

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

Chain of Custody/Analysis Request

COC/Lab Request #:
12-1287

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 - ☒

Rad Screening Info:

Yes, Below Background

Field Sample ID

Sample Date

Sample
Time

Sample
Matrix

WSP-8321A-NMED HEXP

WSP-GENINORG

WSP-GrossA/B

WSP-HEXMOD

WSP-Met+B+SN+SR+U

WSP-NH3+NO3/NO2+PO4

WSP-RAD

WSP-TKN+TOC

CAPA-12-13286

May 7 2012

10:01

W

3

1

2

1

1

CAPA-12-13296

May 7 2012

10:01

W

1

1

1

1

Special Instructions:

Relinquished by:

Relinquished by:

Relinquished by:

Date/Time:

Date/Time:

Date/Time:

Received by:

Received by:

Received by:

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 3855 EVENT NAME: Pajarito (General Surveillance)
 Q3 Watershed Sampling
 SAMPLE ID: CAPA-12-13286 WORK ORDER: NA

	<u>AS PLANNED</u>	<u>AS COLLECTED</u>		<u>AS PLANNED</u>	<u>AS COLLECTED</u>
DATE COLLECTED (MM/DD/YYYY):		05/07/2012	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):		1001	MEDIA:	WGR	↓
PRS ID:		OK	SAMPLE TECH CODE:	UA	WES
LOCATION ID: R-19 S4		↓	FIELD PREP:	UF	OK
LOCATION TYPE: MON		↓	FIELD QC TYPE: REG		↓
PORT: MP4A			SAMPLE USAGE: INV		↓

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
NA	WSP-8321A-NMED HEXP	1 LITER AMBER GLASS	3	ICE	Y	NA
↓	WSP-GrossA/B	1 LITER POLY	1	NONE	↓	↓
	WSP-HEXMOD	1 LITER AMBER GLASS	2	ICE		
	WSP-RAD	1 GAL POLY	1	HNO3		
↓	WSP-TKN+TOC	500 ML AMBER GLASS	1	H2SO4	↓	↓

SAMPLE COMMENTS: NA

LOCATION COMMENTS: NA

FIELD PARAMETERS:

Dissolved Oxygen 7.54 mg/L Oxidation-Reduction Potential NA MV pH 8.04 SU
 Specific Conductance 115 uS/cm Temperature 19.33 deg C Turbidity 0.70 NTU

Zone
pressure
109.57 psi

COLLECTED BY (PRINT) A. Stocker

RELINQUISHED BY (Printed Name) David Fellenz (Signature) <i>[Signature]</i>	Date/Time 1355 5/7/12	RECEIVED BY (Printed Name) <i>[Signature]</i> (Signature) <i>[Signature]</i>	Date/Time 1355 5/7/12
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date 04/11/2012

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 3855 EVENT NAME: Pajarito (General Surveillance)
Q3 Watershed Sampling
SAMPLE ID: CAPA-12-13296 WORK ORDER: NA

	<u>AS PLANNED</u>	<u>AS COLLECTED</u>		<u>AS PLANNED</u>	<u>AS COLLECTED</u>
DATE COLLECTED (MM/DD/YYYY):		05/07/2012	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):		1001	MEDIA:	WGR	↓
PRS ID:		OK	SAMPLE TECH CODE:	UA	WES
LOCATION ID: R-19 S4		↓	FIELD PREP:	F	OK
LOCATION TYPE: MON		↓	FIELD QC TYPE: REG		↓
PORT: MP4A		↓	SAMPLE USAGE: INV		↓

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
NA	WSP-GENINORG	1 LITER POLY	1	ICE	Y	NA
↓	WSP-Met+B+SN+SR+U	1 LITER POLY	1	HNO3	↓	↓
↓	WSP-NH3+NO3/NO2+PO4	500 ML AMBER GLASS	1	H2SO4	↓	↓

SAMPLE COMMENTS:

LOCATION COMMENTS:

FIELD PARAMETERS:

Dissolved Oxygen _____ mg/L Oxidation-Reduction Potential _____ MV pH _____ SU
Specific Conductance _____ uS/cm Temperature _____ deg C Turbidity _____ NTU

COLLECTED BY (PRINT) A. Stocker

RELINQUISHED BY (Printed Name) David Fellenz (Signature) <i>[Signature]</i>	Date/Time 5/7/12 1355	RECEIVED BY (Printed Name) <i>[Signature]</i> (Signature) <i>[Signature]</i>	Date/Time 5/7/12 1355
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date 04/11/2012

Data Validation Report

Chain Of Custody No. 12-1287

1. Distribution Of Samples In EDD.

	Analytical	Regular	Field	Trip	Field	Equipment
SDG	Method	Samples	Duplicates	Blanks	Blanks	Blanks
303971	EPA:120.1	1				
303971	EPA:150.1	1				
303971	EPA:160.1	1				
303971	EPA:245.2	1				
303971	EPA:300.0	1				
303971	EPA:310.1	1				
303971	EPA:350.1	1				
303971	EPA:351.2	1				
303971	EPA:353.2	1				
303971	EPA:365.4	1				
303971	EPA:900	1				
303971	EPA:901.1	1				
303971	EPA:905.0	1				
303971	HASL-300:AM-241	1				
303971	HASL-300:ISOPU	1				
303971	HASL-300:ISOU	1				
303971	SM:A2340B	1				
303971	SW-846:6010B	1				
303971	SW-846:6020	1				
303971	SW-846:6850	1				
303971	SW-846:8321A_MOD	1				
303971	SW-846:9060	1				

	Analytical	Analysis	Prep	Regular	Field	Trip	Field	Equipment	Method	Matrix	Matrix
SDG	Method	Lot ID	Lot ID	Samples	Duplicates	Blanks	Blanks	Blanks	Blanks	Spikes	Spike Dups
303971	EPA:120.1	1211663	1211663	1							
303971	EPA:150.1	1211045	1211045	1							
303971	EPA:160.1	1211656	1211656	1						1	
303971	EPA:245.2	1217402	1217401	1						1	1
303971	EPA:300.0	1210799	1210799	1						1	
303971	EPA:310.1	1213191	1213191	1						1	1
303971	EPA:350.1	1211277	1211240	1						1	1
303971	EPA:351.2	1211236	1211235	1						1	1
303971	EPA:353.2	1212076	1212076	1						1	
303971	EPA:365.4	1210829	1210828	1						1	1
303971	EPA:900	1216347	1216347	1						1	1
303971	EPA:901.1	1211536	1211536	1						1	
303971	EPA:905.0	1214471	1214471	1						1	1
303971	HASL-300:AM-241	1210896	1210896	1						1	
303971	HASL-300:ISOPU	1210899	1210899	1						1	
303971	HASL-300:ISOU	1210900	1210900	1						1	
303971	SM:A2340B	1218066	1218066	1							
303971	SW-846:6010B	1211594	1211593	1						1	1
303971	SW-846:6020	1211596	1211595	1						1	1
303971	SW-846:6850	1211963	1211962	1						1	1
303971	SW-846:8321A_MOD	1211109	1211107	1						1	1
303971	SW-846:9060	1210398	1210398	1						1	

Analytical	Post-Digestion	Lab Control	Lab Control	Blank	Blank	Lab	Storage	Preparation	Reagent
Spikes	Spikes	Samples	Sample Dups	Spikes	Spike Dups	Duplicates	Blanks	Blanks	Blanks
		1				1			
		1				1			
		1				1			
		1				1			
		1				1			
		1				1			
		1				1			
		1				1			
		1				1			
		1				1			
		1				1			
		1				1			
		1				1			
		1				1			
		1				1			
		1				1			
		1				1			
		1				1			
		1				1			
		1				1			
		1				1			
		1				2			

2. Distribution Of Analytes In EDD.

Analytical Method	Method Category	Field Sample ID	Lab Sample ID	Sample Purpose	Target Analytes	Surrogates	Spikes	TICS
EPA:120.1	GENERAL CHEMISTRY	CAPA-12-13272	1202655278	DUP	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	CAPA-12-13296	303971002	REG	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	LCS	1202655279	LCS	0	0	1	0
EPA:150.1	GENERAL CHEMISTRY	CAPA-12-13296	1202653783	DUP	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	CAPA-12-13296	303971002	REG	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	LCS	1202653784	LCS	0	0	1	0
EPA:160.1	GENERAL CHEMISTRY	CAPA-12-13296	1202655259	DUP	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	CAPA-12-13296	303971002	REG	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	LCS	1202655261	LCS	0	0	1	0
EPA:160.1	GENERAL CHEMISTRY	MB	1202655258	MB	1	0	0	0
EPA:245.2	INORGANIC	CAPA-12-13296	1202669185	DUP	1	0	0	0
EPA:245.2	INORGANIC	CAPA-12-13296	1202669186	MS	0	0	1	0
EPA:245.2	INORGANIC	CAPA-12-13296	303971002	REG	1	0	0	0
EPA:245.2	INORGANIC	LCS	1202669184	LCS	0	0	1	0
EPA:245.2	INORGANIC	MB	1202669183	MB	1	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAPA-12-13296	1202653084	DUP	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAPA-12-13296	303971002	REG	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	LCS	1202653086	LCS	0	0	4	0
EPA:300.0	GENERAL CHEMISTRY	MB	1202653083	MB	4	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAPA-12-13296	1202659447	MS	0	0	1	0
EPA:310.1	GENERAL CHEMISTRY	CAPA-12-13296	1202659604	DUP	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAPA-12-13296	303971002	REG	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	LCS	1202659603	LCS	0	0	1	0
EPA:310.1	GENERAL CHEMISTRY	MB	1202659083	MB	3	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAPA-12-13296	1202654315	DUP	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAPA-12-13296	1202654317	MS	0	0	1	0
EPA:350.1	GENERAL CHEMISTRY	CAPA-12-13296	1202654319	MSD	0	0	1	0
EPA:350.1	GENERAL CHEMISTRY	CAPA-12-13296	303971002	REG	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	LCS	1202654321	LCS	0	0	1	0
EPA:350.1	GENERAL CHEMISTRY	MB	1202654314	MB	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAPA-12-13286	1202654202	DUP	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAPA-12-13286	1202654203	MS	0	0	1	0
EPA:351.2	GENERAL CHEMISTRY	CAPA-12-13286	1202654204	MSD	0	0	1	0
EPA:351.2	GENERAL CHEMISTRY	CAPA-12-13286	303971001	REG	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	LCS	1202654205	LCS	0	0	1	0
EPA:351.2	GENERAL CHEMISTRY	MB	1202654201	MB	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAPA-12-13296	1202656245	DUP	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAPA-12-13296	303971002	REG	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	LCS	1202656252	LCS	0	0	1	0
EPA:353.2	GENERAL CHEMISTRY	MB	1202656243	MB	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAPA-12-13296	1202653159	DUP	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAPA-12-13296	1202653161	MS	0	0	1	0
EPA:365.4	GENERAL CHEMISTRY	CAPA-12-13296	1202653163	MSD	0	0	1	0
EPA:365.4	GENERAL CHEMISTRY	CAPA-12-13296	303971002	REG	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	LCS	1202653165	LCS	0	0	1	0
EPA:365.4	GENERAL CHEMISTRY	MB	1202653158	MB	1	0	0	0
EPA:900	RAD	CAPA-12-13286	1202666605	DUP	2	0	0	0
EPA:900	RAD	CAPA-12-13286	1202666606	MS	0	0	2	0
EPA:900	RAD	CAPA-12-13286	1202666607	MSD	0	0	2	0
EPA:900	RAD	CAPA-12-13286	303971001	REG	2	0	0	0
EPA:900	RAD	LCS	1202666608	LCS	0	0	2	0
EPA:900	RAD	MB	1202666604	MB	2	0	0	0
EPA:901.1	RAD	CAPA-12-13285	1202654975	DUP	5	0	0	0

EPA:901.1	RAD	CAPA-12-13286	303971001	REG	5	0	0	0
EPA:901.1	RAD	LCS	1202654976	LCS	0	0	3	0
EPA:901.1	RAD	MB	1202654974	MB	5	0	0	0
EPA:905.0	RAD	CAPA-12-13286	1202662132	DUP	1	0	0	0
EPA:905.0	RAD	CAPA-12-13286	1202662133	MS	0	0	1	0
EPA:905.0	RAD	CAPA-12-13286	303971001	REG	1	0	0	0
EPA:905.0	RAD	LCS	1202662134	LCS	0	0	1	0
EPA:905.0	RAD	MB	1202662131	MB	1	0	0	0
HASL-300:AM-241	RAD	CAPA-12-13285	1202653324	DUP	1	0	0	0
HASL-300:AM-241	RAD	CAPA-12-13286	303971001	REG	1	0	0	0
HASL-300:AM-241	RAD	LCS	1202653325	LCS	0	0	1	0
HASL-300:AM-241	RAD	MB	1202653323	MB	1	0	0	0
HASL-300:ISOPU	RAD	CAPA-12-13285	1202653327	DUP	2	0	0	0
HASL-300:ISOPU	RAD	CAPA-12-13286	303971001	REG	2	0	0	0
HASL-300:ISOPU	RAD	LCS	1202653328	LCS	0	0	1	0
HASL-300:ISOPU	RAD	MB	1202653326	MB	2	0	0	0
HASL-300:ISOU	RAD	CAPA-12-13285	1202653330	DUP	3	0	0	0
HASL-300:ISOU	RAD	CAPA-12-13286	303971001	REG	3	0	0	0
HASL-300:ISOU	RAD	LCS	1202653331	LCS	0	0	1	0
HASL-300:ISOU	RAD	MB	1202653329	MB	3	0	0	0
SM:A2340B	INORGANIC	CAPA-12-13296	303971002	REG	1	0	0	0
SW-846:6010B	INORGANIC	CAPA-12-13296	1202655108	DUP	17	0	0	0
SW-846:6010B	INORGANIC	CAPA-12-13296	1202655109	MS	0	0	17	0
SW-846:6010B	INORGANIC	CAPA-12-13296	303971002	REG	17	0	0	0
SW-846:6010B	INORGANIC	LCS	1202655107	LCS	0	0	17	0
SW-846:6010B	INORGANIC	MB	1202655106	MB	17	0	0	0
SW-846:6020	INORGANIC	CAPA-12-13296	1202655113	DUP	11	0	0	0
SW-846:6020	INORGANIC	CAPA-12-13296	1202655114	MS	0	0	11	0
SW-846:6020	INORGANIC	CAPA-12-13296	303971002	REG	11	0	0	0
SW-846:6020	INORGANIC	LCS	1202655112	LCS	0	0	11	0
SW-846:6020	INORGANIC	MB	1202655111	MB	11	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	CAPA-12-13292	1202655998	MS	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	CAPA-12-13292	1202655999	MSD	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	CAPA-12-13296	303971002	REG	1	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	LCS	1202655997	LCS	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	MB	1202655996	MB	1	0	0	0
SW-846:8321A_MOD	LCMS/MS HIGH EXPLOSIVES	CAPA-12-13286	1202653940	MS	0	2	23	0
SW-846:8321A_MOD	LCMS/MS HIGH EXPLOSIVES	CAPA-12-13286	1202653941	MSD	0	2	23	0
SW-846:8321A_MOD	LCMS/MS HIGH EXPLOSIVES	CAPA-12-13286	303971001	REG	23	2	0	0
SW-846:8321A_MOD	LCMS/MS HIGH EXPLOSIVES	LCS	1202653939	LCS	0	2	23	0
SW-846:8321A_MOD	LCMS/MS HIGH EXPLOSIVES	MB	1202653938	MB	23	2	0	0
SW-846:9060	GENERAL CHEMISTRY	CAPA-12-13277	1202652080	DUP	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	CAPA-12-13286	1202655722	DUP	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	CAPA-12-13286	303971001	REG	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	LCS	1202652082	LCS	0	0	1	0
SW-846:9060	GENERAL CHEMISTRY	MB	1202652079	MB	1	0	0	0

3. Are any analytes missing?

No.

4. Were any holding times exceeded?

No.

5. Any contaminants in blanks?

No.

Any samples affected by the presence of contaminants in blanks?

Field	Blank Field	Blank Lab	Blank	Analytical	Parameter		Blank	Sample	Lab	Detect	
Sample ID	Sample ID	Sample ID	Type	Method	Name	Units	Result	Result	Qualifier	Limit	Detected
CAPA-12-13296	MB	1202653158	METHOD BLANK	EPA:365.4	Total Phosphate as Phosphorus	mg/L	0.0343	0.0831		0.05	Y

6. Any surrogate recoveries outside the control limits?

No.

