indicates 2-each, CAPU-14-79423 lab received 2-8260b chain indicates 4, & 1-8011-EDB chain indicates 2.

**CAPU-14-79413 lab did not receive any PCB's chain indicates 3 PLEASE ADVISE!**  
CAPU-14-79413 lab received 1-HEXP and 2-8270c, chain indicates 4.  
CAPU-14-79415,79431 lab received 3-8270c, chain indicates 4.  
CAPU-14-79414 lab received 1-PCB, chain indicates 3, 1-8270c chain indicates 4.

Thanks!!

---

--  
Patricia Dent  
Project Manager Assistant  
GEL Laboratories, LLC  
2040 Savage Rd.  
Charleston, S.C. 29407  
Main: 843-556-8171 Ext 4264  
Fax: 843-766-1178  
Email: [pad@gel.com](mailto:pad@gel.com)  
Web: [www.gel.com](http://www.gel.com)

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

SHIP DATE: 04 JUN 14  
ACTWGT: 49.0 LB MAN  
CAD: 0014176/CAFE2704

BILL SENDER

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

**CHARLESTON SC 29407**  
(843) 566-8171

REF: WE991158W100



FedEx  
Express



2 of 3

MPS# 5908 1777 1251

0263

Mstr# 5908 1777 1240

0201

**XX CHSA**

THU - 05 JUN 10:30A  
PRIORITY OVERNIGHT

29407  
SC-US CHS



Part # 156148-434 R1T2 10/11

51BC3/A26D/6F03

ORIGIN ID:SAFA (505) 665-9966  
SHIP DATE: 04 JUN 14  
ACTWGT: 42.0 LB MAN  
CAD: 0014176/CAFE2704

KEITH GREENE  
LOS ALAMOS NATL LAB  
TA00 BLDG 1237 DPU 03  
BILL SENDER

LOS ALAMOS NM 87545  
UNITED STATES US

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

**CHARLESTON SC 29407**

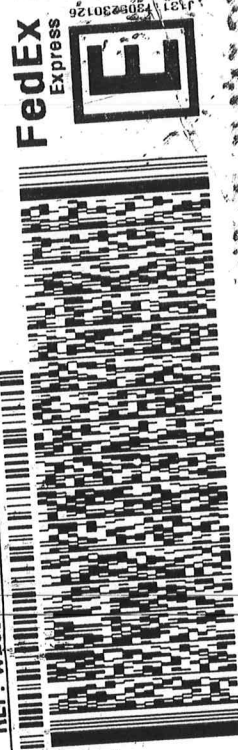
(843) 556-8171  
REF: WE991158W100

2c

CHARLESTON SC 29407

(843) 556-8171

REF: WE991158W100



THU - 05 JUN 10 30A  
PRIORITY OVERNIGHT

3 of 3  
MPS# 5908 1777 1262  
Mstr# 5908 1777 1240

XX CHSA

29407  
SC-US CHS



ORIGIN ID:SAFA (505) 665-9966  
SHIP DATE: 04 JUN 14  
ACTWGT: 49.0 LB MAN  
CAD: 0014176/CAFE2704

KEITH GREENE  
LOS ALAMOS NATL LAB  
TA00 BLDG 1237 DPU 03  
BILL SENDER

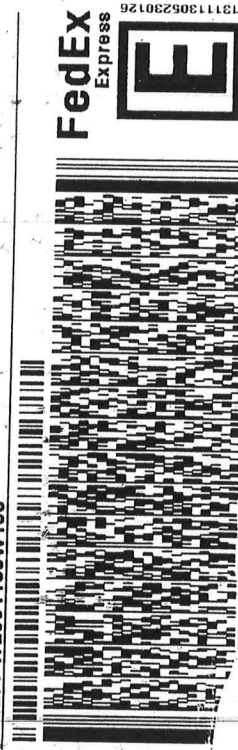
LOS ALAMOS NM 87545  
UNITED STATES US

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

**CHARLESTON SC 29407**

(843) 556-8171  
REF: WE991158W100

3

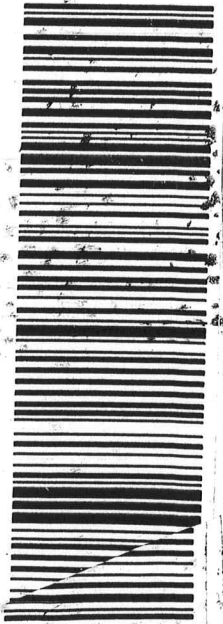


THU - 05 JUN 10 30A  
PRIORITY OVERNIGHT

3 of 3  
MPS# 5908 1777 1230  
Mstr# 5908 1777 1218

XX CHSA

29407  
SC-US CHS





ORIGIN ID: SAFA (505) 665-9966  
KEITH GREENE  
LOS ALAMOS NATL LAB.  
T800 BLDG 1237 DPU 03  
LOS ALAMOS, NM 87545  
UNITED STATES US

SHIP DATE: 04 JUN 14  
ACTWGT: 49.0 LB MAN  
CAD: 0014176/CAFE2704

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GENERAL ENGINEERING LAB  
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 566-8171

REF: WE991158W100



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1 of 3

TRK# 5908 1777 1240

## MASTER ##

XX CHSA

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PRIORITY OVERNIGHT

29407  
SC-US CHS



Part # 156148-434 R172 10/11

ORIGIN ID: SAFA (505) 665-9966  
KEITH GREENE  
LOS ALAMOS NATL LAB.  
T800 BLDG 1237 DPU 03  
LOS ALAMOS, NM 87545  
UNITED STATES US

SHIP DATE: 04 JUN 14  
ACTWGT: 49.0 LB MAN  
CAD: 0014176/CAFE2704

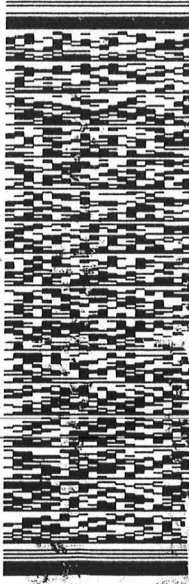
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TO VALERIE DAVIS  
GENERAL ENGINEERING LAB  
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 566-8171

REF: WE991158W100



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Express



2 of 3

MPS# 5908 1777 1229

0263

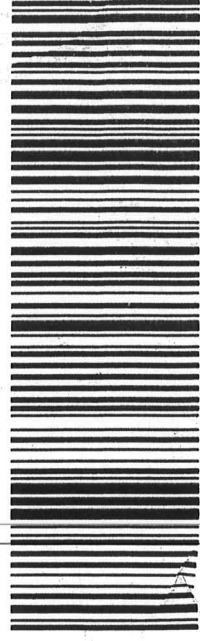
Mstr# 5908 1777 1218

0201

XX CHSA

PRIORITY OVERNIGHT

29407  
SC-US CHS



Part # 156148-434 R172 10/11

51B 3/A26D/6F03

51B 3/A26D/6F03

51B 3/A26D/6F03



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

SHIP DATE: 04JUN14  
ACTWGT: 48.0 LB MAN  
CAD: 0014176/CAFE2704  
BILL SENDER

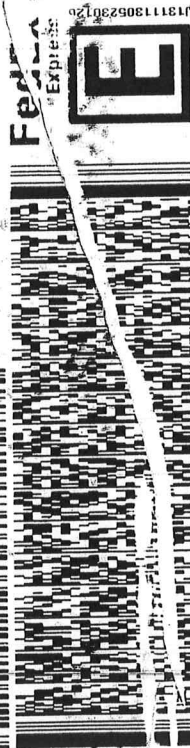
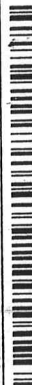
TO VALERIE DAVIS

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2040 SAVAGE RD

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REF: WE991158W100



1 of 3

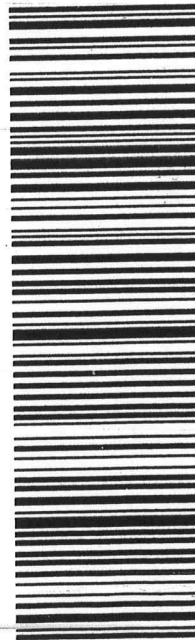
TRK# 5908 1777 1218

## MASTER ##

XX CHSA

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SC-US  
CHS

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PRIORITY OVERNIGHT



Part# 15614B-434 R1T2 10/11 88

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

SHIP DATE: 04JUN14  
ACTWGT: 49.0 LB MAN  
CAD: 0014176/CAFE2704  
BILL SENDER

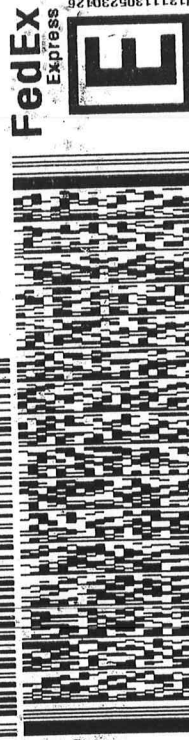
TO VALERIE DAVIS

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REF: WE991158W100

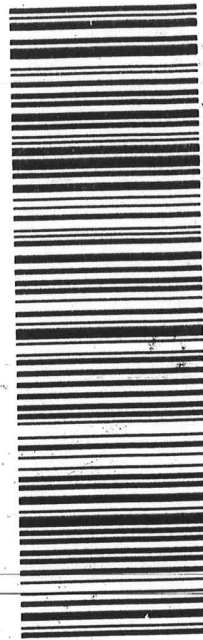


THU - 05 JUN 10:30A  
PRIORITY OVERNIGHT

TRK# 5908 1777 1300

XX CHSA

29407  
SC-US  
CHS



Part# 15614B-434 R1T2 10/11 88

518C3/A2ED/6F03

518C3/A2ED/6F03

# **Data Review Qualifier Flag Definition Sheet**

## Data Review Qualifier Definitions

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

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

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

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

# **Volatile Analysis**

# Case Narrative

**ChemStation Case Narrative  
ARS International, LLC (ARSL)  
SDG 2014-3494**

**Method/Analysis Information**

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

Analytical Method: SW846 8260B DOE-AL

Analytical Batch Number: 1396094

**Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
350053003	CAPU-14-79428
350053008	CAPU-14-79420
350053011	CAPU-14-79431
350053019	CAPU-14-79413
350053027	CAPU-14-79414
350053030	CAPU-14-79415
350053035	CAPU-14-79423
1203109624	Method Blank (MB)
1203109625	Method Blank (MB)
1203109626	350053011(CAPU-14-79431) Post Spike (PS)
1203109627	350053011(CAPU-14-79431) Post Spike (PS)
1203109628	350053011(CAPU-14-79431) Post Spike Duplicate (PSD)
1203109629	350053011(CAPU-14-79431) Post Spike Duplicate (PSD)
1203109630	Laboratory Control Sample (LCS)
1203109631	Laboratory Control Sample (LCS)
1203109632	Laboratory Control Sample (LCS)
1203109633	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 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-038 REV# 21.

Raw data reports are processed and reviewed by the analyst using the Chemstation software package. False positives have been removed from the quantitation reports per standard operating procedures (SOP) section 19.1.2. False positive analytes are designated on the quantitation report with a 'd' qualifier.

### **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**

At the request of the client, linear curve fits, for target analytes that did not meet the x-intercept criteria of less than or equal to 3 times the MDL and had %RSDs less than 60%, were set to use the average response factor to quantitate data in this SDG.

### **Continuing Calibration Verification Requirements**

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

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

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

The blanks 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 350053011 (CAPU-14-79431) was designated for spike analysis.

#### **Matrix Spike (PS) Recovery Statement**

The spike recoveries were within the required acceptance limits.

#### **Matrix Spike Duplicate (PSD) Recovery Statement**

The spike duplicate 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**

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. Samples 1203109626 (CAPU-14-79431), 1203109627 (CAPU-14-79431), 1203109628 (CAPU-14-79431), 1203109629 (CAPU-14-79431), 350053003 (CAPU-14-79428), 350053008 (CAPU-14-79420), 350053011 (CAPU-14-79431), 350053019 (CAPU-14-79413), 350053027 (CAPU-14-79414), 350053030 (CAPU-14-79415) and 350053035 (CAPU-14-79423) were not analyzed within the recommended holding. However, the samples were analyzed within two times the holding period. This satisfies the client criteria.

### **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**

### **Electronic Packaging Comment**

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

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

### **Data Exception (DER) Documentation**

The following DER was generated for this SDG: 1307752.

### **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) were requested for this sample delivery group/work order. Please note that non-requested target analytes that are reported on the quantitation reports will be present on the Form I. These detected analytes are included in the calibrated method and as a result will be reported on the Sample Data Summary (Form I) or Certificate of Analysis (C of A). TIC data are included on the Sample Data Summary (Form I).

### **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.

**System Configuration**

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

<b>Instrument ID</b>	<b>Instrument</b>	<b>System Configuration</b>	<b>Column ID</b>	<b>Column Description</b>	<b>P &amp; T Trap</b>
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 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: 2014-3494 GEL Work Order: 350053

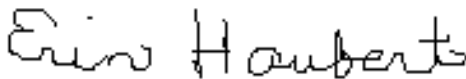
#### The Qualifiers in this report are defined as follows:

- \* A quality control analyte recovery is outside of specified acceptance criteria
- \*\* Analyte is a surrogate compound
- E Concentration of the target analyte exceeds the instrument calibration range
- H Analytical holding time was exceeded
- U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
- DL Indicates that sample is diluted.
- RA Indicates that sample is re-analyzed without re-extraction.
- RE Indicates that sample is re-extracted.

#### Review/Validation

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

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

Signature: 

Name: Erin Haubert

Date: 02 JUL 2014

Title: Data Validator

# **Sample Data Summary**

**Volatile  
Certificate of Analysis  
Sample Summary**

SDG Number: 2014-3494

Lab Sample ID: 350053003

Date Collected: 06/03/2014 11:21

Date Received: 06/05/2014 09:00

Matrix: W

Client: ARSL004

Project: ESHL00714

Client ID: CAPU-14-79428

Batch ID: 1396094

Method: SW846 8260B DOE-AL

SOP Ref: GL-OA-E-038

Run Date: 06/20/2014 16:01

Inst: VOA9.I

Dilution: 1

Prep Date: 06/20/2014 16:01

Analyst: RXY1

Purge Vol: 5 mL

Data File: 062014V9\9R512.D

Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	HU	1.00	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	HU	1.00	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	HU	1.00	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	HU	1.00	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	HU	1.00	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	HU	1.00	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	HU	1.00	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	HU	1.00	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	HU	1.00	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	HU	1.00	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	HU	1.00	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	HU	1.00	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	HU	1.00	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	HU	1.00	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	HU	1.00	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	HU	1.00	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	HU	1.00	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	HU	1.00	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	HU	1.00	ug/L	0.300	1.00
78-93-3	2-Butanone	HU	5.00	ug/L	2.00	5.00
126-99-8	2-Chloro-1,3-butadiene	HU	1.00	ug/L	0.200	1.00
95-49-8	2-Chlorotoluene	HU	1.00	ug/L	0.300	1.00
591-78-6	2-Hexanone	HU	5.00	ug/L	2.20	5.00
106-43-4	4-Chlorotoluene	HU	1.00	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	HU	1.00	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	HU	5.00	ug/L	1.50	5.00
67-64-1	Acetone	HU	10.0	ug/L	3.00	10.0
75-05-8	Acetonitrile	HU	25.0	ug/L	8.00	25.0
107-02-8	Acrolein	HU	5.00	ug/L	1.50	5.00
107-13-1	Acrylonitrile	HU	5.00	ug/L	1.00	5.00
107-05-1	Allyl chloride	HU	5.00	ug/L	1.50	5.00
71-43-2	Benzene	HU	1.00	ug/L	0.300	1.00
108-86-1	Bromobenzene	HU	1.00	ug/L	0.300	1.00
74-97-5	Bromochloromethane	HU	1.00	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	HU	1.00	ug/L	0.300	1.00
75-25-2	Bromoform	HU	1.00	ug/L	0.300	1.00
74-83-9	Bromomethane	HU	1.00	ug/L	0.300	1.00
75-15-0	Carbon disulfide	HU	5.00	ug/L	1.50	5.00

**Volatile  
Certificate of Analysis  
Sample Summary**

SDG Number: 2014-3494

Lab Sample ID: 350053003

Date Collected: 06/03/2014 11:21

Date Received: 06/05/2014 09:00

Matrix: W

Client: ARSL004

Project: ESHL00714

Client ID: CAPU-14-79428

Method: SW846 8260B DOE-AL

SOP Ref: GL-OA-E-038

Batch ID: 1396094

Inst: VOA9.I

Dilution: 1

Run Date: 06/20/2014 16:01

Analyst: RXY1

Purge Vol: 5 mL

Prep Date: 06/20/2014 16:01

Data File: 062014V9\9R512.D

Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
56-23-5	Carbon tetrachloride	HU	1.00	ug/L	0.300	1.00
108-90-7	Chlorobenzene	HU	1.00	ug/L	0.300	1.00
75-00-3	Chloroethane	HU	1.00	ug/L	0.300	1.00
67-66-3	Chloroform	HU	1.00	ug/L	0.300	1.00
74-87-3	Chloromethane	HU	1.00	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	HU	1.00	ug/L	0.300	1.00
74-95-3	Dibromomethane	HU	1.00	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	HU	1.00	ug/L	0.300	1.00
60-29-7	Ethyl ether	HU	1.00	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	HU	5.00	ug/L	1.50	5.00
100-41-4	Ethylbenzene	HU	1.00	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	HU	1.00	ug/L	0.300	1.00
74-88-4	Iodomethane	HU	5.00	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	HU	50.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	HU	1.00	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	HU	5.00	ug/L	1.00	5.00
80-62-6	Methyl methacrylate	HU	5.00	ug/L	1.50	5.00
75-09-2	Methylene chloride	HU	10.0	ug/L	3.00	10.0
91-20-3	Naphthalene	HU	1.00	ug/L	0.400	1.00
107-12-0	Propionitrile	HU	5.00	ug/L	1.50	5.00
100-42-5	Styrene	HU	1.00	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	HU	1.00	ug/L	0.300	1.00
108-88-3	Toluene	HU	1.00	ug/L	0.300	1.00
79-01-6	Trichloroethylene	HU	1.00	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	HU	1.00	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	HU	5.00	ug/L	1.50	5.00
108-05-4	Vinyl acetate	HU	5.00	ug/L	1.50	5.00
75-01-4	Vinyl chloride	HU	1.00	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	HU	1.00	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	HU	1.00	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	HU	2.00	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	HU	50.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	HU	1.00	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	HU	1.00	ug/L	0.300	1.00
95-47-6	o-Xylene	HU	1.00	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	HU	1.00	ug/L	0.300	1.00
1634-04-4	tert-Butyl methyl ether	HU	1.00	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene	HU	1.00	ug/L	0.300	1.00

**Volatile  
Certificate of Analysis  
Sample Summary**

SDG Number: 2014-3494

Lab Sample ID: 350053003

Date Collected: 06/03/2014 11:21

Date Received: 06/05/2014 09:00

Matrix: W

Client ID: CAPU-14-79428

Batch ID: 1396094

Run Date: 06/20/2014 16:01

Prep Date: 06/20/2014 16:01

Data File: 062014V9\9R512.D

Client: ARSL004

Method: SW846 8260B DOE-AL

Inst: VOA9.I

Analyst: RXY1

Column: DB-624

Project: ESHL00714

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
156-60-5	trans-1,2-Dichloroethylene	HU	1.00	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene	HU	1.00	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	44.8	50.0	ug/L 89.6	(78%-124%)
Bromofluorobenzene	44.2	50.0	ug/L 88.4	(80%-120%)
Toluene-d8	44.1	50.0	ug/L 88.1	(80%-120%)

**Tentatively Identified Compound Summary**

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown	4.286	115	ug/L	0	J
	unknown siloxane	14.663	6.26	ug/L	0	J

**Volatile  
Certificate of Analysis  
Sample Summary**

SDG Number: 2014-3494

Lab Sample ID: 350053008

Date Collected: 06/03/2014 11:21

Date Received: 06/05/2014 09:00

Matrix: W

Client: ARSL004

Project: ESHL00714

Client ID: CAPU-14-79420

Method: SW846 8260B DOE-AL

SOP Ref: GL-OA-E-038

Batch ID: 1396094

Inst: VOA9.I

Dilution: 1

Run Date: 06/19/2014 15:22

Analyst: RXY1

Purge Vol: 5 mL

Prep Date: 06/19/2014 15:22

Data File: 061914V9\9R418.D

Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	HU	1.00	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	HU	1.00	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	HU	1.00	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	HU	1.00	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	HU	1.00	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	HU	1.00	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	HU	1.00	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	HU	1.00	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	HU	1.00	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	HU	1.00	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	HU	1.00	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	HU	1.00	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	HU	1.00	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	HU	1.00	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	HU	1.00	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	HU	1.00	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	HU	1.00	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	HU	1.00	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	HU	1.00	ug/L	0.300	1.00
78-93-3	2-Butanone	HU	5.00	ug/L	2.00	5.00
126-99-8	2-Chloro-1,3-butadiene	HU	1.00	ug/L	0.200	1.00
95-49-8	2-Chlorotoluene	HU	1.00	ug/L	0.300	1.00
591-78-6	2-Hexanone	HU	5.00	ug/L	2.20	5.00
106-43-4	4-Chlorotoluene	HU	1.00	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	HU	1.00	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	HU	5.00	ug/L	1.50	5.00
67-64-1	Acetone	HU	10.0	ug/L	3.00	10.0
75-05-8	Acetonitrile	HU	25.0	ug/L	8.00	25.0
107-02-8	Acrolein	HU	5.00	ug/L	1.50	5.00
107-13-1	Acrylonitrile	HU	5.00	ug/L	1.00	5.00
107-05-1	Allyl chloride	HU	5.00	ug/L	1.50	5.00
71-43-2	Benzene	HU	1.00	ug/L	0.300	1.00
108-86-1	Bromobenzene	HU	1.00	ug/L	0.300	1.00
74-97-5	Bromochloromethane	HU	1.00	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	HU	1.00	ug/L	0.300	1.00
75-25-2	Bromoform	HU	1.00	ug/L	0.300	1.00
74-83-9	Bromomethane	HU	1.00	ug/L	0.300	1.00
75-15-0	Carbon disulfide	HU	5.00	ug/L	1.50	5.00



**Volatile  
Certificate of Analysis  
Sample Summary**

SDG Number: 2014-3494

Lab Sample ID: 350053008

Date Collected: 06/03/2014 11:21

Date Received: 06/05/2014 09:00

Matrix: W

Client: ARSL004

Project: ESHL00714

Client ID: CAPU-14-79420

Method: SW846 8260B DOE-AL

SOP Ref: GL-OA-E-038

Batch ID: 1396094

Inst: VOA9.I

Dilution: 1

Run Date: 06/19/2014 15:22

Analyst: RXY1

Purge Vol: 5 mL

Prep Date: 06/19/2014 15:22

Data File: 061914V9\9R418.D

Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
56-23-5	Carbon tetrachloride	HU	1.00	ug/L	0.300	1.00
108-90-7	Chlorobenzene	HU	1.00	ug/L	0.300	1.00
75-00-3	Chloroethane	HU	1.00	ug/L	0.300	1.00
67-66-3	Chloroform	HU	1.00	ug/L	0.300	1.00
74-87-3	Chloromethane	HU	1.00	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	HU	1.00	ug/L	0.300	1.00
74-95-3	Dibromomethane	HU	1.00	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	HU	1.00	ug/L	0.300	1.00
60-29-7	Ethyl ether	HU	1.00	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	HU	5.00	ug/L	1.50	5.00
100-41-4	Ethylbenzene	HU	1.00	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	HU	1.00	ug/L	0.300	1.00
74-88-4	Iodomethane	HU	5.00	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	HU	50.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	HU	1.00	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	HU	5.00	ug/L	1.00	5.00
80-62-6	Methyl methacrylate	HU	5.00	ug/L	1.50	5.00
75-09-2	Methylene chloride	HU	10.0	ug/L	3.00	10.0
91-20-3	Naphthalene	HU	1.00	ug/L	0.400	1.00
107-12-0	Propionitrile	HU	5.00	ug/L	1.50	5.00
100-42-5	Styrene	HU	1.00	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	HU	1.00	ug/L	0.300	1.00
108-88-3	Toluene	HU	1.00	ug/L	0.300	1.00
79-01-6	Trichloroethylene	HU	1.00	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	HU	1.00	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	HU	5.00	ug/L	1.50	5.00
108-05-4	Vinyl acetate	HU	5.00	ug/L	1.50	5.00
75-01-4	Vinyl chloride	HU	1.00	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	HU	1.00	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	HU	1.00	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	HU	2.00	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	HU	50.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	HU	1.00	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	HU	1.00	ug/L	0.300	1.00
95-47-6	o-Xylene	HU	1.00	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	HU	1.00	ug/L	0.300	1.00
1634-04-4	tert-Butyl methyl ether	HU	1.00	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene	HU	1.00	ug/L	0.300	1.00

**Volatile  
Certificate of Analysis  
Sample Summary**

SDG Number: 2014-3494

Lab Sample ID: 350053008

Date Collected: 06/03/2014 11:21

Date Received: 06/05/2014 09:00

Matrix: W

Client ID: CAPU-14-79420

Batch ID: 1396094

Run Date: 06/19/2014 15:22

Prep Date: 06/19/2014 15:22

Data File: 061914V9\9R418.D

Client: ARSL004

Method: SW846 8260B DOE-AL

Inst: VOA9.I

Analyst: RXY1

Project: ESHL00714

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
156-60-5	trans-1,2-Dichloroethylene	HU	1.00	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene	HU	1.00	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	49.5	50.0	ug/L 99.1	(78%-124%)
Bromofluorobenzene	45.8	50.0	ug/L 91.6	(80%-120%)
Toluene-d8	46.3	50.0	ug/L 92.7	(80%-120%)

**Tentatively Identified Compound Summary**

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown	4.286	44.9	ug/L	0	J
	unknown siloxane	14.663	8.34	ug/L	0	J

**Volatile  
Certificate of Analysis  
Sample Summary**

SDG Number: 2014-3494

Lab Sample ID: 350053011

Date Collected: 06/03/2014 11:48

Date Received: 06/05/2014 09:00

Matrix: W

Client: ARSL004

Project: ESHL00714

Client ID: CAPU-14-79431

Method: SW846 8260B DOE-AL

SOP Ref: GL-OA-E-038

Batch ID: 1396094

Inst: VOA9.I

Dilution: 1

Run Date: 06/20/2014 16:29

Analyst: RXY1

Purge Vol: 5 mL

Prep Date: 06/20/2014 16:29

Data File: 062014V9\9R513.D

Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	HU	1.00	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	HU	1.00	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	HU	1.00	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	HU	1.00	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	HU	1.00	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	HU	1.00	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	HU	1.00	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	HU	1.00	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	HU	1.00	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	HU	1.00	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	HU	1.00	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	HU	1.00	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	HU	1.00	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	HU	1.00	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	HU	1.00	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	HU	1.00	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	HU	1.00	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	HU	1.00	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	HU	1.00	ug/L	0.300	1.00
78-93-3	2-Butanone	HU	5.00	ug/L	2.00	5.00
126-99-8	2-Chloro-1,3-butadiene	HU	1.00	ug/L	0.200	1.00
95-49-8	2-Chlorotoluene	HU	1.00	ug/L	0.300	1.00
591-78-6	2-Hexanone	HU	5.00	ug/L	2.20	5.00
106-43-4	4-Chlorotoluene	HU	1.00	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	HU	1.00	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	HU	5.00	ug/L	1.50	5.00
67-64-1	Acetone	HU	10.0	ug/L	3.00	10.0
75-05-8	Acetonitrile	HU	25.0	ug/L	8.00	25.0
107-02-8	Acrolein	HU	5.00	ug/L	1.50	5.00
107-13-1	Acrylonitrile	HU	5.00	ug/L	1.00	5.00
107-05-1	Allyl chloride	HU	5.00	ug/L	1.50	5.00
71-43-2	Benzene	HU	1.00	ug/L	0.300	1.00
108-86-1	Bromobenzene	HU	1.00	ug/L	0.300	1.00
74-97-5	Bromochloromethane	HU	1.00	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	HU	1.00	ug/L	0.300	1.00
75-25-2	Bromoform	HU	1.00	ug/L	0.300	1.00
74-83-9	Bromomethane	HU	1.00	ug/L	0.300	1.00
75-15-0	Carbon disulfide	HU	5.00	ug/L	1.50	5.00

**Volatile**  
**Certificate of Analysis**  
**Sample Summary**

SDG Number: 2014-3494

Lab Sample ID: 350053011

Date Collected: 06/03/2014 11:48

Date Received: 06/05/2014 09:00

Matrix: W

Client: ARSL004

Project: ESHL00714

Client ID: CAPU-14-79431

Method: SW846 8260B DOE-AL

SOP Ref: GL-OA-E-038

Batch ID: 1396094

Inst: VOA9.I

Dilution: 1

Run Date: 06/20/2014 16:29

Analyst: RXY1

Purge Vol: 5 mL

Prep Date: 06/20/2014 16:29

Data File: 062014V9\9R513.D

Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
56-23-5	Carbon tetrachloride	HU	1.00	ug/L	0.300	1.00
108-90-7	Chlorobenzene	HU	1.00	ug/L	0.300	1.00
75-00-3	Chloroethane	HU	1.00	ug/L	0.300	1.00
67-66-3	Chloroform	HU	1.00	ug/L	0.300	1.00
74-87-3	Chloromethane	HU	1.00	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	HU	1.00	ug/L	0.300	1.00
74-95-3	Dibromomethane	HU	1.00	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	HU	1.00	ug/L	0.300	1.00
60-29-7	Ethyl ether	HU	1.00	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	HU	5.00	ug/L	1.50	5.00
100-41-4	Ethylbenzene	HU	1.00	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	HU	1.00	ug/L	0.300	1.00
74-88-4	Iodomethane	HU	5.00	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	HU	50.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	HU	1.00	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	HU	5.00	ug/L	1.00	5.00
80-62-6	Methyl methacrylate	HU	5.00	ug/L	1.50	5.00
75-09-2	Methylene chloride	HU	10.0	ug/L	3.00	10.0
91-20-3	Naphthalene	HU	1.00	ug/L	0.400	1.00
107-12-0	Propionitrile	HU	5.00	ug/L	1.50	5.00
100-42-5	Styrene	HU	1.00	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	HU	1.00	ug/L	0.300	1.00
108-88-3	Toluene	HU	1.00	ug/L	0.300	1.00
79-01-6	Trichloroethylene	HU	1.00	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	HU	1.00	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	HU	5.00	ug/L	1.50	5.00
108-05-4	Vinyl acetate	HU	5.00	ug/L	1.50	5.00
75-01-4	Vinyl chloride	HU	1.00	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	HU	1.00	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	HU	1.00	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	HU	2.00	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	HU	50.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	HU	1.00	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	HU	1.00	ug/L	0.300	1.00
95-47-6	o-Xylene	HU	1.00	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	HU	1.00	ug/L	0.300	1.00
1634-04-4	tert-Butyl methyl ether	HU	1.00	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene	HU	1.00	ug/L	0.300	1.00

**Volatile  
Certificate of Analysis  
Sample Summary**

SDG Number: 2014-3494

Lab Sample ID: 350053011

Date Collected: 06/03/2014 11:48

Date Received: 06/05/2014 09:00

Matrix: W

Client ID: CAPU-14-79431

Batch ID: 1396094

Run Date: 06/20/2014 16:29

Prep Date: 06/20/2014 16:29

Data File: 062014V9\9R513.D

Client: ARSL004

Method: SW846 8260B DOE-AL

Inst: VOA9.I

Analyst: RXY1

Project: ESHL00714

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
156-60-5	trans-1,2-Dichloroethylene	HU	1.00	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene	HU	1.00	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	45.4	50.0	ug/L 90.8	(78%-124%)
Bromofluorobenzene	45.3	50.0	ug/L 90.6	(80%-120%)
Toluene-d8	46.8	50.0	ug/L 93.5	(80%-120%)

**Tentatively Identified Compound Summary**

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown	4.286	96.5	ug/L	0	J
	unknown siloxane	14.663	9.2	ug/L	0	J

**Volatile**  
**Certificate of Analysis**  
**Sample Summary**

SDG Number: 2014-3494

Lab Sample ID: 350053019

Date Collected: 06/03/2014 13:48

Date Received: 06/05/2014 09:00

Matrix: W

Client: ARSL004

Project: ESHL00714

Client ID: CAPU-14-79413

Method: SW846 8260B DOE-AL

SOP Ref: GL-OA-E-038

Batch ID: 1396094

Inst: VOA9.I

Dilution: 1

Run Date: 06/20/2014 16:57

Analyst: RXY1

Purge Vol: 5 mL

Prep Date: 06/20/2014 16:57

Data File: 062014V9\9R514.D

Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	HU	1.00	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	HU	1.00	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	HU	1.00	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	HU	1.00	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	HU	1.00	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	HU	1.00	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	HU	1.00	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	HU	1.00	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	HU	1.00	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	HU	1.00	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	HU	1.00	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	HU	1.00	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	HU	1.00	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	HU	1.00	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	HU	1.00	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	HU	1.00	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	HU	1.00	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	HU	1.00	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	HU	1.00	ug/L	0.300	1.00
78-93-3	2-Butanone	HU	5.00	ug/L	2.00	5.00
126-99-8	2-Chloro-1,3-butadiene	HU	1.00	ug/L	0.200	1.00
95-49-8	2-Chlorotoluene	HU	1.00	ug/L	0.300	1.00
591-78-6	2-Hexanone	HU	5.00	ug/L	2.20	5.00
106-43-4	4-Chlorotoluene	HU	1.00	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	HU	1.00	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	HU	5.00	ug/L	1.50	5.00
67-64-1	Acetone	HU	10.0	ug/L	3.00	10.0
75-05-8	Acetonitrile	HU	25.0	ug/L	8.00	25.0
107-02-8	Acrolein	HU	5.00	ug/L	1.50	5.00
107-13-1	Acrylonitrile	HU	5.00	ug/L	1.00	5.00
107-05-1	Allyl chloride	HU	5.00	ug/L	1.50	5.00
71-43-2	Benzene	HU	1.00	ug/L	0.300	1.00
108-86-1	Bromobenzene	HU	1.00	ug/L	0.300	1.00
74-97-5	Bromochloromethane	HU	1.00	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	HU	1.00	ug/L	0.300	1.00
75-25-2	Bromoform	HU	1.00	ug/L	0.300	1.00
74-83-9	Bromomethane	HU	1.00	ug/L	0.300	1.00
75-15-0	Carbon disulfide	HU	5.00	ug/L	1.50	5.00

**Volatile  
Certificate of Analysis  
Sample Summary**

SDG Number: 2014-3494

Lab Sample ID: 350053019

Date Collected: 06/03/2014 13:48

Date Received: 06/05/2014 09:00

Matrix: W

Client: ARSL004

Project: ESHL00714

Client ID: CAPU-14-79413

Method: SW846 8260B DOE-AL

SOP Ref: GL-OA-E-038

Batch ID: 1396094

Inst: VOA9.I

Dilution: 1

Run Date: 06/20/2014 16:57

Analyst: RXY1

Purge Vol: 5 mL

Prep Date: 06/20/2014 16:57

Data File: 062014V9\9R514.D

Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
56-23-5	Carbon tetrachloride	HU	1.00	ug/L	0.300	1.00
108-90-7	Chlorobenzene	HU	1.00	ug/L	0.300	1.00
75-00-3	Chloroethane	HU	1.00	ug/L	0.300	1.00
67-66-3	Chloroform	HU	1.00	ug/L	0.300	1.00
74-87-3	Chloromethane	HU	1.00	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	HU	1.00	ug/L	0.300	1.00
74-95-3	Dibromomethane	HU	1.00	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	HU	1.00	ug/L	0.300	1.00
60-29-7	Ethyl ether	HU	1.00	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	HU	5.00	ug/L	1.50	5.00
100-41-4	Ethylbenzene	HU	1.00	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	HU	1.00	ug/L	0.300	1.00
74-88-4	Iodomethane	HU	5.00	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	HU	50.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	HU	1.00	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	HU	5.00	ug/L	1.00	5.00
80-62-6	Methyl methacrylate	HU	5.00	ug/L	1.50	5.00
75-09-2	Methylene chloride	HU	10.0	ug/L	3.00	10.0
91-20-3	Naphthalene	HU	1.00	ug/L	0.400	1.00
107-12-0	Propionitrile	HU	5.00	ug/L	1.50	5.00
100-42-5	Styrene	HU	1.00	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	HU	1.00	ug/L	0.300	1.00
108-88-3	Toluene	HU	1.00	ug/L	0.300	1.00
79-01-6	Trichloroethylene	HU	1.00	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	HU	1.00	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	HU	5.00	ug/L	1.50	5.00
108-05-4	Vinyl acetate	HU	5.00	ug/L	1.50	5.00
75-01-4	Vinyl chloride	HU	1.00	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	HU	1.00	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	HU	1.00	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	HU	2.00	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	HU	50.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	HU	1.00	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	HU	1.00	ug/L	0.300	1.00
95-47-6	o-Xylene	HU	1.00	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	HU	1.00	ug/L	0.300	1.00
1634-04-4	tert-Butyl methyl ether	HU	1.00	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene	HU	1.00	ug/L	0.300	1.00

**Volatile  
Certificate of Analysis  
Sample Summary**

SDG Number: 2014-3494

Lab Sample ID: 350053019

Date Collected: 06/03/2014 13:48

Date Received: 06/05/2014 09:00

Matrix: W

Client ID: CAPU-14-79413

Batch ID: 1396094

Run Date: 06/20/2014 16:57

Prep Date: 06/20/2014 16:57

Data File: 062014V9\9R514.D

Client: ARSL004

Method: SW846 8260B DOE-AL

Inst: VOA9.I

Analyst: RXY1

Project: ESHL00714

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
156-60-5	trans-1,2-Dichloroethylene	HU	1.00	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene	HU	1.00	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	48.4	50.0	96.7	(78%-124%)
Bromofluorobenzene	46.0	50.0	91.9	(80%-120%)
Toluene-d8	45.8	50.0	91.6	(80%-120%)

**Tentatively Identified Compound Summary**

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown	4.286	37.2	ug/L	0	J
	unknown siloxane	12.292	6.45	ug/L	0	J
	unknown siloxane	14.663	18.6	ug/L	0	J



**Volatile**  
**Certificate of Analysis**  
**Sample Summary**

SDG Number: 2014-3494

Lab Sample ID: 350053027

Date Collected: 06/03/2014 11:48

Date Received: 06/05/2014 09:00

Matrix: W

Client: ARSL004

Project: ESHL00714

Client ID: CAPU-14-79414

Method: SW846 8260B DOE-AL

SOP Ref: GL-OA-E-038

Batch ID: 1396094

Inst: VOA9.I

Dilution: 1

Run Date: 06/20/2014 17:25

Analyst: RXY1

Purge Vol: 5 mL

Prep Date: 06/20/2014 17:25

Data File: 062014V9\9R515.D

Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	HU	1.00	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	HU	1.00	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	HU	1.00	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	HU	1.00	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	HU	1.00	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	HU	1.00	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	HU	1.00	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	HU	1.00	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	HU	1.00	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	HU	1.00	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	HU	1.00	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	HU	1.00	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	HU	1.00	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	HU	1.00	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	HU	1.00	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	HU	1.00	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	HU	1.00	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	HU	1.00	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	HU	1.00	ug/L	0.300	1.00
78-93-3	2-Butanone	HU	5.00	ug/L	2.00	5.00
126-99-8	2-Chloro-1,3-butadiene	HU	1.00	ug/L	0.200	1.00
95-49-8	2-Chlorotoluene	HU	1.00	ug/L	0.300	1.00
591-78-6	2-Hexanone	HU	5.00	ug/L	2.20	5.00
106-43-4	4-Chlorotoluene	HU	1.00	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	HU	1.00	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	HU	5.00	ug/L	1.50	5.00
67-64-1	Acetone	HU	10.0	ug/L	3.00	10.0
75-05-8	Acetonitrile	HU	25.0	ug/L	8.00	25.0
107-02-8	Acrolein	HU	5.00	ug/L	1.50	5.00
107-13-1	Acrylonitrile	HU	5.00	ug/L	1.00	5.00
107-05-1	Allyl chloride	HU	5.00	ug/L	1.50	5.00
71-43-2	Benzene	HU	1.00	ug/L	0.300	1.00
108-86-1	Bromobenzene	HU	1.00	ug/L	0.300	1.00
74-97-5	Bromochloromethane	HU	1.00	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	HU	1.00	ug/L	0.300	1.00
75-25-2	Bromoform	HU	1.00	ug/L	0.300	1.00
74-83-9	Bromomethane	HU	1.00	ug/L	0.300	1.00
75-15-0	Carbon disulfide	HU	5.00	ug/L	1.50	5.00

**Volatile  
Certificate of Analysis  
Sample Summary**

SDG Number: 2014-3494

Lab Sample ID: 350053027

Date Collected: 06/03/2014 11:48

Date Received: 06/05/2014 09:00

Matrix: W

Client: ARSL004

Project: ESHL00714

Client ID: CAPU-14-79414

Method: SW846 8260B DOE-AL

SOP Ref: GL-OA-E-038

Batch ID: 1396094

Inst: VOA9.I

Dilution: 1

Run Date: 06/20/2014 17:25

Analyst: RXY1

Purge Vol: 5 mL

Prep Date: 06/20/2014 17:25

Data File: 062014V9\9R515.D

Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
56-23-5	Carbon tetrachloride	HU	1.00	ug/L	0.300	1.00
108-90-7	Chlorobenzene	HU	1.00	ug/L	0.300	1.00
75-00-3	Chloroethane	HU	1.00	ug/L	0.300	1.00
67-66-3	Chloroform	HU	1.00	ug/L	0.300	1.00
74-87-3	Chloromethane	HU	1.00	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	HU	1.00	ug/L	0.300	1.00
74-95-3	Dibromomethane	HU	1.00	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	HU	1.00	ug/L	0.300	1.00
60-29-7	Ethyl ether	HU	1.00	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	HU	5.00	ug/L	1.50	5.00
100-41-4	Ethylbenzene	HU	1.00	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	HU	1.00	ug/L	0.300	1.00
74-88-4	Iodomethane	HU	5.00	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	HU	50.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	HU	1.00	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	HU	5.00	ug/L	1.00	5.00
80-62-6	Methyl methacrylate	HU	5.00	ug/L	1.50	5.00
75-09-2	Methylene chloride	HU	10.0	ug/L	3.00	10.0
91-20-3	Naphthalene	HU	1.00	ug/L	0.400	1.00
107-12-0	Propionitrile	HU	5.00	ug/L	1.50	5.00
100-42-5	Styrene	HU	1.00	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	HU	1.00	ug/L	0.300	1.00
108-88-3	Toluene	HU	1.00	ug/L	0.300	1.00
79-01-6	Trichloroethylene	HU	1.00	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	HU	1.00	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	HU	5.00	ug/L	1.50	5.00
108-05-4	Vinyl acetate	HU	5.00	ug/L	1.50	5.00
75-01-4	Vinyl chloride	HU	1.00	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	HU	1.00	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	HU	1.00	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	HU	2.00	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	HU	50.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	HU	1.00	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	HU	1.00	ug/L	0.300	1.00
95-47-6	o-Xylene	HU	1.00	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	HU	1.00	ug/L	0.300	1.00
1634-04-4	tert-Butyl methyl ether	HU	1.00	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene	HU	1.00	ug/L	0.300	1.00

**Volatile  
Certificate of Analysis  
Sample Summary**

SDG Number: 2014-3494

Lab Sample ID: 350053027

Date Collected: 06/03/2014 11:48

Date Received: 06/05/2014 09:00

Matrix: W

Client ID: CAPU-14-79414

Batch ID: 1396094

Run Date: 06/20/2014 17:25

Prep Date: 06/20/2014 17:25

Data File: 062014V9\9R515.D

Client: ARSL004

Method: SW846 8260B DOE-AL

Inst: VOA9.I

Analyst: RXY1

Project: ESHL00714

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
156-60-5	trans-1,2-Dichloroethylene	HU	1.00	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene	HU	1.00	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	48.8	50.0	97.7	(78%-124%)
Bromofluorobenzene	47.8	50.0	95.6	(80%-120%)
Toluene-d8	46.2	50.0	92.5	(80%-120%)

**Tentatively Identified Compound Summary**

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown	4.286	36.6	ug/L	0	J
	unknown siloxane	14.663	11	ug/L	0	J

**Volatile**  
**Certificate of Analysis**  
**Sample Summary**

SDG Number: 2014-3494

Lab Sample ID: 350053030

Date Collected: 06/03/2014 11:48

Date Received: 06/05/2014 09:00

Matrix: W

Client: ARSL004

Project: ESHL00714

Client ID: CAPU-14-79415

Method: SW846 8260B DOE-AL

SOP Ref: GL-OA-E-038

Batch ID: 1396094

Inst: VOA9.I

Dilution: 1

Run Date: 06/20/2014 17:53

Analyst: RXY1

Purge Vol: 5 mL

Prep Date: 06/20/2014 17:53

Data File: 062014V9\9R516.D

Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	HU	1.00	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	HU	1.00	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	HU	1.00	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	HU	1.00	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	HU	1.00	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	HU	1.00	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	HU	1.00	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	HU	1.00	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	HU	1.00	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	HU	1.00	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	HU	1.00	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	HU	1.00	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	HU	1.00	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	HU	1.00	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	HU	1.00	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	HU	1.00	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	HU	1.00	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	HU	1.00	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	HU	1.00	ug/L	0.300	1.00
78-93-3	2-Butanone	HU	5.00	ug/L	2.00	5.00
126-99-8	2-Chloro-1,3-butadiene	HU	1.00	ug/L	0.200	1.00
95-49-8	2-Chlorotoluene	HU	1.00	ug/L	0.300	1.00
591-78-6	2-Hexanone	HU	5.00	ug/L	2.20	5.00
106-43-4	4-Chlorotoluene	HU	1.00	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	HU	1.00	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	HU	5.00	ug/L	1.50	5.00
67-64-1	Acetone	HU	10.0	ug/L	3.00	10.0
75-05-8	Acetonitrile	HU	25.0	ug/L	8.00	25.0
107-02-8	Acrolein	HU	5.00	ug/L	1.50	5.00
107-13-1	Acrylonitrile	HU	5.00	ug/L	1.00	5.00
107-05-1	Allyl chloride	HU	5.00	ug/L	1.50	5.00
71-43-2	Benzene	HU	1.00	ug/L	0.300	1.00
108-86-1	Bromobenzene	HU	1.00	ug/L	0.300	1.00
74-97-5	Bromochloromethane	HU	1.00	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	HU	1.00	ug/L	0.300	1.00
75-25-2	Bromoform	HU	1.00	ug/L	0.300	1.00
74-83-9	Bromomethane	HU	1.00	ug/L	0.300	1.00
75-15-0	Carbon disulfide	HU	5.00	ug/L	1.50	5.00

**Volatile  
Certificate of Analysis  
Sample Summary**

SDG Number: 2014-3494

Lab Sample ID: 350053030

Date Collected: 06/03/2014 11:48

Date Received: 06/05/2014 09:00

Matrix: W

Client: ARSL004

Project: ESHL00714

Client ID: CAPU-14-79415

Method: SW846 8260B DOE-AL

SOP Ref: GL-OA-E-038

Batch ID: 1396094

Inst: VOA9.I

Dilution: 1

Run Date: 06/20/2014 17:53

Analyst: RXY1

Purge Vol: 5 mL

Prep Date: 06/20/2014 17:53

Data File: 062014V9\9R516.D

Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
56-23-5	Carbon tetrachloride	HU	1.00	ug/L	0.300	1.00
108-90-7	Chlorobenzene	HU	1.00	ug/L	0.300	1.00
75-00-3	Chloroethane	HU	1.00	ug/L	0.300	1.00
67-66-3	Chloroform	HU	1.00	ug/L	0.300	1.00
74-87-3	Chloromethane	HU	1.00	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	HU	1.00	ug/L	0.300	1.00
74-95-3	Dibromomethane	HU	1.00	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	HU	1.00	ug/L	0.300	1.00
60-29-7	Ethyl ether	HU	1.00	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	HU	5.00	ug/L	1.50	5.00
100-41-4	Ethylbenzene	HU	1.00	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	HU	1.00	ug/L	0.300	1.00
74-88-4	Iodomethane	HU	5.00	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	HU	50.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	HU	1.00	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	HU	5.00	ug/L	1.00	5.00
80-62-6	Methyl methacrylate	HU	5.00	ug/L	1.50	5.00
75-09-2	Methylene chloride	HU	10.0	ug/L	3.00	10.0
91-20-3	Naphthalene	HU	1.00	ug/L	0.400	1.00
107-12-0	Propionitrile	HU	5.00	ug/L	1.50	5.00
100-42-5	Styrene	HU	1.00	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	HU	1.00	ug/L	0.300	1.00
108-88-3	Toluene	HU	1.00	ug/L	0.300	1.00
79-01-6	Trichloroethylene	HU	1.00	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	HU	1.00	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	HU	5.00	ug/L	1.50	5.00
108-05-4	Vinyl acetate	HU	5.00	ug/L	1.50	5.00
75-01-4	Vinyl chloride	HU	1.00	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	HU	1.00	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	HU	1.00	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	HU	2.00	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	HU	50.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	HU	1.00	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	HU	1.00	ug/L	0.300	1.00
95-47-6	o-Xylene	HU	1.00	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	HU	1.00	ug/L	0.300	1.00
1634-04-4	tert-Butyl methyl ether	HU	1.00	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene	HU	1.00	ug/L	0.300	1.00

**Volatile  
Certificate of Analysis  
Sample Summary**

SDG Number: 2014-3494

Lab Sample ID: 350053030

Date Collected: 06/03/2014 11:48

Date Received: 06/05/2014 09:00

Matrix: W

Client ID: CAPU-14-79415

Batch ID: 1396094

Run Date: 06/20/2014 17:53

Prep Date: 06/20/2014 17:53

Data File: 062014V9\9R516.D

Client: ARSL004

Method: SW846 8260B DOE-AL

Inst: VOA9.I

Analyst: RXY1

Project: ESHL00714

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
156-60-5	trans-1,2-Dichloroethylene	HU	1.00	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene	HU	1.00	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	48.5	50.0	ug/L 97.0	(78%-124%)
Bromofluorobenzene	46.6	50.0	ug/L 93.2	(80%-120%)
Toluene-d8	47.4	50.0	ug/L 94.8	(80%-120%)

**Tentatively Identified Compound Summary**

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown	4.286	88.3	ug/L	0	J
	unknown siloxane	14.663	6.92	ug/L	0	J

**Volatile**  
**Certificate of Analysis**  
**Sample Summary**

SDG Number: 2014-3494

Lab Sample ID: 350053035

Date Collected: 06/03/2014 11:48

Date Received: 06/05/2014 09:00

Matrix: W

Client: ARSL004

Project: ESHL00714

Client ID: CAPU-14-79423

Method: SW846 8260B DOE-AL

SOP Ref: GL-OA-E-038

Batch ID: 1396094

Inst: VOA9.I

Dilution: 1

Run Date: 06/19/2014 15:50

Analyst: RXY1

Purge Vol: 5 mL

Prep Date: 06/19/2014 15:50

Data File: 061914V9\9R419.D

Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	HU	1.00	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	HU	1.00	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	HU	1.00	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	HU	1.00	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	HU	1.00	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	HU	1.00	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	HU	1.00	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	HU	1.00	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	HU	1.00	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	HU	1.00	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	HU	1.00	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	HU	1.00	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	HU	1.00	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	HU	1.00	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	HU	1.00	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	HU	1.00	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	HU	1.00	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	HU	1.00	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	HU	1.00	ug/L	0.300	1.00
78-93-3	2-Butanone	HU	5.00	ug/L	2.00	5.00
126-99-8	2-Chloro-1,3-butadiene	HU	1.00	ug/L	0.200	1.00
95-49-8	2-Chlorotoluene	HU	1.00	ug/L	0.300	1.00
591-78-6	2-Hexanone	HU	5.00	ug/L	2.20	5.00
106-43-4	4-Chlorotoluene	HU	1.00	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	HU	1.00	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	HU	5.00	ug/L	1.50	5.00
67-64-1	Acetone	HU	10.0	ug/L	3.00	10.0
75-05-8	Acetonitrile	HU	25.0	ug/L	8.00	25.0
107-02-8	Acrolein	HU	5.00	ug/L	1.50	5.00
107-13-1	Acrylonitrile	HU	5.00	ug/L	1.00	5.00
107-05-1	Allyl chloride	HU	5.00	ug/L	1.50	5.00
71-43-2	Benzene	HU	1.00	ug/L	0.300	1.00
108-86-1	Bromobenzene	HU	1.00	ug/L	0.300	1.00
74-97-5	Bromochloromethane	HU	1.00	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	HU	1.00	ug/L	0.300	1.00
75-25-2	Bromoform	HU	1.00	ug/L	0.300	1.00
74-83-9	Bromomethane	HU	1.00	ug/L	0.300	1.00
75-15-0	Carbon disulfide	HU	5.00	ug/L	1.50	5.00

**Volatile  
Certificate of Analysis  
Sample Summary**

SDG Number: 2014-3494

Lab Sample ID: 350053035

Date Collected: 06/03/2014 11:48

Date Received: 06/05/2014 09:00

Matrix: W

Client: ARSL004

Project: ESHL00714

Client ID: CAPU-14-79423

Method: SW846 8260B DOE-AL

SOP Ref: GL-OA-E-038

Batch ID: 1396094

Inst: VOA9.I

Dilution: 1

Run Date: 06/19/2014 15:50

Analyst: RXY1

Purge Vol: 5 mL

Prep Date: 06/19/2014 15:50

Data File: 061914V9\9R419.D

Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
56-23-5	Carbon tetrachloride	HU	1.00	ug/L	0.300	1.00
108-90-7	Chlorobenzene	HU	1.00	ug/L	0.300	1.00
75-00-3	Chloroethane	HU	1.00	ug/L	0.300	1.00
67-66-3	Chloroform	HU	1.00	ug/L	0.300	1.00
74-87-3	Chloromethane	HU	1.00	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	HU	1.00	ug/L	0.300	1.00
74-95-3	Dibromomethane	HU	1.00	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	HU	1.00	ug/L	0.300	1.00
60-29-7	Ethyl ether	HU	1.00	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	HU	5.00	ug/L	1.50	5.00
100-41-4	Ethylbenzene	HU	1.00	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	HU	1.00	ug/L	0.300	1.00
74-88-4	Iodomethane	HU	5.00	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	HU	50.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	HU	1.00	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	HU	5.00	ug/L	1.00	5.00
80-62-6	Methyl methacrylate	HU	5.00	ug/L	1.50	5.00
75-09-2	Methylene chloride	HU	10.0	ug/L	3.00	10.0
91-20-3	Naphthalene	HU	1.00	ug/L	0.400	1.00
107-12-0	Propionitrile	HU	5.00	ug/L	1.50	5.00
100-42-5	Styrene	HU	1.00	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	HU	1.00	ug/L	0.300	1.00
108-88-3	Toluene	HU	1.00	ug/L	0.300	1.00
79-01-6	Trichloroethylene	HU	1.00	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	HU	1.00	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	HU	5.00	ug/L	1.50	5.00
108-05-4	Vinyl acetate	HU	5.00	ug/L	1.50	5.00
75-01-4	Vinyl chloride	HU	1.00	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	HU	1.00	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	HU	1.00	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	HU	2.00	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	HU	50.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	HU	1.00	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	HU	1.00	ug/L	0.300	1.00
95-47-6	o-Xylene	HU	1.00	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	HU	1.00	ug/L	0.300	1.00
1634-04-4	tert-Butyl methyl ether	HU	1.00	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene	HU	1.00	ug/L	0.300	1.00



**Volatile  
Certificate of Analysis  
Sample Summary**

SDG Number: 2014-3494

Lab Sample ID: 350053035

Date Collected: 06/03/2014 11:48

Date Received: 06/05/2014 09:00

Matrix: W

Client ID: CAPU-14-79423

Batch ID: 1396094

Run Date: 06/19/2014 15:50

Prep Date: 06/19/2014 15:50

Data File: 061914V9\9R419.D

Client: ARSL004

Method: SW846 8260B DOE-AL

Inst: VOA9.I

Analyst: RXY1

Project: ESHL00714

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
156-60-5	trans-1,2-Dichloroethylene	HU	1.00	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene	HU	1.00	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	48.5	50.0	ug/L 97.1	(78%-124%)
Bromofluorobenzene	43.6	50.0	ug/L 87.3	(80%-120%)
Toluene-d8	47.2	50.0	ug/L 94.3	(80%-120%)

**Tentatively Identified Compound Summary**

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown	4.3	52.7	ug/L	0	J

# **Quality Control Summary**

**Volatile**  
**Surrogate Recovery Report**

Page 1 of 1

**SDG Number: 2014-3494****Matrix Type: LIQUID**

Sample ID	Client ID	DCED4 %REC	TOL %REC	BFB %REC
1203109630	LCS for batch 1396094	95	90	86
1203109631	LCS for batch 1396094	94	92	94
1203109624	MB for batch 1396094	95	93	87
350053008	CAPU-14-79420	99	93	92
350053035	CAPU-14-79423	97	94	87
1203109632	LCS for batch 1396094	87	91	87
1203109633	LCS for batch 1396094	89	93	93
1203109625	MB for batch 1396094	89	92	89
350053003	CAPU-14-79428	90	88	88
350053011	CAPU-14-79431	91	94	91
350053019	CAPU-14-79413	97	92	92
350053027	CAPU-14-79414	98	92	96
350053030	CAPU-14-79415	97	95	93
1203109626	CAPU-14-79431PS	90	92	87
1203109628	CAPU-14-79431PSD	88	95	85
1203109627	CAPU-14-79431PS	88	91	89
1203109629	CAPU-14-79431PSD	88	93	94

**Surrogate****Acceptance Limits**

DCED4 = 1,2-Dichloroethane-d4

(78%-124%)

TOL = Toluene-d8

(80%-120%)

BFB = Bromofluorobenzene

(80%-120%)

\* Recovery outside Acceptance Limits

# Column to be used to flag recovery values

D Sample Diluted

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 1 of 8

SDG Number: 2014-3494

Sample Type: Post Spike

Client ID: CAPU-14-79431PS

Matrix: W

Lab Sample ID 1203109626

Instrument: VOA9.I

Analysis Date: 06/20/2014 19:47

Dilution: 1

Analyst: RXY1

Purge Vol: 5 mL

Batch ID: 1396094

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	HU	97.4	97 72-120
75-05-8	PS Acetonitrile	1250	0.00	HU	993	79 61-135
67-64-1	PS Acetone	250	0.00	HU	137	55 29-144
74-88-4	PS Iodomethane	250	0.00	HU	246	99 73-120
75-15-0	PS Carbon disulfide	250	0.00	HU	233	93 79-138
108-05-4	PS Vinyl acetate	250	0.00	HU	223	89 60-136
78-93-3	PS 2-Butanone	250	0.00	HU	158	63 38-136
108-10-1	PS 4-Methyl-2-pentanone	250	0.00	HU	198	79 70-132
591-78-6	PS 2-Hexanone	250	0.00	HU	169	68 48-137
75-71-8	PS Dichlorodifluoromethane	50.0	0.00	HU	37.7	75 51-133
74-87-3	PS Chloromethane	50.0	0.00	HU	36.1	72 54-135
75-01-4	PS Vinyl chloride	50.0	0.00	HU	39.9	80 52-129
74-83-9	PS Bromomethane	50.0	0.00	HU	40.9	82 67-128
75-00-3	PS Chloroethane	50.0	0.00	HU	42.2	84 69-120
75-69-4	PS Trichlorofluoromethane	50.0	0.00	HU	48.0	96 66-126
60-29-7	PS Ethyl ether	50.0	0.00	HU	44.3	89 69-120
75-35-4	PS 1,1-Dichloroethylene	50.0	0.00	HU	42.1	84 74-130
75-09-2	PS Methylene chloride	50.0	0.00	HU	41.6	83 73-120
1634-04-4	PS tert-Butyl methyl ether	50.0	0.00	HU	43.1	86 71-124
156-60-5	PS trans-1,2-Dichloroethylene	50.0	0.00	HU	44.8	90 75-124
75-34-3	PS 1,1-Dichloroethane	50.0	0.00	HU	44.6	89 76-122
156-59-2	PS cis-1,2-Dichloroethylene	50.0	0.00	HU	45.0	90 77-121

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 2 of 8

SDG Number: 2014-3494

Sample Type: Post Spike

Client ID: CAPU-14-79431PS

Matrix: W

Lab Sample ID 1203109626

Instrument: VOA9.I

Analysis Date: 06/20/2014 19:47

Dilution: 1

Analyst: RXY1

Purge Vol: 5 mL

Batch ID: 1396094

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 HU	48.3	97	72-129
74-97-5	PS Bromochloromethane	50.0	0.00 HU	50.9	102	78-122
67-66-3	PS Chloroform	50.0	0.00 HU	44.8	90	75-123
71-55-6	PS 1,1,1-Trichloroethane	50.0	0.00 HU	48.0	96	76-129
563-58-6	PS 1,1-Dichloropropene	50.0	0.00 HU	45.0	90	76-125
56-23-5	PS Carbon tetrachloride	50.0	0.00 HU	50.8	102	76-132
107-06-2	PS 1,2-Dichloroethane	50.0	0.00 HU	39.8	80	68-128
71-43-2	PS Benzene	50.0	0.00 HU	45.6	91	75-120
79-01-6	PS Trichloroethylene	50.0	0.00 HU	47.0	94	75-125
78-87-5	PS 1,2-Dichloropropane	50.0	0.00 HU	42.6	85	75-120
74-95-3	PS Dibromomethane	50.0	0.00 HU	41.9	84	77-122
75-27-4	PS Bromodichloromethane	50.0	0.00 HU	45.6	91	76-129
10061-01-5	PS cis-1,3-Dichloropropylene	50.0	0.00 HU	44.6	89	75-127
108-88-3	PS Toluene	50.0	0.00 HU	43.2	86	72-120
10061-02-6	PS trans-1,3-Dichloropropylene	50.0	0.00 HU	43.2	86	73-123
79-00-5	PS 1,1,2-Trichloroethane	50.0	0.00 HU	42.3	85	77-120
142-28-9	PS 1,3-Dichloropropane	50.0	0.00 HU	40.8	82	73-120
127-18-4	PS Tetrachloroethylene	50.0	0.00 HU	49.8	100	67-124
124-48-1	PS Dibromochloromethane	50.0	0.00 HU	50.0	100	70-130
108-90-7	PS Chlorobenzene	50.0	0.00 HU	44.8	90	74-120
100-41-4	PS Ethylbenzene	50.0	0.00 HU	45.6	91	72-120
95-47-6	PS o-Xylene	50.0	0.00 HU	50.6	101	72-120

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 3 of 8

SDG Number: 2014-3494

Sample Type: Post Spike

Client ID: CAPU-14-79431PS

Matrix: W

Lab Sample ID 1203109626

Instrument: VOA9.I

Analysis Date: 06/20/2014 19:47

Dilution: 1

Analyst: RXY1

Purge Vol: 5 mL

Batch ID: 1396094

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
100-42-5	PS Styrene	50.0	0.00	HU 50.2	100	74-124
75-25-2	PS Bromoform	50.0	0.00	HU 49.2	98	61-135
98-82-8	PS Isopropylbenzene	50.0	0.00	HU 44.9	90	71-124
79-34-5	PS 1,1,2,2-Tetrachloroethane	50.0	0.00	HU 37.9	76	74-124
96-18-4	PS 1,2,3-Trichloropropane	50.0	0.00	HU 38.2	76	71-125
108-86-1	PS Bromobenzene	50.0	0.00	HU 46.6	93	72-120
103-65-1	PS n-Propylbenzene	50.0	0.00	HU 40.8	82	69-121
108-67-8	PS 1,3,5-Trimethylbenzene	50.0	0.00	HU 45.3	91	71-123
95-49-8	PS 2-Chlorotoluene	50.0	0.00	HU 44.6	89	71-120
106-43-4	PS 4-Chlorotoluene	50.0	0.00	HU 41.2	82	70-120
98-06-6	PS tert-Butylbenzene	50.0	0.00	HU 49.8	100	72-124
95-63-6	PS 1,2,4-Trimethylbenzene	50.0	0.00	HU 43.1	86	71-122
135-98-8	PS sec-Butylbenzene	50.0	0.00	HU 47.1	94	71-124
99-87-6	PS 4-Isopropyltoluene	50.0	0.00	HU 47.7	95	70-124
541-73-1	PS 1,3-Dichlorobenzene	50.0	0.00	HU 45.6	91	70-120
106-46-7	PS 1,4-Dichlorobenzene	50.0	0.00	HU 43.5	87	70-120
104-51-8	PS n-Butylbenzene	50.0	0.00	HU 42.9	86	69-125
87-68-3	PS Hexachlorobutadiene	50.0	0.00	HU 52.4	105	60-129
91-20-3	PS Naphthalene	50.0	0.00	HU 42.6	85	58-134
87-61-6	PS 1,2,3-Trichlorobenzene	50.0	0.00	HU 43.2	86	52-132
120-82-1	PS 1,2,4-Trichlorobenzene	50.0	0.00	HU 43.8	88	59-126
630-20-6	PS 1,1,1,2-Tetrachloroethane	50.0	0.00	HU 50.9	102	78-128

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 4 of 8

SDG Number: 2014-3494

Sample Type: Post Spike

Client ID: CAPU-14-79431PS

Matrix: W

Lab Sample ID 1203109626

Instrument: VOA9.I

Analysis Date: 06/20/2014 19:47

Dilution: 1

Analyst: RXY1

Purge Vol: 5 mL

Batch ID: 1396094

CAS No	Parmname		Amount Added ug/L	Sample Conc. ug/L		Spike Conc. ug/L	Recovery %	Acceptance Limits
95-50-1	PS	1,2-Dichlorobenzene	50.0	0.00	HU	46.2	92	72-120
71-36-3	PS	n-Butyl alcohol	5000	0.00	HU	4740	95	64-138

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 5 of 8

SDG Number: 2014-3494

Sample Type: Post Spike Duplicate

Client ID: CAPU-14-79431PSD

Matrix: W

Lab Sample ID 1203109628

Instrument: VOA9.I

Analysis Date: 06/20/2014 20:15

Dilution: 1

Analyst: RXY1

Purge Vol: 5 mL

Batch ID: 1396094

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	HU 112	112	72-120	14	0-20
75-05-8	PSD Acetonitrile	1250	0.00	HU 1050	84	61-135	6	0-20
67-64-1	PSD Acetone	250	0.00	HU 145	58	29-144	5	0-20
74-88-4	PSD Iodomethane	250	0.00	HU 266	106	73-120	8	0-20
75-15-0	PSD Carbon disulfide	250	0.00	HU 251	100	79-138	7	0-20
108-05-4	PSD Vinyl acetate	250	0.00	HU 231	92	60-136	4	0-20
78-93-3	PSD 2-Butanone	250	0.00	HU 177	71	38-136	11	0-20
108-10-1	PSD 4-Methyl-2-pentanone	250	0.00	HU 225	90	70-132	13	0-20
591-78-6	PSD 2-Hexanone	250	0.00	HU 190	76	48-137	12	0-20
75-71-8	PSD Dichlorodifluoromethane	50.0	0.00	HU 39.0	78	51-133	3	0-20
74-87-3	PSD Chloromethane	50.0	0.00	HU 36.9	74	54-135	2	0-20
75-01-4	PSD Vinyl chloride	50.0	0.00	HU 39.9	80	52-129	0	0-20
74-83-9	PSD Bromomethane	50.0	0.00	HU 39.8	80	67-128	3	0-20
75-00-3	PSD Chloroethane	50.0	0.00	HU 43.0	86	69-120	2	0-20
75-69-4	PSD Trichlorofluoromethane	50.0	0.00	HU 48.4	97	66-126	1	0-20
60-29-7	PSD Ethyl ether	50.0	0.00	HU 46.3	93	69-120	4	0-20
75-35-4	PSD 1,1-Dichloroethylene	50.0	0.00	HU 46.3	93	74-130	10	0-20
75-09-2	PSD Methylene chloride	50.0	0.00	HU 45.0	90	73-120	8	0-20
1634-04-4	PSD tert-Butyl methyl ether	50.0	0.00	HU 47.2	94	71-124	9	0-20
156-60-5	PSD trans-1,2-Dichloroethylene	50.0	0.00	HU 48.4	97	75-124	8	0-20
75-34-3	PSD 1,1-Dichloroethane	50.0	0.00	HU 48.3	97	76-122	8	0-20
156-59-2	PSD cis-1,2-Dichloroethylene	50.0	0.00	HU 48.4	97	77-121	7	0-20



Volatile  
Quality Control Summary  
Spike Recovery Report

Page 6 of 8

SDG Number: 2014-3494

Sample Type: Post Spike Duplicate

Client ID: CAPU-14-79431PSD

Matrix: W

Lab Sample ID 1203109628

Instrument: VOA9.I

Analysis Date: 06/20/2014 20:15

Dilution: 1

Analyst: RXY1

Purge Vol: 5 mL

Batch ID: 1396094

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	HU 51.9	104	72-129	7	0-20
74-97-5	PSD Bromochloromethane	50.0	0.00	HU 54.2	108	78-122	6	0-20
67-66-3	PSD Chloroform	50.0	0.00	HU 48.1	96	75-123	7	0-20
71-55-6	PSD 1,1,1-Trichloroethane	50.0	0.00	HU 52.1	104	76-129	8	0-20
563-58-6	PSD 1,1-Dichloropropene	50.0	0.00	HU 49.5	99	76-125	10	0-20
56-23-5	PSD Carbon tetrachloride	50.0	0.00	HU 54.1	108	76-132	6	0-20
107-06-2	PSD 1,2-Dichloroethane	50.0	0.00	HU 44.2	88	68-128	10	0-20
71-43-2	PSD Benzene	50.0	0.00	HU 50.1	100	75-120	10	0-20
79-01-6	PSD Trichloroethylene	50.0	0.00	HU 53.0	106	75-125	12	0-20
78-87-5	PSD 1,2-Dichloropropane	50.0	0.00	HU 48.4	97	75-120	13	0-20
74-95-3	PSD Dibromomethane	50.0	0.00	HU 47.1	94	77-122	12	0-20
75-27-4	PSD Bromodichloromethane	50.0	0.00	HU 50.4	101	76-129	10	0-20
10061-01-5	PSD cis-1,3-Dichloropropylene	50.0	0.00	HU 51.6	103	75-127	15	0-20
108-88-3	PSD Toluene	50.0	0.00	HU 50.7	101	72-120	16	0-20
10061-02-6	PSD trans-1,3-Dichloropropylene	50.0	0.00	HU 49.7	99	73-123	14	0-20
79-00-5	PSD 1,1,2-Trichloroethane	50.0	0.00	HU 48.4	97	77-120	14	0-20
142-28-9	PSD 1,3-Dichloropropane	50.0	0.00	HU 47.5	95	73-120	15	0-20
127-18-4	PSD Tetrachloroethylene	50.0	0.00	HU 59.6	119	67-124	18	0-20
124-48-1	PSD Dibromochloromethane	50.0	0.00	HU 57.2	114	70-130	14	0-20
108-90-7	PSD Chlorobenzene	50.0	0.00	HU 51.8	104	74-120	15	0-20
100-41-4	PSD Ethylbenzene	50.0	0.00	HU 52.2	104	72-120	13	0-20
95-47-6	PSD o-Xylene	50.0	0.00	HU 57.4	115	72-120	13	0-20

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 7 of 8

SDG Number: 2014-3494

Sample Type: Post Spike Duplicate

Client ID: CAPU-14-79431PSD

Matrix: W

Lab Sample ID 1203109628

Instrument: VOA9.I

Analysis Date: 06/20/2014 20:15

Dilution: 1

Analyst: RXY1

Purge Vol: 5 mL

Batch ID: 1396094

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
100-42-5	PSD Styrene	50.0	0.00	HU 57.5	115	74-124	14	0-20
75-25-2	PSD Bromoform	50.0	0.00	HU 54.8	110	61-135	11	0-20
98-82-8	PSD Isopropylbenzene	50.0	0.00	HU 51.5	103	71-124	14	0-20
79-34-5	PSD 1,1,2,2-Tetrachloroethane	50.0	0.00	HU 42.8	86	74-124	12	0-20
96-18-4	PSD 1,2,3-Trichloropropane	50.0	0.00	HU 43.3	87	71-125	13	0-20
108-86-1	PSD Bromobenzene	50.0	0.00	HU 51.3	103	72-120	10	0-20
103-65-1	PSD n-Propylbenzene	50.0	0.00	HU 45.6	91	69-121	11	0-20
108-67-8	PSD 1,3,5-Trimethylbenzene	50.0	0.00	HU 51.0	102	71-123	12	0-20
95-49-8	PSD 2-Chlorotoluene	50.0	0.00	HU 50.7	101	71-120	13	0-20
106-43-4	PSD 4-Chlorotoluene	50.0	0.00	HU 47.0	94	70-120	13	0-20
98-06-6	PSD tert-Butylbenzene	50.0	0.00	HU 57.0	114	72-124	14	0-20
95-63-6	PSD 1,2,4-Trimethylbenzene	50.0	0.00	HU 48.6	97	71-122	12	0-20
135-98-8	PSD sec-Butylbenzene	50.0	0.00	HU 52.9	106	71-124	12	0-20
99-87-6	PSD 4-Isopropyltoluene	50.0	0.00	HU 52.9	106	70-124	10	0-20
541-73-1	PSD 1,3-Dichlorobenzene	50.0	0.00	HU 51.0	102	70-120	11	0-20
106-46-7	PSD 1,4-Dichlorobenzene	50.0	0.00	HU 48.9	98	70-120	12	0-20
104-51-8	PSD n-Butylbenzene	50.0	0.00	HU 48.8	98	69-125	13	0-20
87-68-3	PSD Hexachlorobutadiene	50.0	0.00	HU 58.5	117	60-129	11	0-20
91-20-3	PSD Naphthalene	50.0	0.00	HU 49.5	99	58-134	15	0-20
87-61-6	PSD 1,2,3-Trichlorobenzene	50.0	0.00	HU 50.4	101	52-132	16	0-20
120-82-1	PSD 1,2,4-Trichlorobenzene	50.0	0.00	HU 50.4	101	59-126	14	0-20
630-20-6	PSD 1,1,1,2-Tetrachloroethane	50.0	0.00	HU 58.2	116	78-128	13	0-20

