

Hard Copy Required

Page 2 of 2

Thursday, February 02, 2012

REQUEST NUMBER: 12-699

PRIORITY	METHOD CODE	CNTNR	SAMPLE ID	SAMPLE MATRIX	DATE SAMPLED	SPECIAL INSTRUCTIONS
	EPA:310.1	1	CAAN-12-2030	WG	2/1/2012	
		1	CAAN-12-2200	WG	2/1/2012	
	EPA:900	1	CAAN-12-2031	WG	2/1/2012	
		1	CAAN-12-2199	WG	2/1/2012	
	EPA:901.1	1	CAAN-12-2031	WG	2/1/2012	
		1	CAAN-12-2199	WG	2/1/2012	
	EPA:903.1	1	CAAN-12-2031	WG	2/1/2012	
	EPA:904	1	CAAN-12-2031	WG	2/1/2012	
	EPA:905.0	1	CAAN-12-2031	WG	2/1/2012	
		1	CAAN-12-2199	WG	2/1/2012	
	HASL-300:AM-241	1	CAAN-12-2031	WG	2/1/2012	
		1	CAAN-12-2199	WG	2/1/2012	
	HASL-300:ISOPU	1	CAAN-12-2031	WG	2/1/2012	
		1	CAAN-12-2199	WG	2/1/2012	
	HASL-300:ISOU	1	CAAN-12-2031	WG	2/1/2012	
		1	CAAN-12-2199	WG	2/1/2012	
	SM:A2340B	1	CAAN-12-2030	WG	2/1/2012	
		1	CAAN-12-2200	WG	2/1/2012	
	SW-846:6010B	1	CAAN-12-2030	WG	2/1/2012	
		1	CAAN-12-2200	WG	2/1/2012	
	SW-846:6020	1	CAAN-12-2030	WG	2/1/2012	
		1	CAAN-12-2200	WG	2/1/2012	
	SW-846:6850	1	CAAN-12-2030	WG	2/1/2012	
		1	CAAN-12-2200	WG	2/1/2012	

Final Page of REQUEST NUMBER 12-699

Thursday, February 02, 2012

**LOS ALAMOS
NATIONAL LABORATORY**

ATTN: Valerie Davis

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

These Samples are on:

LANL Request Number: 12-699
Per Agreement Number: 126310011
Project Cost Code: MR1A015AGWJ0

Please analyse the enclosed samples
according to the schedule indicated:

SHIP DATE: 2/2/2012
TURNAROUND/REPORT DUE: 3/3/2012
TURNAROUND REQ'D: 30 Days

RAD SCREENING: Yes, Below Background
LAB REQUEST COMMENTS:

LANL ER SMO CONTACT:

Signature: 

PRIORITY	METHOD CODE	CNTNR	SAMPLE ID	SAMPLE MATRIX	DATE SAMPLED	SPECIAL INSTRUCTIONS
	EPA:120.1	1	CAAN-12-2030	WG	2/1/2012	
	EPA:150.1	1	CAAN-12-2200	WG	2/1/2012	
	EPA:150.1	1	CAAN-12-2030	WG	2/1/2012	
	EPA:160.1	1	CAAN-12-2200	WG	2/1/2012	
	EPA:160.1	1	CAAN-12-2030	WG	2/1/2012	
	EPA:245.2	1	CAAN-12-2200	WG	2/1/2012	
	EPA:245.2	1	CAAN-12-2030	WG	2/1/2012	
	EPA:300.0	1	CAAN-12-2200	WG	2/1/2012	
	EPA:300.0	1	CAAN-12-2030	WG	2/1/2012	
		1	CAAN-12-2200	WG	2/1/2012	

Thursday, February 02, 2012

LAB CHAIN OF CUSTODY DOCUMENT NUMBER: 12-699C

LOS ALAMOS

REQUEST NUMBER: 12-699

NATIONAL LABORATORY

ATTN: Valerie Davis

TURNAROUND/REPORT DUE: 3/3/2012

General Engineering Laboratories, Inc., Charleston, SC.

TURNAROUND REQ'D: 30

2040 Savage Rd

Charleston, SC 29407

LAB REQUEST COMMENTS:

295268

SAMPLE ID	CTNR	CTNR DESC	ORDER	PRESERV	MATRIX
CAAN-12-2030	1	POLY	WSP-GENINORG	Ice	WG
CAAN-12-2030	1	POLY	WSP-Met+B+SN+SR+U	Nitric Acid (HNO3)	WG
CAAN-12-2031	1	POLY	WSP-GrossA/B	None	WG
CAAN-12-2031	1	POLY	WSP-RAD	Nitric Acid (HNO3)	WG
CAAN-12-2031	1	POLY	Ra226+228	Nitric Acid (HNO3)	WG
CAAN-12-2199	1	POLY	WSP-GrossA/B	None	WG
CAAN-12-2199	1	POLY	WSP-RAD	Nitric Acid (HNO3)	WG
CAAN-12-2200	1	POLY	WSP-GENINORG	Ice	WG
CAAN-12-2200	1	POLY	WSP-Met+B+SN+SR+U	Nitric Acid (HNO3)	WG