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

Field	Matrix	Matrix	Analytical	Parameter	Analysis	Analysis	Sample	MS %	MSD %	Upper	Lower
Sample ID	Spike ID	Spike Dup ID	Method	Name	Lot ID	Date	Matrix	Recvry	Recvry	Limit	Limit
CAPA-12-13286	1202654203	1202654204	EPA:351.2	Total Kjeldahl Nitrogen	1211235	5/11/2012	W	82.2	100	110	90
CAPA-12-13286	1202654203	1202654204	EPA:351.2	Total Kjeldahl Nitrogen	1211235	5/11/2012	W	82.2	100	110	90
CAPA-12-13296	1202655109		SW-846:6010B	Silicon Dioxide	1211593	5/22/2012	W	66.3		125	75
CAPA-12-13296	1202655109		SW-846:6010B	Silicon Dioxide	1211593	5/22/2012	W	66.3		125	75

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

No.

9. Any Field Duplicate RPDs outside the desired limits?

No.

10. Any Lab Duplicate RPDs outside the desired limits?

Field	Lab	Lab Duplicate	Analytical	Parameter	Sample	Sample	Dup Sample		Detected	Detected	
Sample ID	SampleID	Sample ID	Method	Name	Matrix	Result	Result	Units	In Sample	In Dup	RPD
CAPA-12-13296	303971002	1202653159	EPA:365.4	Total Phosphate as Phosphorus	W	0.0831	0.0622	mg/L	Y	Y	28.8
CAPA-12-13286	303971001	1202666605	EPA:900	Gross beta	W	2.99	4.3	pCi/L	Y	Y	36.1

11. Any required reporting limits exceeded?

No.

12. Additional Validator's Comments.

None.

Correction	Correction	Use
Factor (ND)	Factor (J)	Factors
5		Y

Rejection		
Limit	RPD	RPD Limit
10	18.9	20
10	18.9	20
10		
10		

RPD
Limit

21
2.6

13. Display Flagged Data.

Location ID	Chain Of Custody No	Field Sample ID	Sample Purpose	Analysis Type Code	Analytical Suite	Analytical Method	Parameter Name	Lab Qualifier	Validation Qualifier	Validation Reason Codes	Detected
R-19 S4	12-1287	CAPA-12-13286	REG	INIT	RAD	HASL-300:AM-241	Americium-241	U	U	R5	N
R-19 S4	12-1287	CAPA-12-13286	REG	INIT	RAD	EPA:901.1	Cesium-137	U	U	R5	N
R-19 S4	12-1287	CAPA-12-13286	REG	INIT	RAD	EPA:901.1	Cobalt-60	U	U	R5	N
R-19 S4	12-1287	CAPA-12-13286	REG	INIT	RAD	EPA:900	Gross alpha	U	U	R5	N
R-19 S4	12-1287	CAPA-12-13286	REG	INIT	RAD	EPA:900	Gross beta		J	R10	Y
R-19 S4	12-1287	CAPA-12-13286	REG	INIT	RAD	EPA:901.1	Neptunium-237	U	U	R5	N
R-19 S4	12-1287	CAPA-12-13286	REG	INIT	RAD	HASL-300:ISOPU	Plutonium-238	U	U	R5	N
R-19 S4	12-1287	CAPA-12-13286	REG	INIT	RAD	HASL-300:ISOPU	Plutonium-239/240	U	U	R5	N
R-19 S4	12-1287	CAPA-12-13286	REG	INIT	RAD	EPA:901.1	Potassium-40	U	U	R5	N
R-19 S4	12-1287	CAPA-12-13286	REG	INIT	RAD	EPA:901.1	Sodium-22	U	U	R5	N
R-19 S4	12-1287	CAPA-12-13286	REG	INIT	RAD	EPA:905.0	Strontium-90	U	U	R5	N
R-19 S4	12-1287	CAPA-12-13286	REG	INIT	GENERAL CHEMISTRY	EPA:351.2	Total Kjeldahl Nitrogen	U	UJ	I6a	N
R-19 S4	12-1287	CAPA-12-13286	REG	INIT	RAD	HASL-300:ISOU	Uranium-235/236	U	U	R5	N
R-19 S4	12-1287	CAPA-12-13296	REG	INIT	INORGANIC	SW-846:6010B	Silicon Dioxide		J-	I6a	Y
R-19 S4	12-1287	CAPA-12-13296	REG	INIT	GENERAL CHEMISTRY	EPA:365.4	Total Phosphate as Phosphorus		U	I4,I10a	N

Reason Code

Description

I6a The associated matrix spike recovery was below the lower acceptance limit (LAL) but >10%. Follow the external laboratory limits located within the associated data package.

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

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

R10 Associated duplicate sample has DER or RER> the analytical laboratory's acceptance limits.

R5 Analyte is not detected because the amount reported is less than the MDC.

U_LAB The analytical laboratory qualified the analyte as not detected.

14. Useable Result Count.

Field	Location	Sample	Analytical	No. Unuseable	Total No. Of
Sample ID	ID	Purpose	Method	Records	Records
CAPA-12-13286	R-19 S4	REG	EPA:351.2	0	1
CAPA-12-13286	R-19 S4	REG	EPA:900	0	2
CAPA-12-13286	R-19 S4	REG	EPA:901.1	0	5
CAPA-12-13286	R-19 S4	REG	EPA:905.0	0	1
CAPA-12-13286	R-19 S4	REG	HASL-300:AM-241	0	1
CAPA-12-13286	R-19 S4	REG	HASL-300:ISOPU	0	2
CAPA-12-13286	R-19 S4	REG	HASL-300:ISOU	0	3
CAPA-12-13286	R-19 S4	REG	SW-846:8321A_MOD	0	23
CAPA-12-13286	R-19 S4	REG	SW-846:9060	0	1
CAPA-12-13296	R-19 S4	REG	EPA:120.1	0	1
CAPA-12-13296	R-19 S4	REG	EPA:150.1	0	1
CAPA-12-13296	R-19 S4	REG	EPA:160.1	0	1
CAPA-12-13296	R-19 S4	REG	EPA:245.2	0	1
CAPA-12-13296	R-19 S4	REG	EPA:300.0	0	4
CAPA-12-13296	R-19 S4	REG	EPA:310.1	0	2
CAPA-12-13296	R-19 S4	REG	EPA:350.1	0	1
CAPA-12-13296	R-19 S4	REG	EPA:353.2	0	1

Lab Result	Lab Units	Report Result	Report Units	Report MDA	Report Uncertainty	Lab Matrix	Sample Date	Percent Moisture	Analysis Lot ID	Validation Status Code	Use Flag
-0.00823	pCi/L	-0.00823	pCi/L	0.0493	0.00873	W	5/7/2012		1210896	VAL	Y
-0.0015	pCi/L	-0.0015	pCi/L	4.67	1.24	W	5/7/2012		1211536	VAL	Y
0.767	pCi/L	0.767	pCi/L	4.02	0.917	W	5/7/2012		1211536	VAL	Y
0.387	pCi/L	0.387	pCi/L	2.42	0.593	W	5/7/2012		1216347	VAL	Y
2.99	pCi/L	2.99	pCi/L	2.97	0.948	W	5/7/2012		1216347	VAL	Y
1.21	pCi/L	1.21	pCi/L	8.98	2.45	W	5/7/2012		1211536	VAL	Y
0	pCi/L	0	pCi/L	0.0453	0.0101	W	5/7/2012		1210899	VAL	Y
-0.0146	pCi/L	-0.0146	pCi/L	0.0384	0.00713	W	5/7/2012		1210899	VAL	Y
-9.31	pCi/L	-9.31	pCi/L	57.9	15	W	5/7/2012		1211536	VAL	Y
0.0247	pCi/L	0.0247	pCi/L	5.01	1.34	W	5/7/2012		1211536	VAL	Y
0.18	pCi/L	0.18	pCi/L	0.489	0.144	W	5/7/2012		1214471	VAL	Y
0.1	mg/L	0.1	mg/L			W	5/7/2012		1211236	VAL	Y
0.0124	pCi/L	0.0124	pCi/L	0.0538	0.0102	W	5/7/2012		1210900	VAL	Y
67.9	mg/L	67.9	mg/L			W	5/7/2012		1211594	VAL	Y
0.0831	mg/L	0.0831	mg/L			W	5/7/2012		1210829	VAL	Y

CAPA-12-13296	R-19 S4	REG	EPA:365.4	0	1
CAPA-12-13296	R-19 S4	REG	SM:A2340B	0	1
CAPA-12-13296	R-19 S4	REG	SW-846:6010B	0	17
CAPA-12-13296	R-19 S4	REG	SW-846:6020	0	11
CAPA-12-13296	R-19 S4	REG	SW-846:6850	0	1



May 10, 2012

www.gel.com

Keith Greene
Los Alamos National Laboratory
PO Box 1663
TA-03, SM271, Drop Pt. 02U, Rm111
Los Alamos, New Mexico 87545

Re: LANL-WQH Water Samples
Work Order: 303971
SDG: 12-1287

Dear Keith Greene:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the following analytical results for the sample(s) we received on May 09, 2012, and analyzed for Explosives by LCMSMS, General Chemistry, Metals, Perchlorates by LCMSMS and Radiochemistry. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

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

Sincerely,

Hope Taylor for
Valerie Davis
Project Manager

Purchase Order: 63641-10
Chain of Custody: 12-1287
Enclosures



ARS International (63641-10)
LANL-WQH Water Samples
Work Order #: 303971
SDG: 12-1287

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Case Narrative

**Case Narrative for
ARS International (63641-10)
LANL-WQH Water Samples
Workorder #: 303971
SDG # : 12-1287**

May 10, 2012

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 May 09, 2012 for analysis. The samples were delivered with proper chain of custody documentation and signatures. The samples were screened according to GEL Standard Operating Procedure. All sample containers arrived without any visible signs of tampering or breakage. Containers were checked for pH, where appropriate, and matched the preservative as documented on the accompanying chain of custody. Shipping container temperature was within specification (0 - 6C). Shipping container temperatures were checked, documented, and within specifications. There are no additional comments concerning sample receipt.

Sample Identification The laboratory received the following samples:

<u>Laboratory ID</u>	<u>Client ID</u>
303971001	CAPA-12-13286
303971002	CAPA-12-13296

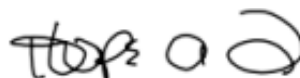
Case Narrative

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, General Chemistry, Metals, Perchlorates by LCMSMS and Radiochemistry.

I certify that this data report is in compliance with the terms and conditions of the subcontract and task order, both technically and for completeness, for other than the conditions detailed in the attached case narrative.



Hope Taylor for
Valerie Davis
Project Manager

List of current GEL Certifications as of 10 May 2012

State	Certification
Arizona	AZ0766
Arkansas	88-0651
CLIA	42D0904046
California NELAP	01151CA
Colorado	SC00012
Connecticut	PH-0169
Delaware	SC00012
DoD ELAP A2LA ISO 17025	2567.01
Florida NELAP	E87156
Foreign Soils Permit	P330-09-00191
Georgia	SC00012
Georgia SDWA	967
Hawaii	SC00012
Idaho	SC00012
Illinois NELAP	200029
Indiana	C-SC-01
Kansas NELAP	E-10332
Kentucky	90129
Louisiana NELAP	03046 (AI33904)
Louisiana SDWA	LA120008
Maryland	270
Massachusetts	M-SC012
Mississippi	SC00012
Nevada	SC000122011-1
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
South Carolina Chemistry	10120001
South Carolina Radiochemi	10120002
Tennessee	TN 02934
Texas NELAP	T104704235-12-7
Utah NELAP	SC00012
Vermont	VT87156
Virginia NELAP	460202
Washington	C780
Wisconsin	999887790

Chain of Custody and Supporting Documentation



SAMPLE RECEIPT & REVIEW FORM

Client: LANL			SDG/AR/COC/Work Order: 12-1287		
Received By: SHANTA WHITLOCK			Date Received: May 9, 2012		
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): 0	
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 Blue ice Dry ice None Other (describe) 2C *all temperatures are recorded in Celsius
2a	Daily check performed and passed on IR temperature gun?	X			Temperature Device Serial #: 51050004 Secondary Temperature Device Serial # (If Applicable):
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: Only 2 containers received for WSP-8321A-NMED HEXP.
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.				Circle Applicable: FedEx Air FedEx Ground UPS Field Services Courier Other 7209 7856 6309
Comments (Use Continuation Form if needed):					

SHIP DATE: 08MAY12

ORIGIN ID: SAFA (505) 665-9968
JOYLENE VALDEZ
LOS ALAMOS NATL LAB
TR00 BLDG 1237 DPU 03

ACTWGT: 47.0 LB MAN
CAD: 0014176/CAFE2511

LOS ALAMOS, NM 87545
UNITED STATES US

BILL SENDER

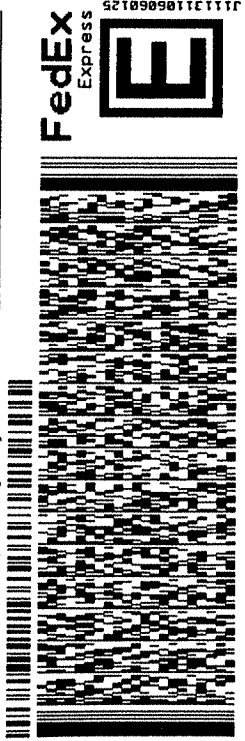
VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 556-8171
REF: MR1A015AGWFO

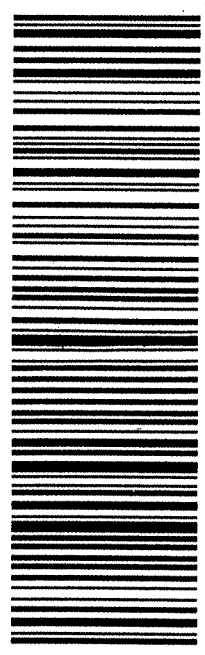
202

500C3/61M4/108C



TRK# 7209 7856 6309
WED - 09 MAY A1
PRIORITY OVERNIGHT

XX CHSA
29407
SC-US CHS



Part # 156148-434 NR11 V3 09-09

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.

Perchlorates by LCMSMS Analysis

Case Narrative

**Perchlorate by LC/MSMS
ARS International (ARSL)
SDG 12-1287**

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: 1211963

Prep Batch Number: 1211962

Sample Analysis

Sample ID	Client ID
303971002	CAPA-12-13296
1202656000	Interference Check Sample (ICS)
1202655996	Method Blank (MB)
1202655997	Laboratory Control Sample (LCS)
1202655998	303750002(CAPA-12-13292) Matrix Spike (MS)
1202655999	303750002(CAPA-12-13292) 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# 9.

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.

CCV Requirements

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

Interference Check Sample (ICS)

The interference check sample (ICS) met all recovery acceptance criteria.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

QC Sample Designation

Sample 303750002 (CAPA-12-13292) 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 RPD(s) between the MS and MSD met the acceptance limits.

Retention Time Standard Area Acceptance

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

Retention Time

During the analysis of Perchlorate by LC/MS/MS, retention time shifts are commonly observed. These retention time shifts, which are caused by fouling of the column by the sample matrices, are problematic when the retention time is used as one of the criterion for confirmation. To overcome this problem, a known amount of O(18) labeled Perchlorate was added to each sample as a retention time standard. The presence of Perchlorate was confirmed by the relative retention time (RRT) of the Perchlorate peak and the O(18) standard. A RRT window of 0.98 to 1.02, as required by Method 332.0, has been used. In addition to the isotopic ratio, the presence of Perchlorate in the samples associated with this data package have been confirmed using the relative retention criteria stated above, not the absolute retention time.

Technical Information**Holding Time Specifications**

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

Preparation/Analytical Method Verification

All procedures were performed as stated in the SOP.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-extraction/Re-analysis

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

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 for this analytical batch.