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 8 of 8

SDG Number: 2014-3494

Sample Type: Post Spike Duplicate

Client ID: CAPU-14-79431PSD

Matrix: W

Lab Sample ID 1203109628

Instrument: VOA9.I

Analysis Date: 06/20/2014 20:15

Dilution: 1

Analyst: RXY1

Purge Vol: 5 mL

Batch ID: 1396094

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L		Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
95-50-1	PSD 1,2-Dichlorobenzene	50.0	0.00	HU	51.9	104	72-120	12	0-20
71-36-3	PSD n-Butyl alcohol	5000	0.00	HU	5270	105	64-138	11	0-20

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 1 of 2

SDG Number: 2014-3494

Sample Type: Post Spike

Client ID: CAPU-14-79431PS

Matrix: W

Lab Sample ID 1203109627

Instrument: VOA9.I

Analysis Date: 06/20/2014 20:43

Dilution: 1

Analyst: RXY1

Purge Vol: 5 mL

Batch ID: 1396094

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	HU 224	90	57-131
76-13-1	PS Trichlorotrifluoroethane	250	0.00	HU 256	102	76-133
107-05-1	PS Allyl chloride	250	0.00	HU 264	106	65-130
107-13-1	PS Acrylonitrile	250	0.00	HU 225	90	70-128
107-12-0	PS Propionitrile	250	0.00	HU 250	100	68-131
126-98-7	PS Methacrylonitrile	250	0.00	HU 248	99	64-129
80-62-6	PS Methyl methacrylate	250	0.00	HU 253	101	76-120
97-63-2	PS Ethyl methacrylate	250	0.00	HU 245	98	72-122
78-83-1	PS Isobutyl alcohol	2500	0.00	HU 2390	96	72-134
126-99-8	PS 2-Chloro-1,3-butadiene	50.0	0.00	HU 61.2	122	46-140

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 2 of 2

SDG Number: 2014-3494

Sample Type: Post Spike Duplicate

Client ID: CAPU-14-79431PSD

Matrix: W

Lab Sample ID 1203109629

Instrument: VOA9.I

Analysis Date: 06/20/2014 21:11

Dilution: 1

Analyst: RXY1

Purge Vol: 5 mL

Batch ID: 1396094

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
107-02-8	PSD Acrolein	250	0.00	HU 212	85	57-131	6	0-20
76-13-1	PSD Trichlorotrifluoroethane	250	0.00	HU 253	101	76-133	1	0-20
107-05-1	PSD Allyl chloride	250	0.00	HU 264	106	65-130	0	0-20
107-13-1	PSD Acrylonitrile	250	0.00	HU 218	87	70-128	3	0-20
107-12-0	PSD Propionitrile	250	0.00	HU 238	95	68-131	5	0-20
126-98-7	PSD Methacrylonitrile	250	0.00	HU 245	98	64-129	1	0-20
80-62-6	PSD Methyl methacrylate	250	0.00	HU 251	100	76-120	1	0-20
97-63-2	PSD Ethyl methacrylate	250	0.00	HU 247	99	72-122	1	0-20
78-83-1	PSD Isobutyl alcohol	2500	0.00	HU 2360	94	72-134	1	0-20
126-99-8	PSD 2-Chloro-1,3-butadiene	50.0	0.00	HU 61.1	122	46-140	0	0-20

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 1 of 4

SDG Number: 2014-3494

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1396094

Matrix: GROUND WATER

Lab Sample ID 1203109630

Instrument: VOA9.I

Analysis Date: 06/19/2014 08:19

Dilution: 1

Analyst: RXY1

Purge Vol: 5 mL

Batch ID: 1396094

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	105	105	80-120
75-05-8	LCS Acetonitrile	1250	0.0	1250	100	63-131
67-64-1	LCS Acetone	250	0.0	337	135	50-149
74-88-4	LCS Iodomethane	250	0.0	253	101	75-120
75-15-0	LCS Carbon disulfide	250	0.0	232	93	80-136
108-05-4	LCS Vinyl acetate	250	0.0	316	126	78-130
78-93-3	LCS 2-Butanone	250	0.0	302	121	57-148
108-10-1	LCS 4-Methyl-2-pentanone	250	0.0	280	112	75-130
591-78-6	LCS 2-Hexanone	250	0.0	320	128	64-149
75-71-8	LCS Dichlorodifluoromethane	50.0	0.0	39.7	79	58-129
74-87-3	LCS Chloromethane	50.0	0.0	37.7	75	59-131
75-01-4	LCS Vinyl chloride	50.0	0.0	40.0	80	59-127
74-83-9	LCS Bromomethane	50.0	0.0	41.6	83	70-125
75-00-3	LCS Chloroethane	50.0	0.0	42.0	84	73-120
75-69-4	LCS Trichlorofluoromethane	50.0	0.0	45.8	92	73-123
60-29-7	LCS Ethyl ether	50.0	0.0	50.1	100	73-120
75-35-4	LCS 1,1-Dichloroethylene	50.0	0.0	41.9	84	80-128
75-09-2	LCS Methylene chloride	50.0	0.0	43.7	87	75-120
1634-04-4	LCS tert-Butyl methyl ether	50.0	0.0	53.7	107	74-122
156-60-5	LCS trans-1,2-Dichloroethylene	50.0	0.0	45.0	90	80-121
75-34-3	LCS 1,1-Dichloroethane	50.0	0.0	45.5	91	79-120
156-59-2	LCS cis-1,2-Dichloroethylene	50.0	0.0	46.9	94	79-120

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 2 of 4

SDG Number: 2014-3494

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1396094

Matrix: GROUND WATER

Lab Sample ID 1203109630

Instrument: VOA9.I

Analysis Date: 06/19/2014 08:19

Dilution: 1

Analyst: RXY1

Purge Vol: 5 mL

Batch ID: 1396094

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	51.8	104	79-130
74-97-5	LCS Bromochloromethane	50.0	0.0	55.7	111	80-121
67-66-3	LCS Chloroform	50.0	0.0	46.3	93	79-120
71-55-6	LCS 1,1,1-Trichloroethane	50.0	0.0	49.6	99	80-128
563-58-6	LCS 1,1-Dichloropropene	50.0	0.0	46.6	93	80-123
56-23-5	LCS Carbon tetrachloride	50.0	0.0	50.7	101	80-131
107-06-2	LCS 1,2-Dichloroethane	50.0	0.0	47.1	94	73-120
71-43-2	LCS Benzene	50.0	0.0	48.3	97	78-120
79-01-6	LCS Trichloroethylene	50.0	0.0	49.9	100	80-121
78-87-5	LCS 1,2-Dichloropropane	50.0	0.0	47.9	96	79-120
74-95-3	LCS Dibromomethane	50.0	0.0	49.2	98	80-120
75-27-4	LCS Bromodichloromethane	50.0	0.0	51.8	104	80-126
10061-01-5	LCS cis-1,3-Dichloropropylene	50.0	0.0	55.6	111	80-125
108-88-3	LCS Toluene	50.0	0.0	46.6	93	78-120
10061-02-6	LCS trans-1,3-Dichloropropylene	50.0	0.0	52.2	104	79-121
79-00-5	LCS 1,1,2-Trichloroethane	50.0	0.0	50.0	100	78-120
142-28-9	LCS 1,3-Dichloropropane	50.0	0.0	49.1	98	75-120
127-18-4	LCS Tetrachloroethylene	50.0	0.0	54.6	109	74-123
124-48-1	LCS Dibromochloromethane	50.0	0.0	58.3	117	73-129
108-90-7	LCS Chlorobenzene	50.0	0.0	48.8	98	79-120
100-41-4	LCS Ethylbenzene	50.0	0.0	48.9	98	79-120
95-47-6	LCS o-Xylene	50.0	0.0	53.9	108	80-123

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 3 of 4

SDG Number: 2014-3494

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1396094

Matrix: GROUND WATER

Lab Sample ID 1203109630

Instrument: VOA9.I

Analysis Date: 06/19/2014 08:19

Dilution: 1

Analyst: RXY1

Purge Vol: 5 mL

Batch ID: 1396094

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
100-42-5	LCS Styrene	50.0	0.0	55.0	110	80-121
75-25-2	LCS Bromoform	50.0	0.0	61.1	122	65-135
98-82-8	LCS Isopropylbenzene	50.0	0.0	46.8	94	79-121
79-34-5	LCS 1,1,2,2-Tetrachloroethane	50.0	0.0	46.4	93	76-123
96-18-4	LCS 1,2,3-Trichloropropane	50.0	0.0	48.6	97	76-120
108-86-1	LCS Bromobenzene	50.0	0.0	50.8	102	79-120
103-65-1	LCS n-Propylbenzene	50.0	0.0	42.4	85	80-123
108-67-8	LCS 1,3,5-Trimethylbenzene	50.0	0.0	48.5	97	80-120
95-49-8	LCS 2-Chlorotoluene	50.0	0.0	47.9	96	79-120
106-43-4	LCS 4-Chlorotoluene	50.0	0.0	44.6	89	79-120
98-06-6	LCS tert-Butylbenzene	50.0	0.0	50.9	102	79-122
95-63-6	LCS 1,2,4-Trimethylbenzene	50.0	0.0	46.4	93	80-120
135-98-8	LCS sec-Butylbenzene	50.0	0.0	47.7	95	80-121
99-87-6	LCS 4-Isopropyltoluene	50.0	0.0	49.1	98	80-121
541-73-1	LCS 1,3-Dichlorobenzene	50.0	0.0	50.0	100	76-120
106-46-7	LCS 1,4-Dichlorobenzene	50.0	0.0	48.8	98	78-120
104-51-8	LCS n-Butylbenzene	50.0	0.0	45.1	90	80-123
87-68-3	LCS Hexachlorobutadiene	50.0	0.0	53.9	108	71-128
91-20-3	LCS Naphthalene	50.0	0.0	57.4	115	64-132
87-61-6	LCS 1,2,3-Trichlorobenzene	50.0	0.0	54.7	109	61-132
120-82-1	LCS 1,2,4-Trichlorobenzene	50.0	0.0	55.3	111	66-130
630-20-6	LCS 1,1,1,2-Tetrachloroethane	50.0	0.0	57.4	115	80-125



Volatile  
Quality Control Summary  
Spike Recovery Report

Page 4 of 4

SDG Number: 2014-3494

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1396094

Matrix: GROUND WATER

Lab Sample ID 1203109630

Instrument: VOA9.I

Analysis Date: 06/19/2014 08:19

Dilution: 1

Analyst: RXY1

Purge Vol: 5 mL

Batch ID: 1396094

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
95-50-1	LCS 1,2-Dichlorobenzene	50.0	0.0	52.0	104	78-120
71-36-3	LCS n-Butyl alcohol	5000	0.0	6670	133	67-137

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 1 of 1

SDG Number: 2014-3494

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1396094

Matrix: GROUND WATER

Lab Sample ID 1203109631

Instrument: VOA9.I

Analysis Date: 06/19/2014 09:16

Dilution: 1

Analyst: RXY1

Purge Vol: 5 mL

Batch ID: 1396094

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	182	73	65-126
76-13-1	LCS Trichlorotrifluoroethane	250	0.0	194	78	73-132
107-05-1	LCS Allyl chloride	250	0.0	210	84	67-127
107-13-1	LCS Acrylonitrile	250	0.0	220	88	74-122
107-12-0	LCS Propionitrile	250	0.0	258	103	73-124
126-98-7	LCS Methacrylonitrile	250	0.0	241	96	68-123
80-62-6	LCS Methyl methacrylate	250	0.0	248	99	79-120
97-63-2	LCS Ethyl methacrylate	250	0.0	236	94	77-120
78-83-1	LCS Isobutyl alcohol	2500	0.0	2580	103	72-133
126-99-8	LCS 2-Chloro-1,3-butadiene	50.0	0.0	50.3	101	57-142

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 1 of 4

SDG Number: 2014-3494

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1396094

Matrix: GROUND WATER

Lab Sample ID 1203109632

Instrument: VOA9.I

Analysis Date: 06/20/2014 13:14

Dilution: 1

Analyst: RXY1

Purge Vol: 5 mL

Batch ID: 1396094

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	101	101	80-120
75-05-8	LCS Acetonitrile	1250	0.0	1020	81	63-131
67-64-1	LCS Acetone	250	0.0	286	115	50-149
74-88-4	LCS Iodomethane	250	0.0	234	93	75-120
75-15-0	LCS Carbon disulfide	250	0.0	219	88	80-136
108-05-4	LCS Vinyl acetate	250	0.0	259	104	78-130
78-93-3	LCS 2-Butanone	250	0.0	247	99	57-148
108-10-1	LCS 4-Methyl-2-pentanone	250	0.0	239	96	75-130
591-78-6	LCS 2-Hexanone	250	0.0	268	107	64-149
75-71-8	LCS Dichlorodifluoromethane	50.0	0.0	36.4	73	58-129
74-87-3	LCS Chloromethane	50.0	0.0	33.4	67	59-131
75-01-4	LCS Vinyl chloride	50.0	0.0	36.2	72	59-127
74-83-9	LCS Bromomethane	50.0	0.0	37.3	75	70-125
75-00-3	LCS Chloroethane	50.0	0.0	37.4	75	73-120
75-69-4	LCS Trichlorofluoromethane	50.0	0.0	42.0	84	73-123
60-29-7	LCS Ethyl ether	50.0	0.0	42.1	84	73-120
75-35-4	LCS 1,1-Dichloroethylene	50.0	0.0	40.0	80	80-128
75-09-2	LCS Methylene chloride	50.0	0.0	40.4	81	75-120
1634-04-4	LCS tert-Butyl methyl ether	50.0	0.0	47.4	95	74-122
156-60-5	LCS trans-1,2-Dichloroethylene	50.0	0.0	42.8	86	80-121
75-34-3	LCS 1,1-Dichloroethane	50.0	0.0	42.4	85	79-120
156-59-2	LCS cis-1,2-Dichloroethylene	50.0	0.0	43.8	88	79-120

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 2 of 4

SDG Number: 2014-3494

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1396094

Matrix: GROUND WATER

Lab Sample ID 1203109632

Instrument: VOA9.I

Analysis Date: 06/20/2014 13:14

Dilution: 1

Analyst: RXY1

Purge Vol: 5 mL

Batch ID: 1396094

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	49.0	98	79-130
74-97-5	LCS Bromochloromethane	50.0	0.0	48.7	97	80-121
67-66-3	LCS Chloroform	50.0	0.0	43.3	87	79-120
71-55-6	LCS 1,1,1-Trichloroethane	50.0	0.0	46.1	92	80-128
563-58-6	LCS 1,1-Dichloropropene	50.0	0.0	44.5	89	80-123
56-23-5	LCS Carbon tetrachloride	50.0	0.0	47.9	96	80-131
107-06-2	LCS 1,2-Dichloroethane	50.0	0.0	41.8	84	73-120
71-43-2	LCS Benzene	50.0	0.0	45.4	91	78-120
79-01-6	LCS Trichloroethylene	50.0	0.0	47.8	96	80-121
78-87-5	LCS 1,2-Dichloropropane	50.0	0.0	43.9	88	79-120
74-95-3	LCS Dibromomethane	50.0	0.0	44.1	88	80-120
75-27-4	LCS Bromodichloromethane	50.0	0.0	47.3	95	80-126
10061-01-5	LCS cis-1,3-Dichloropropylene	50.0	0.0	50.1	100	80-125
108-88-3	LCS Toluene	50.0	0.0	45.5	91	78-120
10061-02-6	LCS trans-1,3-Dichloropropylene	50.0	0.0	48.0	96	79-121
79-00-5	LCS 1,1,2-Trichloroethane	50.0	0.0	45.8	92	78-120
142-28-9	LCS 1,3-Dichloropropane	50.0	0.0	44.5	89	75-120
127-18-4	LCS Tetrachloroethylene	50.0	0.0	52.5	105	74-123
124-48-1	LCS Dibromochloromethane	50.0	0.0	52.4	105	73-129
108-90-7	LCS Chlorobenzene	50.0	0.0	46.7	93	79-120
100-41-4	LCS Ethylbenzene	50.0	0.0	47.2	94	79-120
95-47-6	LCS o-Xylene	50.0	0.0	51.1	102	80-123

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 3 of 4

SDG Number: 2014-3494

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1396094

Matrix: GROUND WATER

Lab Sample ID 1203109632

Instrument: VOA9.I

Analysis Date: 06/20/2014 13:14

Dilution: 1

Analyst: RXY1

Purge Vol: 5 mL

Batch ID: 1396094

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
100-42-5	LCS Styrene	50.0	0.0	52.1	104	80-121
75-25-2	LCS Bromoform	50.0	0.0	55.8	112	65-135
98-82-8	LCS Isopropylbenzene	50.0	0.0	46.9	94	79-121
79-34-5	LCS 1,1,2,2-Tetrachloroethane	50.0	0.0	41.2	82	76-123
96-18-4	LCS 1,2,3-Trichloropropane	50.0	0.0	43.2	86	76-120
108-86-1	LCS Bromobenzene	50.0	0.0	49.2	98	79-120
103-65-1	LCS n-Propylbenzene	50.0	0.0	42.1	84	80-123
108-67-8	LCS 1,3,5-Trimethylbenzene	50.0	0.0	47.5	95	80-120
95-49-8	LCS 2-Chlorotoluene	50.0	0.0	46.8	94	79-120
106-43-4	LCS 4-Chlorotoluene	50.0	0.0	44.1	88	79-120
98-06-6	LCS tert-Butylbenzene	50.0	0.0	51.3	103	79-122
95-63-6	LCS 1,2,4-Trimethylbenzene	50.0	0.0	45.3	91	80-120
135-98-8	LCS sec-Butylbenzene	50.0	0.0	47.4	95	80-121
99-87-6	LCS 4-Isopropyltoluene	50.0	0.0	48.5	97	80-121
541-73-1	LCS 1,3-Dichlorobenzene	50.0	0.0	48.0	96	76-120
106-46-7	LCS 1,4-Dichlorobenzene	50.0	0.0	45.7	91	78-120
104-51-8	LCS n-Butylbenzene	50.0	0.0	44.0	88	80-123
87-68-3	LCS Hexachlorobutadiene	50.0	0.0	54.7	109	71-128
91-20-3	LCS Naphthalene	50.0	0.0	51.5	103	64-132
87-61-6	LCS 1,2,3-Trichlorobenzene	50.0	0.0	51.4	103	61-132
120-82-1	LCS 1,2,4-Trichlorobenzene	50.0	0.0	52.8	106	66-130
630-20-6	LCS 1,1,1,2-Tetrachloroethane	50.0	0.0	52.9	106	80-125

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 4 of 4

SDG Number: 2014-3494

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1396094

Matrix: GROUND WATER

Lab Sample ID 1203109632

Instrument: VOA9.I

Analysis Date: 06/20/2014 13:14

Dilution: 1

Analyst: RXY1

Purge Vol: 5 mL

Batch ID: 1396094

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
95-50-1	LCS 1,2-Dichlorobenzene	50.0	0.0	48.7	97	78-120
71-36-3	LCS n-Butyl alcohol	5000	0.0	5350	107	67-137

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 1 of 1

SDG Number: 2014-3494

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1396094

Matrix: GROUND WATER

Lab Sample ID 1203109633

Instrument: VOA9.I

Analysis Date: 06/20/2014 14:38

Dilution: 1

Analyst: RXY1

Purge Vol: 5 mL

Batch ID: 1396094

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	228	91	65-126
76-13-1	LCS Trichlorotrifluoroethane	250	0.0	249	100	73-132
107-05-1	LCS Allyl chloride	250	0.0	254	102	67-127
107-13-1	LCS Acrylonitrile	250	0.0	223	89	74-122
107-12-0	LCS Propionitrile	250	0.0	257	103	73-124
126-98-7	LCS Methacrylonitrile	250	0.0	246	99	68-123
80-62-6	LCS Methyl methacrylate	250	0.0	260	104	79-120
97-63-2	LCS Ethyl methacrylate	250	0.0	260	104	77-120
78-83-1	LCS Isobutyl alcohol	2500	0.0	2460	98	72-133
126-99-8	LCS 2-Chloro-1,3-butadiene	50.0	0.0	60.1	120	57-142

## Method Blank Summary

Page 1 of 1

SDG Number:	2014-3494	Client:	ARSL004	Matrix:	GROUND WATER
Client ID:	MB for batch 1396094	Instrument ID:	VOA9.I	Data File:	061914V9\9R406B3.D
Lab Sample ID:	1203109624	Prep Date:	06/19/2014 09:44	Analyzed:	06/19/14 09:44
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 1396094	1203109630	061914V9\9R403L3.D	06/19/14	0819
02 LCS for batch 1396094	1203109631	061914V9\9R405L3.D	06/19/14	0916
03 CAPU-14-79420	350053008	061914V9\9R418.D	06/19/14	1522
04 CAPU-14-79423	350053035	061914V9\9R419.D	06/19/14	1550



## Method Blank Summary

Page 1 of 1

SDG Number:	2014-3494	Client:	ARSL004	Matrix:	GROUND WATER
Client ID:	MB for batch 1396094	Instrument ID:	VOA9.I	Data File:	062014V9\9R511B.D
Lab Sample ID:	1203109625	Prep Date:	06/20/2014 15:34	Analyzed:	06/20/14 15:34
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
06 LCS for batch 1396094	1203109632	062014V9\9R506L.D	06/20/14	1314
07 LCS for batch 1396094	1203109633	062014V9\9R509L.D	06/20/14	1438
08 CAPU-14-79428	350053003	062014V9\9R512.D	06/20/14	1601
09 CAPU-14-79431	350053011	062014V9\9R513.D	06/20/14	1629
10 CAPU-14-79413	350053019	062014V9\9R514.D	06/20/14	1657
11 CAPU-14-79414	350053027	062014V9\9R515.D	06/20/14	1725
12 CAPU-14-79415	350053030	062014V9\9R516.D	06/20/14	1753
13 CAPU-14-79431PS	1203109626	062014V9\9R520.D	06/20/14	1947
14 CAPU-14-79431PSD	1203109628	062014V9\9R521.D	06/20/14	2015
15 CAPU-14-79431PS	1203109627	062014V9\9R522.D	06/20/14	2043
16 CAPU-14-79431PSD	1203109629	062014V9\9R523.D	06/20/14	2111

# Quality Control Data

**Volatile  
Certificate of Analysis  
Sample Summary**

<b>SDG Number:</b>	<b>2014-3494</b>	<b>Matrix:</b>	<b>GROUND WATER</b>
<b>Lab Sample ID:</b>	<b>1203109624</b>		
<b>Client Sample:</b>	<b>QC for batch 1396094</b>	<b>Client:</b>	<b>ARSL004</b>
<b>Client ID:</b>	<b>MB for batch 1396094</b>	<b>Method:</b>	<b>SW846 8260B DOE-AL</b>
<b>Batch ID:</b>	<b>1396094</b>	<b>Inst:</b>	<b>VOA9.I</b>
<b>Run Date:</b>	<b>06/19/2014 09:44</b>	<b>Analyst:</b>	<b>RXY1</b>
<b>Prep Date:</b>	<b>06/19/2014 09:44</b>	<b>Purge Vol:</b>	<b>5 mL</b>
<b>Data File:</b>	<b>061914V9\9R406B3.D</b>	<b>Column:</b>	<b>DB-624</b>

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	U	1.00	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	1.00	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	1.00	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	1.00	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	1.00	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	1.00	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	1.00	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	1.00	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	1.00	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	1.00	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
78-93-3	2-Butanone	U	5.00	ug/L	2.00	5.00
126-99-8	2-Chloro-1,3-butadiene	U	1.00	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	1.00	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	5.00	ug/L	2.20	5.00
106-43-4	4-Chlorotoluene	U	1.00	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	1.00	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	5.00	ug/L	1.50	5.00
67-64-1	Acetone	U	10.0	ug/L	2.50	10.0
75-05-8	Acetonitrile	U	25.0	ug/L	8.00	25.0
107-02-8	Acrolein	U	5.00	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	5.00	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	5.00	ug/L	1.50	5.00
71-43-2	Benzene	U	1.00	ug/L	0.300	1.00
108-86-1	Bromobenzene	U	1.00	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	1.00	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	U	1.00	ug/L	0.300	1.00
75-25-2	Bromoform	U	1.00	ug/L	0.300	1.00
74-83-9	Bromomethane	U	1.00	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	5.00	ug/L	1.50	5.00

**Volatile**  
**Certificate of Analysis**  
**Sample Summary**

<b>SDG Number:</b> 2014-3494	<b>Matrix:</b> GROUND WATER
<b>Lab Sample ID:</b> 1203109624	
<b>Client Sample:</b> QC for batch 1396094	<b>Client:</b> ARSL004
<b>Client ID:</b> MB for batch 1396094	<b>Method:</b> SW846 8260B DOE-AL
<b>Batch ID:</b> 1396094	<b>Inst:</b> VOA9.I
<b>Run Date:</b> 06/19/2014 09:44	<b>Analyst:</b> RXY1
<b>Prep Date:</b> 06/19/2014 09:44	<b>Purge Vol:</b> 5 mL
<b>Data File:</b> 061914V9\9R406B3.D	<b>Column:</b> DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
56-23-5	Carbon tetrachloride	U	1.00	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	1.00	ug/L	0.300	1.00
75-00-3	Chloroethane	U	1.00	ug/L	0.300	1.00
67-66-3	Chloroform	U	1.00	ug/L	0.300	1.00
74-87-3	Chloromethane	U	1.00	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	1.00	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	1.00	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	1.00	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	1.00	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	5.00	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	1.00	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	1.00	ug/L	0.300	1.00
74-88-4	Iodomethane	U	5.00	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	50.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	1.00	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	5.00	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	5.00	ug/L	1.50	5.00
75-09-2	Methylene chloride	U	10.0	ug/L	1.70	10.0
91-20-3	Naphthalene	U	1.00	ug/L	0.600	1.00
107-12-0	Propionitrile	U	5.00	ug/L	1.50	5.00
100-42-5	Styrene	U	1.00	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	1.00	ug/L	0.300	1.00
108-88-3	Toluene	U	1.00	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	1.00	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	1.00	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	5.00	ug/L	1.50	5.00
108-05-4	Vinyl acetate	U	5.00	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	1.00	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	1.00	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	1.00	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	2.00	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	50.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	1.00	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	1.00	ug/L	0.300	1.00
95-47-6	o-Xylene	U	1.00	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	1.00	ug/L	0.300	1.00
1634-04-4	tert-Butyl methyl ether	U	1.00	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene	U	1.00	ug/L	0.300	1.00

**Volatile  
Certificate of Analysis  
Sample Summary**

<b>SDG Number:</b>	<b>2014-3494</b>	<b>Matrix:</b>	<b>GROUND WATER</b>
<b>Lab Sample ID:</b>	<b>1203109624</b>		
<b>Client Sample:</b>	<b>QC for batch 1396094</b>	<b>Client:</b>	<b>ARSL004</b>
<b>Client ID:</b>	<b>MB for batch 1396094</b>	<b>Method:</b>	<b>SW846 8260B DOE-AL</b>
<b>Batch ID:</b>	<b>1396094</b>	<b>Inst:</b>	<b>VOA9.I</b>
<b>Run Date:</b>	<b>06/19/2014 09:44</b>	<b>Analyst:</b>	<b>RXY1</b>
<b>Prep Date:</b>	<b>06/19/2014 09:44</b>	<b>Purge Vol:</b>	<b>5 mL</b>
<b>Data File:</b>	<b>061914V9\9R406B3.D</b>	<b>Column:</b>	<b>DB-624</b>

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
156-60-5	trans-1,2-Dichloroethylene	U	1.00	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene	U	1.00	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	47.7	50.0	95.5	(78%-124%)
Bromofluorobenzene	43.4	50.0	86.7	(80%-120%)
Toluene-d8	46.7	50.0	93.4	(80%-120%)

**Tentatively Identified Compound Summary**

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown	4.197	30.3	ug/L	0	J
	unknown	5.295	8.96	ug/L	0	J

**Volatile**  
**Certificate of Analysis**  
**Sample Summary**

<b>SDG Number:</b> 2014-3494	<b>Matrix:</b> GROUND WATER
<b>Lab Sample ID:</b> 1203109625	
<b>Client Sample:</b> QC for batch 1396094	<b>Client:</b> ARSL004
<b>Client ID:</b> MB for batch 1396094	<b>Method:</b> SW846 8260B DOE-AL
<b>Batch ID:</b> 1396094	<b>Project:</b> QC
<b>Run Date:</b> 06/20/2014 15:34	<b>SOP Ref:</b> GL-OA-E-038
<b>Prep Date:</b> 06/20/2014 15:34	<b>Dilution:</b> 1
<b>Data File:</b> 062014V9\9R511B.D	<b>Purge Vol:</b> 5 mL
	<b>Analyst:</b> RXY1
	<b>Column:</b> DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	U	1.00	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	1.00	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	1.00	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	1.00	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	1.00	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	1.00	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	1.00	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	1.00	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	1.00	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	1.00	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
78-93-3	2-Butanone	U	5.00	ug/L	2.00	5.00
126-99-8	2-Chloro-1,3-butadiene	U	1.00	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	1.00	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	5.00	ug/L	2.20	5.00
106-43-4	4-Chlorotoluene	U	1.00	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	1.00	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	5.00	ug/L	1.50	5.00
67-64-1	Acetone	U	10.0	ug/L	2.50	10.0
75-05-8	Acetonitrile	U	25.0	ug/L	8.00	25.0
107-02-8	Acrolein	U	5.00	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	5.00	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	5.00	ug/L	1.50	5.00
71-43-2	Benzene	U	1.00	ug/L	0.300	1.00
108-86-1	Bromobenzene	U	1.00	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	1.00	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	U	1.00	ug/L	0.300	1.00
75-25-2	Bromoform	U	1.00	ug/L	0.300	1.00
74-83-9	Bromomethane	U	1.00	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	5.00	ug/L	1.50	5.00

**Volatile**  
**Certificate of Analysis**  
**Sample Summary**

<b>SDG Number:</b> 2014-3494		<b>Matrix:</b>	<b>GROUND WATER</b>
<b>Lab Sample ID:</b> 1203109625			
<b>Client Sample:</b> QC for batch 1396094	<b>Client:</b> ARSL004	<b>Project:</b>	<b>QC</b>
<b>Client ID:</b> MB for batch 1396094	<b>Method:</b> SW846 8260B DOE-AL	<b>SOP Ref:</b>	<b>GL-OA-E-038</b>
<b>Batch ID:</b> 1396094	<b>Inst:</b> VOA9.I	<b>Dilution:</b>	<b>1</b>
<b>Run Date:</b> 06/20/2014 15:34	<b>Analyst:</b> RXY1	<b>Purge Vol:</b>	<b>5 mL</b>
<b>Prep Date:</b> 06/20/2014 15:34			
<b>Data File:</b> 062014V9\9R511B.D	<b>Column:</b> DB-624		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
56-23-5	Carbon tetrachloride	U	1.00	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	1.00	ug/L	0.300	1.00
75-00-3	Chloroethane	U	1.00	ug/L	0.300	1.00
67-66-3	Chloroform	U	1.00	ug/L	0.300	1.00
74-87-3	Chloromethane	U	1.00	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	1.00	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	1.00	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	1.00	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	1.00	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	5.00	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	1.00	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	1.00	ug/L	0.300	1.00
74-88-4	Iodomethane	U	5.00	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	50.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	1.00	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	5.00	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	5.00	ug/L	1.50	5.00
75-09-2	Methylene chloride	U	10.0	ug/L	1.70	10.0
91-20-3	Naphthalene	U	1.00	ug/L	0.600	1.00
107-12-0	Propionitrile	U	5.00	ug/L	1.50	5.00
100-42-5	Styrene	U	1.00	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	1.00	ug/L	0.300	1.00
108-88-3	Toluene	U	1.00	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	1.00	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	1.00	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	5.00	ug/L	1.50	5.00
108-05-4	Vinyl acetate	U	5.00	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	1.00	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	1.00	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	1.00	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	2.00	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	50.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	1.00	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	1.00	ug/L	0.300	1.00
95-47-6	o-Xylene	U	1.00	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	1.00	ug/L	0.300	1.00
1634-04-4	tert-Butyl methyl ether	U	1.00	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene	U	1.00	ug/L	0.300	1.00

**Volatile  
Certificate of Analysis  
Sample Summary**

<b>SDG Number:</b>	<b>2014-3494</b>	<b>Matrix:</b>	<b>GROUND WATER</b>
<b>Lab Sample ID:</b>	<b>1203109625</b>		
<b>Client Sample:</b>	<b>QC for batch 1396094</b>	<b>Client:</b>	<b>ARSL004</b>
<b>Client ID:</b>	<b>MB for batch 1396094</b>	<b>Method:</b>	<b>SW846 8260B DOE-AL</b>
<b>Batch ID:</b>	<b>1396094</b>	<b>Inst:</b>	<b>VOA9.I</b>
<b>Run Date:</b>	<b>06/20/2014 15:34</b>	<b>Analyst:</b>	<b>RXY1</b>
<b>Prep Date:</b>	<b>06/20/2014 15:34</b>	<b>Purge Vol:</b>	<b>5 mL</b>
<b>Data File:</b>	<b>062014V9\9R511B.D</b>	<b>Column:</b>	<b>DB-624</b>

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
156-60-5	trans-1,2-Dichloroethylene	U	1.00	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene	U	1.00	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	44.4	50.0	ug/L 88.8	(78%-124%)
Bromofluorobenzene	44.3	50.0	ug/L 88.6	(80%-120%)
Toluene-d8	45.9	50.0	ug/L 91.9	(80%-120%)

**Tentatively Identified Compound Summary**

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown	4.286	34.5	ug/L	0	J
	unknown	16.62	5.8	ug/L	0	J



**Volatile**  
**Certificate of Analysis**  
**Sample Summary**

<b>SDG Number:</b> 2014-3494	<b>Date Collected:</b> 06/03/2014 11:48	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 1203109626	<b>Date Received:</b> 06/05/2014 09:00	
<b>Client Sample:</b> QC for batch 1396094	<b>Client:</b> ARSL004	<b>Project:</b> QC
<b>Client ID:</b> CAPU-14-79431PS	<b>Method:</b> SW846 8260B DOE-AL	<b>SOP Ref:</b> GL-OA-E-038
<b>Batch ID:</b> 1396094	<b>Inst:</b> VOA9.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/20/2014 19:47	<b>Analyst:</b> RXY1	<b>Purge Vol:</b> 5 mL
<b>Prep Date:</b> 06/20/2014 19:47		
<b>Data File:</b> 062014V9\9R520.D	<b>Column:</b> DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	H	50.9	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	H	48.0	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	H	37.9	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	H	42.3	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	H	44.6	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	H	42.1	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	H	45.0	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	H	43.2	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	H	38.2	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	H	43.8	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	H	43.1	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	H	46.2	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	H	39.8	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	H	42.6	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	H	45.3	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	H	45.6	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	H	40.8	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	H	43.5	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	H	48.3	ug/L	0.300	1.00
78-93-3	2-Butanone	H	158	ug/L	2.00	5.00
126-99-8	2-Chloro-1,3-butadiene	HU	1.00	ug/L	0.200	1.00
95-49-8	2-Chlorotoluene	H	44.6	ug/L	0.300	1.00
591-78-6	2-Hexanone	H	169	ug/L	2.20	5.00
106-43-4	4-Chlorotoluene	H	41.2	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	H	47.7	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	H	198	ug/L	1.50	5.00
67-64-1	Acetone	H	137	ug/L	3.00	10.0
75-05-8	Acetonitrile	H	993	ug/L	8.00	25.0
107-02-8	Acrolein	HU	5.00	ug/L	1.50	5.00
107-13-1	Acrylonitrile	HU	5.00	ug/L	1.00	5.00
107-05-1	Allyl chloride	HU	5.00	ug/L	1.50	5.00
71-43-2	Benzene	H	45.6	ug/L	0.300	1.00
108-86-1	Bromobenzene	H	46.6	ug/L	0.300	1.00
74-97-5	Bromochloromethane	H	50.9	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	H	45.6	ug/L	0.300	1.00
75-25-2	Bromoform	H	49.2	ug/L	0.300	1.00
74-83-9	Bromomethane	H	40.9	ug/L	0.300	1.00
75-15-0	Carbon disulfide	H	233	ug/L	1.50	5.00

**Volatile**  
**Certificate of Analysis**  
**Sample Summary**

<b>SDG Number:</b> 2014-3494	<b>Date Collected:</b> 06/03/2014 11:48	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 1203109626	<b>Date Received:</b> 06/05/2014 09:00	
<b>Client Sample:</b> QC for batch 1396094	<b>Client:</b> ARSL004	<b>Project:</b> QC
<b>Client ID:</b> CAPU-14-79431PS	<b>Method:</b> SW846 8260B DOE-AL	<b>SOP Ref:</b> GL-OA-E-038
<b>Batch ID:</b> 1396094	<b>Inst:</b> VOA9.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/20/2014 19:47	<b>Analyst:</b> RXY1	<b>Purge Vol:</b> 5 mL
<b>Prep Date:</b> 06/20/2014 19:47		
<b>Data File:</b> 062014V9\9R520.D	<b>Column:</b> DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
56-23-5	Carbon tetrachloride	H	50.8	ug/L	0.300	1.00
108-90-7	Chlorobenzene	H	44.8	ug/L	0.300	1.00
75-00-3	Chloroethane	H	42.2	ug/L	0.300	1.00
67-66-3	Chloroform	H	44.8	ug/L	0.300	1.00
74-87-3	Chloromethane	H	36.1	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	H	50.0	ug/L	0.300	1.00
74-95-3	Dibromomethane	H	41.9	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	H	37.7	ug/L	0.300	1.00
60-29-7	Ethyl ether	H	44.3	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	HU	5.00	ug/L	1.50	5.00
100-41-4	Ethylbenzene	H	45.6	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	H	52.4	ug/L	0.300	1.00
74-88-4	Iodomethane	H	246	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	HU	50.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	H	44.9	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	HU	5.00	ug/L	1.00	5.00
80-62-6	Methyl methacrylate	HU	5.00	ug/L	1.50	5.00
75-09-2	Methylene chloride	H	41.6	ug/L	3.00	10.0
91-20-3	Naphthalene	H	42.6	ug/L	0.400	1.00
107-12-0	Propionitrile	HU	5.00	ug/L	1.50	5.00
100-42-5	Styrene	H	50.2	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	H	49.8	ug/L	0.300	1.00
108-88-3	Toluene	H	43.2	ug/L	0.300	1.00
79-01-6	Trichloroethylene	H	47.0	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	H	48.0	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	HU	5.00	ug/L	1.50	5.00
108-05-4	Vinyl acetate	H	223	ug/L	1.50	5.00
75-01-4	Vinyl chloride	H	39.9	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	H	45.0	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	H	44.6	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	H	97.4	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	H	4740	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	H	42.9	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	H	40.8	ug/L	0.300	1.00
95-47-6	o-Xylene	H	50.6	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	H	47.1	ug/L	0.300	1.00
1634-04-4	tert-Butyl methyl ether	H	43.1	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene	H	49.8	ug/L	0.300	1.00

**Volatile  
Certificate of Analysis  
Sample Summary**

<b>SDG Number:</b>	<b>2014-3494</b>	<b>Date Collected:</b>	<b>06/03/2014 11:48</b>	<b>Matrix:</b>	<b>W</b>
<b>Lab Sample ID:</b>	<b>1203109626</b>	<b>Date Received:</b>	<b>06/05/2014 09:00</b>		
<b>Client Sample:</b>	<b>QC for batch 1396094</b>	<b>Client:</b>	<b>ARSL004</b>	<b>Project:</b>	<b>QC</b>
<b>Client ID:</b>	<b>CAPU-14-79431PS</b>	<b>Method:</b>	<b>SW846 8260B DOE-AL</b>	<b>SOP Ref:</b>	<b>GL-OA-E-038</b>
<b>Batch ID:</b>	<b>1396094</b>	<b>Inst:</b>	<b>VOA9.I</b>	<b>Dilution:</b>	<b>1</b>
<b>Run Date:</b>	<b>06/20/2014 19:47</b>	<b>Analyst:</b>	<b>RXY1</b>	<b>Purge Vol:</b>	<b>5 mL</b>
<b>Prep Date:</b>	<b>06/20/2014 19:47</b>				
<b>Data File:</b>	<b>062014V9\9R520.D</b>	<b>Column:</b>	<b>DB-624</b>		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
156-60-5	trans-1,2-Dichloroethylene	H	44.8	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene	H	43.2	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	44.8	50.0	ug/L	89.5	(78%-124%)
Bromofluorobenzene	43.4	50.0	ug/L	86.9	(80%-120%)
Toluene-d8	46.1	50.0	ug/L	92.2	(80%-120%)

**Volatile**  
**Certificate of Analysis**  
**Sample Summary**

<b>SDG Number:</b> 2014-3494	<b>Date Collected:</b> 06/03/2014 11:48	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 1203109627	<b>Date Received:</b> 06/05/2014 09:00	
<b>Client Sample:</b> QC for batch 1396094	<b>Client:</b> ARSL004	<b>Project:</b> QC
<b>Client ID:</b> CAPU-14-79431PS	<b>Method:</b> SW846 8260B DOE-AL	<b>SOP Ref:</b> GL-OA-E-038
<b>Batch ID:</b> 1396094	<b>Inst:</b> VOA9.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/20/2014 20:43	<b>Analyst:</b> RXY1	<b>Purge Vol:</b> 5 mL
<b>Prep Date:</b> 06/20/2014 20:43		
<b>Data File:</b> 062014V9\9R522.D	<b>Column:</b> DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	HU	1.00	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	HU	1.00	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	HU	1.00	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	HU	1.00	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	HU	1.00	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	HU	1.00	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	HU	1.00	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	HU	1.00	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	HU	1.00	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	HU	1.00	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	HU	1.00	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	HU	1.00	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	HU	1.00	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	HU	1.00	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	HU	1.00	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	HU	1.00	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	HU	1.00	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	HU	1.00	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	HU	1.00	ug/L	0.300	1.00
78-93-3	2-Butanone	HU	5.00	ug/L	2.00	5.00
126-99-8	2-Chloro-1,3-butadiene	EH	61.2	ug/L	0.200	1.00
95-49-8	2-Chlorotoluene	HU	1.00	ug/L	0.300	1.00
591-78-6	2-Hexanone	HU	5.00	ug/L	2.20	5.00
106-43-4	4-Chlorotoluene	HU	1.00	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	HU	1.00	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	HU	5.00	ug/L	1.50	5.00
67-64-1	Acetone	HU	10.0	ug/L	3.00	10.0
75-05-8	Acetonitrile	HU	25.0	ug/L	8.00	25.0
107-02-8	Acrolein	H	224	ug/L	1.50	5.00
107-13-1	Acrylonitrile	H	225	ug/L	1.00	5.00
107-05-1	Allyl chloride	H	264	ug/L	1.50	5.00
71-43-2	Benzene	HU	1.00	ug/L	0.300	1.00
108-86-1	Bromobenzene	HU	1.00	ug/L	0.300	1.00
74-97-5	Bromochloromethane	HU	1.00	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	HU	1.00	ug/L	0.300	1.00
75-25-2	Bromoform	HU	1.00	ug/L	0.300	1.00
74-83-9	Bromomethane	HU	1.00	ug/L	0.300	1.00
75-15-0	Carbon disulfide	HU	5.00	ug/L	1.50	5.00

**Volatile**  
**Certificate of Analysis**  
**Sample Summary**

<b>SDG Number:</b> 2014-3494	<b>Date Collected:</b> 06/03/2014 11:48	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 1203109627	<b>Date Received:</b> 06/05/2014 09:00	
<b>Client Sample:</b> QC for batch 1396094	<b>Client:</b> ARSL004	<b>Project:</b> QC
<b>Client ID:</b> CAPU-14-79431PS	<b>Method:</b> SW846 8260B DOE-AL	<b>SOP Ref:</b> GL-OA-E-038
<b>Batch ID:</b> 1396094	<b>Inst:</b> VOA9.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/20/2014 20:43	<b>Analyst:</b> RXY1	<b>Purge Vol:</b> 5 mL
<b>Prep Date:</b> 06/20/2014 20:43		
<b>Data File:</b> 062014V9\9R522.D	<b>Column:</b> DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
56-23-5	Carbon tetrachloride	HU	1.00	ug/L	0.300	1.00
108-90-7	Chlorobenzene	HU	1.00	ug/L	0.300	1.00
75-00-3	Chloroethane	HU	1.00	ug/L	0.300	1.00
67-66-3	Chloroform	HU	1.00	ug/L	0.300	1.00
74-87-3	Chloromethane	HU	1.00	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	HU	1.00	ug/L	0.300	1.00
74-95-3	Dibromomethane	HU	1.00	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	HU	1.00	ug/L	0.300	1.00
60-29-7	Ethyl ether	HU	1.00	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	H	245	ug/L	1.50	5.00
100-41-4	Ethylbenzene	HU	1.00	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	HU	1.00	ug/L	0.300	1.00
74-88-4	Iodomethane	HU	5.00	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	H	2390	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	HU	1.00	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	H	248	ug/L	1.00	5.00
80-62-6	Methyl methacrylate	H	253	ug/L	1.50	5.00
75-09-2	Methylene chloride	HU	10.0	ug/L	3.00	10.0
91-20-3	Naphthalene	HU	1.00	ug/L	0.400	1.00
107-12-0	Propionitrile	H	250	ug/L	1.50	5.00
100-42-5	Styrene	HU	1.00	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	HU	1.00	ug/L	0.300	1.00
108-88-3	Toluene	HU	1.00	ug/L	0.300	1.00
79-01-6	Trichloroethylene	HU	1.00	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	HU	1.00	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	H	256	ug/L	1.50	5.00
108-05-4	Vinyl acetate	HU	5.00	ug/L	1.50	5.00
75-01-4	Vinyl chloride	HU	1.00	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	HU	1.00	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	HU	1.00	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	HU	2.00	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	HU	50.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	HU	1.00	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	HU	1.00	ug/L	0.300	1.00
95-47-6	o-Xylene	HU	1.00	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	HU	1.00	ug/L	0.300	1.00
1634-04-4	tert-Butyl methyl ether	HU	1.00	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene	HU	1.00	ug/L	0.300	1.00

**Volatile  
Certificate of Analysis  
Sample Summary**

<b>SDG Number:</b>	<b>2014-3494</b>	<b>Date Collected:</b>	<b>06/03/2014 11:48</b>	<b>Matrix:</b>	<b>W</b>
<b>Lab Sample ID:</b>	<b>1203109627</b>	<b>Date Received:</b>	<b>06/05/2014 09:00</b>		
<b>Client Sample:</b>	<b>QC for batch 1396094</b>	<b>Client:</b>	<b>ARSL004</b>	<b>Project:</b>	<b>QC</b>
<b>Client ID:</b>	<b>CAPU-14-79431PS</b>	<b>Method:</b>	<b>SW846 8260B DOE-AL</b>	<b>SOP Ref:</b>	<b>GL-OA-E-038</b>
<b>Batch ID:</b>	<b>1396094</b>	<b>Inst:</b>	<b>VOA9.I</b>	<b>Dilution:</b>	<b>1</b>
<b>Run Date:</b>	<b>06/20/2014 20:43</b>	<b>Analyst:</b>	<b>RXY1</b>	<b>Purge Vol:</b>	<b>5 mL</b>
<b>Prep Date:</b>	<b>06/20/2014 20:43</b>				
<b>Data File:</b>	<b>062014V9\9R522.D</b>	<b>Column:</b>	<b>DB-624</b>		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
156-60-5	trans-1,2-Dichloroethylene	HU	1.00	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene	HU	1.00	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits	
1,2-Dichloroethane-d4	44.2	50.0	ug/L	88.3	(78%-124%)
Bromofluorobenzene	44.7	50.0	ug/L	89.4	(80%-120%)
Toluene-d8	45.6	50.0	ug/L	91.1	(80%-120%)

**Volatile  
Certificate of Analysis  
Sample Summary**

<b>SDG Number:</b>	<b>2014-3494</b>	<b>Date Collected:</b>	<b>06/03/2014 11:48</b>	<b>Matrix:</b>	<b>W</b>
<b>Lab Sample ID:</b>	<b>1203109628</b>	<b>Date Received:</b>	<b>06/05/2014 09:00</b>		
<b>Client Sample:</b>	<b>QC for batch 1396094</b>	<b>Client:</b>	<b>ARSL004</b>	<b>Project:</b>	<b>QC</b>
<b>Client ID:</b>	<b>CAPU-14-79431PSD</b>	<b>Method:</b>	<b>SW846 8260B DOE-AL</b>	<b>SOP Ref:</b>	<b>GL-OA-E-038</b>
<b>Batch ID:</b>	<b>1396094</b>	<b>Inst:</b>	<b>VOA9.I</b>	<b>Dilution:</b>	<b>1</b>
<b>Run Date:</b>	<b>06/20/2014 20:15</b>	<b>Analyst:</b>	<b>RXY1</b>	<b>Purge Vol:</b>	<b>5 mL</b>
<b>Prep Date:</b>	<b>06/20/2014 20:15</b>				
<b>Data File:</b>	<b>062014V9\9R521.D</b>	<b>Column:</b>	<b>DB-624</b>		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	H	58.2	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	H	52.1	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	H	42.8	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	H	48.4	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	H	48.3	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	H	46.3	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	H	49.5	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	H	50.4	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	H	43.3	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	H	50.4	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	H	48.6	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	H	51.9	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	H	44.2	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	H	48.4	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	H	51.0	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	H	51.0	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	H	47.5	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	H	48.9	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	H	51.9	ug/L	0.300	1.00
78-93-3	2-Butanone	H	177	ug/L	2.00	5.00
126-99-8	2-Chloro-1,3-butadiene	HU	1.00	ug/L	0.200	1.00
95-49-8	2-Chlorotoluene	H	50.7	ug/L	0.300	1.00
591-78-6	2-Hexanone	H	190	ug/L	2.20	5.00
106-43-4	4-Chlorotoluene	H	47.0	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	H	52.9	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	H	225	ug/L	1.50	5.00
67-64-1	Acetone	H	145	ug/L	3.00	10.0
75-05-8	Acetonitrile	H	1050	ug/L	8.00	25.0
107-02-8	Acrolein	HU	5.00	ug/L	1.50	5.00
107-13-1	Acrylonitrile	HU	5.00	ug/L	1.00	5.00
107-05-1	Allyl chloride	HU	5.00	ug/L	1.50	5.00
71-43-2	Benzene	H	50.1	ug/L	0.300	1.00
108-86-1	Bromobenzene	H	51.3	ug/L	0.300	1.00
74-97-5	Bromochloromethane	H	54.2	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	H	50.4	ug/L	0.300	1.00
75-25-2	Bromoform	H	54.8	ug/L	0.300	1.00
74-83-9	Bromomethane	H	39.8	ug/L	0.300	1.00
75-15-0	Carbon disulfide	H	251	ug/L	1.50	5.00

**Volatile**  
**Certificate of Analysis**  
**Sample Summary**

<b>SDG Number:</b> 2014-3494	<b>Date Collected:</b> 06/03/2014 11:48	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 1203109628	<b>Date Received:</b> 06/05/2014 09:00	
<b>Client Sample:</b> QC for batch 1396094	<b>Client:</b> ARSL004	<b>Project:</b> QC
<b>Client ID:</b> CAPU-14-79431PSD	<b>Method:</b> SW846 8260B DOE-AL	<b>SOP Ref:</b> GL-OA-E-038
<b>Batch ID:</b> 1396094	<b>Inst:</b> VOA9.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/20/2014 20:15	<b>Analyst:</b> RXY1	<b>Purge Vol:</b> 5 mL
<b>Prep Date:</b> 06/20/2014 20:15		
<b>Data File:</b> 062014V9\9R521.D	<b>Column:</b> DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
56-23-5	Carbon tetrachloride	H	54.1	ug/L	0.300	1.00
108-90-7	Chlorobenzene	H	51.8	ug/L	0.300	1.00
75-00-3	Chloroethane	H	43.0	ug/L	0.300	1.00
67-66-3	Chloroform	H	48.1	ug/L	0.300	1.00
74-87-3	Chloromethane	H	36.9	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	H	57.2	ug/L	0.300	1.00
74-95-3	Dibromomethane	H	47.1	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	H	39.0	ug/L	0.300	1.00
60-29-7	Ethyl ether	H	46.3	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	HU	5.00	ug/L	1.50	5.00
100-41-4	Ethylbenzene	H	52.2	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	H	58.5	ug/L	0.300	1.00
74-88-4	Iodomethane	H	266	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	HU	50.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	H	51.5	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	HU	5.00	ug/L	1.00	5.00
80-62-6	Methyl methacrylate	HU	5.00	ug/L	1.50	5.00
75-09-2	Methylene chloride	H	45.0	ug/L	3.00	10.0
91-20-3	Naphthalene	H	49.5	ug/L	0.400	1.00
107-12-0	Propionitrile	HU	5.00	ug/L	1.50	5.00
100-42-5	Styrene	H	57.5	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	H	59.6	ug/L	0.300	1.00
108-88-3	Toluene	H	50.7	ug/L	0.300	1.00
79-01-6	Trichloroethylene	H	53.0	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	H	48.4	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	HU	5.00	ug/L	1.50	5.00
108-05-4	Vinyl acetate	H	231	ug/L	1.50	5.00
75-01-4	Vinyl chloride	H	39.9	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	H	48.4	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	H	51.6	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	H	112	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	H	5270	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	H	48.8	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	H	45.6	ug/L	0.300	1.00
95-47-6	o-Xylene	H	57.4	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	H	52.9	ug/L	0.300	1.00
1634-04-4	tert-Butyl methyl ether	H	47.2	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene	H	57.0	ug/L	0.300	1.00



**Volatile  
Certificate of Analysis  
Sample Summary**

<b>SDG Number:</b>	<b>2014-3494</b>	<b>Date Collected:</b>	<b>06/03/2014 11:48</b>	<b>Matrix:</b>	<b>W</b>
<b>Lab Sample ID:</b>	<b>1203109628</b>	<b>Date Received:</b>	<b>06/05/2014 09:00</b>		
<b>Client Sample:</b>	<b>QC for batch 1396094</b>	<b>Client:</b>	<b>ARSL004</b>	<b>Project:</b>	<b>QC</b>
<b>Client ID:</b>	<b>CAPU-14-79431PSD</b>	<b>Method:</b>	<b>SW846 8260B DOE-AL</b>	<b>SOP Ref:</b>	<b>GL-OA-E-038</b>
<b>Batch ID:</b>	<b>1396094</b>	<b>Inst:</b>	<b>VOA9.I</b>	<b>Dilution:</b>	<b>1</b>
<b>Run Date:</b>	<b>06/20/2014 20:15</b>	<b>Analyst:</b>	<b>RXY1</b>	<b>Purge Vol:</b>	<b>5 mL</b>
<b>Prep Date:</b>	<b>06/20/2014 20:15</b>				
<b>Data File:</b>	<b>062014V9\9R521.D</b>	<b>Column:</b>	<b>DB-624</b>		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
156-60-5	trans-1,2-Dichloroethylene	H	48.4	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene	H	49.7	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	43.8	50.0	87.7	(78%-124%)
Bromofluorobenzene	42.5	50.0	85.1	(80%-120%)
Toluene-d8	47.4	50.0	94.7	(80%-120%)

**Volatile**  
**Certificate of Analysis**  
**Sample Summary**

<b>SDG Number:</b> 2014-3494	<b>Date Collected:</b> 06/03/2014 11:48	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 1203109629	<b>Date Received:</b> 06/05/2014 09:00	
<b>Client Sample:</b> QC for batch 1396094	<b>Client:</b> ARSL004	<b>Project:</b> QC
<b>Client ID:</b> CAPU-14-79431PSD	<b>Method:</b> SW846 8260B DOE-AL	<b>SOP Ref:</b> GL-OA-E-038
<b>Batch ID:</b> 1396094	<b>Inst:</b> VOA9.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/20/2014 21:11	<b>Analyst:</b> RXY1	<b>Purge Vol:</b> 5 mL
<b>Prep Date:</b> 06/20/2014 21:11		
<b>Data File:</b> 062014V9\9R523.D	<b>Column:</b> DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	HU	1.00	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	HU	1.00	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	HU	1.00	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	HU	1.00	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	HU	1.00	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	HU	1.00	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	HU	1.00	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	HU	1.00	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	HU	1.00	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	HU	1.00	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	HU	1.00	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	HU	1.00	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	HU	1.00	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	HU	1.00	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	HU	1.00	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	HU	1.00	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	HU	1.00	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	HU	1.00	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	HU	1.00	ug/L	0.300	1.00
78-93-3	2-Butanone	HU	5.00	ug/L	2.00	5.00
126-99-8	2-Chloro-1,3-butadiene	EH	61.1	ug/L	0.200	1.00
95-49-8	2-Chlorotoluene	HU	1.00	ug/L	0.300	1.00
591-78-6	2-Hexanone	HU	5.00	ug/L	2.20	5.00
106-43-4	4-Chlorotoluene	HU	1.00	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	HU	1.00	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	HU	5.00	ug/L	1.50	5.00
67-64-1	Acetone	HU	10.0	ug/L	3.00	10.0
75-05-8	Acetonitrile	HU	25.0	ug/L	8.00	25.0
107-02-8	Acrolein	H	212	ug/L	1.50	5.00
107-13-1	Acrylonitrile	H	218	ug/L	1.00	5.00
107-05-1	Allyl chloride	H	264	ug/L	1.50	5.00
71-43-2	Benzene	HU	1.00	ug/L	0.300	1.00
108-86-1	Bromobenzene	HU	1.00	ug/L	0.300	1.00
74-97-5	Bromochloromethane	HU	1.00	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	HU	1.00	ug/L	0.300	1.00
75-25-2	Bromoform	HU	1.00	ug/L	0.300	1.00
74-83-9	Bromomethane	HU	1.00	ug/L	0.300	1.00
75-15-0	Carbon disulfide	HU	5.00	ug/L	1.50	5.00

**Volatile**  
**Certificate of Analysis**  
**Sample Summary**

<b>SDG Number:</b> 2014-3494	<b>Date Collected:</b> 06/03/2014 11:48	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 1203109629	<b>Date Received:</b> 06/05/2014 09:00	
<b>Client Sample:</b> QC for batch 1396094	<b>Client:</b> ARSL004	<b>Project:</b> QC
<b>Client ID:</b> CAPU-14-79431PSD	<b>Method:</b> SW846 8260B DOE-AL	<b>SOP Ref:</b> GL-OA-E-038
<b>Batch ID:</b> 1396094	<b>Inst:</b> VOA9.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/20/2014 21:11	<b>Analyst:</b> RXY1	<b>Purge Vol:</b> 5 mL
<b>Prep Date:</b> 06/20/2014 21:11		
<b>Data File:</b> 062014V9\9R523.D	<b>Column:</b> DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
56-23-5	Carbon tetrachloride	HU	1.00	ug/L	0.300	1.00
108-90-7	Chlorobenzene	HU	1.00	ug/L	0.300	1.00
75-00-3	Chloroethane	HU	1.00	ug/L	0.300	1.00
67-66-3	Chloroform	HU	1.00	ug/L	0.300	1.00
74-87-3	Chloromethane	HU	1.00	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	HU	1.00	ug/L	0.300	1.00
74-95-3	Dibromomethane	HU	1.00	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	HU	1.00	ug/L	0.300	1.00
60-29-7	Ethyl ether	HU	1.00	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	H	247	ug/L	1.50	5.00
100-41-4	Ethylbenzene	HU	1.00	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	HU	1.00	ug/L	0.300	1.00
74-88-4	Iodomethane	HU	5.00	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	H	2360	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	HU	1.00	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	H	245	ug/L	1.00	5.00
80-62-6	Methyl methacrylate	H	251	ug/L	1.50	5.00
75-09-2	Methylene chloride	HU	10.0	ug/L	3.00	10.0
91-20-3	Naphthalene	HU	1.00	ug/L	0.400	1.00
107-12-0	Propionitrile	H	238	ug/L	1.50	5.00
100-42-5	Styrene	HU	1.00	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	HU	1.00	ug/L	0.300	1.00
108-88-3	Toluene	HU	1.00	ug/L	0.300	1.00
79-01-6	Trichloroethylene	HU	1.00	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	HU	1.00	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	H	253	ug/L	1.50	5.00
108-05-4	Vinyl acetate	HU	5.00	ug/L	1.50	5.00
75-01-4	Vinyl chloride	HU	1.00	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	HU	1.00	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	HU	1.00	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	HU	2.00	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	HU	50.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	HU	1.00	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	HU	1.00	ug/L	0.300	1.00
95-47-6	o-Xylene	HU	1.00	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	HU	1.00	ug/L	0.300	1.00
1634-04-4	tert-Butyl methyl ether	HU	1.00	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene	HU	1.00	ug/L	0.300	1.00

**Volatile  
Certificate of Analysis  
Sample Summary**

<b>SDG Number:</b>	<b>2014-3494</b>	<b>Date Collected:</b>	<b>06/03/2014 11:48</b>	<b>Matrix:</b>	<b>W</b>
<b>Lab Sample ID:</b>	<b>1203109629</b>	<b>Date Received:</b>	<b>06/05/2014 09:00</b>		
<b>Client Sample:</b>	<b>QC for batch 1396094</b>	<b>Client:</b>	<b>ARSL004</b>	<b>Project:</b>	<b>QC</b>
<b>Client ID:</b>	<b>CAPU-14-79431PSD</b>	<b>Method:</b>	<b>SW846 8260B DOE-AL</b>	<b>SOP Ref:</b>	<b>GL-OA-E-038</b>
<b>Batch ID:</b>	<b>1396094</b>	<b>Inst:</b>	<b>VOA9.I</b>	<b>Dilution:</b>	<b>1</b>
<b>Run Date:</b>	<b>06/20/2014 21:11</b>	<b>Analyst:</b>	<b>RXY1</b>	<b>Purge Vol:</b>	<b>5 mL</b>
<b>Prep Date:</b>	<b>06/20/2014 21:11</b>				
<b>Data File:</b>	<b>062014V9\9R523.D</b>	<b>Column:</b>	<b>DB-624</b>		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
156-60-5	trans-1,2-Dichloroethylene	HU	1.00	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene	HU	1.00	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits	
1,2-Dichloroethane-d4	43.9	50.0	ug/L	87.8	(78%-124%)
Bromofluorobenzene	47.0	50.0	ug/L	94.1	(80%-120%)
Toluene-d8	46.4	50.0	ug/L	92.8	(80%-120%)

**Volatile**  
**Certificate of Analysis**  
**Sample Summary**

<b>SDG Number:</b> 2014-3494	<b>Matrix:</b> GROUND WATER
<b>Lab Sample ID:</b> 1203109630	
<b>Client Sample:</b> QC for batch 1396094	<b>Client:</b> ARSL004
<b>Client ID:</b> LCS for batch 1396094	<b>Method:</b> SW846 8260B DOE-AL
<b>Batch ID:</b> 1396094	<b>Project:</b> QC
<b>Run Date:</b> 06/19/2014 08:19	<b>SOP Ref:</b> GL-OA-E-038
<b>Prep Date:</b> 06/19/2014 08:19	<b>Dilution:</b> 1
<b>Data File:</b> 061914V9\9R403L3.D	<b>Purge Vol:</b> 5 mL
	<b>Analyst:</b> RXY1
	<b>Column:</b> DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane		57.4	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane		49.6	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane		46.4	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane		50.0	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane		45.5	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene		41.9	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene		46.6	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene		54.7	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane		48.6	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene		55.3	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene		46.4	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene		52.0	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane		47.1	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane		47.9	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene		48.5	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene		50.0	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane		49.1	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene		48.8	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane		51.8	ug/L	0.300	1.00
78-93-3	2-Butanone		302	ug/L	2.00	5.00
126-99-8	2-Chloro-1,3-butadiene	U	1.00	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene		47.9	ug/L	0.300	1.00
591-78-6	2-Hexanone		320	ug/L	2.20	5.00
106-43-4	4-Chlorotoluene		44.6	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene		49.1	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone		280	ug/L	1.50	5.00
67-64-1	Acetone		337	ug/L	2.50	10.0
75-05-8	Acetonitrile		1250	ug/L	8.00	25.0
107-02-8	Acrolein	U	5.00	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	5.00	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	5.00	ug/L	1.50	5.00
71-43-2	Benzene		48.3	ug/L	0.300	1.00
108-86-1	Bromobenzene		50.8	ug/L	0.300	1.00
74-97-5	Bromochloromethane		55.7	ug/L	0.300	1.00
75-27-4	Bromodichloromethane		51.8	ug/L	0.300	1.00
75-25-2	Bromoform		61.1	ug/L	0.300	1.00
74-83-9	Bromomethane		41.6	ug/L	0.300	1.00
75-15-0	Carbon disulfide		232	ug/L	1.50	5.00

**Volatile**  
**Certificate of Analysis**  
**Sample Summary**

<b>SDG Number:</b> 2014-3494	<b>Matrix:</b> GROUND WATER
<b>Lab Sample ID:</b> 1203109630	
<b>Client Sample:</b> QC for batch 1396094	<b>Client:</b> ARSL004
<b>Client ID:</b> LCS for batch 1396094	<b>Method:</b> SW846 8260B DOE-AL
<b>Batch ID:</b> 1396094	<b>Project:</b> QC
<b>Run Date:</b> 06/19/2014 08:19	<b>SOP Ref:</b> GL-OA-E-038
<b>Prep Date:</b> 06/19/2014 08:19	<b>Dilution:</b> 1
<b>Data File:</b> 061914V9\9R403L3.D	<b>Purge Vol:</b> 5 mL
	<b>Analyst:</b> RXY1
	<b>Column:</b> DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
56-23-5	Carbon tetrachloride		50.7	ug/L	0.300	1.00
108-90-7	Chlorobenzene		48.8	ug/L	0.300	1.00
75-00-3	Chloroethane		42.0	ug/L	0.300	1.00
67-66-3	Chloroform		46.3	ug/L	0.300	1.00
74-87-3	Chloromethane		37.7	ug/L	0.300	1.00
124-48-1	Dibromochloromethane		58.3	ug/L	0.300	1.00
74-95-3	Dibromomethane		49.2	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane		39.7	ug/L	0.300	1.00
60-29-7	Ethyl ether		50.1	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	5.00	ug/L	1.50	5.00
100-41-4	Ethylbenzene		48.9	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene		53.9	ug/L	0.300	1.00
74-88-4	Iodomethane		253	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	50.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene		46.8	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	5.00	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	5.00	ug/L	1.50	5.00
75-09-2	Methylene chloride		43.7	ug/L	1.70	10.0
91-20-3	Naphthalene		57.4	ug/L	0.600	1.00
107-12-0	Propionitrile	U	5.00	ug/L	1.50	5.00
100-42-5	Styrene		55.0	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene		54.6	ug/L	0.300	1.00
108-88-3	Toluene		46.6	ug/L	0.300	1.00
79-01-6	Trichloroethylene		49.9	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane		45.8	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	5.00	ug/L	1.50	5.00
108-05-4	Vinyl acetate		316	ug/L	1.50	5.00
75-01-4	Vinyl chloride		40.0	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene		46.9	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene		55.6	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes		105	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol		6670	ug/L	15.0	50.0
104-51-8	n-Butylbenzene		45.1	ug/L	0.300	1.00
103-65-1	n-Propylbenzene		42.4	ug/L	0.300	1.00
95-47-6	o-Xylene		53.9	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene		47.7	ug/L	0.300	1.00
1634-04-4	tert-Butyl methyl ether		53.7	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene		50.9	ug/L	0.300	1.00

**Volatile  
Certificate of Analysis  
Sample Summary**

<b>SDG Number:</b>	<b>2014-3494</b>	<b>Matrix:</b>	<b>GROUND WATER</b>
<b>Lab Sample ID:</b>	<b>1203109630</b>		
<b>Client Sample:</b>	<b>QC for batch 1396094</b>	<b>Client:</b>	<b>ARSL004</b>
<b>Client ID:</b>	<b>LCS for batch 1396094</b>	<b>Method:</b>	<b>SW846 8260B DOE-AL</b>
<b>Batch ID:</b>	<b>1396094</b>	<b>Inst:</b>	<b>VOA9.I</b>
<b>Run Date:</b>	<b>06/19/2014 08:19</b>	<b>Analyst:</b>	<b>RXY1</b>
<b>Prep Date:</b>	<b>06/19/2014 08:19</b>	<b>Purge Vol:</b>	<b>5 mL</b>
<b>Data File:</b>	<b>061914V9\9R403L3.D</b>	<b>Column:</b>	<b>DB-624</b>

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
156-60-5	trans-1,2-Dichloroethylene		45.0	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene		52.2	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	47.4	50.0	94.8	(78%-124%)
Bromofluorobenzene	43.0	50.0	86.1	(80%-120%)
Toluene-d8	45.2	50.0	90.4	(80%-120%)

**Volatile**  
**Certificate of Analysis**  
**Sample Summary**

<b>SDG Number:</b> 2014-3494	<b>Matrix:</b> GROUND WATER
<b>Lab Sample ID:</b> 1203109631	
<b>Client Sample:</b> QC for batch 1396094	<b>Client:</b> ARSL004
<b>Client ID:</b> LCS for batch 1396094	<b>Method:</b> SW846 8260B DOE-AL
<b>Batch ID:</b> 1396094	<b>Inst:</b> VOA9.I
<b>Run Date:</b> 06/19/2014 09:16	<b>Analyst:</b> RXY1
<b>Prep Date:</b> 06/19/2014 09:16	<b>Purge Vol:</b> 5 mL
<b>Data File:</b> 061914V9\9R405L3.D	<b>Column:</b> DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	U	1.00	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	1.00	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	1.00	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	1.00	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	1.00	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	1.00	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	1.00	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	1.00	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	1.00	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	1.00	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
78-93-3	2-Butanone	U	5.00	ug/L	2.00	5.00
126-99-8	2-Chloro-1,3-butadiene		50.3	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	1.00	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	5.00	ug/L	2.20	5.00
106-43-4	4-Chlorotoluene	U	1.00	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	1.00	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	5.00	ug/L	1.50	5.00
67-64-1	Acetone	U	10.0	ug/L	2.50	10.0
75-05-8	Acetonitrile	U	25.0	ug/L	8.00	25.0
107-02-8	Acrolein		182	ug/L	1.50	5.00
107-13-1	Acrylonitrile		220	ug/L	1.50	5.00
107-05-1	Allyl chloride		210	ug/L	1.50	5.00
71-43-2	Benzene	U	1.00	ug/L	0.300	1.00
108-86-1	Bromobenzene	U	1.00	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	1.00	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	U	1.00	ug/L	0.300	1.00
75-25-2	Bromoform	U	1.00	ug/L	0.300	1.00
74-83-9	Bromomethane	U	1.00	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	5.00	ug/L	1.50	5.00



**Volatile**  
**Certificate of Analysis**  
**Sample Summary**

<b>SDG Number:</b> 2014-3494	<b>Matrix:</b> GROUND WATER
<b>Lab Sample ID:</b> 1203109631	
<b>Client Sample:</b> QC for batch 1396094	<b>Client:</b> ARSL004
<b>Client ID:</b> LCS for batch 1396094	<b>Method:</b> SW846 8260B DOE-AL
<b>Batch ID:</b> 1396094	<b>Inst:</b> VOA9.I
<b>Run Date:</b> 06/19/2014 09:16	<b>Analyst:</b> RXY1
<b>Prep Date:</b> 06/19/2014 09:16	<b>Purge Vol:</b> 5 mL
<b>Data File:</b> 061914V9\9R405L3.D	<b>Column:</b> DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
56-23-5	Carbon tetrachloride	U	1.00	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	1.00	ug/L	0.300	1.00
75-00-3	Chloroethane	U	1.00	ug/L	0.300	1.00
67-66-3	Chloroform	U	1.00	ug/L	0.300	1.00
74-87-3	Chloromethane	U	1.00	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	1.00	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	1.00	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	1.00	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	1.00	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate		236	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	1.00	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	1.00	ug/L	0.300	1.00
74-88-4	Iodomethane	U	5.00	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol		2580	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	1.00	ug/L	0.300	1.00
126-98-7	Methacrylonitrile		241	ug/L	1.50	5.00
80-62-6	Methyl methacrylate		248	ug/L	1.50	5.00
75-09-2	Methylene chloride	U	10.0	ug/L	1.70	10.0
91-20-3	Naphthalene	U	1.00	ug/L	0.600	1.00
107-12-0	Propionitrile		258	ug/L	1.50	5.00
100-42-5	Styrene	U	1.00	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	1.00	ug/L	0.300	1.00
108-88-3	Toluene	U	1.00	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	1.00	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	1.00	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane		194	ug/L	1.50	5.00
108-05-4	Vinyl acetate	U	5.00	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	1.00	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	1.00	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	1.00	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	2.00	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	50.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	1.00	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	1.00	ug/L	0.300	1.00
95-47-6	o-Xylene	U	1.00	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	1.00	ug/L	0.300	1.00
1634-04-4	tert-Butyl methyl ether	U	1.00	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene	U	1.00	ug/L	0.300	1.00

**Volatile  
Certificate of Analysis  
Sample Summary**

<b>SDG Number:</b>	<b>2014-3494</b>	<b>Matrix:</b>	<b>GROUND WATER</b>
<b>Lab Sample ID:</b>	<b>1203109631</b>		
<b>Client Sample:</b>	<b>QC for batch 1396094</b>	<b>Client:</b>	<b>ARSL004</b>
<b>Client ID:</b>	<b>LCS for batch 1396094</b>	<b>Method:</b>	<b>SW846 8260B DOE-AL</b>
<b>Batch ID:</b>	<b>1396094</b>	<b>Inst:</b>	<b>VOA9.I</b>
<b>Run Date:</b>	<b>06/19/2014 09:16</b>	<b>Analyst:</b>	<b>RXY1</b>
<b>Prep Date:</b>	<b>06/19/2014 09:16</b>	<b>Purge Vol:</b>	<b>5 mL</b>
<b>Data File:</b>	<b>061914V9\9R405L3.D</b>	<b>Column:</b>	<b>DB-624</b>

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
156-60-5	trans-1,2-Dichloroethylene	U	1.00	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene	U	1.00	ug/L	0.300	1.00
Surrogate/Tracer recovery		Result	Nominal		Recovery%	Acceptable Limits
1,2-Dichloroethane-d4		47.0	50.0	ug/L	93.9	(78%-124%)
Bromofluorobenzene		46.8	50.0	ug/L	93.6	(80%-120%)
Toluene-d8		46.0	50.0	ug/L	92.0	(80%-120%)

**Volatile**  
**Certificate of Analysis**  
**Sample Summary**

<b>SDG Number:</b> 2014-3494		<b>Matrix:</b>	GROUND WATER
<b>Lab Sample ID:</b> 1203109632			
<b>Client Sample:</b> QC for batch 1396094	<b>Client:</b> ARSL004	<b>Project:</b>	QC
<b>Client ID:</b> LCS for batch 1396094	<b>Method:</b> SW846 8260B DOE-AL	<b>SOP Ref:</b>	GL-OA-E-038
<b>Batch ID:</b> 1396094	<b>Inst:</b> VOA9.I	<b>Dilution:</b>	1
<b>Run Date:</b> 06/20/2014 13:14	<b>Analyst:</b> RXY1	<b>Purge Vol:</b>	5 mL
<b>Prep Date:</b> 06/20/2014 13:14			
<b>Data File:</b> 062014V9\9R506L.D	<b>Column:</b> DB-624		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane		52.9	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane		46.1	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane		41.2	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane		45.8	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane		42.4	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene		40.0	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene		44.5	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene		51.4	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane		43.2	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene		52.8	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene		45.3	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene		48.7	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane		41.8	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane		43.9	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene		47.5	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene		48.0	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane		44.5	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene		45.7	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane		49.0	ug/L	0.300	1.00
78-93-3	2-Butanone		247	ug/L	2.00	5.00
126-99-8	2-Chloro-1,3-butadiene	U	1.00	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene		46.8	ug/L	0.300	1.00
591-78-6	2-Hexanone		268	ug/L	2.20	5.00
106-43-4	4-Chlorotoluene		44.1	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene		48.5	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone		239	ug/L	1.50	5.00
67-64-1	Acetone		286	ug/L	2.50	10.0
75-05-8	Acetonitrile		1020	ug/L	8.00	25.0
107-02-8	Acrolein	U	5.00	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	5.00	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	5.00	ug/L	1.50	5.00
71-43-2	Benzene		45.4	ug/L	0.300	1.00
108-86-1	Bromobenzene		49.2	ug/L	0.300	1.00
74-97-5	Bromochloromethane		48.7	ug/L	0.300	1.00
75-27-4	Bromodichloromethane		47.3	ug/L	0.300	1.00
75-25-2	Bromoform		55.8	ug/L	0.300	1.00
74-83-9	Bromomethane		37.3	ug/L	0.300	1.00
75-15-0	Carbon disulfide		219	ug/L	1.50	5.00

**Volatile**  
**Certificate of Analysis**  
**Sample Summary**

<b>SDG Number:</b> 2014-3494	<b>Matrix:</b> GROUND WATER
<b>Lab Sample ID:</b> 1203109632	
<b>Client Sample:</b> QC for batch 1396094	<b>Client:</b> ARSL004
<b>Client ID:</b> LCS for batch 1396094	<b>Method:</b> SW846 8260B DOE-AL
<b>Batch ID:</b> 1396094	<b>Project:</b> QC
<b>Run Date:</b> 06/20/2014 13:14	<b>SOP Ref:</b> GL-OA-E-038
<b>Prep Date:</b> 06/20/2014 13:14	<b>Dilution:</b> 1
<b>Data File:</b> 062014V9\9R506L.D	<b>Purge Vol:</b> 5 mL
	<b>Analyst:</b> RXY1
	<b>Column:</b> DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
56-23-5	Carbon tetrachloride		47.9	ug/L	0.300	1.00
108-90-7	Chlorobenzene		46.7	ug/L	0.300	1.00
75-00-3	Chloroethane		37.4	ug/L	0.300	1.00
67-66-3	Chloroform		43.3	ug/L	0.300	1.00
74-87-3	Chloromethane		33.4	ug/L	0.300	1.00
124-48-1	Dibromochloromethane		52.4	ug/L	0.300	1.00
74-95-3	Dibromomethane		44.1	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane		36.4	ug/L	0.300	1.00
60-29-7	Ethyl ether		42.1	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	5.00	ug/L	1.50	5.00
100-41-4	Ethylbenzene		47.2	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene		54.7	ug/L	0.300	1.00
74-88-4	Iodomethane		234	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	50.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene		46.9	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	5.00	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	5.00	ug/L	1.50	5.00
75-09-2	Methylene chloride		40.4	ug/L	1.70	10.0
91-20-3	Naphthalene		51.5	ug/L	0.600	1.00
107-12-0	Propionitrile	U	5.00	ug/L	1.50	5.00
100-42-5	Styrene		52.1	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene		52.5	ug/L	0.300	1.00
108-88-3	Toluene		45.5	ug/L	0.300	1.00
79-01-6	Trichloroethylene		47.8	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane		42.0	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	5.00	ug/L	1.50	5.00
108-05-4	Vinyl acetate		259	ug/L	1.50	5.00
75-01-4	Vinyl chloride		36.2	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene		43.8	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene		50.1	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes		101	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol		5350	ug/L	15.0	50.0
104-51-8	n-Butylbenzene		44.0	ug/L	0.300	1.00
103-65-1	n-Propylbenzene		42.1	ug/L	0.300	1.00
95-47-6	o-Xylene		51.1	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene		47.4	ug/L	0.300	1.00
1634-04-4	tert-Butyl methyl ether		47.4	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene		51.3	ug/L	0.300	1.00

**Volatile  
Certificate of Analysis  
Sample Summary**

<b>SDG Number:</b>	<b>2014-3494</b>	<b>Matrix:</b>	<b>GROUND WATER</b>
<b>Lab Sample ID:</b>	<b>1203109632</b>		
<b>Client Sample:</b>	<b>QC for batch 1396094</b>	<b>Client:</b>	<b>ARSL004</b>
<b>Client ID:</b>	<b>LCS for batch 1396094</b>	<b>Method:</b>	<b>SW846 8260B DOE-AL</b>
<b>Batch ID:</b>	<b>1396094</b>	<b>Inst:</b>	<b>VOA9.I</b>
<b>Run Date:</b>	<b>06/20/2014 13:14</b>	<b>Analyst:</b>	<b>RXY1</b>
<b>Prep Date:</b>	<b>06/20/2014 13:14</b>	<b>Purge Vol:</b>	<b>5 mL</b>
<b>Data File:</b>	<b>062014V9\9R506L.D</b>	<b>Column:</b>	<b>DB-624</b>

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
156-60-5	trans-1,2-Dichloroethylene		42.8	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene		48.0	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	43.5	50.0	87.0	(78%-124%)
Bromofluorobenzene	43.5	50.0	86.9	(80%-120%)
Toluene-d8	45.6	50.0	91.3	(80%-120%)

**Volatile**  
**Certificate of Analysis**  
**Sample Summary**

<b>SDG Number:</b> 2014-3494	<b>Matrix:</b> GROUND WATER
<b>Lab Sample ID:</b> 1203109633	
<b>Client Sample:</b> QC for batch 1396094	<b>Client:</b> ARSL004
<b>Client ID:</b> LCS for batch 1396094	<b>Method:</b> SW846 8260B DOE-AL
<b>Batch ID:</b> 1396094	<b>Inst:</b> VOA9.I
<b>Run Date:</b> 06/20/2014 14:38	<b>Analyst:</b> RXY1
<b>Prep Date:</b> 06/20/2014 14:38	<b>Purge Vol:</b> 5 mL
<b>Data File:</b> 062014V9\9R509L.D	<b>Column:</b> DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	U	1.00	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	1.00	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	1.00	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	1.00	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	1.00	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	1.00	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	1.00	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	1.00	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	1.00	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	1.00	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
78-93-3	2-Butanone	U	5.00	ug/L	2.00	5.00
126-99-8	2-Chloro-1,3-butadiene	E	60.1	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	1.00	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	5.00	ug/L	2.20	5.00
106-43-4	4-Chlorotoluene	U	1.00	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	1.00	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	5.00	ug/L	1.50	5.00
67-64-1	Acetone	U	10.0	ug/L	2.50	10.0
75-05-8	Acetonitrile	U	25.0	ug/L	8.00	25.0
107-02-8	Acrolein		228	ug/L	1.50	5.00
107-13-1	Acrylonitrile		223	ug/L	1.50	5.00
107-05-1	Allyl chloride		254	ug/L	1.50	5.00
71-43-2	Benzene	U	1.00	ug/L	0.300	1.00
108-86-1	Bromobenzene	U	1.00	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	1.00	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	U	1.00	ug/L	0.300	1.00
75-25-2	Bromoform	U	1.00	ug/L	0.300	1.00
74-83-9	Bromomethane	U	1.00	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	5.00	ug/L	1.50	5.00

**Volatile  
Certificate of Analysis  
Sample Summary**

<b>SDG Number:</b>	<b>2014-3494</b>	<b>Matrix:</b>	<b>GROUND WATER</b>
<b>Lab Sample ID:</b>	<b>1203109633</b>		
<b>Client Sample:</b>	<b>QC for batch 1396094</b>	<b>Client:</b>	<b>ARSL004</b>
<b>Client ID:</b>	<b>LCS for batch 1396094</b>	<b>Method:</b>	<b>SW846 8260B DOE-AL</b>
<b>Batch ID:</b>	<b>1396094</b>	<b>Inst:</b>	<b>VOA9.I</b>
<b>Run Date:</b>	<b>06/20/2014 14:38</b>	<b>Analyst:</b>	<b>RXY1</b>
<b>Prep Date:</b>	<b>06/20/2014 14:38</b>	<b>Purge Vol:</b>	<b>5 mL</b>
<b>Data File:</b>	<b>062014V9\9R509L.D</b>	<b>Column:</b>	<b>DB-624</b>

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
56-23-5	Carbon tetrachloride	U	1.00	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	1.00	ug/L	0.300	1.00
75-00-3	Chloroethane	U	1.00	ug/L	0.300	1.00
67-66-3	Chloroform	U	1.00	ug/L	0.300	1.00
74-87-3	Chloromethane	U	1.00	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	1.00	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	1.00	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	1.00	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	1.00	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate		260	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	1.00	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	1.00	ug/L	0.300	1.00
74-88-4	Iodomethane	U	5.00	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol		2460	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	1.00	ug/L	0.300	1.00
126-98-7	Methacrylonitrile		246	ug/L	1.50	5.00
80-62-6	Methyl methacrylate		260	ug/L	1.50	5.00
75-09-2	Methylene chloride	U	10.0	ug/L	1.70	10.0
91-20-3	Naphthalene	U	1.00	ug/L	0.600	1.00
107-12-0	Propionitrile		257	ug/L	1.50	5.00
100-42-5	Styrene	U	1.00	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	1.00	ug/L	0.300	1.00
108-88-3	Toluene	U	1.00	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	1.00	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	1.00	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane		249	ug/L	1.50	5.00
108-05-4	Vinyl acetate	U	5.00	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	1.00	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	1.00	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	1.00	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	2.00	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	50.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	1.00	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	1.00	ug/L	0.300	1.00
95-47-6	o-Xylene	U	1.00	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	1.00	ug/L	0.300	1.00
1634-04-4	tert-Butyl methyl ether	U	1.00	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene	U	1.00	ug/L	0.300	1.00

**Volatile  
Certificate of Analysis  
Sample Summary**

<b>SDG Number:</b>	<b>2014-3494</b>	<b>Matrix:</b>	<b>GROUND WATER</b>
<b>Lab Sample ID:</b>	<b>1203109633</b>		
<b>Client Sample:</b>	<b>QC for batch 1396094</b>	<b>Client:</b>	<b>ARSL004</b>
<b>Client ID:</b>	<b>LCS for batch 1396094</b>	<b>Method:</b>	<b>SW846 8260B DOE-AL</b>
<b>Batch ID:</b>	<b>1396094</b>	<b>Inst:</b>	<b>VOA9.I</b>
<b>Run Date:</b>	<b>06/20/2014 14:38</b>	<b>Analyst:</b>	<b>RXY1</b>
<b>Prep Date:</b>	<b>06/20/2014 14:38</b>	<b>Purge Vol:</b>	<b>5 mL</b>
<b>Data File:</b>	<b>062014V9\9R509L.D</b>	<b>Column:</b>	<b>DB-624</b>

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
156-60-5	trans-1,2-Dichloroethylene	U	1.00	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene	U	1.00	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits	
1,2-Dichloroethane-d4	44.4	50.0	ug/L	88.8	(78%-124%)
Bromofluorobenzene	46.4	50.0	ug/L	92.9	(80%-120%)
Toluene-d8	46.7	50.0	ug/L	93.3	(80%-120%)



# Miscellaneous

DATA EXCEPTION REPORT			
<b>Mo.Day Yr.</b> 24-JUN-14	<b>Division:</b> Industrial	<b>Quality Criteria:</b> Specifications	<b>Type:</b> Process
<b>Instrument Type:</b> VOA GC/MS	<b>Test / Method:</b> SW846 8260B DOE-AL	<b>Matrix Type:</b> Liquid	<b>Client Code:</b> ESHL
<b>Batch ID:</b> 1396094	<b>Sample Numbers:</b> 349932002, 350053003, 350053008, 350053011, 350053019, 350053027, 350053030, 350053035, 350137001, 350137008, 350137009, 350137016, 350260005, 1203109626, 1203109627, 1203109628, 1203109629		
<b>Potentially affected work order(s)(SDG): 349932(2014-3483),350053(2014-3494),350137(2014-3500),350260(2014-3510)</b> <b>Application Issues:</b> Sample Analyzed out of Holding			
<b>Specification and Requirements Exception Description:</b>		<b>DER Disposition:</b>	
1. Sample Analyzed out of Holding: 349932 002 350053 003,008,011,019,027,030,035 350137 001,008,009,016 350260 005 QC 1203109626PS,1203109627PS, 1203109628PSD, 1203109629PSD		1. Samples were analyzed within two times the hold date. Therefore, sample date analysis was acceptable per client.	

**Originator's Name:**  
Morgan Mickalis 24-JUN-14

**Data Validator/Group Leader:**  
Erin Haubert 01-JUL-14

# **Semi-Volatile Analysis**

# Case Narrative

**Semi-Volatile Case Narrative  
ARS International, LLC (ARSL)  
SDG 2014-3494**

**Method/Analysis Information**

<b>Procedure:</b>	<b>Analysis of Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry</b>
Analytical Method:	SW846 3510C/8270D
Prep Method:	SW846 3510C
Analytical Batch Number:	1393520
Prep Batch Number:	1393519

**Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
350053003	CAPU-14-79428
350053011	CAPU-14-79431
350053019	CAPU-14-79413
350053027	CAPU-14-79414
350053030	CAPU-14-79415
1203102908	Method Blank (MB)
1203102909	Laboratory Control Sample (LCS)
1203102910	349932002(WST09-14-79994) Matrix Spike (MS)
1203102911	349932002(WST09-14-79994) 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# 32.

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. However, the method allows for a designated number of outliers dependent on the requested analyte list. This SDG satisfied the 8270D outlier acceptance criteria. Detected concentrations of these analytes should be considered as estimated.

#### **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 (LCS) Recovery**

The LCS spike recoveries met the acceptance limits.

##### **QC Sample Designation**

Sample 349932002 (WST09-14-79994) was selected for analysis as the matrix spike and matrix spike duplicate.

##### **Matrix Spike (MS) Recovery Statement**

The MS1203102910 (WST09-14-79994) exceeded spike recovery limits for Pyridine at 100% (SPC limits: 14.0%-94.1%), bis(2-Ethylhexyl)phthalate at 121% (SPC limits: 29.0%-120.0%), Di-n-octylphthalate at 119% (SPC limits: 25.0%-118.0%), and Benzyl alcohol at 101% (SPC limits: 31.0%-100.0%). Since there were no target analytes detected in the parent sample, the positive biases in MS spike recoveries had no adverse impact on the data and the results have been reported.

##### **Matrix Spike Duplicate (MSD) Recovery Statement**

The MSD1203102911 (WST09-14-79994) exceeded spike recovery limits for Pyridine at 97.5% (SPC limits: 14.0%-94.1%). Since Pyridine was not detected in the parent sample, the positive bias in the MSD had no adverse impact on the data and the results have been reported.

##### **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:**

##### **Data Exception (DER) Documentation**

The following DER was generated for this SDG: 1302222.

##### **Manual Integrations**

Some initial calibration standards, continuing calibration standards, and/or samples may require manual integrations due to software limitations. Manual integrations were required in this SDG and are included with the raw data.

##### **TIC Comment**

Tentatively identified compounds (TIC) may be requested for samples 1203102908 (MB), 350053003 (CAPU-14-79428), 350053011 (CAPU-14-79431), 350053019 (CAPU-14-79413), 350053027 (CAPU-14-79414) and 350053030 (CAPU-14-79415) 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, are included on the Sample Data Summary (Form 1) and are also included with the sample raw data.

##### **Additional Comments**

The additional comments field is used to address special issues associated with each analysis, clarify method/contractual issues pertaining to the analysis, and to list any report documents generated as a result of sample analysis or review. The following additional comments were required:

Due to rounding differences in the calculation, the data reported in the Surrogate Recovery Report may differ slightly from the raw data. Due to software issue, the raw data may not correctly display the updated SPC limits. Please see Sample Data Summary Report and Surrogate Recovery Report for the correct surrogate acceptance limits.

##### **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:

<b>Instrument ID</b>	<b>Instrument</b>	<b>System Configuration</b>	<b>Column ID</b>	<b>Column Description</b>
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: 2014-3494 GEL Work Order: 350053

#### 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, 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: 11 JUN 2014

Title: Data Validator

# **Sample Data Summary**

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

SDG Number: 2014-3494

Lab Sample ID: 350053003

Date Collected: 06/03/2014 11:21

Date Received: 06/05/2014 09:00

Matrix: W

Client: ARSL004

Project: ESHL00714

Method: SW846 3510C/8270D

SOP Ref: GL-OA-E-009

Client ID: CAPU-14-79428

Batch ID: 1393520

Inst: MSD4.I

Dilution: 1

Run Date: 06/09/2014 14:14

Analyst: JMB3

Inj. Vol: 1 uL

Prep Date: 06/06/2014 15:40

Aliquot: 980 mL

Final Volume: 1 mL

Data File: s060914.B\s4f0912.D

Column: DB-5ms

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
95-94-3	1,2,4,5-Tetrachlorobenzene	U	10.2	ug/L	3.06	10.2
120-82-1	1,2,4-Trichlorobenzene	U	10.2	ug/L	3.06	10.2
95-50-1	1,2-Dichlorobenzene	U	10.2	ug/L	3.06	10.2
122-66-7	Azobenzene	U	10.2	ug/L	3.06	10.2
	<i>1,2-Diphenylhydrazine</i>					
541-73-1	1,3-Dichlorobenzene	U	10.2	ug/L	3.06	10.2
106-46-7	1,4-Dichlorobenzene	U	10.2	ug/L	3.06	10.2
123-91-1	1,4-Dioxane	U	10.2	ug/L	3.06	10.2
58-90-2	2,3,4,6-Tetrachlorophenol	U	10.2	ug/L	3.06	10.2
95-95-4	2,4,5-Trichlorophenol	U	10.2	ug/L	3.06	10.2
88-06-2	2,4,6-Trichlorophenol	U	10.2	ug/L	3.06	10.2
120-83-2	2,4-Dichlorophenol	U	10.2	ug/L	3.06	10.2
105-67-9	2,4-Dimethylphenol	U	10.2	ug/L	3.06	10.2
51-28-5	2,4-Dinitrophenol	U	20.4	ug/L	5.10	20.4
121-14-2	2,4-Dinitrotoluene	U	10.2	ug/L	3.06	10.2
606-20-2	2,6-Dinitrotoluene	U	10.2	ug/L	3.06	10.2
91-58-7	2-Chloronaphthalene	U	1.02	ug/L	0.418	1.02
95-57-8	2-Chlorophenol	U	10.2	ug/L	3.06	10.2
534-52-1	2-Methyl-4,6-dinitrophenol	U	10.2	ug/L	3.06	10.2
88-75-5	2-Nitrophenol	U	10.2	ug/L	3.06	10.2
91-94-1	3,3'-Dichlorobenzidine	U	10.2	ug/L	3.06	10.2
101-55-3	4-Bromophenylphenylether	U	10.2	ug/L	3.06	10.2
59-50-7	Parachlorometa cresol	U	10.2	ug/L	3.06	10.2
	<i>4-Chloro-3-methylphenol</i>					
106-47-8	4-Chloroaniline	U	10.2	ug/L	3.37	10.2
7005-72-3	4-Chlorophenylphenylether	U	10.2	ug/L	3.06	10.2
100-02-7	4-Nitrophenol	U	10.2	ug/L	3.06	10.2
62-53-3	Aniline	U	10.2	ug/L	4.29	10.2
1912-24-9	Atrazine	U	10.2	ug/L	3.06	10.2
92-87-5	Benzidine	U	10.2	ug/L	3.98	10.2
65-85-0	Benzoic acid	U	20.4	ug/L	6.12	20.4
100-51-6	Benzyl alcohol	U	10.2	ug/L	3.06	10.2
85-68-7	Butylbenzylphthalate	U	10.2	ug/L	3.06	10.2
84-74-2	Di-n-butylphthalate	U	10.2	ug/L	3.06	10.2
117-84-0	Di-n-octylphthalate	U	10.2	ug/L	3.06	10.2
132-64-9	Dibenzofuran	U	10.2	ug/L	3.06	10.2
84-66-2	Diethylphthalate	U	10.2	ug/L	3.06	10.2
131-11-3	Dimethylphthalate	U	10.2	ug/L	3.06	10.2
88-85-7	Dinoseb	U	10.2	ug/L	3.06	10.2

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

Page 2 of 2

SDG Number: 2014-3494

Lab Sample ID: 350053003

Date Collected: 06/03/2014 11:21

Date Received: 06/05/2014 09:00

Matrix: W

Client: ARSL004

Project: ESHL00714

Method: SW846 3510C/8270D

SOP Ref: GL-OA-E-009

Batch ID: 1393520

Inst: MSD4.I

Dilution: 1

Run Date: 06/09/2014 14:14

Analyst: JMB3

Inj. Vol: 1 uL

Prep Date: 06/06/2014 15:40

Aliquot: 980 mL

Final Volume: 1 mL

Data File: s060914.B\s4f0912.D

Column: DB-5ms

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
122-39-4	Diphenylamine	U	10.2	ug/L	3.06	10.2
87-68-3	Hexachlorobutadiene	U	10.2	ug/L	3.06	10.2
77-47-4	Hexachlorocyclopentadiene	U	10.2	ug/L	3.06	10.2
67-72-1	Hexachloroethane	U	10.2	ug/L	3.06	10.2
78-59-1	Isophorone	U	10.2	ug/L	3.57	10.2
62-75-9	N-Methyl-N-nitrosomethylamine	U	10.2	ug/L	3.06	10.2
924-16-3	N-Nitrosodi-n-butylamine	U	10.2	ug/L	3.06	10.2
55-18-5	N-Nitrosodiethylamine	U	10.2	ug/L	3.06	10.2
621-64-7	N-Nitrosodi--n-propylamine	U	10.2	ug/L	3.06	10.2
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine	U	10.2	ug/L	3.06	10.2
98-95-3	Nitrobenzene	U	10.2	ug/L	3.06	10.2
608-93-5	Pentachlorobenzene	U	10.2	ug/L	3.06	10.2
108-95-2	Phenol	U	10.2	ug/L	3.06	10.2
110-86-1	Pyridine	U	10.2	ug/L	3.06	10.2
108-60-1	bis(2-Chloro-1-methylethyl)ether	U	10.2	ug/L	3.06	10.2
111-91-1	bis(2-Chloroethoxy)methane	U	10.2	ug/L	3.06	10.2
111-44-4	bis(2-Chloroethyl) ether	U	10.2	ug/L	3.06	10.2
117-81-7	bis(2-Ethylhexyl)phthalate	U	10.2	ug/L	3.06	10.2
65794-96-9	m,p-Cresols	U	10.2	ug/L	3.78	10.2
99-09-2	3-Nitroaniline	U	10.2	ug/L	3.06	10.2
	<i>m-Nitroaniline</i>					
95-48-7	o-Cresol	U	10.2	ug/L	3.06	10.2
88-74-4	2-Nitroaniline	U	10.2	ug/L	3.06	10.2
	<i>o-Nitroaniline</i>					
100-01-6	4-Nitroaniline	U	10.2	ug/L	3.06	10.2
	<i>p-Nitroaniline</i>					

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
2,4,6-Tribromophenol	80.6	102	ug/L 79.0	(26%-129%)
2-Fluorobiphenyl	37.4	51.0	ug/L 73.4	(32%-102%)
2-Fluorophenol	52.6	102	ug/L 51.5	(10%-78%)
Nitrobenzene-d5	38.4	51.0	ug/L 75.3	(36%-125%)
Phenol-d5	32.4	102	ug/L 31.8	(10%-104%)
p-Terphenyl-d14	45.4	51.0	ug/L 89.1	(34%-135%)

**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**

SDG Number: 2014-3494

Lab Sample ID: 350053011

Date Collected: 06/03/2014 11:48

Date Received: 06/05/2014 09:00

Matrix: W

Client: ARSL004

Project: ESHL00714

Method: SW846 3510C/8270D

SOP Ref: GL-OA-E-009

Inst: MSD4.I

Dilution: 1

Run Date: 06/09/2014 14:43

Analyst: JMB3

Inj. Vol: 1 uL

Prep Date: 06/06/2014 15:40

Aliquot: 890 mL

Final Volume: 1 mL

Data File: s060914.B\s4f0913.D

Column: DB-5ms

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
95-94-3	1,2,4,5-Tetrachlorobenzene	U	11.2	ug/L	3.37	11.2
120-82-1	1,2,4-Trichlorobenzene	U	11.2	ug/L	3.37	11.2
95-50-1	1,2-Dichlorobenzene	U	11.2	ug/L	3.37	11.2
122-66-7	Azobenzene	U	11.2	ug/L	3.37	11.2
	<i>1,2-Diphenylhydrazine</i>					
541-73-1	1,3-Dichlorobenzene	U	11.2	ug/L	3.37	11.2
106-46-7	1,4-Dichlorobenzene	U	11.2	ug/L	3.37	11.2
123-91-1	1,4-Dioxane	U	11.2	ug/L	3.37	11.2
58-90-2	2,3,4,6-Tetrachlorophenol	U	11.2	ug/L	3.37	11.2
95-95-4	2,4,5-Trichlorophenol	U	11.2	ug/L	3.37	11.2
88-06-2	2,4,6-Trichlorophenol	U	11.2	ug/L	3.37	11.2
120-83-2	2,4-Dichlorophenol	U	11.2	ug/L	3.37	11.2
105-67-9	2,4-Dimethylphenol	U	11.2	ug/L	3.37	11.2
51-28-5	2,4-Dinitrophenol	U	22.5	ug/L	5.62	22.5
121-14-2	2,4-Dinitrotoluene	U	11.2	ug/L	3.37	11.2
606-20-2	2,6-Dinitrotoluene	U	11.2	ug/L	3.37	11.2
91-58-7	2-Chloronaphthalene	U	1.12	ug/L	0.461	1.12
95-57-8	2-Chlorophenol	U	11.2	ug/L	3.37	11.2
534-52-1	2-Methyl-4,6-dinitrophenol	U	11.2	ug/L	3.37	11.2
88-75-5	2-Nitrophenol	U	11.2	ug/L	3.37	11.2
91-94-1	3,3'-Dichlorobenzidine	U	11.2	ug/L	3.37	11.2
101-55-3	4-Bromophenylphenylether	U	11.2	ug/L	3.37	11.2
59-50-7	Parachlorometa cresol	U	11.2	ug/L	3.37	11.2
	<i>4-Chloro-3-methylphenol</i>					
106-47-8	4-Chloroaniline	U	11.2	ug/L	3.71	11.2
7005-72-3	4-Chlorophenylphenylether	U	11.2	ug/L	3.37	11.2
100-02-7	4-Nitrophenol	U	11.2	ug/L	3.37	11.2
62-53-3	Aniline	U	11.2	ug/L	4.72	11.2
1912-24-9	Atrazine	U	11.2	ug/L	3.37	11.2
92-87-5	Benzidine	U	11.2	ug/L	4.38	11.2
65-85-0	Benzoic acid	U	22.5	ug/L	6.74	22.5
100-51-6	Benzyl alcohol	U	11.2	ug/L	3.37	11.2
85-68-7	Butylbenzylphthalate	U	11.2	ug/L	3.37	11.2
84-74-2	Di-n-butylphthalate	U	11.2	ug/L	3.37	11.2
117-84-0	Di-n-octylphthalate	U	11.2	ug/L	3.37	11.2
132-64-9	Dibenzofuran	U	11.2	ug/L	3.37	11.2
84-66-2	Diethylphthalate	U	11.2	ug/L	3.37	11.2
131-11-3	Dimethylphthalate	U	11.2	ug/L	3.37	11.2
88-85-7	Dinoseb	U	11.2	ug/L	3.37	11.2

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

Page 2 of 2

SDG Number: 2014-3494

Lab Sample ID: 350053011

Date Collected: 06/03/2014 11:48

Date Received: 06/05/2014 09:00

Matrix: W

Client ID: CAPU-14-79431

Batch ID: 1393520

Run Date: 06/09/2014 14:43

Prep Date: 06/06/2014 15:40

Data File: s060914.B\s4f0913.D

Client: ARSL004

Method: SW846 3510C/8270D

Inst: MSD4.I

Analyst: JMB3

Aliquot: 890 mL

Column: DB-5ms

Project: ESHL00714

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
122-39-4	Diphenylamine	U	11.2	ug/L	3.37	11.2
87-68-3	Hexachlorobutadiene	U	11.2	ug/L	3.37	11.2
77-47-4	Hexachlorocyclopentadiene	U	11.2	ug/L	3.37	11.2
67-72-1	Hexachloroethane	U	11.2	ug/L	3.37	11.2
78-59-1	Isophorone	U	11.2	ug/L	3.93	11.2
62-75-9	N-Methyl-N-nitrosomethylamine	U	11.2	ug/L	3.37	11.2
924-16-3	N-Nitrosodi-n-butylamine	U	11.2	ug/L	3.37	11.2
55-18-5	N-Nitrosodiethylamine	U	11.2	ug/L	3.37	11.2
621-64-7	N-Nitrosodi--n-propylamine	U	11.2	ug/L	3.37	11.2
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine	U	11.2	ug/L	3.37	11.2
98-95-3	Nitrobenzene	U	11.2	ug/L	3.37	11.2
608-93-5	Pentachlorobenzene	U	11.2	ug/L	3.37	11.2
108-95-2	Phenol	U	11.2	ug/L	3.37	11.2
110-86-1	Pyridine	U	11.2	ug/L	3.37	11.2
108-60-1	bis(2-Chloro-1-methylethyl)ether	U	11.2	ug/L	3.37	11.2
111-91-1	bis(2-Chloroethoxy)methane	U	11.2	ug/L	3.37	11.2
111-44-4	bis(2-Chloroethyl) ether	U	11.2	ug/L	3.37	11.2
117-81-7	bis(2-Ethylhexyl)phthalate	U	11.2	ug/L	3.37	11.2
65794-96-9	m,p-Cresols	U	11.2	ug/L	4.16	11.2
99-09-2	3-Nitroaniline	U	11.2	ug/L	3.37	11.2
	<i>m-Nitroaniline</i>					
95-48-7	o-Cresol	U	11.2	ug/L	3.37	11.2
88-74-4	2-Nitroaniline	U	11.2	ug/L	3.37	11.2
	<i>o-Nitroaniline</i>					
100-01-6	4-Nitroaniline	U	11.2	ug/L	3.37	11.2
	<i>p-Nitroaniline</i>					

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	101	112	ug/L	90.1	(26%-129%)
2-Fluorobiphenyl	46.9	56.2	ug/L	83.4	(32%-102%)
2-Fluorophenol	66.6	112	ug/L	59.3	(10%-78%)
Nitrobenzene-d5	48.6	56.2	ug/L	86.6	(36%-125%)
Phenol-d5	41.7	112	ug/L	37.1	(10%-104%)
p-Terphenyl-d14	54.4	56.2	ug/L	96.8	(34%-135%)

**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 2

SDG Number: 2014-3494

Lab Sample ID: 350053019

Date Collected: 06/03/2014 13:48

Date Received: 06/05/2014 09:00

Matrix: W

Client: ARSL004

Project: ESHL00714

Method: SW846 3510C/8270D

SOP Ref: GL-OA-E-009

Inst: MSD4.I

Dilution: 1

Run Date: 06/09/2014 15:13

Analyst: JMB3

Inj. Vol: 1 uL

Prep Date: 06/06/2014 15:40

Aliquot: 940 mL

Final Volume: 1 mL

Data File: s060914.B\s4f0914.D

Column: DB-5ms

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
95-94-3	1,2,4,5-Tetrachlorobenzene	U	10.6	ug/L	3.19	10.6
120-82-1	1,2,4-Trichlorobenzene	U	10.6	ug/L	3.19	10.6
95-50-1	1,2-Dichlorobenzene	U	10.6	ug/L	3.19	10.6
122-66-7	Azobenzene	U	10.6	ug/L	3.19	10.6
	<i>1,2-Diphenylhydrazine</i>					
541-73-1	1,3-Dichlorobenzene	U	10.6	ug/L	3.19	10.6
106-46-7	1,4-Dichlorobenzene	U	10.6	ug/L	3.19	10.6
123-91-1	1,4-Dioxane	U	10.6	ug/L	3.19	10.6
58-90-2	2,3,4,6-Tetrachlorophenol	U	10.6	ug/L	3.19	10.6
95-95-4	2,4,5-Trichlorophenol	U	10.6	ug/L	3.19	10.6
88-06-2	2,4,6-Trichlorophenol	U	10.6	ug/L	3.19	10.6
120-83-2	2,4-Dichlorophenol	U	10.6	ug/L	3.19	10.6
105-67-9	2,4-Dimethylphenol	U	10.6	ug/L	3.19	10.6
51-28-5	2,4-Dinitrophenol	U	21.3	ug/L	5.32	21.3
121-14-2	2,4-Dinitrotoluene	U	10.6	ug/L	3.19	10.6
606-20-2	2,6-Dinitrotoluene	U	10.6	ug/L	3.19	10.6
91-58-7	2-Chloronaphthalene	U	1.06	ug/L	0.436	1.06
95-57-8	2-Chlorophenol	U	10.6	ug/L	3.19	10.6
534-52-1	2-Methyl-4,6-dinitrophenol	U	10.6	ug/L	3.19	10.6
88-75-5	2-Nitrophenol	U	10.6	ug/L	3.19	10.6
91-94-1	3,3'-Dichlorobenzidine	U	10.6	ug/L	3.19	10.6
101-55-3	4-Bromophenylphenylether	U	10.6	ug/L	3.19	10.6
59-50-7	Parachlorometa cresol	U	10.6	ug/L	3.19	10.6
	<i>4-Chloro-3-methylphenol</i>					
106-47-8	4-Chloroaniline	U	10.6	ug/L	3.51	10.6
7005-72-3	4-Chlorophenylphenylether	U	10.6	ug/L	3.19	10.6
100-02-7	4-Nitrophenol	U	10.6	ug/L	3.19	10.6
62-53-3	Aniline	U	10.6	ug/L	4.47	10.6
1912-24-9	Atrazine	U	10.6	ug/L	3.19	10.6
92-87-5	Benzidine	U	10.6	ug/L	4.15	10.6
65-85-0	Benzoic acid	U	21.3	ug/L	6.38	21.3
100-51-6	Benzyl alcohol	U	10.6	ug/L	3.19	10.6
85-68-7	Butylbenzylphthalate	U	10.6	ug/L	3.19	10.6
84-74-2	Di-n-butylphthalate	U	10.6	ug/L	3.19	10.6
117-84-0	Di-n-octylphthalate	U	10.6	ug/L	3.19	10.6
132-64-9	Dibenzofuran	U	10.6	ug/L	3.19	10.6
84-66-2	Diethylphthalate	U	10.6	ug/L	3.19	10.6
131-11-3	Dimethylphthalate	U	10.6	ug/L	3.19	10.6
88-85-7	Dinoseb	U	10.6	ug/L	3.19	10.6

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

Page 2 of 2

SDG Number: 2014-3494

Lab Sample ID: 350053019

Date Collected: 06/03/2014 13:48

Date Received: 06/05/2014 09:00

Matrix: W

Client: ARSL004

Project: ESHL00714

Method: SW846 3510C/8270D

SOP Ref: GL-OA-E-009

Inst: MSD4.I

Dilution: 1

Batch ID: 1393520

Analyst: JMB3

Inj. Vol: 1 uL

Run Date: 06/09/2014 15:13

Aliquot: 940 mL

Final Volume: 1 mL

Prep Date: 06/06/2014 15:40

Data File: s060914.B\s4f0914.D

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
122-39-4	Diphenylamine	U	10.6	ug/L	3.19	10.6
87-68-3	Hexachlorobutadiene	U	10.6	ug/L	3.19	10.6
77-47-4	Hexachlorocyclopentadiene	U	10.6	ug/L	3.19	10.6
67-72-1	Hexachloroethane	U	10.6	ug/L	3.19	10.6
78-59-1	Isophorone	U	10.6	ug/L	3.72	10.6
62-75-9	N-Methyl-N-nitrosomethylamine	U	10.6	ug/L	3.19	10.6
924-16-3	N-Nitrosodi-n-butylamine	U	10.6	ug/L	3.19	10.6
55-18-5	N-Nitrosodiethylamine	U	10.6	ug/L	3.19	10.6
621-64-7	N-Nitrosodi--n-propylamine	U	10.6	ug/L	3.19	10.6
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine	U	10.6	ug/L	3.19	10.6
98-95-3	Nitrobenzene	U	10.6	ug/L	3.19	10.6
608-93-5	Pentachlorobenzene	U	10.6	ug/L	3.19	10.6
108-95-2	Phenol	U	10.6	ug/L	3.19	10.6
110-86-1	Pyridine	U	10.6	ug/L	3.19	10.6
108-60-1	bis(2-Chloro-1-methylethyl)ether	U	10.6	ug/L	3.19	10.6
111-91-1	bis(2-Chloroethoxy)methane	U	10.6	ug/L	3.19	10.6
111-44-4	bis(2-Chloroethyl) ether	U	10.6	ug/L	3.19	10.6
117-81-7	bis(2-Ethylhexyl)phthalate	U	10.6	ug/L	3.19	10.6
65794-96-9	m,p-Cresols	U	10.6	ug/L	3.94	10.6
99-09-2	3-Nitroaniline	U	10.6	ug/L	3.19	10.6
	<i>m-Nitroaniline</i>					
95-48-7	o-Cresol	U	10.6	ug/L	3.19	10.6
88-74-4	2-Nitroaniline	U	10.6	ug/L	3.19	10.6
	<i>o-Nitroaniline</i>					
100-01-6	4-Nitroaniline	U	10.6	ug/L	3.19	10.6
	<i>p-Nitroaniline</i>					

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
2,4,6-Tribromophenol	102	106	ug/L 96.3	(26%-129%)
2-Fluorobiphenyl	46.1	53.2	ug/L 86.7	(32%-102%)
2-Fluorophenol	50.6	106	ug/L 47.5	(10%-78%)
Nitrobenzene-d5	47.7	53.2	ug/L 89.7	(36%-125%)
Phenol-d5	30.6	106	ug/L 28.8	(10%-104%)
p-Terphenyl-d14	56.8	53.2	ug/L 107	(34%-135%)

**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**

SDG Number: 2014-3494

Lab Sample ID: 350053027

Date Collected: 06/03/2014 11:48

Date Received: 06/05/2014 09:00

Matrix: W

Client: ARSL004

Project: ESHL00714

Method: SW846 3510C/8270D

SOP Ref: GL-OA-E-009

Batch ID: 1393520

Inst: MSD4.I

Dilution: 1

Run Date: 06/09/2014 15:43

Analyst: JMB3

Inj. Vol: 1 uL

Prep Date: 06/06/2014 15:40

Aliquot: 960 mL

Final Volume: 1 mL

Data File: s060914.B\s4f0915.D

Column: DB-5ms

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
95-94-3	1,2,4,5-Tetrachlorobenzene	U	10.4	ug/L	3.13	10.4
120-82-1	1,2,4-Trichlorobenzene	U	10.4	ug/L	3.13	10.4
95-50-1	1,2-Dichlorobenzene	U	10.4	ug/L	3.13	10.4
122-66-7	Azobenzene	U	10.4	ug/L	3.13	10.4
	<i>1,2-Diphenylhydrazine</i>					
541-73-1	1,3-Dichlorobenzene	U	10.4	ug/L	3.13	10.4
106-46-7	1,4-Dichlorobenzene	U	10.4	ug/L	3.13	10.4
123-91-1	1,4-Dioxane	U	10.4	ug/L	3.13	10.4
58-90-2	2,3,4,6-Tetrachlorophenol	U	10.4	ug/L	3.13	10.4
95-95-4	2,4,5-Trichlorophenol	U	10.4	ug/L	3.13	10.4
88-06-2	2,4,6-Trichlorophenol	U	10.4	ug/L	3.13	10.4
120-83-2	2,4-Dichlorophenol	U	10.4	ug/L	3.13	10.4
105-67-9	2,4-Dimethylphenol	U	10.4	ug/L	3.13	10.4
51-28-5	2,4-Dinitrophenol	U	20.8	ug/L	5.21	20.8
121-14-2	2,4-Dinitrotoluene	U	10.4	ug/L	3.13	10.4
606-20-2	2,6-Dinitrotoluene	U	10.4	ug/L	3.13	10.4
91-58-7	2-Chloronaphthalene	U	1.04	ug/L	0.427	1.04
95-57-8	2-Chlorophenol	U	10.4	ug/L	3.13	10.4
534-52-1	2-Methyl-4,6-dinitrophenol	U	10.4	ug/L	3.13	10.4
88-75-5	2-Nitrophenol	U	10.4	ug/L	3.13	10.4
91-94-1	3,3'-Dichlorobenzidine	U	10.4	ug/L	3.13	10.4
101-55-3	4-Bromophenylphenylether	U	10.4	ug/L	3.13	10.4
59-50-7	Parachlorometa cresol	U	10.4	ug/L	3.13	10.4
	<i>4-Chloro-3-methylphenol</i>					
106-47-8	4-Chloroaniline	U	10.4	ug/L	3.44	10.4
7005-72-3	4-Chlorophenylphenylether	U	10.4	ug/L	3.13	10.4
100-02-7	4-Nitrophenol	U	10.4	ug/L	3.13	10.4
62-53-3	Aniline	U	10.4	ug/L	4.38	10.4
1912-24-9	Atrazine	U	10.4	ug/L	3.13	10.4
92-87-5	Benzidine	U	10.4	ug/L	4.06	10.4
65-85-0	Benzoic acid	U	20.8	ug/L	6.25	20.8
100-51-6	Benzyl alcohol	U	10.4	ug/L	3.13	10.4
85-68-7	Butylbenzylphthalate	U	10.4	ug/L	3.13	10.4
84-74-2	Di-n-butylphthalate	U	10.4	ug/L	3.13	10.4
117-84-0	Di-n-octylphthalate	U	10.4	ug/L	3.13	10.4
132-64-9	Dibenzofuran	U	10.4	ug/L	3.13	10.4
84-66-2	Diethylphthalate	U	10.4	ug/L	3.13	10.4
131-11-3	Dimethylphthalate	U	10.4	ug/L	3.13	10.4
88-85-7	Dinoseb	U	10.4	ug/L	3.13	10.4

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

Page 2 of 2

SDG Number: 2014-3494

Lab Sample ID: 350053027

Date Collected: 06/03/2014 11:48

Date Received: 06/05/2014 09:00

Matrix: W

Client ID: CAPU-14-79414

Batch ID: 1393520

Run Date: 06/09/2014 15:43

Prep Date: 06/06/2014 15:40

Data File: s060914.B\s4f0915.D

Client: ARSL004

Method: SW846 3510C/8270D

Inst: MSD4.I

Analyst: JMB3

Aliquot: 960 mL

Column: DB-5ms

Project: ESHL00714

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
122-39-4	Diphenylamine	U	10.4	ug/L	3.13	10.4
87-68-3	Hexachlorobutadiene	U	10.4	ug/L	3.13	10.4
77-47-4	Hexachlorocyclopentadiene	U	10.4	ug/L	3.13	10.4
67-72-1	Hexachloroethane	U	10.4	ug/L	3.13	10.4
78-59-1	Isophorone	U	10.4	ug/L	3.65	10.4
62-75-9	N-Methyl-N-nitrosomethylamine	U	10.4	ug/L	3.13	10.4
924-16-3	N-Nitrosodi-n-butylamine	U	10.4	ug/L	3.13	10.4
55-18-5	N-Nitrosodiethylamine	U	10.4	ug/L	3.13	10.4
621-64-7	N-Nitrosodi--n-propylamine	U	10.4	ug/L	3.13	10.4
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine	U	10.4	ug/L	3.13	10.4
98-95-3	Nitrobenzene	U	10.4	ug/L	3.13	10.4
608-93-5	Pentachlorobenzene	U	10.4	ug/L	3.13	10.4
108-95-2	Phenol	U	10.4	ug/L	3.13	10.4
110-86-1	Pyridine	U	10.4	ug/L	3.13	10.4
108-60-1	bis(2-Chloro-1-methylethyl)ether	U	10.4	ug/L	3.13	10.4
111-91-1	bis(2-Chloroethoxy)methane	U	10.4	ug/L	3.13	10.4
111-44-4	bis(2-Chloroethyl) ether	U	10.4	ug/L	3.13	10.4
117-81-7	bis(2-Ethylhexyl)phthalate	U	10.4	ug/L	3.13	10.4
65794-96-9	m,p-Cresols	U	10.4	ug/L	3.85	10.4
99-09-2	3-Nitroaniline	U	10.4	ug/L	3.13	10.4
	<i>m-Nitroaniline</i>					
95-48-7	o-Cresol	U	10.4	ug/L	3.13	10.4
88-74-4	2-Nitroaniline	U	10.4	ug/L	3.13	10.4
	<i>o-Nitroaniline</i>					
100-01-6	4-Nitroaniline	U	10.4	ug/L	3.13	10.4
	<i>p-Nitroaniline</i>					

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
2,4,6-Tribromophenol	80.6	104	ug/L 77.4	(26%-129%)
2-Fluorobiphenyl	42.3	52.1	ug/L 81.1	(32%-102%)
2-Fluorophenol	46.3	104	ug/L 44.5	(10%-78%)
Nitrobenzene-d5	43.4	52.1	ug/L 83.2	(36%-125%)
Phenol-d5	27.2	104	ug/L 26.1	(10%-104%)
p-Terphenyl-d14	57.0	52.1	ug/L 109	(34%-135%)

**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**

SDG Number: 2014-3494

Lab Sample ID: 350053030

Date Collected: 06/03/2014 11:48

Date Received: 06/05/2014 09:00

Matrix: W

Client: ARSL004

Project: ESHL00714

Method: SW846 3510C/8270D

SOP Ref: GL-OA-E-009

Inst: MSD4.I

Dilution: 1

Run Date: 06/09/2014 16:13

Analyst: JMB3

Inj. Vol: 1 uL

Prep Date: 06/06/2014 15:40

Aliquot: 950 mL

Final Volume: 1 mL

Data File: s060914.B\s4f0916.D

Column: DB-5ms

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
95-94-3	1,2,4,5-Tetrachlorobenzene	U	10.5	ug/L	3.16	10.5
120-82-1	1,2,4-Trichlorobenzene	U	10.5	ug/L	3.16	10.5
95-50-1	1,2-Dichlorobenzene	U	10.5	ug/L	3.16	10.5
122-66-7	Azobenzene	U	10.5	ug/L	3.16	10.5
	<i>1,2-Diphenylhydrazine</i>					
541-73-1	1,3-Dichlorobenzene	U	10.5	ug/L	3.16	10.5
106-46-7	1,4-Dichlorobenzene	U	10.5	ug/L	3.16	10.5
123-91-1	1,4-Dioxane	U	10.5	ug/L	3.16	10.5
58-90-2	2,3,4,6-Tetrachlorophenol	U	10.5	ug/L	3.16	10.5
95-95-4	2,4,5-Trichlorophenol	U	10.5	ug/L	3.16	10.5
88-06-2	2,4,6-Trichlorophenol	U	10.5	ug/L	3.16	10.5
120-83-2	2,4-Dichlorophenol	U	10.5	ug/L	3.16	10.5
105-67-9	2,4-Dimethylphenol	U	10.5	ug/L	3.16	10.5
51-28-5	2,4-Dinitrophenol	U	21.1	ug/L	5.26	21.1
121-14-2	2,4-Dinitrotoluene	U	10.5	ug/L	3.16	10.5
606-20-2	2,6-Dinitrotoluene	U	10.5	ug/L	3.16	10.5
91-58-7	2-Chloronaphthalene	U	1.05	ug/L	0.432	1.05
95-57-8	2-Chlorophenol	U	10.5	ug/L	3.16	10.5
534-52-1	2-Methyl-4,6-dinitrophenol	U	10.5	ug/L	3.16	10.5
88-75-5	2-Nitrophenol	U	10.5	ug/L	3.16	10.5
91-94-1	3,3'-Dichlorobenzidine	U	10.5	ug/L	3.16	10.5
101-55-3	4-Bromophenylphenylether	U	10.5	ug/L	3.16	10.5
59-50-7	Parachlorometa cresol	U	10.5	ug/L	3.16	10.5
	<i>4-Chloro-3-methylphenol</i>					
106-47-8	4-Chloroaniline	U	10.5	ug/L	3.47	10.5
7005-72-3	4-Chlorophenylphenylether	U	10.5	ug/L	3.16	10.5
100-02-7	4-Nitrophenol	U	10.5	ug/L	3.16	10.5
62-53-3	Aniline	U	10.5	ug/L	4.42	10.5
1912-24-9	Atrazine	U	10.5	ug/L	3.16	10.5
92-87-5	Benzidine	U	10.5	ug/L	4.11	10.5
65-85-0	Benzoic acid	U	21.1	ug/L	6.32	21.1
100-51-6	Benzyl alcohol	U	10.5	ug/L	3.16	10.5
85-68-7	Butylbenzylphthalate	U	10.5	ug/L	3.16	10.5
84-74-2	Di-n-butylphthalate	U	10.5	ug/L	3.16	10.5
117-84-0	Di-n-octylphthalate	U	10.5	ug/L	3.16	10.5
132-64-9	Dibenzofuran	U	10.5	ug/L	3.16	10.5
84-66-2	Diethylphthalate	U	10.5	ug/L	3.16	10.5
131-11-3	Dimethylphthalate	U	10.5	ug/L	3.16	10.5
88-85-7	Dinoseb	U	10.5	ug/L	3.16	10.5

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

Page 2 of 2

SDG Number: 2014-3494

Lab Sample ID: 350053030

Date Collected: 06/03/2014 11:48

Date Received: 06/05/2014 09:00

Matrix: W

Client: ARSL004

Project: ESHL00714

Method: SW846 3510C/8270D

SOP Ref: GL-OA-E-009

Batch ID: 1393520

Inst: MSD4.I

Dilution: 1

Run Date: 06/09/2014 16:13

Analyst: JMB3

Inj. Vol: 1 uL

Prep Date: 06/06/2014 15:40

Aliquot: 950 mL

Final Volume: 1 mL

Data File: s060914.B\s4f0916.D

Column: DB-5ms

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
122-39-4	Diphenylamine	U	10.5	ug/L	3.16	10.5
87-68-3	Hexachlorobutadiene	U	10.5	ug/L	3.16	10.5
77-47-4	Hexachlorocyclopentadiene	U	10.5	ug/L	3.16	10.5
67-72-1	Hexachloroethane	U	10.5	ug/L	3.16	10.5
78-59-1	Isophorone	U	10.5	ug/L	3.68	10.5
62-75-9	N-Methyl-N-nitrosomethylamine	U	10.5	ug/L	3.16	10.5
924-16-3	N-Nitrosodi-n-butylamine	U	10.5	ug/L	3.16	10.5
55-18-5	N-Nitrosodiethylamine	U	10.5	ug/L	3.16	10.5
621-64-7	N-Nitrosodi--n-propylamine	U	10.5	ug/L	3.16	10.5
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine	U	10.5	ug/L	3.16	10.5
98-95-3	Nitrobenzene	U	10.5	ug/L	3.16	10.5
608-93-5	Pentachlorobenzene	U	10.5	ug/L	3.16	10.5
108-95-2	Phenol	U	10.5	ug/L	3.16	10.5
110-86-1	Pyridine	U	10.5	ug/L	3.16	10.5
108-60-1	bis(2-Chloro-1-methylethyl)ether	U	10.5	ug/L	3.16	10.5
111-91-1	bis(2-Chloroethoxy)methane	U	10.5	ug/L	3.16	10.5
111-44-4	bis(2-Chloroethyl) ether	U	10.5	ug/L	3.16	10.5
117-81-7	bis(2-Ethylhexyl)phthalate	U	10.5	ug/L	3.16	10.5
65794-96-9	m,p-Cresols	U	10.5	ug/L	3.89	10.5
99-09-2	3-Nitroaniline	U	10.5	ug/L	3.16	10.5
	<i>m-Nitroaniline</i>					
95-48-7	o-Cresol	U	10.5	ug/L	3.16	10.5
88-74-4	2-Nitroaniline	U	10.5	ug/L	3.16	10.5
	<i>o-Nitroaniline</i>					
100-01-6	4-Nitroaniline	U	10.5	ug/L	3.16	10.5
	<i>p-Nitroaniline</i>					

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	68.8	105	ug/L	65.4	(26%-129%)
2-Fluorobiphenyl	35.6	52.6	ug/L	67.7	(32%-102%)
2-Fluorophenol	50.6	105	ug/L	48.1	(10%-78%)
Nitrobenzene-d5	36.3	52.6	ug/L	69.0	(36%-125%)
Phenol-d5	32.4	105	ug/L	30.8	(10%-104%)
p-Terphenyl-d14	42.7	52.6	ug/L	81.2	(34%-135%)

**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: 2014-3494

Matrix Type: LIQUID

Sample ID	Client ID	2FP %REC	PHL %REC	NBZ %REC	FBP %REC	TBP %REC	TPH %REC
1203102908	MB for batch 1393519	48	30	69	46	78	85
1203102909	LCS for batch 1393519	53	34	79	68	91	89
1203102910	WST09-14-79994MS	64	59	89	85	98	102
1203102911	WST09-14-79994MSD	62	56	86	82	95	97
350053003	CAPU-14-79428	52	32	75	73	79	89
350053011	CAPU-14-79431	59	37	87	83	90	97
350053019	CAPU-14-79413	48	29	90	87	96	107
350053027	CAPU-14-79414	44	26	83	81	77	109
350053030	CAPU-14-79415	48	31	69	68	65	81

## Surrogate

## Acceptance Limits

2FP	= 2-Fluorophenol	(10%-78%)
PHL	= Phenol-d5	(10%-104%)
NBZ	= Nitrobenzene-d5	(36%-125%)
FBP	= 2-Fluorobiphenyl	(32%-102%)
TBP	= 2,4,6-Tribromophenol	(26%-129%)
TPH	= p-Terphenyl-d14	(34%-135%)

\* 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 3

SDG Number: 2014-3494

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1393519

Matrix: WATER

Lab Sample ID 1203102909

Instrument: MSD4.I

Analysis Date: 06/09/2014 11:44

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1393519

Inj. Vol: 1 uL

Batch ID: 1393520

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
62-75-9	LCS N-Methyl-N-nitrosomethylam	50.0	0.0	29.6	59	18-75
110-86-1	LCS Pyridine	50.0	0.0	38.5	77	11-88
62-53-3	LCS Aniline	50.0	0.0	52.5	105	35-107
108-95-2	LCS Phenol	50.0	0.0	17.9	36	13-77
111-44-4	LCS bis(2-Chloroethyl) ether	50.0	0.0	45.1	90	35-111
95-57-8	LCS 2-Chlorophenol	50.0	0.0	41.1	82	39-99
541-73-1	LCS 1,3-Dichlorobenzene	50.0	0.0	25.8	52	25-100
106-46-7	LCS 1,4-Dichlorobenzene	50.0	0.0	26.0	52	24-88
95-50-1	LCS 1,2-Dichlorobenzene	50.0	0.0	26.9	54	27-87
108-60-1	LCS bis(2-Chloro-1-methylethyl)et	50.0	0.0	40.5	81	23-120
100-51-6	LCS Benzyl alcohol	50.0	0.0	42.1	84	33-90
95-48-7	LCS o-Cresol	50.0	0.0	39.4	79	32-90
65794-96-9	LCS m,p-Cresols	50.0	0.0	40.1	80	28-100
621-64-7	LCS N-Nitrosodi--n-propylamine <i>N-Nitrosodipropylamine</i>	50.0	0.0	45.9	92	39-113
67-72-1	LCS Hexachloroethane	50.0	0.0	24.7	49	20-85
98-95-3	LCS Nitrobenzene	50.0	0.0	41.2	82	41-119
78-59-1	LCS Isophorone	50.0	0.0	48.0	96	49-133
88-75-5	LCS 2-Nitrophenol	50.0	0.0	39.7	79	42-111
105-67-9	LCS 2,4-Dimethylphenol	50.0	0.0	41.2	82	43-99
111-91-1	LCS bis(2-Chloroethoxy)methane	50.0	0.0	45.2	90	44-109
120-83-2	LCS 2,4-Dichlorophenol	50.0	0.0	40.5	81	45-106
65-85-0	LCS Benzoic acid	100	0.0	26.3	26	10-81

Semi-Volatile  
Quality Control Summary  
Spike Recovery Report

Page 2 of 3

SDG Number: 2014-3494

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1393519

Matrix: WATER

Lab Sample ID 1203102909

Instrument: MSD4.I

Analysis Date: 06/09/2014 11:44

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1393519

Inj. Vol: 1 uL

Batch ID: 1393520

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
106-47-8	LCS 4-Chloroaniline	50.0	0.0	47.8	96	50-122
87-68-3	LCS Hexachlorobutadiene	50.0	0.0	23.4	47	19-92
59-50-7	LCS Parachlorometa cresol 4-Chloro-3-methylphenol	50.0	0.0	43.4	87	46-111
77-47-4	LCS Hexachlorocyclopentadiene	50.0	0.0	21.0	42	15-72
88-06-2	LCS 2,4,6-Trichlorophenol	50.0	0.0	42.0	84	41-109
95-95-4	LCS 2,4,5-Trichlorophenol	50.0	0.0	44.2	88	41-111
91-58-7	LCS 2-Chloronaphthalene	50.0	0.0	31.0	62	36-98
88-74-4	LCS 2-Nitroaniline o-Nitroaniline	50.0	0.0	48.6	97	44-117
99-09-2	LCS 3-Nitroaniline m-Nitroaniline	50.0	0.0	50.4	101	45-124
131-11-3	LCS Dimethylphthalate	50.0	0.0	47.8	96	53-112
606-20-2	LCS 2,6-Dinitrotoluene	50.0	0.0	46.9	94	52-117
121-14-2	LCS 2,4-Dinitrotoluene	50.0	0.0	47.8	96	45-124
51-28-5	LCS 2,4-Dinitrophenol	50.0	0.0	38.9	78	19-110
132-64-9	LCS Dibenzofuran	50.0	0.0	38.8	78	45-107
58-90-2	LCS 2,3,4,6-Tetrachlorophenol	50.0	0.0	45.5	91	45-120
84-66-2	LCS Diethylphthalate	50.0	0.0	48.5	97	51-116
100-02-7	LCS 4-Nitrophenol	50.0	0.0	17.5	35	16-77
7005-72-3	LCS 4-Chlorophenylphenylether	50.0	0.0	41.0	82	40-114
100-01-6	LCS 4-Nitroaniline p-Nitroaniline	50.0	0.0	56.3	113	38-133
534-52-1	LCS 2-Methyl-4,6-dinitrophenol	50.0	0.0	48.0	96	34-114
122-39-4	LCS Diphenylamine	50.0	0.0	45.5	91	47-111
122-66-7	LCS Azobenzene 1,2-Diphenylhydrazine	50.0	0.0	45.7	91	40-112



Semi-Volatile  
Quality Control Summary  
Spike Recovery Report

Page 3 of 3

SDG Number: 2014-3494

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1393519

Matrix: WATER

Lab Sample ID 1203102909

Instrument: MSD4.I

Analysis Date: 06/09/2014 11:44

Dilution: 1

Analyst: JMB3

Prep Batch ID:1393519

Inj. Vol: 1 uL

Batch ID: 1393520

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
101-55-3	LCS 4-Bromophenylphenylether	50.0	0.0	45.0	90	41-113
84-74-2	LCS Di-n-butylphthalate	50.0	0.0	51.2	102	49-116
85-68-7	LCS Butylbenzylphthalate	50.0	0.0	50.0	100	40-122
117-81-7	LCS bis(2-Ethylhexyl)phthalate	50.0	0.0	51.1	102	37-124
117-84-0	LCS Di-n-octylphthalate	50.0	0.0	51.8	104	33-122
123-91-1	LCS 1,4-Dioxane	50.0	0.0	27.4	55	26-73
930-55-2	LCS N-Nitrosopyrrolidine	50.0	0.0	46.8	94	42-106
95-94-3	LCS 1,2,4,5-Tetrachlorobenzene	50.0	0.0	26.5	53	36-95
1912-24-9	LCS Atrazine	50.0	0.0	44.9	90	47-115
92-87-5	LCS Benzidine	100	0.0	79.4	79	10-124
91-94-1	LCS 3,3'-Dichlorobenzidine	50.0	0.0	46.0	92	31-113
120-82-1	LCS 1,2,4-Trichlorobenzene	50.0	0.0	25.0	50	26-92

Semi-Volatile  
Quality Control Summary  
Spike Recovery Report

Page 1 of 6

SDG Number: 2014-3494

Sample Type: Matrix Spike

Client ID: WST09-14-79994MS

Matrix: W

Lab Sample ID 1203102910

Instrument: MSD4.I

Analysis Date: 06/09/2014 12:44

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1393519

Inj. Vol: 1 uL

Batch ID: 1393520

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
62-75-9	MS N-Methyl-N-nitrosomethylam	118	0.00 U	98.2	83	21-88
110-86-1	MS Pyridine	118	0.00 U	118	100 *	14-94
62-53-3	MS Aniline	118	0.00 U	88.7	75	24-109
108-95-2	MS Phenol	118	0.00 U	74.6	63	10-88
111-44-4	MS bis(2-Chloroethyl) ether	118	0.00 U	117	100	25-114
95-57-8	MS 2-Chlorophenol	118	0.00 U	96.5	82	31-103
541-73-1	MS 1,3-Dichlorobenzene	118	0.00 U	70.6	60	18-83
106-46-7	MS 1,4-Dichlorobenzene	118	0.00 U	72.4	62	20-86
95-50-1	MS 1,2-Dichlorobenzene	118	0.00 U	75.4	64	21-85
108-60-1	MS bis(2-Chloro-1-methylethyl)et	118	0.00 U	115	98	16-121
100-51-6	MS Benzyl alcohol	118	0.00 U	118	101 *	31-100
95-48-7	MS o-Cresol	118	0.00 U	107	91	26-97
65794-96-9	MS m,p-Cresols	118	0.00 U	119	101	24-110
621-64-7	MS N-Nitrosodi--n-propylamine <i>N-Nitrosodipropylamine</i>	118	0.00 U	120	102	29-116
67-72-1	MS Hexachloroethane	118	0.00 U	66.8	57	17-82
98-95-3	MS Nitrobenzene	118	0.00 U	112	95	32-126
78-59-1	MS Isophorone	118	0.00 U	126	107	36-139
88-75-5	MS 2-Nitrophenol	118	0.00 U	108	92	29-117
105-67-9	MS 2,4-Dimethylphenol	118	0.00 U	105	89	28-107
111-91-1	MS bis(2-Chloroethoxy)methane	118	0.00 U	118	100	34-112
120-83-2	MS 2,4-Dichlorophenol	118	0.00 U	104	88	34-111
65-85-0	MS Benzoic acid	235	0.00 U	126	54	10-105

Semi-Volatile  
Quality Control Summary  
Spike Recovery Report

Page 2 of 6

SDG Number: 2014-3494

Sample Type: Matrix Spike

Client ID: WST09-14-79994MS

Matrix: W

Lab Sample ID 1203102910

Instrument: MSD4.I

Analysis Date: 06/09/2014 12:44

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1393519

Inj. Vol: 1 uL

Batch ID: 1393520

CAS No		Parmname	Amount Added ug/L	Sample Conc. ug/L		Spike Conc. ug/L	Recovery %	Acceptance Limits
106-47-8	MS	4-Chloroaniline	118	0.00	U	108	92	28-123
87-68-3	MS	Hexachlorobutadiene	118	0.00	U	66.3	56	11-97
59-50-7	MS	Parachlorometa cresol 4-Chloro-3-methylphenol	118	0.00	U	108	92	31-119
77-47-4	MS	Hexachlorocyclopentadiene	118	0.00	U	69.5	59	14-73
88-06-2	MS	2,4,6-Trichlorophenol	118	0.00	U	113	96	31-113
95-95-4	MS	2,4,5-Trichlorophenol	118	0.00	U	113	96	30-117
91-58-7	MS	2-Chloronaphthalene	118	0.00	U	97.3	83	30-97
88-74-4	MS	2-Nitroaniline o-Nitroaniline	118	0.00	U	122	104	28-122
99-09-2	MS	3-Nitroaniline m-Nitroaniline	118	0.00	U	122	103	29-125
131-11-3	MS	Dimethylphthalate	118	0.00	U	125	106	41-116
606-20-2	MS	2,6-Dinitrotoluene	118	0.00	U	124	105	40-123
121-14-2	MS	2,4-Dinitrotoluene	118	0.00	U	122	103	34-126
51-28-5	MS	2,4-Dinitrophenol	118	0.00	U	98.0	83	17-110
132-64-9	MS	Dibenzofuran	118	0.00	U	109	92	36-107
58-90-2	MS	2,3,4,6-Tetrachlorophenol	118	0.00	U	119	101	29-126
84-66-2	MS	Diethylphthalate	118	0.00	U	125	106	41-117
100-02-7	MS	4-Nitrophenol	118	0.00	U	72.0	61	16-71
7005-72-3	MS	4-Chlorophenylphenylether	118	0.00	U	112	95	30-112
100-01-6	MS	4-Nitroaniline p-Nitroaniline	118	0.00	U	130	111	25-133
534-52-1	MS	2-Methyl-4,6-dinitrophenol	118	0.00	U	124	105	22-118
122-39-4	MS	Diphenylamine	118	0.00	U	116	98	34-111
122-66-7	MS	Azobenzene 1,2-Diphenylhydrazine	118	0.00	U	125	106	30-112

Semi-Volatile  
Quality Control Summary  
Spike Recovery Report

Page 3 of 6

SDG Number: 2014-3494

Sample Type: Matrix Spike

Client ID: WST09-14-79994MS

Matrix: W

Lab Sample ID 1203102910

Instrument: MSD4.I

Analysis Date: 06/09/2014 12:44

Dilution: 1

Analyst: JMB3

Prep Batch ID:1393519

Inj. Vol: 1 uL

Batch ID: 1393520

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
101-55-3	MS 4-Bromophenylphenylether	118	0.00 U	122	104	32-111
84-74-2	MS Di-n-butylphthalate	118	0.00 U	134	114	35-118
85-68-7	MS Butylbenzylphthalate	118	0.00 U	138	117	29-121
117-81-7	MS bis(2-Ethylhexyl)phthalate	118	0.00 U	143	121 *	29-120
117-84-0	MS Di-n-octylphthalate	118	0.00 U	140	119 *	25-118
123-91-1	MS 1,4-Dioxane	118	0.00 U	83.5	71	26-88
930-55-2	MS N-Nitrosopyrrolidine	118	0.00 U	127	108	42-110
95-94-3	MS 1,2,4,5-Tetrachlorobenzene	118	0.00 U	83.5	71	29-96
1912-24-9	MS Atrazine	118	0.00 U	118	100	33-121
92-87-5	MS Benzidine	235	0.00 U	156	66	10-117
91-94-1	MS 3,3'-Dichlorobenzidine	118	0.00 U	120	102	22-111
120-82-1	MS 1,2,4-Trichlorobenzene	118	0.00 U	75.4	64	20-90

Semi-Volatile  
Quality Control Summary  
Spike Recovery Report

Page 4 of 6

SDG Number: 2014-3494

Sample Type: Matrix Spike Duplicate

Client ID: WST09-14-79994MSD

Matrix: W

Lab Sample ID 1203102911

Instrument: MSD4.I

Analysis Date: 06/09/2014 13:14

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1393519

Inj. Vol: 1 uL

Batch ID: 1393520

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
62-75-9	MSD N-Methyl-N-nitrosomethylam	118	0.00 U	93.9	80	21-88	4	0-30
110-86-1	MSD Pyridine	118	0.00 U	115	97 *	14-94	3	0-30
62-53-3	MSD Aniline	118	0.00 U	84.0	71	24-109	6	0-30
108-95-2	MSD Phenol	118	0.00 U	70.3	60	10-88	6	0-30
111-44-4	MSD bis(2-Chloroethyl) ether	118	0.00 U	115	97	25-114	2	0-30
95-57-8	MSD 2-Chlorophenol	118	0.00 U	93.8	80	31-103	3	0-30
541-73-1	MSD 1,3-Dichlorobenzene	118	0.00 U	71.6	61	18-83	1	0-30
106-46-7	MSD 1,4-Dichlorobenzene	118	0.00 U	73.2	62	20-86	1	0-30
95-50-1	MSD 1,2-Dichlorobenzene	118	0.00 U	76.4	65	21-85	1	0-30
108-60-1	MSD bis(2-Chloro-1-methylethyl)et	118	0.00 U	113	96	16-121	2	0-30
100-51-6	MSD Benzyl alcohol	118	0.00 U	116	99	31-100	2	0-30
95-48-7	MSD o-Cresol	118	0.00 U	103	88	26-97	4	0-30
65794-96-9	MSD m,p-Cresols	118	0.00 U	115	98	24-110	4	0-30
621-64-7	MSD N-Nitrosodi--n-propylamine <i>N-Nitrosodipropylamine</i>	118	0.00 U	118	100	29-116	2	0-30
67-72-1	MSD Hexachloroethane	118	0.00 U	67.2	57	17-82	1	0-30
98-95-3	MSD Nitrobenzene	118	0.00 U	109	93	32-126	2	0-30
78-59-1	MSD Isophorone	118	0.00 U	121	103	36-139	4	0-30
88-75-5	MSD 2-Nitrophenol	118	0.00 U	106	90	29-117	2	0-30
105-67-9	MSD 2,4-Dimethylphenol	118	0.00 U	101	86	28-107	4	0-30
111-91-1	MSD bis(2-Chloroethoxy)methane	118	0.00 U	116	99	34-112	2	0-30
120-83-2	MSD 2,4-Dichlorophenol	118	0.00 U	101	86	34-111	3	0-30
65-85-0	MSD Benzoic acid	235	0.00 U	128	54	10-105	1	0-30

Semi-Volatile  
Quality Control Summary  
Spike Recovery Report

Page 5 of 6

SDG Number: 2014-3494

Sample Type: Matrix Spike Duplicate

Client ID: WST09-14-79994MSD

Matrix: W

Lab Sample ID 1203102911

Instrument: MSD4.I

Analysis Date: 06/09/2014 13:14

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1393519

Inj. Vol: 1 uL

Batch ID: 1393520

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	118	0.00 U	105	89	28-123	3	0-30
87-68-3	MSD Hexachlorobutadiene	118	0.00 U	66.3	56	11-97	0	0-30
59-50-7	MSD Parachlorometa cresol 4-Chloro-3-methylphenol	118	0.00 U	104	89	31-119	4	0-30
77-47-4	MSD Hexachlorocyclopentadiene	118	0.00 U	70.8	60	14-73	2	0-30
88-06-2	MSD 2,4,6-Trichlorophenol	118	0.00 U	106	90	31-113	7	0-30
95-95-4	MSD 2,4,5-Trichlorophenol	118	0.00 U	107	91	30-117	5	0-30
91-58-7	MSD 2-Chloronaphthalene	118	0.00 U	95.9	82	30-97	1	0-30
88-74-4	MSD 2-Nitroaniline o-Nitroaniline	118	0.00 U	120	102	28-122	2	0-30
99-09-2	MSD 3-Nitroaniline m-Nitroaniline	118	0.00 U	120	102	29-125	2	0-30
131-11-3	MSD Dimethylphthalate	118	0.00 U	118	101	41-116	5	0-30
606-20-2	MSD 2,6-Dinitrotoluene	118	0.00 U	117	100	40-123	5	0-30
121-14-2	MSD 2,4-Dinitrotoluene	118	0.00 U	119	101	34-126	2	0-30
51-28-5	MSD 2,4-Dinitrophenol	118	0.00 U	96.8	82	17-110	1	0-30
132-64-9	MSD Dibenzofuran	118	0.00 U	106	90	36-107	3	0-30
58-90-2	MSD 2,3,4,6-Tetrachlorophenol	118	0.00 U	115	98	29-126	3	0-30
84-66-2	MSD Diethylphthalate	118	0.00 U	120	102	41-117	4	0-30
100-02-7	MSD 4-Nitrophenol	118	0.00 U	69.8	59	16-71	3	0-30
7005-72-3	MSD 4-Chlorophenylphenylether	118	0.00 U	107	91	30-112	4	0-30
100-01-6	MSD 4-Nitroaniline p-Nitroaniline	118	0.00 U	132	113	25-133	2	0-30
534-52-1	MSD 2-Methyl-4,6-dinitrophenol	118	0.00 U	120	102	22-118	3	0-30
122-39-4	MSD Diphenylamine	118	0.00 U	110	93	34-111	6	0-30
122-66-7	MSD Azobenzene 1,2-Diphenylhydrazine	118	0.00 U	118	100	30-112	6	0-30