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

ARSL001 ARS International (63641-10)

Client SDG: 12-1287 GEL Work Order: 303971

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: Patricia Steele

Date: 25 MAY 2012

Title: Data Validator

Sample Data Summary

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: SW846 6850 ModifiedMatrix: WATERExtraction Batch ID: 1211962Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAPA-12-13296Date Received: 09-MAY-12GEL Job No (SDG): 12-1287GEL Sample ID: 303971002Date Filtered: 17-MAY-12Injection 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	0.227	ug/L		1	18-MAY-12 18:52	per0518037a
	Perchlorate Isotope Ratio			3.12			1	18-MAY-12 18:52	per0518037a
14797-73-0	Perchlorate-101	.05	.2	0.229	ug/L		1	18-MAY-12 18:52	per0518037a
	Perchlorate-O(18)			0.528	ug/L		1	18-MAY-12 18:52	per0518037a

^ 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): 12-1287

Extract Batch Code: 1211962

Date Filtered: 17-MAY-12

Matrix: WATER

Sample ID: 1202655997

Analyte^	True	Found	Units	%Rec	Q	Control Limits
Perchlorate	0.200	.211	ug/L	106		85 - 115
Perchlorate Isotope Ratio		3.21				-
Perchlorate-101	0.200	.207	ug/L	104		85 - 115
Perchlorate-O(18)		.523	ug/L			-

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

Perchlorate Spike/Spike Duplicate Summary

Lab Name: General Engineering Laboratories

Lab Code: GEL

GEL Job No (SDG): 12-1287

Extract Batch Code: 1211962

Date Extracted: 17-MAY-12

GEL MS/PS ID: 1202655998

Client ID: CAPA-12-13292

GEL MSD/PSD ID: 1202655999

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	0.268	ug/L	0.469	101	.492	112	4.82	30	75 - 125
Perchlorate Isotope Ratio	0	3.17		3.17		3.16		.5		-
Perchlorate-101	0.200	0.267	ug/L	0.466	99.7	.491	112	5.32	30	75 - 125
Perchlorate-O(18)	0	0.518	ug/L	0.516		.537		3.83		-

^ 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: 1211962Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

MBDate Received: 17-MAY-12GEL Job No (SDG): 12-1287GEL Sample ID: 1202655996Date Filtered: 17-MAY-12Injection Volume (uL): 20%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.050	ug/L	U	1	18-MAY-12 17:14	per0518024a
	Perchlorate Isotope Ratio						1	18-MAY-12 17:14	per0518024a
14797-73-0	Perchlorate-101	.05	.2	0.050	ug/L	U	1	18-MAY-12 17:14	per0518024a
	Perchlorate-O(18)			0.492	ug/L		1	18-MAY-12 17:14	per0518024a

^ 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: 1211962Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

LCSDate Received: 17-MAY-12GEL Job No (SDG): 12-1287GEL Sample ID: 1202655997Date Filtered: 17-MAY-12Injection 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	0.211	ug/L		1	18-MAY-12 17:22	per0518025a
	Perchlorate Isotope Ratio			3.21			1	18-MAY-12 17:22	per0518025a
14797-73-0	Perchlorate-101	.05	.2	0.207	ug/L		1	18-MAY-12 17:22	per0518025a
	Perchlorate-O(18)			0.523	ug/L		1	18-MAY-12 17:22	per0518025a

^ 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: 1211962Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

ICS

Date Received:

GEL Job No (SDG): 12-1287GEL Sample ID: 1202656000Date Filtered: 17-MAY-12Injection 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	0.228	ug/L		1	18-MAY-12 17:30	per0518026a
	Perchlorate Isotope Ratio			3.22			1	18-MAY-12 17:30	per0518026a
14797-73-0	Perchlorate-101	.05	.2	0.223	ug/L		1	18-MAY-12 17:30	per0518026a
	Perchlorate-O(18)			0.544	ug/L		1	18-MAY-12 17:30	per0518026a

^ 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: 1211962Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAPA-12-13292MSDate Received: 04-MAY-12GEL Job No (SDG): 12-1287GEL Sample ID: 1202655998Date Filtered: 17-MAY-12Injection 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	0.469	ug/L		1	18-MAY-12 17:45	per0518028a
	Perchlorate Isotope Ratio			3.17			1	18-MAY-12 17:45	per0518028a
14797-73-0	Perchlorate-101	.05	.2	0.466	ug/L		1	18-MAY-12 17:45	per0518028a
	Perchlorate-O(18)			0.516	ug/L		1	18-MAY-12 17:45	per0518028a

^ 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: 1211962Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAPA-12-13292MSDDate Received: 04-MAY-12GEL Job No (SDG): 12-1287GEL Sample ID: 1202655999Date Filtered: 17-MAY-12Injection 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	0.492	ug/L		1	18-MAY-12 17:52	per0518029a
	Perchlorate Isotope Ratio			3.16			1	18-MAY-12 17:52	per0518029a
14797-73-0	Perchlorate-101	.05	.2	0.491	ug/L		1	18-MAY-12 17:52	per0518029a
	Perchlorate-O(18)			0.537	ug/L		1	18-MAY-12 17:52	per0518029a

^ 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 (ARSL)
SDG 12-1287**

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: 1211109

Prep Batch Number: 1211107

Sample Analysis

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

Sample ID	Client ID
303971001	CAPA-12-13286
1202653938	Method Blank (MB)
1202653939	Laboratory Control Sample (LCS)
1202653940	303971001(CAPA-12-13286) Matrix Spike (MS)
1202653941	303971001(CAPA-12-13286) 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# 16.

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 Primary analyte analysis met the acceptance criteria.

Calibration Blank Requirements

All initial or continuing calibration blanks (ICB or 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 Primary analyte analysis were met by all bracketing CRI standards.

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

The MB(s) 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 303971001 (CAPA-12-13286) 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.

Matrix Spike Duplicate (MSD) Recovery Statement

The MSD spike recoveries were within the established acceptance limits.

MS/MSD Relative Percent Difference (RPD) Statement

The RPD(s) 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

According to the GEL SOP for Method 8321A, all sample and QC extracts are diluted 1:1 v/v with HPLC 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

Samples were re-analyzed for low CRI recoveries in the original Primary analyte analysis. The low recoveries were not confirmed. Only the data from the Primary analyte re-analysis are reported.

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 Secondary analyte analysis met the acceptance criteria.

Calibration Blank Requirements

All initial or continuing calibration blanks (ICB or 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 Secondary analyte analysis were met by all bracketing CRI standards.

Quality Control (QC) Information

Method Blank (MB) Statement

The MB(s) 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 303971001 (CAPA-12-13286) 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.

Matrix Spike Duplicate (MSD) Recovery Statement

The MSD spike recoveries were within the established acceptance limits.

MS/MSD Relative Percent Difference (RPD) Statement

The RPD(s) 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 analysis 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

According to the GEL SOP for Method 8321A, all sample and QC extracts are diluted 1:1 v/v with HPLC 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 for the Secondary analyte analysis.

Miscellaneous Information

Data Exception (DER) Documentation

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

Manual Integrations

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

Flagging Convention

The samples were not originally analyzed using SW-846 Method 8330.

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 in the Secondary analyte analysis, false positives and analytes detected below the MDL cannot be deleted from the raw data.

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 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 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 LCMSMS #3 or LCMSMS #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 analyte Nitroaromatic and Nitramines 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

ARSL001 ARS International (63641-10)

Client SDG: 12-1287 GEL Work Order: 303971

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: 06 JUN 2012

Title: Group Leader

Sample Data Summary

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAPA-12-13286

Lab Code: GEL

GEL Job No (SDG) 12-1287

Matrix: WATER

GEL Sample ID: 303971001

Sample Amount 920 mL

Date Received: 09-MAY-12

Moisture: .

Extraction Batch ID: 1211107

Extraction Type Sol Exchange

Date Extracted: 11-MAY-12

Concentrated Extract Volume (mL) 5

Injection Volume (uL): 50

GEL data file: EXP0605015.wiff

Date Analyzed: 05-JUN-12 23:48

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
118-96-7	2,4,6-Trinitrotoluene	0.272	U	0.087	0.272
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
121-14-2	2,4-Dinitrotoluene	0.272	U	0.087	0.272
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
121-82-4	RDX	0.272	U	0.087	0.272
<i>121-82-4</i>	<i>RDX</i>				
13980-04-6	TNX	0.272	U	0.087	0.272
<i>13980-04-6</i>	<i>TNX</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	0.272	U	0.087	0.272
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
2691-41-0	HMX	0.272	U	0.087	0.272
<i>2691-41-0</i>	<i>HMX</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	0.272	U	0.087	0.272
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
5755-27-1	MNX	0.272	U	0.087	0.272
<i>5755-27-1</i>	<i>MNX</i>				
606-20-2	2,6-Dinitrotoluene	0.272	U	0.087	0.272
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
80251-29-2	DNX	0.272	U	0.087	0.272
<i>80251-29-2</i>	<i>DNX</i>				
88-72-2	o-Nitrotoluene	0.272	U	0.0891	0.272
<i>88-72-2</i>	<i>o-Nitrotoluene</i>				
98-95-3	Nitrobenzene	0.272	U	0.087	0.272
<i>98-95-3</i>	<i>Nitrobenzene</i>				
99-08-1	m-Nitrotoluene	0.272	U	0.087	0.272
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAPA-12-13286

Lab Code: GEL

GEL Job No (SDG) 12-1287

Matrix: WATER

GEL Sample ID: 303971001

Sample Amount 920 mL

Date Received: 09-MAY-12

Moisture: .

Extraction Batch ID: 1211107

Extraction Type Sol Exchange

Date Extracted: 11-MAY-12

Concentrated Extract Volume (mL) 5

Injection Volume (uL): 50

Cas No.	Compound	Concentration*	Q	MDL	PQL
99-35-4	1,3,5-Trinitrobenzene	0.272	U	0.087	0.272
<i>99-35-4</i>	<i>1,3,5-Trinitrobenzene</i>				
99-65-0	m-Dinitrobenzene	0.272	U	0.087	0.272
<i>99-65-0</i>	<i>m-Dinitrobenzene</i>				
479-45-8	Tetryl	0.543	U	0.087	0.543
<i>479-45-8</i>	<i>Tetryl</i>				
78-11-5	PETN	0.543	U	0.109	0.543
<i>78-11-5</i>	<i>PETN</i>				
99-99-0	p-Nitrotoluene	0.543	U	0.163	0.543
<i>99-99-0</i>	<i>p-Nitrotoluene</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAPA-12-13286

Lab Code: GEL

GEL Job No (SDG) 12-1287

Matrix: WATER

GEL Sample ID: 303971001

Sample Amount 920 mL

Date Received: 09-MAY-12

Moisture: .

Extraction Batch ID: 1211107

Extraction Type Sol Exchange

Date Extracted: 11-MAY-12

Concentrated Extract Volume (mL) 5

Injection Volume (uL): 50

GEL data file: EXS05150022.wiff

Date Analyzed: 15-MAY-12 15:42

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
3058-38-6 <i>3058-38-6</i>	TATB <i>TATB</i>	1.09	U	0.326	1.09
618-87-1 <i>618-87-1</i>	3,5-Dinitroaniline <i>3,5-Dinitroaniline</i>	1.09	U	0.326	1.09
78-30-8 <i>78-30-8</i>	tris(o-cresyl) phosphate <i>tris(o-cresyl) phosphate</i>	1.09	U	0.326	1.09
59229-75-3 <i>59229-75-3</i>	2,6-Diamino-4-nitrotoluene <i>2,6-Diamino-4-nitrotoluene</i>	2.72	U	0.543	2.72
6629-29-4 <i>6629-29-4</i>	2,4-Diamino-6-nitrotoluene <i>2,4-Diamino-6-nitrotoluene</i>	2.72	U	0.543	2.72

Quality Control Summary

High Explosives Surrogate Recovery Summary

Lab Name: GEL Laboratories LLCGEL Job No (SDG): 12-1287Lab Code: GELHPLC Column: Phenomenex Ultracarb 5u ODS(20)

Lab Sample ID	Client Sample ID	DNT	QC Limits	Flg
303971001	CAPA-12-13286	90	68 - 122	
303971001	CAPA-12-13286	89.2	68 - 122	
1202653938	MB for batch 1211107	95.6	68 - 122	
1202653938	MB for batch 1211107	86.4	68 - 122	
1202653939	LCS for batch 1211107	90	68 - 122	
1202653939	LCS for batch 1211107	87.2	68 - 122	
1202653940	CAPA-12-13286(303971001MS)	92	68 - 122	
1202653940	CAPA-12-13286(303971001MS)	86.4	68 - 122	
1202653941	CAPA-12-13286(303971001MSD)	102	68 - 122	
1202653941	CAPA-12-13286(303971001MSD)	100	68 - 122	

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) 12-1287

Extract Batch Code: 1211107

Date Extracted: 11-MAY-12

GEL LCS ID: 1202653939

GEL LCSDUP ID: .

Analysis Date/Time: 05-JUN-12 23:13

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
RDX	5	4.34	86.8					79 - 128
TNX	5	4.14	82.8					66 - 118
Tetryl	5	3.76	75.2					38 - 150
m-Dinitrobenzene	5	4.43	88.6					86 - 119
m-Nitrotoluene	5	4.46	89.2					63 - 109
o-Nitrotoluene	5	4.25	85					61 - 109
p-Nitrotoluene	5	4.37	87.4					64 - 112
2,4,6-Trinitrotoluene	5	4.5	90					77 - 132
2,6-Dinitrotoluene	5	4.4	88					82 - 111
PETN	5	3.89	77.8					61 - 138
Nitrobenzene	5	4.24	84.8					63 - 110
MNX	5	4	80					68 - 129
HMX	5	3.55	71					65 - 112
DNX	5	4.06	81.2					73 - 117
4-Amino-2,6-dinitrotoluene	5	4.52	90.4					78 - 125
2-Amino-4,6-dinitrotoluene	5	4.41	88.2					75 - 129
2,4-Dinitrotoluene	5	4.49	89.8					78 - 125
1,3,5-Trinitrobenzene	5	4.1	82					60 - 115

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) 12-1287

Extract Batch Code: 1211107

Date Extracted: 11-MAY-12

GEL LCS ID: 1202653939

GEL LCSDUP ID: .

Analysis Date/Time: 15-MAY-12 15:25

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	4	80					49 - 112
2,6-Diamino-4-nitrotoluene	5	4.16	83.2					61 - 116
3,5-Dinitroaniline	5	4.61	92.2					66 - 119
TATB	5	2.6	52					32 - 169
tris(o-cresyl) phosphate	5	2.93	58.6					38 - 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: CAPA-12-13286

Lab Code: GEL

GEL Job No (SDG) 12-1287

Extract Batch Code: 1211107

Date Extracted: 11-MAY-12

GEL Spike ID: 1202653940

GEL SpikeDup ID: 1202653941

Analysis Date/Time: 06-JUN-12 00:23

MSD Analysis Date/Time: 06-JUN-12 00:58

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
o-Nitrotoluene	5.74713	0	4.49	78.2	4.82	83.8	6.91	25	57 - 119
p-Nitrotoluene	5.74713	0	4.64	80.8	5.33	92.8	13.8	25	57 - 124
1,3,5-Trinitrobenzene	5.74713	0	5.03	87.6	5.22	90.8	3.59	25	58 - 114
2,6-Dinitrotoluene	5.74713	0	5.07	88.2	5.31	92.4	4.65	25	79 - 115
2,4-Dinitrotoluene	5.74713	0	5.38	93.6	5.66	98.4	5	25	73 - 128
2,4,6-Trinitrotoluene	5.74713	.00142	5.43	94.4	5.72	99.6	5.36	25	65 - 140
2-Amino-4,6-dinitrotoluene	5.74713	0	5.24	91.2	5.62	97.8	6.98	25	66 - 137
DNX	5.74713	0	4.86	84.6	4.9	85.2	.707	34	67 - 126
MXN	5.74713	0	4.98	86.6	4.79	83.4	3.77	25	74 - 127
m-Nitrotoluene	5.74713	0	4.34	75.6	4.98	86.6	13.6	25	55 - 123
m-Dinitrobenzene	5.74713	0	5.32	92.6	5.49	95.6	3.19	25	79 - 126
Tetryl	5.74713	0	4.78	83.2	4.64	80.8	2.93	28	31 - 119
TNX	5.74713	0	4.8	83.6	4.71	82	1.93	31	51 - 133
RDX	5.74713	0	5.33	92.8	5.29	92	.866	25	63 - 145
PETN	5.74713	0	5.01	87.2	5.13	89.2	2.27	27	53 - 143
Nitrobenzene	5.74713	0	4.46	77.6	5.21	90.6	15.5	25	61 - 118
HMX	5.74713	0	4.83	84	5	87	3.51	25	51 - 128
4-Amino-2,6-dinitrotoluene	5.74713	0	5.34	93	5.78	101	7.85	25	65 - 137

#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: CAPA-12-13286

Lab Code: GEL

GEL Job No (SDG) 12-1287

Extract Batch Code: 1211107

Date Extracted: 11-MAY-12

GEL Spike ID: 1202653940

GEL SpikeDup ID: 1202653941

Analysis Date/Time: 15-MAY-12 15:59

MSD Analysis Date/Time: 15-MAY-12 16:15

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	5.74713	0	4.93	85.8	5.18	90.2	5	25	42 - 117
2,6-Diamino-4-nitrotoluene	5.74713	0	4.99	86.8	5.23	91	4.72	25	50 - 121
3,5-Dinitroaniline	5.74713	0	5.48	95.4	6.59	115	18.3	25	59 - 125
TATB	5.74713	0	2.98	51.8	3.47	60.4	15.3	25	30 - 169
tris(o-cresyl) phosphate	5.74713	.0241	3.61	62.4	3.56	61.6	1.28	25	28 - 87

#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 1211107

Lab Code: GEL

GEL Job No (SDG) 12-1287

Matrix: WATER

GEL Sample ID: 1202653938

Sample Amount 1000 mL

Date Received: 09-MAY-12

Moisture: .