Semi-Volatile  
Quality Control Summary  
Spike Recovery Report

Page 6 of 6

SDG Number: 2014-3494

Sample Type: Matrix Spike Duplicate

Client ID: WST09-14-79994MSD

Matrix: W

Lab Sample ID 1203102911

Instrument: MSD4.I

Analysis Date: 06/09/2014 13:14

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1393519

Inj. Vol: 1 uL

Batch ID: 1393520

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
101-55-3	MSD 4-Bromophenylphenylether	118	0.00 U	115	97	32-111	6	0-30
84-74-2	MSD Di-n-butylphthalate	118	0.00 U	127	108	35-118	6	0-30
85-68-7	MSD Butylbenzylphthalate	118	0.00 U	130	111	29-121	6	0-30
117-81-7	MSD bis(2-Ethylhexyl)phthalate	118	0.00 U	134	114	29-120	7	0-30
117-84-0	MSD Di-n-octylphthalate	118	0.00 U	133	113	25-118	5	0-30
123-91-1	MSD 1,4-Dioxane	118	0.00 U	82.4	70	26-88	1	0-30
930-55-2	MSD N-Nitrosopyrrolidine	118	0.00 U	124	106	42-110	2	0-30
95-94-3	MSD 1,2,4,5-Tetrachlorobenzene	118	0.00 U	81.9	70	29-96	2	0-30
1912-24-9	MSD Atrazine	118	0.00 U	111	94	33-121	6	0-30
92-87-5	MSD Benzidine	235	0.00 U	152	65	10-117	2	0-30
91-94-1	MSD 3,3'-Dichlorobenzidine	118	0.00 U	109	93	22-111	9	0-30
120-82-1	MSD 1,2,4-Trichlorobenzene	118	0.00 U	77.0	65	20-90	2	0-30

## Method Blank Summary

Page 1 of 1

SDG Number:	2014-3494	Client:	ARSL004	Matrix:	WATER
Client ID:	MB for batch 1393519	Instrument ID:	MSD4.I	Data File:	s060914.B\s4f0906.D
Lab Sample ID:	1203102908	Prep Date:	06/06/2014 15:40	Analyzed:	06/09/14 11:14
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 1393519	1203102909	s060914.B\s4f0907.D	06/09/14	1144
02 WST09-14-79994MS	1203102910	s060914.B\s4f0909.D	06/09/14	1244
03 WST09-14-79994MSD	1203102911	s060914.B\s4f0910.D	06/09/14	1314
04 CAPU-14-79428	350053003	s060914.B\s4f0912.D	06/09/14	1414
05 CAPU-14-79431	350053011	s060914.B\s4f0913.D	06/09/14	1443
06 CAPU-14-79413	350053019	s060914.B\s4f0914.D	06/09/14	1513
07 CAPU-14-79414	350053027	s060914.B\s4f0915.D	06/09/14	1543
08 CAPU-14-79415	350053030	s060914.B\s4f0916.D	06/09/14	1613



# Quality Control Data

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

Page 1 of 2

<b>SDG Number:</b> 2014-3494		<b>Matrix:</b>	WATER
<b>Lab Sample ID:</b> 1203102908			
<b>Client Sample:</b> QC for batch 1393519	<b>Client:</b> ARSL004	<b>Project:</b>	QC
<b>Client ID:</b> MB for batch 1393519	<b>Method:</b> SW846 3510C/8270D	<b>SOP Ref:</b>	GL-OA-E-009
<b>Batch ID:</b> 1393520	<b>Inst:</b> MSD4.I	<b>Dilution:</b>	1
<b>Run Date:</b> 06/09/2014 11:14	<b>Analyst:</b> JMB3	<b>Inj. Vol:</b>	1 uL
<b>Prep Date:</b> 06/06/2014 15:40	<b>Aliquot:</b> 1000 mL	<b>Final Volume:</b>	1 mL
<b>Data File:</b> s060914.B\s4f0906.D	<b>Column:</b> DB-5ms		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
95-94-3	1,2,4,5-Tetrachlorobenzene	U	10.0	ug/L	3.00	10.0
120-82-1	1,2,4-Trichlorobenzene	U	10.0	ug/L	3.00	10.0
95-50-1	1,2-Dichlorobenzene	U	10.0	ug/L	3.00	10.0
122-66-7	Azobenzene	U	10.0	ug/L	3.00	10.0
	<i>1,2-Diphenylhydrazine</i>					
541-73-1	1,3-Dichlorobenzene	U	10.0	ug/L	3.00	10.0
106-46-7	1,4-Dichlorobenzene	U	10.0	ug/L	3.00	10.0
123-91-1	1,4-Dioxane	U	10.0	ug/L	3.00	10.0
58-90-2	2,3,4,6-Tetrachlorophenol	U	10.0	ug/L	3.00	10.0
95-95-4	2,4,5-Trichlorophenol	U	10.0	ug/L	3.00	10.0
88-06-2	2,4,6-Trichlorophenol	U	10.0	ug/L	3.00	10.0
120-83-2	2,4-Dichlorophenol	U	10.0	ug/L	3.00	10.0
105-67-9	2,4-Dimethylphenol	U	10.0	ug/L	3.00	10.0
51-28-5	2,4-Dinitrophenol	U	20.0	ug/L	5.00	20.0
121-14-2	2,4-Dinitrotoluene	U	10.0	ug/L	3.00	10.0
606-20-2	2,6-Dinitrotoluene	U	10.0	ug/L	3.00	10.0
91-58-7	2-Chloronaphthalene	U	1.00	ug/L	0.410	1.00
95-57-8	2-Chlorophenol	U	10.0	ug/L	3.00	10.0
534-52-1	2-Methyl-4,6-dinitrophenol	U	10.0	ug/L	3.00	10.0
88-75-5	2-Nitrophenol	U	10.0	ug/L	3.00	10.0
91-94-1	3,3'-Dichlorobenzidine	U	10.0	ug/L	3.00	10.0
101-55-3	4-Bromophenylphenylether	U	10.0	ug/L	3.00	10.0
59-50-7	Parachlorometa cresol	U	10.0	ug/L	3.00	10.0
	<i>4-Chloro-3-methylphenol</i>					
106-47-8	4-Chloroaniline	U	10.0	ug/L	3.30	10.0
7005-72-3	4-Chlorophenylphenylether	U	10.0	ug/L	3.00	10.0
100-02-7	4-Nitrophenol	U	10.0	ug/L	3.00	10.0
62-53-3	Aniline	U	10.0	ug/L	4.20	10.0
1912-24-9	Atrazine	U	10.0	ug/L	3.00	10.0
92-87-5	Benzidine	U	10.0	ug/L	3.90	10.0
65-85-0	Benzoic acid	U	20.0	ug/L	6.00	20.0
100-51-6	Benzyl alcohol	U	10.0	ug/L	3.00	10.0
85-68-7	Butylbenzylphthalate	U	10.0	ug/L	3.00	10.0
84-74-2	Di-n-butylphthalate	U	10.0	ug/L	3.00	10.0
117-84-0	Di-n-octylphthalate	U	10.0	ug/L	3.00	10.0
132-64-9	Dibenzofuran	U	10.0	ug/L	3.00	10.0
84-66-2	Diethylphthalate	U	10.0	ug/L	3.00	10.0
131-11-3	Dimethylphthalate	U	10.0	ug/L	3.00	10.0
88-85-7	Dinoseb	U	10.0	ug/L	3.00	10.0

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

Page 2 of 2

SDG Number: 2014-3494

Lab Sample ID: 1203102908

Client Sample: QC for batch 1393519

Client ID: MB for batch 1393519

Batch ID: 1393520

Run Date: 06/09/2014 11:14

Prep Date: 06/06/2014 15:40

Data File: s060914.B\s4f0906.D

Matrix: WATER

Project: QC

SOP Ref: GL-OA-E-009

Dilution: 1

Inj. Vol: 1 uL

Final Volume: 1 mL

Client: ARSL004

Method: SW846 3510C/8270D

Inst: MSD4.I

Analyst: JMB3

Aliquot: 1000 mL

Column: DB-5ms

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
122-39-4	Diphenylamine	U	10.0	ug/L	3.00	10.0
87-68-3	Hexachlorobutadiene	U	10.0	ug/L	3.00	10.0
77-47-4	Hexachlorocyclopentadiene	U	10.0	ug/L	3.00	10.0
67-72-1	Hexachloroethane	U	10.0	ug/L	3.00	10.0
78-59-1	Isophorone	U	10.0	ug/L	3.50	10.0
62-75-9	N-Methyl-N-nitrosomethylamine	U	10.0	ug/L	3.00	10.0
924-16-3	N-Nitrosodi-n-butylamine	U	10.0	ug/L	3.00	10.0
55-18-5	N-Nitrosodiethylamine	U	10.0	ug/L	3.00	10.0
621-64-7	N-Nitrosodi--n-propylamine	U	10.0	ug/L	3.00	10.0
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine	U	10.0	ug/L	3.00	10.0
98-95-3	Nitrobenzene	U	10.0	ug/L	3.00	10.0
608-93-5	Pentachlorobenzene	U	10.0	ug/L	3.00	10.0
108-95-2	Phenol	U	10.0	ug/L	3.00	10.0
110-86-1	Pyridine	U	10.0	ug/L	3.00	10.0
108-60-1	bis(2-Chloro-1-methylethyl)ether	U	10.0	ug/L	3.00	10.0
111-91-1	bis(2-Chloroethoxy)methane	U	10.0	ug/L	3.00	10.0
111-44-4	bis(2-Chloroethyl) ether	U	10.0	ug/L	3.00	10.0
117-81-7	bis(2-Ethylhexyl)phthalate	U	10.0	ug/L	3.00	10.0
65794-96-9	m,p-Cresols	U	10.0	ug/L	3.70	10.0
99-09-2	3-Nitroaniline	U	10.0	ug/L	3.00	10.0
	<i>m-Nitroaniline</i>					
95-48-7	o-Cresol	U	10.0	ug/L	3.00	10.0
88-74-4	2-Nitroaniline	U	10.0	ug/L	3.00	10.0
	<i>o-Nitroaniline</i>					
100-01-6	4-Nitroaniline	U	10.0	ug/L	3.00	10.0
	<i>p-Nitroaniline</i>					

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	78.1	100	ug/L	78.1	(26%-129%)
2-Fluorobiphenyl	23.0	50.0	ug/L	45.9	(32%-102%)
2-Fluorophenol	47.6	100	ug/L	47.6	(10%-78%)
Nitrobenzene-d5	34.6	50.0	ug/L	69.1	(36%-125%)
Phenol-d5	29.7	100	ug/L	29.7	(10%-104%)
p-Terphenyl-d14	42.6	50.0	ug/L	85.2	(34%-135%)

**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**

SDG Number: 2014-3494

Lab Sample ID: 1203102909

Client Sample: QC for batch 1393519

Client ID: LCS for batch 1393519

Batch ID: 1393520

Run Date: 06/09/2014 11:44

Prep Date: 06/06/2014 15:40

Data File: s060914.B\s4f0907.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		26.5	ug/L	3.00	10.0
120-82-1	1,2,4-Trichlorobenzene		25.0	ug/L	3.00	10.0
95-50-1	1,2-Dichlorobenzene		26.9	ug/L	3.00	10.0
122-66-7	Azobenzene		45.7	ug/L	3.00	10.0
	<i>1,2-Diphenylhydrazine</i>					
541-73-1	1,3-Dichlorobenzene		25.8	ug/L	3.00	10.0
106-46-7	1,4-Dichlorobenzene		26.0	ug/L	3.00	10.0
123-91-1	1,4-Dioxane		27.4	ug/L	3.00	10.0
58-90-2	2,3,4,6-Tetrachlorophenol		45.5	ug/L	3.00	10.0
95-95-4	2,4,5-Trichlorophenol		44.2	ug/L	3.00	10.0
88-06-2	2,4,6-Trichlorophenol		42.0	ug/L	3.00	10.0
120-83-2	2,4-Dichlorophenol		40.5	ug/L	3.00	10.0
105-67-9	2,4-Dimethylphenol		41.2	ug/L	3.00	10.0
51-28-5	2,4-Dinitrophenol		38.9	ug/L	5.00	20.0
121-14-2	2,4-Dinitrotoluene		47.8	ug/L	3.00	10.0
606-20-2	2,6-Dinitrotoluene		46.9	ug/L	3.00	10.0
91-58-7	2-Chloronaphthalene		31.0	ug/L	0.410	1.00
95-57-8	2-Chlorophenol		41.1	ug/L	3.00	10.0
534-52-1	2-Methyl-4,6-dinitrophenol		48.0	ug/L	3.00	10.0
88-75-5	2-Nitrophenol		39.7	ug/L	3.00	10.0
91-94-1	3,3'-Dichlorobenzidine		46.0	ug/L	3.00	10.0
101-55-3	4-Bromophenylphenylether		45.0	ug/L	3.00	10.0
59-50-7	Parachlorometa cresol		43.4	ug/L	3.00	10.0
	<i>4-Chloro-3-methylphenol</i>					
106-47-8	4-Chloroaniline		47.8	ug/L	3.30	10.0
7005-72-3	4-Chlorophenylphenylether		41.0	ug/L	3.00	10.0
100-02-7	4-Nitrophenol		17.5	ug/L	3.00	10.0
62-53-3	Aniline		52.5	ug/L	4.20	10.0
1912-24-9	Atrazine		44.9	ug/L	3.00	10.0
92-87-5	Benzidine		79.4	ug/L	3.90	10.0
65-85-0	Benzoic acid		26.3	ug/L	6.00	20.0
100-51-6	Benzyl alcohol		42.1	ug/L	3.00	10.0
85-68-7	Butylbenzylphthalate		50.0	ug/L	3.00	10.0
84-74-2	Di-n-butylphthalate		51.2	ug/L	3.00	10.0
117-84-0	Di-n-octylphthalate		51.8	ug/L	3.00	10.0
132-64-9	Dibenzofuran		38.8	ug/L	3.00	10.0
84-66-2	Diethylphthalate		48.5	ug/L	3.00	10.0
131-11-3	Dimethylphthalate		47.8	ug/L	3.00	10.0
88-85-7	Dinoseb	U	10.0	ug/L	3.00	10.0

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

Page 2 of 2

SDG Number: 2014-3494

Lab Sample ID: 1203102909

Client Sample: QC for batch 1393519

Client ID: LCS for batch 1393519

Batch ID: 1393520

Run Date: 06/09/2014 11:44

Prep Date: 06/06/2014 15:40

Data File: s060914.B\s4f0907.D

Matrix: WATER

Client: ARSL004

Method: SW846 3510C/8270D

Inst: MSD4.I

Analyst: JMB3

Aliquot: 1000 mL

Column: DB-5ms

Project: QC

SOP Ref: GL-OA-E-009

Dilution: 1

Inj. Vol: 1 uL

Final Volume: 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
122-39-4	Diphenylamine		45.5	ug/L	3.00	10.0
87-68-3	Hexachlorobutadiene		23.4	ug/L	3.00	10.0
77-47-4	Hexachlorocyclopentadiene		21.0	ug/L	3.00	10.0
67-72-1	Hexachloroethane		24.7	ug/L	3.00	10.0
78-59-1	Isophorone		48.0	ug/L	3.50	10.0
62-75-9	N-Methyl-N-nitrosomethylamine		29.6	ug/L	3.00	10.0
924-16-3	N-Nitrosodi-n-butylamine	U	10.0	ug/L	3.00	10.0
55-18-5	N-Nitrosodiethylamine	U	10.0	ug/L	3.00	10.0
621-64-7	N-Nitrosodi--n-propylamine		45.9	ug/L	3.00	10.0
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine		46.8	ug/L	3.00	10.0
98-95-3	Nitrobenzene		41.2	ug/L	3.00	10.0
608-93-5	Pentachlorobenzene	U	10.0	ug/L	3.00	10.0
108-95-2	Phenol		17.9	ug/L	3.00	10.0
110-86-1	Pyridine		38.5	ug/L	3.00	10.0
108-60-1	bis(2-Chloro-1-methylethyl)ether		40.5	ug/L	3.00	10.0
111-91-1	bis(2-Chloroethoxy)methane		45.2	ug/L	3.00	10.0
111-44-4	bis(2-Chloroethyl) ether		45.1	ug/L	3.00	10.0
117-81-7	bis(2-Ethylhexyl)phthalate		51.1	ug/L	3.00	10.0
65794-96-9	m,p-Cresols		40.1	ug/L	3.70	10.0
99-09-2	3-Nitroaniline		50.4	ug/L	3.00	10.0
	<i>m-Nitroaniline</i>					
95-48-7	o-Cresol		39.4	ug/L	3.00	10.0
88-74-4	2-Nitroaniline		48.6	ug/L	3.00	10.0
	<i>o-Nitroaniline</i>					
100-01-6	4-Nitroaniline		56.3	ug/L	3.00	10.0
	<i>p-Nitroaniline</i>					

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	91.2	100	ug/L	91.2	(26%-129%)
2-Fluorobiphenyl	34.2	50.0	ug/L	68.3	(32%-102%)
2-Fluorophenol	53.3	100	ug/L	53.3	(10%-78%)
Nitrobenzene-d5	39.3	50.0	ug/L	78.6	(36%-125%)
Phenol-d5	33.8	100	ug/L	33.8	(10%-104%)
p-Terphenyl-d14	44.7	50.0	ug/L	89.5	(34%-135%)

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

<b>SDG Number:</b> 2014-3494	<b>Date Collected:</b> 06/02/2014 10:46	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 1203102910	<b>Date Received:</b> 06/04/2014 08:55	
<b>Client Sample:</b> QC for batch 1393519	<b>Client:</b> ARSL004	<b>Project:</b> QC
<b>Client ID:</b> WST09-14-79994MS	<b>Method:</b> SW846 3510C/8270D	<b>SOP Ref:</b> GL-OA-E-009
<b>Batch ID:</b> 1393520	<b>Inst:</b> MSD4.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/09/2014 12:44	<b>Analyst:</b> JMB3	<b>Inj. Vol:</b> 1 uL
<b>Prep Date:</b> 06/06/2014 15:40	<b>Aliquot:</b> 425 mL	<b>Final Volume:</b> 1 mL
<b>Data File:</b> s060914.B\s4f0909.D	<b>Column:</b> DB-5ms	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
95-94-3	1,2,4,5-Tetrachlorobenzene		83.5	ug/L	7.06	23.5
120-82-1	1,2,4-Trichlorobenzene		75.4	ug/L	7.06	23.5
95-50-1	1,2-Dichlorobenzene		75.4	ug/L	7.06	23.5
122-66-7	Azobenzene		125	ug/L	7.06	23.5
	<i>1,2-Diphenylhydrazine</i>					
541-73-1	1,3-Dichlorobenzene		70.6	ug/L	7.06	23.5
106-46-7	1,4-Dichlorobenzene		72.4	ug/L	7.06	23.5
123-91-1	1,4-Dioxane		83.5	ug/L	7.06	23.5
58-90-2	2,3,4,6-Tetrachlorophenol		119	ug/L	7.06	23.5
95-95-4	2,4,5-Trichlorophenol		113	ug/L	7.06	23.5
88-06-2	2,4,6-Trichlorophenol		113	ug/L	7.06	23.5
120-83-2	2,4-Dichlorophenol		104	ug/L	7.06	23.5
105-67-9	2,4-Dimethylphenol		105	ug/L	7.06	23.5
51-28-5	2,4-Dinitrophenol		98.0	ug/L	11.8	47.1
121-14-2	2,4-Dinitrotoluene		122	ug/L	7.06	23.5
606-20-2	2,6-Dinitrotoluene		124	ug/L	7.06	23.5
91-58-7	2-Chloronaphthalene		97.3	ug/L	0.965	2.35
95-57-8	2-Chlorophenol		96.5	ug/L	7.06	23.5
534-52-1	2-Methyl-4,6-dinitrophenol		124	ug/L	7.06	23.5
88-75-5	2-Nitrophenol		108	ug/L	7.06	23.5
91-94-1	3,3'-Dichlorobenzidine		120	ug/L	7.06	23.5
101-55-3	4-Bromophenylphenylether		122	ug/L	7.06	23.5
59-50-7	Parachlorometa cresol		108	ug/L	7.06	23.5
	<i>4-Chloro-3-methylphenol</i>					
106-47-8	4-Chloroaniline		108	ug/L	7.76	23.5
7005-72-3	4-Chlorophenylphenylether		112	ug/L	7.06	23.5
100-02-7	4-Nitrophenol		72.0	ug/L	7.06	23.5
62-53-3	Aniline		88.7	ug/L	9.88	23.5
1912-24-9	Atrazine		118	ug/L	7.06	23.5
92-87-5	Benzidine		156	ug/L	9.18	23.5
65-85-0	Benzoic acid		126	ug/L	14.1	47.1
100-51-6	Benzyl alcohol		118	ug/L	7.06	23.5
85-68-7	Butylbenzylphthalate		138	ug/L	7.06	23.5
84-74-2	Di-n-butylphthalate		134	ug/L	7.06	23.5
117-84-0	Di-n-octylphthalate		140	ug/L	7.06	23.5
132-64-9	Dibenzofuran		109	ug/L	7.06	23.5
84-66-2	Diethylphthalate		125	ug/L	7.06	23.5
131-11-3	Dimethylphthalate		125	ug/L	7.06	23.5
88-85-7	Dinoseb	U	23.5	ug/L	7.06	23.5

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

Page 2 of 2

**SDG Number:** 2014-3494  
**Lab Sample ID:** 1203102910  
**Client Sample:** QC for batch 1393519  
**Client ID:** WST09-14-79994MS  
**Batch ID:** 1393520  
**Run Date:** 06/09/2014 12:44  
**Prep Date:** 06/06/2014 15:40  
**Data File:** s060914.B\s4f0909.D

**Date Collected:** 06/02/2014 10:46  
**Date Received:** 06/04/2014 08:55  
**Client:** ARSL004  
**Method:** SW846 3510C/8270D  
**Inst:** MSD4.I  
**Analyst:** JMB3  
**Aliquot:** 425 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
122-39-4	Diphenylamine		116	ug/L	7.06	23.5
87-68-3	Hexachlorobutadiene		66.3	ug/L	7.06	23.5
77-47-4	Hexachlorocyclopentadiene		69.5	ug/L	7.06	23.5
67-72-1	Hexachloroethane		66.8	ug/L	7.06	23.5
78-59-1	Isophorone		126	ug/L	8.24	23.5
62-75-9	N-Methyl-N-nitrosomethylamine		98.2	ug/L	7.06	23.5
924-16-3	N-Nitrosodi-n-butylamine	U	23.5	ug/L	7.06	23.5
55-18-5	N-Nitrosodiethylamine	U	23.5	ug/L	7.06	23.5
621-64-7	N-Nitrosodi--n-propylamine		120	ug/L	7.06	23.5
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine		127	ug/L	7.06	23.5
98-95-3	Nitrobenzene		112	ug/L	7.06	23.5
608-93-5	Pentachlorobenzene	U	23.5	ug/L	7.06	23.5
108-95-2	Phenol		74.6	ug/L	7.06	23.5
110-86-1	Pyridine		118	ug/L	7.06	23.5
108-60-1	bis(2-Chloro-1-methylethyl)ether		115	ug/L	7.06	23.5
111-91-1	bis(2-Chloroethoxy)methane		118	ug/L	7.06	23.5
111-44-4	bis(2-Chloroethyl) ether		117	ug/L	7.06	23.5
117-81-7	bis(2-Ethylhexyl)phthalate		143	ug/L	7.06	23.5
65794-96-9	m,p-Cresols		119	ug/L	8.71	23.5
99-09-2	3-Nitroaniline		122	ug/L	7.06	23.5
	<i>m-Nitroaniline</i>					
95-48-7	o-Cresol		107	ug/L	7.06	23.5
88-74-4	2-Nitroaniline		122	ug/L	7.06	23.5
	<i>o-Nitroaniline</i>					
100-01-6	4-Nitroaniline		130	ug/L	7.06	23.5
	<i>p-Nitroaniline</i>					

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
2,4,6-Tribromophenol	231	235	ug/L 98.3	(26%-129%)
2-Fluorobiphenyl	99.5	118	ug/L 84.5	(32%-102%)
2-Fluorophenol	150	235	ug/L 63.9	(10%-78%)
Nitrobenzene-d5	104	118	ug/L 88.7	(36%-125%)
Phenol-d5	139	235	ug/L 59.0	(10%-104%)
p-Terphenyl-d14	120	118	ug/L 102	(34%-135%)

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

<b>SDG Number:</b> 2014-3494	<b>Date Collected:</b> 06/02/2014 10:46	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 1203102911	<b>Date Received:</b> 06/04/2014 08:55	
<b>Client Sample:</b> QC for batch 1393519	<b>Client:</b> ARSL004	<b>Project:</b> QC
<b>Client ID:</b> WST09-14-79994MSD	<b>Method:</b> SW846 3510C/8270D	<b>SOP Ref:</b> GL-OA-E-009
<b>Batch ID:</b> 1393520	<b>Inst:</b> MSD4.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/09/2014 13:14	<b>Analyst:</b> JMB3	<b>Inj. Vol:</b> 1 uL
<b>Prep Date:</b> 06/06/2014 15:40	<b>Aliquot:</b> 425 mL	<b>Final Volume:</b> 1 mL
<b>Data File:</b> s060914.B\s4f0910.D	<b>Column:</b> DB-5ms	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
95-94-3	1,2,4,5-Tetrachlorobenzene		81.9	ug/L	7.06	23.5
120-82-1	1,2,4-Trichlorobenzene		77.0	ug/L	7.06	23.5
95-50-1	1,2-Dichlorobenzene		76.4	ug/L	7.06	23.5
122-66-7	Azobenzene		118	ug/L	7.06	23.5
	<i>1,2-Diphenylhydrazine</i>					
541-73-1	1,3-Dichlorobenzene		71.6	ug/L	7.06	23.5
106-46-7	1,4-Dichlorobenzene		73.2	ug/L	7.06	23.5
123-91-1	1,4-Dioxane		82.4	ug/L	7.06	23.5
58-90-2	2,3,4,6-Tetrachlorophenol		115	ug/L	7.06	23.5
95-95-4	2,4,5-Trichlorophenol		107	ug/L	7.06	23.5
88-06-2	2,4,6-Trichlorophenol		106	ug/L	7.06	23.5
120-83-2	2,4-Dichlorophenol		101	ug/L	7.06	23.5
105-67-9	2,4-Dimethylphenol		101	ug/L	7.06	23.5
51-28-5	2,4-Dinitrophenol		96.8	ug/L	11.8	47.1
121-14-2	2,4-Dinitrotoluene		119	ug/L	7.06	23.5
606-20-2	2,6-Dinitrotoluene		117	ug/L	7.06	23.5
91-58-7	2-Chloronaphthalene		95.9	ug/L	0.965	2.35
95-57-8	2-Chlorophenol		93.8	ug/L	7.06	23.5
534-52-1	2-Methyl-4,6-dinitrophenol		120	ug/L	7.06	23.5
88-75-5	2-Nitrophenol		106	ug/L	7.06	23.5
91-94-1	3,3'-Dichlorobenzidine		109	ug/L	7.06	23.5
101-55-3	4-Bromophenylphenylether		115	ug/L	7.06	23.5
59-50-7	Parachlorometa cresol		104	ug/L	7.06	23.5
	<i>4-Chloro-3-methylphenol</i>					
106-47-8	4-Chloroaniline		105	ug/L	7.76	23.5
7005-72-3	4-Chlorophenylphenylether		107	ug/L	7.06	23.5
100-02-7	4-Nitrophenol		69.8	ug/L	7.06	23.5
62-53-3	Aniline		84.0	ug/L	9.88	23.5
1912-24-9	Atrazine		111	ug/L	7.06	23.5
92-87-5	Benzidine		152	ug/L	9.18	23.5
65-85-0	Benzoic acid		128	ug/L	14.1	47.1
100-51-6	Benzyl alcohol		116	ug/L	7.06	23.5
85-68-7	Butylbenzylphthalate		130	ug/L	7.06	23.5
84-74-2	Di-n-butylphthalate		127	ug/L	7.06	23.5
117-84-0	Di-n-octylphthalate		133	ug/L	7.06	23.5
132-64-9	Dibenzofuran		106	ug/L	7.06	23.5
84-66-2	Diethylphthalate		120	ug/L	7.06	23.5
131-11-3	Dimethylphthalate		118	ug/L	7.06	23.5
88-85-7	Dinoseb	U	23.5	ug/L	7.06	23.5



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

Page 2 of 2

**SDG Number:** 2014-3494  
**Lab Sample ID:** 1203102911  
**Client Sample:** QC for batch 1393519  
**Client ID:** WST09-14-79994MSD  
**Batch ID:** 1393520  
**Run Date:** 06/09/2014 13:14  
**Prep Date:** 06/06/2014 15:40  
**Data File:** s060914.B\4f0910.D

**Date Collected:** 06/02/2014 10:46  
**Date Received:** 06/04/2014 08:55  
**Client:** ARSL004  
**Method:** SW846 3510C/8270D  
**Inst:** MSD4.I  
**Analyst:** JMB3  
**Aliquot:** 425 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
122-39-4	Diphenylamine		110	ug/L	7.06	23.5
87-68-3	Hexachlorobutadiene		66.3	ug/L	7.06	23.5
77-47-4	Hexachlorocyclopentadiene		70.8	ug/L	7.06	23.5
67-72-1	Hexachloroethane		67.2	ug/L	7.06	23.5
78-59-1	Isophorone		121	ug/L	8.24	23.5
62-75-9	N-Methyl-N-nitrosomethylamine		93.9	ug/L	7.06	23.5
924-16-3	N-Nitrosodi-n-butylamine	U	23.5	ug/L	7.06	23.5
55-18-5	N-Nitrosodiethylamine	U	23.5	ug/L	7.06	23.5
621-64-7	N-Nitrosodi--n-propylamine		118	ug/L	7.06	23.5
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine		124	ug/L	7.06	23.5
98-95-3	Nitrobenzene		109	ug/L	7.06	23.5
608-93-5	Pentachlorobenzene	U	23.5	ug/L	7.06	23.5
108-95-2	Phenol		70.3	ug/L	7.06	23.5
110-86-1	Pyridine		115	ug/L	7.06	23.5
108-60-1	bis(2-Chloro-1-methylethyl)ether		113	ug/L	7.06	23.5
111-91-1	bis(2-Chloroethoxy)methane		116	ug/L	7.06	23.5
111-44-4	bis(2-Chloroethyl) ether		115	ug/L	7.06	23.5
117-81-7	bis(2-Ethylhexyl)phthalate		134	ug/L	7.06	23.5
65794-96-9	m,p-Cresols		115	ug/L	8.71	23.5
99-09-2	3-Nitroaniline		120	ug/L	7.06	23.5
	<i>m-Nitroaniline</i>					
95-48-7	o-Cresol		103	ug/L	7.06	23.5
88-74-4	2-Nitroaniline		120	ug/L	7.06	23.5
	<i>o-Nitroaniline</i>					
100-01-6	4-Nitroaniline		132	ug/L	7.06	23.5
	<i>p-Nitroaniline</i>					

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
2,4,6-Tribromophenol	224	235	ug/L	95.1 (26%-129%)
2-Fluorobiphenyl	96.0	118	ug/L	81.6 (32%-102%)
2-Fluorophenol	147	235	ug/L	62.4 (10%-78%)
Nitrobenzene-d5	102	118	ug/L	86.4 (36%-125%)
Phenol-d5	133	235	ug/L	56.5 (10%-104%)
p-Terphenyl-d14	115	118	ug/L	97.4 (34%-135%)

# Miscellaneous

### DATA EXCEPTION REPORT

<b>Mo.Day Yr.</b> 09-JUN-14	<b>Division:</b> Industrial	<b>Quality Criteria:</b> Specifications	<b>Type:</b> Process
<b>Instrument Type:</b> SEMIOVA GC/MS	<b>Test / Method:</b> SW846 3510C/8270D	<b>Matrix Type:</b> Liquid	<b>Client Code:</b> ESHL
<b>Batch ID:</b> 1393520	<b>Sample Numbers:</b> See Below		
<b>Potentially affected work order(s)(SDG): 349932(2014-3483),350053(2014-3494),350128(2014-3501),350137(2014-3500)</b> <b>Application Issues:</b> Failed Recovery for MS/PS Failed Recovery for MSD/PSD			
<b>Specification and Requirements</b>		<b>DER Disposition:</b>	
<b>Exception Description:</b>			
1. The MS(1203102910) and MSD(1203102911) exceeded spike recovery limits for Pyridine at 100% and 97.5%, respectively (SPC limits: 14.0%-94.1%). Additionally, the MS exceeded spike recovery limits for bis(2-Ethylhexyl)phthalate at 121% (SPC limits: 29.0%-120.0%), Di-n-octylphthalate at 119% (SPC limits: 25.0%-118.0%), and Benzyl alcohol at 101% (SPC limits: 31.0%-100.0%).		1. Since there were no target analytes detected in the parent sample, the positive biases in MS and MSD spike recoveries had no adverse impact on the data and the results have been reported.	

**Originator's Name:**

Josh Brooks 10-JUN-14

**Data Validator/Group Leader:**

Barbara Bailey 10-JUN-14

# **HPLC Polynuclear Aromatic Hydrocarbon Analysis**

**HPLC-PAH**  
**ARS International, LLC (ARSL)**  
**SDG 2014-3494**

**Method/Analysis Information**

**Procedure:**                      **Polynuclear Aromatic Hydrocarbons**

Analytical Method:            SW846 8310

Prep Method:                  SW846 3510C

Analytical Batch Number: 1394138

Prep Batch Number:        1394132

**Sample Analysis**

The following samples were analyzed using the analytical protocol as established in SW846 8310:

<b>Sample ID</b>	<b>Client ID</b>
350053002	CAPU-14-79428
350053010	CAPU-14-79431
350053016	CAPU-14-79413
350053023	CAPU-14-79414
350053029	CAPU-14-79415
1203104426	Method Blank (MB)
1203104427	Laboratory Control Sample (LCS)
1203104428	350137003(CAPU-14-79429) Matrix Spike (MS)
1203104430	Laboratory Control Sample Duplicate (LCSD)

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

**Preparation/Analytical Method Verification**

**SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-OA-E-030 REV# 15.

Raw data reports are processed and reviewed by the analyst using the Target software package. False positives have been removed from the Target quantitation reports per standard operating procedures (SOP) section 18.0.

### **Calibration Information**

Due to software limitations, the files displayed at the beginning of the Form 6 are only the last files uploaded for each individual level. A complete listing of all files used in the current ICAL are shown on the Calibration History that is included with each Level 4 or higher package. The last file by date in each level is the one currently uploaded for that level.

The linear equation used in Target and indicated on the initial calibration summary form is not a conventional linear equation (slope intercept formula) and does not match the equation found in SW-846 method 8000B. The x and y axes are inversed in Target, so that the instrument response is treated as the independent variable (x) and the concentration ratio is treated as the dependent variable (y). The equation used in Target to calculate sample results is adjusted to account for the linear equation inversion and reciprocal slope. The adjusted calculation has been independently verified to produce valid results.

### **Initial Calibration**

All initial calibration requirements have been met for this SDG.

### **CCV Requirements**

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

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

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

The MB analyzed with this SDG met the acceptance criteria.

#### **Surrogate Recoveries**

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

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

The LCS spike recoveries met the acceptance limits.

#### **Laboratory Control Sample Duplicate (LCSD) Recovery**

The LCSD spike recoveries met the acceptance limits.

#### **LCS/LCSD Relative Percent Difference (RPD) Statement**

The RPD(s) between the LCS and LCSD met the acceptance limits.

#### **QC Sample Designation**

Client sample 350137003 (CAPU-14-79429) was chosen for matrix spike and matrix spike duplicate analysis.

**Matrix Spike (MS) Recovery Statement**

The MS recoveries were within the established acceptance limits.

**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 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.

**Sample Dilutions**

The samples in this SDG did not require dilutions.

**Sample Re-extraction/Re-analysis**

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

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

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

**Manual Integrations**

Some initial calibration standards, continuing calibration standards, and/or samples may have required manual integrations due to software limitations. Please see the raw data in the Miscellaneous Section.

**Additional Comments**

The Form 8 was used a sequence of the analysis only.

**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 analyst, reviewer, and report specialist names 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 laboratory utilizes a high performance liquid chromatography (HPLC) instrument configuration for Polynuclear Aromatic Hydrocarbons analyses. The chromatographic hardware system consists of a HP Model 1100 HPLC with programmable gradient pumping and a 100uL loop injector. The HPLC 1100 is coupled to a HP Model G1315A Diode Array UV detector which monitors absorbance at the following five wavelengths: 1) 224 nm; 2) 250 nm; 3) 270 nm; 4) 234 nm; 5) 300 nm. The HPLC 1100 is also coupled to a HP Model G1321A Fluorescence Detector in series which monitors the following varying excitations and emissions 1) EX 230 nm EM 330 nm; 2) EX 210 nm EM 314 nm; 3) EX 250 nm EM 368 nm; 4) EX 237 nm EM 440 nm; 5) EX 277 nm EM 376 nm; 6) EX 255 nm EM 420 nm; 7) EX 230 nm EM 453 nm. The Diode Array UV detector is used as the primary detector and the Fluorescence Detector is used as the confirmation detector. All results are reported from the primary Diode Array UV detector. The HPLC system is identified with a designation of HPLC C, or HPLC E in the raw data printouts.

### **Chromatographic Columns**

Chromatographic separation of Polynuclear Aromatic Hydrocarbons is accomplished through analysis on the following reversed phase columns:

Phenomenex: Luna C18 (2), 100 A, 250 mm x 4.6 mm containing 5 um size particle.

### **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: 2014-3494 GEL Work Order: 350053

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

\* A quality control analyte recovery is outside of specified acceptance criteria

\*\* Analyte is a surrogate compound

J Value is estimated

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

DL Indicates that sample is diluted.

RA Indicates that sample is re-analyzed without re-extraction.

RE Indicates that sample is re-extracted.

#### Review/Validation

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

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

Signature: 

Name: Patricia Steele

Date: 27 JUN 2014

Title: Data Validator

## Roadmap for ARSL 2014-3494 HPLC\_PAH

This roadmap was analyzed by cww on 06-17-2014, 12:16.

This roadmap was reviewed by ps on 06-27-2014, 15:15.

Sample

exclude	manual	datafile	smpid	injdate	injtime	sublist	clientid	dilution	batchid	comment
<input type="checkbox"/>	N	/chem/hplce.i/p061214.b/ph5f1230.d	350053002	13-JUN-2014	04:45	2014-3494.sub	CAPU-14-79428	1	1394138	<input type="text"/>
<input type="checkbox"/>	N	/chem/hplce.i/p061214.b/ph5f1231.d	350053010	13-JUN-2014	05:27	2014-3494.sub	CAPU-14-79431	1	1394138	<input type="text"/>
<input type="checkbox"/>	N	/chem/hplce.i/p061214.b/ph5f1232.d	350053016	13-JUN-2014	06:10	2014-3494.sub	CAPU-14-79413	1	1394138	<input type="text"/>
<input type="checkbox"/>	N	/chem/hplce.i/p061214.b/ph5f1233.d	350053023	13-JUN-2014	06:52	2014-3494.sub	CAPU-14-79414	1	1394138	<input type="text"/>
<input type="checkbox"/>	N	/chem/hplce.i/p061214.b/ph5f1234.d	350053029	13-JUN-2014	07:34	2014-3494.sub	CAPU-14-79415	1	1394138	<input type="text"/>

QC Sample

exclude	manual	datafile	smpid	sampletype	injdate	injtime	sublist	clientid	dilution	batchid	comment
<input type="checkbox"/>	N	/chem/hplce.i/p061214.b/ph5f1227.d	1203104426	mb	13-JUN-2014	02:38	2014-3494.sub	PAHBLK01	1	1394138	<input type="text"/>
<input type="checkbox"/>	N	/chem/hplce.i/p061214.b/ph5f1228.d	1203104427	lcs	13-JUN-2014	03:21	2014-3494.sub	PAHBLK01LCS	1	1394138	<input type="text" value="Pass"/>
<input type="checkbox"/>	N	/chem/hplce.i/p061214.b/ph5f1229.d	1203104430	lcscd	13-JUN-2014	04:03	2014-3494.sub	PAHBLK01LCSD	1	1394138	<input type="text" value="Pass"/>

# **Sample Data Summary**

**PAH by HPLC**  
**Certificate of Analysis**  
**Sample Summary**

Page 1 of 1

**SDG Number:** 2014-3494  
**Lab Sample ID:** 350053016

**Date Collected:** 06/03/2014 13:48  
**Date Received:** 06/05/2014 09:00

**Matrix:** W

**Client ID:** CAPU-14-79413

**Client:** ARSL004

**Project:** ESHL00714

**Batch ID:** 1394138

**Method:** SW846 8310

**SOP Ref:** GL-OA-E-030

**Run Date:** 06/13/2014 06:10

**Inst:** HPLCE.I

**Dilution:** 1

**Prep Date:** 06/09/2014 07:15

**Analyst:** CWW

**Inj. Vol:** 20 uL

**Data File:** ph5f1232.d

**Aliquot:** 950 mL

**Final Volume:** 1 mL

**Column:** C-18, DAD/FLD

**Level:** LOW

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
90-12-0	1-Methylnaphthalene	U	0.526	ug/L	0.229	0.526
91-57-6	2-Methylnaphthalene	U	0.526	ug/L	0.158	0.526
83-32-9	Acenaphthene	U	0.526	ug/L	0.158	0.526
208-96-8	Acenaphthylene	U	0.526	ug/L	0.158	0.526
120-12-7	Anthracene	U	0.526	ug/L	0.158	0.526
56-55-3	Benzo(a)anthracene	U	0.0526	ug/L	0.0168	0.0526
50-32-8	Benzo(a)pyrene	U	0.0526	ug/L	0.0168	0.0526
205-99-2	Benzo(b)fluoranthene	U	0.0526	ug/L	0.0168	0.0526
191-24-2	Benzo(ghi)perylene	U	0.0526	ug/L	0.0168	0.0526
207-08-9	Benzo(k)fluoranthene	U	0.0263	ug/L	0.00842	0.0263
218-01-9	Chrysene	U	0.0526	ug/L	0.0168	0.0526
53-70-3	Dibenzo(a,h)anthracene	U	0.0526	ug/L	0.0168	0.0526
206-44-0	Fluoranthene	U	0.0526	ug/L	0.0168	0.0526
86-73-7	Fluorene	U	0.526	ug/L	0.158	0.526
193-39-5	Indeno(1,2,3-cd)pyrene	U	0.0526	ug/L	0.0168	0.0526
91-20-3	Naphthalene	U	0.526	ug/L	0.158	0.526
85-01-8	Phenanthrene	U	0.526	ug/L	0.192	0.526
129-00-0	Pyrene	U	0.0526	ug/L	0.0168	0.0526

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
Decafluorobiphenyl	157	263	59.5	(21% -96%)

**PAH by HPLC  
Certificate of Analysis  
Sample Summary**

Page 1 of 1

SDG Number: 2014-3494

Lab Sample ID: 350053023

Date Collected: 06/03/2014 11:48

Date Received: 06/05/2014 09:00

Matrix: W

Client ID: CAPU-14-79414

Batch ID: 1394138

Run Date: 06/13/2014 06:52

Prep Date: 06/09/2014 07:15

Data File: ph5f1233.d

Client: ARSL004

Method: SW846 8310

Inst: HPLCE.I

Analyst: CWW

Aliquot: 950 mL

Column: C-18, DAD/FLD

Project: ESHL00714

SOP Ref: GL-OA-E-030

Dilution: 1

Inj. Vol: 20 uL

Final Volume: 1 mL

Level: LOW

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
90-12-0	1-Methylnaphthalene	U	0.526	ug/L	0.229	0.526
91-57-6	2-Methylnaphthalene	U	0.526	ug/L	0.158	0.526
83-32-9	Acenaphthene	U	0.526	ug/L	0.158	0.526
208-96-8	Acenaphthylene	U	0.526	ug/L	0.158	0.526
120-12-7	Anthracene	U	0.526	ug/L	0.158	0.526
56-55-3	Benzo(a)anthracene	U	0.0526	ug/L	0.0168	0.0526
50-32-8	Benzo(a)pyrene	U	0.0526	ug/L	0.0168	0.0526
205-99-2	Benzo(b)fluoranthene	U	0.0526	ug/L	0.0168	0.0526
191-24-2	Benzo(ghi)perylene	U	0.0526	ug/L	0.0168	0.0526
207-08-9	Benzo(k)fluoranthene	U	0.0263	ug/L	0.00842	0.0263
218-01-9	Chrysene	U	0.0526	ug/L	0.0168	0.0526
53-70-3	Dibenzo(a,h)anthracene	U	0.0526	ug/L	0.0168	0.0526
206-44-0	Fluoranthene	U	0.0526	ug/L	0.0168	0.0526
86-73-7	Fluorene	U	0.526	ug/L	0.158	0.526
193-39-5	Indeno(1,2,3-cd)pyrene	U	0.0526	ug/L	0.0168	0.0526
91-20-3	Naphthalene	U	0.526	ug/L	0.158	0.526
85-01-8	Phenanthrene	U	0.526	ug/L	0.192	0.526
129-00-0	Pyrene	U	0.0526	ug/L	0.0168	0.0526

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
Decafluorobiphenyl	156	263	59.2	(21%-96%)

**PAH by HPLC**  
**Certificate of Analysis**  
**Sample Summary**

Page 1 of 1

SDG Number: 2014-3494

Lab Sample ID: 350053029

Date Collected: 06/03/2014 11:48

Date Received: 06/05/2014 09:00

Matrix: W

Client ID: CAPU-14-79415

Batch ID: 1394138

Run Date: 06/13/2014 07:34

Prep Date: 06/09/2014 07:15

Data File: ph5f1234.d

Client: ARSL004

Method: SW846 8310

Inst: HPLCE.I

Analyst: CWW

Aliquot: 930 mL

Column: C-18, DAD/FLD

Project: ESHL00714

SOP Ref: GL-OA-E-030

Dilution: 1

Inj. Vol: 20 uL

Final Volume: 1 mL

Level: LOW

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
90-12-0	1-Methylnaphthalene	U	0.538	ug/L	0.234	0.538
91-57-6	2-Methylnaphthalene	U	0.538	ug/L	0.161	0.538
83-32-9	Acenaphthene	U	0.538	ug/L	0.161	0.538
208-96-8	Acenaphthylene	U	0.538	ug/L	0.161	0.538
120-12-7	Anthracene	U	0.538	ug/L	0.161	0.538
56-55-3	Benzo(a)anthracene	U	0.0538	ug/L	0.0172	0.0538
50-32-8	Benzo(a)pyrene	U	0.0538	ug/L	0.0172	0.0538
205-99-2	Benzo(b)fluoranthene	U	0.0538	ug/L	0.0172	0.0538
191-24-2	Benzo(ghi)perylene	U	0.0538	ug/L	0.0172	0.0538
207-08-9	Benzo(k)fluoranthene	J	0.0102	ug/L	0.0086	0.0269
218-01-9	Chrysene	U	0.0538	ug/L	0.0172	0.0538
53-70-3	Dibenzo(a,h)anthracene	U	0.0538	ug/L	0.0172	0.0538
206-44-0	Fluoranthene	U	0.0538	ug/L	0.0172	0.0538
86-73-7	Fluorene	U	0.538	ug/L	0.161	0.538
193-39-5	Indeno(1,2,3-cd)pyrene	U	0.0538	ug/L	0.0172	0.0538
91-20-3	Naphthalene	U	0.538	ug/L	0.161	0.538
85-01-8	Phenanthrene	U	0.538	ug/L	0.196	0.538
129-00-0	Pyrene	J	0.0187	ug/L	0.0172	0.0538

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
Decafluorobiphenyl	125	269	46.5	(21% -96%)

**PAH by HPLC**  
**Certificate of Analysis**  
**Sample Summary**

Page 1 of 1

SDG Number: 2014-3494

Lab Sample ID: 350053002

Date Collected: 06/03/2014 11:21

Date Received: 06/05/2014 09:00

Matrix: W

Client ID: CAPU-14-79428

Batch ID: 1394138

Run Date: 06/13/2014 04:45

Prep Date: 06/09/2014 07:15

Data File: ph5f1230.d

Client: ARSL004

Method: SW846 8310

Inst: HPLCE.I

Analyst: CWW

Aliquot: 930 mL

Column: C-18, DAD/FLD

Project: ESHL00714

SOP Ref: GL-OA-E-030

Dilution: 1

Inj. Vol: 20 uL

Final Volume: 1 mL

Level: LOW

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
90-12-0	1-Methylnaphthalene	U	0.538	ug/L	0.234	0.538
91-57-6	2-Methylnaphthalene	U	0.538	ug/L	0.161	0.538
83-32-9	Acenaphthene	U	0.538	ug/L	0.161	0.538
208-96-8	Acenaphthylene	U	0.538	ug/L	0.161	0.538
120-12-7	Anthracene	U	0.538	ug/L	0.161	0.538
56-55-3	Benzo(a)anthracene	U	0.0538	ug/L	0.0172	0.0538
50-32-8	Benzo(a)pyrene	U	0.0538	ug/L	0.0172	0.0538
205-99-2	Benzo(b)fluoranthene	U	0.0538	ug/L	0.0172	0.0538
191-24-2	Benzo(ghi)perylene	U	0.0538	ug/L	0.0172	0.0538
207-08-9	Benzo(k)fluoranthene	U	0.0269	ug/L	0.0086	0.0269
218-01-9	Chrysene	U	0.0538	ug/L	0.0172	0.0538
53-70-3	Dibenzo(a,h)anthracene	U	0.0538	ug/L	0.0172	0.0538
206-44-0	Fluoranthene	U	0.0538	ug/L	0.0172	0.0538
86-73-7	Fluorene	U	0.538	ug/L	0.161	0.538
193-39-5	Indeno(1,2,3-cd)pyrene	U	0.0538	ug/L	0.0172	0.0538
91-20-3	Naphthalene	U	0.538	ug/L	0.161	0.538
85-01-8	Phenanthrene	U	0.538	ug/L	0.196	0.538
129-00-0	Pyrene	U	0.0538	ug/L	0.0172	0.0538

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
Decafluorobiphenyl	183	269	ug/L 68.1	(21% -96%)

**PAH by HPLC**  
**Certificate of Analysis**  
**Sample Summary**

Page 1 of 1

SDG Number: 2014-3494

Lab Sample ID: 350053010

Date Collected: 06/03/2014 11:48

Date Received: 06/05/2014 09:00

Matrix: W

Client ID: CAPU-14-79431

Batch ID: 1394138

Run Date: 06/13/2014 05:27

Prep Date: 06/09/2014 07:15

Data File: ph5f1231.d

Client: ARSL004

Method: SW846 8310

Inst: HPLCE.I

Analyst: CWW

Aliquot: 940 mL

Column: C-18, DAD/FLD

Project: ESHL00714

SOP Ref: GL-OA-E-030

Dilution: 1

Inj. Vol: 20 uL

Final Volume: 1 mL

Level: LOW

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
90-12-0	1-Methylnaphthalene	U	0.532	ug/L	0.232	0.532
91-57-6	2-Methylnaphthalene	U	0.532	ug/L	0.160	0.532
83-32-9	Acenaphthene	U	0.532	ug/L	0.160	0.532
208-96-8	Acenaphthylene	U	0.532	ug/L	0.160	0.532
120-12-7	Anthracene	U	0.532	ug/L	0.160	0.532
56-55-3	Benzo(a)anthracene	U	0.0532	ug/L	0.017	0.0532
50-32-8	Benzo(a)pyrene	U	0.0532	ug/L	0.017	0.0532
205-99-2	Benzo(b)fluoranthene	U	0.0532	ug/L	0.017	0.0532
191-24-2	Benzo(ghi)perylene	U	0.0532	ug/L	0.017	0.0532
207-08-9	Benzo(k)fluoranthene	U	0.0266	ug/L	0.00851	0.0266
218-01-9	Chrysene	U	0.0532	ug/L	0.017	0.0532
53-70-3	Dibenzo(a,h)anthracene	U	0.0532	ug/L	0.017	0.0532
206-44-0	Fluoranthene	U	0.0532	ug/L	0.017	0.0532
86-73-7	Fluorene	U	0.532	ug/L	0.160	0.532
193-39-5	Indeno(1,2,3-cd)pyrene	U	0.0532	ug/L	0.017	0.0532
91-20-3	Naphthalene	U	0.532	ug/L	0.160	0.532
85-01-8	Phenanthrene	U	0.532	ug/L	0.194	0.532
129-00-0	Pyrene	U	0.0532	ug/L	0.017	0.0532

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
Decafluorobiphenyl	177	266	66.4	(21% -96%)



# QC Summary

PAH by HPLC  
Surrogate Recovery Report

Page 1 of 1

SDG Number: 2014-3494

Matrix Type: LIQUID

PACK Column (1) : C-18, DAD/FLD

Sample ID	Client ID	DFBF %REC
1203104426	MB for batch 1394132	62
1203104427	LCS for batch 1394132	60
1203104430	LCSD for batch 1394132	59
350053002	CAPU-14-79428	68
350053010	CAPU-14-79431	66
350053016	CAPU-14-79413	60
350053023	CAPU-14-79414	59
350053029	CAPU-14-79415	46
1203104428	CAPU-14-79429MS	56

## Surrogate

## Acceptance Limits

DFBF = Decafluorobiphenyl

(21%-96%)

\* Recovery outside Acceptance Limits

# Column to be used to flag recovery values

D Sample Diluted

PAH by HPLC  
Quality Control Summary  
Spike Recovery Report

Page 1 of 2

SDG Number: 2014-3494

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1394132

Matrix: WATER

Lab Sample ID 1203104427

Instrument: HPLCE.I

Analysis Date: 06/13/2014 03:21

Dilution: 1

Analyst: CWW

Prep Batch ID:1394132

Inj. Vol: 20 uL

Batch ID: 1394138

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
91-20-3	LCS Naphthalene	50.0	0.0	36.5	73	54-108
91-57-6	LCS 2-Methylnaphthalene	50.0	0.0	42.3	85	50-91
90-12-0	LCS 1-Methylnaphthalene	50.0	0.0	39.4	79	55-96
208-96-8	LCS Acenaphthylene	50.0	0.0	40.4	81	52-100
83-32-9	LCS Acenaphthene	50.0	0.0	43.3	87	53-107
86-73-7	LCS Fluorene	50.0	0.0	41.8	84	62-130
85-01-8	LCS Phenanthrene	50.0	0.0	41.8	84	69-130
120-12-7	LCS Anthracene	50.0	0.0	42.8	86	70-130
206-44-0	LCS Fluoranthene	5.00	0.0	4.04	81	70-130
129-00-0	LCS Pyrene	5.00	0.0	4.19	84	70-130
56-55-3	LCS Benzo(a)anthracene	5.00	0.0	4.22	84	70-130
218-01-9	LCS Chrysene	5.00	0.0	4.30	86	70-130
205-99-2	LCS Benzo(b)fluoranthene	5.00	0.0	4.08	82	70-130
207-08-9	LCS Benzo(k)fluoranthene	2.50	0.0	2.22	89	70-130
50-32-8	LCS Benzo(a)pyrene	5.00	0.0	4.21	84	70-130
193-39-5	LCS Indeno(1,2,3-cd)pyrene	5.00	0.0	4.33	87	57-114
53-70-3	LCS Dibenzo(a,h)anthracene	5.00	0.0	3.83	77	30-118
191-24-2	LCS Benzo(ghi)perylene	5.00	0.0	3.48	70	42-115

PAH by HPLC  
Quality Control Summary  
Spike Recovery Report

Page 2 of 2

SDG Number: 2014-3494

Sample Type: Laboratory Control Sample Duplicate

Client ID: LCSD for batch 1394132

Matrix: WATER

Lab Sample ID 1203104430

Instrument: HPLCE.I

Analysis Date: 06/13/2014 04:03

Dilution: 1

Analyst: CWW

Prep Batch ID: 1394132

Inj. Vol: 20 uL

Batch ID: 1394138

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
91-20-3	LCSD Naphthalene	50.0	0.0	35.9	72	54-108	2	0-26
91-57-6	LCSD 2-Methylnaphthalene	50.0	0.0	41.2	82	50-91	2	0-20
90-12-0	LCSD 1-Methylnaphthalene	50.0	0.0	38.3	77	55-96	3	0-20
208-96-8	LCSD Acenaphthylene	50.0	0.0	38.7	77	52-100	4	0-20
83-32-9	LCSD Acenaphthene	50.0	0.0	41.4	83	53-107	4	0-20
86-73-7	LCSD Fluorene	50.0	0.0	40.8	82	62-130	2	0-20
85-01-8	LCSD Phenanthrene	50.0	0.0	41.3	83	69-130	1	0-20
120-12-7	LCSD Anthracene	50.0	0.0	43.5	87	70-130	2	0-20
206-44-0	LCSD Fluoranthene	5.00	0.0	4.00	80	70-130	1	0-20
129-00-0	LCSD Pyrene	5.00	0.0	4.15	83	70-130	1	0-20
56-55-3	LCSD Benzo(a)anthracene	5.00	0.0	4.12	82	70-130	2	0-20
218-01-9	LCSD Chrysene	5.00	0.0	4.37	87	70-130	1	0-20
205-99-2	LCSD Benzo(b)fluoranthene	5.00	0.0	4.07	81	70-130	0	0-20
207-08-9	LCSD Benzo(k)fluoranthene	2.50	0.0	2.20	88	70-130	1	0-20
50-32-8	LCSD Benzo(a)pyrene	5.00	0.0	4.17	83	70-130	1	0-20
193-39-5	LCSD Indeno(1,2,3-cd)pyrene	5.00	0.0	4.29	86	57-114	1	0-20
53-70-3	LCSD Dibenzo(a,h)anthracene	5.00	0.0	3.46	69	30-118	10	0-20
191-24-2	LCSD Benzo(ghi)perylene	5.00	0.0	3.26	65	42-115	6	0-20

PAH by HPLC  
Quality Control Summary  
Spike Recovery Report

Page 1 of 1

SDG Number: 2014-3494

Sample Type: Matrix Spike

Client ID: CAPU-14-79429MS

Matrix: W

Lab Sample ID 1203104428

Instrument: HPLCE.I

Analysis Date: 06/13/2014 11:05

Dilution: 1

Analyst: CWW

Prep Batch ID: 1394132

Inj. Vol: 20 uL

Batch ID: 1394138

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
207-08-9	MS Benzo(k)fluoranthene	2.63	0.0116 J	2.08	79	28-134
53-70-3	MS Dibenzo(a,h)anthracene	5.26	0.0216 J	4.30	81	25-133
191-24-2	MS Benzo(ghi)perylene	5.26	0.0187 J	3.66	69	27-140
91-20-3	MS Naphthalene	52.6	0.00 U	34.1	65	32-104
91-57-6	MS 2-Methylnaphthalene	52.6	0.00 U	39.2	74	56-130
90-12-0	MS 1-Methylnaphthalene	52.6	0.00 U	36.1	69	46-130
208-96-8	MS Acenaphthylene	52.6	0.00 U	36.3	69	26-121
83-32-9	MS Acenaphthene	52.6	0.00 U	39.0	74	27-118
86-73-7	MS Fluorene	52.6	0.00 U	39.0	74	29-123
85-01-8	MS Phenanthrene	52.6	0.00 U	39.8	76	35-126
120-12-7	MS Anthracene	52.6	0.00 U	41.7	79	36-122
206-44-0	MS Fluoranthene	5.26	0.00 U	3.79	72	32-134
129-00-0	MS Pyrene	5.26	0.00 U	3.93	75	32-134
56-55-3	MS Benzo(a)anthracene	5.26	0.00 U	3.93	75	35-129
218-01-9	MS Chrysene	5.26	0.00 U	4.11	78	25-141
205-99-2	MS Benzo(b)fluoranthene	5.26	0.00 U	3.82	73	29-133
50-32-8	MS Benzo(a)pyrene	5.26	0.00 U	3.95	75	25-135
193-39-5	MS Indeno(1,2,3-cd)pyrene	5.26	0.00 U	4.08	78	25-135

## Method Blank Summary

Page 1 of 1

SDG Number:	2014-3494	Client:	ARSL004	Matrix:	WATER
Client ID:	MB for batch 1394132	Instrument ID:	HPLCE.I	Data File:	ph5f1227.d
Lab Sample ID:	1203104426	Prep Date:	06/09/2014 07:15	Analyzed:	06/13/14 02:38
Column:	C-18, DAD/FLD	Level:	LOW		

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 1394132	1203104427	ph5f1228.d	06/13/14	0321
02 LCSD for batch 1394132	1203104430	ph5f1229.d	06/13/14	0403
03 CAPU-14-79428	350053002	ph5f1230.d	06/13/14	0445
04 CAPU-14-79431	350053010	ph5f1231.d	06/13/14	0527
05 CAPU-14-79413	350053016	ph5f1232.d	06/13/14	0610
06 CAPU-14-79414	350053023	ph5f1233.d	06/13/14	0652
07 CAPU-14-79415	350053029	ph5f1234.d	06/13/14	0734
08 CAPU-14-79429MS	1203104428	ph5f1239.d	06/13/14	1105

# QC Data

**PAH by HPLC**  
**Certificate of Analysis**  
**Sample Summary**

Page 1 of 1

SDG Number: 2014-3494

Lab Sample ID: 1203104426

Client Sample: QC for batch 1394132

Client ID: MB for batch 1394132

Batch ID: 1394138

Run Date: 06/13/2014 02:38

Prep Date: 06/09/2014 07:15

Data File: ph5f1227.d

Matrix: WATER

Project: QC

SOP Ref: GL-OA-E-030

Dilution: 1

Inj. Vol: 20 uL

Final Volume: 1 mL

Level: LOW

Client: ARSL004  
 Method: SW846 8310  
 Inst: HPLCE.I  
 Analyst: CWW  
 Aliquot: 1000 mL  
 Column: C-18, DAD/FLD

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
90-12-0	1-Methylnaphthalene	U	0.500	ug/L	0.218	0.500
91-57-6	2-Methylnaphthalene	U	0.500	ug/L	0.150	0.500
83-32-9	Acenaphthene	U	0.500	ug/L	0.150	0.500
208-96-8	Acenaphthylene	U	0.500	ug/L	0.150	0.500
120-12-7	Anthracene	U	0.500	ug/L	0.150	0.500
56-55-3	Benzo(a)anthracene	U	0.050	ug/L	0.016	0.050
50-32-8	Benzo(a)pyrene	U	0.050	ug/L	0.016	0.050
205-99-2	Benzo(b)fluoranthene	U	0.050	ug/L	0.016	0.050
191-24-2	Benzo(ghi)perylene	U	0.050	ug/L	0.016	0.050
207-08-9	Benzo(k)fluoranthene	U	0.025	ug/L	0.008	0.025
218-01-9	Chrysene	U	0.050	ug/L	0.016	0.050
53-70-3	Dibenzo(a,h)anthracene	U	0.050	ug/L	0.016	0.050
206-44-0	Fluoranthene	U	0.050	ug/L	0.016	0.050
86-73-7	Fluorene	U	0.500	ug/L	0.150	0.500
193-39-5	Indeno(1,2,3-cd)pyrene	U	0.050	ug/L	0.016	0.050
91-20-3	Naphthalene	U	0.500	ug/L	0.150	0.500
85-01-8	Phenanthrene	U	0.500	ug/L	0.182	0.500
129-00-0	Pyrene	U	0.050	ug/L	0.016	0.050

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
Decafluorobiphenyl	156	250	62.3	(21%-96%)



**PAH by HPLC**  
**Certificate of Analysis**  
**Sample Summary**

Page 1 of 1

SDG Number: 2014-3494

Lab Sample ID: 1203104427

Client Sample: QC for batch 1394132

Client ID: LCS for batch 1394132

Batch ID: 1394138

Run Date: 06/13/2014 03:21

Prep Date: 06/09/2014 07:15

Data File: ph5f1228.d

Client: ARSL004

Method: SW846 8310

Inst: HPLCE.I

Analyst: CWW

Aliquot: 1000 mL

Column: C-18, DAD/FLD

Matrix: WATER

Project: QC

SOP Ref: GL-OA-E-030

Dilution: 1

Inj. Vol: 20 uL

Final Volume: 1 mL

Level: LOW

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
90-12-0	1-Methylnaphthalene		39.4	ug/L	0.218	0.500
91-57-6	2-Methylnaphthalene		42.3	ug/L	0.150	0.500
83-32-9	Acenaphthene		43.3	ug/L	0.150	0.500
208-96-8	Acenaphthylene		40.4	ug/L	0.150	0.500
120-12-7	Anthracene		42.8	ug/L	0.150	0.500
56-55-3	Benzo(a)anthracene		4.22	ug/L	0.016	0.050
50-32-8	Benzo(a)pyrene		4.21	ug/L	0.016	0.050
205-99-2	Benzo(b)fluoranthene		4.08	ug/L	0.016	0.050
191-24-2	Benzo(ghi)perylene		3.48	ug/L	0.016	0.050
207-08-9	Benzo(k)fluoranthene		2.22	ug/L	0.008	0.025
218-01-9	Chrysene		4.30	ug/L	0.016	0.050
53-70-3	Dibenzo(a,h)anthracene		3.83	ug/L	0.016	0.050
206-44-0	Fluoranthene		4.04	ug/L	0.016	0.050
86-73-7	Fluorene		41.8	ug/L	0.150	0.500
193-39-5	Indeno(1,2,3-cd)pyrene		4.33	ug/L	0.016	0.050
91-20-3	Naphthalene		36.5	ug/L	0.150	0.500
85-01-8	Phenanthrene		41.8	ug/L	0.182	0.500
129-00-0	Pyrene		4.19	ug/L	0.016	0.050

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
Decafluorobiphenyl	151	250	60.2	(21%-96%)

**PAH by HPLC**  
**Certificate of Analysis**  
**Sample Summary**

Page 1 of 1

<b>SDG Number:</b> 2014-3494	<b>Matrix:</b> WATER
<b>Lab Sample ID:</b> 1203104430	
<b>Client Sample:</b> QC for batch 1394132	<b>Client:</b> ARSL004
<b>Client ID:</b> LCSD for batch 1394132	<b>Method:</b> SW846 8310
<b>Batch ID:</b> 1394138	<b>Inst:</b> HPLCE.I
<b>Run Date:</b> 06/13/2014 04:03	<b>Analyst:</b> CWW
<b>Prep Date:</b> 06/09/2014 07:15	<b>Aliquot:</b> 1000 mL
<b>Data File:</b> ph5f1229.d	<b>Column:</b> C-18, DAD/FLD
	<b>Project:</b> QC
	<b>SOP Ref:</b> GL-OA-E-030
	<b>Dilution:</b> 1
	<b>Inj. Vol:</b> 20 uL
	<b>Final Volume:</b> 1 mL
	<b>Level:</b> LOW

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
90-12-0	1-Methylnaphthalene		38.3	ug/L	0.218	0.500
91-57-6	2-Methylnaphthalene		41.2	ug/L	0.150	0.500
83-32-9	Acenaphthene		41.4	ug/L	0.150	0.500
208-96-8	Acenaphthylene		38.7	ug/L	0.150	0.500
120-12-7	Anthracene		43.5	ug/L	0.150	0.500
56-55-3	Benzo(a)anthracene		4.12	ug/L	0.016	0.050
50-32-8	Benzo(a)pyrene		4.17	ug/L	0.016	0.050
205-99-2	Benzo(b)fluoranthene		4.07	ug/L	0.016	0.050
191-24-2	Benzo(ghi)perylene		3.26	ug/L	0.016	0.050
207-08-9	Benzo(k)fluoranthene		2.20	ug/L	0.008	0.025
218-01-9	Chrysene		4.37	ug/L	0.016	0.050
53-70-3	Dibenzo(a,h)anthracene		3.46	ug/L	0.016	0.050
206-44-0	Fluoranthene		4.00	ug/L	0.016	0.050
86-73-7	Fluorene		40.8	ug/L	0.150	0.500
193-39-5	Indeno(1,2,3-cd)pyrene		4.29	ug/L	0.016	0.050
91-20-3	Naphthalene		35.9	ug/L	0.150	0.500
85-01-8	Phenanthrene		41.3	ug/L	0.182	0.500
129-00-0	Pyrene		4.15	ug/L	0.016	0.050

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
Decafluorobiphenyl	148	250	59.0	(21%-96%)

**PAH by HPLC**  
**Certificate of Analysis**  
**Sample Summary**

Page 1 of 1

<b>SDG Number:</b> 2014-3494	<b>Date Collected:</b> 06/04/2014 12:45	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 1203104428	<b>Date Received:</b> 06/06/2014 08:55	
<b>Client Sample:</b> QC for batch 1394132	<b>Client:</b> ARSL004	<b>Project:</b> QC
<b>Client ID:</b> CAPU-14-79429MS	<b>Method:</b> SW846 8310	<b>SOP Ref:</b> GL-OA-E-030
<b>Batch ID:</b> 1394138	<b>Inst:</b> HPLCE.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/13/2014 11:05	<b>Analyst:</b> CWW	<b>Inj. Vol:</b> 20 uL
<b>Prep Date:</b> 06/09/2014 07:15	<b>Aliquot:</b> 950 mL	<b>Final Volume:</b> 1 mL
<b>Data File:</b> ph5f1239.d	<b>Column:</b> C-18, DAD/FLD	<b>Level:</b> LOW

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
90-12-0	1-Methylnaphthalene		36.1	ug/L	0.229	0.526
91-57-6	2-Methylnaphthalene		39.2	ug/L	0.158	0.526
83-32-9	Acenaphthene		39.0	ug/L	0.158	0.526
208-96-8	Acenaphthylene		36.3	ug/L	0.158	0.526
120-12-7	Anthracene		41.7	ug/L	0.158	0.526
56-55-3	Benzo(a)anthracene		3.93	ug/L	0.0168	0.0526
50-32-8	Benzo(a)pyrene		3.95	ug/L	0.0168	0.0526
205-99-2	Benzo(b)fluoranthene		3.82	ug/L	0.0168	0.0526
191-24-2	Benzo(ghi)perylene		3.66	ug/L	0.0168	0.0526
207-08-9	Benzo(k)fluoranthene		2.08	ug/L	0.00842	0.0263
218-01-9	Chrysene		4.11	ug/L	0.0168	0.0526
53-70-3	Dibenzo(a,h)anthracene		4.30	ug/L	0.0168	0.0526
206-44-0	Fluoranthene		3.79	ug/L	0.0168	0.0526
86-73-7	Fluorene		39.0	ug/L	0.158	0.526
193-39-5	Indeno(1,2,3-cd)pyrene		4.08	ug/L	0.0168	0.0526
91-20-3	Naphthalene		34.1	ug/L	0.158	0.526
85-01-8	Phenanthrene		39.8	ug/L	0.192	0.526
129-00-0	Pyrene		3.93	ug/L	0.0168	0.0526

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
Decafluorobiphenyl	149	263	56.5	(21%-96%)

# **Perchlorates by LCMSMS Analysis**

# Case Narrative

**Perchlorate by LC-MS/MS  
ARS International, LLC (ARSL)  
SDG 2014-3494**

**Method/Analysis Information**

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

Analytical Method: SW846 6850 Modified

Prep Method: SW846 6850 Modified

Analytical Batch Number: 1394191

Prep Batch Number: 1394190

**Sample Analysis**

<b>Sample ID</b>	<b>Client ID</b>
350053006	CAPU-14-79436
350053014	CAPU-14-79439
350053019	CAPU-14-79413
350053033	CAPU-14-79416
1203104534	Interference Check Sample (ICS)
1203104530	Method Blank (MB)
1203104531	Laboratory Control Sample (LCS)
1203104532	350053006(CAPU-14-79436) Matrix Spike (MS)
1203104533	350053006(CAPU-14-79436) 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# 11.

**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**

The initial calibration verification standard (ICV) met the acceptance criteria.

**CCB Requirements**

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

**CCV Requirements**

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

**Low Level Standard (CRI) Requirements**

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

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

The MB analyzed with this SDG met the acceptance criteria.

**Interference Check Sample (ICS)**

The ICS spike recoveries met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**

The LCS spike recoveries met the acceptance limits.

**QC Sample Designation**

Client sample 350053006 (CAPU-14-79436) was chosen for matrix spike and matrix spike duplicate analysis.

**Matrix Spike (MS) Recovery Statement**

The MS recoveries were within the established acceptance limits.

**Matrix Spike Duplicate (MSD) Recovery Statement**

The MSD recoveries were within the established acceptance limits.

**MS/MSD Relative Percent Difference (RPD) Statement**

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

**Retention Time Standard Area Acceptance**

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

**Retention Time**

During the analysis of Perchlorate by LC/MS/MS, retention time shifts are commonly observed. These retention time shifts, which are caused by fouling of the column by the sample matrices, are problematic when the retention time is used as one of the criterion for confirmation. To overcome this problem, a known amount of O(18) labeled Perchlorate was added to each sample as a retention time standard.

The presence of Perchlorate was confirmed by the relative retention time (RRT) of the Perchlorate peak and the O(18) standard. A RRT window of 0.98 to 1.02, as required by Method 332.0, has been used.

In addition to the isotopic ratio, the presence of Perchlorate in the samples associated with this data package have been confirmed using the relative retention criteria stated above, not the absolute retention time.

## **Technical Information**

### **Holding Time Specifications**

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

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

All procedures were performed as stated in the SOP.

### **Sample Dilutions**

Samples 350053014 (CAPU-14-79439) and 350053033 (CAPU-14-79416) were diluted to bring the over range concentrations within the calibration range.

### **Sample Re-extraction/Re-analysis**

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

## **Miscellaneous Information**

### **Data Exception (DER) Documentation**

Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents.

A data exception report (DER) was not generated for this SDG.

### **Manual Integrations**

Some initial calibration standards, continuing calibration standards, and/or samples may require manual integrations due to software limitations.

### **Method Comments**

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

### **Additional Comments**

The Perchlorate Isotope Ratio on the Form I may differ slightly from the ratio on the corresponding raw data due to rounding rules and/or significant figures or due to software limitations when there are manual integrations, dilutions or other factors. The ratio value of the Form I is the correct value.

The retention time marker, Perchlorate-O (18), is added to all samples, instrument blanks, and standards prior to injection. It is used to verify the retention time of Perchlorate and Perchlorate-101 and to insure an accurate injection occurred.

Due to various anions affecting the recovery of Perchlorate-O (18) and not Perchlorate and Perchlorate-101, the calibration curves of Perchlorate and Perchlorate-101 are not internally corrected for using Perchlorate-O (18). They are external calibrations.

### **Perchlorate Isotope Ratio**

The Perchlorate isotope ratio met acceptance criteria for all samples and QC samples.

Please see the isotope ratio criteria in the Miscellaneous Section.



### **System Configuration**

The laboratory utilizes a Waters LC 2795 liquid chromatography instrument for Perchlorate analysis. It is coupled with either a Micromass Quattro Micro Mass Spectrometer/ Mass Spectrometer, or a Micromass Quattro Ultima Mass Spectrometer/ Mass Spectrometer. Each being designated as LCMSMS #1 and LCMSMS #2, respectively. 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**

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: 2014-3494 GEL Work Order: 350053

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

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

#### Review/Validation

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

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

Signature: 

Name: Michael Penny

Date: 13 JUN 2014

Title: Group Leader

# **Sample Data Summary**

## Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: SW846 6850 ModifiedMatrix: WATERExtraction Batch ID: 1394190Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAPU-14-79436Date Received: 05-JUN-14GEL Job No (SDG): 2014-3494GEL Sample ID: 350053006Date Filtered: 07-JUN-14Injection 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	0.358	ug/L		1	11-JUN-14 15:55	per0611017a
	Perchlorate Isotope Ratio			2.9			1	11-JUN-14 15:55	per0611017a
14797-73-0	Perchlorate-101	.05	.2	0.359	ug/L		1	11-JUN-14 15:55	per0611017a
	Perchlorate-O(18)			0.471	ug/L		1	11-JUN-14 15:55	per0611017a

^ 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: 1394190Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAPU-14-79439Date Received: 05-JUN-14GEL Job No (SDG): 2014-3494GEL Sample ID: 350053014Date Filtered: 07-JUN-14Injection Volume (uL): 20%Solids:     

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.25	1	3.22	ug/L		5	11-JUN-14 19:33	per0611036a
	Perchlorate Isotope Ratio			2.96			5	11-JUN-14 19:33	per0611036a
14797-73-0	Perchlorate-101	.25	1	3.17	ug/L		5	11-JUN-14 19:33	per0611036a
	Perchlorate-O(18)			2.46	ug/L		5	11-JUN-14 19:33	per0611036a

^ 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: 1394190Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAPU-14-79413Date Received: 05-JUN-14GEL Job No (SDG): 2014-3494GEL Sample ID: 350053019Date Filtered: 07-JUN-14Injection Volume (uL): 20%Solids:     

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.200	ug/L	U	1	11-JUN-14 16:41	per0611021a
	Perchlorate Isotope Ratio						1	11-JUN-14 16:41	per0611021a
14797-73-0	Perchlorate-101	.05	.2	0.200	ug/L	U	1	11-JUN-14 16:41	per0611021a
	Perchlorate-O(18)			0.492	ug/L		1	11-JUN-14 16:41	per0611021a

^ 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: 1394190Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAPU-14-79416Date Received: 05-JUN-14GEL Job No (SDG): 2014-3494GEL Sample ID: 350053033Date Filtered: 07-JUN-14Injection Volume (uL): 20%Solids:     

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.25	1	3.16	ug/L		5	11-JUN-14 19:44	per0611037a
	Perchlorate Isotope Ratio			2.96			5	11-JUN-14 19:44	per0611037a
14797-73-0	Perchlorate-101	.25	1	3.12	ug/L		5	11-JUN-14 19:44	per0611037a
	Perchlorate-O(18)			2.31	ug/L		5	11-JUN-14 19:44	per0611037a

^ 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):** 2014-3494

**Extract Batch Code:** 1394190

**Date Filtered:** 07-JUN-14

**Matrix:** WATER

**Sample ID:** 1203104531

Analyte^	True	Found	Units	%Rec	Q	Control Limits
Perchlorate	0.200	.194	ug/L	97.0		85 - 115
Perchlorate Isotope Ratio		2.87				-
Perchlorate-101	0.200	.197	ug/L	98.5		85 - 115
Perchlorate-O(18)		.487	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

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**Lab Name:** General Engineering Laboratories

**Lab Code:** GEL

**GEL Job No (SDG):** 2014-3494

**Extract Batch Code:** 1394190

**Date Extracted:** 07-JUN-14

**GEL MS/PS ID:** 1203104532

**Client ID:** CAPU-14-79436

**GEL MSD/PSD ID:** 1203104533

**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	0.358	ug/L	0.545	93.5	.541	91.9	.612	30	75 - 125
Perchlorate Isotope Ratio	0	2.90		2.95		2.92		1.33		-
Perchlorate-101	0.200	0.359	ug/L	0.537	88.9	.541	90.8	.716	30	75 - 125
Perchlorate-O(18)	0	0.471	ug/L	0.492		.491		.251		-

^ 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: 1394190Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

MBDate Received: 07-JUN-14GEL Job No (SDG): 2014-3494GEL Sample ID: 1203104530Date Filtered: 07-JUN-14Injection Volume (uL): 20%Solids:     

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.200	ug/L	U	1	11-JUN-14 14:57	per0611012a
	Perchlorate Isotope Ratio						1	11-JUN-14 14:57	per0611012a
14797-73-0	Perchlorate-101	.05	.2	0.200	ug/L	U	1	11-JUN-14 14:57	per0611012a
	Perchlorate-O(18)			0.482	ug/L		1	11-JUN-14 14:57	per0611012a

^ 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: 1394190Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

LCSDate Received: 07-JUN-14GEL Job No (SDG): 2014-3494GEL Sample ID: 1203104531Date Filtered: 07-JUN-14Injection 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	0.194	ug/L	J	1	11-JUN-14 15:09	per0611013a
	Perchlorate Isotope Ratio			2.87			1	11-JUN-14 15:09	per0611013a
14797-73-0	Perchlorate-101	.05	.2	0.197	ug/L	J	1	11-JUN-14 15:09	per0611013a
	Perchlorate-O(18)			0.487	ug/L		1	11-JUN-14 15:09	per0611013a

^ 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: 1394190Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

ICS

Date Received:

GEL Job No (SDG): 2014-3494GEL Sample ID: 1203104534Date Filtered: 07-JUN-14Injection 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	0.191	ug/L	J	1	11-JUN-14 15:20	per0611014a
	Perchlorate Isotope Ratio			2.96			1	11-JUN-14 15:20	per0611014a
14797-73-0	Perchlorate-101	.05	.2	0.188	ug/L	J	1	11-JUN-14 15:20	per0611014a
	Perchlorate-O(18)			0.487	ug/L		1	11-JUN-14 15:20	per0611014a

^ 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: 1394190Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAPU-14-79436MSDate Received: 05-JUN-14GEL Job No (SDG): 2014-3494GEL Sample ID: 1203104532Date Filtered: 07-JUN-14Injection 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	0.545	ug/L		1	11-JUN-14 16:06	per0611018a
	Perchlorate Isotope Ratio			2.95			1	11-JUN-14 16:06	per0611018a
14797-73-0	Perchlorate-101	.05	.2	0.537	ug/L		1	11-JUN-14 16:06	per0611018a
	Perchlorate-O(18)			0.492	ug/L		1	11-JUN-14 16:06	per0611018a

^ 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: 1394190Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAPU-14-79436MSDDate Received: 05-JUN-14GEL Job No (SDG): 2014-3494GEL Sample ID: 1203104533Date Filtered: 07-JUN-14Injection 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	0.541	ug/L		1	11-JUN-14 16:18	per0611019a
	Perchlorate Isotope Ratio			2.92			1	11-JUN-14 16:18	per0611019a
14797-73-0	Perchlorate-101	.05	.2	0.541	ug/L		1	11-JUN-14 16:18	per0611019a
	Perchlorate-O(18)			0.491	ug/L		1	11-JUN-14 16:18	per0611019a

^ 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

**LC-MS/MS Case Narrative  
ARS International, LLC (ARSL)  
SDG 2014-3494**

**Method/Analysis Information**

**Procedure:** **Definitive Low Level Analysis of Nitroaromatic Explosives Utilizing Liquid Chromatography-Mass Spectrometry/Mass Spectrometry (LC-MS/MS) by SW-846 Method 8321 Modified (8321M)**

Analytical Method: SW846 3535/8321A Modified

Prep Method: SW846 Method 3535

Analytical Batch Number: 1394380

Prep Batch Number: 1394379

**Sample Analysis**

The following samples were analyzed using the analytical protocol as established in SW846 3535/8321A Modified:

<b>Sample ID</b>	<b>Client ID</b>
350053021	CAPU-14-79413
1203105142	Method Blank (MB)
1203105143	Laboratory Control Sample (LCS)
1203105144	350261001(CAWA-14-79408) Matrix Spike (MS)
1203105145	350261001(CAWA-14-79408) 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-056 REV# 17.

**Primary Analyte Analysis**

**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 (1203105143) did not meet acceptance criteria for the recovery of Tetryl at 54.4%. The limits are 65-120%. Both the MS (1203105144) and MSD (1203105145) met spike recovery limits for Tetryl. The data are reported with the appropriate DER.

**QC Sample Designation**

Client sample 350261001 (CAWA-14-79408) from SDG 2014-3511 was chosen for matrix spike and matrix spike duplicate analysis.

**Matrix Spike (MS) Recovery Statement**

The MS (1203105144) did not meet acceptance criteria for the recovery of RDX at 173%. The limits are 67-131%. The MSD (1203105145) duplicated the biased high recovery at 155%. The parent sample, 350261001 (CAWA-14-79408), was analyzed at a 50x dilution for RDX in order to bring the over range concentration within the calibration range of the instrument. Since the RDX concentrations in the MS (1203105144) and MSD (1203105145) were outside of the calibration range of the instrument, the concentrations could not be quantitated accurately. The data are reported with the appropriate DER.

**Matrix Spike Duplicate (MSD) Recovery Statement**

The MSD (1203105145) did not meet acceptance criteria for the recovery of RDX at 155%. The limits are 67-131%. The MS (1203105144) duplicated the biased high recovery at 173%. The parent sample, 350261001 (CAWA-14-79408), was analyzed at a 50x dilution for RDX in order to bring the over range concentration within the calibration range of the instrument. Since the RDX concentrations in the MS (1203105144) and MSD (1203105145) were outside of the calibration range of the instrument, the concentrations could not be quantitated accurately. The data are reported with the appropriate DER.

**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**

A final internal standard concentration of 100ug/L is employed in order to meet the minimum response factor requirement of 0.01 per EPA Method 8000C for the analysis of explosives on the API 4000.

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

## **Technical Information**

### **Holding Time Specifications**

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

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

All procedures were performed as stated in the SOP.

### **Sample Dilutions**

In accordance with GEL SOP GL-OA-056, all sample and QC extracts are diluted 1:1 v/v with LC reagent grade Water.

The samples in this SDG in this analytical batch for this analysis did not require any additional dilutions.

### **Sample Re-extraction/Re-analysis**

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

### **Secondary Analyte Analysis**

## **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 350261001 (CAWA-14-79408) from SDG 2014-3511 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.

**Matrix Spike Duplicate (MSD) Recovery Statement**

The MSD 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 was not added to the Secondary analyte extracts.

**Technical Information****Holding Time Specifications**

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

**Preparation/Analytical Method Verification**

All procedures were performed as stated in the SOP.

**Sample Dilutions**

In accordance with GEL SOP GL-OA-056, all sample and QC extracts are diluted 1:1 v/v with LC reagent grade Water.

The samples in this SDG in this analytical batch for this analysis did not require any additional dilutions.

**Sample Re-extraction/Re-analysis**

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

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

Data Exception Report 1313414 was generated for this SDG.

The LCS (1203105143) did not meet acceptance criteria for the recovery of Tetryl at 54.4%. The limits are 65-120%. Both the MS (1203105144) and MSD (1203105145) met spike recovery limits for Tetryl. The data are reported with the appropriate DER.

The MS (1203105144) did not meet acceptance criteria for the recovery of RDX at 173%. The limits are 67-131%. The MSD (1203105145) duplicated the biased high recovery at 155%. The parent sample, 350261001 (CAWA-14-79408), was analyzed at a 50x dilution for RDX in order to bring the over range concentration within the calibration range of the instrument. Since the RDX concentrations in the MS (1203105144) and MSD (1203105145) were outside of the calibration range of the instrument, the concentrations could not be quantitated accurately. The data are reported with the appropriate DER.

The MSD (1203105145) did not meet acceptance criteria for the recovery of RDX at 155%. The limits are 67-131%. The MS(1203105144) duplicated the biased high recovery at 173%. The parent sample, 350261001 (CAWA-14-79408), was analyzed at a 50x dilution for RDX in order to bring the over range concentration within the calibration range of the instrument. Since the RDX concentrations in the MS (1203105144) and MSD (1203105145) were outside of the calibration range of the instrument, the concentrations could not be quantitated accurately. The data are reported with the appropriate DER.

#### **Manual Integrations**

Some initial calibration standards, continuing calibration standards, and/or samples may require manual integrations due to software limitations.

#### **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.

#### **System Configuration**

The laboratory utilizes a Waters LC 2795 liquid chromatography instrument for Primary analyte analysis. It is coupled with a Micromass Quattro Micro Mass Spectrometer/ Mass Spectrometer, or a Micromass Quattro Ultima Mass Spectrometer/ Mass Spectrometer. Each being designated as LC-MS/MS #1, and LC-MS/MS #2, respectively. It is fitted with an APCI (Atmospheric Pressure Chemical Ionization) probe that is operated in the negative ionization mode for the Primary analyte analysis.

The laboratory also 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. It is 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 detection of the Primary 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.

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

YMC: J'sphere ODS-H80, 150 x 4.6mm I.D.

### **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: 2014-3494 GEL Work Order: 350053

#### 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, 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: 11 JUL 2014

Title: Group Leader

# **Sample Data Summary**

1  
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAPU-14-79413

Lab Code: GEL

GEL Job No (SDG) 2014-3494

Matrix: WATER

GEL Sample ID: 350053021

Sample Amount 945 mL

Date Received: 05-JUN-14

Moisture: .

Extraction Batch ID: 1394379

Extraction Type Sol Exchange

Date Extracted: 09-JUN-14

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0709015.wiff

Date Analyzed: 09-JUL-14 18:29

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
118-96-7	2,4,6-Trinitrotoluene	0.265	U	0.0847	0.265
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
121-14-2	2,4-Dinitrotoluene	0.265	U	0.0847	0.265
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
121-82-4	RDX	0.265	U	0.0847	0.265
<i>121-82-4</i>	<i>RDX</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	0.265	U	0.0847	0.265
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
2691-41-0	HMX	0.265	U	0.0847	0.265
<i>2691-41-0</i>	<i>HMX</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	0.265	U	0.0847	0.265
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
606-20-2	2,6-Dinitrotoluene	0.265	U	0.0847	0.265
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
88-72-2	o-Nitrotoluene	0.265	U	0.0868	0.265
<i>88-72-2</i>	<i>o-Nitrotoluene</i>				
98-95-3	Nitrobenzene	0.265	U	0.0847	0.265
<i>98-95-3</i>	<i>Nitrobenzene</i>				
99-08-1	m-Nitrotoluene	0.265	U	0.0847	0.265
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				
99-35-4	1,3,5-Trinitrobenzene	0.265	U	0.0847	0.265
<i>99-35-4</i>	<i>1,3,5-Trinitrobenzene</i>				
99-65-0	m-Dinitrobenzene	0.265	U	0.0847	0.265
<i>99-65-0</i>	<i>m-Dinitrobenzene</i>				
479-45-8	Tetryl	0.529	U	0.0847	0.529
<i>479-45-8</i>	<i>Tetryl</i>				

1  
**High Explosives Analysis Data Sheet**

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** CAPU-14-79413

**Lab Code:** GEL

**GEL Job No (SDG)** 2014-3494

**Matrix:** WATER

**GEL Sample ID:** 350053021

**Sample Amount** 945 mL

**Date Received:** 05-JUN-14

**Moisture:** .

**Extraction Batch ID:** 1394379

**Extraction Type** Sol Exchange

**Date Extracted:** 09-JUN-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):**50

Cas No.	Compound	Concentration*	Q	MDL	PQL
78-11-5	PETN	0.529	U	0.106	0.529
<i>78-11-5</i>	<i>PETN</i>				
99-99-0	p-Nitrotoluene	0.529	U	0.159	0.529
<i>99-99-0</i>	<i>p-Nitrotoluene</i>				

1  
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAPU-14-79413

Lab Code: GEL

GEL Job No (SDG) 2014-3494

Matrix: WATER

GEL Sample ID: 350053021

Sample Amount 945 mL

Date Received: 05-JUN-14

Moisture: .

Extraction Batch ID: 1394379

Extraction Type Sol Exchange

Date Extracted: 09-JUN-14

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXS06300016.wiff

Date Analyzed: 30-JUN-14 16:04

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
3058-38-6	TATB	1.06	U	0.317	1.06
<i>3058-38-6</i>	<i>TATB</i>				
618-87-1	3,5-Dinitroaniline	1.06	U	0.317	1.06
<i>618-87-1</i>	<i>3,5-Dinitroaniline</i>				
78-30-8	tris(o-cresyl) phosphate	1.06	U	0.317	1.06
<i>78-30-8</i>	<i>tris(o-cresyl) phosphate</i>				
59229-75-3	2,6-Diamino-4-nitrotoluene	2.65	U	0.529	2.65
<i>59229-75-3</i>	<i>2,6-Diamino-4-nitrotoluene</i>				
6629-29-4	2,4-Diamino-6-nitrotoluene	2.65	U	0.529	2.65
<i>6629-29-4</i>	<i>2,4-Diamino-6-nitrotoluene</i>				

# **Quality Control Summary**

## High Explosives Surrogate Recovery Summary

Lab Name: GEL Laboratories LLCGEL Job No (SDG): 2014-3494Lab Code: GEL

HPLC Column: Ultracarb Phenomenex 5u ODS (20)

Lab Sample ID	Client Sample ID	DNT	QC Limits	Flg
350053021	CAPU-14-79413	84.4	69 - 120	
1203105142	MB for batch 1394379	89.6	69 - 120	
1203105143	LCS for batch 1394379	81.6	69 - 120	
1203105144	CAWA-14-79408MS	86.8	69 - 120	
1203105145	CAWA-14-79408MSD	85.2	69 - 120	

DNT = 3,4-Dinitrotoluene

Lab Code: GEL

HPLC Column: YMC J'sphere ODS-H80

Lab Sample ID	Client Sample ID	DNT	QC Limits	Flg
350053021	CAPU-14-79413	89.2	69 - 120	
1203105142	MB for batch 1394379	90.4	69 - 120	
1203105143	LCS for batch 1394379	84.8	69 - 120	
1203105144	CAWA-14-79408MS	88.8	69 - 120	
1203105145	CAWA-14-79408MSD	88	69 - 120	

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)** 2014-3494

**Extract Batch Code:** 1394379

**Date Extracted:** 09-JUN-14

**GEL LCS ID:** 1203105143

**GEL LCSDUP ID:** .

**Analysis Date/Time:** 09-JUL-14 17:55

**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
PETN	5	4.16	83.2					67 - 121
RDX	5	4.61	92.2					70 - 125
Tetryl	5	2.72	54.4 *					65 - 120
m-Dinitrobenzene	5	5.01	100					70 - 115
m-Nitrotoluene	5	4.34	86.8					69 - 113
o-Nitrotoluene	5	4.27	85.4					66 - 111
p-Nitrotoluene	5	4.48	89.6					67 - 113
1,3,5-Trinitrobenzene	5	4.06	81.2					70 - 117
2,4-Dinitrotoluene	5	4.08	81.6					70 - 115
HMX	5	3.69	73.8					66 - 115
4-Amino-2,6-dinitrotoluene	5	4.69	93.8					70 - 119
2-Amino-4,6-dinitrotoluene	5	4.4	88					70 - 121
2,6-Dinitrotoluene	5	4.6	92					70 - 109
2,4,6-Trinitrotoluene	5	4.15	83					70 - 121
Nitrobenzene	5	4.06	81.2					69 - 113

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

\* Values outside of QC limits



**3B**  
**High Explosives LCS/LCS Duplicate Summary**

**Lab Name:** GEL Laboratories LLC

**Client ID:** LCS

**Lab Code:** GEL

**GEL Job No (SDG)** 2014-3494

**Extract Batch Code:** 1394379

**Date Extracted:** 09-JUN-14

**GEL LCS ID:** 1203105143

**GEL LCSDUP ID:** .

**Analysis Date/Time:** 30-JUN-14 15:47

**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
2,4-Diamino-6-nitrotoluene	5	3.99	79.8					70 - 109
2,6-Diamino-4-nitrotoluene	5	4.19	83.8					61 - 117
3,5-Dinitroaniline	5	3.85	77					70 - 117
TATB	5	4.13	82.6					32 - 169
tris(o-cresyl) phosphate	5	3.42	68.4					51 - 87

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

\* Values outside of QC limits

**3**  
**High Explosives MS/MSD Summary**

**Lab Name:** GEL Laboratories LLC

**Client ID:** CAWA-14-79408

**Lab Code:** GEL

**GEL Job No (SDG)** 2014-3494

**Extract Batch Code:** 1394379

**Date Extracted:** 09-JUN-14

**GEL Spike ID:** 1203105144

**GEL SpikeDup ID:** 1203105145

**Analysis Date/Time:** 09-JUL-14 19:39

**MSD Analysis Date/Time:** 09-JUL-14 20:14

**Reporting Units:** ug/L

**QC Type:** MS/MSD

Compound	Spike Added	Sample Conc	MS Conc	MS Rec #	MSD Conc	MSD Rec #	RPD #	RPD Limit	Rec Limits
1,3,5-Trinitrobenzene	5.20833	.121	4.56	85.3	4.41	79.4	3.38	20	60 - 120
2,4,6-Trinitrotoluene	5.20833	0	4.75	91.2	4.7	87	1	20	60 - 123
2,4-Dinitrotoluene	5.20833	0	4.41	84.6	4.86	90	9.89	20	60 - 119
2,6-Dinitrotoluene	5.20833	.0598	4.77	90.5	4.78	87.3	.158	20	60 - 113
2-Amino-4,6-dinitrotoluene	5.20833	.0322	4.88	93	4.86	89.4	.208	20	60 - 124
4-Amino-2,6-dinitrotoluene	5.20833	1.81	6.33	86.9	6.79	92.1	6.95	20	63 - 133
HMX	5.20833	6.14	9.98	73.7	9.56	63.2	4.32	20	59 - 117
Nitrobenzene	5.20833	0	4.24	81.4	4.15	76.8	2.1	20	63 - 112
PETN	5.20833	0	4.16	79.8	4.06	75.2	2.22	20	65 - 118
RDX	5.20833	117	126	173 *	125	155 *	.506	20	67 - 131
Tetryl	5.20833	0	3.84	73.8	3.68	68	4.47	20	44 - 109
m-Dinitrobenzene	5.20833	0	5.18	99.4	5.35	99	3.31	20	60 - 117
m-Nitrotoluene	5.20833	0	4.86	93.4	4.59	85	5.71	20	61 - 110
o-Nitrotoluene	5.20833	.0561	4.69	88.9	4.66	85.2	.6	20	57 - 112
p-Nitrotoluene	5.20833	0	4.91	94.2	5.5	102	11.5	20	63 - 111

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

3  
High Explosives MS/MSD Summary

Lab Name: GEL Laboratories LLC

Client ID: CAWA-14-79408

Lab Code: GEL

GEL Job No (SDG) 2014-3494

Extract Batch Code: 1394379

Date Extracted: 09-JUN-14

GEL Spike ID: 1203105144

GEL SpikeDup ID: 1203105145

Analysis Date/Time: 30-JUN-14 16:38

MSD Analysis Date/Time: 30-JUN-14 16:54

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
2,4-Diamino-6-nitrotoluene	5.20833	0	3.99	76.6	4.18	77.4	4.75	20	68 - 116
2,6-Diamino-4-nitrotoluene	5.20833	0	4.17	80	4.4	81.4	5.45	20	53 - 124
3,5-Dinitroaniline	5.20833	.0133	3.97	75.9	4.15	76.6	4.5	20	67 - 123
TATB	5.20833	0	4.34	83.4	4.46	82.6	2.75	20	39 - 112
tris(o-cresyl) phosphate	5.20833	0	3.63	69.6	3.41	63	6.25	20	49 - 86

#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 1394379

Lab Code: GEL

GEL Job No (SDG) 2014-3494

Matrix: WATER

GEL Sample ID: 1203105142

Sample Amount 1000 mL

Date Received: 05-JUN-14

Moisture: .

Extraction Batch ID: 1394379

Extraction Type Sol Exchange

Date Extracted: 09-JUN-14

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0709013.wiff

Date Analyzed: 09-JUL-14 17:20

Dilution Factor: 2

Concentration Units: ug/L

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

1  
**High Explosives Analysis Data Sheet**

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** MB for batch 1394379

**Lab Code:** GEL

**GEL Job No (SDG)** 2014-3494

**Matrix:** WATER

**GEL Sample ID:** 1203105142

**Sample Amount** 1000 mL

**Date Received:** 05-JUN-14

**Moisture:** .

**Extraction Batch ID:** 1394379

**Extraction Type** Sol Exchange

**Date Extracted:** 09-JUN-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):**50

Cas No.	Compound	Concentration*	Q	MDL	PQL
78-11-5	PETN	0.500	U	0.100	0.500
<i>78-11-5</i>	<i>PETN</i>				
99-99-0	p-Nitrotoluene	0.500	U	0.150	0.500
<i>99-99-0</i>	<i>p-Nitrotoluene</i>				

1  
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: MB for batch 1394379

Lab Code: GEL

GEL Job No (SDG) 2014-3494

Matrix: WATER

GEL Sample ID: 1203105142

Sample Amount 1000 mL

Date Received: 05-JUN-14

Moisture: .

Extraction Batch ID: 1394379

Extraction Type Sol Exchange

Date Extracted: 09-JUN-14

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXS06300014.wiff

Date Analyzed: 30-JUN-14 15:31

Dilution Factor: 2

Concentration Units: ug/L

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

1  
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: LCS for batch 1394379

Lab Code: GEL

GEL Job No (SDG) 2014-3494

Matrix: WATER

GEL Sample ID: 1203105143

Sample Amount 1000 mL

Date Received: 05-JUN-14

Moisture: .

Extraction Batch ID: 1394379

Extraction Type Sol Exchange

Date Extracted: 09-JUN-14

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0709014.wiff

Date Analyzed: 09-JUL-14 17:55

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
479-45-8	Tetryl	2.72		0.080	0.500
<i>479-45-8</i>	<i>Tetryl</i>				
2691-41-0	HMX	3.69		0.080	0.250
<i>2691-41-0</i>	<i>HMX</i>				
98-95-3	Nitrobenzene	4.06		0.080	0.250
<i>98-95-3</i>	<i>Nitrobenzene</i>				
99-35-4	1,3,5-Trinitrobenzene	4.06		0.080	0.250
<i>99-35-4</i>	<i>1,3,5-Trinitrobenzene</i>				
121-14-2	2,4-Dinitrotoluene	4.08		0.080	0.250
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
118-96-7	2,4,6-Trinitrotoluene	4.15		0.080	0.250
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
78-11-5	PETN	4.16		0.100	0.500
<i>78-11-5</i>	<i>PETN</i>				
88-72-2	o-Nitrotoluene	4.27		0.082	0.250
<i>88-72-2</i>	<i>o-Nitrotoluene</i>				
99-08-1	m-Nitrotoluene	4.34		0.080	0.250
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	4.4		0.080	0.250
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
99-99-0	p-Nitrotoluene	4.48		0.150	0.500
<i>99-99-0</i>	<i>p-Nitrotoluene</i>				
606-20-2	2,6-Dinitrotoluene	4.6		0.080	0.250
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
121-82-4	RDX	4.61		0.080	0.250
<i>121-82-4</i>	<i>RDX</i>				



1  
**High Explosives Analysis Data Sheet**

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** LCS for batch 1394379

**Lab Code:** GEL

**GEL Job No (SDG)** 2014-3494

**Matrix:** WATER

**GEL Sample ID:** 1203105143

**Sample Amount** 1000 mL

**Date Received:** 05-JUN-14

**Moisture:** .

**Extraction Batch ID:** 1394379

**Extraction Type** Sol Exchange

**Date Extracted:** 09-JUN-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):**50

Cas No.	Compound	Concentration*	Q	MDL	PQL
19406-51-0	4-Amino-2,6-dinitrotoluene	4.69		0.080	0.250
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
99-65-0	m-Dinitrobenzene	5.01		0.080	0.250
<i>99-65-0</i>	<i>m-Dinitrobenzene</i>				

1  
**High Explosives Analysis Data Sheet**

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** LCS for batch 1394379

**Lab Code:** GEL

**GEL Job No (SDG)** 2014-3494

**Matrix:** WATER

**GEL Sample ID:** 1203105143

**Sample Amount** 1000 mL

**Date Received:** 05-JUN-14

**Moisture:** .

**Extraction Batch ID:** 1394379

**Extraction Type** Sol Exchange

**Date Extracted:** 09-JUN-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):**50

**GEL data file:** EXS06300015.wiff

**Date Analyzed:** 30-JUN-14 15:47

**Dilution Factor:** 2

**Concentration Units:** ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
78-30-8	tris(o-cresyl) phosphate	3.42		0.300	1.00
78-30-8	tris(o-cresyl) phosphate				
618-87-1	3,5-Dinitroaniline	3.85		0.300	1.00
618-87-1	3,5-Dinitroaniline				
6629-29-4	2,4-Diamino-6-nitrotoluene	3.99		0.500	2.50
6629-29-4	2,4-Diamino-6-nitrotoluene				
3058-38-6	TATB	4.13		0.300	1.00
3058-38-6	TATB				
59229-75-3	2,6-Diamino-4-nitrotoluene	4.19		0.500	2.50
59229-75-3	2,6-Diamino-4-nitrotoluene				

1  
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-14-79408(350261001MS)MS

Lab Code: GEL

GEL Job No (SDG) 2014-3494

Matrix: WATER

GEL Sample ID: 1203105144

Sample Amount 960 mL

Date Received: 05-JUN-14

Moisture: .

Extraction Batch ID: 1394379

Extraction Type Sol Exchange

Date Extracted: 09-JUN-14

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0709017.wiff

Date Analyzed: 09-JUL-14 19:39

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
479-45-8	Tetryl	3.84		0.0833	0.521
<i>479-45-8</i>	<i>Tetryl</i>				
78-11-5	PETN	4.16		0.104	0.521
<i>78-11-5</i>	<i>PETN</i>				
98-95-3	Nitrobenzene	4.24		0.0833	0.260
<i>98-95-3</i>	<i>Nitrobenzene</i>				
121-14-2	2,4-Dinitrotoluene	4.41		0.0833	0.260
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
99-35-4	1,3,5-Trinitrobenzene	4.56		0.0833	0.260
<i>99-35-4</i>	<i>1,3,5-Trinitrobenzene</i>				
88-72-2	o-Nitrotoluene	4.69		0.0854	0.260
<i>88-72-2</i>	<i>o-Nitrotoluene</i>				
118-96-7	2,4,6-Trinitrotoluene	4.75		0.0833	0.260
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
606-20-2	2,6-Dinitrotoluene	4.77		0.0833	0.260
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
99-08-1	m-Nitrotoluene	4.86		0.0833	0.260
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	4.88		0.0833	0.260
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
99-99-0	p-Nitrotoluene	4.91		0.156	0.521
<i>99-99-0</i>	<i>p-Nitrotoluene</i>				
99-65-0	m-Dinitrobenzene	5.18		0.0833	0.260
<i>99-65-0</i>	<i>m-Dinitrobenzene</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	6.33		0.0833	0.260
<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:** CAWA-14-79408(350261001MS)MS

**Lab Code:** GEL

**GEL Job No (SDG)** 2014-3494

**Matrix:** WATER

**GEL Sample ID:** 1203105144

**Sample Amount** 960 mL

**Date Received:** 05-JUN-14

**Moisture:** .

**Extraction Batch ID:** 1394379

**Extraction Type** Sol Exchange

**Date Extracted:** 09-JUN-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):**50

Cas No.	Compound	Concentration*	Q	MDL	PQL
2691-41-0	HMX	9.98		0.0833	0.260
2691-41-0	HMX				
121-82-4	RDX	126		0.0833	0.260
121-82-4	RDX				

1  
**High Explosives Analysis Data Sheet**

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** CAWA-14-79408(350261001MS)MS

**Lab Code:** GEL

**GEL Job No (SDG)** 2014-3494

**Matrix:** WATER

**GEL Sample ID:** 1203105144

**Sample Amount** 960 mL

**Date Received:** 05-JUN-14

**Moisture:** .

**Extraction Batch ID:** 1394379

**Extraction Type** Sol Exchange

**Date Extracted:** 09-JUN-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):**50

**GEL data file:** EXS06300018.wiff

**Date Analyzed:** 30-JUN-14 16:38

**Dilution Factor:** 2

**Concentration Units:** ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
78-30-8	tris(o-cresyl) phosphate	3.63		0.313	1.04
78-30-8	tris(o-cresyl) phosphate				
618-87-1	3,5-Dinitroaniline	3.97		0.313	1.04
618-87-1	3,5-Dinitroaniline				
6629-29-4	2,4-Diamino-6-nitrotoluene	3.99		0.521	2.60
6629-29-4	2,4-Diamino-6-nitrotoluene				
59229-75-3	2,6-Diamino-4-nitrotoluene	4.17		0.521	2.60
59229-75-3	2,6-Diamino-4-nitrotoluene				
3058-38-6	TATB	4.34		0.313	1.04
3058-38-6	TATB				

1  
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-14-79408(350261001MSD)MSD

Lab Code: GEL

GEL Job No (SDG) 2014-3494

Matrix: WATER

GEL Sample ID: 1203105145

Sample Amount 925 mL

Date Received: 05-JUN-14

Moisture: .

Extraction Batch ID: 1394379

Extraction Type Sol Exchange

Date Extracted: 09-JUN-14

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0709018.wiff

Date Analyzed: 09-JUL-14 20:14

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
479-45-8	Tetryl	3.68		0.0865	0.541
<i>479-45-8</i>	<i>Tetryl</i>				
78-11-5	PETN	4.06		0.108	0.541
<i>78-11-5</i>	<i>PETN</i>				
98-95-3	Nitrobenzene	4.15		0.0865	0.270
<i>98-95-3</i>	<i>Nitrobenzene</i>				
99-35-4	1,3,5-Trinitrobenzene	4.41		0.0865	0.270
<i>99-35-4</i>	<i>1,3,5-Trinitrobenzene</i>				
99-08-1	m-Nitrotoluene	4.59		0.0865	0.270
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				
88-72-2	o-Nitrotoluene	4.66		0.0886	0.270
<i>88-72-2</i>	<i>o-Nitrotoluene</i>				
118-96-7	2,4,6-Trinitrotoluene	4.7		0.0865	0.270
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
606-20-2	2,6-Dinitrotoluene	4.78		0.0865	0.270
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
121-14-2	2,4-Dinitrotoluene	4.86		0.0865	0.270
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	4.86		0.0865	0.270
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
99-65-0	m-Dinitrobenzene	5.35		0.0865	0.270
<i>99-65-0</i>	<i>m-Dinitrobenzene</i>				
99-99-0	p-Nitrotoluene	5.5		0.162	0.541
<i>99-99-0</i>	<i>p-Nitrotoluene</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	6.79		0.0865	0.270
<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:** CAWA-14-79408(350261001MSD)MSD

**Lab Code:** GEL

**GEL Job No (SDG)** 2014-3494

**Matrix:** WATER

**GEL Sample ID:** 1203105145

**Sample Amount** 925 mL

**Date Received:** 05-JUN-14

**Moisture:** .

**Extraction Batch ID:** 1394379

**Extraction Type** Sol Exchange

**Date Extracted:** 09-JUN-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):**50

Cas No.	Compound	Concentration*	Q	MDL	PQL
2691-41-0	HMX	9.56		0.0865	0.270
<i>2691-41-0</i>	<i>HMX</i>				
121-82-4	RDX	125		0.0865	0.270
<i>121-82-4</i>	<i>RDX</i>				

1  
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-14-79408(350261001MSD)MSD

Lab Code: GEL

GEL Job No (SDG) 2014-3494

Matrix: WATER

GEL Sample ID: 1203105145

Sample Amount 925 mL

Date Received: 05-JUN-14

Moisture: .

Extraction Batch ID: 1394379

Extraction Type Sol Exchange

Date Extracted: 09-JUN-14

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXS06300019.wiff

Date Analyzed: 30-JUN-14 16:54

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
78-30-8	tris(o-cresyl) phosphate	3.41		0.324	1.08
78-30-8	tris(o-cresyl) phosphate				
618-87-1	3,5-Dinitroaniline	4.15		0.324	1.08
618-87-1	3,5-Dinitroaniline				
6629-29-4	2,4-Diamino-6-nitrotoluene	4.18		0.541	2.70
6629-29-4	2,4-Diamino-6-nitrotoluene				
59229-75-3	2,6-Diamino-4-nitrotoluene	4.4		0.541	2.70
59229-75-3	2,6-Diamino-4-nitrotoluene				
3058-38-6	TATB	4.46		0.324	1.08
3058-38-6	TATB				



## Explosives Initial Calibration Blank

Lab Name: GEL Laboratories LLCGEL Job No(SDG): 2014-3494Lab Code: GELLab Sample ID: XIBLK01Analysis Date: 09-JUL-14 10:21GEL Data File: EXP0709001.wiffInstrument ID: LCMSMS3Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	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

## Explosives Initial Calibration Blank

Lab Name: GEL Laboratories LLCGEL Job No(SDG): 2014-3494Lab Code: GELLab Sample ID: XIBLK01Analysis Date: 09-JUL-14 10:56GEL Data File: EXP0709002.wiffInstrument ID: LCMSMS3Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	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

## Explosives Initial Calibration Blank

Lab Name: GEL Laboratories LLCGEL Job No(SDG): 2014-3494Lab Code: GELLab Sample ID: XIBLK01Analysis Date: 30-JUN-14 11:53GEL Data File: EXS06300001.wiffInstrument ID: LCMSMS4Column: YMC J'sphere ODS-H80

Compound	True	Found (ug/L)
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	3.67
TATB	0	0
3,5-Dinitroaniline	0	0

## Explosives Initial Calibration Blank

Lab Name: GEL Laboratories LLCGEL Job No(SDG): 2014-3494Lab Code: GELLab Sample ID: XIBLK01Analysis Date: 30-JUN-14 12:10GEL Data File: EXS06300002.wiffInstrument ID: LCMSMS4Column: YMC J'sphere ODS-H80

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

**4A**  
**Explosives Continuing Calibration Blank**

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2014-3494

**Lab Code:** GEL

**Lab Sample ID:** XIBLK02

**Analysis Date:** 09-JUL-14 15:00

**GEL Data File:** EXP0709009.wiff

**Instrument ID:** LCMSMS3

**Column:** Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	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):** 2014-3494

**Lab Code:** GEL

**Lab Sample ID:** XIBLK03

**Analysis Date:** 09-JUL-14 16:10

**GEL Data File:** EXP0709011.wiff

**Instrument ID:** LCMSMS3

**Column:** Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	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):** 2014-3494

**Lab Code:** GEL

**Lab Sample ID:** XIBLK04

**Analysis Date:** 09-JUL-14 20:49

**GEL Data File:** EXP0709019.wiff

**Instrument ID:** LCMSMS3

**Column:** Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	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):** 2014-3494

**Lab Code:** GEL

**Lab Sample ID:** XIBLK05

**Analysis Date:** 09-JUL-14 21:59

**GEL Data File:** EXP0709021.wiff

**Instrument ID:** LCMSMS3

**Column:** Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	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):** 2014-3494

**Lab Code:** GEL

**Lab Sample ID:** XIBLK02

**Analysis Date:** 30-JUN-14 14:24

**GEL Data File:** EXS06300010.wiff

**Instrument ID:** LCMSMS4

**Column:** YMC J'sphere ODS-H80

Compound	True	Found (ug/L)
3,5-Dinitroaniline	0	1.03
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	5.64
TATB	0	0

**4A**  
**Explosives Continuing Calibration Blank**

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2014-3494

**Lab Code:** GEL

**Lab Sample ID:** XIBLK03

**Analysis Date:** 30-JUN-14 14:57

**GEL Data File:** EXS06300012.wiff

**Instrument ID:** LCMSMS4

**Column:** YMC J'sphere ODS-H80

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

**4A**  
**Explosives Continuing Calibration Blank**

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2014-3494

**Lab Code:** GEL

**Lab Sample ID:** XIBLK04

**Analysis Date:** 30-JUN-14 17:28

**GEL Data File:** EXS06300021.wiff

**Instrument ID:** LCMSMS4

**Column:** YMC J'sphere ODS-H80

Compound	True	Found (ug/L)
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	0
TATB	0	0

# Miscellaneous

### DATA EXCEPTION REPORT

<b>Mo.Day Yr.</b> 11-JUL-14	<b>Division:</b> Industrial	<b>Quality Criteria:</b> Specifications	<b>Type:</b> Process
<b>Instrument Type:</b> LC-MS/MS	<b>Test / Method:</b> SW846 3535/8321A Modified	<b>Matrix Type:</b> Liquid	<b>Client Code:</b> ESHL
<b>Batch ID:</b> 1394380	<b>Sample Numbers:</b> See Below		
<b>Potentially affected work order(s)(SDG): 350053(2014-3494),350261(2014-3511)</b> <b>Application Issues:</b> Failed Recovery for LCS/LCSD			
<b>Specification and Requirements Exception Description:</b>		<b>DER Disposition:</b>	
<p>1. The LCS (1203105143) did not meet acceptance criteria for the recovery of Tetryl at 54.4%. The limits are 65-120%.</p> <p>2. The MS (1203105144) did not meet acceptance criteria for the recovery of RDX at 173%. The limits are 67-131%. The MSD (1203105145) duplicated the biased high recovery at 155%.</p> <p>3. The MSD (1203105145) did not meet acceptance criteria for the recovery of RDX at 155%. The limits are 67-131%. The MS (1203105144) duplicated the biased high recovery at 173%.</p>		<p>1. Both the MS (1203105144) and MSD (1203105145) met spike recovery limits for Tetryl. The data are reported with the appropriate DER.</p> <p>2. &amp; 3. The parent sample, 350261001 (CAWA-14-79408), was analyzed at a 50x dilution for RDX in order to bring the over range concentration within the calibration range of the instrument. Since the RDX concentrations in the MS (1203105144) and MSD (1203105145) were outside of the calibration range of the instrument, the concentrations could not be quantitated accurately. The data are reported with the appropriate DER. The discrepancies are noted in the Case Narrative.</p>	

**Originator's Name:**

Lynne Russell 11-JUL-14

**Data Validator/Group Leader:**

Michael Penny 11-JUL-14

# **Pesticide Analysis**

# Case Narrative

**Pesticide Case Narrative**  
**ARS International, LLC (ARSL)**  
**SDG 2014-3494**

**Method/Analysis Information**

**Procedure:** Analysis of 1,2-Dibromoethane (EDB) and 1,2-Dibromo-3-Chloropropane (DBCP) in Water by GC/ECD Using Methods 504.1 or 8011

Analytical Method: SW846 8011

Prep Method: SW846 8011 PREP

Analytical Batch Number: 1393888

Prep Batch Number: 1393887

**Sample Analysis**

<b>Sample ID</b>	<b>Client ID</b>
350053001	CAPU-14-79428
350053007	CAPU-14-79420
350053009	CAPU-14-79431
350053015	CAPU-14-79413
350053022	CAPU-14-79414
350053028	CAPU-14-79415
350053034	CAPU-14-79423
1203103868	Method Blank (MB)
1203103869	Laboratory Control Sample (LCS)
1203103870	Laboratory Control Sample Duplicate (LCSD)

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

**Preparation/Analytical Method Verification**

**SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-OA-E-059 REV# 12.

Raw data reports are processed and reviewed by the analyst using ChemStation software. False positives have been removed from the ChemStation 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.

#### **Initial Calibration**

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

#### **Continuing Calibration Verification (CCV) Requirements**

All associated calibration verification standard(s) (ICV or CCV) met the acceptance criteria. All analytes were within the established retention time windows for this method.

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

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

The MB analyzed with this SDG met the acceptance criteria.

##### **Surrogate Recoveries**

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

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

The laboratory control sample (LCS) spike recoveries met the acceptance limits.

##### **Laboratory Control Sample Duplicate (LCSD) Recovery**

The laboratory control sample duplicate (LCSD) spike recoveries met the acceptance limits.

##### **LCS/LCSD Relative Percent Difference (RPD) Statement**

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

##### **QC Sample Designation**

Matrix spike and matrix spike duplicate analyses were not performed on a sample in this batch for this SDG.

##### **Matrix Spike (MS) Recovery Statement**

Matrix spike and matrix spike duplicate analyses were not performed on a sample in this batch for this SDG.

##### **Matrix Spike Duplicate (MSD) Recovery Statement**

Matrix spike and matrix spike duplicate analyses were not performed on a sample in this batch for this SDG.

##### **MS/MSD Relative Percent Difference (RPD) Statement**

Matrix spike and matrix spike duplicate analyses were not performed on a sample in this batch for this SDG.

#### **Technical Information:**

##### **Holding Time Specifications**

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 in this analytical batch met the specified holding time.

##### **Sample preservation**

Samples 350053007 (CAPU-14-79420) and 350053034 (CAPU-14-79423) had a initial pH of 2.

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

All procedures were performed as stated in the SOP. All reported analyte detections in client and quality control samples were within the established retention time windows.

##### **Sample Dilutions**

The samples in this SDG in this analytical 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:****Electronic Package Comment**

This 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. The data validator will always sign and date the case narrative.

**Data Exception (DER) Documentation**

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

**Manual Integrations**

Certain standards and samples may have required manual integration to correctly position the baseline as set in the calibration standard injections. If manual integration was performed, copies of all manual integration peak profiles are included in the raw data section of this pesticide fraction.

**Additional Comments**

The higher result is reported.

**System Configuration**

The 504.1/8011 analysis of EDB/DBCP was performed on the following instrument configuration:

<b>Instrument ID</b>	<b>Instrument</b>	<b>System Configuration</b>	<b>Column ID</b>	<b>Column Description</b>
ECD1A.I_1	Agilent 6890 Gas Chromatograph/Dual ECD w/ 7683 Autosampler	HP6890 Series ECD	Rtx-CLP I	30m x 0.25mm, 0.25um (Rtx-CLPesticide)
ECD1A.I_1	Agilent 6890 Gas Chromatograph/Dual ECD w/ 7683 Autosampler	HP6890 Series ECD	ZB-50-504/8011	30m x 0.53mm, 1.00um
ECD1A.I_2	Agilent 6890 Gas Chromatograph/Dual ECD w/ 7683 Autosampler	HP6890 Series ECD	Rtx-CLP II	30m x 0.25mm, 0.20um (Rtx-CLPesticide II)
ECD1A.I_2	Agilent 6890 Gas Chromatograph/Dual ECD w/ 7683 Autosampler	HP6890 Series ECD	ZB-XLB-504/8	30m x 0.53mm, 1.50um

### Method/Analysis Information

**Procedure:** Organochlorine Pesticides and Chlorinated Hydrocarbons

Analytical Method: SW846 3535A/8081B

Prep Method: SW846 3535A

Analytical Batch Number: 1394113

Prep Batch Number: 1394107

### Sample Analysis

<b>Sample ID</b>	<b>Client ID</b>
350053004	CAPU-14-79428
350053012	CAPU-14-79431
350053017	CAPU-14-79413
350053024	CAPU-14-79414
350053031	CAPU-14-79415
1203104374	Method Blank (MB)
1203104375	Laboratory Control Sample (LCS)
1203104376	350137004(CAPU-14-79429) Matrix Spike (MS)
1203104384	Laboratory Control Sample Duplicate (LCSD)

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

### Preparation/Analytical Method Verification

#### **SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-OA-E-041 REV# 13.

Raw data reports are processed and reviewed by the analyst using ChemStation software. False positives have been removed from the ChemStation 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.

#### **Initial Calibration**

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

#### **Continuing Calibration Verification (CCV) Requirements**

All calibration verification standards (CVS, ICV, or CCV) requirements have not been met for this SDG. Several target analytes failed acceptance criteria with a positive bias on one analytical column in the standards bracketing the samples in this SDG. The positive bias for the analytical data is a result of instrument response increasing after the initial calibration. These target analytes were not detected above the PQL in the samples; therefore, the non-compliance has no adverse effects on the data.

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

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

The MB analyzed with this SDG met the acceptance criteria.

### **Surrogate Recoveries**

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

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

The laboratory control sample (LCS) spike recoveries met the acceptance limits.

### **Laboratory Control Sample Duplicate (LCSD) Recovery**

The laboratory control sample duplicate (LCSD) spike recoveries met the acceptance limits.

### **LCS/LCSD Relative Percent Difference (RPD) Statement**

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

### **QC Sample Designation**

Sample 350137004 (CAPU-14-79429) was selected for the matrix spike analysis.

### **Matrix Spike (MS) Recovery Statement**

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

## **Technical Information:**

### **Holding Time Specifications**

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 in this analytical batch met the specified holding time.

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

All procedures were performed as stated in the SOP. All reported analyte detections in client and quality control samples were within the established retention time windows.

### **Sample Dilutions**

The samples in this SDG in this analytical 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.

### **Florisil**

Florisil clean-up was not performed on client and quality control samples in this batch.

## **Miscellaneous Information:**

### **Electronic Package Comment**

This 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. The data validator will always sign and date the case narrative.

**Data Exception (DER) Documentation**

The following DER was generated for this SDG: 1303137.

**Manual Integrations**

Certain standards and samples may have required manual integration to correctly position the baseline as set in the calibration standard injections. If manual integration was performed, copies of all manual integration peak profiles are included in the raw data section of this pesticide fraction.

**Additional Comments**

The additional comments field is used to address special issues associated with each analysis, clarify method/contractual issues pertaining to the analysis, and to list any report documents generated as a result of sample analysis or review. The following additional comments required for this SDG:

**System Configuration**

The Semi-Volatiles-Pesticide analysis was performed on the following instrument configuration:

<b>Instrument ID</b>	<b>Instrument</b>	<b>System Configuration</b>	<b>Column ID</b>	<b>Column Description</b>
ECD7A.I_1	Agilent 6890 Gas Chromatograph/Dual ECD w/ 7673 Autosampler	HP6890 Series ECD	Rtx-CLP I	30m x 0.25mm, 0.25um (Rtx-CLPesticide I)
ECD7A.I_2	Agilent 6890 Gas Chromatograph/Dual ECD w/ 7673 Autosampler	HP6890 Series ECD	Rtx-CLP II	30m x 0.25mm, 0.20um (Rtx-CLPesticide II)

**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: 2014-3494 GEL Work Order: 350053

#### 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, or LOD.
- DL Indicates that sample is diluted.
- RA Indicates that sample is re-analyzed without re-extraction.
- RE Indicates that sample is re-extracted.

#### Review/Validation

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

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

Signature:



Name: Cameron Bearden

Date: 18 JUN 2014

Title: Group Leader

# **Sample Data Summary**

**Pesticide  
Certificate of Analysis  
Sample Summary**

Page 1 of 1

SDG Number: 2014-3494

Lab Sample ID: 350053001

Date Collected: 06/03/2014 11:21

Date Received: 06/05/2014 09:00

Matrix: W

Client ID: CAPU-14-79428

Batch ID: 1393888

Run Date: 06/09/2014 15:40

Prep Date: 06/09/2014 14:45

Data File: 060914HE\E1f0910.D  
060914HE\E1f0910.D

Client: ARSL004

Method: SW846 8011

Inst: ECD1A.I

Analyst: RXE1

Aliquot: 36.62 mL

Column: 1 ZB-50  
2 ZB-XLB

Project: ESHL00714

SOP Ref: GL-OA-E-059

Dilution: 1

Inj. Vol: 1 uL

Final Volume: 35 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	Column
96-12-8	1,2-Dibromo-3-chloropropane	U	0.0191	ug/L	0.00573	0.0191	1
106-93-4	1,2-Dibromoethane	U	0.0191	ug/L	0.00573	0.0191	1
Surrogate/Tracer recovery		Result	Nominal		Recovery%	Acceptable Limits	
Bromofluorobenzene		3.79	3.41	ug/L	111	(73%-135%)	



**Pesticide  
Certificate of Analysis  
Sample Summary**

**SDG Number:** 2014-3494  
**Lab Sample ID:** 350053004  
  
**Client ID:** CAPU-14-79428  
**Batch ID:** 1394113  
**Run Date:** 06/10/2014 16:37  
**Prep Date:** 06/09/2014 12:45  
**Data File:** 061014.B\7f1013.D  
061014.B\7f1013.D

**Date Collected:** 06/03/2014 11:21  
**Date Received:** 06/05/2014 09:00  
**Client:** ARSL004  
**Method:** SW846 3535A/8081B  
**Inst:** ECD7A.I  
**Analyst:** LOF  
**Aliquot:** 990 mL  
**Column:** 1 CLPesticides  
2 CLPesticides2

**Matrix:** W  
**Project:** ESHL00714  
**SOP Ref:** GL-OA-E-041  
**Dilution:** 1  
**Inj. Vol:** 1 uL  
**Final Volume:** 5 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	Column
118-74-1	Hexachlorobenzene	U	0.0202	ug/L	0.00631	0.0202	1

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
4cmx	0.936	1.01	ug/L	92.7	(36%-106%)
Decachlorobiphenyl	1.13	1.01	ug/L	112	(41%-124%)

**Pesticide  
Certificate of Analysis  
Sample Summary**

Page 1 of 1

SDG Number: 2014-3494

Lab Sample ID: 350053007

Date Collected: 06/03/2014 11:21

Date Received: 06/05/2014 09:00

Matrix: W

Client ID: CAPU-14-79420

Batch ID: 1393888

Run Date: 06/09/2014 16:01

Prep Date: 06/09/2014 14:45

Data File: 060914HE\E1f0911.D  
060914HE\E1f0911.D

Client: ARSL004

Method: SW846 8011

Inst: ECD1A.I

Analyst: RXE1

Aliquot: 35.95 mL

Column: 1 ZB-50  
2 ZB-XLB

Project: ESHL00714

SOP Ref: GL-OA-E-059

Dilution: 1

Inj. Vol: 1 uL

Final Volume: 35 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	Column
96-12-8	1,2-Dibromo-3-chloropropane	U	0.0195	ug/L	0.00584	0.0195	1
106-93-4	1,2-Dibromoethane	U	0.0195	ug/L	0.00584	0.0195	1
Surrogate/Tracer recovery		Result	Nominal		Recovery%	Acceptable Limits	
Bromofluorobenzene		4.44	3.48	ug/L	128	(73%-135%)	

**Pesticide  
Certificate of Analysis  
Sample Summary**

SDG Number: 2014-3494

Lab Sample ID: 350053009

Date Collected: 06/03/2014 11:48

Date Received: 06/05/2014 09:00

Matrix: W

Client ID: CAPU-14-79431

Batch ID: 1393888

Run Date: 06/09/2014 16:22

Prep Date: 06/09/2014 14:45

Data File: 060914HE\E1f0912.D

Client: ARSL004

Method: SW846 8011

Inst: ECD1A.I

Analyst: RXE1

Aliquot: 37.27 mL

Column: 1 ZB-50  
2 ZB-XLB

Project: ESHL00714

SOP Ref: GL-OA-E-059

Dilution: 1

Inj. Vol: 1 uL

Final Volume: 35 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	Column
96-12-8	1,2-Dibromo-3-chloropropane	U	0.0188	ug/L	0.00563	0.0188	1
106-93-4	1,2-Dibromoethane	U	0.0188	ug/L	0.00563	0.0188	1
Surrogate/Tracer recovery		Result	Nominal		Recovery%	Acceptable Limits	
Bromofluorobenzene		3.81	3.35	ug/L	113	(73%-135%)	

**Pesticide  
Certificate of Analysis  
Sample Summary**

**SDG Number:** 2014-3494  
**Lab Sample ID:** 350053012  
  
**Client ID:** CAPU-14-79431  
**Batch ID:** 1394113  
**Run Date:** 06/10/2014 16:53  
**Prep Date:** 06/09/2014 12:45  
**Data File:** 061014.B\ef1014.D  
061014.B\ef1014.D

**Date Collected:** 06/03/2014 11:48  
**Date Received:** 06/05/2014 09:00  
**Client:** ARSL004  
**Method:** SW846 3535A/8081B  
**Inst:** ECD7A.I  
**Analyst:** LOF  
**Aliquot:** 960 mL  
**Column:** 1 CLPesticides  
2 CLPesticides2

**Matrix:** W  
**Project:** ESHL00714  
**SOP Ref:** GL-OA-E-041  
**Dilution:** 1  
**Inj. Vol:** 1 uL  
**Final Volume:** 5 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	Column
118-74-1	Hexachlorobenzene	U	0.0208	ug/L	0.00651	0.0208	1

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
4cmx	0.894	1.04	85.8	(36%-106%)
Decachlorobiphenyl	1.04	1.04	99.8	(41%-124%)

**Pesticide  
Certificate of Analysis  
Sample Summary**

SDG Number: 2014-3494

Lab Sample ID: 350053015

Date Collected: 06/03/2014 13:48

Date Received: 06/05/2014 09:00

Matrix: W

Client ID: CAPU-14-79413

Batch ID: 1393888

Run Date: 06/09/2014 16:43

Prep Date: 06/09/2014 14:45

Data File: 060914HE\E1f0913.D

Client: ARSL004

Method: SW846 8011

Inst: ECD1A.I

Analyst: RXE1

Aliquot: 34.87 mL

Column: 1 ZB-50

Project: ESHL00714

SOP Ref: GL-OA-E-059

Dilution: 1

Inj. Vol: 1 uL

Final Volume: 35 mL

2 ZB-XLB

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	Column
96-12-8	1,2-Dibromo-3-chloropropane	U	0.0201	ug/L	0.00602	0.0201	1
106-93-4	1,2-Dibromoethane	U	0.0201	ug/L	0.00602	0.0201	1
Surrogate/Tracer recovery		Result	Nominal		Recovery%	Acceptable Limits	
Bromofluorobenzene		4.09	3.58	ug/L	114	(73%-135%)	

**Pesticide  
Certificate of Analysis  
Sample Summary**

**SDG Number:** 2014-3494  
**Lab Sample ID:** 350053017  
  
**Client ID:** CAPU-14-79413  
**Batch ID:** 1394113  
**Run Date:** 06/10/2014 17:09  
**Prep Date:** 06/09/2014 12:45  
**Data File:** 061014.B\ef1015.D  
061014.B\ef1015.D

**Date Collected:** 06/03/2014 13:48  
**Date Received:** 06/05/2014 09:00  
**Client:** ARSL004  
**Method:** SW846 3535A/8081B  
**Inst:** ECD7A.I  
**Analyst:** LOF  
**Aliquot:** 960 mL  
**Column:** 1 CLPesticides  
2 CLPesticides2

**Matrix:** W  
  
**Project:** ESHL00714  
**SOP Ref:** GL-OA-E-041  
**Dilution:** 1  
**Inj. Vol:** 1 uL  
**Final Volume:** 5 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	Column
118-74-1	Hexachlorobenzene	U	0.0208	ug/L	0.00651	0.0208	1

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
4cmx	1.03	1.04	99.2	(36%-106%)
Decachlorobiphenyl	1.21	1.04	116	(41%-124%)

**Pesticide  
Certificate of Analysis  
Sample Summary**

Page 1 of 1

**SDG Number:** 2014-3494  
**Lab Sample ID:** 350053022

**Date Collected:** 06/03/2014 11:48  
**Date Received:** 06/05/2014 09:00

**Matrix:** W

**Client ID:** CAPU-14-79414

**Client:** ARSL004

**Project:** ESHL00714

**Batch ID:** 1393888

**Method:** SW846 8011

**SOP Ref:** GL-OA-E-059

**Run Date:** 06/09/2014 17:46

**Inst:** ECD1A.I

**Dilution:** 1

**Prep Date:** 06/09/2014 14:45

**Analyst:** RXE1

**Inj. Vol:** 1 uL

**Data File:** 060914HE\E1f0916.D  
060914HE\E1f0916.D

**Aliquot:** 35.4 mL

**Final Volume:** 35 mL

**Column:** 1 ZB-50  
2 ZB-XLB

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	Column
96-12-8	1,2-Dibromo-3-chloropropane	U	0.0198	ug/L	0.00593	0.0198	1
106-93-4	1,2-Dibromoethane	U	0.0198	ug/L	0.00593	0.0198	1
Surrogate/Tracer recovery		Result	Nominal		Recovery%	Acceptable Limits	
Bromofluorobenzene		4.05	3.53	ug/L	115	(73%-135%)	

**Pesticide  
Certificate of Analysis  
Sample Summary**

**SDG Number:** 2014-3494  
**Lab Sample ID:** 350053024  
  
**Client ID:** CAPU-14-79414  
**Batch ID:** 1394113  
**Run Date:** 06/10/2014 17:25  
**Prep Date:** 06/09/2014 12:45  
**Data File:** 061014.B\ef1016.D  
061014.B\ef1016.D

**Date Collected:** 06/03/2014 11:48  
**Date Received:** 06/05/2014 09:00  
**Client:** ARSL004  
**Method:** SW846 3535A/8081B  
**Inst:** ECD7A.I  
**Analyst:** LOF  
**Aliquot:** 970 mL  
**Column:** 1 CLPesticides  
2 CLPesticides2

**Matrix:** W  
  
**Project:** ESHL00714  
**SOP Ref:** GL-OA-E-041  
**Dilution:** 1  
**Inj. Vol:** 1 uL  
**Final Volume:** 5 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	Column
118-74-1	Hexachlorobenzene	U	0.0206	ug/L	0.00644	0.0206	1

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
4cmx	0.902	1.03	ug/L	87.5 (36%-106%)
Decachlorobiphenyl	1.07	1.03	ug/L	104 (41%-124%)



**Pesticide  
Certificate of Analysis  
Sample Summary**

Page 1 of 1

**SDG Number:** 2014-3494  
**Lab Sample ID:** 350053028

**Date Collected:** 06/03/2014 11:48  
**Date Received:** 06/05/2014 09:00

**Matrix:** W

**Client ID:** CAPU-14-79415

**Client:** ARSL004

**Project:** ESHL00714

**Batch ID:** 1393888

**Method:** SW846 8011

**SOP Ref:** GL-OA-E-059

**Run Date:** 06/09/2014 18:08

**Inst:** ECD1A.I

**Dilution:** 1

**Prep Date:** 06/09/2014 14:45

**Analyst:** RXE1

**Inj. Vol:** 1 uL

**Data File:** 060914HE\E1f0917.D  
060914HE\E1f0917.D

**Aliquot:** 34.57 mL

**Final Volume:** 35 mL

**Column:** 1 ZB-50  
2 ZB-XLB

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	Column
96-12-8	1,2-Dibromo-3-chloropropane	U	0.0202	ug/L	0.00607	0.0202	1
106-93-4	1,2-Dibromoethane	U	0.0202	ug/L	0.00607	0.0202	1
Surrogate/Tracer recovery		Result	Nominal		Recovery%	Acceptable Limits	
Bromofluorobenzene		4.13	3.62	ug/L	114	(73%-135%)	

**Pesticide  
Certificate of Analysis  
Sample Summary**

Page 1 of 1

SDG Number: 2014-3494

Lab Sample ID: 350053031

Date Collected: 06/03/2014 11:48

Date Received: 06/05/2014 09:00

Matrix: W

Client: ARSL004

Project: ESHL00714

Client ID: CAPU-14-79415

Method: SW846 3535A/8081B

SOP Ref: GL-OA-E-041

Batch ID: 1394113

Inst: ECD7A.I

Dilution: 1

Run Date: 06/10/2014 17:41

Analyst: LOF

Inj. Vol: 1 uL

Prep Date: 06/09/2014 12:45

Aliquot: 970 mL

Final Volume: 5 mL

Data File: 061014.B\7f1017.D

Column: 1 CLPesticides

061014.B\7f1017.D 2 CLPesticides2

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	Column
118-74-1	Hexachlorobenzene	U	0.0206	ug/L	0.00644	0.0206	1

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
4cmx	0.810	1.03	ug/L	78.6	(36%-106%)
Decachlorobiphenyl	1.07	1.03	ug/L	103	(41%-124%)

**Pesticide  
Certificate of Analysis  
Sample Summary**

SDG Number: 2014-3494

Lab Sample ID: 350053034

Date Collected: 06/03/2014 11:48

Date Received: 06/05/2014 09:00

Matrix: W

Client ID: CAPU-14-79423

Client: ARSL004

Project: ESHL00714

Batch ID: 1393888

Method: SW846 8011

SOP Ref: GL-OA-E-059

Run Date: 06/09/2014 18:29

Inst: ECD1A.I

Dilution: 1

Prep Date: 06/09/2014 14:45

Analyst: RXE1

Inj. Vol: 1 uL

Data File: 060914HE\E1f0918.D

Aliquot: 35.46 mL

Final Volume: 35 mL

Column: 1 ZB-50  
2 ZB-XLB

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	Column
96-12-8	1,2-Dibromo-3-chloropropane	U	0.0197	ug/L	0.00592	0.0197	1
106-93-4	1,2-Dibromoethane	U	0.0197	ug/L	0.00592	0.0197	1
Surrogate/Tracer recovery		Result	Nominal		Recovery%	Acceptable Limits	
Bromofluorobenzene		4.44	3.53	ug/L	126	(73%-135%)	

# **Quality Control Summary**

---

**Pesticide**  
**Surrogate Recovery Report**

Page 1 of 2

**SDG Number: 2014-3494****Matrix Type: LIQUID**

---

Sample ID	Client ID	BFB 1 %REC #	BFB 2 %REC #
1203103868	MB for batch 1393887	113	101
1203103869	LCS for batch 1393887	109	107
1203103870	LCSD for batch 1393887	110	108
350053001	CAPU-14-79428	111	98
350053007	CAPU-14-79420	121	128
350053009	CAPU-14-79431	113	99
350053015	CAPU-14-79413	114	100
350053022	CAPU-14-79414	115	99
350053028	CAPU-14-79415	114	99
350053034	CAPU-14-79423	126	117

**Surrogate****Acceptance Limits**

BFB     = Bromofluorobenzene

(73%-135%)

\* Recovery outside Acceptance Limits

# Column to be used to flag recovery values

D Sample Diluted

---

**Pesticide**  
**Surrogate Recovery Report**

Page 2 of 2

**SDG Number: 2014-3494****Matrix Type: LIQUID**

---

Sample ID	Client ID	4CMX 1 %REC #	4CMX 2 %REC #	DCB 1 %REC #	DCB 2 %REC #
1203104374	MB for batch 1394107	86	79	106	102
1203104375	LCS for batch 1394107	87	84	116	113
1203104384	LCSD for batch 1394107	99	92	120	116
350053004	CAPU-14-79428	93	88	111	112
350053012	CAPU-14-79431	86	81	100	99
350053017	CAPU-14-79413	99	93	116	115
350053024	CAPU-14-79414	88	84	104	100
350053031	CAPU-14-79415	79	74	101	103
1203104376	CAPU-14-79429MS	87	82	112	109

---

**Surrogate****Acceptance Limits**

4CMX = 4cmx (36%-106%)

DCB = Decachlorobiphenyl (41%-124%)

\* Recovery outside Acceptance Limits

# Column to be used to flag recovery values

D Sample Diluted

Pesticide  
Quality Control Summary  
Spike Recovery Report

Page 1 of 2

SDG Number: 2014-3494

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1393887

Matrix: WATER

Lab Sample ID 1203103869

Instrument: ECD1A.I

Analysis Date: 06/09/2014 14:58

Dilution: 1

Analyst: RXE1

Prep Batch ID:1393887

Inj. Vol: 1 uL

Batch ID: 1393888

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
106-93-4	LCS 1,2-Dibromoethane	0.200	0.0	0.222	111	70-130
96-12-8	LCS 1,2-Dibromo-3-chloropropane	0.200	0.0	0.218	109	70-130

Pesticide  
Quality Control Summary  
Spike Recovery Report

Page 2 of 2

SDG Number: 2014-3494

Sample Type: Laboratory Control Sample Duplicate

Client ID: LCSD for batch 1393887

Matrix: WATER

Lab Sample ID 1203103870

Instrument: ECD1A.I

Analysis Date: 06/09/2014 15:19

Dilution: 1

Analyst: RXE1

Prep Batch ID: 1393887

Inj. Vol: 1 uL

Batch ID: 1393888

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
106-93-4	LCSD 1,2-Dibromoethane	0.200	0.0	0.222	111	70-130	0	0-20
96-12-8	LCSD 1,2-Dibromo-3-chloropropane	0.200	0.0	0.219	110	70-130	0	0-20



---

**Pesticide**  
**Quality Control Summary**  
**Spike Recovery Report**

Page 1 of 2

SDG Number: 2014-3494

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1394107

Matrix: WATER

Lab Sample ID 1203104375

Instrument: ECD7A.I

Analysis Date: 06/10/2014 15:33

Dilution: 1

Analyst: LOF

Prep Batch ID:1394107

Inj. Vol: 1 uL

Batch ID: 1394113

---

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
118-74-1	LCS Hexachlorobenzene	0.100	0.0	0.132	132	50-150

---

## Pesticide

Page 2 of 2

Quality Control Summary  
Spike Recovery Report

SDG Number: 2014-3494

Sample Type: Laboratory Control Sample Duplicate

Client ID: LCSD for batch 1394107

Matrix: WATER

Lab Sample ID 1203104384

Instrument: ECD7A.I

Analysis Date: 06/10/2014 15:49

Dilution: 1

Analyst: LOF

Prep Batch ID:1394107

Inj. Vol: 1 uL

Batch ID: 1394113

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
118-74-1	LCSD Hexachlorobenzene	0.100	0.0	0.114	114	50-150	15	0-30

---

**Pesticide**  
**Quality Control Summary**  
**Spike Recovery Report**

Page 1 of 1

SDG Number: 2014-3494

Sample Type: Matrix Spike

Client ID: CAPU-14-79429MS

Matrix: W

Lab Sample ID 1203104376

Instrument: ECD7A.I

Analysis Date: 06/10/2014 19:01

Dilution: 1

Analyst: LOF

Prep Batch ID:1394107

Inj. Vol: 1 uL

Batch ID: 1394113

---

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
118-74-1	MS Hexachlorobenzene	0.104	0.00 U	0.112	108	50-150

---

## Method Blank Summary

Page 1 of 1

<b>SDG Number:</b>	<b>2014-3494</b>	<b>Client:</b>	<b>ARSL004</b>	<b>Matrix:</b>	<b>WATER</b>
<b>Client ID:</b>	<b>MB for batch 1393887</b>	<b>Instrument ID:</b>	<b>ECD1A.I_1</b>	<b>Data File:</b>	<b>060914HE\E1f0907.D</b>
<b>Lab Sample ID:</b>	<b>1203103868</b>		<b>ECD1A.I_2</b>		<b>060914HE\E1f0907.D</b>
<b>Column:</b>	<b>ZB-50</b>	<b>Prep Date:</b>	<b>06/09/2014 12:00</b>	<b>Analyzed:</b>	<b>06/09/14 14:37</b>
	<b>ZB-XLB</b>				

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 1393887	1203103869	060914HE\E1f0908.D 060914HE\E1f0908.D	06/09/14	1458
02 LCSD for batch 1393887	1203103870	060914HE\E1f0909.D 060914HE\E1f0909.D	06/09/14	1519
03 CAPU-14-79428	350053001	060914HE\E1f0910.D 060914HE\E1f0910.D	06/09/14	1540
04 CAPU-14-79420	350053007	060914HE\E1f0911.D 060914HE\E1f0911.D	06/09/14	1601
05 CAPU-14-79431	350053009	060914HE\E1f0912.D 060914HE\E1f0912.D	06/09/14	1622
06 CAPU-14-79413	350053015	060914HE\E1f0913.D 060914HE\E1f0913.D	06/09/14	1643
07 CAPU-14-79414	350053022	060914HE\E1f0916.D 060914HE\E1f0916.D	06/09/14	1746
08 CAPU-14-79415	350053028	060914HE\E1f0917.D 060914HE\E1f0917.D	06/09/14	1808
09 CAPU-14-79423	350053034	060914HE\E1f0918.D 060914HE\E1f0918.D	06/09/14	1829

## Method Blank Summary

Page 1 of 1

<b>SDG Number:</b>	<b>2014-3494</b>	<b>Client:</b>	<b>ARSL004</b>	<b>Matrix:</b>	<b>WATER</b>
<b>Client ID:</b>	<b>MB for batch 1394107</b>	<b>Instrument ID:</b>	<b>ECD7A.I_1</b>	<b>Data File:</b>	<b>061014.B\7f1008.D</b>
<b>Lab Sample ID:</b>	<b>1203104374</b>		<b>ECD7A.I_2</b>		<b>061014.B\7f1008.D</b>
<b>Column:</b>	<b>CLPesticides</b>	<b>Prep Date:</b>	<b>06/09/2014 12:45</b>	<b>Analyzed:</b>	<b>06/10/14 15:17</b>
	<b>CLPesticides2</b>				

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 1394107	1203104375	061014.B\7f1009.D 061014.B\7f1009.D	06/10/14	1533
02 LCSD for batch 1394107	1203104384	061014.B\7f1010.D 061014.B\7f1010.D	06/10/14	1549
03 CAPU-14-79428	350053004	061014.B\7f1013.D 061014.B\7f1013.D	06/10/14	1637
04 CAPU-14-79431	350053012	061014.B\7f1014.D 061014.B\7f1014.D	06/10/14	1653
05 CAPU-14-79413	350053017	061014.B\7f1015.D 061014.B\7f1015.D	06/10/14	1709
06 CAPU-14-79414	350053024	061014.B\7f1016.D 061014.B\7f1016.D	06/10/14	1725
07 CAPU-14-79415	350053031	061014.B\7f1017.D 061014.B\7f1017.D	06/10/14	1741
08 CAPU-14-79429MS	1203104376	061014.B\7f1022.D 061014.B\7f1022.D	06/10/14	1901

# Quality Control Data

**Pesticide  
Certificate of Analysis  
Sample Summary**

Page 1 of 1

**SDG Number:** 2014-3494  
**Lab Sample ID:** 1203103868  
**Client Sample:** QC for batch 1393887  
**Client ID:** MB for batch 1393887  
**Batch ID:** 1393888  
**Run Date:** 06/09/2014 14:37  
**Prep Date:** 06/09/2014 12:00  
**Data File:** 060914HE\E1f0907.D  
060914HE\E1f0907.D

**Client:** ARSL004  
**Method:** SW846 8011  
**Inst:** ECD1A.I  
**Analyst:** RXE1  
**Aliquot:** 35 mL  
**Column:** 1 ZB-50  
2 ZB-XLB

**Matrix:** WATER  
**Project:** QC  
**SOP Ref:** GL-OA-E-059  
**Dilution:** 1  
**Inj. Vol:** 1 uL  
**Final Volume:** 35 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	Column
96-12-8	1,2-Dibromo-3-chloropropane	U	0.020	ug/L	0.006	0.020	1
106-93-4	1,2-Dibromoethane	U	0.020	ug/L	0.006	0.020	1
Surrogate/Tracer recovery		Result	Nominal		Recovery%	Acceptable Limits	
Bromofluorobenzene		4.04	3.57	ug/L	113	(73%-135%)	

**Pesticide  
Certificate of Analysis  
Sample Summary**

Page 1 of 1

<b>SDG Number:</b>	2014-3494	<b>Matrix:</b>	WATER
<b>Lab Sample ID:</b>	1203103869		
<b>Client Sample:</b>	QC for batch 1393887	<b>Client:</b>	ARSL004
<b>Client ID:</b>	LCS for batch 1393887	<b>Method:</b>	SW846 8011
<b>Batch ID:</b>	1393888	<b>Inst:</b>	ECD1A.I
<b>Run Date:</b>	06/09/2014 14:58	<b>Analyst:</b>	RXE1
<b>Prep Date:</b>	06/09/2014 12:00	<b>Aliquot:</b>	35 mL
<b>Data File:</b>	060914HE\E1f0908.D	<b>Column:</b>	1 ZB-50
	060914HE\E1f0908.D		2 ZB-XLB

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	Column
96-12-8	1,2-Dibromo-3-chloropropane		0.218	ug/L	0.006	0.020	1
106-93-4	1,2-Dibromoethane		0.222	ug/L	0.006	0.020	1
Surrogate/Tracer recovery		Result	Nominal		Recovery%	Acceptable Limits	
Bromofluorobenzene		3.89	3.57	ug/L	109	(73%-135%)	



**Pesticide  
Certificate of Analysis  
Sample Summary**

Page 1 of 1

SDG Number: 2014-3494

Lab Sample ID: 1203103870

Client Sample: QC for batch 1393887

Client ID: LCSD for batch 1393887

Batch ID: 1393888

Run Date: 06/09/2014 15:19

Prep Date: 06/09/2014 12:00

Data File: 060914HE\E1f0909.D  
060914HE\E1f0909.D

Client: ARSL004

Method: SW846 8011

Inst: ECD1A.I

Analyst: RXE1

Aliquot: 35 mL

Column: 1 ZB-50  
2 ZB-XLB

Matrix: WATER

Project: QC

SOP Ref: GL-OA-E-059

Dilution: 1

Inj. Vol: 1 uL

Final Volume: 35 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	Column
96-12-8	1,2-Dibromo-3-chloropropane		0.219	ug/L	0.006	0.020	1
106-93-4	1,2-Dibromoethane		0.222	ug/L	0.006	0.020	1
Surrogate/Tracer recovery		Result	Nominal		Recovery%	Acceptable Limits	
Bromofluorobenzene		3.94	3.57	ug/L	110	(73%-135%)	

**Pesticide  
Certificate of Analysis  
Sample Summary**

Page 1 of 1

**SDG Number:** 2014-3494  
**Lab Sample ID:** 1203104374  
**Client Sample:** QC for batch 1394107  
**Client ID:** MB for batch 1394107  
**Batch ID:** 1394113  
**Run Date:** 06/10/2014 15:17  
**Prep Date:** 06/09/2014 12:45  
**Data File:** 061014.B\7f1008.D  
061014.B\7f1008.D

**Client:** ARSL004  
**Method:** SW846 3535A/8081B  
**Inst:** ECD7A.I  
**Analyst:** LOF  
**Aliquot:** 1000 mL  
**Column:** 1 CLPesticides  
2 CLPesticides2

**Matrix:** WATER  
**Project:** QC  
**SOP Ref:** GL-OA-E-041  
**Dilution:** 1  
**Inj. Vol:** 1 uL  
**Final Volume:** 5 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	Column
118-74-1	Hexachlorobenzene	U	0.020	ug/L	0.00625	0.020	1

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
4cmx	0.861	1.00	86.1	(36%-106%)
Decachlorobiphenyl	1.06	1.00	106	(41%-124%)

**Pesticide  
Certificate of Analysis  
Sample Summary**

Page 1 of 1

<b>SDG Number:</b>	2014-3494	<b>Matrix:</b>	WATER
<b>Lab Sample ID:</b>	1203104375		
<b>Client Sample:</b>	QC for batch 1394107	<b>Client:</b>	ARSL004
<b>Client ID:</b>	LCS for batch 1394107	<b>Method:</b>	SW846 3535A/8081B
<b>Batch ID:</b>	1394113	<b>Inst:</b>	ECD7A.I
<b>Run Date:</b>	06/10/2014 15:33	<b>Analyst:</b>	LOF
<b>Prep Date:</b>	06/09/2014 12:45	<b>Aliquot:</b>	1000 mL
<b>Data File:</b>	061014.B\ef1009.D	<b>Column:</b>	1 CLPesticides
	061014.B\ef1009.D		2 CLPesticides2

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	Column
118-74-1	Hexachlorobenzene		0.132	ug/L	0.00625	0.020	1

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits	
4cmx	0.868	1.00	ug/L	86.8	(36%-106%)
Decachlorobiphenyl	1.16	1.00	ug/L	116	(41%-124%)

**Pesticide  
Certificate of Analysis  
Sample Summary**

Page 1 of 1

<b>SDG Number:</b>	2014-3494	<b>Date Collected:</b>	06/04/2014 12:45	<b>Matrix:</b>	W
<b>Lab Sample ID:</b>	1203104376	<b>Date Received:</b>	06/06/2014 08:55		
<b>Client Sample:</b>	QC for batch 1394107	<b>Client:</b>	ARSL004	<b>Project:</b>	QC
<b>Client ID:</b>	CAPU-14-79429MS	<b>Method:</b>	SW846 3535A/8081B	<b>SOP Ref:</b>	GL-OA-E-041
<b>Batch ID:</b>	1394113	<b>Inst:</b>	ECD7A.I	<b>Dilution:</b>	1
<b>Run Date:</b>	06/10/2014 19:01	<b>Analyst:</b>	LOF	<b>Inj. Vol:</b>	1 uL
<b>Prep Date:</b>	06/09/2014 12:45	<b>Aliquot:</b>	960 mL	<b>Final Volume:</b>	5 mL
<b>Data File:</b>	061014.B\7f1022.D	<b>Column:</b>	1 CLPesticides		
	061014.B\7f1022.D		2 CLPesticides2		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	Column
118-74-1	Hexachlorobenzene		0.112	ug/L	0.00651	0.0208	1
Surrogate/Tracer recovery		Result	Nominal		Recovery%	Acceptable Limits	
4cmx		0.909	1.04	ug/L	87.3	(36%-106%)	
Decachlorobiphenyl		1.16	1.04	ug/L	112	(41%-124%)	

**Pesticide  
Certificate of Analysis  
Sample Summary**

Page 1 of 1

<b>SDG Number:</b>	2014-3494	<b>Matrix:</b>	WATER
<b>Lab Sample ID:</b>	1203104384		
<b>Client Sample:</b>	QC for batch 1394107	<b>Client:</b>	ARSL004
<b>Client ID:</b>	LCSD for batch 1394107	<b>Method:</b>	SW846 3535A/8081B
<b>Batch ID:</b>	1394113	<b>Inst:</b>	ECD7A.I
<b>Run Date:</b>	06/10/2014 15:49	<b>Analyst:</b>	LOF
<b>Prep Date:</b>	06/09/2014 12:45	<b>Aliquot:</b>	1000 mL
<b>Data File:</b>	061014.B\7f1010.D	<b>Column:</b>	1 CLPesticides
	061014.B\7f1010.D		2 CLPesticides2

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	Column
118-74-1	Hexachlorobenzene		0.114	ug/L	0.00625	0.020	1

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
4cmx	0.990	1.00	99.0	(36%-106%)
Decachlorobiphenyl	1.20	1.00	120	(41%-124%)

# PCB Analysis

# Case Narrative

**PCB Case Narrative**  
**ARS International, LLC (ARSL)**  
**SDG 2014-3494**

**Method/Analysis Information**

**Procedure:** Analysis of Polychlorinated Biphenyls by ECD

Analytical Method: SW846 3535A/8082

Prep Method: SW846 3535A

Analytical Batch Number: 1395486

Prep Batch Number: 1395480

**Sample Analysis**

The following samples were analyzed using the analytical protocol as established in SW846 3535A/8082:

<b>Sample ID</b>	<b>Client ID</b>
350053020	CAPU-14-79413
350053026	CAPU-14-79414
1203108029	Method Blank (MB)
1203108030	Laboratory Control Sample (LCS)
1203108031	350417002(BDW08-14-79467) Matrix Spike (MS)
1203108032	350417002(BDW08-14-79467) 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-040 REV# 20.