Extraction Batch ID: 1211107

Extraction Type Sol Exchange

Date Extracted: 11-MAY-12

Concentrated Extract Volume (mL) 5

Injection Volume (uL): 50

GEL data file: EXP0605013.wiff

Date Analyzed: 05-JUN-12 22:38

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>				
13980-04-6	TNX	0.250	U	0.080	0.250
<i>13980-04-6</i>	<i>TNX</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>				
5755-27-1	MNX	0.250	U	0.080	0.250
<i>5755-27-1</i>	<i>MNX</i>				
606-20-2	2,6-Dinitrotoluene	0.250	U	0.080	0.250
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
80251-29-2	DNX	0.250	U	0.080	0.250
<i>80251-29-2</i>	<i>DNX</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>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: MB for batch 1211107

Lab Code: GEL

GEL Job No (SDG) 12-1287

Matrix: WATER

GEL Sample ID: 1202653938

Sample Amount 1000 mL

Date Received: 09-MAY-12

Moisture: .

Extraction Batch ID: 1211107

Extraction Type Sol Exchange

Date Extracted: 11-MAY-12

Concentrated Extract Volume (mL) 5

Injection Volume (uL): 50

Cas No.	Compound	Concentration*	Q	MDL	PQL
99-35-4 <i>99-35-4</i>	1,3,5-Trinitrobenzene <i>1,3,5-Trinitrobenzene</i>	0.250	U	0.080	0.250
99-65-0 <i>99-65-0</i>	m-Dinitrobenzene <i>m-Dinitrobenzene</i>	0.250	U	0.080	0.250
479-45-8 <i>479-45-8</i>	Tetryl <i>Tetryl</i>	0.500	U	0.080	0.500
78-11-5 <i>78-11-5</i>	PETN <i>PETN</i>	0.500	U	0.100	0.500
99-99-0 <i>99-99-0</i>	p-Nitrotoluene <i>p-Nitrotoluene</i>	0.500	U	0.150	0.500

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: MB for batch 1211107

Lab Code: GEL

GEL Job No (SDG) 12-1287

Matrix: WATER

GEL Sample ID: 1202653938

Sample Amount 1000 mL

Date Received: 09-MAY-12

Moisture: .

Extraction Batch ID: 1211107

Extraction Type Sol Exchange

Date Extracted: 11-MAY-12

Concentrated Extract Volume (mL) 5

Injection Volume (uL): 50

GEL data file: EXS05150020.wiff

Date Analyzed: 15-MAY-12 15:08

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
3058-38-6	TATB				
618-87-1	3,5-Dinitroaniline	1.00	U	0.300	1.00
618-87-1	3,5-Dinitroaniline				
78-30-8	tris(o-cresyl) phosphate	1.00	U	0.300	1.00
78-30-8	tris(o-cresyl) phosphate				
59229-75-3	2,6-Diamino-4-nitrotoluene	2.50	U	0.500	2.50
59229-75-3	2,6-Diamino-4-nitrotoluene				
6629-29-4	2,4-Diamino-6-nitrotoluene	2.50	U	0.500	2.50
6629-29-4	2,4-Diamino-6-nitrotoluene				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: LCS for batch 1211107

Lab Code: GEL

GEL Job No (SDG) 12-1287

Matrix: WATER

GEL Sample ID: 1202653939

Sample Amount 1000 mL

Date Received: 09-MAY-12

Moisture: .

Extraction Batch ID: 1211107

Extraction Type Sol Exchange

Date Extracted: 11-MAY-12

Concentrated Extract Volume (mL) 5

Injection Volume (uL): 50

GEL data file: EXP0605014.wiff

Date Analyzed: 05-JUN-12 23:13

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
2691-41-0	HMX	3.55		0.080	0.250
<i>2691-41-0</i>	<i>HMX</i>				
479-45-8	Tetryl	3.76		0.080	0.500
<i>479-45-8</i>	<i>Tetryl</i>				
78-11-5	PETN	3.89		0.100	0.500
<i>78-11-5</i>	<i>PETN</i>				
5755-27-1	MNX	4		0.080	0.250
<i>5755-27-1</i>	<i>MNX</i>				
80251-29-2	DNX	4.06		0.080	0.250
<i>80251-29-2</i>	<i>DNX</i>				
99-35-4	1,3,5-Trinitrobenzene	4.1		0.080	0.250
<i>99-35-4</i>	<i>1,3,5-Trinitrobenzene</i>				
13980-04-6	TNX	4.14		0.080	0.250
<i>13980-04-6</i>	<i>TNX</i>				
98-95-3	Nitrobenzene	4.24		0.080	0.250
<i>98-95-3</i>	<i>Nitrobenzene</i>				
88-72-2	o-Nitrotoluene	4.25		0.082	0.250
<i>88-72-2</i>	<i>o-Nitrotoluene</i>				
121-82-4	RDX	4.34		0.080	0.250
<i>121-82-4</i>	<i>RDX</i>				
99-99-0	p-Nitrotoluene	4.37		0.150	0.500
<i>99-99-0</i>	<i>p-Nitrotoluene</i>				
606-20-2	2,6-Dinitrotoluene	4.4		0.080	0.250
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	4.41		0.080	0.250
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: LCS for batch 1211107

Lab Code: GEL

GEL Job No (SDG) 12-1287

Matrix: WATER

GEL Sample ID: 1202653939

Sample Amount 1000 mL

Date Received: 09-MAY-12

Moisture: .

Extraction Batch ID: 1211107

Extraction Type Sol Exchange

Date Extracted: 11-MAY-12

Concentrated Extract Volume (mL) 5

Injection Volume (uL): 50

Cas No.	Compound	Concentration*	Q	MDL	PQL
99-65-0	m-Dinitrobenzene	4.43		0.080	0.250
<i>99-65-0</i>	<i>m-Dinitrobenzene</i>				
99-08-1	m-Nitrotoluene	4.46		0.080	0.250
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				
121-14-2	2,4-Dinitrotoluene	4.49		0.080	0.250
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
118-96-7	2,4,6-Trinitrotoluene	4.5		0.080	0.250
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	4.52		0.080	0.250
<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: LCS for batch 1211107

Lab Code: GEL

GEL Job No (SDG) 12-1287

Matrix: WATER

GEL Sample ID: 1202653939

Sample Amount 1000 mL

Date Received: 09-MAY-12

Moisture: .

Extraction Batch ID: 1211107

Extraction Type Sol Exchange

Date Extracted: 11-MAY-12

Concentrated Extract Volume (mL) 5

Injection Volume (uL): 50

GEL data file: EXS05150021.wiff

Date Analyzed: 15-MAY-12 15:25

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
3058-38-6	TATB	2.6		0.300	1.00
3058-38-6	TATB				
78-30-8	tris(o-cresyl) phosphate	2.93		0.300	1.00
78-30-8	tris(o-cresyl) phosphate				
6629-29-4	2,4-Diamino-6-nitrotoluene	4		0.500	2.50
6629-29-4	2,4-Diamino-6-nitrotoluene				
59229-75-3	2,6-Diamino-4-nitrotoluene	4.16		0.500	2.50
59229-75-3	2,6-Diamino-4-nitrotoluene				
618-87-1	3,5-Dinitroaniline	4.61		0.300	1.00
618-87-1	3,5-Dinitroaniline				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAPA-12-13286(303971001MS)MS

Lab Code: GEL

GEL Job No (SDG) 12-1287

Matrix: WATER

GEL Sample ID: 1202653940

Sample Amount 870 mL

Date Received: 09-MAY-12

Moisture: .

Extraction Batch ID: 1211107

Extraction Type Sol Exchange

Date Extracted: 11-MAY-12

Concentrated Extract Volume (mL) 5

Injection Volume (uL): 50

GEL data file: EXP0605016.wiff

Date Analyzed: 06-JUN-12 00:23

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
99-08-1	m-Nitrotoluene	4.34		0.092	0.287
99-08-1	m-Nitrotoluene				
98-95-3	Nitrobenzene	4.46		0.092	0.287
98-95-3	Nitrobenzene				
88-72-2	o-Nitrotoluene	4.49		0.0943	0.287
88-72-2	o-Nitrotoluene				
99-99-0	p-Nitrotoluene	4.64		0.172	0.575
99-99-0	p-Nitrotoluene				
479-45-8	Tetryl	4.78		0.092	0.575
479-45-8	Tetryl				
13980-04-6	TNX	4.8		0.092	0.287
13980-04-6	TNX				
2691-41-0	HMX	4.83		0.092	0.287
2691-41-0	HMX				
80251-29-2	DNX	4.86		0.092	0.287
80251-29-2	DNX				
5755-27-1	MNX	4.98		0.092	0.287
5755-27-1	MNX				
78-11-5	PETN	5.01		0.115	0.575
78-11-5	PETN				
99-35-4	1,3,5-Trinitrobenzene	5.03		0.092	0.287
99-35-4	1,3,5-Trinitrobenzene				
606-20-2	2,6-Dinitrotoluene	5.07		0.092	0.287
606-20-2	2,6-Dinitrotoluene				
35572-78-2	2-Amino-4,6-dinitrotoluene	5.24		0.092	0.287
35572-78-2	2-Amino-4,6-dinitrotoluene				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAPA-12-13286(303971001MS)MS

Lab Code: GEL

GEL Job No (SDG) 12-1287

Matrix: WATER

GEL Sample ID: 1202653940

Sample Amount 870 mL

Date Received: 09-MAY-12

Moisture: .

Extraction Batch ID: 1211107

Extraction Type Sol Exchange

Date Extracted: 11-MAY-12

Concentrated Extract Volume (mL) 5

Injection Volume (uL): 50

Cas No.	Compound	Concentration*	Q	MDL	PQL
99-65-0	m-Dinitrobenzene	5.32		0.092	0.287
<i>99-65-0</i>	<i>m-Dinitrobenzene</i>				
121-82-4	RDX	5.33		0.092	0.287
<i>121-82-4</i>	<i>RDX</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	5.34		0.092	0.287
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
121-14-2	2,4-Dinitrotoluene	5.38		0.092	0.287
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
118-96-7	2,4,6-Trinitrotoluene	5.43		0.092	0.287
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAPA-12-13286(303971001MS)MS

Lab Code: GEL

GEL Job No (SDG) 12-1287

Matrix: WATER

GEL Sample ID: 1202653940

Sample Amount 870 mL

Date Received: 09-MAY-12

Moisture: .

Extraction Batch ID: 1211107

Extraction Type Sol Exchange

Date Extracted: 11-MAY-12

Concentrated Extract Volume (mL) 5

Injection Volume (uL): 50

GEL data file: EXS05150023.wiff

Date Analyzed: 15-MAY-12 15:59

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
3058-38-6	TATB	2.98		0.345	1.15
3058-38-6	TATB				
78-30-8	tris(o-cresyl) phosphate	3.61		0.345	1.15
78-30-8	tris(o-cresyl) phosphate				
6629-29-4	2,4-Diamino-6-nitrotoluene	4.93		0.575	2.87
6629-29-4	2,4-Diamino-6-nitrotoluene				
59229-75-3	2,6-Diamino-4-nitrotoluene	4.99		0.575	2.87
59229-75-3	2,6-Diamino-4-nitrotoluene				
618-87-1	3,5-Dinitroaniline	5.48		0.345	1.15
618-87-1	3,5-Dinitroaniline				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAPA-12-13286(303971001MSD)MSD

Lab Code: GEL

GEL Job No (SDG) 12-1287

Matrix: WATER

GEL Sample ID: 1202653941

Sample Amount 870 mL

Date Received: 09-MAY-12

Moisture: .

Extraction Batch ID: 1211107

Extraction Type Sol Exchange

Date Extracted: 11-MAY-12

Concentrated Extract Volume (mL) 5

Injection Volume (uL): 50

GEL data file: EXP0605017.wiff

Date Analyzed: 06-JUN-12 00:58

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
479-45-8	Tetryl	4.64		0.092	0.575
<i>479-45-8</i>	<i>Tetryl</i>				
13980-04-6	TNX	4.71		0.092	0.287
<i>13980-04-6</i>	<i>TNX</i>				
5755-27-1	MNX	4.79		0.092	0.287
<i>5755-27-1</i>	<i>MNX</i>				
88-72-2	o-Nitrotoluene	4.82		0.0943	0.287
<i>88-72-2</i>	<i>o-Nitrotoluene</i>				
80251-29-2	DNX	4.9		0.092	0.287
<i>80251-29-2</i>	<i>DNX</i>				
99-08-1	m-Nitrotoluene	4.98		0.092	0.287
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				
2691-41-0	HMX	5		0.092	0.287
<i>2691-41-0</i>	<i>HMX</i>				
78-11-5	PETN	5.13		0.115	0.575
<i>78-11-5</i>	<i>PETN</i>				
98-95-3	Nitrobenzene	5.21		0.092	0.287
<i>98-95-3</i>	<i>Nitrobenzene</i>				
99-35-4	1,3,5-Trinitrobenzene	5.22		0.092	0.287
<i>99-35-4</i>	<i>1,3,5-Trinitrobenzene</i>				
121-82-4	RDX	5.29		0.092	0.287
<i>121-82-4</i>	<i>RDX</i>				
606-20-2	2,6-Dinitrotoluene	5.31		0.092	0.287
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
99-99-0	p-Nitrotoluene	5.33		0.172	0.575
<i>99-99-0</i>	<i>p-Nitrotoluene</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAPA-12-13286(303971001MSD)MSD

Lab Code: GEL

GEL Job No (SDG) 12-1287

Matrix: WATER

GEL Sample ID: 1202653941

Sample Amount 870 mL

Date Received: 09-MAY-12

Moisture: .

Extraction Batch ID: 1211107

Extraction Type Sol Exchange

Date Extracted: 11-MAY-12

Concentrated Extract Volume (mL) 5

Injection Volume (uL): 50

Cas No.	Compound	Concentration*	Q	MDL	PQL
99-65-0	m-Dinitrobenzene	5.49		0.092	0.287
<i>99-65-0</i>	<i>m-Dinitrobenzene</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	5.62		0.092	0.287
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
121-14-2	2,4-Dinitrotoluene	5.66		0.092	0.287
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
118-96-7	2,4,6-Trinitrotoluene	5.72		0.092	0.287
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	5.78		0.092	0.287
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAPA-12-13286(303971001MSD)MSD

Lab Code: GEL

GEL Job No (SDG) 12-1287

Matrix: WATER

GEL Sample ID: 1202653941

Sample Amount 870 mL

Date Received: 09-MAY-12

Moisture: .