Raw data reports are processed and reviewed by the analyst using the Chemstation 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.

**Initial Calibration**

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

**Continuing Calibration Verification (CCV) Requirements**

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



several of the five quantified peaks did not meet the acceptance criteria in Aroclor-1016 and Aroclor-1260 standard analyzed for this SDG. The average concentration of the five quantified peaks met the acceptance criteria on one analytical column while failed with negative bias on the other column. This non-compliance had no adverse effects on the data as the associated ARSL samples were not detected with any of the Aroclors on either of the columns.

All analytes were within the established retention time windows for this method.

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

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

The MB analyzed with this SDG met the acceptance criteria.

#### **Surrogate Recoveries**

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

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

The LCS spike recoveries met the acceptance limits.

#### **QC Sample Designation**

ARSL sample 350417002 (BDW08-14-79467) of similar matrix in SDG 2014-3526 was selected for the matrix spike and matrix spike duplicate analysis for this batch of the samples.

#### **Matrix Spike (MS) Recovery Statement**

The MS recoveries were within the established acceptance limits.

#### **Matrix Spike Duplicate (MSD) Recovery Statement**

The MSD recoveries were within the established acceptance limits.

#### **MS/MSD Relative Percent Difference (RPD) Statement**

The RPD between the MS and MSD did not meet the acceptance limits due to relatively lower spike recovery in the MS.

### **Technical Information**

#### **Holding Time Specifications**

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. All reported analyte detections in client and quality control samples were within the established retention time windows. Reported analyte concentrations were confirmed on dissimilar columns. All sample extracts were cleaned using alumina.

#### **Sample Dilutions**

The samples in this SDG did not require dilutions.

#### **Sample Re-extraction/Re-analysis**

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

### **Miscellaneous Information**

## 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. 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.

## Data Exception (DER) Documentation

Data exception report (DER) is generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A DER was not required for the samples in this SDG in this batch.

## Manual Integrations

Certain standards and samples may have required manual integration to correctly position the baseline as set in the calibration standard injections. If manual integration was performed, copies of all manual integration peak profiles are included in the raw data section of this PCB fraction.

## Additional Comments

The additional comments field is used to address special issues associated with each analysis, clarify method/contractual issues pertaining to the analysis, and to list any report documents generated as a result of sample analysis or review. The following additional comments were required:

The higher results from either column have been chosen and reported in the data package for the client samples, MB and LCS. The data reported for the MS and MSD are from the same analytical column as the parent sample.

Due to software issue, the surrogate recovery range was not indicated or possibly indicated incorrectly in Quantitation Report. Please see Surrogate Recovery Report for correct surrogate acceptance limits.

Due to rounding differences in the calculation between the forms, the data reported in Sample Summary (form 1) and Spike Recovery Report (form 3) may differ slightly from the data reported in Identification Summary (form 10).

Aroclors quantitated on the raw data report by ChemStation data system do not necessarily represent positive Aroclor identification. In order for positive identification to be made, the Aroclor must match in pattern and retention time; as well as quantitate relatively close between the primary and confirmation columns, as specified in SW846 method 8000. When these conditions are not met, the Aroclor is reported as a non-detect on the data report.

## System Configuration

The Semi-Volatiles-PCB analysis was performed on the following instrument configuration:

Instrument ID	Instrument	System Configuration	Column ID	Column Description
ECD9A.I_1	Agilent 7890A Gas Chromatograph/Dual ECD w/ 7693 Autosampler	7890A GC/ECD	Restek Rtx-CLPest 1	30m x 0.25mm, 0.25um
ECD9A.I_2	Agilent 7890A Gas Chromatograph/Dual ECD w/ 7693 Autosampler	7890A GC/ECD	Restek Rtx-CLPest 2	30m x 0.25mm, 0.20um

**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: 2014-3494 GEL Work Order: 350053

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

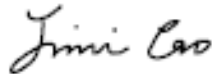
- \* A quality control analyte recovery is outside of specified acceptance criteria
- \*\* Analyte is a surrogate compound
- U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
- DL Indicates that sample is diluted.
- RA Indicates that sample is re-analyzed without re-extraction.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

Date: 19 JUN 2014

Title: Data Validator

# **Sample Data Summary**

**PCB**  
**Certificate of Analysis**  
**Sample Summary**

Page 1 of 1

**SDG Number:** 2014-3494  
**Lab Sample ID:** 350053020  
  
**Client ID:** CAPU-14-79413  
**Batch ID:** 1395486  
**Run Date:** 06/16/2014 17:24  
**Prep Date:** 06/13/2014 06:45  
**Data File:** 061614.S\E9f1647.D  
061614.S\E9f1647.D

**Date Collected:** 06/03/2014 13:48  
**Date Received:** 06/05/2014 09:00  
**Client:** ARSL004  
**Method:** SW846 3535A/8082  
**Inst:** ECD9A.I  
**Analyst:** YS1  
**Aliquot:** 930 mL  
**Column:** 1 RTX-CLPEST 1  
2 RTX-CLPEST 2

**Matrix:** W  
  
**Project:** ESHL00714  
**SOP Ref:** GL-OA-E-040  
**Dilution:** 1  
**Inj. Vol:** 1 uL  
**Final Volume:** 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	Column
12674-11-2	Aroclor-1016	U	0.108	ug/L	0.0358	0.108	1
11104-28-2	Aroclor-1221	U	0.108	ug/L	0.0358	0.108	1
11141-16-5	Aroclor-1232	U	0.108	ug/L	0.0358	0.108	1
53469-21-9	Aroclor-1242	U	0.108	ug/L	0.0358	0.108	1
12672-29-6	Aroclor-1248	U	0.108	ug/L	0.0358	0.108	1
11097-69-1	Aroclor-1254	U	0.108	ug/L	0.0358	0.108	1
11096-82-5	Aroclor-1260	U	0.108	ug/L	0.0358	0.108	1
37324-23-5	Aroclor-1262	U	0.108	ug/L	0.0358	0.108	1

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
Decachlorobiphenyl	0.166	0.215	77.4	(45%-120%)
4cmx	0.151	0.215	70.3	(45%-120%)

**PCB**  
**Certificate of Analysis**  
**Sample Summary**

Page 1 of 1

**SDG Number:** 2014-3494  
**Lab Sample ID:** 350053026  
  
**Client ID:** CAPU-14-79414  
**Batch ID:** 1395486  
**Run Date:** 06/16/2014 17:38  
**Prep Date:** 06/13/2014 06:45  
**Data File:** 061614.S\E9f1648.D  
061614.S\E9f1648.D

**Date Collected:** 06/03/2014 11:48  
**Date Received:** 06/05/2014 09:00  
**Client:** ARSL004  
**Method:** SW846 3535A/8082  
**Inst:** ECD9A.I  
**Analyst:** YS1  
**Aliquot:** 920 mL  
**Column:** 1 RTX-CLPEST 1  
2 RTX-CLPEST 2

**Matrix:** W  
  
**Project:** ESHL00714  
**SOP Ref:** GL-OA-E-040  
**Dilution:** 1  
**Inj. Vol:** 1 uL  
**Final Volume:** 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	Column
12674-11-2	Aroclor-1016	U	0.109	ug/L	0.0362	0.109	1
11104-28-2	Aroclor-1221	U	0.109	ug/L	0.0362	0.109	1
11141-16-5	Aroclor-1232	U	0.109	ug/L	0.0362	0.109	1
53469-21-9	Aroclor-1242	U	0.109	ug/L	0.0362	0.109	1
12672-29-6	Aroclor-1248	U	0.109	ug/L	0.0362	0.109	1
11097-69-1	Aroclor-1254	U	0.109	ug/L	0.0362	0.109	1
11096-82-5	Aroclor-1260	U	0.109	ug/L	0.0362	0.109	1
37324-23-5	Aroclor-1262	U	0.109	ug/L	0.0362	0.109	1

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
4cmx	0.150	0.217	69.0	(45%-120%)
Decachlorobiphenyl	0.170	0.217	78.4	(45%-120%)

# **Quality Control Summary**



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**PCB**  
**Surrogate Recovery Report**

Page 1 of 1

**SDG Number: 2014-3494****Matrix Type: LIQUID**

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Sample ID	Client ID	4CMX 1 %REC #	4CMX 2 %REC #	DCB 1 %REC #	DCB 2 %REC #
1203108029	MB for batch 1395480	70	71	78	76
1203108030	LCS for batch 1395480	66	67	79	79
350053020	CAPU-14-79413	69	70	77	77
350053026	CAPU-14-79414	68	69	78	78
1203108031	BDW08-14-79467MS	42 *	42 *	49	50
1203108032	BDW08-14-79467MSD	71	70	79	80

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**Surrogate****Acceptance Limits**

4CMX = 4cmx

(45%-120%)

DCB = Decachlorobiphenyl

(45%-120%)

\* Recovery outside Acceptance Limits

# Column to be used to flag recovery values

D Sample Diluted

**PCB**  
**Quality Control Summary**  
**Spike Recovery Report**

Page 1 of 1

SDG Number: 2014-3494

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1395480

Matrix: WATER

Lab Sample ID 1203108030

Instrument: ECD9A.I

Analysis Date: 06/16/2014 17:13

Dilution: 1

Analyst: YS1

Prep Batch ID:1395480

Inj. Vol: 1 uL

Batch ID: 1395486

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
12674-11-2	LCS Aroclor-1016	1.00	0.0	0.732	73	48-109
11096-82-5	LCS Aroclor-1260	1.00	0.0	0.766	77	54-111

**PCB**  
**Quality Control Summary**  
**Spike Recovery Report**

Page 1 of 2

SDG Number: 2014-3494

Sample Type: Matrix Spike

Client ID: BDW08-14-79467MS

Matrix: W

Lab Sample ID 1203108031

Instrument: ECD9A.I

Analysis Date: 06/16/2014 18:58

Dilution: 1

Analyst: YS1

Prep Batch ID:1395480

Inj. Vol: 1 uL

Batch ID: 1395486

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
12674-11-2	MS Aroclor-1016	1.03	0.00 U	0.450	44	40-104
11096-82-5	MS Aroclor-1260	1.03	0.00 U	0.521	50	42-112

**PCB**  
**Quality Control Summary**  
**Spike Recovery Report**

Page 2 of 2

SDG Number: 2014-3494

Sample Type: Matrix Spike Duplicate

Client ID: BDW08-14-79467MSD

Matrix: W

Lab Sample ID 1203108032

Instrument: ECD9A.I

Analysis Date: 06/16/2014 19:34

Dilution: 1

Analyst: YS1

Prep Batch ID:1395480

Inj. Vol: 1 uL

Batch ID: 1395486

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L		Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
12674-11-2	MSD Aroclor-1016	1.04	0.00	U	0.744	71	40-104	49 *	0-30
11096-82-5	MSD Aroclor-1260	1.04	0.00	U	0.770	74	42-112	39 *	0-30

## Method Blank Summary

Page 1 of 1

SDG Number:	2014-3494	Client:	ARSL004	Matrix:	WATER
Client ID:	MB for batch 1395480	Instrument ID:	ECD9A.I_1	Data File:	061614.S\E9f1645.D
Lab Sample ID:	1203108029		ECD9A.I_2		061614.S\E9f1645.D
Column:	RTX-CLPEST 1	Prep Date:	06/13/2014 06:45	Analyzed:	06/16/14 17:02
	RTX-CLPEST 2				

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 1395480	1203108030	061614.S\E9f1646.D 061614.S\E9f1646.D	06/16/14	1713
02 CAPU-14-79413	350053020	061614.S\E9f1647.D 061614.S\E9f1647.D	06/16/14	1724
03 CAPU-14-79414	350053026	061614.S\E9f1648.D 061614.S\E9f1648.D	06/16/14	1738
04 BDW08-14-79467MS	1203108031	061614.S\E9f1654.D 061614.S\E9f1654.D	06/16/14	1858
05 BDW08-14-79467MSD	1203108032	061614.S\E9f1657.D 061614.S\E9f1657.D	06/16/14	1934

# Quality Control Data

**PCB**  
**Certificate of Analysis**  
**Sample Summary**

Page 1 of 1

**SDG Number:** 2014-3494  
**Lab Sample ID:** 1203108029  
**Client Sample:** QC for batch 1395480  
**Client ID:** MB for batch 1395480  
**Batch ID:** 1395486  
**Run Date:** 06/16/2014 17:02  
**Prep Date:** 06/13/2014 06:45  
**Data File:** 061614.S\E9f1645.D  
 061614.S\E9f1645.D

**Client:** ARSL004  
**Method:** SW846 3535A/8082  
**Inst:** ECD9A.I  
**Analyst:** YS1  
**Aliquot:** 1000 mL  
**Column:** 1 RTX-CLPEST 1  
 2 RTX-CLPEST 2

**Matrix:** WATER  
**Project:** QC  
**SOP Ref:** GL-OA-E-040  
**Dilution:** 1  
**Inj. Vol:** 1 uL  
**Final Volume:** 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	Column
12674-11-2	Aroclor-1016	U	0.100	ug/L	0.0333	0.100	1
11104-28-2	Aroclor-1221	U	0.100	ug/L	0.0333	0.100	1
11141-16-5	Aroclor-1232	U	0.100	ug/L	0.0333	0.100	1
53469-21-9	Aroclor-1242	U	0.100	ug/L	0.0333	0.100	1
12672-29-6	Aroclor-1248	U	0.100	ug/L	0.0333	0.100	1
11097-69-1	Aroclor-1254	U	0.100	ug/L	0.0333	0.100	1
11096-82-5	Aroclor-1260	U	0.100	ug/L	0.0333	0.100	1
37324-23-5	Aroclor-1262	U	0.100	ug/L	0.0333	0.100	1

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
Decachlorobiphenyl	0.155	0.200	77.7	(45%-120%)
4cmx	0.142	0.200	71.1	(45%-120%)

**PCB**  
**Certificate of Analysis**  
**Sample Summary**

Page 1 of 1

**SDG Number:** 2014-3494  
**Lab Sample ID:** 1203108030  
**Client Sample:** QC for batch 1395480  
**Client ID:** LCS for batch 1395480  
**Batch ID:** 1395486  
**Run Date:** 06/16/2014 17:13  
**Prep Date:** 06/13/2014 06:45  
**Data File:** 061614.S\E9f1646.D  
 061614.S\E9f1646.D

**Client:** ARSL004  
**Method:** SW846 3535A/8082  
**Inst:** ECD9A.I  
**Analyst:** YS1  
**Aliquot:** 1000 mL  
**Column:** 1 RTX-CLPEST 1  
 2 RTX-CLPEST 2

**Matrix:** WATER  
**Project:** QC  
**SOP Ref:** GL-OA-E-040  
**Dilution:** 1  
**Inj. Vol:** 1 uL  
**Final Volume:** 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	Column
12674-11-2	Aroclor-1016		0.732	ug/L	0.0333	0.100	2
11104-28-2	Aroclor-1221	U	0.100	ug/L	0.0333	0.100	1
11141-16-5	Aroclor-1232	U	0.100	ug/L	0.0333	0.100	1
53469-21-9	Aroclor-1242	U	0.100	ug/L	0.0333	0.100	1
12672-29-6	Aroclor-1248	U	0.100	ug/L	0.0333	0.100	1
11097-69-1	Aroclor-1254	U	0.100	ug/L	0.0333	0.100	1
11096-82-5	Aroclor-1260		0.766	ug/L	0.0333	0.100	1
37324-23-5	Aroclor-1262	U	0.100	ug/L	0.0333	0.100	1

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
Decachlorobiphenyl	0.159	0.200	79.4	(45%-120%)
4cmx	0.134	0.200	66.8	(45%-120%)



# Herbicide Analysis

# Case Narrative

**Herbicide Case Narrative  
ARS International, LLC (ARSL)  
SDG 2014-3494**

**Method/Analysis Information**

**Procedure:** Analysis of Chlorophenoxy Acid Herbicides by ECD  
**Analytical Method:** SW846 8151A  
**Prep Method:** SW846 8151A  
**Analytical Batch Number:** 1394530  
**Prep Batch Number:** 1394525

**Sample Analysis**

The following samples were analyzed using the analytical protocol as established in SW846 8151A:

<b>Sample ID</b>	<b>Client ID</b>
350053005	CAPU-14-79428
350053013	CAPU-14-79431
350053018	CAPU-14-79413
350053025	CAPU-14-79414
350053032	CAPU-14-79415
1203105474	Method Blank (MB)
1203105475	Laboratory Control Sample (LCS)
1203105476	350260004(CAPU-14-79427) Matrix Spike (MS)
1203105478	Laboratory Control Sample Duplicate (LCSD)

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

**Preparation/Analytical Method Verification**

**SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-OA-E-011 REV# 21.

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

**Calibration Information**

**Initial Calibration**

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

**Continuing Calibration Verification (CCV) Requirements**

All Initial Calibration Verification (ICV) requirements have been met for this SDG. However, not all Calibration Verification Standards (CCV) requirements were met. Pentachlorophenol failed acceptance criteria with a

positive bias on one analytical column in the standards bracketing the samples in this SDG. The positive bias for the analytical data is a result of instrument response increasing after the initial calibration. Since the target analytes were not detected in the samples, the non-compliance had no adverse impact on the data. All analytes were within the established retention time windows for this method.

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

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

The MB analyzed with this SDG met the acceptance criteria.

#### **Surrogate Recoveries**

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

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

The LCS spike recoveries met the acceptance limits.

#### **Laboratory Control Sample Duplicate (LCSD) Recovery**

The LCSD spike recoveries met the acceptance limits.

#### **LCS/LCSD Relative Percent Difference (RPD) Statement**

The RPD(s) between the LCS and LCSD met the acceptance limits.

#### **QC Sample Designation**

Sample 350260004 (CAPU-14-79427) was selected for analysis as the matrix spike. A matrix spike duplicate was not extracted or analyzed with this batch. A LCSD was extracted and analyzed with the batch to measure precision and accuracy of the spike analytes.

#### **Matrix Spike (MS) Recovery Statement**

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

#### **Matrix Spike Duplicate (MSD) Recovery Statement**

There was no matrix spike duplicate extracted and analyzed with this batch, only a matrix spike. A LCSD was extracted and analyzed with the batch to measure precision and accuracy of the spike analytes.

#### **MS/MSD Relative Percent Difference (RPD) Statement**

There are no reportable MS/MSD RDP values since a MSD was not extracted and analyzed with this batch, only a matrix spike. A LCSD was extracted and analyzed with the batch to measure precision and accuracy of the spike analytes.

### **Technical Information**

#### **Holding Time Specifications**

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. All reported analyte detections in client and quality control samples were within the established retention time windows. Reported target analyte concentrations were confirmed on a dissimilar column.

#### **Sample Dilutions**

The samples in this SDG did not require dilutions.

#### **Sample Re-extraction/Re-analysis**

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

### **Miscellaneous Information**

#### **Electronic Package 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 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.

#### **Data Exception (DER) Documentation**

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

#### **Manual Integrations**

Some initial calibration standards, continuing calibration standards, and/or samples may have required manual integration to correctly position the baseline as set in the calibration standard injections. If manual integration was performed, copies of all manual integration peak profiles are included in the raw data section of this Herbicide fraction.

#### **Additional Comments**

The additional comments field is used to address special issues associated with each analysis, clarify method/contractual issues pertaining to the analysis, and to list any report documents generated as a result of sample analysis or review. The following additional comments were required:

The higher results from either column have been chosen and reported in the data package for the client samples, MB and LCS. The data reported for the MS are from the same analytical column as the parent sample. The data reported for the LCSD are from the same analytical column as the LCS.

Due to rounding differences in the calculation between the forms, the data reported in the Sample Summary (form 1) and Spike Recovery Report (form 3) may differ slightly from the data reported in Identification Summary (form 10).

Due to software issue, the raw data may not correctly display the updated SPC limits. Please see Sample Data Summary Report and Surrogate Recovery Report for the correct surrogate acceptance limits.

### **System Configuration**

The Semi-Volatiles-HERB analysis was performed on the following instrument configuration:

<b>Instrument ID</b>	<b>Instrument</b>	<b>System Configuration</b>	<b>Column ID</b>	<b>Column Description</b>
ECD6A.I_1	Agilent 6890 Gas Chromatograph/Dual ECD w/ 7683 Autosampler	HP6890 Series GC/ECD	Rtx-CLP I	30m x 0.32mm, 0.50um (Rtx-CLPesticide)

ECD6A.I_2	Agilent 6890 Gas Chromatograph/Dual ECD w/ 7683 Autosampler	HP6890 Series GC/ECD	Rtx-CLP II	30m x 0.32mm, 0.50um (Rtx-CLPesticide II)
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**Certification Statement**

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

## GEL LABORATORIES LLC

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

### Qualifier Definition Report for

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

Client SDG: 2014-3494 GEL Work Order: 350053

#### 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, 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: 23 JUN 2014

Title: Data Validator

# Sample Data Summary



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**Herbicide  
Certificate of Analysis  
Sample Summary**

Page 1 of 1

**SDG Number:** 2014-3494  
**Lab Sample ID:** 350053005  
  
**Client ID:** CAPU-14-79428  
**Batch ID:** 1394530  
**Run Date:** 06/11/2014 14:13  
**Prep Date:** 06/10/2014 13:30  
**Data File:** 061114\E6f1108.D  
061114\E6f1108.D

**Date Collected:** 06/03/2014 11:21  
**Date Received:** 06/05/2014 09:00  
**Client:** ARSL004  
**Method:** SW846 8151A  
**Inst:** ECD6A.I  
**Analyst:** RXE1  
**Aliquot:** 950 mL  
**Column:** 1 CLP  
2 CLP2

**Matrix:** W  
  
**Project:** ESHL00714  
**SOP Ref:** GL-OA-E-011  
**Dilution:** 1  
**Inj. Vol:** 1 uL  
**Final Volume:** 10 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	Column
87-86-5	Pentachlorophenol	U	0.263	ug/L	0.0526	0.263	1
Surrogate/Tracer recovery		Result	Nominal		Recovery%	Acceptable Limits	
2,4-Dichlorophenylacetic acid		5.17	5.26	ug/L	98.2	(43%-137%)	

---

**Herbicide**  
**Certificate of Analysis**  
**Sample Summary**

Page 1 of 1

SDG Number: 2014-3494

Lab Sample ID: 350053013

Date Collected: 06/03/2014 11:48

Date Received: 06/05/2014 09:00

Matrix: W

Client ID: CAPU-14-79431

Batch ID: 1394530

Run Date: 06/11/2014 14:41

Prep Date: 06/10/2014 13:30

Data File: 061114\E6f1109.D

Client: ARSL004

Method: SW846 8151A

Inst: ECD6A.I

Analyst: RXE1

Aliquot: 950 mL

Column: 1 CLP

Project: ESHL00714

SOP Ref: GL-OA-E-011

Dilution: 1

Inj. Vol: 1 uL

Final Volume: 10 mL

2 CLP2

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	Column
87-86-5	Pentachlorophenol	U	0.263	ug/L	0.0526	0.263	1

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
2,4-Dichlorophenylacetic acid	5.28	5.26	100	(43%-137%)

---

**Herbicide  
Certificate of Analysis  
Sample Summary**

Page 1 of 1

SDG Number: 2014-3494

Lab Sample ID: 350053018

Date Collected: 06/03/2014 13:48

Date Received: 06/05/2014 09:00

Matrix: W

Client: ARSL004

Project: ESHL00714

Method: SW846 8151A

SOP Ref: GL-OA-E-011

Batch ID: 1394530

Inst: ECD6A.I

Dilution: 1

Run Date: 06/11/2014 15:08

Analyst: RXE1

Inj. Vol: 1 uL

Prep Date: 06/10/2014 13:30

Aliquot: 950 mL

Final Volume: 10 mL

Data File: 061114\E6f1110.D

Column: 1 CLP

2 CLP2

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	Column
87-86-5	Pentachlorophenol	U	0.263	ug/L	0.0526	0.263	1

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
2,4-Dichlorophenylacetic acid	5.22	5.26	99.2	(43%-137%)

---

**Herbicide**  
**Certificate of Analysis**  
**Sample Summary**

Page 1 of 1

SDG Number: 2014-3494

Lab Sample ID: 350053025

Date Collected: 06/03/2014 11:48

Date Received: 06/05/2014 09:00

Matrix: W

Client: ARSL004

Project: ESHL00714

Method: SW846 8151A

SOP Ref: GL-OA-E-011

Batch ID: 1394530

Inst: ECD6A.I

Dilution: 1

Run Date: 06/11/2014 15:36

Analyst: RXE1

Inj. Vol: 1 uL

Prep Date: 06/10/2014 13:30

Aliquot: 930 mL

Final Volume: 10 mL

Data File: 061114\E6f1111.D

Column: 1 CLP

2 CLP2

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	Column
87-86-5	Pentachlorophenol	U	0.269	ug/L	0.0538	0.269	1

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
2,4-Dichlorophenylacetic acid	5.59	5.38	104	(43%-137%)

---

**Herbicide**  
**Certificate of Analysis**  
**Sample Summary**

Page 1 of 1

SDG Number: 2014-3494

Lab Sample ID: 350053032

Date Collected: 06/03/2014 11:48

Date Received: 06/05/2014 09:00

Matrix: W

Client ID: CAPU-14-79415

Batch ID: 1394530

Run Date: 06/11/2014 16:03

Prep Date: 06/10/2014 13:30

Data File: 061114\E6f1112.D

Client: ARSL004

Method: SW846 8151A

Inst: ECD6A.I

Analyst: RXE1

Aliquot: 940 mL

Column: 1 CLP

Project: ESHL00714

SOP Ref: GL-OA-E-011

Dilution: 1

Inj. Vol: 1 uL

Final Volume: 10 mL

2 CLP2

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	Column
87-86-5	Pentachlorophenol	U	0.266	ug/L	0.0532	0.266	1

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
2,4-Dichlorophenylacetic acid	5.82	5.32	109	(43%-137%)

# **Quality Control Summary**

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**Herbicide**  
**Surrogate Recovery Report**

Page 1 of 1

**SDG Number: 2014-3494****Matrix Type: LIQUID**

Sample ID	Client ID	DCAA 1	DCAA 2
		%REC #	%REC #
1203105474	MB for batch 1394525	83	80
1203105475	LCS for batch 1394525	90	87
1203105478	LCSD for batch 1394525	85	83
350053005	CAPU-14-79428	98	90
350053013	CAPU-14-79431	100	91
350053018	CAPU-14-79413	99	92
350053025	CAPU-14-79414	104	91
350053032	CAPU-14-79415	109	94
1203105476	CAPU-14-79427MS	113	131

**Surrogate****Acceptance Limits**

DCAA = 2,4-Dichlorophenylacetic acid

(43%-137%)

\* Recovery outside Acceptance Limits

# Column to be used to flag recovery values

D Sample Diluted

---

**Herbicide**  
**Quality Control Summary**  
**Spike Recovery Report**

Page 1 of 2

SDG Number: 2014-3494

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1394525

Matrix: GROUND WATER

Lab Sample ID 1203105475

Instrument: ECD6A.I

Analysis Date: 06/11/2014 13:17

Dilution: 1

Analyst: RXE1

Prep Batch ID:1394525

Inj. Vol: 1 uL

Batch ID: 1394530

---

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
87-86-5	LCS Pentachlorophenol	2.00	0.0	1.75	87	55-113

---



## Herbicide

Page 2 of 2

Quality Control Summary  
Spike Recovery Report

SDG Number: 2014-3494

Sample Type: Laboratory Control Sample Duplicate

Client ID: LCSD for batch 1394525

Matrix: WATER

Lab Sample ID 1203105478

Instrument: ECD6A.I

Analysis Date: 06/11/2014 13:46

Dilution: 1

Analyst: RXE1

Prep Batch ID:1394525

Inj. Vol: 1 uL

Batch ID: 1394530

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
87-86-5	LCSD Pentachlorophenol	2.00	0.0	1.57	79	55-113	11	0-30

---

**Herbicide**  
**Quality Control Summary**  
**Spike Recovery Report**

Page 1 of 1

SDG Number: 2014-3494

Sample Type: Matrix Spike

Client ID: CAPU-14-79427MS

Matrix: W

Lab Sample ID 1203105476

Instrument: ECD6A.I

Analysis Date: 06/11/2014 18:38

Dilution: 1

Analyst: RXE1

Prep Batch ID:1394525

Inj. Vol: 1 uL

Batch ID: 1394530

---

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	U	Spike Conc. ug/L	Recovery %	Acceptance Limits
87-86-5	MS Pentachlorophenol	2.11	0.00	U	2.06	98	37-114

---

## Method Blank Summary

Page 1 of 1

<b>SDG Number:</b>	<b>2014-3494</b>	<b>Client:</b>	<b>ARSL004</b>	<b>Matrix:</b>	<b>GROUND WATER</b>
<b>Client ID:</b>	<b>MB for batch 1394525</b>	<b>Instrument ID:</b>	<b>ECD6A.I_1</b>	<b>Data File:</b>	<b>061114\E6f1105.D</b>
<b>Lab Sample ID:</b>	<b>1203105474</b>		<b>ECD6A.I_2</b>		<b>061114\E6f1105.D</b>
<b>Column:</b>	<b>CLP</b>	<b>Prep Date:</b>	<b>06/10/2014 13:30</b>	<b>Analyzed:</b>	<b>06/11/14 12:50</b>
	<b>CLP2</b>				

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 1394525	1203105475	061114\E6f1106.D 061114\E6f1106.D	06/11/14	1317
02 LCSD for batch 1394525	1203105478	061114\E6f1107.D 061114\E6f1107.D	06/11/14	1346
03 CAPU-14-79428	350053005	061114\E6f1108.D 061114\E6f1108.D	06/11/14	1413
04 CAPU-14-79431	350053013	061114\E6f1109.D 061114\E6f1109.D	06/11/14	1441
05 CAPU-14-79413	350053018	061114\E6f1110.D 061114\E6f1110.D	06/11/14	1508
06 CAPU-14-79414	350053025	061114\E6f1111.D 061114\E6f1111.D	06/11/14	1536
07 CAPU-14-79415	350053032	061114\E6f1112.D 061114\E6f1112.D	06/11/14	1603
08 CAPU-14-79427MS	1203105476	061114\E6f1118.D 061114\E6f1118.D	06/11/14	1838

# Quality Control Data

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**Herbicide  
Certificate of Analysis  
Sample Summary**

Page 1 of 1

<b>SDG Number:</b>	2014-3494	<b>Matrix:</b>	GROUND WATER
<b>Lab Sample ID:</b>	1203105474		
<b>Client Sample:</b>	QC for batch 1394525	<b>Client:</b>	ARSL004
<b>Client ID:</b>	MB for batch 1394525	<b>Method:</b>	SW846 8151A
<b>Batch ID:</b>	1394530	<b>Inst:</b>	ECD6A.I
<b>Run Date:</b>	06/11/2014 12:50	<b>Analyst:</b>	RXE1
<b>Prep Date:</b>	06/10/2014 13:30	<b>Aliquot:</b>	1000 mL
<b>Data File:</b>	061114\E6f1105.D	<b>Column:</b>	1 CLP
	061114\E6f1105.D		2 CLP2

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	Column
87-86-5	Pentachlorophenol	U	0.250	ug/L	0.050	0.250	1
Surrogate/Tracer recovery		Result	Nominal		Recovery%	Acceptable Limits	
2,4-Dichlorophenylacetic acid		4.17	5.00	ug/L	83.5	(43%-137%)	

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**Herbicide  
Certificate of Analysis  
Sample Summary**

Page 1 of 1

<b>SDG Number:</b>	2014-3494	<b>Matrix:</b>	GROUND WATER
<b>Lab Sample ID:</b>	1203105475		
<b>Client Sample:</b>	QC for batch 1394525	<b>Client:</b>	ARSL004
<b>Client ID:</b>	LCS for batch 1394525	<b>Method:</b>	SW846 8151A
<b>Batch ID:</b>	1394530	<b>Inst:</b>	ECD6A.I
<b>Run Date:</b>	06/11/2014 13:17	<b>Analyst:</b>	RXE1
<b>Prep Date:</b>	06/10/2014 13:30	<b>Aliquot:</b>	1000 mL
<b>Data File:</b>	061114\E6f1106.D	<b>Column:</b>	1 CLP
	061114\E6f1106.D		2 CLP2

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	Column
87-86-5	Pentachlorophenol		1.75	ug/L	0.050	0.250	1
Surrogate/Tracer recovery		Result	Nominal		Recovery%	Acceptable Limits	
2,4-Dichlorophenylacetic acid		4.49	5.00	ug/L	89.9	(43%-137%)	

---

**Herbicide**  
**Certificate of Analysis**  
**Sample Summary**

Page 1 of 1

<b>SDG Number:</b>	2014-3494	<b>Date Collected:</b>	06/05/2014 12:09	<b>Matrix:</b>	W
<b>Lab Sample ID:</b>	1203105476	<b>Date Received:</b>	06/07/2014 08:35		
<b>Client Sample:</b>	QC for batch 1394525	<b>Client:</b>	ARSL004	<b>Project:</b>	QC
<b>Client ID:</b>	CAPU-14-79427MS	<b>Method:</b>	SW846 8151A	<b>SOP Ref:</b>	GL-OA-E-011
<b>Batch ID:</b>	1394530	<b>Inst:</b>	ECD6A.I	<b>Dilution:</b>	1
<b>Run Date:</b>	06/11/2014 18:38	<b>Analyst:</b>	RXE1	<b>Inj. Vol:</b>	1 uL
<b>Prep Date:</b>	06/10/2014 13:30	<b>Aliquot:</b>	950 mL	<b>Final Volume:</b>	10 mL
<b>Data File:</b>	061114\E6f1118.D	<b>Column:</b>	1 CLP		
	061114\E6f1118.D		2 CLP2		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	Column
87-86-5	Pentachlorophenol		2.06	ug/L	0.0526	0.263	1
Surrogate/Tracer recovery		Result	Nominal		Recovery%	Acceptable Limits	
2,4-Dichlorophenylacetic acid		5.93	5.26	ug/L	113	(43%-137%)	

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**Herbicide  
Certificate of Analysis  
Sample Summary**

Page 1 of 1

SDG Number: 2014-3494

Lab Sample ID: 1203105478

Client Sample: QC for batch 1394525

Client ID: LCSD for batch 1394525

Batch ID: 1394530

Run Date: 06/11/2014 13:46

Prep Date: 06/10/2014 13:30

Data File: 061114\E6f1107.D

061114\E6f1107.D

Client: ARSL004

Method: SW846 8151A

Inst: ECD6A.I

Analyst: RXE1

Aliquot: 1000 mL

Column: 1 CLP

2 CLP2

Matrix: WATER

Project: QC

SOP Ref: GL-OA-E-011

Dilution: 1

Inj. Vol: 1 uL

Final Volume: 10 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	Column
87-86-5	Pentachlorophenol		1.57	ug/L	0.050	0.250	1

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
2,4-Dichlorophenylacetic acid	4.26	5.00	85.1	(43%-137%)



# Metals Analysis

# Case Narrative

**Metals Fractional Narrative  
ARS International, LLC (ARSL)  
SDG 2014-3494**

**Sample Analysis**

<b>Sample ID</b>	<b>Client ID</b>
350053003	CAPU-14-79428
350053006	CAPU-14-79436
350053011	CAPU-14-79431
350053014	CAPU-14-79439
350053019	CAPU-14-79413
350053030	CAPU-14-79415
350053033	CAPU-14-79416
1203103478	Method Blank (MB) <b>ICP</b>
1203103479	Laboratory Control Sample (LCS)
1203103483	350053006(CAPU-14-79436L) Serial Dilution (SD)
1203103480	350053006(CAPU-14-79436D) Sample Duplicate (DUP)
1203103481	350053006(CAPU-14-79436S) Matrix Spike (MS)
1203103526	Method Blank (MB) <b>ICP-MS</b>
1203103527	Laboratory Control Sample (LCS)
1203103530	350053006(CAPU-14-79436L) Serial Dilution (SD)
1203103528	350053006(CAPU-14-79436D) Sample Duplicate (DUP)
1203103529	350053006(CAPU-14-79436S) Matrix Spike (MS)
1203110252	Method Blank (MB) <b>CVAA</b>
1203110253	Laboratory Control Sample (LCS)
1203110264	350053003(CAPU-14-79428L) Serial Dilution (SD)
1203110257	350053003(CAPU-14-79428D) Sample Duplicate (DUP)
1203110258	350053003(CAPU-14-79428S) Matrix Spike (MS)

**Method/Analysis Information**

<b>Analytical Batch:</b>	1393740, 1393764, 1396344 and 1399077
<b>Prep Batch :</b>	1393739, 1393763 and 1396342
<b>Standard Operating Procedures:</b>	GL-MA-E-013 REV# 22, GL-MA-E-006 REV# 10, GL-MA-E-014 REV# 25, GL-MA-E-010 REV# 27 and GL-GC-E-107 REV# 9
<b>Analytical Method:</b>	SW846 3005A/6010C, SW846 3005A/6020A, EPA 245.1/245.2 and SM 2340 B
<b>Prep Method :</b>	SW846 3005A and EPA 245.1/245.2 Prep

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

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

### **System Configuration**

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

The Metals analysis-ICP was performed on a P E 5300 Optima radial/axial-viewing inductively coupled plasma atomic emission spectrometer. The instrument is equipped with an ESI SC-FAST introduction, cyclonic spray chamber, and yttrium or scandium internal standard. Operating conditions for the ICP are set at a power level of 1500 watts. The instrument has a peristaltic pump flow rate of 0.4L/min, argon gas flows of 13 L/min and 0.2 L/min for the torch and auxiliary gases, and a flow setting of 0.65L/min for the nebulizer.

The Metals analysis - ICPMS was performed on a Perkin Elmer ELAN 9000 inductively coupled plasma mass spectrometer (ICP-MS). The instrument is equipped with a cross-flow nebulizer, quadrupole mass spectrometer, and dual mode electron multiplier detector. Internal standards of scandium, germanium, indium, tantalum, and/or lutetium were utilized to cover the mass spectrum. Operating conditions are set at 1400W power and combined argon pressures of 360+/-7 kPa for the plasma and auxiliary gases, and 0.85 L/min carrier gas flow, and an initial lens voltage of 5.2.

The Metals analysis - ICPMS was performed on a Perkin Elmer ELAN DRC-e inductively coupled plasma mass spectrometer (ICP-MS). The instrument is equipped with a cross-flow nebulizer, quadrupole mass spectrometer, and dual mode electron multiplier detector, and dynamic reaction cell. The DRC-e uses a dynamic reaction cell to eliminate polyatomic interferences. Internal standards of scandium, germanium, indium, tantalum, and/or lutetium were utilized to cover the mass spectrum. Operating conditions are set at 1400W power and combined argon pressures of 360+/-7 kPa for the plasma and auxiliary gases, and 0.85 L/min carrier gas flow, and an initial lens voltage of 5.2.

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. Sample introduction through the flow injection system is performed via a peristaltic pump at 9 mL/min and nitrogen carrier gas rate of 80 mL/min.

### **Calibration Information**

#### **Instrument Calibration**

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

#### **CRDL/PQL Requirements**

The CRDL/PQL standard recoveries met the referenced advisory control limits.

**ICSA/ICSAB Statement**

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

**Continuing Calibration Blanks (CCB) Requirements**

The CCB was slightly contaminated with silica but these samples were 10x greater and less than the contamination, thus the results are not biased. The data is reported. 350053006 (CAPU-14-79436), 350053014 (CAPU-14-79439), 350053019 (CAPU-14-79413) and 350053033 (CAPU-14-79416)-ICP.

**Continuing Calibration Verification (CCV) Requirements**

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

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

The MBs analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**

The LCS spike recoveries met the acceptance limits.

**Quality Control (QC) Sample Statement**

The following samples were selected as the quality control (QC) samples for this SDG: 350053006 (CAPU-14-79436)-ICP and ICP-MS and 350053003 (CAPU-14-79428)-CVAA.

**Matrix Spike (MS) Recovery Statement**

The percent recoveries (%R) obtained from the MS analyses are evaluated when the sample concentration is less than four times (4X) the spike concentration added. All applicable analytes met the acceptance criteria.

**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. All applicable analytes met these requirements.

**Serial Dilution % Difference Statement**

The serial dilution is used to assess matrix suppression or enhancement. Raw element concentrations 25x the IDL/MDL for CVAA, 50X the IDL/MDL for ICP and 100X the IDL/MDL for ICP-MS analyses are applicable for serial dilution assessment. All applicable analytes met the established acceptance percent difference criteria.

**Technical Information****Holding Time Specifications**

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**

Dilutions are performed to minimize matrix interferences resulting from elevated mineral element concentrations

present in solid samples and/or to bring over range target analyte concentrations into the linear calibration range of the instrument. Samples required dilutions for tin in order to minimize suppression due to matrix interferences. 350053006 (CAPU-14-79436), 350053014 (CAPU-14-79439) and 350053033 (CAPU-14-79416)-ICP.

#### **Preparation Information**

The samples in this SDG were prepared exactly according to the cited SOP.

#### **Miscellaneous Information**

##### **Electronic Packaging Comment**

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

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

##### **Data Exception (DER) Documentation**

Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. Data exception reports were included behind the Case Narrative or in the Miscellaneous Data section of this data package. A data exception report was not required for this SDG.

##### **Additional Comments**

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

Hardness = 2.497 (Ca) + 4.118 (Mg)

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

**Certification Statement**

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

**Review Validation:**

GEL requires all analytical data to be verified by a qualified data validator. In addition, all data designated for CLP or CLP-like packaging will receive a third level validation upon completion of the data package.

**The following data validator verified the information presented in this case narrative:**

Reviewer: Nick Cole A. Elmore Date: 7.2.14

# **Sample Data Summary**



## 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: 2014-3494 GEL Work Order: 350053

**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, or LOD.

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 Certificate of Analysis.

The designation ND, if present, appears in the result column when the analyte concentration is not detected above the limit as defined in the 'U' qualifier above.

This data report has been prepared and reviewed in accordance with GEL Laboratories LLC standard operating procedures. Please direct any questions to your Project Manager, Valerie Davis.

Reviewed by

Nick Cole A. Elmore 7.2.14

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

**SDG No:** 2014-3494**CONTRACT:** ESHL00714**METHOD TYPE:** EPA**SAMPLE ID:** 350053003**BASIS:** As Received**DATE COLLECTED** 03-JUN-14**CLIENT ID:** CAPU-14-79428**LEVEL:** Low**DATE RECEIVED** 05-JUN-14**MATRIX:** W**%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7439-97-6	Mercury	0.20	ug/L	U	0.067	0.2	0.2	1	AV	NOR1	06/18/14 17:06	061814W2-5	1396344

**Prep Information:**

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1396344	1396342	EPA 245.1/245.2 Prep	20	mL	20	mL	06/17/14	AXS5

**\*Analytical Methods:**

AV EPA 245.1/245.2

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

**SDG No:** 2014-3494**CONTRACT:** ESHL00714**METHOD TYPE:** EPA**SAMPLE ID:** 350053006**BASIS:** As Received**DATE COLLECTED** 03-JUN-14**CLIENT ID:** CAPU-14-79436**LEVEL:** Low**DATE RECEIVED** 05-JUN-14**MATRIX:** W**%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7439-97-6	Mercury	0.20	ug/L	U	0.067	0.2	0.2	1	AV	NOR1	06/18/14 17:15	061814W2-5	1396344

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

SDG No: 2014-3494

CONTRACT: ESHL00714

METHOD TYPE: SW846

SAMPLE ID: 350053006

BASIS: As Received

DATE COLLECTED 03-JUN-14

CLIENT ID: CAPU-14-79436

LEVEL: Low

DATE RECEIVED 05-JUN-14

MATRIX: W

%SOLIDS: 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7429-90-5	Aluminum	200	ug/L	U	68	200	200	1	P	HSC	06/13/14 14:32	061314-1	1393740
7440-36-0	Antimony	3	ug/L	U	1	3	3	1	MS	BAJ	06/22/14 04:02	140621-3	1393764
7440-38-2	Arsenic	1.78	ug/L	J	1.7	5	5	1	MS	BAJ	06/22/14 04:02	140621-3	1393764
7440-39-3	Barium	53.5	ug/L		1	5	5	1	P	HSC	06/13/14 14:32	061314-1	1393740
7440-41-7	Beryllium	5	ug/L	U	1	5	5	1	P	HSC	06/13/14 14:32	061314-1	1393740
7440-42-8	Boron	50.6	ug/L		15	50	50	1	P	HSC	06/13/14 14:32	061314-1	1393740
7440-43-9	Cadmium	1	ug/L	U	0.11	1	1	1	MS	BAJ	06/22/14 04:02	140621-3	1393764
7440-70-2	Calcium	21800	ug/L		50	200	200	1	P	HSC	06/13/14 14:32	061314-1	1393740
7440-47-3	Chromium	2.68	ug/L	J	2	10	10	1	MS	BAJ	06/22/14 04:02	140621-3	1393764
7440-48-4	Cobalt	5	ug/L	U	1	5	5	1	P	HSC	06/13/14 14:32	061314-1	1393740
7440-50-8	Copper	10	ug/L	U	3	10	10	1	P	HSC	06/13/14 14:32	061314-1	1393740
7439-89-6	Iron	100	ug/L	U	30	100	100	1	P	HSC	06/13/14 14:32	061314-1	1393740
7439-92-1	Lead	2	ug/L	U	0.5	2	2	1	MS	BAJ	06/22/14 04:02	140621-3	1393764
7439-95-4	Magnesium	3740	ug/L		110	300	300	1	P	HSC	06/13/14 14:32	061314-1	1393740
7439-96-5	Manganese	10	ug/L	U	2	10	10	1	P	HSC	06/13/14 14:32	061314-1	1393740
7439-98-7	Molybdenum	1.81	ug/L		0.165	0.5	0.5	1	MS	BAJ	06/23/14 17:43	140623-4	1393764
7440-02-0	Nickel	5.17	ug/L		0.5	2	2	1	MS	BAJ	06/22/14 04:02	140621-3	1393764
7440-09-7	Potassium	3250	ug/L		50	150	150	1	P	HSC	06/13/14 14:32	061314-1	1393740
7782-49-2	Selenium	5	ug/L	U	1.5	5	5	1	MS	BAJ	06/22/14 04:02	140621-3	1393764
7631-86-9	Silica	56400	ug/L		53	213	213	1	P	HSC	06/13/14 14:32	061314-1	1393740
7440-22-4	Silver	1	ug/L	U	0.2	1	1	1	MS	BAJ	06/22/14 04:02	140621-3	1393764
7440-23-5	Sodium	24200	ug/L		100	300	300	1	P	HSC	06/13/14 14:32	061314-1	1393740
7440-24-6	Strontium	120	ug/L		1	5	5	1	P	HSC	06/13/14 14:32	061314-1	1393740
7440-28-0	Thallium	2	ug/L	U	0.45	2	2	1	MS	BAJ	06/22/14 04:02	140621-3	1393764
7440-31-5	Tin	100	ug/L	U	25	100	100	10	P	HSC	06/16/14 17:39	061614-2	1393740
7440-61-1	Uranium	1.5	ug/L		0.067	0.2	0.2	1	MS	BAJ	06/22/14 04:02	140621-3	1393764
7440-62-2	Vanadium	17.1	ug/L		1	5	5	1	P	HSC	06/13/14 14:32	061314-1	1393740
7440-66-6	Zinc	11.2	ug/L		3.3	10	10	1	P	HSC	06/13/14 14:32	061314-1	1393740

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

**SDG No:** 2014-3494**CONTRACT:** ESHL00714**METHOD TYPE:****SAMPLE ID:** 350053006      **BASIS:** As Received      **DATE COLLECTED** 03-JUN-14**CLIENT ID:** CAPU-14-79436      **LEVEL:** Low      **DATE RECEIVED** 05-JUN-14**MATRIX:** W      **%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
	Hardness as CaCO3	69.8	mg/L		0.453	1.24	1.24	1		JJ2	06/26/14 15:45		1399077

**Prep Information:**

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1393740	1393739	SW846 3005A	50	mL	50	mL	06/11/14	JXM5
1393764	1393763	SW846 3005A	50	mL	50	mL	06/11/14	JXM5
1396344	1396342	EPA 245.1/245.2 Prep	20	mL	20	mL	06/17/14	AXS5

**\*Analytical Methods:**

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

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

**SDG No:** 2014-3494**CONTRACT:** ESHL00714**METHOD TYPE:** EPA**SAMPLE ID:** 350053011**BASIS:** As Received**DATE COLLECTED** 03-JUN-14**CLIENT ID:** CAPU-14-79431**LEVEL:** Low**DATE RECEIVED** 05-JUN-14**MATRIX:** W**%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7439-97-6	Mercury	0.20	ug/L	U	0.067	0.2	0.2	1	AV	NOR1	06/18/14 17:17	061814W2-5	1396344

**Prep Information:**

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1396344	1396342	EPA 245.1/245.2 Prep	20	mL	20	mL	06/17/14	AXS5

**\*Analytical Methods:**

AV EPA 245.1/245.2

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

**SDG No:** 2014-3494**CONTRACT:** ESHL00714**METHOD TYPE:** EPA**SAMPLE ID:** 350053014**BASIS:** As Received**DATE COLLECTED** 03-JUN-14**CLIENT ID:** CAPU-14-79439**LEVEL:** Low**DATE RECEIVED** 05-JUN-14**MATRIX:** W**%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7439-97-6	Mercury	0.20	ug/L	U	0.067	0.2	0.2	1	AV	NOR1	06/18/14 17:18	061814W2-5	1396344

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

SDG No: 2014-3494

CONTRACT: ESHL00714

METHOD TYPE: SW846

SAMPLE ID: 350053014

BASIS: As Received

DATE COLLECTED 03-JUN-14

CLIENT ID: CAPU-14-79439

LEVEL: Low

DATE RECEIVED 05-JUN-14

MATRIX: W

%SOLIDS: 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7429-90-5	Aluminum	200	ug/L	U	68	200	200	1	P	HSC	06/13/14 14:20	061314-1	1393740
7440-36-0	Antimony	3	ug/L	U	1	3	3	1	MS	BAJ	06/22/14 04:35	140621-3	1393764
7440-38-2	Arsenic	5	ug/L	U	1.7	5	5	1	MS	BAJ	06/22/14 04:35	140621-3	1393764
7440-39-3	Barium	38.5	ug/L		1	5	5	1	P	HSC	06/13/14 14:20	061314-1	1393740
7440-41-7	Beryllium	5	ug/L	U	1	5	5	1	P	HSC	06/13/14 14:20	061314-1	1393740
7440-42-8	Boron	27.3	ug/L	J	15	50	50	1	P	HSC	06/13/14 14:20	061314-1	1393740
7440-43-9	Cadmium	1	ug/L	U	0.11	1	1	1	MS	BAJ	06/22/14 04:35	140621-3	1393764
7440-70-2	Calcium	18900	ug/L		50	200	200	1	P	HSC	06/13/14 14:20	061314-1	1393740
7440-47-3	Chromium	2.6	ug/L	J	2	10	10	1	MS	BAJ	06/22/14 04:35	140621-3	1393764
7440-48-4	Cobalt	5	ug/L	U	1	5	5	1	P	HSC	06/13/14 14:20	061314-1	1393740
7440-50-8	Copper	10	ug/L	U	3	10	10	1	P	HSC	06/13/14 14:20	061314-1	1393740
7439-89-6	Iron	100	ug/L	U	30	100	100	1	P	HSC	06/13/14 14:20	061314-1	1393740
7439-92-1	Lead	2	ug/L	U	0.5	2	2	1	MS	BAJ	06/22/14 04:35	140621-3	1393764
7439-95-4	Magnesium	3670	ug/L		110	300	300	1	P	HSC	06/13/14 14:20	061314-1	1393740
7439-96-5	Manganese	10	ug/L	U	2	10	10	1	P	HSC	06/13/14 14:20	061314-1	1393740
7439-98-7	Molybdenum	2.07	ug/L		0.165	0.5	0.5	1	MS	BAJ	06/23/14 18:18	140623-4	1393764
7440-02-0	Nickel	0.857	ug/L	J	0.5	2	2	1	MS	BAJ	06/22/14 04:35	140621-3	1393764
7440-09-7	Potassium	2700	ug/L		50	150	150	1	P	HSC	06/13/14 14:20	061314-1	1393740
7782-49-2	Selenium	5	ug/L	U	1.5	5	5	1	MS	BAJ	06/22/14 04:35	140621-3	1393764
7631-86-9	Silica	73800	ug/L		53	213	213	1	P	HSC	06/13/14 14:20	061314-1	1393740
7440-22-4	Silver	1	ug/L	U	0.2	1	1	1	MS	BAJ	06/22/14 04:35	140621-3	1393764
7440-23-5	Sodium	12300	ug/L		100	300	300	1	P	HSC	06/13/14 14:20	061314-1	1393740
7440-24-6	Strontium	89.2	ug/L		1	5	5	1	P	HSC	06/13/14 14:20	061314-1	1393740
7440-28-0	Thallium	2	ug/L	U	0.45	2	2	1	MS	BAJ	06/22/14 04:35	140621-3	1393764
7440-31-5	Tin	100	ug/L	U	25	100	100	10	P	HSC	06/16/14 17:27	061614-2	1393740
7440-61-1	Uranium	0.811	ug/L		0.067	0.2	0.2	1	MS	BAJ	06/22/14 04:35	140621-3	1393764
7440-62-2	Vanadium	7.31	ug/L		1	5	5	1	P	HSC	06/13/14 14:20	061314-1	1393740
7440-66-6	Zinc	10	ug/L	U	3.3	10	10	1	P	HSC	06/13/14 14:20	061314-1	1393740



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

**SDG No:** 2014-3494**CONTRACT:** ESHL00714**METHOD TYPE:****SAMPLE ID:** 350053014**BASIS:** As Received**DATE COLLECTED** 03-JUN-14**CLIENT ID:** CAPU-14-79439**LEVEL:** Low**DATE RECEIVED** 05-JUN-14**MATRIX:** W**%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
	Hardness as CaCO3	62.2	mg/L		0.453	1.24	1.24	1		JJ2	06/26/14 15:45		1399077

**Prep Information:**

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1393740	1393739	SW846 3005A	50	mL	50	mL	06/11/14	JXM5
1393764	1393763	SW846 3005A	50	mL	50	mL	06/11/14	JXM5
1396344	1396342	EPA 245.1/245.2 Prep	20	mL	20	mL	06/17/14	AXS5

**\*Analytical Methods:****P** SW846 3005A/6010C**MS** SW846 3005A/6020A**AV** EPA 245.1/245.2

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

**SDG No:** 2014-3494

**CONTRACT:** ESHL00714

**METHOD TYPE:** EPA

**SAMPLE ID:** 350053019

**BASIS:** As Received

**DATE COLLECTED** 03-JUN-14

**CLIENT ID:** CAPU-14-79413

**LEVEL:** Low

**DATE RECEIVED** 05-JUN-14

**MATRIX:** W

**%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7439-97-6	Mercury	0.20	ug/L	U	0.067	0.2	0.2	1	AV	NOR1	06/18/14 17:23	061814W2-5	1396344

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

SDG No: 2014-3494

CONTRACT: ESHL00714

METHOD TYPE: SW846

SAMPLE ID: 350053019

BASIS: As Received

DATE COLLECTED 03-JUN-14

CLIENT ID: CAPU-14-79413

LEVEL: Low

DATE RECEIVED 05-JUN-14

MATRIX: W

%SOLIDS: 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7429-90-5	Aluminum	200	ug/L	U	68	200	200	1	P	HSC	06/13/14 14:24	061314-1	1393740
7440-36-0	Antimony	3	ug/L	U	1	3	3	1	MS	BAJ	06/22/14 04:41	140621-3	1393764
7440-38-2	Arsenic	5	ug/L	U	1.7	5	5	1	MS	BAJ	06/22/14 04:41	140621-3	1393764
7440-39-3	Barium	5	ug/L	U	1	5	5	1	P	HSC	06/13/14 14:24	061314-1	1393740
7440-41-7	Beryllium	5	ug/L	U	1	5	5	1	P	HSC	06/13/14 14:24	061314-1	1393740
7440-42-8	Boron	50	ug/L	U	15	50	50	1	P	HSC	06/13/14 14:24	061314-1	1393740
7440-43-9	Cadmium	1	ug/L	U	0.11	1	1	1	MS	BAJ	06/22/14 04:41	140621-3	1393764
7440-70-2	Calcium	200	ug/L	U	50	200	200	1	P	HSC	06/13/14 14:24	061314-1	1393740
7440-47-3	Chromium	10	ug/L	U	2	10	10	1	MS	BAJ	06/22/14 04:41	140621-3	1393764
7440-48-4	Cobalt	5	ug/L	U	1	5	5	1	P	HSC	06/13/14 14:24	061314-1	1393740
7440-50-8	Copper	10	ug/L	U	3	10	10	1	P	HSC	06/13/14 14:24	061314-1	1393740
7439-89-6	Iron	100	ug/L	U	30	100	100	1	P	HSC	06/13/14 14:24	061314-1	1393740
7439-92-1	Lead	2	ug/L	U	0.5	2	2	1	MS	BAJ	06/22/14 04:41	140621-3	1393764
7439-95-4	Magnesium	300	ug/L	U	110	300	300	1	P	HSC	06/13/14 14:24	061314-1	1393740
7439-96-5	Manganese	10	ug/L	U	2	10	10	1	P	HSC	06/13/14 14:24	061314-1	1393740
7439-98-7	Molybdenum	0.50	ug/L	U	0.165	0.5	0.5	1	MS	BAJ	06/23/14 18:22	140623-4	1393764
7440-02-0	Nickel	2	ug/L	U	0.5	2	2	1	MS	BAJ	06/22/14 04:41	140621-3	1393764
7440-09-7	Potassium	150	ug/L	U	50	150	150	1	P	HSC	06/13/14 14:24	061314-1	1393740
7782-49-2	Selenium	5	ug/L	U	1.5	5	5	1	MS	BAJ	06/22/14 04:41	140621-3	1393764
7631-86-9	Silica	213	ug/L	U	53	213	213	1	P	HSC	06/13/14 14:24	061314-1	1393740
7440-22-4	Silver	1	ug/L	U	0.2	1	1	1	MS	BAJ	06/22/14 04:41	140621-3	1393764
7440-23-5	Sodium	300	ug/L	U	100	300	300	1	P	HSC	06/13/14 14:24	061314-1	1393740
7440-24-6	Strontium	5	ug/L	U	1	5	5	1	P	HSC	06/13/14 14:24	061314-1	1393740
7440-28-0	Thallium	2	ug/L	U	0.45	2	2	1	MS	BAJ	06/22/14 04:41	140621-3	1393764
7440-31-5	Tin	10	ug/L	U	2.5	10	10	1	P	HSC	06/16/14 17:31	061614-2	1393740
7440-61-1	Uranium	0.20	ug/L	U	0.067	0.2	0.2	1	MS	BAJ	06/22/14 04:41	140621-3	1393764
7440-62-2	Vanadium	5	ug/L	U	1	5	5	1	P	HSC	06/13/14 14:24	061314-1	1393740
7440-66-6	Zinc	10	ug/L	U	3.3	10	10	1	P	HSC	06/13/14 14:24	061314-1	1393740

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

**SDG No:** 2014-3494**CONTRACT:** ESHL00714**METHOD TYPE:****SAMPLE ID:** 350053019**BASIS:** As Received**DATE COLLECTED** 03-JUN-14**CLIENT ID:** CAPU-14-79413**LEVEL:** Low**DATE RECEIVED** 05-JUN-14**MATRIX:** W**%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
	Hardness as CaCO3	1.24	mg/L	U	0.453	1.24	1.24	1		JJ2	06/26/14 15:45		1399077

**Prep Information:**

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1393740	1393739	SW846 3005A	50	mL	50	mL	06/11/14	JXM5
1393764	1393763	SW846 3005A	50	mL	50	mL	06/11/14	JXM5
1396344	1396342	EPA 245.1/245.2 Prep	20	mL	20	mL	06/17/14	AXS5

**\*Analytical Methods:****P** SW846 3005A/6010C**MS** SW846 3005A/6020A**AV** EPA 245.1/245.2

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

**SDG No:** 2014-3494**CONTRACT:** ESHL00714**METHOD TYPE:** EPA**SAMPLE ID:** 350053030**BASIS:** As Received**DATE COLLECTED** 03-JUN-14**CLIENT ID:** CAPU-14-79415**LEVEL:** Low**DATE RECEIVED** 05-JUN-14**MATRIX:** W**%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7439-97-6	Mercury	0.20	ug/L	U	0.067	0.2	0.2	1	AV	NOR1	06/18/14 17:25	061814W2-5	1396344

**Prep Information:**

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1396344	1396342	EPA 245.1/245.2 Prep	20	mL	20	mL	06/17/14	AXS5

**\*Analytical Methods:**

AV      EPA 245.1/245.2

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

**SDG No:** 2014-3494**CONTRACT:** ESHL00714**METHOD TYPE:** EPA**SAMPLE ID:** 350053033**BASIS:** As Received**DATE COLLECTED** 03-JUN-14**CLIENT ID:** CAPU-14-79416**LEVEL:** Low**DATE RECEIVED** 05-JUN-14**MATRIX:** W**%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7439-97-6	Mercury	0.20	ug/L	U	0.067	0.2	0.2	1	AV	NOR1	06/18/14 17:27	061814W2-5	1396344

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

SDG No: 2014-3494

CONTRACT: ESHL00714

METHOD TYPE: SW846

SAMPLE ID: 350053033

BASIS: As Received

DATE COLLECTED 03-JUN-14

CLIENT ID: CAPU-14-79416

LEVEL: Low

DATE RECEIVED 05-JUN-14

MATRIX: W

%SOLIDS: 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7429-90-5	Aluminum	200	ug/L	U	68	200	200	1	P	HSC	06/13/14 14:28	061314-1	1393740
7440-36-0	Antimony	3	ug/L	U	1	3	3	1	MS	BAJ	06/22/14 04:48	140621-3	1393764
7440-38-2	Arsenic	5	ug/L	U	1.7	5	5	1	MS	BAJ	06/22/14 04:48	140621-3	1393764
7440-39-3	Barium	36.5	ug/L		1	5	5	1	P	HSC	06/13/14 14:28	061314-1	1393740
7440-41-7	Beryllium	5	ug/L	U	1	5	5	1	P	HSC	06/13/14 14:28	061314-1	1393740
7440-42-8	Boron	26.6	ug/L	J	15	50	50	1	P	HSC	06/13/14 14:28	061314-1	1393740
7440-43-9	Cadmium	1	ug/L	U	0.11	1	1	1	MS	BAJ	06/22/14 04:48	140621-3	1393764
7440-70-2	Calcium	18400	ug/L		50	200	200	1	P	HSC	06/13/14 14:28	061314-1	1393740
7440-47-3	Chromium	2.7	ug/L	J	2	10	10	1	MS	BAJ	06/22/14 04:48	140621-3	1393764
7440-48-4	Cobalt	5	ug/L	U	1	5	5	1	P	HSC	06/13/14 14:28	061314-1	1393740
7440-50-8	Copper	10	ug/L	U	3	10	10	1	P	HSC	06/13/14 14:28	061314-1	1393740
7439-89-6	Iron	100	ug/L	U	30	100	100	1	P	HSC	06/13/14 14:28	061314-1	1393740
7439-92-1	Lead	2	ug/L	U	0.5	2	2	1	MS	BAJ	06/22/14 04:48	140621-3	1393764
7439-95-4	Magnesium	3570	ug/L		110	300	300	1	P	HSC	06/13/14 14:28	061314-1	1393740
7439-96-5	Manganese	10	ug/L	U	2	10	10	1	P	HSC	06/13/14 14:28	061314-1	1393740
7439-98-7	Molybdenum	2.05	ug/L		0.165	0.5	0.5	1	MS	BAJ	06/23/14 18:27	140623-4	1393764
7440-02-0	Nickel	0.881	ug/L	J	0.5	2	2	1	MS	BAJ	06/22/14 04:48	140621-3	1393764
7440-09-7	Potassium	2620	ug/L		50	150	150	1	P	HSC	06/13/14 14:28	061314-1	1393740
7782-49-2	Selenium	5	ug/L	U	1.5	5	5	1	MS	BAJ	06/22/14 04:48	140621-3	1393764
7631-86-9	Silica	71800	ug/L		53	213	213	1	P	HSC	06/13/14 14:28	061314-1	1393740
7440-22-4	Silver	1	ug/L	U	0.2	1	1	1	MS	BAJ	06/22/14 04:48	140621-3	1393764
7440-23-5	Sodium	12000	ug/L		100	300	300	1	P	HSC	06/13/14 14:28	061314-1	1393740
7440-24-6	Strontium	86.9	ug/L		1	5	5	1	P	HSC	06/13/14 14:28	061314-1	1393740
7440-28-0	Thallium	2	ug/L	U	0.45	2	2	1	MS	BAJ	06/22/14 04:48	140621-3	1393764
7440-31-5	Tin	100	ug/L	U	25	100	100	10	P	HSC	06/16/14 17:35	061614-2	1393740
7440-61-1	Uranium	0.783	ug/L		0.067	0.2	0.2	1	MS	BAJ	06/22/14 04:48	140621-3	1393764
7440-62-2	Vanadium	7.48	ug/L		1	5	5	1	P	HSC	06/13/14 14:28	061314-1	1393740
7440-66-6	Zinc	10	ug/L	U	3.3	10	10	1	P	HSC	06/13/14 14:28	061314-1	1393740

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

**SDG No:** 2014-3494**CONTRACT:** ESHL00714**METHOD TYPE:****SAMPLE ID:** 350053033**BASIS:** As Received**DATE COLLECTED** 03-JUN-14**CLIENT ID:** CAPU-14-79416**LEVEL:** Low**DATE RECEIVED** 05-JUN-14**MATRIX:** W**%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
	Hardness as CaCO3	60.5	mg/L		0.453	1.24	1.24	1		JJ2	06/26/14 15:45		1399077

**Prep Information:**

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1393740	1393739	SW846 3005A	50	mL	50	mL	06/11/14	JXM5
1393764	1393763	SW846 3005A	50	mL	50	mL	06/11/14	JXM5
1396344	1396342	EPA 245.1/245.2 Prep	20	mL	20	mL	06/17/14	AXS5

**\*Analytical Methods:****P** SW846 3005A/6010C**MS** SW846 3005A/6020A**AV** EPA 245.1/245.2



# **Quality Control Summary**

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

SDG NO. 2014-3494

Contract: ESHL00714

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>
1203103478	Aluminum	68	ug/L	+/-200	U	P	68	200
	Barium	1	ug/L	+/-5	U	P	1	5
	Beryllium	1	ug/L	+/-5	U	P	1	5
	Boron	15	ug/L	+/-50	U	P	15	50
	Calcium	50	ug/L	+/-200	U	P	50	200
	Cobalt	1	ug/L	+/-5	U	P	1	5
	Copper	3	ug/L	+/-10	U	P	3	10
	Iron	30	ug/L	+/-100	U	P	30	100
	Magnesium	110	ug/L	+/-300	U	P	110	300
	Manganese	2	ug/L	+/-10	U	P	2	10
	Potassium	50	ug/L	+/-150	U	P	50	150
	Silica	53	ug/L	+/-213	U	P	53	213
	Sodium	100	ug/L	+/-300	U	P	100	300
	Strontium	1	ug/L	+/-5	U	P	1	5
	Tin	2.5	ug/L	+/-10	U	P	2.5	10
	Vanadium	1	ug/L	+/-5	U	P	1	5
	Zinc	3.3	ug/L	+/-10	U	P	3.3	10
1203103526	Antimony	1	ug/L	+/-3	U	MS	1	3
	Arsenic	1.7	ug/L	+/-5	U	MS	1.7	5
	Cadmium	0.11	ug/L	+/-1	U	MS	0.11	1
	Chromium	2	ug/L	+/-10	U	MS	2	10
	Lead	0.5	ug/L	+/-2	U	MS	0.5	2
	Molybdenum	0.165	ug/L	+/-0.5	U	MS	0.165	0.5
	Nickel	0.5	ug/L	+/-2	U	MS	0.5	2
	Selenium	1.5	ug/L	+/-5	U	MS	1.5	5
	Silver	0.2	ug/L	+/-1	U	MS	0.2	1
	Thallium	0.45	ug/L	+/-2	U	MS	0.45	2
	Uranium	0.067	ug/L	+/-0.2	U	MS	0.067	0.2
1203110252	Mercury	0.067	ug/L	+/-0.2	U	AV	0.067	0.2

## \*Analytical Methods:

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

## METALS

-5a-

## Matrix Spike Summary

SDG NO. 2014-3494 Client ID: CAPU-14-79436S

Contract: ESHL00714 Level: Low

Matrix: WATER % Solids:

Sample ID: 350053006 Spike ID: 1203103481

<u>Analyte</u>	<u>Units</u>	<u>Acceptance Limit</u>	<u>Spiked Result</u>	<u>C</u>	<u>Sample Result</u>	<u>C</u>	<u>Spike Added</u>	<u>% Recovery</u>	<u>Qual</u>	<u>M*</u>
Aluminum	ug/L	75-125	4960		68	U	5000	98.8		P
Barium	ug/L	75-125	568		53.5		500	103		P
Beryllium	ug/L	75-125	514		1	U	500	103		P
Boron	ug/L	75-125	551		50.6		500	100		P
Calcium	ug/L		27200		21800		5000	107	N/A	P
Cobalt	ug/L	75-125	502		1	U	500	100		P
Copper	ug/L	75-125	528		3	U	500	105		P
Iron	ug/L	75-125	5220		30	U	5000	104		P
Magnesium	ug/L	75-125	9030		3740		5000	106		P
Manganese	ug/L	75-125	514		2	U	500	103		P
Potassium	ug/L	75-125	8350		3250		5000	102		P
Silica	ug/L		66800		56400		10700	97.2	N/A	P
Sodium	ug/L		29500		24200		5000	106	N/A	P
Strontium	ug/L	75-125	633		120		500	103		P
Tin	ug/L	75-125	468		25	U	500	93.5		P
Vanadium	ug/L	75-125	552		17.1		500	107		P
Zinc	ug/L	75-125	523		11.2		500	102		P

\*Analytical Methods:

P SW846 3005A/6010C

## METALS

-5a-

## Matrix Spike Summary

SDG NO. 2014-3494 Client ID: CAPU-14-79436S

Contract: ESHL00714 Level: Low

Matrix: WATER % Solids:

Sample ID: 350053006 Spike ID: 1203103529

<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>
Arsenic	ug/L	75-125	47.2		1.78	J	50	90.9		MS
Cadmium	ug/L	75-125	49.7		0.11	U	50	99.4		MS
Chromium	ug/L	75-125	50.3		2.68	J	50	95.3		MS
Lead	ug/L	75-125	46.3		0.5	U	50	92.6		MS
Molybdenum	ug/L	75-125	53.4		1.81		50	103		MS
Nickel	ug/L	75-125	50.3		5.17		50	90.2		MS
Selenium	ug/L	75-125	45.7		1.5	U	50	90.5		MS
Silver	ug/L	75-125	50.6		0.2	U	50	101		MS
Thallium	ug/L	75-125	44.6		0.45	U	50	89		MS
Uranium	ug/L	75-125	50.4		1.5		50	97.7		MS
Antimony	ug/L	75-125	52.5		1	U	50	104		MS

## \*Analytical Methods:

MS SW846 3005A/6020A

## METALS

-5a-

## Matrix Spike Summary

**SDG NO.** 2014-3494 **Client ID:** CAPU-14-79428S**Contract:** ESHL00714 **Level:** Low**Matrix:** WATER **% Solids:****Sample ID:** 350053003 **Spike ID:** 1203110258

<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	2.21		0.067	U	2	111		AV

## \*Analytical Methods:

AV EPA 245.1/245.2

**Metals**  
**–6–**  
**Duplicate Sample Summary**

SDG No.: 2014–3494

Lab Code: GEL

Contract: ESHL00714

Client ID: CAPU–14–79436D

Matrix: WATER

Level: Low

Sample ID: 350053006

Duplicate ID: 1203103480

Percent Solids for Dup: N/A

Analyte	Units	Acceptance Limit	Sample Result	C	Duplicate Result	C	RPD	Qual	M*
Aluminum	ug/L		68 U		68 U				P
Barium	ug/L	+/-20%	53.5		54		.863		P
Beryllium	ug/L		1 U		1 U				P
Boron	ug/L	+/-50	50.6		50.3		.553		P
Calcium	ug/L	+/-20%	21800		21800		.00459		P
Cobalt	ug/L		1 U		1 U				P
Copper	ug/L		3 U		3 U				P
Iron	ug/L		30 U		30 U				P
Magnesium	ug/L	+/-20%	3740		3760		.387		P
Manganese	ug/L		2 U		2 U				P
Potassium	ug/L	+/-20%	3250		3270		.541		P
Silica	ug/L	+/-20%	56400		56600		.42		P
Sodium	ug/L	+/-20%	24200		24700		1.77		P
Strontium	ug/L	+/-20%	120		123		1.85		P
Tin	ug/L		25 U		25 U				P
Vanadium	ug/L	+/-5	17.1		17.6		2.4		P
Zinc	ug/L	+/-10	11.2		11.2		.17		P

\*Analytical Methods:

P SW846 3005A/6010C

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

SDG No.: 2014-3494

Lab Code: GEL

Contract: ESHL00714

Client ID: CAPU-14-79436D

Matrix: WATER

Level: Low

Sample ID: 350053006

Duplicate ID: 1203103528

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		1.78 J		1.7 U		200		MS
Cadmium	ug/L		0.11 U		0.11 U				MS
Chromium	ug/L	+/-10	2.68 J		2.79 J		4.03		MS
Lead	ug/L		0.5 U		0.5 U				MS
Molybdenum	ug/L	+/- .5	1.81		1.89		4.33		MS
Nickel	ug/L	+/-2	5.17		5.25		1.57		MS
Selenium	ug/L		1.5 U		1.5 U				MS
Silver	ug/L		0.2 U		0.2 U				MS
Thallium	ug/L		0.45 U		0.45 U				MS
Uranium	ug/L	+/-20%	1.5		1.51		.533		MS

## \*Analytical Methods:

MS SW846 3005A/6020A

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**Metals**  
**–6–**  
**Duplicate Sample Summary**

**SDG No.:** 2014–3494**Lab Code:** GEL**Contract:** ESHL00714**Client ID:** CAPU–14–79428D**Matrix:** WATER**Level:** Low**Sample ID:** 350053003**Duplicate ID:** 1203110257**Percent Solids for Dup:** N/A

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

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**\*Analytical Methods:**

AV EPA 245.1/245.2



## METALS

-7-

## Laboratory Control Sample Summary

SDG NO. 2014-3494

Contract: ESHL00714

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>
1203103479								
	Aluminum	ug/L	5000	5030		101	80-120	P
	Barium	ug/L	500	523		105	80-120	P
	Beryllium	ug/L	500	516		103	80-120	P
	Boron	ug/L	500	502		100	80-120	P
	Calcium	ug/L	5000	5100		102	80-120	P
	Cobalt	ug/L	500	518		104	80-120	P
	Copper	ug/L	500	517		103	80-120	P
	Iron	ug/L	5000	5220		104	80-120	P
	Magnesium	ug/L	5000	5320		106	80-120	P
	Manganese	ug/L	500	522		104	80-120	P
	Potassium	ug/L	5000	5200		104	80-120	P
	Silica	ug/L	10700	10700		100	80-120	P
	Sodium	ug/L	5000	5240		105	80-120	P
	Strontium	ug/L	500	518		104	80-120	P
	Tin	ug/L	500	501		100	80-120	P
	Vanadium	ug/L	500	541		108	80-120	P
	Zinc	ug/L	500	519		104	80-120	P

## \*Analytical Methods:

P SW846 3005A/6010C

## METALS

-7-

## Laboratory Control Sample Summary

SDG NO. 2014-3494

Contract: ESHL00714

Aqueous LCS Source:O2Si

Solid LCS Source:

<u>Sample ID</u>	<u>Analyte</u>	<u>Units</u>	<u>True Value</u>	<u>Result</u>	<u>C</u>	<u>% Recovery</u>	<u>Acceptance Limit</u>	<u>M*</u>
1203103527								
	Antimony	ug/L	50	52.9		106	80-120	MS
	Arsenic	ug/L	50	46.3		92.6	80-120	MS
	Chromium	ug/L	50	49.1		98.1	80-120	MS
	Lead	ug/L	50	48		96.1	80-120	MS
	Molybdenum	ug/L	50	50.4		101	80-120	MS
	Nickel	ug/L	50	48.5		97	80-120	MS
	Selenium	ug/L	50	47.3		94.7	80-120	MS
	Silver	ug/L	50	53.1		106	80-120	MS
	Thallium	ug/L	50	46.5		92.9	80-120	MS
	Uranium	ug/L	50	50.9		102	80-120	MS
	Cadmium	ug/L	50	51.3		103	80-120	MS

## \*Analytical Methods:

MS SW846 3005A/6020A

## METALS

-7-

## Laboratory Control Sample Summary

SDG NO. 2014-3494

Contract: ESHL00714

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>
1203110253	Mercury	ug/L	2	2		100	85-115	AV

## \*Analytical Methods:

AV EPA 245.1/245.2

## METALS

-9-

## Serial Dilution Sample Summary

SDG NO. 2014-3494 Client ID: CAPU-14-79436L

Contract: ESHL00714

Matrix: LIQUID Level: Low

Sample ID: 350053006 Serial Dilution ID: 1203103483

<u>Analyte</u>	<u>Initial Value ug/L</u>	<u>C</u>	<u>Serial Value ug/L</u>	<u>C</u>	<u>% Difference</u>	<u>Qual</u>	<u>Acceptance Limit</u>	<u>M*</u>
Aluminum	68	U	340	U				P
Barium	53.5		54.9		2.54		10	P
Beryllium	1	U	5	U				P
Boron	50.6		75	U	100			P
Calcium	21800		21600		.833		10	P
Cobalt	1	U	5	U				P
Copper	3	U	15	U				P
Iron	30	U	150	U				P
Magnesium	3740		3690		1.23			P
Manganese	2	U	10	U				P
Potassium	3250		3090		4.88		10	P
Silica	56400		54500		3.35		10	P
Sodium	24200		24500		1.24		10	P
Strontium	120		120		.054		10	P
Tin	2.5	U	12.5	U				P
Vanadium	17.1		15.8	J	7.53			P
Zinc	11.2		16.5	U	100			P

## \*Analytical Methods:

P SW846 3005A/6010C

## METALS

-9-

## Serial Dilution Sample Summary

**SDG NO.** 2014-3494 **Client ID:** CAPU-14-79436L

**Contract:** ESHL00714

**Matrix:** LIQUID **Level:** Low

**Sample ID:** 350053006 **Serial Dilution ID:** 1203103530

<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	1.78	J	8.5	U	100			MS
Cadmium	.11	U	.55	U				MS
Chromium	2.68	J	10	U	100			MS
Lead	.5	U	2.5	U				MS
Molybdenum	1.81		1.88	J	3.65			MS
Nickel	5.17		5.53	J	6.85			MS
Selenium	1.5	U	7.5	U				MS
Silver	.2	U	1	U				MS
Thallium	.45	U	2.25	U				MS
Uranium	1.5		1.39		7.54			MS

## \*Analytical Methods:

MS SW846 3005A/6020A

## METALS

-9-

## Serial Dilution Sample Summary

**SDG NO.** 2014-3494 **Client ID:** CAPU-14-79428L**Contract:** ESHL00714**Matrix:** LIQUID **Level:** Low**Sample ID:** 350053003 **Serial Dilution ID:** 1203110264

<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 Narrative  
ARS International, LLC (ARSL)  
SDG 2014-3494**

**Method/Analysis Information**

**Product:** Carbon and Total Organic

**Analytical Batch:** 1394347

**Method:** SW 9060 Total Organic Carbon

**Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
350053003	CAPU-14-79428
350053011	CAPU-14-79431
350053019	CAPU-14-79413
350053030	CAPU-14-79415
1203105820	Method Blank (MB)
1203105822	350260005(CAPU-14-79427) Sample Duplicate (DUP)
1203105823	350053030(CAPU-14-79415) Sample Duplicate (DUP)
1203105824	350260005(CAPU-14-79427) Post Spike (PS)
1203105825	350053030(CAPU-14-79415) Post Spike (PS)
1203105826	Laboratory Control Sample (LCS)
1203112489	350748001(VS-R28-V2-79984) Sample Duplicate (DUP)
1203112490	350748001(VS-R28-V2-79984) 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# 12.

**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 Model 1010 Total Organic Carbon Analyzer.

**Initial Calibration**

All initial calibration requirements have been met for this SDG.

**Continuing Calibration Blanks**

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

**Calibration Verification Information (CCV)**

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

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

The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**

The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**

The following samples were selected for QC analysis: 350053030 (CAPU-14-79415), 350260005 (CAPU-14-79427) and 350748001 (VS-R28-V2-79984).

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

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

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

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

**Technical Information**

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

**Holding Times**

All samples in this SDG met the specified holding time.

**Sample Preservation/Integrity**

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

**Sample Dilutions**

The samples in this SDG did not require dilutions.

**Sample Re-analysis**

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

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

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

**Additional Comments**

A 15 mg/L Total Inorganic Carbon check standard is analyzed with each analytical run to prove that the instrument is effectively sparging away the inorganic carbon.

**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:** 1393812      **Method:** WSP-CN(T)  
**Prep Batch :** 1393811      **Method:** EPA 335.4

### **Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
350053003	CAPU-14-79428
350053011	CAPU-14-79431
350053019	CAPU-14-79413
350053030	CAPU-14-79415
1203103653	Method Blank (MB)
1203103654	350053003(CAPU-14-79428) Sample Duplicate (DUP)
1203103657	350053003(CAPU-14-79428) Matrix Spike (MS)
1203103660	Laboratory Control Sample (LCS)

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

### **SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-095 REV# 17.

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

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

### **Calibration Information**

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

### **Initial Calibration**

All initial calibration requirements have been met for this SDG.

### **Continuing Calibration Blanks**

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

**Calibration Verification Information (CCV)**

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

**Y Intercept Rule**

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

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

The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**

The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**

The following sample was selected for QC analysis: 350053003 (CAPU-14-79428).

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

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

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

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

**Technical Information**

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

**Holding Times**

All samples in this SDG met the specified holding time.

**Sample Preservation/Integrity**

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

**Sample Dilutions**

The samples in this SDG did not require dilutions.

**Sample Re-analysis**

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

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

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

**Additional Comments**

Additional comments were not required for this SDG.

**Electronic Packaging Comment**

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

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

### **Method/Analysis Information**

**Product:** Ion Chromatography

**Analytical Batch:** 1393647

**Method:** EPA 300.0 Anions Liquid 28 day

### **Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
350053006	CAPU-14-79436
350053014	CAPU-14-79439
350053019	CAPU-14-79413
350053033	CAPU-14-79416
1203103274	Method Blank (MB)
1203103275	350053033(CAPU-14-79416) Sample Duplicate (DUP)
1203103276	350053033(CAPU-14-79416) Post Spike (PS)
1203103277	Laboratory Control Sample (LCS)

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# 22.

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

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

### **Calibration Information**

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

### **Initial Calibration**

All initial calibration requirements have been met for this SDG.

### **Continuing Calibration Blanks**

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

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

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

**Y Intercept Rule**

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

**Quality Control (QC) Information**

**Method Blank (MB) Statement**

The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**

The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**

The following sample was selected for QC analysis: 350053033 (CAPU-14-79416).

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

The spike recovery falls outside of the established acceptance limits due to matrix interference: 1203103276 (CAPU-14-79416).

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

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

**Technical Information**

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

**Holding Times**

All samples in this SDG met the specified holding time.

**Sample Dilutions**

The samples in this SDG did not require dilutions.

**Sample Re-analysis**

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

**Miscellaneous Information**

**Data Exception (DER) Documentation**

The following DER was generated for this SDG: 1303455, 1203103276 (CAPU-14-79416).

**Manual Integrations**

Manual integrations were not required for the samples in this SDG.

**Additional Comments**

Additional comments were not required for this SDG.

**Electronic Packaging Comment**



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

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

### **Method/Analysis Information**

**Product:** Ammonia Nitrogen

**Analytical Batch:** 1394294      **Method:** EPA 350.1 Nitrogen and Ammonia L

**Prep Batch :** 1394293      **Method:** EEPA 350.2 Prep

### **Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
350053006	CAPU-14-79436
350053014	CAPU-14-79439
350053019	CAPU-14-79413
350053033	CAPU-14-79416
1203104860	Method Blank (MB)
1203104861	Laboratory Control Sample (LCS)
1203104864	350137006(CAPU-14-79437) Sample Duplicate (DUP)
1203104865	350137006(CAPU-14-79437) Matrix Spike (MS)
1203107049	350260006(CAPU-14-79435) Sample Duplicate (DUP)
1203107050	350260006(CAPU-14-79435) Matrix Spike (MS)

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

### **SOP Reference**

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

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

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

### **Calibration Information**

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

### **Initial Calibration**

All initial calibration requirements have been met for this SDG.

### **Continuing Calibration Blanks**

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

**Calibration Verification Information (CCV)**

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

**Y Intercept Rule**

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

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

The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**

The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**

The following samples were selected for QC analysis: 350137006 (CAPU-14-79437) and 350260006 (CAPU-14-79435).

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

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

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

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

**Technical Information**

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

**Holding Times**

All samples in this SDG met the specified holding time.

**Sample Preservation/Integrity**

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

**Sample Dilutions**

The samples in this SDG did not require dilutions.

**Sample Re-analysis**

The following samples were re-analyzed due to instrument failure. The results from the reanalysis are reported. 1203104860 (MB) and 1203107049 (CAPU-14-79435).

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

The following DER was generated for this SDG: 1303764. 350053019 (CAPU-14-79413).

**Additional Comments**

Additional comments were not required for this SDG.

**Electronic Packaging Comment**

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

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

### **Method/Analysis Information**

<b>Product:</b>	<b>Total Kjeldahl Nitrogen</b>		
<b>Analytical Batch:</b>	1394292	<b>Method:</b>	Nitrogen and Total Kjeldahl (TKN)
<b>Prep Batch :</b>	1394290	<b>Method:</b>	EEPA 351.2 Prep

### **Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
350053003	CAPU-14-79428
350053011	CAPU-14-79431
350053019	CAPU-14-79413
350053030	CAPU-14-79415
1203104856	Method Blank (MB)
1203104857	Laboratory Control Sample (LCS)
1203104858	350137001(CAPU-14-79429) Sample Duplicate (DUP)
1203104859	350137001(CAPU-14-79429) Matrix Spike (MS)
1203106955	350260005(CAPU-14-79427) Sample Duplicate (DUP)
1203106956	350260005(CAPU-14-79427) Matrix Spike (MS)

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

### **SOP Reference**

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

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

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

### **Calibration Information**

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

### **Calibration Verification Information**

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

### **Continuing Calibration Blanks**

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

**Calibration Verification Information (CCV)**

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

**Y Intercept Rule**

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

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

The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**

The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**

The following samples were selected for QC analysis: 350137001 (CAPU-14-79429) and 350260005 (CAPU-14-79427).

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

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

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

The Relative Percent Difference (RPD) between the sample and duplicate falls outside of the established acceptance limits because of the heterogeneous matrix of the sample: 1203106955 (CAPU-14-79427). The values for the sample and duplicate are less than the Practical Quantitation Limit (PQL); therefore, the RPD is not applicable. 1203104858 (CAPU-14-79429).

**Technical Information**

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

**Holding Times**

All samples in this SDG met the specified holding time.

**Sample Preservation/Integrity**

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

**Sample Dilutions**

The samples in this SDG did not require dilutions.

**Sample Re-analysis**

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

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

The following DER was generated for this SDG: 1303181. 1203106955 (CAPU-14-79427).

**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:** 1394285

**Method:** EPA 353.2 Nitrogen and Nitrate/Nitrite

### **Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
350053006	CAPU-14-79436
350053014	CAPU-14-79439
350053019	CAPU-14-79413
350053033	CAPU-14-79416
1203104833	Method Blank (MB)
1203104835	349927006(CAPU-14-79434) Sample Duplicate (DUP)
1203104838	349927006(CAPU-14-79434) Post Spike (PS)
1203104840	Laboratory Control Sample (LCS)
1203107052	350260006(CAPU-14-79435) Sample Duplicate (DUP)
1203107053	350260006(CAPU-14-79435) Post Spike (PS)

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

### **SOP Reference**

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

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

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

### **Calibration Information**

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

### **Calibration Verification Information**

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

### **Continuing Calibration Blanks**



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

**Calibration Verification Information (CCV)**

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

**Y Intercept Rule**

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

**Quality Control (QC) Information**

**Method Blank (MB) Statement**

The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**

The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**

The following samples were selected for QC analysis: 349927006 (CAPU-14-79434) and 350260006 (CAPU-14-79435).

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

The spike recovery falls outside of the GEL acceptance limits but within the client specified limits. 1203104838 (CAPU-14-79434).

**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 in this sample group were diluted due to high concentration: 1203104835 (CAPU-14-79434) and 1203104838 (CAPU-14-79434). The following sample in this sample group was diluted due to matrix interference: 350053033 (CAPU-14-79416).

**Sample Re-analysis**

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

**Miscellaneous Information**

**Data Exception (DER) Documentation**

The following DER was generated for this SDG: 1303709. 1203104838 (CAPU-14-79434).

**Additional Comments**

Additional comments were not required for this SDG.

**Electronic Packaging Comment**

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

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

### **Method/Analysis Information**

<b>Product:</b>	<b>Total Phosphorus</b>		
<b>Analytical Batch:</b>	1394297	<b>Method:</b>	EPA 365.4 Phosphorus and Total in
<b>Prep Batch :</b>	1394295	<b>Method:</b>	EEPA 365.4 Prep

### **Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
350053006	CAPU-14-79436
350053014	CAPU-14-79439
350053019	CAPU-14-79413
350053033	CAPU-14-79416
1203104869	Method Blank (MB)
1203104870	349932001(WST09-14-74376) Sample Duplicate (DUP)
1203104873	349932001(WST09-14-74376) Matrix Spike (MS)
1203104876	Laboratory Control Sample (LCS)

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

### **SOP Reference**

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

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

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

### **Calibration Information**

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

### **Continuing Calibration Blanks**

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

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

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

**Y Intercept Rule**

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

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

The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**

The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**

The following sample was selected for QC analysis: 349932001 (WST09-14-74376).

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

The spike recovery falls outside of the established acceptance limits due to matrix interference: 1203104873 (WST09-14-74376).

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

The values for the sample and duplicate are less than the Practical Quantitation Limit (PQL); therefore, the RPD is not applicable. 1203104870 (WST09-14-74376).

**Technical Information**

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

**Holding Times**

All samples in this SDG met the specified holding time.

**Sample Preservation/Integrity**

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

**Sample Dilutions**

The samples in this SDG did not require dilutions.

**Sample Re-analysis**

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

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

The following DER was generated for this SDG: 1302939. 1203104873 (WST09-14-74376).

**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:** 1394315

**Method:** EPA 160.1 Solids and Dissolved-F

### **Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
350053006	CAPU-14-79436
350053014	CAPU-14-79439
350053019	CAPU-14-79413
350053033	CAPU-14-79416
1203104926	Method Blank (MB)
1203104927	350053019(CAPU-14-79413) Sample Duplicate (DUP)
1203104929	Laboratory Control Sample (LCS)

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

### **SOP Reference**

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

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

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

### **Calibration Information**

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

### **Initial Calibration**

All initial calibration requirements have been met for this SDG.

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

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

The MB analyzed with this SDG met the acceptance criteria.

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

The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**

The following sample was selected for QC analysis: 350053019 (CAPU-14-79413).

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

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

**Technical Information**

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

**Holding Times**

All samples in this SDG met the specified holding time.

**Sample Dilutions**

The samples in this SDG did not require dilutions.

**Sample Re-analysis**

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

**Sample Aliquot**

A sufficient amount of sample was provided by the client for analysis.

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

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

**Additional Comments**

Additional comments were not required for this SDG.

**Electronic Packaging Comment**

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

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

### **Method/Analysis Information**

**Product:** Specific Conductivity

**Analytical Batch:** 1397102

**Method:** EPA120.1 Specific Conductivity

### **Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
350053006	CAPU-14-79436
350053014	CAPU-14-79439
350053019	CAPU-14-79413
350053033	CAPU-14-79416
1203112083	350053014(CAPU-14-79439) Sample Duplicate (DUP)
1203112084	Laboratory Control Sample (LCS)

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

### **SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-009 REV# 11.

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

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

### **Calibration Information**

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

### **Initial Standardization**

The titrant was properly standardized

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

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

The LCS spike recovery met the acceptance limits.

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

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



### **Technical Information**

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

### **Sample Dilutions**

The samples in this SDG did not require dilutions.

### **Sample Re-analysis**

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

### **Miscellaneous Information**

### **Data Exception (DER) Documentation**

Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents.

### **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:** 1395344 **Method:** EPA 150.1 pH

### **Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
350053006	CAPU-14-79436
350053014	CAPU-14-79439
350053019	CAPU-14-79413
350053033	CAPU-14-79416
1203107683	349927006(CAPU-14-79434) Sample Duplicate (DUP)
1203107686	Laboratory Control Sample (LCS)

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

### **SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-008 REV# 21.

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

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

### **Calibration Information**

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

### **Initial Standardization**

The titrant was properly standardized

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

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

The LCS spike recovery met the acceptance limits.

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

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

### **Technical Information**

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

### **Sample Dilutions**

The samples in this SDG did not require dilutions.

### **Sample Re-analysis**

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

### **Miscellaneous Information**

#### **Data Exception (DER) Documentation**

The following DER was generated for this SDG: 1304724, 1203107683 (CAPU-14-79434), 350053006 (CAPU-14-79436), 350053014 (CAPU-14-79439), 350053019 (CAPU-14-79413) and 350053033 (CAPU-14-79416).

### **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:** 1396238      **Method:** EPA 310.1 Total Alkalinity

### **Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
350053006	CAPU-14-79436
350053014	CAPU-14-79439
350053019	CAPU-14-79413
350053033	CAPU-14-79416
1203109960	Method Blank (MB)
1203109963	350053014(CAPU-14-79439) Sample Duplicate (DUP)
1203109965	350053014(CAPU-14-79439) Matrix Spike (MS)
1203109966	Laboratory Control Sample (LCS)

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

### **SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-033 REV# 11.

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

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

### **Calibration Information**

The Titration and Ion analysis was performed on a manually operated buret.

### **Initial Standardization**

The titrant was properly standardized

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

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

The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**

The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**

The following sample was selected for QC analysis: 350053014 (CAPU-14-79439).

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

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

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

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

**Technical Information**

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

**Holding Times**

All samples in this SDG met the specified holding time.

**Sample Dilutions**

The samples in this SDG did not require dilutions.

**Sample Re-analysis**

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

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

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

**Additional Comments**

Additional comments were not required for this SDG.

**Electronic Packaging Comment**

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

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

**Certification Statement**

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

**Review Validation:**

GEL requires all analytical data to be verified by a qualified data validator. In addition, all data designated for CLP or CLP-like packaging will receive a third level validation upon completion of the data package.

**The following data validator verified the information presented in this case narrative:**

Reviewer:



Date:

02July14

# **Sample Data Summary**

## GEL LABORATORIES LLC

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

### Certificate of Analysis Report for

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

Client SDG: 2014-3494 GEL Work Order: 350053

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

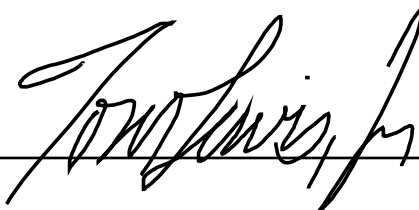
- \* A quality control analyte recovery is outside of specified acceptance criteria
- \*\* Analyte is a Tracer compound
- \*\* Analyte is a surrogate compound
- E Concentration of the target analyte exceeds the instrument calibration range
- H Analytical holding time was exceeded
- J Value is estimated
- U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

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 Certificate of Analysis.

The designation ND, if present, appears in the result column when the analyte concentration is not detected above the limit as defined in the 'U' qualifier above.

This data report has been prepared and reviewed in accordance with GEL Laboratories LLC standard operating procedures. Please direct any questions to your Project Manager, Valerie Davis.

Reviewed by





# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: July 1, 2014

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

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

Client SDG: 2014-3494

Client Sample ID: CAPU-14-79428  
Sample ID: 350053003  
Matrix: W  
Collect Date: 03-JUN-14 11:21  
Receive Date: 05-JUN-14  
Collector: Client

Project: ESHL00714  
Client ID: ARSL004

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Carbon Analysis											
SW 9060 Total Organic Carbon "As Received"											
Total Organic Carbon Average	J	0.448	0.330	1.00	mg/L	1	TSM	06/19/14	2026	1394347	1
Flow Injection Analysis											
WSP-CN(T) "As Received"											
Cyanide, Total	U	ND	1.67	5.00	ug/L	1	AXH3	06/09/14	1326	1393812	2
Nutrient Analysis											
Nitrogen, Total Kjeldahl (TKN) "As Received"											
Nitrogen, Total Kjeldahl	J	0.064	0.033	0.100	mg/L	1	KLP1	06/11/14	1300	1394292	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 335.4	EPA 335.4 Total Cyanide	AXH3	06/09/14	0924	1393811
EPA 351.2 Prep	EPA 351.2 Total Kjeldahl Nitrogen Prep	KLP1	06/10/14	1600	1394290

The following Analytical Methods were performed:

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

Notes:

# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: July 1, 2014

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

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

Client SDG: 2014-3494

Client Sample ID: CAPU-14-79436  
Sample ID: 350053006  
Matrix: W  
Collect Date: 03-JUN-14 11:21  
Receive Date: 05-JUN-14  
Collector: Client

Project: ESHL00714  
Client ID: ARSL004

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography											
EPA 300.0 Anions Liquid 28 day "As Received"											
Bromide	U	ND	0.067	0.200	mg/L	1	RXB5	06/11/14	0041	1393647	1
Chloride		8.31	0.067	0.200	mg/L	1					
Fluoride		0.403	0.033	0.100	mg/L	1					
Sulfate		8.12	0.133	0.400	mg/L	1					
Nutrient Analysis											
EPA 350.1 Nitrogen, Ammonia L "As Received"											
Nitrogen, Ammonia	J	0.0274	0.017	0.050	mg/L	1	KLP1	06/12/14	1421	1394294	2
EPA 353.2 Nitrogen, Nitrate/Nitrite "As Received"											
Nitrogen, Nitrate/Nitrite		0.341	0.017	0.050	mg/L	1	KLP1	06/12/14	1054	1394285	3
EPA 365.4 Phosphorus, Total in "As Received"											
Phosphorus, Total as P	U	ND	0.017	0.050	mg/L	1	KLP1	06/11/14	0951	1394297	4
Solids Analysis											
EPA 160.1 Solids, Dissolved-F "As Received"											
Total Dissolved Solids		160	3.40	14.3	mg/L		MXB3	06/09/14	1332	1394315	5
Titration and Ion Analysis											
EPA 150.1 pH "As Received"											
pH at Temp 21.7C	H	8.29	0.010	0.100	SU	1	PXO1	06/12/14	2011	1395344	6
EPA 310.1 Total Alkalinity "As Received"											
Alkalinity, Total as CaCO3		105	0.725	1.00	mg/L		PXO1	06/17/14	1202	1396238	7
Carbonate alkalinity (CaCO3)	U	ND	0.725	1.00	mg/L						
EPA120.1 Specific Conductivity "As Received"											
Conductivity		248	1.00	1.00	umhos/cm	1	EXM3	06/19/14	1523	1397102	8

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 350.2 Prep	EPA 350.1 Ammonia Nitrogen Prep	KLP1	06/12/14	1229	1394293
EPA 365.4 Prep	EPA 365.4 Phosphorus, Total in liquid PR	KLP1	06/10/14	1600	1394295

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## Certificate of Analysis

Report Date: July 1, 2014

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

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

Client SDG: 2014-3494

Client Sample ID: CAPU-14-79436  
Sample ID: 350053006

Project: ESHL00714  
Client ID: ARSL004

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	
5	EPA 160.1	
6	EPA 150.1	
7	EPA 310.1	
8	EPA 120.1	

**Notes:**

# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: July 1, 2014

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

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

Client SDG: 2014-3494

Client Sample ID: CAPU-14-79431  
Sample ID: 350053011  
Matrix: W  
Collect Date: 03-JUN-14 11:48  
Receive Date: 05-JUN-14  
Collector: Client

Project: ESHL00714  
Client ID: ARSL004

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Carbon Analysis											
SW 9060 Total Organic Carbon "As Received"											
Total Organic Carbon Average	U	ND	0.330	1.00	mg/L	1	TSM	06/19/14	2059	1394347	1
Flow Injection Analysis											
WSP-CN(T) "As Received"											
Cyanide, Total	U	ND	1.67	5.00	ug/L	1	AXH3	06/09/14	1329	1393812	2
Nutrient Analysis											
Nitrogen, Total Kjeldahl (TKN) "As Received"											
Nitrogen, Total Kjeldahl	J	0.0658	0.033	0.100	mg/L	1	KLP1	06/11/14	1301	1394292	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 335.4	EPA 335.4 Total Cyanide	AXH3	06/09/14	0924	1393811
EPA 351.2 Prep	EPA 351.2 Total Kjeldahl Nitrogen Prep	KLP1	06/10/14	1600	1394290

The following Analytical Methods were performed:

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

Notes:

# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: July 1, 2014

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

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

Client SDG: 2014-3494

Client Sample ID: CAPU-14-79439  
Sample ID: 350053014  
Matrix: W  
Collect Date: 03-JUN-14 11:48  
Receive Date: 05-JUN-14  
Collector: Client

Project: ESHL00714  
Client ID: ARSL004

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography											
EPA 300.0 Anions Liquid 28 day "As Received"											
Bromide	U	ND	0.067	0.200	mg/L	1	RXB5	06/11/14	0111	1393647	1
Chloride		5.89	0.067	0.200	mg/L	1					
Fluoride		0.832	0.033	0.100	mg/L	1					
Sulfate		4.79	0.133	0.400	mg/L	1					
Nutrient Analysis											
EPA 350.1 Nitrogen, Ammonia L "As Received"											
Nitrogen, Ammonia	J	0.0353	0.017	0.050	mg/L	1	KLP1	06/12/14	1422	1394294	2
EPA 353.2 Nitrogen, Nitrate/Nitrite "As Received"											
Nitrogen, Nitrate/Nitrite		1.21	0.017	0.050	mg/L	1	KLP1	06/12/14	1056	1394285	3
EPA 365.4 Phosphorus, Total in "As Received"											
Phosphorus, Total as P	U	ND	0.017	0.050	mg/L	1	KLP1	06/11/14	0952	1394297	4
Solids Analysis											
EPA 160.1 Solids, Dissolved-F "As Received"											
Total Dissolved Solids		140	3.40	14.3	mg/L		MXB3	06/09/14	1332	1394315	5
Titration and Ion Analysis											
EPA 150.1 pH "As Received"											
pH at Temp 21.6C	H	8.24	0.010	0.100	SU	1	PXO1	06/12/14	2020	1395344	6
EPA 310.1 Total Alkalinity "As Received"											
Alkalinity, Total as CaCO3		72.1	0.725	1.00	mg/L		PXO1	06/17/14	1209	1396238	7
Carbonate alkalinity (CaCO3)	U	ND	0.725	1.00	mg/L						
EPA120.1 Specific Conductivity "As Received"											
Conductivity		180	1.00	1.00	umhos/cm	1	EXM3	06/19/14	1524	1397102	8

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 350.2 Prep	EPA 350.1 Ammonia Nitrogen Prep	KLP1	06/12/14	1229	1394293
EPA 365.4 Prep	EPA 365.4 Phosphorus, Total in liquid PR	KLP1	06/10/14	1600	1394295

# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: July 1, 2014

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

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

Client SDG: 2014-3494

Client Sample ID: CAPU-14-79439

Sample ID: 350053014

Project: ESHL00714

Client ID: ARSL004

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	
5	EPA 160.1	
6	EPA 150.1	
7	EPA 310.1	
8	EPA 120.1	

**Notes:**

# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: July 1, 2014

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

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

Client SDG: 2014-3494

Client Sample ID: CAPU-14-79413  
Sample ID: 350053019  
Matrix: W  
Collect Date: 03-JUN-14 13:48  
Receive Date: 05-JUN-14  
Collector: Client

Project: ESHL00714  
Client ID: ARSL004

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
<b>Carbon Analysis</b>											
<b>SW 9060 Total Organic Carbon "As Received"</b>											
Total Organic Carbon Average	U	ND	0.330	1.00	mg/L	1	TSM	06/19/14	2133	1394347	1
<b>Flow Injection Analysis</b>											
<b>WSP-CN(T) "As Received"</b>											
Cyanide, Total	U	ND	1.67	5.00	ug/L	1	AXH3	06/09/14	1330	1393812	2
<b>Ion Chromatography</b>											
<b>EPA 300.0 Anions Liquid 28 day "As Received"</b>											
Bromide	U	ND	0.067	0.200	mg/L	1	RXB5	06/11/14	0141	1393647	3
Chloride	U	ND	0.067	0.200	mg/L	1					
Fluoride	U	ND	0.033	0.100	mg/L	1					
Sulfate	U	ND	0.133	0.400	mg/L	1					
<b>Nutrient Analysis</b>											
<b>EPA 350.1 Nitrogen, Ammonia L "As Received"</b>											
Nitrogen, Ammonia	U	ND	0.017	0.050	mg/L	1	KLP1	06/12/14	1427	1394294	4
<b>EPA 353.2 Nitrogen, Nitrate/Nitrite "As Received"</b>											
Nitrogen, Nitrate/Nitrite		0.0631	0.017	0.050	mg/L	1	KLP1	06/12/14	1057	1394285	5
<b>EPA 365.4 Phosphorus, Total in "As Received"</b>											
Phosphorus, Total as P	U	ND	0.017	0.050	mg/L	1	KLP1	06/11/14	0952	1394297	6
<b>Nitrogen, Total Kjeldahl (TKN) "As Received"</b>											
Nitrogen, Total Kjeldahl	U	ND	0.033	0.100	mg/L	1	KLP1	06/11/14	1302	1394292	7
<b>Solids Analysis</b>											
<b>EPA 160.1 Solids, Dissolved-F "As Received"</b>											
Total Dissolved Solids	U	ND	3.40	14.3	mg/L		MXB3	06/09/14	1332	1394315	8
<b>Titration and Ion Analysis</b>											
<b>EPA 150.1 pH "As Received"</b>											
pH at Temp 22.0C	H	6.27	0.010	0.100	SU	1	PXO1	06/12/14	2023	1395344	9
<b>EPA 310.1 Total Alkalinity "As Received"</b>											
Alkalinity, Total as CaCO3	U	ND	0.725	1.00	mg/L		PXO1	06/17/14	1226	1396238	10
Carbonate alkalinity (CaCO3)	U	ND	0.725	1.00	mg/L						
<b>EPA120.1 Specific Conductivity "As Received"</b>											
Conductivity		1.36	1.00	1.00	umhos/cm	1	EXM3	06/19/14	1527	1397102	11

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
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## Certificate of Analysis

Report Date: July 1, 2014

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

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

Client SDG: 2014-3494

Client Sample ID: CAPU-14-79413  
Sample ID: 350053019

Project: ESHL00714  
Client ID: ARSL004

EPA 335.4	EPA 335.4 Total Cyanide	AXH3	06/09/14	0924	1393811
EPA 350.2 Prep	EPA 350.1 Ammonia Nitrogen Prep	KLP1	06/12/14	1229	1394293
EPA 351.2 Prep	EPA 351.2 Total Kjeldahl Nitrogen Prep	KLP1	06/10/14	1600	1394290
EPA 365.4 Prep	EPA 365.4 Phosphorus, Total in liquid PR	KLP1	06/10/14	1600	1394295

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 9060	
2	EPA 335.4	
3	EPA 300.0	
4	EPA 350.1	
5	EPA 353.2	
6	EPA 365.4	
7	EPA 351.2	
8	EPA 160.1	
9	EPA 150.1	
10	EPA 310.1	
11	EPA 120.1	

Notes:



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## Certificate of Analysis

Report Date: July 1, 2014

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

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

Client SDG: 2014-3494

Client Sample ID: CAPU-14-79415  
Sample ID: 350053030  
Matrix: W  
Collect Date: 03-JUN-14 11:48  
Receive Date: 05-JUN-14  
Collector: Client

Project: ESHL00714  
Client ID: ARSL004

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Carbon Analysis											
SW 9060 Total Organic Carbon "As Received"											
Total Organic Carbon Average	U	ND	0.330	1.00	mg/L	1	TSM	06/19/14	2206	1394347	1
Flow Injection Analysis											
WSP-CN(T) "As Received"											
Cyanide, Total	U	ND	1.67	5.00	ug/L	1	AXH3	06/09/14	1331	1393812	2
Nutrient Analysis											
Nitrogen, Total Kjeldahl (TKN) "As Received"											
Nitrogen, Total Kjeldahl	U	ND	0.033	0.100	mg/L	1	KLP1	06/11/14	1303	1394292	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 335.4	EPA 335.4 Total Cyanide	AXH3	06/09/14	0924	1393811
EPA 351.2 Prep	EPA 351.2 Total Kjeldahl Nitrogen Prep	KLP1	06/10/14	1600	1394290

The following Analytical Methods were performed:

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

Notes:

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## Certificate of Analysis

Report Date: July 1, 2014

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

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

Client SDG: 2014-3494

Client Sample ID: CAPU-14-79416  
Sample ID: 350053033  
Matrix: W  
Collect Date: 03-JUN-14 11:48  
Receive Date: 05-JUN-14  
Collector: Client

Project: ESHL00714  
Client ID: ARSL004

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography											
EPA 300.0 Anions Liquid 28 day "As Received"											
Bromide	U	ND	0.067	0.200	mg/L	1	RXB5	06/11/14	0211	1393647	1
Chloride		5.91	0.067	0.200	mg/L	1					
Fluoride		0.909	0.033	0.100	mg/L	1					
Sulfate		4.76	0.133	0.400	mg/L	1					
Nutrient Analysis											
EPA 350.1 Nitrogen, Ammonia L "As Received"											
Nitrogen, Ammonia	U	ND	0.017	0.050	mg/L	1	KLP1	06/12/14	1428	1394294	2
EPA 353.2 Nitrogen, Nitrate/Nitrite "As Received"											
Nitrogen, Nitrate/Nitrite		1.17	0.085	0.250	mg/L	5	KLP1	06/12/14	1058	1394285	3
EPA 365.4 Phosphorus, Total in "As Received"											
Phosphorus, Total as P	U	ND	0.017	0.050	mg/L	1	KLP1	06/11/14	0953	1394297	4
Solids Analysis											
EPA 160.1 Solids, Dissolved-F "As Received"											
Total Dissolved Solids		123	3.40	14.3	mg/L		MXB3	06/09/14	1332	1394315	5
Titration and Ion Analysis											
EPA 150.1 pH "As Received"											
pH at Temp 21.3C	H	8.22	0.010	0.100	SU	1	PXO1	06/12/14	2038	1395344	6
EPA 310.1 Total Alkalinity "As Received"											
Alkalinity, Total as CaCO3		71.6	0.725	1.00	mg/L		PXO1	06/17/14	1230	1396238	7
Carbonate alkalinity (CaCO3)	U	ND	0.725	1.00	mg/L						
EPA120.1 Specific Conductivity "As Received"											
Conductivity		186	1.00	1.00	umhos/cm	1	EXM3	06/19/14	1527	1397102	8

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 350.2 Prep	EPA 350.1 Ammonia Nitrogen Prep	KLP1	06/12/14	1229	1394293
EPA 365.4 Prep	EPA 365.4 Phosphorus, Total in liquid PR	KLP1	06/10/14	1600	1394295

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## Certificate of Analysis

Report Date: July 1, 2014

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

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

Client SDG: 2014-3494

Client Sample ID: CAPU-14-79416  
Sample ID: 350053033

Project: ESHL00714  
Client ID: ARSL004

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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	
5	EPA 160.1	
6	EPA 150.1	
7	EPA 310.1	
8	EPA 120.1	

**Notes:**

# **Quality Control Summary**

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## QC Summary

Report Date: July 1, 2014

Page 1 of 5

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

Contact: Mr. Keith Greene

Workorder: 350053

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Carbon Analysis</b>											
Batch	1394347										
QC1203105822	350260005	DUP									
Total Organic Carbon Average	U	ND	U	ND	mg/L	N/A			TSM	06/20/14	01:07
QC1203105823	350053030	DUP									
Total Organic Carbon Average	U	ND	U	ND	mg/L	N/A				06/19/14	22:40
QC1203112489	350748001	DUP									
Total Organic Carbon Average	J	0.439	J	0.426	mg/L	3.01	^	(+/-1.00)		06/20/14	04:59
QC1203105826	LCS										
Total Organic Carbon Average	10.0			9.92	mg/L			99.2	(85%-115%)	06/19/14	19:10
QC1203105820	MB										
Total Organic Carbon Average			U	ND	mg/L					06/19/14	19:01
QC1203105824	350260005	PS									
Total Organic Carbon Average	10.0	U	ND	10.5	mg/L			103	(65%-120%)	06/20/14	01:27
QC1203105825	350053030	PS									
Total Organic Carbon Average	10.0	U	ND	10.4	mg/L			102	(65%-120%)	06/19/14	23:00
QC1203112490	350748001	PS									
Total Organic Carbon Average	10.0	J	0.439	10.7	mg/L			103	(65%-120%)	06/20/14	05:19
<b>Flow Injection Analysis</b>											
Batch	1393812										
QC1203103654	350053003	DUP									
Cyanide, Total	U	ND	U	ND	ug/L	N/A			AXH3	06/09/14	13:27
QC1203103660	LCS										
Cyanide, Total	50.0			51.2	ug/L			102	(90%-110%)	06/09/14	13:15
QC1203103653	MB										
Cyanide, Total			U	ND	ug/L					06/09/14	13:14
QC1203103657	350053003	MS									
Cyanide, Total	100	U	ND	103	ug/L			103	(90%-110%)	06/09/14	13:28
<b>Ion Chromatography</b>											
Batch	1393647										
QC1203103275	350053033	DUP									
Bromide	U	ND	U	ND	mg/L	N/A			RXB5	06/11/14	02:40

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## QC Summary

Workorder: 350053

Page 2 of 5

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Ion Chromatography</b>											
Batch	1393647										
Chloride		5.91		5.95	mg/L	0.720		(0%-20%)			
Fluoride		0.909		0.911	mg/L	0.209		(0%-20%)	RXB5	06/11/14	02:40
Sulfate		4.76		4.77	mg/L	0.0986		(0%-20%)			
QC1203103277	LCS										
Bromide	1.25			1.33	mg/L		106	(90%-110%)		06/10/14	23:11
Chloride	5.00			4.93	mg/L		98.6	(90%-110%)			
Fluoride	2.50			2.55	mg/L		102	(90%-110%)			
Sulfate	10.0			10.3	mg/L		103	(90%-110%)			
QC1203103274	MB										
Bromide			U	ND	mg/L					06/10/14	22:41
Chloride			U	ND	mg/L						
Fluoride			U	ND	mg/L						
Sulfate			U	ND	mg/L						
QC1203103276	350053033	PS									
Bromide	1.25	U	ND	1.42	mg/L		113 *	(90%-110%)		06/11/14	03:10
Chloride	5.00		5.91	11.8	mg/L		118 *	(90%-110%)			
Fluoride	2.50		0.909	3.57	mg/L		106	(90%-110%)			
Sulfate	10.0		4.76	15.7	mg/L		109	(90%-110%)			
<b>Nutrient Analysis</b>											
Batch	1394285										
QC1203104835	349927006	DUP									
Nitrogen, Nitrate/Nitrite			4.01	3.74	mg/L	6.97		(0%-20%)	KLP1	06/12/14	10:43
QC1203107052	350260006	DUP									
Nitrogen, Nitrate/Nitrite			0.478	0.480	mg/L	0.418		(0%-20%)		06/12/14	11:25
QC1203104840	LCS										
Nitrogen, Nitrate/Nitrite	1.00			1.00	mg/L		100	(90%-110%)		06/12/14	10:40
QC1203104833	MB										
Nitrogen, Nitrate/Nitrite			U	ND	mg/L					06/12/14	10:39

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## QC Summary

Workorder: 350053

Page 3 of 5

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Nutrient Analysis</b>											
Batch	1394285										
QC1203104838	349927006	PS									
Nitrogen, Nitrate/Nitrite	1.00	0.401		1.52	mg/L		112 *	(90%-110%)	KLP1	06/12/14	10:44
QC1203107053	350260006	PS									
Nitrogen, Nitrate/Nitrite	1.00	0.478		1.44	mg/L		96.2	(90%-110%)		06/12/14	11:26
Batch	1394292										
QC1203104858	350137001	DUP									
Nitrogen, Total Kjeldahl	J	0.0605	J	0.0372	mg/L	47.7 ^		(+/-0.100)	KLP1	06/11/14	13:06
QC1203106955	350260005	DUP									
Nitrogen, Total Kjeldahl		0.145	U	ND	mg/L	145* ^		(+/-0.100)		06/11/14	13:13
QC1203104857	LCS										
Nitrogen, Total Kjeldahl	1.00			1.07	mg/L		107	(90%-110%)		06/11/14	12:54
QC1203104856	MB										
Nitrogen, Total Kjeldahl			J	0.0621	mg/L					06/11/14	12:53
QC1203104859	350137001	MS									
Nitrogen, Total Kjeldahl	1.00	J	0.0605	1.06	mg/L		100	(90%-110%)		06/11/14	13:07
QC1203106956	350260005	MS									
Nitrogen, Total Kjeldahl	1.00	0.145		1.16	mg/L		102	(90%-110%)		06/11/14	13:14
Batch	1394294										
QC1203104864	350137006	DUP									
Nitrogen, Ammonia		0.0958		0.116	mg/L	19.1 ^		(+/-0.050)	KLP1	06/12/14	14:30
QC1203107049	350260006	DUP									
Nitrogen, Ammonia		0.176		0.202	mg/L	13.8 ^		(+/-0.050)		06/12/14	14:53
QC1203104861	LCS										
Nitrogen, Ammonia	1.00			1.00	mg/L		100	(90%-110%)		06/12/14	14:16
QC1203104860	MB										
Nitrogen, Ammonia			U	ND	mg/L					06/12/14	14:26
QC1203104865	350137006	MS									
Nitrogen, Ammonia	1.00	0.0958		1.13	mg/L		103	(90%-110%)		06/12/14	14:30
QC1203107050	350260006	MS									
Nitrogen, Ammonia	1.00	0.176		1.10	mg/L		92.4	(90%-110%)		06/12/14	14:41
Batch	1394297										
QC1203104870	349932001	DUP									

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## QC Summary

Workorder: 350053

Page 4 of 5

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Nutrient Analysis</b>											
Batch	1394297										
Phosphorus, Total as P		U	ND	U	ND	mg/L	N/A		KLP1	06/11/14	09:36
QC1203104876 LCS	1.00				1.01	mg/L	101	(79%-126%)		06/11/14	09:34
Phosphorus, Total as P											
QC1203104869 MB			U		ND	mg/L				06/11/14	09:33
Phosphorus, Total as P											
QC1203104873 349932001 MS	1.00	U	ND		1.74	mg/L	173 *	(64%-134%)		06/11/14	09:37
Phosphorus, Total as P											
<b>Solids Analysis</b>											
Batch	1394315										
QC1203104927 350053019 DUP											
Total Dissolved Solids		U	ND	U	ND	mg/L	N/A		MXB3	06/09/14	13:32
QC1203104929 LCS	300				287	mg/L	95.7	(95%-105%)		06/09/14	13:32
Total Dissolved Solids											
QC1203104926 MB			U		ND	mg/L				06/09/14	13:32
Total Dissolved Solids											
<b>Titration and Ion Analysis</b>											
Batch	1395344										
QC1203107683 349927006 DUP											
pH		H	8.03	H	8.02	SU	0.125	(0%-10%)	PXO1	06/12/14	19:51
QC1203107686 LCS	7.00				7.01	SU	100	(99%-101%)		06/12/14	19:26
pH											
Batch	1396238										
QC1203109963 350053014 DUP											
Alkalinity, Total as CaCO3			72.1		71.6	mg/L	0.712	(0%-20%)	PXO1	06/17/14	12:12
Carbonate alkalinity (CaCO3)		U	ND	U	ND	mg/L	N/A				
QC1203109966 LCS	50.0				51.7	mg/L	103	(90%-110%)		06/17/14	11:26
Alkalinity, Total as CaCO3											
QC1203109960 MB			U		ND	mg/L				06/17/14	11:26
Alkalinity, Total as CaCO3											
Carbonate alkalinity (CaCO3)			U		ND	mg/L					
QC1203109965 350053014 MS	50.0		72.1		122	mg/L	100	(80%-120%)		06/17/14	12:20
Alkalinity, Total as CaCO3											



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## QC Summary

Workorder: 350053

Page 5 of 5

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Titration and Ion Analysis</b>											
Batch	1397102										
QC1203112083	350053014	DUP									
Conductivity		180		181	umhos/cm	0.719		(0%-10%)	EXM3	06/19/14	15:26
QC1203112084	LCS										
Conductivity	1410			1340	umhos/cm		95.1	(95%-105%)		06/19/14	15:21

### Notes:

- < Result is less than value reported
- > Result is greater than value reported
- B The target analyte was detected in the associated blank.
- E General Chemistry--Concentration of the target analyte exceeds the instrument calibration range
- H Analytical holding time was exceeded
- J Value is estimated
- N/A RPD or %Recovery limits do not apply.
- N1 See case narrative
- ND Analyte concentration is not detected above the detection limit
- NJ Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Q One or more quality control criteria have not been met. Refer to the applicable narrative or DER.
- R Per section 9.3.4.1 of Method 1664 Revision B, due to matrix spike recovery issues, this result may not be reported or used for regulatory compliance purposes.
- R Sample results are rejected
- U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Z Paint Filter Test--Particulates passed through the filter, however no free liquids were observed.
- ^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry.
- d 5-day BOD--The 2:1 depletion requirement was not met for this sample
- e 5-day BOD--Test replicates show more than 30% difference between high and low values. The data is qualified per the method and can be used for reporting purposes
- h Preparation or preservation holding time was exceeded

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

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

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

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

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

# Miscellaneous

DATA EXCEPTION REPORT			
<b>Mo.Day Yr.</b> 11-JUN-14	<b>Division:</b> Industrial	<b>Quality Criteria:</b> Specifications	<b>Type:</b> Process
<b>Instrument Type:</b> LACHAT Flow Injection Analyzer	<b>Test / Method:</b> EPA 365.4	<b>Matrix Type:</b> Liquid	<b>Client Code:</b> ALBR, BRKL, CBMW, ECWS,
<b>Batch ID:</b> 1394297	<b>Sample Numbers:</b> See Below		
<b>Potentially affected work order(s)(SDG):</b> 349932(2014-3483),350018,350034(X406037),350053(2014-3494),350074(34668),350075,350079,350080,350088,350137(2014-3500),350262(X406074) <b>Application Issues:</b> Failed Recovery for MS/PS			
<b>Specification and Requirements</b>		<b>DER Disposition:</b>	
<b>Exception Description:</b>			
1. Failed Recovery for MS/PS: QC 1203104873MS		1. The spike recovery falls outside of the established acceptance limits due to matrix interference.	

**Originator's Name:**  
Kristen Parson 11-JUN-14

**Data Validator/Group Leader:**  
Aubrey Kingsbury 11-JUN-14

DATA EXCEPTION REPORT

<b>Mo.Day Yr.</b> 11-JUN-14	<b>Division:</b> Industrial	<b>Quality Criteria:</b> Specifications	<b>Type:</b> Process
<b>Instrument Type:</b> LACHAT Flow Injection Analyzer	<b>Test / Method:</b> EPA 351.2, EPA 351.2 SC	<b>Matrix Type:</b> Liquid	<b>Client Code:</b> ESHL
<b>Batch ID:</b> 1394292	<b>Sample Numbers:</b> See Below		
<b>Potentially affected work order(s)(SDG):</b> 349927(2014-3481),350053(2014-3494),350137(2014-3500),350260(2014-3510) <b>Application Issues:</b> Failed RPD for DUP			
<b>Specification and Requirements Exception Description:</b>		<b>DER Disposition:</b>	
1. Failed RPD for DUP:  QC 1203106955DUP		1. The Relative Percent Difference (RPD) between the sample and duplicate falls outside of the established acceptance limits because of the heterogeneous matrix of the sample.	

**Originator's Name:**

Kristen Parson 11-JUN-14

**Data Validator/Group Leader:**

Aubrey Kingsbury 11-JUN-14

DATA EXCEPTION REPORT			
<b>Mo.Day Yr.</b> 12-JUN-14	<b>Division:</b> Industrial	<b>Quality Criteria:</b> Specifications	<b>Type:</b> Process
<b>Instrument Type:</b> IC	<b>Test / Method:</b> EPA 300.0	<b>Matrix Type:</b> Liquid	<b>Client Code:</b> ESHL
<b>Batch ID:</b> 1393647	<b>Sample Numbers:</b> See Below		
<b>Potentially affected work order(s)(SDG):</b> 349927(2014-3481),350053(2014-3494),350137(2014-3500) <b>Application Issues:</b> Failed Recovery for MS/PS			
<b>Specification and Requirements Exception Description:</b>		<b>DER Disposition:</b>	
1. Failed Recovery for MS/PS:  QC 1203103276PS		1. The spike recovery falls outside of the GEL acceptance limits for chloride and bromide but within the client specified limits.	

**Originator's Name:**  
Rachael Bell 12-JUN-14

**Data Validator/Group Leader:**  
Thomas Lewis 01-JUL-14

DATA EXCEPTION REPORT			
<b>Mo.Day Yr.</b> 12-JUN-14	<b>Division:</b> Industrial	<b>Quality Criteria:</b> Specifications	<b>Type:</b> Process
<b>Instrument Type:</b> LACHAT Flow Injection Analyzer	<b>Test / Method:</b> EPA 353.2	<b>Matrix Type:</b> Liquid	<b>Client Code:</b> ESHL
<b>Batch ID:</b> 1394285	<b>Sample Numbers:</b> See Below		
<b>Potentially affected work order(s)(SDG):</b> 349927(2014-3481),350053(2014-3494),350137(2014-3500),350260(2014-3510) <b>Application Issues:</b> Failed Recovery for MS/PS			
<b>Specification and Requirements Exception Description:</b>		<b>DER Disposition:</b>	
1. Failed Recovery for MS/PS: QC   1203104838PS		1. The spike recovery falls outside of the GEL acceptance limits but within the client specified limits.	

**Originator's Name:**  
Kristen Parson      12-JUN-14

**Data Validator/Group Leader:**  
Elzbieta Szulc      12-JUN-14

DATA EXCEPTION REPORT			
<b>Mo.Day Yr.</b> 12-JUN-14	<b>Division:</b> Industrial	<b>Quality Criteria:</b> Specifications	<b>Type:</b> Process
<b>Instrument Type:</b> LACHAT Flow Injection Analyzer	<b>Test / Method:</b> EPA 350.1	<b>Matrix Type:</b> Liquid	<b>Client Code:</b> PNTX
<b>Batch ID:</b> 1394294	<b>Sample Numbers:</b> See Below		
<b>Potentially affected work order(s)(SDG): 350053(2014-3494),350264</b> <b>Application Issues:</b> Failed Recovery for MS/PS			
<b>Specification and Requirements</b>		<b>DER Disposition:</b>	
<b>Exception Description:</b>  1. Failed Recovery for MS/PS: QC   1203105284MS		1. The spike recovery falls outside of the GEL acceptance limits but within the client specified limits.	

**Originator's Name:**  
Kristen Parson      12-JUN-14

**Data Validator/Group Leader:**  
Elzbieta Szulc      12-JUN-14

### DATA EXCEPTION REPORT

<b>Mo.Day Yr.</b> 16-JUN-14	<b>Division:</b> Industrial	<b>Quality Criteria:</b> Specifications	<b>Type:</b> Process
<b>Instrument Type:</b> ELECTRODE	<b>Test / Method:</b> EPA 150.1, SW846 9040B/9040C, SW846 9040C	<b>Matrix Type:</b> Liquid	<b>Client Code:</b> BATL, ESHL, VAER, WSRB
<b>Batch ID:</b> 1395344	<b>Sample Numbers:</b> See Below		
<p><b>Potentially affected work order(s)(SDG):</b> 349094(2014-3407),349549,349672(2014-3456),349757(2014-3466),349759(2014-3469),349927(2014-3481),349932(2014-3483),349998,350053(2014-3494),350117,350137(2014-3500)</p> <p><b>Application Issues:</b></p> <p>Container scanning event for custody missed</p> <p>Sample received out of holding</p>			
<b>Specification and Requirements</b>		<b>DER Disposition:</b>	
<b>Exception Description:</b>			
<p>1. Sample received out of holding:</p> <p>349094 002</p> <p>349549 012</p> <p>349672 002</p> <p>349757 001</p> <p>349759 001</p> <p>349927 006,014</p> <p>349932 001,002</p> <p>349998 005</p> <p>350053 006,014,019,033</p> <p>350117 001,002</p> <p>350137 006</p> <p>2. Container scanning event for custody missed: 349549 012</p>		<p>1. Samples were received and analyzed outside of method specified holding time.</p> <p>2. Sample was not scanned to the analytical batch prior to analysis; however, sample was in the analyst's custody at the time of analysis.</p>	

**Originator's Name:**

Patrick Orgel 16-JUN-14

**Data Validator/Group Leader:**

Elzbieta Szulc 17-JUN-14



# **Radiological Analysis**

**Radiochemistry Case Narrative  
ARS International, LLC (ARSL)  
SDG 2014-3494  
Work Order 350053**

**Method/Analysis Information**

**Product:** Alphaspec Am241 Liquid  
**Analytical Method:** DOE EML HASL-300, Am-05-RC Modified  
**Analytical Batch Number:** 1393676

<b>Sample ID</b>	<b>Client ID</b>
350053003	CAPU-14-79428
350053011	CAPU-14-79431
350053019	CAPU-14-79413
350053030	CAPU-14-79415
1203103309	Method Blank (MB)
1203103310	350053003(CAPU-14-79428) Sample Duplicate (DUP)
1203103311	Laboratory Control Sample (LCS)

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# 25.

**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.

**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 1203103309 (MB) and 1203103311 (LCS) were changed to 1.0 per client request.

**Designated QC**

The following sample was used for QC: 350053003 (CAPU-14-79428). The QC was from ARSL work order

350053.

**QC Information**

All of the QC samples met the required acceptance limits.

**CSU**

The blank result is less than 1.65 times the CSU.

**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 batch were recounted.

**Miscellaneous Information:**

**Data Exception (DER) Documentation**

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

**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**

The MDCs (and Lc if requested) are calculated using a blank population.

**Blank Decision Level**

The blank result is less than the decision level.

**Qualifier Information**

Manual qualifiers were not required.

**Method/Analysis Information**

<b>Product:</b>	<b>Alphaspec U, Liquid</b>
Analytical Method:	DOE EML HASL-300, U-02-RC Modified
Analytical Batch Number:	1393680

<b>Sample ID</b>	<b>Client ID</b>
350053003	CAPU-14-79428

350053011	CAPU-14-79431
350053019	CAPU-14-79413
350053030	CAPU-14-79415
1203103312	Method Blank (MB)
1203103313	350053003(CAPU-14-79428) Sample Duplicate (DUP)
1203103314	Laboratory Control Sample (LCS)

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# 25.

### **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.

#### **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 1203103312 (MB) and 1203103314 (LCS) were changed to 1.0 per client request.

#### **Designated QC**

The following sample was used for QC: 350053003 (CAPU-14-79428). The QC was from ARSL work order 350053.

#### **QC Information**

All of the QC samples met the required acceptance limits.

#### **CSU**

The blank result is less than 1.65 times the CSU.

### **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 batch were recounted.

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

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

**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**

The MDCs (and Lc if requested) are calculated using a blank population.

**Blank Decision Level**

The blank result is less than the decision level.

**Qualifier Information**

Manual qualifiers were not required.

**Method/Analysis Information**

<b>Product:</b>	<b>Alphaspec Pu, Liquid</b>
Analytical Method:	DOE EML HASL-300, Pu-11-RC Modified
Analytical Batch Number:	1393681

<b>Sample ID</b>	<b>Client ID</b>
350053003	CAPU-14-79428
350053011	CAPU-14-79431
350053019	CAPU-14-79413
350053030	CAPU-14-79415
1203103315	Method Blank (MB)
1203103316	350053003(CAPU-14-79428) Sample Duplicate (DUP)
1203103317	Laboratory Control Sample (LCS)

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# 25.

**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.

#### **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 1203103315 (MB) and 1203103317 (LCS) were changed to 1.0 per client request.

##### **Designated QC**

The following sample was used for QC: 350053003 (CAPU-14-79428). The QC was from ARSL work order 350053.

##### **QC Information**

All of the QC samples met the required acceptance limits.

##### **CSU**

The blank result is less than 1.65 times the CSU.

#### **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 batch were recounted.

#### **Miscellaneous Information:**

##### **Data Exception (DER) Documentation**

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

##### **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**

The MDCs (and Lc if requested) are calculated using a blank population.

##### **Blank Decision Level**

The blank result is less than the decision level.

#### **Qualifier Information**

Manual qualifiers were not required.

### **Method/Analysis Information**

**Product:**                      **GammaSpec**

Analytical Method:              EPA 901.1

Analytical Batch Number:      1393862

<b>Sample ID</b>	<b>Client ID</b>
350053003	CAPU-14-79428
350053011	CAPU-14-79431
350053019	CAPU-14-79413
350053030	CAPU-14-79415
1203103777	Method Blank (MB)
1203103778	350053003(CAPU-14-79428) Sample Duplicate (DUP)
1203103779	Laboratory Control Sample (LCS)

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# 25.

### **Calibration Information:**

#### **Calibration Information**

All initial and continuing calibration requirements have been met. The initial Calibrations were performed in August 2013, November 2013 and June 2014.

#### **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.

#### **Designated QC**

The following sample was used for QC: 350053003 (CAPU-14-79428). The QC was from ARSL work order 350053.

#### **QC Information**

All of the QC samples met the required acceptance limits.

**CSU**

The blank result is less than 1.65 times the CSU.

**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**

Sample 350053011 (CAPU-14-79431) was recounted to verify results. The recount is reported.

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

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

**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.

**Blank Decision Level**

The blank result is less than the decision level.

**Qualifier Information**

Manual qualifiers were not required.

**Method/Analysis Information**

**Product:** GFPC, Sr90, liquid  
**Analytical Method:** EPA 905.0 Modified  
**Analytical Batch Number:** 1395946

<b>Sample ID</b>	<b>Client ID</b>
350053003	CAPU-14-79428
350053011	CAPU-14-79431
350053019	CAPU-14-79413
350053030	CAPU-14-79415
1203109191	Method Blank (MB)
1203109192	350260005(CAPU-14-79427) Sample Duplicate (DUP)
1203109193	350260005(CAPU-14-79427) Matrix Spike (MS)
1203109194	Laboratory Control Sample (LCS)



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# 17.

#### **Calibration Information:**

##### **Calibration Information**

All initial and continuing calibration requirements have been met. The initial Calibration was performed in March 2013.

##### **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 1203109191 (MB) and 1203109194 (LCS) were changed to 1.0 per client request.

##### **Designated QC**

The following sample was used for QC: 350260005 (CAPU-14-79427). The QC was from ARSL work order 350260.

##### **QC Information**

All of the QC samples met the required acceptance limits.

##### **CSU**

The blank result is less than 1.65 times the CSU.

#### **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.

##### **Chemical Recoveries**

All chemical recoveries meet the required acceptance limits for this sample set.

##### **Recounts**

Sample 1203109192 (CAPU-14-79427) was recounted due to results more negative than the three sigma TPU. The second count is reported.

#### **Miscellaneous Information:**

##### **Data Exception (DER) Documentation**

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

**Sample-Specific MDA/MDC**

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

**Additional Comments**

The matrix spike, 1203109193 (CAPU-14-79427), aliquot was reduced to conserve sample volume.

**Blank Decision Level**

The blank result is less than the decision level.

**Qualifier Information**

Manual qualifiers were not required.

**Method/Analysis Information**

<b>Product:</b>	<b>WSP-GrossA/B</b>
Analytical Method:	EPA 900.0/SW846 9310
Analytical Batch Number:	1395947

<b>Sample ID</b>	<b>Client ID</b>
350053003	CAPU-14-79428
350053011	CAPU-14-79431
350053019	CAPU-14-79413
350053030	CAPU-14-79415
1203109195	Method Blank (MB)
1203109196	350417001(BDW08-14-79467) Sample Duplicate (DUP)
1203109197	350417001(BDW08-14-79467) Matrix Spike (MS)
1203109198	350417001(BDW08-14-79467) Matrix Spike Duplicate (MSD)
1203109199	Laboratory Control Sample (LCS)

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# 17.

**Calibration Information:****Calibration Information**

All initial and continuing calibration requirements have been met. The initial Calibration was performed in October 2013.

**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 1203109195 (MB) and 1203109199 (LCS) were changed to 1.0 per client request.

**Designated QC**

The following sample was used for QC: 350417001 (BDW08-14-79467). The QC was from ARSL work order 350417.

**QC Information**

All of the QC samples met the required acceptance limits.

**CSU**

The blank result is less than 1.65 times the CSU.

**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.

**Chemical Recoveries**

All chemical recoveries meet the required acceptance limits for this sample set.

**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**

None of the samples in this batch were recounted.

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

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

**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, 1203109197 (BDW08-14-79467) and 1203109198 (BDW08-14-79467), aliquots were reduced to conserve sample volume.

**Blank Decision Level**

The blank result is less than the decision level.

#### **Qualifier Information**

Manual qualifiers were not required.

#### **Method/Analysis Information**

**Product:** WSP-H-3  
**Analytical Method:** EPA 906.0 Modified  
**Analytical Batch Number:** 1396341

<b>Sample ID</b>	<b>Client ID</b>
350053019	CAPU-14-79413
1203110248	Method Blank (MB)
1203110249	350600001(WSTMO-14-75612) Sample Duplicate (DUP)
1203110250	350600001(WSTMO-14-75612) Matrix Spike (MS)
1203110251	Laboratory Control Sample (LCS)

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-002 REV# 21.

#### **Calibration Information:**

##### **Calibration Information**

All initial and continuing calibration requirements have been met. The initial Calibration was performed in August 2013.

##### **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.

##### **Designated QC**

The following sample was used for QC: 350600001 (WSTMO-14-75612). The QC was from ARSL work order 350600.

**QC Information**

All of the QC samples met the required acceptance limits.

**CSU**

The blank result is less than 1.65 times the CSU.

**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 batch were recounted.

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

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

**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.

**Blank Decision Level**

The blank result is less than the decision level.

**Qualifier Information**

Manual qualifiers were not required.