Extraction Batch ID: 1211107

Extraction Type Sol Exchange

Date Extracted: 11-MAY-12

Concentrated Extract Volume (mL) 5

Injection Volume (uL): 50

GEL data file: EXS05150024.wiff

Date Analyzed: 15-MAY-12 16:15

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
3058-38-6	TATB	3.47		0.345	1.15
<i>3058-38-6</i>	<i>TATB</i>				
78-30-8	tris(o-cresyl) phosphate	3.56		0.345	1.15
<i>78-30-8</i>	<i>tris(o-cresyl) phosphate</i>				
6629-29-4	2,4-Diamino-6-nitrotoluene	5.18		0.575	2.87
<i>6629-29-4</i>	<i>2,4-Diamino-6-nitrotoluene</i>				
59229-75-3	2,6-Diamino-4-nitrotoluene	5.23		0.575	2.87
<i>59229-75-3</i>	<i>2,6-Diamino-4-nitrotoluene</i>				
618-87-1	3,5-Dinitroaniline	6.59		0.345	1.15
<i>618-87-1</i>	<i>3,5-Dinitroaniline</i>				

Explosives Initial Calibration Blank

Lab Name: GEL Laboratories LLCGEL Job No(SDG): 12-1287Lab Code: GELLab Sample ID: XIBLK01Analysis Date: 05-JUN-12 15:39GEL Data File: EXP0605001.wiffInstrument ID: LCMSMSColumn: Phenomenex Ultracarb 5u ODS(20)

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

Explosives Initial Calibration Blank

Lab Name: GEL Laboratories LLCGEL Job No(SDG): 12-1287Lab Code: GELLab Sample ID: XIBLK01Analysis Date: 05-JUN-12 16:14GEL Data File: EXP0605002.wiffInstrument ID: LCMSMSColumn: Phenomenex Ultracarb 5u ODS(20)

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

Explosives Initial Calibration Blank

Lab Name: GEL Laboratories LLCGEL Job No(SDG): 12-1287Lab Code: GELLab Sample ID: XIBLK01Analysis Date: 15-MAY-12 09:51GEL Data File: EXS05150001.wiffInstrument ID: LCMSMSColumn: Phenomenex Ultracarb 5u ODS(20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	4.16
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0

Explosives Initial Calibration Blank

Lab Name: GEL Laboratories LLCGEL Job No(SDG): 12-1287Lab Code: GELLab Sample ID: XIBLK01Analysis Date: 15-MAY-12 10:07GEL Data File: EXS05150002.wiffInstrument ID: LCMSMSColumn: Phenomenex Ultracarb 5u ODS(20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	2.17
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): 12-1287

Lab Code: GEL

Lab Sample ID: XIBLK02

Analysis Date: 05-JUN-12 20:19

GEL Data File: EXP0605009.wiff

Instrument ID: LCMSMS

Column: Phenomenex Ultracarb 5u ODS(20)

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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 12-1287

Lab Code: GEL

Lab Sample ID: XIBLK03

Analysis Date: 05-JUN-12 21:28

GEL Data File: EXP0605011.wiff

Instrument ID: LCMSMS

Column: Phenomenex Ultracarb 5u ODS(20)

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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 12-1287

Lab Code: GEL

Lab Sample ID: XIBLK04

Analysis Date: 06-JUN-12 02:08

GEL Data File: EXP0605019.wiff

Instrument ID: LCMSMS

Column: Phenomenex Ultracarb 5u ODS(20)

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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 12-1287

Lab Code: GEL

Lab Sample ID: XIBLK02

Analysis Date: 15-MAY-12 12:21

GEL Data File: EXS05150010.wiff

Instrument ID: LCMSMS

Column: Phenomenex Ultracarb 5u ODS(20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	11
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): 12-1287

Lab Code: GEL

Lab Sample ID: XIBLK03

Analysis Date: 15-MAY-12 12:55

GEL Data File: EXS05150012.wiff

Instrument ID: LCMSMS

Column: Phenomenex Ultracarb 5u ODS(20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	5.33
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): 12-1287

Lab Code: GEL

Lab Sample ID: XIBLK04

Analysis Date: 15-MAY-12 14:35

GEL Data File: EXS05150018.wiff

Instrument ID: LCMSMS

Column: Phenomenex Ultracarb 5u ODS(20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	4.25
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): 12-1287

Lab Code: GEL

Lab Sample ID: XIBLK05

Analysis Date: 15-MAY-12 16:49

GEL Data File: EXS05150026.wiff

Instrument ID: LCMSMS

Column: Phenomenex Ultracarb 5u ODS(20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	4.86
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0

Metals Analysis

Case Narrative

**Metals Fractional Narrative
ARS International (ARSL)
SDG 12-1287**

Sample Analysis

Sample ID	Client ID
303971002	CAPA-12-13296
1202655106	Method Blank (MB) ICP
1202655107	Laboratory Control Sample (LCS)
1202655110	303971002(CAPA-12-13296L) Serial Dilution (SD)
1202655108	303971002(CAPA-12-13296D) Sample Duplicate (DUP)
1202655109	303971002(CAPA-12-13296S) Matrix Spike (MS)
1202655111	Method Blank (MB) ICP-MS
1202655112	Laboratory Control Sample (LCS)
1202655115	303971002(CAPA-12-13296L) Serial Dilution (SD)
1202655113	303971002(CAPA-12-13296D) Sample Duplicate (DUP)
1202655114	303971002(CAPA-12-13296S) Matrix Spike (MS)
1202669183	Method Blank (MB) CVAA
1202669184	Laboratory Control Sample (LCS)
1202669187	303971002(CAPA-12-13296L) Serial Dilution (SD)
1202669185	303971002(CAPA-12-13296D) Sample Duplicate (DUP)
1202669186	303971002(CAPA-12-13296S) Matrix Spike (MS)

Method/Analysis Information

Analytical Batch:	1211594, 1211596, 1217402 and 1218066
Prep Batch :	1211593, 1211595 and 1217401
Standard Operating Procedures:	GL-MA-E-013 REV# 20, GL-MA-E-006 REV# 9, GL-MA-E-014 REV# 24, GL-MA-E-010 REV# 25 and GL-GC-E-107 REV# 7
Analytical Method:	SW846 3005/6010B, SW846 3005/6020 DOE-AL, EPA 245.1/245.2 and SM 2340 B
Prep Method :	SW846 3005A and EPA 245.1/245.2 Prep

Preparation/Analytical Method Verification

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

System Configuration

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

The Metals analysis-ICP was performed on a P E 5300 Optima radial/axial-viewing inductively coupled plasma atomic emission spectrometer. The instrument is equipped with a Burgener nebulizer, 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 1.4L/min, argon gas flows of 15 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-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 Requirements

All CRDL standard(s) 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 Blank (CCB) Requirements

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

Continuing Calibration Verification (CCV) Requirements

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

Quality Control (QC) Information

Method Blank (MB) Statement

The MBs analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

Quality Control (QC) Sample Statement

The following sample was selected as the quality control (QC) sample for this SDG: 303971002 (CAPA-12-13296)-ICP, ICP-MS and 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 elements 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 detection 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 that are 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 acceptance criteria of less than 10% difference (%D).

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. The samples in this SDG did not require dilutions.

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 (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.

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

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

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

Certification Statement

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

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. Emore Date: 06-05-12

Sample Data Summary

GEL LABORATORIES LLC

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

Qualifier Definition Report for

ARSL001 ARS International (63641-10)

Client SDG: 12-1287 GEL Work Order: 303971

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.

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 detection limit.

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

 06-05-12

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 12-1287

METHOD TYPE: EPA

SAMPLE ID: 303971002

CLIENT ID: CAPA-12-13296

CONTRACT: ESHL00210

MATRIX:W

DATE RECEIVED 09-MAY-12

LEVEL: Low %SOLIDS:

<u>CAS No</u>	<u>Analyte</u>	<u>Result</u>	<u>Units</u>	<u>C</u>	<u>Qual</u>	<u>M*</u>	<u>MDL</u>	<u>DF</u>	<u>Inst ID</u>	<u>Analytical Run</u>
7439-97-6	Mercury	0.067	ug/L	U		AV	0.067	1	MER536	060412W1-4
7631-86-9	Silica	67.9	mg/L			P	0.053	1	OPTIMA3	052212-1
7429-90-5	Aluminum	68	ug/L	U		P	68	1	OPTIMA3	052212-1
7440-36-0	Antimony	1	ug/L	U		MS	1	1	ICPMS6	120522-2
7440-38-2	Arsenic	1.7	ug/L	U		MS	1.7	1	ICPMS6	120522-2
7440-39-3	Barium	26.4	ug/L			P	1	1	OPTIMA3	052212-1
7440-41-7	Beryllium	1	ug/L	U		P	1	1	OPTIMA3	052212-1
7440-42-8	Boron	30.5	ug/L	J		P	15	1	OPTIMA3	052212-1
7440-43-9	Cadmium	0.11	ug/L	U		MS	0.11	1	ICPMS6	120522-2
7440-70-2	Calcium	10500	ug/L			P	50	1	OPTIMA3	052212-1
7440-47-3	Chromium	3.25	ug/L	J		MS	2	1	ICPMS6	120522-2
7440-48-4	Cobalt	1	ug/L	U		P	1	1	OPTIMA3	052212-1
7440-50-8	Copper	3	ug/L	U		P	3	1	OPTIMA3	052212-1
7439-89-6	Iron	30	ug/L	U		P	30	1	OPTIMA3	052212-1
7439-92-1	Lead	0.5	ug/L	U		MS	0.5	1	ICPMS6	120522-2
7439-95-4	Magnesium	2880	ug/L			P	110	1	OPTIMA3	052212-1
7439-96-5	Manganese	7.76	ug/L	J		P	2	1	OPTIMA3	052212-1
7439-98-7	Molybdenum	1.33	ug/L			MS	0.165	1	ICPMS6	120522-2
7440-02-0	Nickel	0.5	ug/L	U		MS	0.5	1	ICPMS6	120522-2
7440-09-7	Potassium	1650	ug/L			P	50	1	OPTIMA3	052212-1
7782-49-2	Selenium	1.5	ug/L	U		MS	1.5	1	ICPMS6	120522-2
7440-22-4	Silver	0.2	ug/L	U		MS	0.2	1	ICPMS6	120522-2
7440-23-5	Sodium	10500	ug/L			P	100	1	OPTIMA3	052212-1
7440-24-6	Strontium	50.2	ug/L			P	1	1	OPTIMA3	052212-1
7440-28-0	Thallium	0.45	ug/L	U		MS	0.45	1	ICPMS6	120522-2
7440-31-5	Tin	2.5	ug/L	U		P	2.5	1	OPTIMA3	052212-1

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 12-1287

METHOD TYPE: EPA

SAMPLE ID: 303971002

CLIENT ID: CAPA-12-13296

CONTRACT: ESHL00210

MATRIX:W

DATE RECEIVED 09-MAY-12

LEVEL: Low %SOLIDS:

<u>CAS No</u>	<u>Analyte</u>	<u>Result</u>	<u>Units</u>	<u>C</u>	<u>Qual</u>	<u>M*</u>	<u>MDL</u>	<u>DF</u>	<u>Inst ID</u>	<u>Analytical Run</u>
7440-61-1	Uranium	0.289	ug/L			MS	0.067	1	ICPMS6	120523-3
7440-62-2	Vanadium	4.74	ug/L	J		P	1	1	OPTIMA3	052212-1
7440-66-6	Zinc	26.7	ug/L			P	3.3	1	OPTIMA3	052212-1
	Hardness as CaCO3	38.1	mg/L				0.453	1	CALC001	

***Analytical Methods:**

MS SW846 3005/6020 DOE-AL
P SW846 3005/6010B
AV EPA 245.1/245.2
SM 2340 B

Quality Control Summary

METALS
-3b-
PREPARATION BLANK SUMMARY

SDG NO. 12-1287
Contract: ESHL00210
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>
1202655106	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	0.053	mg/L	+/-0.213	U	P	0.053	0.213
	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
1202655111	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
1202669183	Mercury	0.067	ug/L	+/-0.2	U	AV	0.067	0.2

***Analytical Methods:**

MS SW846 3005/6020 DOE-AL
P SW846 3005/6010B
AV EPA 245.1/245.2

METALS

-5a-

Matrix Spike Summary

SDG NO. 12-1287

Client ID: CAPA-12-13296S

Contract: ESHL00210

Level: Low

Matrix: WATER

% Solids:

Sample ID: 303971002

Spike ID: 1202655109

<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	5030		68	U	5000	100		P
Barium	ug/L	75-125	540		26.4		500	103		P
Beryllium	ug/L	75-125	523		1	U	500	105		P
Boron	ug/L	75-125	546		30.5	J	500	103		P
Calcium	ug/L	75-125	15000		10500		5000	90.6		P
Cobalt	ug/L	75-125	513		1	U	500	102		P
Copper	ug/L	75-125	523		3	U	500	104		P
Iron	ug/L	75-125	5270		30	U	5000	105		P
Magnesium	ug/L	75-125	8080		2880		5000	104		P
Manganese	ug/L	75-125	512		7.76	J	500	101		P
Potassium	ug/L	75-125	6650		1650		5000	100		P
Silica	mg/L		75		67.9		10.7	66.3	N/A	P
Sodium	ug/L	75-125	15000		10500		5000	91.6		P
Strontium	ug/L	75-125	553		50.2		500	101		P
Tin	ug/L	75-125	507		2.5	U	500	101		P
Vanadium	ug/L	75-125	518		4.74	J	500	103		P
Zinc	ug/L	75-125	519		26.7		500	98.5		P

*Analytical Methods:

P

SW846 3005/6010B

METALS

-5a-

Matrix Spike Summary

SDG NO. 12-1287

Client ID: CAPA-12-13296S

Contract: ESHL00210

Level: Low

Matrix: WATER

% Solids:

Sample ID: 303971002

Spike ID: 1202655114

<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	73.6		1.7	U	80	92		MS
Cadmium	ug/L	75-125	10.9		0.11	U	10	109		MS
Chromium	ug/L	75-125	51.9		3.25	J	50	97.4		MS
Lead	ug/L	75-125	42.8		0.5	U	40	107		MS
Molybdenum	ug/L	75-125	54.3		1.33		50	106		MS
Nickel	ug/L	75-125	49.6		0.5	U	50	98.4		MS
Selenium	ug/L	75-125	19		1.5	U	20	93.5		MS
Silver	ug/L	75-125	55.4		0.2	U	50	111		MS
Thallium	ug/L	75-125	98.9		0.45	U	100	98.7		MS
Uranium	ug/L	75-125	47.8		0.289		50	95.1		MS
Antimony	ug/L	75-125	202		1	U	200	101		MS

*Analytical Methods:

MS SW846 3005/6020 DOE-AL

METALS

-5a-

Matrix Spike Summary

SDG NO. 12-1287

Client ID: CAPA-12-13296S

Contract: ESHL00210

Level: Low

Matrix: WATER

% Solids:

Sample ID: 303971002

Spike ID: 1202669186

<u>Analyte</u>	<u>Units</u>	<u>Acceptance Limit</u>	<u>Spiked Result</u>	<u>C</u>	<u>Sample Result</u>	<u>C</u>	<u>Spike Added</u>	<u>% Recovery</u>	<u>Qual</u>	<u>M*</u>
Mercury	ug/L	75-125	1.98		0.067	U	2	98.8		AV

*Analytical Methods:

AV EPA 245.1/245.2

Metals
–6–
Duplicate Sample Summary

SDG No.: 12–1287

Lab Code: GEL

Contract: ESHL00210

Client ID: CAPA–12–13296D

Matrix: LIQUID

Level: Low

Sample ID: 303971002

Duplicate ID: 1202655108

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%	26.4		25		5.32		P
Beryllium	ug/L		1 U		1 U				P
Boron	ug/L	+/-50	30.5 J		29.8 J		2.28		P
Calcium	ug/L	+/-20%	10500		10000		4.78		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%	2880		2750		4.75		P
Manganese	ug/L	+/-10	7.76 J		7.27 J		6.48		P
Potassium	ug/L	+/-20%	1650		1560		5.45		P
Silica	mg/L	+/-20%	67.9		64.7		4.76		P
Sodium	ug/L	+/-20%	10500		9830		6.25		P
Strontium	ug/L	+/-20%	50.2		47.9		4.69		P
Tin	ug/L		2.5 U		2.5 U				P
Vanadium	ug/L	+/-5	4.74 J		4.24 J		11		P
Zinc	ug/L	+/-10	26.7		25.2		5.79		P

*Analytical Methods:

P SW846 3005/6010B

Metals
–6–
Duplicate Sample Summary

SDG No.: 12–1287

Lab Code: GEL

Contract: ESHL00210

Client ID: CAPA–12–13296D

Matrix: LIQUID

Level: Low

Sample ID: 303971002

Duplicate ID: 1202655113

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		1.7 U		1.7 U				MS
Cadmium	ug/L		0.11 U		0.11 U				MS
Chromium	ug/L	+/-10	3.25 J		3.35 J		2.94		MS
Lead	ug/L		0.5 U		0.5 U				MS
Molybdenum	ug/L	+/- .5	1.33		1.26		4.87		MS
Nickel	ug/L		0.5 U		0.551 J		200		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	+/- .2	0.289		0.278		3.88		MS

*Analytical Methods:

MS SW846 3005/6020 DOE–AL

Metals
–6–
Duplicate Sample Summary

SDG No.: 12–1287**Lab Code:** GEL**Contract:** ESHL00210**Client ID:** CAPA–12–13296D**Matrix:** LIQUID**Level:** Low**Sample ID:** 303971002**Duplicate ID:** 1202669185**Percent Solids for Dup:** N/A