**Certification Statement**

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

## GEL LABORATORIES LLC

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

### Qualifier Definition Report for

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

Client SDG: 2014-3494 GEL Work Order: 350053


**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, 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:** Theresa Austin

**Date:** 01 JUL 2014

**Title:** Group Leader

# **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-03, SM271, Drop Pt. 02U, Rm111

Los Alamos, New Mexico 87545

Contact: Mr. Keith Greene

Project: LANL-WQH Groundwater Samples

Report Date: July 1, 2014

Client Sample ID: CAPU-14-79428  
Sample ID: 350053003  
Matrix: W  
Collect Date: 03-JUN-14  
Receive Date: 05-JUN-14  
Collector: Client

Project: ESHL00714  
Client ID: ARSL004

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
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### Rad Alpha Spec Analysis

*Alphaspec Am241 Liquid "As Received"*

Americium-241	U	0.00	+/-0.00654	0.0461	0.0195	+/-0.00654	0.050	pCi/L		JXD2	06/23/14	1548	1393676	1
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*Alphaspec Pu, Liquid "As Received"*

Plutonium-238	U	-0.00592	+/-0.00725	0.0327	0.0123	+/-0.00725	0.050	pCi/L		JXD2	06/23/14	1239	1393681	2
Plutonium-239/240	U	0.0385	+/-0.0122	0.0539	0.0229	+/-0.0123	0.050	pCi/L						

*Alphaspec U, Liquid "As Received"*

Uranium-234		0.910	+/-0.0534	0.0785	0.0351	+/-0.0801	1.00	pCi/L		JXD2	06/21/14	1306	1393680	3
Uranium-235/236	U	0.030	+/-0.0119	0.0658	0.0278	+/-0.012	1.00	pCi/L						
Uranium-238		0.507	+/-0.0399	0.0441	0.0179	+/-0.0519	0.500	pCi/L						

### Rad Gamma Spec Analysis

*Gammasespec "As Received"*

Cesium-137	U	-3.13	+/-1.70	4.69	2.07	+/-1.85	8.00	pCi/L		MJH1	06/13/14	0738	1393862	4
Cobalt-60	U	-0.0249	+/-1.71	6.30	2.74	+/-1.71	8.00	pCi/L						
Neptunium-237	U	-1.21	+/-2.79	9.06	4.16	+/-2.80	10.0	pCi/L						
Potassium-40	U	27.2	+/-19.3	48.1	20.0	+/-19.4	10.0	pCi/L						
Sodium-22	U	1.53	+/-1.19	5.23	2.22	+/-1.24	10.0	pCi/L						

### Rad Gas Flow Proportional Counting

*GFPC, Sr90, liquid "As Received"*

Strontium-90	U	-0.112	+/-0.119	0.475	0.210	+/-0.119	0.500	pCi/L		KSD1	06/24/14	0729	1395946	5
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*WSP-GrossA/B "As Received"*

Beta		2.74	+/-0.502	1.56	0.761	+/-0.551	3.00	pCi/L		BXF1	06/22/14	1307	1395947	6
Alpha	U	0.935	+/-0.558	1.84	0.863	+/-0.564	3.00	pCi/L		BXF1	06/25/14	1605	1395947	7

### The following Analytical Methods were performed

Method	Description
1	DOE EML HASL-300, Am-05-RC Modified
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	EPA 901.1
5	EPA 905.0 Modified
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"	1393676	81.9	(50%-105%)
Plutonium-242 Tracer	Alphaspec Pu, Liquid "As Received"	1393681	56.7	(50%-105%)
Uranium-232 Tracer	Alphaspec U, Liquid "As Received"	1393680	71.7	(50%-105%)



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## Certificate of Analysis

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

Los Alamos, New Mexico 87545

Report Date: July 1, 2014

Contact: Mr. Keith Greene

Project: LANL-WQH Groundwater Samples

Client Sample ID: CAPU-14-79428

Project: ESHL00714

Sample ID: 350053003

Client ID: ARSL004

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer Recovery		Test							Batch ID	Recovery%	Acceptable Limits			
Strontium Carrier		GFPC, Sr90, liquid "As Received"							1395946	78.0	(50%-105%)			

### Notes:

TPU and Counting Uncertainty are calculated at the 68% confidence level (1-sigma).

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Los Alamos, New Mexico 87545

Report Date: July 1, 2014

Contact: Mr. Keith Greene

Project: LANL-WQH Groundwater Samples

Client Sample ID: CAPU-14-79431

Sample ID: 350053011

Matrix: W

Collect Date: 03-JUN-14

Receive Date: 05-JUN-14

Collector: Client

Project: ESHL00714

Client ID: ARSL004

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
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### Rad Alpha Spec Analysis

#### *Alphaspec Am241 Liquid "As Received"*

Americium-241	U	-0.00275	+/-0.00476	0.0476	0.0201	+/-0.00476	0.050	pCi/L		JXD2	06/23/14	1548	1393676	1
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#### *Alphaspec Pu, Liquid "As Received"*

Plutonium-238	U	-0.0096	+/-0.00576	0.0212	0.008	+/-0.00576	0.050	pCi/L		JXD2	06/23/14	1239	1393681	2
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Plutonium-239/240	U	-0.00768	+/-0.0112	0.035	0.0149	+/-0.0112	0.050	pCi/L						
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#### *Alphaspec U, Liquid "As Received"*

Uranium-234		0.738	+/-0.0478	0.0764	0.0342	+/-0.0679	1.00	pCi/L		JXD2	06/21/14	1306	1393680	3
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Uranium-235/236	U	0.0182	+/-0.00966	0.064	0.0271	+/-0.00973	1.00	pCi/L						
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Uranium-238		0.266	+/-0.0301	0.0429	0.0174	+/-0.0348	0.500	pCi/L						
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### Rad Gamma Spec Analysis

#### *Gammasppec "As Received"*

Cesium-137	U	0.845	+/-1.57	6.12	2.74	+/-1.59	8.00	pCi/L		MJH1	06/17/14	0802	1393862	4
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Cobalt-60	U	3.71	+/-1.52	7.29	3.15	+/-1.75	8.00	pCi/L						
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Neptunium-237	U	1.34	+/-3.09	11.4	5.27	+/-3.11	10.0	pCi/L						
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Potassium-40	U	14.8	+/-18.3	78.6	34.4	+/-18.6	10.0	pCi/L						
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Sodium-22	U	0.582	+/-1.48	6.11	2.58	+/-1.48	10.0	pCi/L						
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### Rad Gas Flow Proportional Counting

#### *GFPC, Sr90, liquid "As Received"*

Strontium-90	U	0.334	+/-0.155	0.493	0.218	+/-0.157	0.500	pCi/L		KSD1	06/24/14	0730	1395946	5
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#### *WSP-GrossA/B "As Received"*

Beta		2.82	+/-0.480	1.48	0.717	+/-0.534	3.00	pCi/L		BXF1	06/22/14	1251	1395947	6
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Alpha	U	1.90	+/-0.685	2.17	1.01	+/-0.705	3.00	pCi/L		BXF1	06/25/14	1605	1395947	7
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### The following Analytical Methods were performed

Method	Description
1	DOE EML HASL-300, Am-05-RC Modified
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	EPA 901.1
5	EPA 905.0 Modified
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"	1393676	80.6	(50%-105%)
Plutonium-242 Tracer		Alphaspec Pu, Liquid "As Received"	1393681	86.5	(50%-105%)
Uranium-232 Tracer		Alphaspec U, Liquid "As Received"	1393680	71.6	(50%-105%)
Strontium Carrier		GFPC, Sr90, liquid "As Received"	1395946	85.4	(50%-105%)

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Los Alamos, New Mexico 87545

Report Date: July 1, 2014

Contact: Mr. Keith Greene

Project: LANL-WQH Groundwater Samples

Client Sample ID: CAPU-14-79431

Project: ESHL00714

Sample ID: 350053011

Client ID: ARSL004

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer Recovery		Test									Batch ID	Recovery%	Acceptable Limits	

### Notes:

TPU and Counting Uncertainty are calculated at the 68% confidence level (1-sigma).

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## Certificate of Analysis

Company : Los Alamos National Laboratory  
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Los Alamos, New Mexico 87545

Report Date: July 1, 2014

Contact: Mr. Keith Greene

Project: LANL-WQH Groundwater Samples

Client Sample ID: CAPU-14-79413

Sample ID: 350053019

Matrix: W

Collect Date: 03-JUN-14

Receive Date: 05-JUN-14

Collector: Client

Project: ESHL00714

Client ID: ARSL004

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
<b>Rad Alpha Spec Analysis</b>														
<i>Alphaspec Am241 Liquid "As Received"</i>														
Americium-241	U	-0.00533	+/-0.00753	0.0461	0.0194	+/-0.00753	0.050	pCi/L		JXD2	06/23/14	1548	1393676	1
<i>Alphaspec Pu, Liquid "As Received"</i>														
Plutonium-238	U	0.00568	+/-0.00803	0.0313	0.0118	+/-0.00803	0.050	pCi/L		JXD2	06/23/14	1239	1393681	2
Plutonium-239/240	U	0.0199	+/-0.011	0.0517	0.022	+/-0.011	0.050	pCi/L						
<i>Alphaspec U, Liquid "As Received"</i>														
Uranium-234	U	0.00315	+/-0.00944	0.0814	0.0364	+/-0.00944	1.00	pCi/L		JXD2	06/21/14	1142	1393680	3
Uranium-235/236	U	0.00389	+/-0.00673	0.0682	0.0288	+/-0.00674	1.00	pCi/L						
Uranium-238	U	-0.00315	+/-0.00703	0.0457	0.0186	+/-0.00704	0.500	pCi/L						
<b>Rad Gamma Spec Analysis</b>														
<i>Gammasspec "As Received"</i>														
Cesium-137	U	0.197	+/-2.18	8.20	3.62	+/-2.18	8.00	pCi/L		MJH1	06/13/14	0738	1393862	4
Cobalt-60	U	2.29	+/-1.76	8.32	3.42	+/-1.84	8.00	pCi/L						
Neptunium-237	U	6.40	+/-3.54	13.9	6.40	+/-3.84	10.0	pCi/L						
Potassium-40	U	-12.3	+/-29.2	110	47.5	+/-29.4	10.0	pCi/L						
Sodium-22	U	-0.544	+/-1.40	5.68	2.13	+/-1.41	10.0	pCi/L						
<b>Rad Gas Flow Proportional Counting</b>														
<i>GFPC, Sr90, liquid "As Received"</i>														
Strontium-90	U	0.380	+/-0.152	0.474	0.212	+/-0.155	0.500	pCi/L		KSD1	06/24/14	0731	1395946	5
<i>WSP-GrossA/B "As Received"</i>														
Beta	U	-0.321	+/-0.406	1.39	0.677	+/-0.406	3.00	pCi/L		BXF1	06/22/14	1251	1395947	6
Alpha	U	-0.352	+/-0.331	1.21	0.566	+/-0.331	3.00	pCi/L		BXF1	06/25/14	1605	1395947	7
<b>Rad Liquid Scintillation Analysis</b>														
<i>WSP-H-3 "As Received"</i>														
Tritium	U	-40.7	+/-44.7	173	77.8	+/-44.7	200	pCi/L		BYS1	06/20/14	1434	1396341	8

### The following Analytical Methods were performed

Method	Description
1	DOE EML HASL-300, Am-05-RC Modified
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	EPA 901.1
5	EPA 905.0 Modified
6	EPA 900.0/SW846 9310
7	EPA 900.0/SW846 9310
8	EPA 906.0 Modified

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Americium-243 Tracer	Alphaspec Am241 Liquid "As Received"	1393676	82.4	(50%-105%)

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## Certificate of Analysis

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

Los Alamos, New Mexico 87545

Contact: Mr. Keith Greene

Project: LANL-WQH Groundwater Samples

Client Sample ID: CAPU-14-79413

Sample ID: 350053019

Project: ESHL00714

Client ID: ARSL004

Report Date: July 1, 2014

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer Recovery	Test							Batch ID	Recovery%	Acceptable Limits				
Plutonium-242 Tracer		Alphaspec Pu, Liquid "As Received"						1393681	66.9	(50%-105%)				
Uranium-232 Tracer		Alphaspec U, Liquid "As Received"						1393680	69.9	(50%-105%)				
Strontium Carrier		GFPC, Sr90, liquid "As Received"						1395946	84.1	(50%-105%)				

### Notes:

TPU and Counting Uncertainty are calculated at the 68% confidence level (1-sigma).

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## Certificate of Analysis

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

Los Alamos, New Mexico 87545

Report Date: July 1, 2014

Contact: Mr. Keith Greene

Project: LANL-WQH Groundwater Samples

Client Sample ID: CAPU-14-79415

Sample ID: 350053030

Matrix: W

Collect Date: 03-JUN-14

Receive Date: 05-JUN-14

Collector: Client

Project: ESHL00714

Client ID: ARSL004

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
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### Rad Alpha Spec Analysis

#### *Alphaspec Am241 Liquid "As Received"*

Americium-241	U	0.00616	+/-0.00754	0.0533	0.0225	+/-0.00755	0.050	pCi/L		JXD2	06/23/14	1548	1393676	1
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#### *Alphaspec Pu, Liquid "As Received"*

Plutonium-238	U	0.00425	+/-0.00521	0.0235	0.00886	+/-0.00521	0.050	pCi/L		JXD2	06/23/14	1239	1393681	2
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Plutonium-239/240	U	0.0213	+/-0.00737	0.0387	0.0165	+/-0.00742	0.050	pCi/L						
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#### *Alphaspec U, Liquid "As Received"*

Uranium-234		0.566	+/-0.0419	0.0762	0.0341	+/-0.0558	1.00	pCi/L		JXD2	06/21/14	1142	1393680	3
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Uranium-235/236	U	0.0182	+/-0.0109	0.0639	0.027	+/-0.011	1.00	pCi/L						
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Uranium-238		0.303	+/-0.0308	0.0428	0.0174	+/-0.0366	0.500	pCi/L						
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### Rad Gamma Spec Analysis

#### *Gammasespec "As Received"*

Cesium-137	U	1.00	+/-1.53	5.75	2.57	+/-1.54	8.00	pCi/L		MJH1	06/13/14	0739	1393862	4
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Cobalt-60	U	1.81	+/-1.29	5.83	2.46	+/-1.36	8.00	pCi/L						
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Neptunium-237	U	0.670	+/-2.86	10.5	4.84	+/-2.87	10.0	pCi/L						
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Potassium-40	U	-1.58	+/-18.0	73.0	31.9	+/-18.0	10.0	pCi/L						
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Sodium-22	U	-0.655	+/-1.71	6.19	2.65	+/-1.72	10.0	pCi/L						
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### Rad Gas Flow Proportional Counting

#### *GFPC, Sr90, liquid "As Received"*

Strontium-90	U	-0.187	+/-0.117	0.495	0.217	+/-0.117	0.500	pCi/L		KSD1	06/24/14	0731	1395946	5
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#### *WSP-GrossA/B "As Received"*

Beta		2.47	+/-0.517	1.63	0.795	+/-0.556	3.00	pCi/L		BXF1	06/22/14	1251	1395947	6
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Alpha	U	0.503	+/-0.682	2.31	1.10	+/-0.683	3.00	pCi/L		BXF1	06/25/14	1616	1395947	7
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### The following Analytical Methods were performed

Method	Description
1	DOE EML HASL-300, Am-05-RC Modified
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	EPA 901.1
5	EPA 905.0 Modified
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"	1393676	72.5	(50%-105%)
Plutonium-242 Tracer		Alphaspec Pu, Liquid "As Received"	1393681	79.3	(50%-105%)
Uranium-232 Tracer		Alphaspec U, Liquid "As Received"	1393680	76.2	(50%-105%)
Strontium Carrier		GFPC, Sr90, liquid "As Received"	1395946	82.9	(50%-105%)

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## Certificate of Analysis

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

Los Alamos, New Mexico 87545

Report Date: July 1, 2014

Contact: Mr. Keith Greene

Project: LANL-WQH Groundwater Samples

Client Sample ID: CAPU-14-79415

Project: ESHL00714

Sample ID: 350053030

Client ID: ARSL004

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer Recovery		Test									Batch ID	Recovery%	Acceptable Limits	

### Notes:

TPU and Counting Uncertainty are calculated at the 68% confidence level (1-sigma).

# Quality Control Data



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## QC Summary

Report Date: July 1, 2014

Page 1 of 6

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

Los Alamos, New Mexico

Contact: Mr. Keith Greene

Workorder: 350053

Parmname	NOM	Sample	Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time
<b>Rad Alpha Spec</b>											
Batch	1393676										
QC1203103310	350053003	DUP									
Americium-241	U	0.00	U	0.00537	pCi/L	0.225		(0-1)	JXD2	06/23/1415:48	
	Uncert:	+/-0.00654		+/-0.00537							
	TPU:	+/-0.00654		+/-0.00537							
**Americium-243 Tracer	2.73	2.24		2.19	pCi/L		80	(50%-105%)			
	Uncert:	+/-0.0848		+/-0.0851							
	TPU:	+/-0.143		+/-0.143							
QC1203103311	LCS										
Americium-241	1.41			1.35	pCi/L		95.7	(80%-120%)	JXD2	06/23/1415:48	
	Uncert:			+/-0.0498							
	TPU:			+/-0.0737							
**Americium-243 Tracer	2.19			2.13	pCi/L		97.5	(50%-105%)			
	Uncert:			+/-0.0627							
	TPU:			+/-0.108							
QC1203103309	MB										
Americium-241			U	0.00408	pCi/L				JXD2	06/23/1415:48	
	Uncert:			+/-0.00866							
	TPU:			+/-0.00866							
**Americium-243 Tracer	2.19			1.92	pCi/L		88	(50%-105%)			
	Uncert:			+/-0.0665							
	TPU:			+/-0.113							
Batch	1393680										
QC1203103313	350053003	DUP									
Uranium-234		0.910		0.897	pCi/L	0.0405		(0-1)	JXD2	06/21/1411:42	
	Uncert:	+/-0.0534		+/-0.0506							
	TPU:	+/-0.0801		+/-0.0771							
Uranium-235/236	U	0.030	U	0.0242	pCi/L	0.129		(0-1)			
	Uncert:	+/-0.0119		+/-0.0104							
	TPU:	+/-0.012		+/-0.0105							
Uranium-238		0.507		0.520	pCi/L	0.0645		(0-1)			
	Uncert:	+/-0.0399		+/-0.0389							
	TPU:	+/-0.0519		+/-0.0515							
**Uranium-232 Tracer	2.74	1.97		2.20	pCi/L		80.1	(50%-105%)			
	Uncert:	+/-0.0917		+/-0.0879							
	TPU:	+/-0.202		+/-0.199							
QC1203103314	LCS										
Uranium-234				2.81	pCi/L				JXD2	06/21/1411:42	
	Uncert:			+/-0.0779							
	TPU:			+/-0.198							
Uranium-235/236				0.144	pCi/L						
	Uncert:			+/-0.0203							
	TPU:			+/-0.0223							

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## QC Summary

Workorder: 350053

Page 2 of 6

Parmname	NOM	Sample	Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time
<b>Rad Alpha Spec</b>											
Batch	1393680										
Uranium-238	2.72			2.70	pCi/L		99.4	(80%-120%)			
	Uncert:			+/-0.0766							
	TPU:			+/-0.191							
**Uranium-232 Tracer	2.19			1.77	pCi/L		80.7	(50%-105%)			
	Uncert:			+/-0.0692							
	TPU:			+/-0.158							
QC1203103312 MB											
Uranium-234			U	-0.00423	pCi/L				JXD2	06/21/1411:42	
	Uncert:			+/-0.00668							
	TPU:			+/-0.00669							
Uranium-235/236			U	0.00	pCi/L						
	Uncert:			+/-0.0037							
	TPU:			+/-0.0037							
Uranium-238			U	-0.00211	pCi/L						
	Uncert:			+/-0.00366							
	TPU:			+/-0.00366							
**Uranium-232 Tracer	2.19			1.88	pCi/L		85.6	(50%-105%)			
	Uncert:			+/-0.0685							
	TPU:			+/-0.157							
Batch	1393681										
QC1203103316 350053003 DUP											
Plutonium-238		U	-0.00592	U	-0.0111	pCi/L	0.171	(0-1)	JXD2	06/23/1412:39	
	Uncert:		+/-0.00725		+/-0.00783						
	TPU:		+/-0.00725		+/-0.00783						
Plutonium-239/240		U	0.0385	U	0.0415	pCi/L	0.0586	(0-1)			
	Uncert:		+/-0.0122		+/-0.0133						
	TPU:		+/-0.0123		+/-0.0134						
**Plutonium-242 Tracer	2.41		1.36		1.54	pCi/L		64	(50%-105%)		
	Uncert:		+/-0.0849		+/-0.0823						
	TPU:		+/-0.138		+/-0.135						
QC1203103317 LCS											
Plutonium-238				0.0335	pCi/L			(80%-120%)	JXD2	06/23/1412:39	
	Uncert:			+/-0.00873							
	TPU:			+/-0.00884							
Plutonium-239/240	1.97			2.07	pCi/L		105	(80%-120%)			
	Uncert:			+/-0.0624							
	TPU:			+/-0.107							
**Plutonium-242 Tracer	1.93			1.31	pCi/L		68	(50%-105%)			
	Uncert:			+/-0.0603							
	TPU:			+/-0.101							
QC1203103315 MB											
Plutonium-238			U	-0.00559	pCi/L				JXD2	06/23/1412:39	
	Uncert:			+/-0.00493							
	TPU:			+/-0.00493							
Plutonium-239/240			U	0.00372	pCi/L						
	Uncert:			+/-0.00456							

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## QC Summary

Workorder: 350053

Page 3 of 6

Parmname	NOM	Sample	Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time
Rad Alpha Spec											
Batch	1393681										
**Plutonium-242 Tracer		TPU:		+/-0.00456							
	1.93			1.51	pCi/L		78.5	(50%-105%)			
		Uncert:		+/-0.060							
		TPU:		+/-0.101							
Rad Gamma Spec											
Batch	1393862										
QC1203103778	350053003	DUP									
Cesium-137		U	-3.13	U	-1.63	pCi/L	0.214		(0-1)	MJH1	06/13/1409:49
		Uncert:	+/-1.70		+/-1.63						
		TPU:	+/-1.85		+/-1.67						
Cobalt-60		U	-0.0249	U	1.48	pCi/L	0.236		(0-1)		
		Uncert:	+/-1.71		+/-1.44						
		TPU:	+/-1.71		+/-1.48						
Neptunium-237		U	-1.21	U	3.15	pCi/L	0.384		(0-1)		
		Uncert:	+/-2.79		+/-2.77						
		TPU:	+/-2.80		+/-2.87						
Potassium-40		U	27.2	U	4.62	pCi/L	0.310		(0-1)		
		Uncert:	+/-19.3		+/-17.0						
		TPU:	+/-19.4		+/-17.0						
Sodium-22		U	1.53	U	0.485	pCi/L	0.215		(0-1)		
		Uncert:	+/-1.19		+/-1.19						
		TPU:	+/-1.24		+/-1.20						
QC1203103779	LCS										
Americium-241	34500				35800	pCi/L	104	(80%-120%)	MJH1	06/13/1408:30	
		Uncert:			+/-889						
		TPU:			+/-2450						
Cesium-137	14100				13800	pCi/L	98.3	(80%-120%)			
		Uncert:			+/-142						
		TPU:			+/-618						
Cobalt-60	17700				18300	pCi/L	104	(80%-120%)			
		Uncert:			+/-182						
		TPU:			+/-777						
Neptunium-237				U	2.75	pCi/L					
		Uncert:			+/-67.6						
		TPU:			+/-67.6						
Potassium-40				U	160	pCi/L					
		Uncert:			+/-120						
		TPU:			+/-125						
Sodium-22				U	-5.67	pCi/L					
		Uncert:			+/-21.1						
		TPU:			+/-21.2						
QC1203103777	MB										
Cesium-137				U	-0.115	pCi/L			MJH1	06/13/1407:49	
		Uncert:			+/-1.53						
		TPU:			+/-1.53						
Cobalt-60				U	0.583	pCi/L					

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## QC Summary

Workorder: 350053

Page 4 of 6

Parmname	NOM	Sample	Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time
<b>Rad Gamma Spec</b>											
Batch	1393862										
Neptunium-237	Uncert:			+/-1.34							
	TPU:			+/-1.34							
			U	-3.14	pCi/L						
	Uncert:			+/-2.58							
Potassium-40	TPU:			+/-2.68							
			U	1.01	pCi/L						
	Uncert:			+/-13.7							
	TPU:			+/-13.7							
Sodium-22			U	0.724	pCi/L						
	Uncert:			+/-1.37							
	TPU:			+/-1.38							
<b>Rad Gas Flow</b>											
Batch	1395946										
QC1203109192	350260005	DUP									
Strontium-90		U	-0.0242	U	-0.166	pCi/L	0.341	(0-1)	KSD1	06/24/1417:14	
	Uncert:		+/-0.129		+/-0.0781						
	TPU:		+/-0.129		+/-0.0781						
	8.20		5.00		7.00	mg	85.4	(50%-105%)			
**Strontium Carrier											
QC1203109194	LCS										
Strontium-90					23.3	pCi/L	103	(80%-120%)	KSD1	06/24/1407:51	
	Uncert:				+/-0.647						
	TPU:				+/-1.97						
	8.20				7.10	mg	86.6	(50%-105%)			
**Strontium Carrier											
QC1203109191	MB										
Strontium-90				U	-0.14	pCi/L			KSD1	06/24/1407:50	
	Uncert:				+/-0.111						
	TPU:				+/-0.111						
	8.20				7.00	mg	85.4	(50%-105%)			
**Strontium Carrier											
QC1203109193	350260005	MS									
Strontium-90		453	U	-0.0242	470	pCi/L	104	(75%-125%)	KSD1	06/24/1407:51	
	Uncert:			+/-0.129	+/-12.7						
	TPU:			+/-0.129	+/-39.6						
	8.20		5.00		7.40	mg	90.2	(50%-105%)			
**Strontium Carrier											
Batch	1395947										
QC1203109196	350417001	DUP									
Alpha			13.1		12.9	pCi/L	0.0393	(0-1)	BXF1	06/25/1416:01	
	Uncert:		+/-0.924		+/-0.883						
	TPU:		+/-1.44		+/-1.41						
			7.83		6.14	pCi/L	0.467	(0-1)		06/22/1413:49	
Beta	Uncert:		+/-0.697		+/-0.653						
	TPU:		+/-0.977		+/-0.831						
QC1203109199	LCS										
Alpha		12.3			11.6	pCi/L	93.8	(80%-120%)	BXF1	06/25/1416:00	
	Uncert:				+/-0.655						
	TPU:				+/-1.18						

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## QC Summary

Workorder: 350053

Page 5 of 6

Parmname	NOM	Sample	Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time
<b>Rad Gas Flow</b>											
Batch	1395947										
Beta	45.2			52.1	pCi/L		115	(80%-120%)			
	Uncert:			+/-0.936							
	TPU:			+/-4.42							
QC1203109195	MB										
Alpha			U	-0.059	pCi/L				BXF1	06/25/1416:01	
	Uncert:			+/-0.0301							
	TPU:			+/-0.0301							
Beta			U	-0.168	pCi/L					06/22/1413:53	
	Uncert:			+/-0.0709							
	TPU:			+/-0.0709							
QC1203109197	350417001	MS									
Alpha	165	13.1		190	pCi/L		108	(75%-125%)	BXF1	06/25/1416:00	
	Uncert:	+/-0.924		+/-11.9							
	TPU:	+/-1.44		+/-20.3							
Beta	603	7.83		707	pCi/L		116	(75%-125%)		06/22/1412:13	
	Uncert:	+/-0.697		+/-13.0							
	TPU:	+/-0.977		+/-60.2							
QC1203109198	350417001	MSD									
Alpha	165	13.1		196	pCi/L	0.0692	111	(0-1)	BXF1	06/25/1416:00	
	Uncert:	+/-0.924		+/-11.3							
	TPU:	+/-1.44		+/-20.0							
Beta	603	7.83		602	pCi/L	0.470	98.4	(0-1)		06/22/1412:13	
	Uncert:	+/-0.697		+/-12.1							
	TPU:	+/-0.977		+/-51.6							
<b>Rad Liquid Scintillation</b>											
Batch	1396341										
QC1203110249	350600001	DUP									
Tritium			U	53.1	pCi/L	0.180		(0-1)	BYS1	06/20/1417:11	
	Uncert:			+/-50.3							
	TPU:			+/-50.6							
QC1203110251	LCS										
Tritium	1780			1530	pCi/L		85.8	(80%-120%)	BYS1	06/20/1418:21	
	Uncert:			+/-183							
	TPU:			+/-237							
QC1203110248	MB										
Tritium			U	-23.1	pCi/L				BYS1	06/20/1416:19	
	Uncert:			+/-45.7							
	TPU:			+/-45.7							
QC1203110250	350600001	MS									
Tritium	1780	U	53.1	1660	pCi/L		92.9	(75%-125%)	BYS1	06/20/1418:04	
	Uncert:		+/-50.3	+/-191							
	TPU:		+/-50.6	+/-252							

### Notes:

TPU and Counting Uncertainty are calculated at the 68% confidence level (1-sigma).

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## QC Summary

Workorder: 350053

Page 6 of 6

Parmname	NOM	Sample Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time
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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	REMP Result > MDC/CL and < RDL
N/A	RPD or %Recovery limits do not apply.
N1	See case narrative
ND	Analyte concentration is not detected above the detection limit
NJ	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
Q	One or more quality control criteria have not been met. Refer to the applicable narrative or DER.
R	Sample results are rejected
U	Analyte was analyzed for, but not detected above the MDL, MDA, 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.



August 15, 2014

[www.gel.com](http://www.gel.com)

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

Re: LANL-WQH Groundwater Samples  
Work Order: 354157  
SDG: 2014-3494-1

Dear Mr. Greene:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the following analytical results for the sample(s) we received on June 05, 2014, and analyzed for HPLC Polynuclear Aromatic Hydrocarbon. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

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

Sincerely,

Hope Taylor for  
Valerie Davis  
Project Manager

Purchase Order: 63641-10  
Chain of Custody: 2014-3494  
Enclosures



**ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)**  
**LANL-WQH Groundwater Samples**  
**Work Order #: 354157**  
**SDG: 2014-3494-1**



## Table of Contents

Case Narrative.....	1
Chain of Custody and Supporting Documentation.....	4
Data Review Qualifier Flag Definition Sheet.....	16
HPLC Polynuclear Aromatic Hydrocarbon Analysis.....	19
Sample Data Summary.....	26
QC Summary.....	28
QC Data.....	33
Miscellaneous Data.....	37

# Case Narrative

**Case Narrative for  
ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)  
LANL-WQH Groundwater Samples  
Workorder #: 354157  
SDG # : 2014-3494-1**

**August 19, 2014**

**Laboratory Identification:**

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

**Summary**

**Sample receipt** The sample arrived at GEL Laboratories LLC, Charleston, South Carolina on June 05, 2014 for analysis. The sample was delivered with proper chain of custody documentation and signatures. The samples were screened according to GEL Standard Operating Procedure. All sample containers arrived without any visible signs of tampering or breakage. Containers were checked for pH, where appropriate, and matched the preservative as documented on the accompanying chain of custody. Shipping container temperature was within specification (0 - 6C). Shipping container temperature was checked, documented, and within specifications. There are no additional comments concerning sample receipt.

**Sample Identification** The laboratory received the following sample:

<b><u>Laboratory ID</u></b>	<b><u>Client ID</u></b>
354157001	CAPU-14-79415

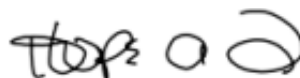
**Case Narrative**

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: HPLC Polynuclear Aromatic Hydrocarbon.

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.



Hope Taylor for  
Valerie Davis  
Project Manager

**List of current GEL Certifications as of 15 August 2014**

<b>State</b>	<b>Certification</b>
Alaska	UST-110
Arkansas	88-0651
CLIA	42D0904046
California NELAP	01151CA
Colorado	SC00012
Connecticut	PH-0169
Delaware	SC000122013-10
DoD ELAP/ ISO17025 A2LA	2567.01
Florida NELAP	E87156
Foreign Soils Permit	P330-12-00283, P330-12-00284
Georgia	SC00012
Georgia SDWA	967
Hawaii	SC000122013-10
Idaho Chemistry	SC00012
Idaho Radiochemistry	SC00012
Illinois NELAP	200029
Indiana	C-SC-01
Kansas NELAP	E-10332
Kentucky	90129
Louisiana NELAP	03046 (AI33904)
Louisiana SDWA	LA130005
Maryland	270
Massachusetts	M-SC012
Michigan	9976
Mississippi	SC000122013-10
Nebraska	NE-OS-26-13
Nevada	SC000122014-1
New Hampshire NELAP	2054
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
Oklahoma	9904
Pennsylvania NELAP	68-00485
Plant Material Permit	PDEP-12-00260
South Carolina Chemistry	10120001
South Carolina GVL	23611001
South Carolina Radiochemi	10120002
Tennessee	TN 02934
Texas NELAP	T104704235-14-9
Utah NELAP	SC000122014-14
Vermont	VT87156
Virginia NELAP	460202
Washington	C780-12
Wisconsin	999887790

# **Chain of Custody and Supporting Documentation**

General Engineering Laboratories, Inc., Charleston, SC  
2040 Savage Rd  
Charleston SC 29407

# Chain of Custody/Analysis Request

COC/Lab Request #:  
2014-3494  
Page 1 of 1

Client Contact:

Lab Agreement #: 126310011

Site Name: Los Alamos National Laboratory

Project Number:

Analysis Turnaround Time:

24 Hour - ☐ Other - ☐  
7 Day - ☐  
14 Day - ☐  
21 Day - ☐  
28 Day - ☒

Field Sample ID

Sample Date

Sample Time

Sample Matrix

Sample Matrix

Sample Matrix

Sample Matrix

Sample Matrix

Sample Matrix

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Sample Matrix

Sample Matrix

Sample Matrix

Sample Matrix

Sample Matrix

Sample Matrix

Sample Matrix

MSGP-Hg

WSP-8011-EDB\_DBCP

WSP-8082-PCB

WSP-8260B-VOA

WSP-8270C-SVOA

WSP-8310-PAH

WSP-8321A-NMED HEXP

WSP-All Metals

WSP-CN(T)

WSP-GENINORG+Perchlorate

WSP-GrossA/B

WSP-H-3

WSP-LL-8081A-HCB

WSP-LL-8151A-PCP

WSP-LL-8260B

WSP-LL-8270C

WSP-NH3+NO3/NO2+PO4

WSP-RAD

WSP-TKN+TOC

Rad Screening Info:

Yes, Below Background

Lab Reporting Limit Type:

Sample Quantitation Limit

Special Instructions:

Special Instructions:

Relinquished by:

Relinquished by:

Relinquished by:

Print Name:

Print Name:

Print Name:

Date/Time:

Date/Time:

Date/Time:

Received by:

Received by:

Received by:

Print Name:

Print Name:

Print Name:

Date/Time:

Date/Time:

Date/Time:

## SAMPLE RECEIPT &amp; REVIEW FORM

Client: <u>LANL</u>		SDG/AR/COC/Work Order: <u>2014-3494</u>	
Received By: <u>P. Went</u>		Date Received: <u>6-5-14</u>	
Suspected Hazard Information	Yes	No	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.
COC/Samples marked as radioactive?		X	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): <u>00 PM</u>
Classified Radioactive II or III by RSO?		X	If yes, Were swipes taken of sample containers < action levels?
COC/Samples marked containing PCBs?		X	
Package, COC, and/or Samples marked as beryllium or asbestos containing?		X	If yes, samples are to be segregated as Safety Controlled Samples, and opened by the GEL Safety Group.
Shipped as a DOT Hazardous?		X	Hazard Class Shipped: UN#:
Samples identified as Foreign Soil?		X	

Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1 Shipping containers received intact and sealed?	X			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2 Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	X			Preservation Method: Ice bags <u>Blue ice</u> Dry ice <u>None</u> Other (describe) *all temperatures are recorded in Celsius <u>2-5, 23</u>
2a Daily check performed and passed on IR temperature gun?	X			Temperature Device Serial #: Secondary Temperature Device Serial # (If Applicable): <u>130462966</u>
3 Chain of custody documents included with shipment?	X			
4 Sample containers intact and sealed?	X			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
5 Samples requiring chemical preservation at proper pH?	X			Sample ID's, containers affected and observed pH: If Preservation added Lot#:
6 VOA vials free of headspace (defined as < 6mm bubble)?	X			Sample ID's and containers affected:
7 Are Encore containers present?			X	(If yes, immediately deliver to Volatiles laboratory)
8 Samples received within holding time?	X			ID's and tests affected:
9 Sample ID's on COC match ID's on bottles?	X			Sample ID's and containers affected:
10 Date & time on COC match date & time on bottles?	X			Sample ID's affected:
11 Number of containers received match number indicated on COC?			X	Sample ID's affected: <u>SEE MORE BELOW</u> <u>CAPU-14-79414 rec'd (1) 8270c instead of (4)</u>
12 Are sample containers identifiable as GEL provided?			X	
13 COC form is properly signed in relinquished/received sections?	X			
14 Carrier and tracking number.	X			Circle Applicable: FedEx Air FedEx Ground UPS Field Services Courier Other <u>5908 1777 1251</u> <u>5908 1777 1230</u> <u>5908 1777 1262</u> <u>5908 1777 1240</u> <u>5908 1777 1229</u> <u>5908 1777 1218</u> <u>5908 1777 1300</u>

Comments (Use Continuation Form if needed): CAPU-14-79420 Rec'd (1) 8011 (1) 8260B instead of (2) etc.  
CAPU-14-79423 Rec'd (2) 8260B instead of (4). (1) 8011-EDB instead of (2).  
CAPU-14-79413 Rec'd (0) PCB, (1) HEP. Instead of (3). (2) 8270c instead of (4).  
CAPU-14-79415, 79431 rec'd (3) 8270c instead of (4) CAPU-14-79414 rec'd (1) PCB instead (3)

PM (or PMA) review: Initials

HA

Date

060514

Page

1 of

1

**Subject:** RE: Sample receipt issue from 06/05/14  
**From:** "Greene, Keith R" <kgreene@lanl.gov>  
**Date:** 6/6/2014 9:40 AM  
**To:** Pat Dent <Pat.Dent@gel.com>  
**CC:** "team.davis" <team.davis@gel.com>, "LANL@amrad.com" <LANL@amrad.com>, "Patel, Nita" <npatel@lanl.gov>

Please use one of the svoc bottles for this test

---

**From:** Pat Dent [mailto:Pat.Dent@gel.com]  
**Sent:** Friday, June 06, 2014 6:44 AM  
**To:** Greene, Keith R  
**Cc:** team.davis; LANL@amrad.com; Patel, Nita  
**Subject:** Sample receipt issue from 06/05/14

RN#2014-3494  
CAPU-14-79420 lab received 1-8011-EDB & 1-8260b container chain indicates 2-each, CAPU-14-79423 lab received 2-8260b chain indicates 4, & 1-8011-EDB chain indicates 2.

**CAPU-14-79413 lab did not receive any PCB's chain indicates 3 PLEASE ADVISE!**  
CAPU-14-79413 lab received 1-HEXP and 2-8270c, chain indicates 4.  
CAPU-14-79415,79431 lab received 3-8270c, chain indicates 4.  
CAPU-14-79414 lab received 1-PCB, chain indicates 3, 1-8270c chain indicates 4.

Thanks!!

---

--  
Patricia Dent  
Project Manager Assistant  
GEL Laboratories, LLC  
2040 Savage Rd.  
Charleston, S.C. 29407  
Main: 843-556-8171 Ext 4264  
Fax: 843-766-1178  
Email: [pad@gel.com](mailto:pad@gel.com)  
Web: [www.gel.com](http://www.gel.com)



**Subject:** FW: FW: R-4 reanalysis reanalyze CAPU-14-79415 for all SW-846:8310  
**From:** "Patel, Nita" <npatel@lanl.gov>  
**Date:** 7/23/2014 6:55 PM  
**To:** "Valerie Davis (vsd@gel.com)" <vsd@gel.com>

Hi Val. Im sorry. See below.

---

**From:** Rogers, David Bruce  
**Sent:** Wednesday, July 23, 2014 4:13 PM  
**To:** Patel, Nita  
**Cc:** Ding, Mei  
**Subject:** RE: FW: R-4 reanalysis

Nita;

These reanalyses for CAPU-14-79429 SW-846:8310 are all UH. Can we "R" the original and replace with these?

Additionally, would you ask to reanalyze CAPU-14-79415 for all SW-846:8310?

Thanks, David

---

**From:** Valerie Davis [<mailto:vsd@gel.com>]  
**Sent:** Wednesday, July 23, 2014 3:33 PM  
**To:** Patel, Nita; Rogers, David Bruce  
**Subject:** Re: FW: R-4 reanalysis

Yes. The package was sent yesterday. A copy of the mini package is attached.

On 7/23/2014 5:18 PM, Patel, Nita wrote:

Val, are these complete?

---

**From:** Valerie Davis [<mailto:vsd@gel.com>]  
**Sent:** Wednesday, July 09, 2014 1:35 PM  
**To:** Rogers, David B; Patel, Nita  
**Subject:** Re: FW: R-4 reanalysis

Thanks! The lab will reanalyze to confirm the initial results.

On 7/9/2014 3:28 PM, Rogers, David B wrote:

"What's wrong with the results initially reported?"

Nothing, just want to confirm.

Thanks, David

---

**From:** Patel, Nita  
**Sent:** Wednesday, July 09, 2014 12:03 PM  
**To:** Rogers, David B  
**Cc:** '[vsd@gel.com](mailto:vsd@gel.com)'  
**Subject:** Fw: FW: R-4 reanalysis

Hi David, please see Val's Q below.

---

**From:** Valerie Davis [<mailto:vsd@gel.com>]  
**Sent:** Wednesday, July 09, 2014 11:14 AM  
**To:** Patel, Nita  
**Subject:** Re: FW: R-4 reanalysis

Hi Nita,

What's wrong with the results initially reported?

Valerie

On 7/9/2014 9:06 AM, Patel, Nita wrote:

Good Morning Val, please see below. Thanks, Nita

---

**From:** Rogers, David B  
**Sent:** Tuesday, July 08, 2014 3:18 PM  
**To:** Patel, Nita  
**Cc:** Ding, Mei  
**Subject:** R-4 reanalysis

Hi Nita;

Will you request a reanalysis for the SW-846:8310 analytes for CAPU-14-79429?

This is R-4.

Thanks, David

David B. Rogers  
Environmental Services Group  
Corrective Actions Projects  
Environmental Programs Directorate  
Los Alamos National Laboratory MS M992  
Los Alamos, NM 87545

email [slug@lanl.gov](mailto:slug@lanl.gov)  
office 505-667-0313  
fax 505-606-0503

--  
Valerie S. Davis  
Project Manager  
GEL Laboratories, LLC  
2040 Savage Road  
Charleston, SC (USA) 29407

Direct: 843.769.7391  
Main: 843.556.8171  
Fax: 843.766.1178  
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--

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--

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

SHIP DATE: 04 JUN 14  
ACTWGT: 49.0 LB MAN  
CAD: 0014176/CAFE2704

BILL SENDER

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

**CHARLESTON SC 29407**  
(843) 566-8171

REF: WE991158W100



FedEx  
Express



2 of 3

MPS# 5908 1777 1251

0263

Mstr# 5908 1777 1240

0201

**XX CHSA**

THU - 05 JUN 10:30A  
PRIORITY OVERNIGHT

29407  
SC-US CHS



Part # 156148-434 R1T2 10/11

51BC3/A26D/6F03

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SHIP DATE: 04 JUN 14  
ACTWGT: 42.0 LB MAN  
CAD: 0014176/CAFE2704

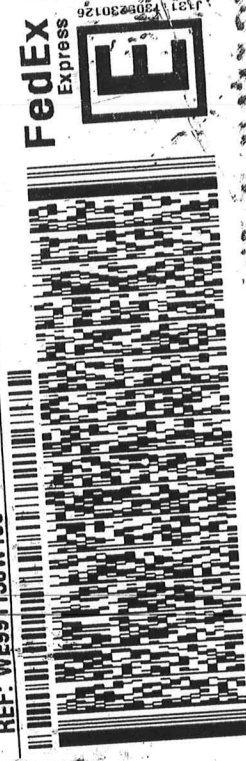
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2c



THU - 05 JUN 10 30A  
PRIORITY OVERNIGHT

3 of 3  
MPS# 5908 1777 1262  
Mstr# 5908 1777 1240

XX CHSA

29407  
SC-US CHS



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CAD: 0014176/CAFE2704

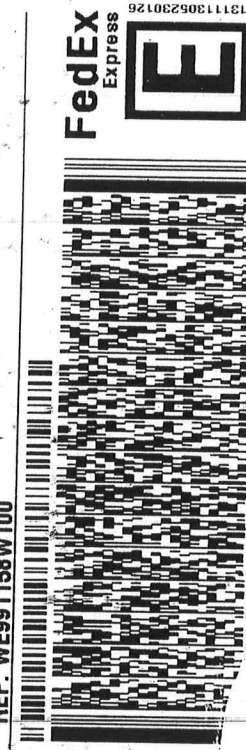
KEITH GREENE  
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3



THU - 05 JUN 10 30A  
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3 of 3  
MPS# 5908 1777 1230  
Mstr# 5908 1777 1218

XX CHSA

29407  
SC-US CHS



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T800 BLDG 1237-DPU 03

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ACTWGT: 49.0 LB MAN  
CAD: 0014176/CAFE2704

LOS ALAMOS, NM 87545  
UNITED STATES US

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23



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1 of 3

TRK# 5908 1777 1240

## MASTER ##

XX CHSA

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PRIORITY OVERNIGHT

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SC-US CHS



Part # 156148-434 R172 10/11

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LOS ALAMOS NATL LAB.  
T800 BLDG 1237-DPU 03

SHIP DATE: 04 JUN 14  
ACTWGT: 49.0 LB MAN  
CAD: 0014176/CAFE2704

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2 of 3

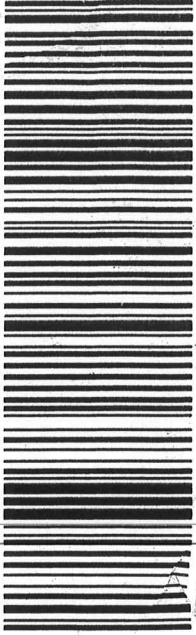
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XX CHSA

PRIORITY OVERNIGHT

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SC-US CHS



Part # 156148-434 R172 10/11

51873/A26D/6F03

518C3/A26D/6F03

J13111305230126

J13111305230126



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

SHIP DATE: 04JUN14  
ACTWGT: 48.0 LB MAN  
CAD: 0014176/CAFE2704  
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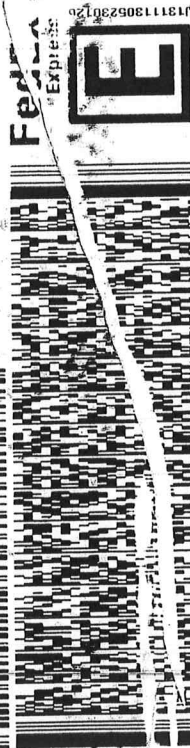
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1 of 3

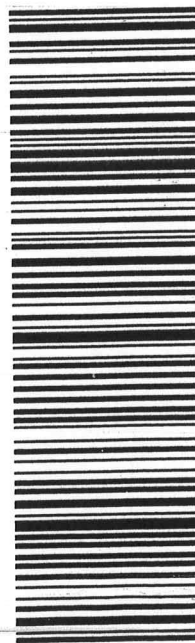
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## MASTER ##

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Part# 15614B-434 R1T2 10/11 88

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LOS ALAMOS, NM 87545  
UNITED STATES US

SHIP DATE: 04JUN14  
ACTWGT: 49.0 LB MAN  
CAD: 0014176/CAFE2704  
BILL SENDER

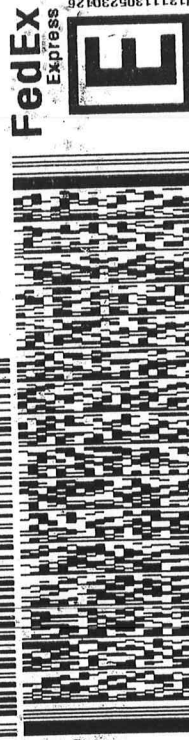
TO VALERIE DAVIS

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REF: WE991158W100

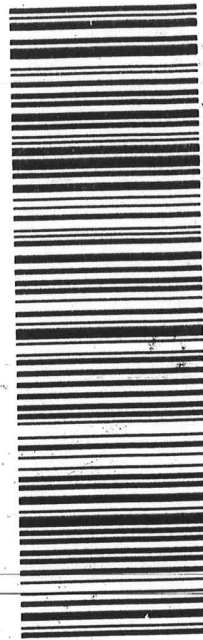


THU - 05 JUN 10:30A  
PRIORITY OVERNIGHT

TRK# 5908 1777 1300

XX CHSA

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Part# 15614B-434 R1T2 10/11 88

518C3/A2ED/6F03

518C3/A2ED/6F03



# **Data Review Qualifier Flag Definition Sheet**

## Data Review Qualifier Definitions

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

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

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

# **HPLC Polynuclear Aromatic Hydrocarbon Analysis**

**HPLC-PAH**  
**ARS International, LLC (ARSL)**  
**SDG 2014-3494-1**

**Method/Analysis Information**

**Procedure: Polynuclear Aromatic Hydrocarbons**

Analytical Method: SW846 8310

Prep Method: SW846 3510C

Analytical Batch Number: 1410224

Prep Batch Number: 1410220

**Sample Analysis**

The following samples were analyzed using the analytical protocol as established in SW846 8310:

<b>Sample ID</b>	<b>Client ID</b>
354157001	CAPU-14-79415
1203144952	MB for batch 1410220
1203144953	Laboratory Control Sample (LCS)
1203144954	Laboratory Control Sample Duplicate (LCSD)

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

**Preparation/Analytical Method Verification**

**SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-OA-E-030 REV# 15.

Raw data reports are processed and reviewed by the analyst using the Target software package. False positives have been removed from the Target quantitation reports per standard operating procedures (SOP) section 18.0.

**Calibration Information**

Due to software limitations, the files displayed at the beginning of the Form 6 are only the last files uploaded for each individual level. A complete listing of all files used in the current ICAL are shown on the Calibration History that is included with each Level 4 or higher package. The last file by date in each level is the one currently uploaded for that level.

The linear equation used in Target and indicated on the initial calibration summary form is not a conventional linear equation (slope intercept formula) and does not match the equation found in SW-846 method 8000B. The x and y axes are inversed in Target, so that the instrument response is treated as the independent variable (x) and the concentration ratio is treated as the dependent variable (y). The equation used in Target to calculate sample results is adjusted to account for the linear equation inversion and reciprocal slope. The adjusted calculation has been independently verified to produce valid results.

**Initial Calibration**

All initial calibration requirements have been met for this SDG.

**CCV Requirements**

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

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

The MB analyzed with this SDG met the acceptance criteria.

**Surrogate Recoveries**

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

**Laboratory Control Sample (LCS) Recovery**

A low recovery for Fluoranthene was observed in the LCS (1203144953). The recovery was 69% and the acceptance range is 70-130%. The low recovery may be due to vagaries in the extraction process. Due to depleted sample volume for all samples, re-extraction was not attempted. The data are reported with the appropriate DER.

**Laboratory Control Sample Duplicate (LCSD) Recovery**

The LCSD spike recoveries met the acceptance limits.

**LCS/LCSD Relative Percent Difference (RPD) Statement**

High RPD values were observed for multiple target analytes in the LCS/LCSD pair (1203144953/1203144954). Please see the Form 3 in the package for a complete list of values and acceptance ranges. The high RPD values were due to lower recoveries in the LCS, which may be due to vagaries in the extraction process. Due to depleted sample volume for all samples, re-extraction was not attempted. The data are reported with the appropriate DER.

**QC Sample Designation**

A matrix spike and matrix spike duplicate were not performed with this SDG in this batch.

**Technical Information:****Holding Time Specifications**

At the request of the client, sample 354157001 (CAPU-14-79415) was logged in for re-extraction and re-analysis. Since the sample exceeded the method specified hold time, the data are 'h' qualified and reported with the appropriate DER.

**Preparation/Analytical Method Verification**

All procedures were performed as stated in the SOP.

**Sample Dilutions**

The samples in this SDG did not require dilutions.

**Sample Re-extraction/Re-analysis**

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

### **Miscellaneous Information:**

#### **Data Exception (DER) Documentation**

Data Exception Report 1324567 was generated for this SDG.

A low recovery for Fluoranthene was observed in the LCS (1203144953). The recovery was 69% and the acceptance range is 70-130%. The low recovery may be due to vagaries in the extraction process. Due to depleted sample volume for all samples, re-extraction was not attempted. The data are reported with the appropriate DER.

High RPD values were observed for multiple target analytes in the LCS/LCSD pair (1203144953/1203144954). Please see the Form 3 in the package for a complete list of values and acceptance ranges. The high RPD values were due to lower recoveries in the LCS, which may be due to vagaries in the extraction process. Due to depleted sample volume for all samples, re-extraction was not attempted. The data are reported with the appropriate DER.

At the request of the client, sample 354157001 (CAPU-14-79415) was logged in for re-extraction and re-analysis. Since the sample exceeded the method specified hold time, the data are 'h' qualified and reported with the appropriate DER.

#### **Manual Integrations**

Some initial calibration standards required manual integrations due to software limitations.

Please see the raw data in the Miscellaneous Section.

#### **Additional Comments**

The Form 8 is used only as a sequence of the analysis.

#### **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 analyst, reviewer, and report specialist names 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 laboratory utilizes a high performance liquid chromatography (HPLC) instrument configuration for Polynuclear Aromatic Hydrocarbons analyses.

The chromatographic hardware system consists of a HP Model 1100 HPLC with programmable gradient pumping and a 100uL loop injector.

The HPLC 1100 is coupled to a HP Model G1315A Diode Array UV detector which monitors absorbance at the following five wavelengths: 1) 224 nm; 2) 250 nm; 3) 270 nm; 4) 234 nm; 5) 300 nm.

The HPLC 1100 is also coupled to a HP Model G1321A Fluorescence Detector in series which monitors the following varying excitations and emissions 1) EX 230 nm EM 330 nm; 2) EX 210 nm EM 314 nm; 3) EX 250 nm EM 368 nm; 4) EX 237 nm EM 440 nm; 5) EX 277 nm EM 376 nm; 6) EX 255 nm EM 420 nm; 7) EX 230 nm EM 453 nm.

The Diode Array UV detector is used as the primary detector and the Fluorescence Detector is used as the confirmation detector. All results are reported from the primary Diode Array UV detector.

The HPLC system is identified with a designation of HPLC E in the raw data printouts.

### **Chromatographic Columns**

Chromatographic separation of Polynuclear Aromatic Hydrocarbons is accomplished through analysis on the following reversed phase columns:

Phenomenex: Luna C18 (2), 100 A, 250 mm x 4.6 mm containing 5 um size particle.

### **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: 2014-3494-1 GEL Work Order: 354157

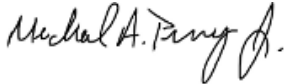
#### The Qualifiers in this report are defined as follows:

- \* 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, or LOD.
- h Preparation or preservation holding time was exceeded
- DL Indicates that sample is diluted.
- RA Indicates that sample is re-analyzed without re-extraction.
- RE Indicates that sample is re-extracted.

#### Review/Validation

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

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

Signature: 

Name: Michael Penny

Date: 15 AUG 2014

Title: Group Leader

## Roadmap for ARSL 2014-3494-1 HPLC\_PAH

This roadmap was analyzed by cww on 08-15-2014, 11:59.

This roadmap was reviewed by map on 08-15-2014, 12:29.

This roadmap was packaged by map on 08-15-2014, 13:33.

Sample

exclude	manual	datafile	smpid	injdate	injtime	sublist	clientid	dilution	batchid	comment
<input type="checkbox"/>	N	/chem/hplce.i/p081314.b/ph5h1307.d	354157001	13-AUG-2014	12:52	2014-3494-1.sub	CAPU-14-79415	1	1410224	<input type="text"/>

QC Sample

exclude	manual	datafile	smpid	sampletype	injdate	injtime	sublist	clientid	dilution	batchid	comment
<input type="checkbox"/>	N	/chem/hplce.i/p081314.b/ph5h1304.d	1203144952	mb	13-AUG-2014	10:45	2014-3494-1.sub	PAHBLK01	1	1410224	<input type="text"/>
<input type="checkbox"/>	N	/chem/hplce.i/p081314.b/ph5h1305.d	1203144953	lcs	13-AUG-2014	11:27	2014-3494-1.sub	PAHBLK01LCS	1	1410224	Flouranthene low
<input type="checkbox"/>	N	/chem/hplce.i/p081314.b/ph5h1306.d	1203144954	lcsd	13-AUG-2014	12:09	2014-3494-1.sub	PAHBLK01LCSD	1	1410224	Pass

# **Sample Data Summary**

**PAH by HPLC**  
**Certificate of Analysis**  
**Sample Summary**

Page 1 of 1

<b>SDG Number:</b> 2014-3494-1	<b>Date Collected:</b> 06/03/2014 11:48	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 354157001	<b>Date Received:</b> 06/05/2014 09:00	
<b>Client Sample:</b> -Relog from 350053029	<b>Client:</b> ARSL004	<b>Project:</b> ESHL00714
<b>Client ID:</b> CAPU-14-79415	<b>Method:</b> SW846 8310	<b>SOP Ref:</b> GL-OA-E-030
<b>Batch ID:</b> 1410224	<b>Inst:</b> HPLCE.I	<b>Dilution:</b> 1
<b>Run Date:</b> 08/13/2014 12:52	<b>Analyst:</b> CWW	<b>Inj. Vol:</b> 20 uL
<b>Prep Date:</b> 08/11/2014 07:05	<b>Aliquot:</b> 950 mL	<b>Final Volume:</b> 1 mL
<b>Data File:</b> ph5h1307.d	<b>Column:</b> C-18, DAD/FLD	<b>Level:</b> LOW

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
90-12-0	1-Methylnaphthalene	Uh	0.526	ug/L	0.229	0.526
91-57-6	2-Methylnaphthalene	Uh	0.526	ug/L	0.158	0.526
83-32-9	Acenaphthene	Uh	0.526	ug/L	0.158	0.526
208-96-8	Acenaphthylene	Uh	0.526	ug/L	0.158	0.526
120-12-7	Anthracene	Uh	0.526	ug/L	0.158	0.526
56-55-3	Benzo(a)anthracene	Uh	0.0526	ug/L	0.0168	0.0526
50-32-8	Benzo(a)pyrene	Uh	0.0526	ug/L	0.0168	0.0526
205-99-2	Benzo(b)fluoranthene	Uh	0.0526	ug/L	0.0168	0.0526
191-24-2	Benzo(ghi)perylene	Uh	0.0526	ug/L	0.0168	0.0526
207-08-9	Benzo(k)fluoranthene	Uh	0.0263	ug/L	0.00842	0.0263
218-01-9	Chrysene	Uh	0.0526	ug/L	0.0168	0.0526
53-70-3	Dibenzo(a,h)anthracene	Uh	0.0526	ug/L	0.0168	0.0526
206-44-0	Fluoranthene	Uh	0.0526	ug/L	0.0168	0.0526
86-73-7	Fluorene	Uh	0.526	ug/L	0.158	0.526
193-39-5	Indeno(1,2,3-cd)pyrene	Uh	0.0526	ug/L	0.0168	0.0526
91-20-3	Naphthalene	Uh	0.526	ug/L	0.158	0.526
85-01-8	Phenanthrene	Uh	0.526	ug/L	0.192	0.526
129-00-0	Pyrene	Uh	0.0526	ug/L	0.0168	0.0526

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
Decafluorobiphenyl	199	263	ug/L 75.7	(21% -96%)

# QC Summary

PAH by HPLC  
Surrogate Recovery Report

Page 1 of 1

SDG Number: 2014-3494-1

Matrix Type: LIQUID

PACK Column (1) : C-18, DAD/FLD

Sample ID	Client ID	DFBF %REC
1203144952	MB for batch 1410220	73
1203144953	LCS for batch 1410220	55
1203144954	LCSD for batch 1410220	66
354157001	CAPU-14-79415	76

## Surrogate

## Acceptance Limits

DFBF = Decafluorobiphenyl

(21%-96%)

\* Recovery outside Acceptance Limits

# Column to be used to flag recovery values

D Sample Diluted

PAH by HPLC  
Quality Control Summary  
Spike Recovery Report

Page 1 of 2

SDG Number: 2014-3494-1

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1410220

Matrix: WATER

Lab Sample ID 1203144953

Instrument: HPLCE.I

Analysis Date: 08/13/2014 11:27

Dilution: 1

Analyst: CWW

Prep Batch ID: 1410220

Inj. Vol: 20 uL

Batch ID: 1410224

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
91-20-3	LCS Naphthalene	50.0	0.0	30.7	61	54-108
91-57-6	LCS 2-Methylnaphthalene	50.0	0.0	34.9	70	50-91
90-12-0	LCS 1-Methylnaphthalene	50.0	0.0	32.9	66	55-96
208-96-8	LCS Acenaphthylene	50.0	0.0	32.6	65	52-100
83-32-9	LCS Acenaphthene	50.0	0.0	35.4	71	53-107
86-73-7	LCS Fluorene	50.0	0.0	34.8	70	62-130
85-01-8	LCS Phenanthrene	50.0	0.0	35.3	71	69-130
120-12-7	LCS Anthracene	50.0	0.0	39.8	80	70-130
206-44-0	LCS Fluoranthene	5.00	0.0	3.45	69 *	70-130
129-00-0	LCS Pyrene	5.00	0.0	3.63	73	70-130
56-55-3	LCS Benzo(a)anthracene	5.00	0.0	3.69	74	70-130
218-01-9	LCS Chrysene	5.00	0.0	3.94	79	70-130
205-99-2	LCS Benzo(b)fluoranthene	5.00	0.0	3.65	73	70-130
207-08-9	LCS Benzo(k)fluoranthene	2.50	0.0	1.96	78	70-130
50-32-8	LCS Benzo(a)pyrene	5.00	0.0	3.72	74	70-130
193-39-5	LCS Indeno(1,2,3-cd)pyrene	5.00	0.0	3.90	78	57-114
53-70-3	LCS Dibenzo(a,h)anthracene	5.00	0.0	4.28	86	30-118
191-24-2	LCS Benzo(ghi)perylene	5.00	0.0	3.44	69	42-115

PAH by HPLC  
Quality Control Summary  
Spike Recovery Report

Page 2 of 2

SDG Number: 2014-3494-1

Sample Type: Laboratory Control Sample Duplicate

Client ID: LCSD for batch 1410220

Matrix: WATER

Lab Sample ID 1203144954

Instrument: HPLCE.I

Analysis Date: 08/13/2014 12:09

Dilution: 1

Analyst: CWW

Prep Batch ID: 1410220

Inj. Vol: 20 uL

Batch ID: 1410224

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
91-20-3	LCSD Naphthalene	50.0	0.0	37.4	75	54-108	20	0-26
91-57-6	LCSD 2-Methylnaphthalene	50.0	0.0	42.4	85	50-91	19	0-20
90-12-0	LCSD 1-Methylnaphthalene	50.0	0.0	39.8	80	55-96	19	0-20
208-96-8	LCSD Acenaphthylene	50.0	0.0	39.5	79	52-100	19	0-20
83-32-9	LCSD Acenaphthene	50.0	0.0	42.8	86	53-107	19	0-20
86-73-7	LCSD Fluorene	50.0	0.0	42.7	85	62-130	21 *	0-20
85-01-8	LCSD Phenanthrene	50.0	0.0	42.8	86	69-130	19	0-20
120-12-7	LCSD Anthracene	50.0	0.0	47.7	95	70-130	18	0-20
206-44-0	LCSD Fluoranthene	5.00	0.0	4.27	85	70-130	21 *	0-20
129-00-0	LCSD Pyrene	5.00	0.0	4.48	90	70-130	21 *	0-20
56-55-3	LCSD Benzo(a)anthracene	5.00	0.0	4.58	92	70-130	22 *	0-20
218-01-9	LCSD Chrysene	5.00	0.0	4.87	97	70-130	21 *	0-20
205-99-2	LCSD Benzo(b)fluoranthene	5.00	0.0	4.51	90	70-130	21 *	0-20
207-08-9	LCSD Benzo(k)fluoranthene	2.50	0.0	2.42	97	70-130	21 *	0-20
50-32-8	LCSD Benzo(a)pyrene	5.00	0.0	4.58	92	70-130	21 *	0-20
193-39-5	LCSD Indeno(1,2,3-cd)pyrene	5.00	0.0	4.76	95	57-114	20	0-20
53-70-3	LCSD Dibenzo(a,h)anthracene	5.00	0.0	4.61	92	30-118	7	0-20
191-24-2	LCSD Benzo(ghi)perylene	5.00	0.0	3.69	74	42-115	7	0-20



## Method Blank Summary

Page 1 of 1

SDG Number:	2014-3494-1	Client:	ARSL004	Matrix:	WATER
Client ID:	MB for batch 1410220	Instrument ID:	HPLCE.I	Data File:	ph5h1304.d
Lab Sample ID:	1203144952	Prep Date:	08/11/2014 07:05	Analyzed:	08/13/14 10:45
Column:	C-18, DAD/FLD	Level:	LOW		

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 1410220	1203144953	ph5h1305.d	08/13/14	1127
02 LCSD for batch 1410220	1203144954	ph5h1306.d	08/13/14	1209
03 CAPU-14-79415	354157001	ph5h1307.d	08/13/14	1252

# QC Data

**PAH by HPLC**  
**Certificate of Analysis**  
**Sample Summary**

Page 1 of 1

SDG Number: 2014-3494-1

Lab Sample ID: 1203144952

Client Sample: QC for batch 1410220

Client ID: MB for batch 1410220

Batch ID: 1410224

Run Date: 08/13/2014 10:45

Prep Date: 08/11/2014 07:05

Data File: ph5h1304.d

Matrix: WATER

Project: QC

SOP Ref: GL-OA-E-030

Dilution: 1

Inj. Vol: 20 uL

Final Volume: 1 mL

Level: LOW

Client: ARSL004  
 Method: SW846 8310  
 Inst: HPLCE.I  
 Analyst: CWW  
 Aliquot: 1000 mL  
 Column: C-18, DAD/FLD

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
90-12-0	1-Methylnaphthalene	U	0.500	ug/L	0.218	0.500
91-57-6	2-Methylnaphthalene	U	0.500	ug/L	0.150	0.500
83-32-9	Acenaphthene	U	0.500	ug/L	0.150	0.500
208-96-8	Acenaphthylene	U	0.500	ug/L	0.150	0.500
120-12-7	Anthracene	U	0.500	ug/L	0.150	0.500
56-55-3	Benzo(a)anthracene	U	0.050	ug/L	0.016	0.050
50-32-8	Benzo(a)pyrene	U	0.050	ug/L	0.016	0.050
205-99-2	Benzo(b)fluoranthene	U	0.050	ug/L	0.016	0.050
191-24-2	Benzo(ghi)perylene	U	0.050	ug/L	0.016	0.050
207-08-9	Benzo(k)fluoranthene	U	0.025	ug/L	0.008	0.025
218-01-9	Chrysene	U	0.050	ug/L	0.016	0.050
53-70-3	Dibenzo(a,h)anthracene	U	0.050	ug/L	0.016	0.050
206-44-0	Fluoranthene	U	0.050	ug/L	0.016	0.050
86-73-7	Fluorene	U	0.500	ug/L	0.150	0.500
193-39-5	Indeno(1,2,3-cd)pyrene	U	0.050	ug/L	0.016	0.050
91-20-3	Naphthalene	U	0.500	ug/L	0.150	0.500
85-01-8	Phenanthrene	U	0.500	ug/L	0.182	0.500
129-00-0	Pyrene	U	0.050	ug/L	0.016	0.050

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
Decafluorobiphenyl	181	250	72.5	(21%-96%)

**PAH by HPLC  
Certificate of Analysis  
Sample Summary**

Page 1 of 1

SDG Number: 2014-3494-1

Lab Sample ID: 1203144953

Client Sample: QC for batch 1410220

Client ID: LCS for batch 1410220

Batch ID: 1410224

Run Date: 08/13/2014 11:27

Prep Date: 08/11/2014 07:05

Data File: ph5h1305.d

Client: ARSL004

Method: SW846 8310

Inst: HPLCE.I

Analyst: CWW

Aliquot: 1000 mL

Column: C-18, DAD/FLD

Matrix: WATER

Project: QC

SOP Ref: GL-OA-E-030

Dilution: 1

Inj. Vol: 20 uL

Final Volume: 1 mL

Level: LOW

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
90-12-0	1-Methylnaphthalene		32.9	ug/L	0.218	0.500
91-57-6	2-Methylnaphthalene		34.9	ug/L	0.150	0.500
83-32-9	Acenaphthene		35.4	ug/L	0.150	0.500
208-96-8	Acenaphthylene		32.6	ug/L	0.150	0.500
120-12-7	Anthracene		39.8	ug/L	0.150	0.500
56-55-3	Benzo(a)anthracene		3.69	ug/L	0.016	0.050
50-32-8	Benzo(a)pyrene		3.72	ug/L	0.016	0.050
205-99-2	Benzo(b)fluoranthene		3.65	ug/L	0.016	0.050
191-24-2	Benzo(ghi)perylene		3.44	ug/L	0.016	0.050
207-08-9	Benzo(k)fluoranthene		1.96	ug/L	0.008	0.025
218-01-9	Chrysene		3.94	ug/L	0.016	0.050
53-70-3	Dibenzo(a,h)anthracene		4.28	ug/L	0.016	0.050
206-44-0	Fluoranthene		3.45	ug/L	0.016	0.050
86-73-7	Fluorene		34.8	ug/L	0.150	0.500
193-39-5	Indeno(1,2,3-cd)pyrene		3.90	ug/L	0.016	0.050
91-20-3	Naphthalene		30.7	ug/L	0.150	0.500
85-01-8	Phenanthrene		35.3	ug/L	0.182	0.500
129-00-0	Pyrene		3.63	ug/L	0.016	0.050

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
Decafluorobiphenyl	137	250	54.7	(21% -96%)

**PAH by HPLC**  
**Certificate of Analysis**  
**Sample Summary**

Page 1 of 1

SDG Number: 2014-3494-1

Lab Sample ID: 1203144954

Client Sample: QC for batch 1410220

Client ID: LCSD for batch 1410220

Batch ID: 1410224

Run Date: 08/13/2014 12:09

Prep Date: 08/11/2014 07:05

Data File: ph5h1306.d

Matrix: WATER

Client: ARSL004

Method: SW846 8310

Inst: HPLCE.I

Analyst: CWW

Aliquot: 1000 mL

Column: C-18, DAD/FLD

Project: QC

SOP Ref: GL-OA-E-030

Dilution: 1

Inj. Vol: 20 uL

Final Volume: 1 mL

Level: LOW

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
90-12-0	1-Methylnaphthalene		39.8	ug/L	0.218	0.500
91-57-6	2-Methylnaphthalene		42.4	ug/L	0.150	0.500
83-32-9	Acenaphthene		42.8	ug/L	0.150	0.500
208-96-8	Acenaphthylene		39.5	ug/L	0.150	0.500
120-12-7	Anthracene		47.7	ug/L	0.150	0.500
56-55-3	Benzo(a)anthracene		4.58	ug/L	0.016	0.050
50-32-8	Benzo(a)pyrene		4.58	ug/L	0.016	0.050
205-99-2	Benzo(b)fluoranthene		4.51	ug/L	0.016	0.050
191-24-2	Benzo(ghi)perylene		3.69	ug/L	0.016	0.050
207-08-9	Benzo(k)fluoranthene		2.42	ug/L	0.008	0.025
218-01-9	Chrysene		4.87	ug/L	0.016	0.050
53-70-3	Dibenzo(a,h)anthracene		4.61	ug/L	0.016	0.050
206-44-0	Fluoranthene		4.27	ug/L	0.016	0.050
86-73-7	Fluorene		42.7	ug/L	0.150	0.500
193-39-5	Indeno(1,2,3-cd)pyrene		4.76	ug/L	0.016	0.050
91-20-3	Naphthalene		37.4	ug/L	0.150	0.500
85-01-8	Phenanthrene		42.8	ug/L	0.182	0.500
129-00-0	Pyrene		4.48	ug/L	0.016	0.050

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
Decafluorobiphenyl	166	250	66.2	(21%-96%)

# Miscellaneous Data

### DATA EXCEPTION REPORT

<b>Mo.Day Yr.</b> 15-AUG-14	<b>Division:</b> Industrial	<b>Quality Criteria:</b> Specifications	<b>Type:</b> Process
<b>Instrument Type:</b> HPLC	<b>Test / Method:</b> SW846 8310	<b>Matrix Type:</b> Liquid	<b>Client Code:</b> ESHL
<b>Batch ID:</b> 1410224	<b>Sample Numbers:</b> See Below		
<p><b>Potentially affected work order(s)(SDG): 354157(2014-3494-1),354323(2014-4281),354327(2014-4257)</b></p> <p><b>Application Issues:</b></p> <p>Failed RPD for MS/MSD, or PS/PSD</p> <p>Sample received out of holding</p> <p>Failed Recovery for LCS/LCSD</p> <p>Sample Logged out of Holding</p>			
<b>Specification and Requirements</b>		<b>DER Disposition:</b>	
<p><b>Exception Description:</b></p> <p>1. Sample 354157001 (CAPU-14-79415) was logged in for re-analysis out of holding.</p> <p>2. Samples 354323003 (WTESR-14-78473), 354323008 (WTESR-14-85836), 354323009 (WTESR-14-85837), 354323010 (WTESR-14-85838), 354327001 (WTESR-14-85829), 354327002(WTESR-14-85830), 354327003 (WTESR-14-85831), and 354327007 (WTESR-14-78507+) were received out of holding.</p> <p>3. A Low recovery for Fluoranthene was observed in the LCS (1203144953). The recovery was 69% and the acceptance range is 70-130%.</p> <p>4. High RPD values were observed for multiple target analytes in the LCS/LCSD pair (1203144953/1203144954). Please see the Form 3 in the package for a complete list of values and acceptance ranges.</p>		<p>1. &amp; 2. Since it was not possible to extract the samples within hold, the data are reported with 'h' qualifiers. The data are reported with the appropriate DER.</p> <p>3. The low recovery may be due to vagaries in the extraction process. Due to depleted sample volume for all samples, re-extraction was not attempted. The data are reported with the appropriate DER.</p> <p>4. The high RPD values were due to lower recoveries in the LCS, which may be due to vagaries in the extraction process. Due to depleted sample volume for all samples, re-extraction was not attempted. The data are reported with the appropriate DER.</p>	

**Originator's Name:**

Charles Wilson 15-AUG-14

**Data Validator/Group Leader:**

Michael Penny 15-AUG-14