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

***Analytical Methods:**

AV EPA 245.1/245.2

METALS

-7-

Laboratory Control Sample Summary

SDG NO. 12-1287

Contract: ESHL00210

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>
1202655107								
	Aluminum	ug/L	5000	5160		103	80-120	P
	Barium	ug/L	500	521		104	80-120	P
	Beryllium	ug/L	500	520		104	80-120	P
	Boron	ug/L	500	514		103	80-120	P
	Calcium	ug/L	5000	5350		107	80-120	P
	Cobalt	ug/L	500	518		104	80-120	P
	Copper	ug/L	500	512		102	80-120	P
	Iron	ug/L	5000	5270		105	80-120	P
	Magnesium	ug/L	5000	5420		108	80-120	P
	Manganese	ug/L	500	509		102	80-120	P
	Potassium	ug/L	5000	5250		105	80-120	P
	Silica	mg/L	10.7	11		102	80-120	P
	Sodium	ug/L	5000	5260		105	80-120	P
	Strontium	ug/L	500	517		103	80-120	P
	Tin	ug/L	500	513		103	80-120	P
	Vanadium	ug/L	500	516		103	80-120	P
	Zinc	ug/L	500	496		99.2	80-120	P

*Analytical Methods:

P SW846 3005/6010B

METALS

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Laboratory Control Sample Summary

SDG NO. 12-1287

Contract: ESHL00210

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>
1202655112								
	Antimony	ug/L	50	52.4		105	80-120	MS
	Arsenic	ug/L	50	51.6		103	80-120	MS
	Cadmium	ug/L	50	53.6		107	80-120	MS
	Chromium	ug/L	50	51.6		103	80-120	MS
	Lead	ug/L	50	52.1		104	80-120	MS
	Molybdenum	ug/L	50	53.9		108	80-120	MS
	Nickel	ug/L	50	53.6		107	80-120	MS
	Selenium	ug/L	50	51.7		103	80-120	MS
	Silver	ug/L	50	56.2		112	80-120	MS
	Thallium	ug/L	50	49.9		99.9	80-120	MS
	Uranium	ug/L	50	50.6		101	80-120	MS

*Analytical Methods:

MS SW846 3005/6020 DOE-AL

METALS

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Laboratory Control Sample Summary

SDG NO. 12-1287

Contract: ESHL00210

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>
1202669184	Mercury	ug/L	2	2.05		103	85-115	AV

*Analytical Methods:

AV EPA 245.1/245.2

METALS

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Serial Dilution Sample Summary

SDG NO. 12-1287

Client ID: CAPA-12-13296L

Contract: ESHL00210

Matrix: LIQUID

Level: Low

Sample ID: 303971002

Serial Dilution ID: 1202655110

<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	26.4		27.1		2.77			P
Beryllium	1	U	5	U				P
Boron	30.5	J	75	U	100			P
Calcium	10500		10300		1.64		10	P
Cobalt	1	U	5	U				P
Copper	3	U	15	U				P
Iron	30	U	150	U				P
Magnesium	2880		2740		4.85			P
Manganese	7.76	J	10	U	100			P
Potassium	1650		1670		1.1			P
Silica	67900		68000		.178		10	P
Sodium	10500		10500		.086		10	P
Strontium	50.2		53.7		6.92			P
Tin	2.5	U	12.5	U				P
Vanadium	4.74	J	5.49	J	15.9			P
Zinc	26.7		30.6	J	14.9			P

*Analytical Methods:

P SW846 3005/6010B

METALS

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Serial Dilution Sample Summary

SDG NO. 12-1287

Client ID: CAPA-12-13296L

Contract: ESHL00210

Matrix: LIQUID

Level: Low

Sample ID: 303971002

Serial Dilution ID: 1202655115

<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	1.7	U	8.5	U				MS
Cadmium	.11	U	.55	U				MS
Chromium	3.25	J	10	U	100			MS
Lead	.5	U	2.5	U				MS
Molybdenum	1.33		1.23	J	7.55			MS
Nickel	.5	U	2.5	U				MS
Selenium	1.5	U	7.5	U				MS
Silver	.2	U	1	U				MS
Thallium	.45	U	2.25	U				MS
Uranium	.289		.48	J	66.1			MS

*Analytical Methods:

MS SW846 3005/6020 DOE-AL

METALS

-9-

Serial Dilution Sample Summary

SDG NO. 12-1287 **Client ID:** CAPA-12-13296L**Contract:** ESHL00210**Matrix:** LIQUID **Level:** Low**Sample ID:** 303971002 **Serial Dilution ID:** 1202669187

<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 (ARSL)
SDG 12-1287**

Method/Analysis Information

Product: Carbon, Total Organic

Analytical Batch: 1210398

Method: SW 9060 Total Organic Carbon

Sample Analysis

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

Sample ID	Client ID
303971001	CAPA-12-13286
1202652079	Method Blank (MB)
1202652080	303221002(CAPA-12-13277) Sample Duplicate (DUP)
1202652081	303221002(CAPA-12-13277) Post Spike (PS)
1202652082	Laboratory Control Sample (LCS)
1202655722	303971001(CAPA-12-13286) Sample Duplicate (DUP)
1202655723	303971001(CAPA-12-13286) 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# 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 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: 303221002 (CAPA-12-13277) and 303971001 (CAPA-12-13286).

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: Specific Conductivity

Analytical Batch: 1211663

Method: EPA120.1 Specific Conductivity

Sample Analysis

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

Sample ID	Client ID
303971002	CAPA-12-13296
1202655278	303613003(CAPA-12-13272) Sample Duplicate (DUP)
1202655279	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# 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 Conductivity analysis was performed on a Orion 160 Conductivity Meter.

Initial Calibration

All initial calibration requirements have been met for this SDG.

Quality Control (QC) Information

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: 303613003 (CAPA-12-13272).

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

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

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

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

Method/Analysis Information

Product: pH

Analytical Batch: 1211045 **Method:** EPA 150.1 pH

Sample Analysis

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

Sample ID	Client ID
303971002	CAPA-12-13296
1202653783	303971002(CAPA-12-13296) Sample Duplicate (DUP)
1202653784	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# 20.

Preparation/Analytical Method Verification

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

Calibration Information

The Electrode analysis was performed on a PerpHect pH Meter Orion 370.

Initial Calibration

All initial calibration requirements have been met for this SDG.

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

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: 303971002 (CAPA-12-13296).

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 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. The following DER was generated for this SDG: DER# 1077115.

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: 1210799

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:

Sample ID	Client ID
303971002	CAPA-12-13296
1202653083	Method Blank (MB)
1202653084	303971002(CAPA-12-13296) Sample Duplicate (DUP)
1202653085	303971002(CAPA-12-13296) Post Spike (PS)
1202653086	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# 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 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: 303971002 (CAPA-12-13296).

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

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

Miscellaneous Information

Data Exception (DER) Documentation

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

Manual Integrations

The following samples from this sample group had to be manually integrated due to errors in the instrument software peak integration: 1202653084 (CAPA-12-13296), 1202653085 (CAPA-12-13296) and 303971002 (CAPA-12-13296).

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: 1211277 **Method:** EPA 350.1 Nitrogen and Ammonia L

Prep Batch : 1211240 **Method:** EEPA 350.2 Prep

Sample Analysis

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

Sample ID	Client ID
303971002	CAPA-12-13296
1202654314	Method Blank (MB)
1202654315	303971002(CAPA-12-13296) Sample Duplicate (DUP)
1202654317	303971002(CAPA-12-13296) Matrix Spike (MS)
1202654319	303971002(CAPA-12-13296) Matrix Spike Duplicate (MSD)
1202654321	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-106 REV# 7.

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: 303971002 (CAPA-12-13296).

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

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

Matrix Spike Duplicate (MSD) Recovery Statement

The MSD recovery for this sample set was within the required acceptance limits.

MS/MSD Relative Percent Difference (RPD) Statement

The RPD between the spike and spike duplicate 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.

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:	Total Kjeldahl Nitrogen		
Analytical Batch:	1211236	Method:	Nitrogen and Total Kjeldahl (TKN)
Prep Batch :	1211235	Method:	EEPA 351.2 Prep

Sample Analysis

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

Sample ID	Client ID
303971001	CAPA-12-13286
1202654201	Method Blank (MB)
1202654202	303971001(CAPA-12-13286) Sample Duplicate (DUP)
1202654203	303971001(CAPA-12-13286) Matrix Spike (MS)
1202654204	303971001(CAPA-12-13286) Matrix Spike Duplicate (MSD)
1202654205	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-104 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 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: 303971001 (CAPA-12-13286).

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

The spike recovery falls outside of the established acceptance limits. Since both the spike duplicate recovery and the RPD between the spike and spike duplicate fall within acceptance limits, the data is reported. 1202654203 (CAPA-12-13286).

Matrix Spike Duplicate (MSD) Recovery Statement

The MSD recovery for this sample set was within the required acceptance limits.

MS/MSD Relative Percent Difference (RPD) Statement

The RPD between the spike and spike duplicate met the acceptance limits.

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. 1202654202 (CAPA-12-13286).

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: 1077807 1202654203 (CAPA-12-13286).

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:	1212076	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:

Sample ID	Client ID
303971002	CAPA-12-13296
1202656243	Method Blank (MB)
1202656245	303971002(CAPA-12-13296) Sample Duplicate (DUP)
1202656249	303971002(CAPA-12-13296) Post Spike (PS)
1202656252	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-128 REV# 7.

Preparation/Analytical Method Verification

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

Calibration Information

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

Continuing Calibration Blanks

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

Calibration Verification Information (CCV)

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

acceptance limits.

Y Intercept Rule

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

Quality Control (QC) Information

Method Blank (MB) Statement

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

The following sample was selected for QC analysis: 303971002 (CAPA-12-13296).

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:	Total Phosphorus		
Analytical Batch:	1210829	Method:	EPA 365.4 Phosphorus and Total in
Prep Batch :	1210828	Method:	EEPA 365.4 Prep

Sample Analysis

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

Sample ID	Client ID
303971002	CAPA-12-13296
1202653158	Method Blank (MB)
1202653159	303971002(CAPA-12-13296) Sample Duplicate (DUP)
1202653161	303971002(CAPA-12-13296) Matrix Spike (MS)
1202653163	303971002(CAPA-12-13296) Matrix Spike Duplicate (MSD)
1202653165	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# 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+ 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: 303971002 (CAPA-12-13296).

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

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

Matrix Spike Duplicate (MSD) Recovery Statement

The MSD recovery for this sample set was within the required acceptance limits.

MS/MSD Relative Percent Difference (RPD) Statement

The RPD between the spike and spike duplicate met the acceptance limits.

Duplicate Relative Percent Difference (RPD) Statement

One or more of the values for the sample and/or duplicate are less than 5 times the Practical Quantitation Limit (PQL), and the difference is within one PQL value; therefore, the RPD is not applicable. 1202653159 (CAPA-12-13296).

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: 1202653163 (CAPA-12-13296) and 1202653165 (LCS).

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

Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced

SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

Method/Analysis Information

Product: Solids, Total Dissolved

Analytical Batch: 1211656

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:

Sample ID	Client ID
303971002	CAPA-12-13296
1202655258	Method Blank (MB)
1202655259	303971002(CAPA-12-13296) Sample Duplicate (DUP)
1202655261	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# 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 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: 303971002 (CAPA-12-13296).

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 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.

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: 1213191 **Method:** EPA 310.1 Total Alkalinity

Sample Analysis

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

Sample ID	Client ID
303971002	CAPA-12-13296
1202659083	Method Blank (MB)
1202659447	303971002(CAPA-12-13296) Matrix Spike (MS)
1202659603	Laboratory Control Sample (LCS)
1202659604	303971002(CAPA-12-13296) Sample Duplicate (DUP)

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

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-033 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 Titration 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: 303971002 (CAPA-12-13296).

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 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

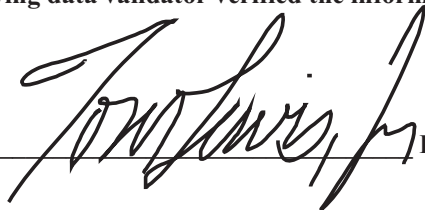
Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

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: _____

04Jun12

Sample Data Summary

GEL LABORATORIES LLC

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

Certificate of Analysis Report for

ARSL001 ARS International (63641-10)

Client SDG: 12-1287 GEL Work Order: 303971

The Qualifiers in this report are defined as follows:

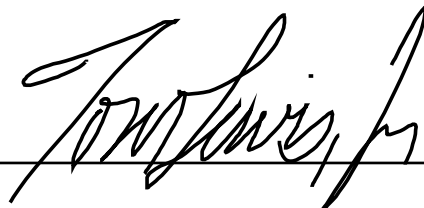
- * A quality control analyte recovery is outside of specified acceptance criteria
- ** Analyte is a surrogate compound
- H Analytical holding time was exceeded
- J Value is estimated
- U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

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 detection limit.

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

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

Certificate of Analysis

Report Date: June 4, 2012

Company : Los Alamos National Laboratory
Address : PO Box 1663
TA-03, SM271, Drop Pt. 02U, Rm111
Los Alamos, New Mexico 87545

Contact: Keith Greene
Project: LANL-WQH Water Samples

Client SDG: 12-1287

Client Sample ID: CAPA-12-13286
Sample ID: 303971001
Matrix: W
Collect Date: 07-MAY-12 10:01
Receive Date: 09-MAY-12
Collector: Client

Project: ESHL00210
Client ID: ARSL001

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		1.71	0.330	1.00	mg/L	1	TSM	05/11/12	2244	1210398	1
Nutrient Analysis											
Nitrogen, Total Kjeldahl (TKN) "As Received"											
Nitrogen, Total Kjeldahl	U	ND	0.035	0.100	mg/L	1	KLP1	05/11/12	1049	1211236	2

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 351.2 Prep	EPA 351.2 Total Kjeldahl Nitrogen Prep	KLP1	05/10/12	1446	1211235

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 9060	
2	EPA 351.2	

GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: June 4, 2012

Company : Los Alamos National Laboratory
Address : PO Box 1663
TA-03, SM271, Drop Pt. 02U, Rm111
Los Alamos, New Mexico 87545

Contact: Keith Greene
Project: LANL-WQH Water Samples

Client SDG: 12-1287

Client Sample ID: CAPA-12-13296
Sample ID: 303971002
Matrix: W
Collect Date: 07-MAY-12 10:01
Receive Date: 09-MAY-12
Collector: Client

Project: ESHL00210
Client ID: ARSL001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Conductivity Analysis											
EPA120.1 Specific Conductivity "As Received"											
Conductivity		111	1.00	1.00	umhos/cm	1	TXT1	05/11/12	1748	1211663	1
Electrode Analysis											
EPA 150.1 pH "As Received"											
pH at Temp 14.1C		7.96	0.010	0.100	SU	1	TXT1	05/09/12	1513	1211045	2
Ion Chromatography											
EPA 300.0 Anions Liquid 28 day "As Received"											
Bromide	U	ND	0.067	0.200	mg/L	1	MAR1	05/16/12	1605	1210799	3
Chloride		1.55	0.067	0.200	mg/L	1					
Fluoride		0.222	0.033	0.100	mg/L	1					
Sulfate		1.25	0.133	0.400	mg/L	1					
Nutrient Analysis											
EPA 350.1 Nitrogen, Ammonia L "As Received"											
Nitrogen, Ammonia		0.0856	0.017	0.050	mg/L	1	KLP1	05/14/12	1637	1211277	4
EPA 353.2 Nitrogen, Nitrate/Nitrite "As Received"											
Nitrogen, Nitrate/Nitrite		0.245	0.017	0.050	mg/L	1	KLP1	05/14/12	1612	1212076	5
EPA 365.4 Phosphorus, Total in "As Received"											
Phosphorus, Total as P		0.0831	0.017	0.050	mg/L	1	KLP1	05/11/12	1622	1210829	6
Solids Analysis											
EPA 160.1 Solids, Dissolved-F "As Received"											
Total Dissolved Solids		117	3.40	14.3	mg/L		LYG1	05/11/12	0940	1211656	7
Titration Analysis											
EPA 310.1 Total Alkalinity "As Received"											
Alkalinity, Total as CaCO3		51.3	0.725	1.00	mg/L		LXA1	05/17/12	1313	1213191	8
Carbonate alkalinity (CaCO3)	U	ND	0.725	1.00	mg/L						

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 350.2 Prep	EPA 350.1 Ammonia Nitrogen Prep	KLP1	05/14/12	1335	1211240
EPA 365.4 Prep	EPA 365.4 Phosphorus, Total in liquid PR	KLP1	05/10/12	1700	1210828

GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: June 4, 2012

Company : Los Alamos National Laboratory
Address : PO Box 1663
TA-03, SM271, Drop Pt. 02U, Rm111
Los Alamos, New Mexico 87545
Contact: Keith Greene
Project: LANL-WQH Water Samples

Client SDG: 12-1287

Client Sample ID: CAPA-12-13296
Sample ID: 303971002

Project: ESHL00210
Client ID: ARSL001

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

Quality Control Summary

GEL LABORATORIES LLC

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QC Summary

Report Date: June 4, 2012
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Los Alamos National Laboratory
PO Box 1663
TA-03, SM271, Drop Pt. 02U, Rm111
Los Alamos, New Mexico

Contact: Keith Greene

Workorder: 303971

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Carbon Analysis											
Batch	1210398										
QC1202652080	303221002	DUP									
Total Organic Carbon Average		4.18		4.15	mg/L	0.865	^	(+/-1.00)	TSM	05/11/12	16:22
QC1202655722	303971001	DUP									
Total Organic Carbon Average		1.71		1.70	mg/L	0.234	^	(+/-1.00)		05/11/12	23:18
QC1202652082	LCS										
Total Organic Carbon Average	10.0			9.59	mg/L			95.9 (85%-115%)		05/11/12	15:41
QC1202652079	MB										
Total Organic Carbon Average			U	ND	mg/L					05/11/12	15:32
QC1202652081	303221002	PS									
Total Organic Carbon Average	10.0	4.18		12.8	mg/L			86.2 (65%-120%)		05/11/12	16:42
QC1202655723	303971001	PS									
Total Organic Carbon Average	10.0	1.71		11.1	mg/L			94.3 (65%-120%)		05/11/12	23:37
Conductivity Analysis											
Batch	1211663										
QC1202655278	303613003	DUP									
Conductivity		312		312	umhos/cm	0.00		(0%-10%)	TXT1	05/11/12	17:48
QC1202655279	LCS										
Conductivity	1410			1420	umhos/cm			100 (95%-105%)		05/11/12	17:48
Electrode Analysis											
Batch	1211045										
QC1202653783	303971002	DUP									
pH		7.96		8.01	SU	0.626		(0%-10%)	TXT1	05/09/12	15:16
QC1202653784	LCS										
pH	7.00			7.02	SU			100 (99%-101%)		05/09/12	15:07
Ion Chromatography											
Batch	1210799										
QC1202653084	303971002	DUP									
Bromide		U	ND	U	ND	mg/L	N/A		MAR1	05/16/12	16:33
Chloride			1.55		1.54	mg/L	0.460	(0%-20%)			
Fluoride			0.222		0.216	mg/L	2.74	^ (+/-0.100)			
Sulfate			1.25		1.18	mg/L	5.90	^ (+/-0.400)			
QC1202653086	LCS										
Bromide	2.50			2.49	mg/L			99.6 (90%-110%)		05/16/12	15:37
Chloride	10.0			9.56	mg/L			95.6 (90%-110%)			
Fluoride	5.00			5.02	mg/L			100 (90%-110%)			
Sulfate	20.0			19.4	mg/L			96.8 (90%-110%)			
QC1202653083	MB										
Bromide			U	ND	mg/L					05/16/12	15:09
Chloride			U	ND	mg/L						
Fluoride			U	ND	mg/L						
Sulfate			U	ND	mg/L						

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QC Summary

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Ion Chromatography											
Batch	1210799										
QC1202653085	303971002	PS									
Bromide	2.50	U	ND	2.51	mg/L		100	(90%-110%)	MAR1	05/16/12	17:01
Chloride	10.0		1.55	11.0	mg/L		94.8	(90%-110%)			
Fluoride	5.00		0.222	4.88	mg/L		93.1	(90%-110%)			
Sulfate	20.0		1.25	19.9	mg/L		93.2	(90%-110%)			
Nutrient Analysis											
Batch	1210829										
QC1202653159	303971002	DUP									
Phosphorus, Total as P			0.0831	0.0622	mg/L	28.8 ^		(+/-0.050)	KLP1	05/11/12	16:23
QC1202653165	LCS										
Phosphorus, Total as P	1.00			1.08	mg/L		108	(84%-122%)		05/11/12	16:12
QC1202653158	MB										
Phosphorus, Total as P			J	0.0343	mg/L					05/11/12	16:06
QC1202653161	303971002	MS									
Phosphorus, Total as P	1.00		0.0831	1.14	mg/L		106	(46%-146%)		05/11/12	16:24
QC1202653163	303971002	MSD									
Phosphorus, Total as P	1.00		0.0831	1.18	mg/L	3.45	110	(0%-21%)		05/11/12	16:36
Batch	1211236										
QC1202654202	303971001	DUP									
Nitrogen, Total Kjeldahl		U	ND	ND	mg/L	N/A			KLP1	05/11/12	10:50
QC1202654205	LCS										
Nitrogen, Total Kjeldahl	1.00			1.02	mg/L		102	(90%-110%)		05/11/12	10:48
QC1202654201	MB										
Nitrogen, Total Kjeldahl			U	ND	mg/L					05/11/12	10:48
QC1202654203	303971001	MS									
Nitrogen, Total Kjeldahl	1.00	U	ND	0.852	mg/L		82.2 *	(90%-110%)		05/11/12	10:51
QC1202654204	303971001	MSD									
Nitrogen, Total Kjeldahl	1.00	U	ND	1.03	mg/L	18.9	100	(0%-20%)		05/11/12	10:52
Batch	1211277										
QC1202654315	303971002	DUP									
Nitrogen, Ammonia			0.0856	0.0866	mg/L	1.16 ^		(+/-0.050)	KLP1	05/14/12	16:38
QC1202654321	LCS										
Nitrogen, Ammonia	1.00			1.03	mg/L		103	(90%-110%)		05/14/12	16:36
QC1202654314	MB										
Nitrogen, Ammonia			U	ND	mg/L					05/14/12	16:35
QC1202654317	303971002	MS									
Nitrogen, Ammonia	1.00		0.0856	1.17	mg/L		108	(90%-110%)		05/14/12	16:42
QC1202654319	303971002	MSD									
Nitrogen, Ammonia	1.00		0.0856	1.16	mg/L	0.858	107	(0%-15%)		05/14/12	16:43
Batch	1212076										
QC1202656245	303971002	DUP									
Nitrogen, Nitrate/Nitrite			0.245	0.243	mg/L	0.820 ^		(+/-0.050)	KLP1	05/14/12	16:14
QC1202656252	LCS										
Nitrogen, Nitrate/Nitrite	1.00			1.03	mg/L		103	(90%-110%)		05/14/12	15:56
QC1202656243	MB										
Nitrogen, Nitrate/Nitrite			U	ND	mg/L					05/14/12	15:55
QC1202656249	303971002	PS									

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QC Summary

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Nutrient Analysis											
Batch	1212076										
Nitrogen, Nitrate/Nitrite	1.00	0.245		1.25	mg/L		101	(90%-110%)		05/14/12	16:15
Solids Analysis											
Batch	1211656										
QC1202655259	303971002	DUP									
Total Dissolved Solids		117		107	mg/L	8.92		(0%-10%)	LYG1	05/11/12	09:40
QC1202655261	LCS										
Total Dissolved Solids	300			297	mg/L		99	(95%-105%)		05/11/12	09:40
QC1202655258	MB										
Total Dissolved Solids			U	ND	mg/L					05/11/12	09:40
Titration Analysis											
Batch	1213191										
QC1202659604	303971002	DUP									
Alkalinity, Total as CaCO3		51.3		51.8	mg/L	1.01		(0%-20%)	LXA1	05/17/12	13:14
Carbonate alkalinity (CaCO3)		U	ND	U	mg/L	N/A					
QC1202659603	LCS										
Alkalinity, Total as CaCO3	50.0			50.7	mg/L		101	(90%-110%)		05/17/12	12:22
QC1202659083	MB										
Alkalinity, Total as CaCO3			U	ND	mg/L					05/17/12	12:18
Carbonate alkalinity (CaCO3)			U	ND	mg/L						
QC1202659447	303971002	MS									
Alkalinity, Total as CaCO3	50.0	51.3		104	mg/L		105	(80%-120%)		05/17/12	13:16

Notes:

RER is calculated at the 95% confidence level (2-sigma).

The Qualifiers in this report are defined as follows:

** Analyte is a surrogate compound

< Result is less than value reported

> Result is greater than value reported

A The TIC is a suspected aldol-condensation product

B For General Chemistry and Organic analysis the target analyte was detected in the associated blank.

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

E General Chemistry--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

E Organics--Concentration of the target analyte exceeds the instrument calibration range

F Estimated Value

FB Mercury was found present at quantifiable concentrations in field blanks received with these samples. Data associated with the blank are deemed invalid for reporting to regulatory agencies

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.

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QC Summary

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
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	Matrix Related Failure										
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	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										
P	Organics--The concentrations between the primary and confirmation columns/detectors is >40% different. For HPLC, difference is also <70%										
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	QC Samples were not spiked with this compound										
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										
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.

^ 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			
Mo.Day Yr. 09-MAY-12	Division: Industrial	Quality Criteria: Specifications	Type: Process
Instrument Type: ELECTRODE	Test / Method: EPA 150.1	Matrix Type: Liquid	Client Code: CARE, ESHL, INEL, KMRN,
Batch ID: 1211045	Sample Numbers: See below.		
Potentially affected work order(s)(SDG): 303971(12-1287),303973(CAH-12-051),304013,304036(EUI-8880),304038(FSA1285019A_WCH) Application Issues: Sample received out of holding			
Specification and Requirements		DER Disposition:	
Exception Description:			
1. Sample received out of holding: 303971 002 303973 001 304013 001 304036 001 304038 001,002,003,004,005,006,007,008,009		1. Samples were received out of holding.	

Originator's Name:
Travis Tola 09-MAY-12

Data Validator/Group Leader:
Julia Hamilton 16-MAY-12

DATA EXCEPTION REPORT			
Mo.Day Yr. 11-MAY-12	Division: Industrial	Quality Criteria: Specifications	Type: Process
Instrument Type: LACHAT Flow Injection Analyzer	Test / Method: EPA 351.2	Matrix Type: Liquid	Client Code: ESHL, WETL
Batch ID: 1211236	Sample Numbers: See below.		
Potentially affected work order(s)(SDG): 303971(12-1287),304012 Application Issues: Failed Recovery for MS/PS			
Specification and Requirements		DER Disposition:	
Exception Description: 1. Failed Recovery for MS: QC 1202654203MS		1. The spike recovery falls outside of the established acceptance limits. Since both the spike duplicate recovery and the RPD between the spike and spike duplicate fall within acceptance limits, the data is reported.	

Originator's Name:

Kristen Parson 11-MAY-12

Data Validator/Group Leader:

Julia Hamilton 23-MAY-12

Radiological Analysis

**Radiochemistry Case Narrative
ARS International (ARSL)
SDG 12-1287
Work Order 303971**

Method/Analysis Information

Product: Alphaspec Am241 Liquid
Analytical Method: DOE EML HASL-300, Am-05-RC Modified
Analytical Batch Number: 1210896

Sample ID	Client ID
303971001	CAPA-12-13286
1202653323	Method Blank (MB)
1202653324	303859001(CAPA-12-13285) Sample Duplicate (DUP)
1202653325	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# 21.

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 1202653323 (MB) and 1202653325 (LCS) were changed to 1.0 per client request.

Designated QC

The following sample was used for QC: 303859001 (CAPA-12-13285). The QC was from ARSL work order 303859.

QC Information

All of the QC samples meet the required acceptance limits with the following exceptions: Refer to Data Exception Report (DER).

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

Sample 1202653324 (CAPA-12-13285) was recounted due to high MDC. The recount is reported.

Miscellaneous Information:

Data Exception (DER) Documentation

The following DER was generated for this SDG: 1080472 The following DER was generated for this SDG: DER 1080472 was generated due to RDL less than MDA. 1. Sample 1202653324 does not meet the detection limits for Americium-241 due to the high standard deviation. 1. When a blank population is performed, the MDC is greater than the RDL due to the high standard deviation. Sample did achieve more than 400 tracer counts and was counted for the maximum count time of 1000 minutes. Reporting results.

Manual Integration

No manual integrations were performed on data in this batch.

Additional Comments

The MDCs 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:	Alphaspec Pu, Liquid
Analytical Method:	DOE EML HASL-300, Pu-11-RC Modified
Analytical Batch Number:	1210899

Sample ID	Client ID
303971001	CAPA-12-13286
1202653326	Method Blank (MB)
1202653327	303859001(CAPA-12-13285) Sample Duplicate (DUP)
1202653328	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# 21.

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 1202653326 (MB) and 1202653328 (LCS) were changed to 1.0 per client request.

Designated QC

The following sample was used for QC: 303859001 (CAPA-12-13285). The QC was from ARSL work order 303859.

QC Information

All of the QC samples met the required acceptance limits.

CSU

The Pu-239/240 blank result, 1202653326 (MB), is greater than 1.65 times the CSU but less than the MDC.

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.

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.

Additional Comments

The MDCs are calculated using a blank population.

Blank Decision Level

The Pu-239/240 blank result, 1202653326 (MB), is greater than the decision level but less than the MDC.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product: Alphaspec U, Liquid
Analytical Method: DOE EML HASL-300, U-02-RC Modified
Analytical Batch Number: 1210900

Sample ID	Client ID
303971001	CAPA-12-13286
1202653329	Method Blank (MB)
1202653330	303859001(CAPA-12-13285) Sample Duplicate (DUP)
1202653331	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# 21.

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 1202653329 (MB) and 1202653331 (LCS) were changed to 1.0 per client request.

Designated QC

The following sample was used for QC: 303859001 (CAPA-12-13285). The QC was from ARSL work order 303859.

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.

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.

Additional Comments

The MDCs 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: **Gammasec**

Analytical Method: EPA 901.1

Analytical Batch Number: 1211536

Sample ID	Client ID
303971001	CAPA-12-13286
1202654974	Method Blank (MB)
1202654975	303859001(CAPA-12-13285) Sample Duplicate (DUP)
1202654976	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# 24.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met. The initial Calibrations were performed in August 2011, January 2012, February 2012 and March 2012.

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: 303859001 (CAPA-12-13285). The QC was from ARSL work order 303859.

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.

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.

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: 1214471

Sample ID	Client ID
303971001	CAPA-12-13286
1202662131	Method Blank (MB)
1202662132	303971001(CAPA-12-13286) Sample Duplicate (DUP)
1202662133	303971001(CAPA-12-13286) Matrix Spike (MS)
1202662134	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# 15.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met. The initial Calibration was performed in April 2012.

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 1202662131 (MB) and 1202662134 (LCS) were changed to 1.0 per client request.

Designated QC

The following sample was used for QC: 303971001 (CAPA-12-13286). The QC was from ARSL work order 303971.

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.

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.

Additional Comments

The matrix spike, 1202662133 (CAPA-12-13286), 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

Product:	WSP-GrossA/B
Analytical Method:	EPA 900.0/SW846 9310
Analytical Batch Number:	1216347

Sample ID	Client ID
303971001	CAPA-12-13286
1202666604	Method Blank (MB)
1202666605	303971001(CAPA-12-13286) Sample Duplicate (DUP)
1202666606	303971001(CAPA-12-13286) Matrix Spike (MS)
1202666607	303971001(CAPA-12-13286) Matrix Spike Duplicate (MSD)
1202666608	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# 15.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met. The initial Calibration was performed in September 2011. The discrimination settings are calibrated in beta discriminating mode to reduce beta to alpha crosstalk.

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 1202666604 (MB) and 1202666608 (LCS) were changed to 1.0 per client request.

Designated QC

The following sample was used for QC: 303971001 (CAPA-12-13286). The QC was from ARSL work order 303971.

QC Information

All of the QC samples met the required acceptance limits.

CSU

The blank 1202666604 (MB) beta result is greater than 1.65 times the CSU but less than the MDC.

Technical Information:

Holding Time

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

Sample Re-prep/Re-analysis

Sample 1202666608 (LCS) was recounted due to high recovery. The recount is reported. Samples 1202666604 (MB) and 1202666605 (CAPA-12-13286) were recounted due to results more negative than the three sigma TPU. The second counts are reported.

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.

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.

Additional Comments

The matrix spike and matrix spike duplicate, 1202666606 (CAPA-12-13286) and 1202666607 (CAPA-12-13286), aliquots were reduced to conserve sample volume.

Blank Decision Level

The blank 1202666604 (MB) beta result is greater than the decision level but less than the MDC.

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.

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Qualifier Definition Report for

ARSL001 ARS International (63641-10)

Client SDG: 12-1287 GEL Work Order: 303971

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.

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: Kate Gellatly

Date: 04 JUN 2012

Title: Analyst I

DATA EXCEPTION REPORT			
Mo.Day Yr. 19-MAY-12	Division: Radiochemistry	Quality Criteria: SOP	Type: Process
Instrument Type: ALPHA SPECTROMETER	Test / Method: DOE EML HASL-300, Am-05-RC Modified	Matrix Type: Liquid	Client Code: ARSL
Batch ID: 1210896	Sample Numbers: see below		
Potentially affected work order(s)(SDG): 303859(12-1277),303971(12-1287) Application Issues: RDL less than MDA			
Specification and Requirements Exception Description:		DER Disposition:	
1. Sample 1202653324 does not meet the detection limits for Americium-241 due to the high standard deviation.		1. When a blank population is performed, the MDC is greater than the RDL due to the high standard deviation. Sample did achieve more than 400 tracer counts and was counted for the maximum count time of 1000 minutes. Reporting results.	

Originator's Name:
Matelon DeFreese 19-MAY-12

Data Validator/Group Leader:
Jessica Davis 31-MAY-12

Sample Data Summary

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Certificate of Analysis

Company : Los Alamos National Laboratory
Address : PO Box 1663
TA-03, SM271, Drop Pt. 02U, Rm111
Los Alamos, New Mexico 87545
Contact: Keith Greene
Project: LANL-WQH Water Samples

Report Date: June 4, 2012

Client Sample ID: CAPA-12-13286
Sample ID: 303971001
Matrix: W
Collect Date: 07-MAY-12
Receive Date: 09-MAY-12
Collector: Client

Project: ESHL00210
Client ID: ARSL001

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
Rad Alpha Spec Analysis													
<i>Alphaspec Am241 Liquid "As Received"</i>													
Americium-241	U	-0.00823	+/-0.00873	0.0493	+/-0.00873	0.050	pCi/L		JXD2	05/12/12	1212	1210896	1
<i>Alphaspec Pu, Liquid "As Received"</i>													
Plutonium-238	U	0.00	+/-0.0101	0.0453	+/-0.0101	0.050	pCi/L		JXD2	05/16/12	1433	1210899	2
Plutonium-239/240	U	-0.0146	+/-0.00713	0.0384	+/-0.00713	0.050	pCi/L						
<i>Alphaspec U, Liquid "As Received"</i>													
Uranium-234		0.126	+/-0.0306	0.0753	+/-0.0319	1.00	pCi/L		JXD2	05/15/12	1736	1210900	3
Uranium-235/236	U	0.0124	+/-0.0102	0.0538	+/-0.0103	1.00	pCi/L						
Uranium-238		0.0894	+/-0.0204	0.038	+/-0.0214	0.500	pCi/L						
Rad Gamma Spec Analysis													
<i>Gammasspec "As Received"</i>													
Cesium-137	U	-0.0015	+/-1.24	4.67	+/-1.24	8.00	pCi/L		KXG3	05/20/12	1012	1211536	4
Cobalt-60	U	0.767	+/-0.917	4.02	+/-0.917	8.00	pCi/L						
Neptunium-237	U	1.21	+/-2.45	8.98	+/-2.45	10.0	pCi/L						
Potassium-40	U	-9.31	+/-15.0	57.9	+/-15.0	10.0	pCi/L						
Sodium-22	U	0.0247	+/-1.34	5.01	+/-1.34	10.0	pCi/L						
Rad Gas Flow Proportional Counting													
<i>GFPC, Sr90, liquid "As Received"</i>													
Strontium-90	U	0.180	+/-0.144	0.489	+/-0.145	0.500	pCi/L		VXC2	06/01/12	1326	1214471	5
<i>WSP-GrossA/B "As Received"</i>													
Beta		2.99	+/-0.948	2.97	+/-0.980	3.00	pCi/L		CYH1	05/31/12	0937	1216347	6
Alpha	U	0.387	+/-0.593	2.42	+/-0.594	3.00	pCi/L		CYH1	06/01/12	1531	1216347	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"	1210896	79.9	(50%-105%)
Plutonium-242 Tracer	Alphaspec Pu, Liquid "As Received"	1210899	79.4	(50%-105%)
Uranium-232 Tracer	Alphaspec U, Liquid "As Received"	1210900	67.1	(50%-105%)
Strontium Carrier	GFPC, Sr90, liquid "As Received"	1214471	93.3	(50%-105%)

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Certificate of Analysis

Company : Los Alamos National Laboratory
Address : PO Box 1663
TA-03, SM271, Drop Pt. 02U, Rm111
Los Alamos, New Mexico 87545

Report Date: June 4, 2012

Contact: Keith Greene

Project: LANL-WQH Water Samples

Client Sample ID: CAPA-12-13286

Sample ID: 303971001

Project: ESHL00210

Client ID: ARSL001

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer Recovery	Test						Batch ID	Recovery%	Acceptable Limits				

Notes:

TPU and Uncertainty are calculated at the 67% confidence level (1-sigma).

Quality Control Data

GEL LABORATORIES LLC

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QC Summary

Report Date: June 4, 2012
Page 1 of 6

Client : Los Alamos National Laboratory
PO Box 1663
TA-03, SM271, Drop Pt. 02U, Rm
Los Alamos, New Mexico

Contact: Keith Greene

Workorder: 303971

Parmname	NOM	Sample	Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time
Rad Alpha Spec											
Batch	1210896										
QC1202653324	303859001	DUP									
Americium-241		U	0.00399	U	0.00	pCi/L	0.323	(0-1)	JXD2	05/17/12	14:07
		Uncert:	+/-0.00564		+/-0.0028						
		TPU:	+/-0.00564		+/-0.0028						
		Yield:	86.1		53.9						
QC1202653325	LCS										
Americium-241		1.42			1.37	pCi/L	96.8	(80%-120%)		05/12/12	12:12
		Uncert:			+/-0.056						
		TPU:			+/-0.082						
		Yield:			60.7						
QC1202653323	MB										
Americium-241				U	-0.00166	pCi/L					
		Uncert:			+/-0.00438						
		TPU:			+/-0.00438						
		Yield:			90.4						
Batch	1210899										
QC1202653327	303859001	DUP									
Plutonium-238		U	0.00269	U	0.00506	pCi/L	0.0904	(0-1)	JXD2	05/16/12	14:33
		Uncert:	+/-0.00806		+/-0.00506						
		TPU:	+/-0.00807		+/-0.00507						
		Yield:	77.3		92.6						
Plutonium-239/240		U	0.00	U	0.0127	pCi/L	0.475	(0-1)			
		Uncert:	+/-0.00658		+/-0.0067						
		TPU:	+/-0.00658		+/-0.00673						
		Yield:	77.3		92.6						
QC1202653328	LCS										
Plutonium-238				U	0.0227	pCi/L		(80%-120%)		05/16/12	14:33
		Uncert:			+/-0.00909						
		TPU:			+/-0.00917						
		Yield:			77.4						
Plutonium-239/240		2.03			2.28	pCi/L	113	(80%-120%)			
		Uncert:			+/-0.0723						
		TPU:			+/-0.142						
		Yield:			77.4						
QC1202653326	MB										
Plutonium-238				U	0.00836	pCi/L					
		Uncert:			+/-0.00782						
		TPU:			+/-0.00783						
		Yield:			82.4						
Plutonium-239/240				U	0.0125	pCi/L					
		Uncert:			+/-0.00512						
		TPU:			+/-0.00516						
		Yield:			82.4						

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QC Summary

Workorder: 303971

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Parmname	NOM	Sample	Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time
Rad Alpha Spec											
Batch	1210900										
QC1202653330	303859001	DUP									
Uranium-234		0.282		0.204	pCi/L	0.510		(0-1)	JXD2	05/15/1217:36	
	Uncert:	+/-0.0366		+/-0.0318							
	TPU:	+/-0.0415		+/-0.0348							
	Yield:	64.0		67.4							
Uranium-235/236	U	0.00158	U	0.00152	pCi/L	0.00227		(0-1)			
	Uncert:	+/-0.00695		+/-0.00668							
	TPU:	+/-0.00696		+/-0.00669							
	Yield:	64.0		67.4							
Uranium-238		0.119		0.0789	pCi/L	0.451		(0-1)			
	Uncert:	+/-0.0233		+/-0.0186							
	TPU:	+/-0.0247		+/-0.0194							
	Yield:	64.0		67.4							
QC1202653331	LCS										
Uranium-234				2.38	pCi/L					05/15/1217:36	
	Uncert:			+/-0.087							
	TPU:			+/-0.183							
	Yield:			75.5							
Uranium-235/236				0.129	pCi/L						
	Uncert:			+/-0.0224							
	TPU:			+/-0.024							
	Yield:			75.5							
Uranium-238	2.67			2.58	pCi/L		96.8	(80%-120%)			
	Uncert:			+/-0.0903							
	TPU:			+/-0.197							
	Yield:			75.5							
QC1202653329	MB										
Uranium-234			U	-0.00638	pCi/L					05/15/1217:36	
	Uncert:			+/-0.00541							
	TPU:			+/-0.00541							
	Yield:			77.4							
Uranium-235/236			U	0.00488	pCi/L						
	Uncert:			+/-0.00605							
	TPU:			+/-0.00606							
	Yield:			77.4							
Uranium-238			U	-0.00444	pCi/L						
	Uncert:			+/-0.0044							
	TPU:			+/-0.00441							
	Yield:			77.4							
Rad Gamma Spec											
Batch	1211536										
QC1202654975	303859001	DUP									
Cesium-137	U	2.17	U	-0.484	pCi/L	0.519		(0-1)	KXG3	05/20/1214:28	
	Uncert:	+/-1.53		+/-1.04							
	TPU:	+/-1.53		+/-1.04							
Cobalt-60	U	1.02	U	-0.664	pCi/L	0.289		(0-1)			
	Uncert:	+/-1.58		+/-1.33							
	TPU:	+/-1.58		+/-1.33							

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QC Summary

Workorder: 303971

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Parmname	NOM	Sample	Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time
Rad Gamma Spec											
Batch	1211536										
Neptunium-237	U	0.939	U	3.10	pCi/L	0.202		(0-1)			
	Uncert:	+/-2.96		+/-2.41							
	TPU:	+/-2.96		+/-2.41							
Potassium-40	U	-6.35	U	-6.3	pCi/L	0.00063		(0-1)			
	Uncert:	+/-18.8		+/-16.9							
	TPU:	+/-18.8		+/-16.9							
Sodium-22	U	0.451	U	-0.0324	pCi/L	0.0916		(0-1)			
	Uncert:	+/-1.34		+/-1.29							
	TPU:	+/-1.34		+/-1.29							
QC1202654976 LCS											
Americium-241	2780			3020	pCi/L		108	(80%-120%)		05/20/1215:36	
	Uncert:			+/-177							
	TPU:			+/-177							
Cesium-137	6160			6360	pCi/L		103	(80%-120%)			
	Uncert:			+/-269							
	TPU:			+/-269							
Cobalt-60	6040			6030	pCi/L		99.7	(80%-120%)			
	Uncert:			+/-253							
	TPU:			+/-253							
Neptunium-237			U	7.02	pCi/L						
	Uncert:			+/-25.1							
	TPU:			+/-25.1							
Potassium-40			U	-23.6	pCi/L						
	Uncert:			+/-55.5							
	TPU:			+/-55.5							
Sodium-22			U	-22.6	pCi/L						
	Uncert:			+/-8.54							
	TPU:			+/-8.54							
QC1202654974 MB											
Cesium-137			U	2.05	pCi/L					05/20/1210:13	
	Uncert:			+/-1.36							
	TPU:			+/-1.36							
Cobalt-60			U	0.709	pCi/L						
	Uncert:			+/-1.38							
	TPU:			+/-1.38							
Neptunium-237			U	0.820	pCi/L						
	Uncert:			+/-2.84							
	TPU:			+/-2.84							
Potassium-40			U	-12.5	pCi/L						
	Uncert:			+/-15.9							
	TPU:			+/-15.9							
Sodium-22			U	-1.04	pCi/L						
	Uncert:			+/-1.56							
	TPU:			+/-1.56							
Rad Gas Flow											
Batch	1214471										
QC1202662132 303971001 DUP											
Strontium-90	U	0.180	U	0.190	pCi/L	0.017		(0-1)	VXC2	06/01/1213:26	

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QC Summary

Workorder: 303971

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Parmname	NOM	Sample	Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time
Rad Gas Flow											
Batch	1214471										
		Uncert:	+/-0.144	+/-0.144							
		TPU:	+/-0.145	+/-0.144							
		Yield:	93.3	92.2							
QC1202662134	LCS										
Strontium-90		25.1		22.0	pCi/L		87.8	(80%-120%)		06/01/1213:26	
		Uncert:		+/-0.622							
		TPU:		+/-1.89							
		Yield:		95.6							
QC1202662131	MB										
Strontium-90			U	0.0515	pCi/L					06/01/1213:26	
		Uncert:		+/-0.137							
		TPU:		+/-0.137							
		Yield:		91.1							
QC1202662133	303971001	MS									
Strontium-90		126	U	0.180	pCi/L		87	(75%-125%)		06/01/1213:26	
		Uncert:		+/-0.144							
		TPU:		+/-0.145							
		Yield:		93.3							
Batch	1216347										
QC1202666605	303971001	DUP									
Alpha			U	0.387	pCi/L	0.0184		(0-1)	CYH1	06/02/1218:42	
		Uncert:		+/-0.593							
		TPU:		+/-0.594							
Beta				2.99	pCi/L	0.338		(0-1)		05/31/1209:37	
		Uncert:		+/-0.948							
		TPU:		+/-0.980							
QC1202666608	LCS										
Alpha		12.0		13.5	pCi/L		112	(80%-120%)		06/02/1218:42	
		Uncert:		+/-0.693							
		TPU:		+/-1.32							
Beta		50.2		52.5	pCi/L		104	(80%-120%)		05/31/1209:51	
		Uncert:		+/-0.888							
		TPU:		+/-4.62							
QC1202666604	MB										
Alpha			U	-0.0202	pCi/L					06/02/1218:42	
		Uncert:		+/-0.0471							
		TPU:		+/-0.0471							
Beta			U	0.292	pCi/L					05/31/1209:37	
		Uncert:		+/-0.111							
		TPU:		+/-0.114							
QC1202666606	303971001	MS									
Alpha		241	U	0.387	pCi/L		114	(75%-125%)		06/01/1215:31	
		Uncert:		+/-0.593							
		TPU:		+/-0.594							
Beta		1000		2.99	pCi/L		102	(75%-125%)		05/31/1209:51	
		Uncert:		+/-0.948							
		TPU:		+/-0.980							
QC1202666607	303971001	MSD									
Alpha		241	U	0.387	pCi/L	0.0406	112	(0-1)		06/01/1215:59	

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QC Summary

Workorder: 303971

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Parmname	NOM	Sample Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time
Rad Gas Flow										
Batch	1216347									
		Uncert:	+/-0.593							
		TPU:	+/-0.594							
Beta	1000		2.99	1060	pCi/L	0.0742	105	(0-1)		05/31/1209:51
		Uncert:	+/-0.948							
		TPU:	+/-0.980							

Notes:

The Qualifiers in this report are defined as follows:

**	Analyte is a surrogate compound
<	Result is less than value reported
>	Result is greater than value reported
A	The TIC is a suspected aldol-condensation product
B	For General Chemistry and Organic analysis the target analyte was detected in the associated blank.
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
E	General Chemistry--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
E	Organics--Concentration of the target analyte exceeds the instrument calibration range
F	Estimated Value
FB	Mercury was found present at quantifiable concentrations in field blanks received with these samples. Data associated with the blank are deemed invalid for reporting to regulatory agencies
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	Matrix Related Failure
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	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
P	Organics--The concentrations between the primary and confirmation columns/detectors is >40% different. For HPLC, difference is also <70%
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.

GEL LABORATORIES LLC

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

QC Summary

Workorder: 303971

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Parmname	NOM	Sample Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time
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.									
^	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									
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.

** Indicates analyte is a surrogate 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.