Relinquished By:

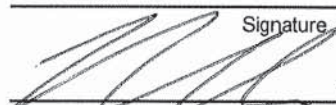
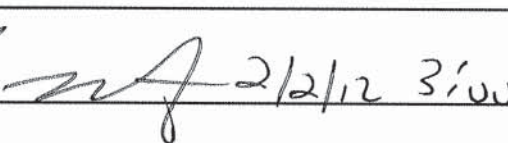
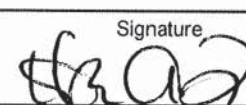
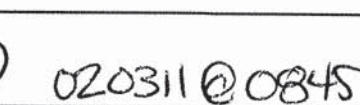
Date

Time

Received By:

Date

Time

			
Signature	Signature	Signature	Signature

Signature

Signature

Received for DISPOSAL By:

Date

Time

Remarks:

Signature

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 3734

EVENT NAME: Ancho, MDA AB Mon. Group Sampling Q2, January 2012, 2011
Interim Plan rev. 1

SAMPLE ID: CAAN-12-2031

WORK ORDER:

AS PLANNED		AS COLLECTED		AS PLANNED		AS COLLECTED	
DATE COLLECTED(MM/DD/YYYY):		2 / 1 / 2012		MEDIA:		WGR	
TIME COLLECTED (HH:MM)		1245		SUB-MEDIA:		UA	
PRS ID: Ancho		OK		SAMPLE TECH CODE:		GSP	
LOCATION ID: R-30				FIELD QC TYPE:		NA	
LOCATION TYPE: MON				FIELD PREP:		UE	
PORT: SINGLE COMPLETION				SAMPLE USAGE:		INV	
				SCREEN/PORT DESC:			
FIELD MATRIX: WG				EXCAVATED: YES/NO/NA		NA	
COMPOSITE TYPE: NA		COMPOSITE TIME INTERVAL: NA		WATER FLOWING: YES/NO/NA		NA	
BOREHOLE: YES/NO/NA		BOREHOLE DECLINATION: NA		BOREHOLE DIRECTION: NA			

#	PRIORITY	ORDER	CNTNR	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
2	NA	WSP-8260B-VOA	40 ML SEPTUM AMBER GLASS	Hydrochloric Acid (HCL)	Y	NA
3		WSP-8270C-SVOA	1 LITER AMBER GLASS	Ice		
3		WSP-8321A-NMED HEXP	1 LITER AMBER GLASS	Ice		
1		WSP-GrossA/B	1 LITER POLY	None		
2		WSP-HEXMOD	1 LITER AMBER GLASS	Ice		
1		WSP-LL-H-3	1 LITER POLY	None		
1		WSP-RAD	1 GAL POLY	Nitric Acid (HNO3)		
1		WSP-TKN+TOC	500 ML AMBER GLASS	Sulfuric Acid (H2SO4)		
1		RA226+228	1 GAL POLY	Nitric Acid (HNO3)	NA 1/30/12	

SAMPLE DESC:

NA

SAMPLE COMMENTS:

Diesel generator running ~50' away during sampling

LOCATION DESC:

NA

FIELD SCREENING/MEASUREMENT RESULTS:

pH	T°C	SC (mg/L)	Diss/L	ORP (mV)	Agpm	Turb (NTU)
7.97	20.25	117	7.98	176.6	1.25 us / 5.71 pm	1.25

COLLECTED BY (PRINT)

D Woody

REVIEWED BY (PRINT)

W. Shaw

RELINQUISHED BY

Date/Time

RECEIVED BY

Date/Time

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 3734

EVENT NAME: Ancho, MDA AB Mon. Group Sampling Q2, January 2012, 2011
Interim Plan rev 1

(Printed Name) J Woody	02/01/12	(Printed Name) STEPHEN SAEWOOD	02/01/12
(Signature) J Woody	1415	(Signature) Stephen SaeWood	1415
RELINQUISHED BY	Date/Time	RECEIVED BY	Date/Time
(Printed Name)		(Printed Name)	
(Signature)		(Signature)	

3734

CAAN-12-2031

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 3734

EVENT NAME: Ancho, MDA AB Mon. Group Sampling Q2, January 2012, 2011
Interim Plan rev. 1

SAMPLE ID: CAAN-12-2030

WORK ORDER:

AS PLANNED		AS COLLECTED	AS PLANNED		AS COLLECTED
DATE COLLECTED(MM/DD/YYYY):		2/1/2012	MEDIA:	WGR	OK
TIME COLLECTED (HH:MM)		1245	SUB-MEDIA:	UA	
PRS ID:	Ancho	OK	SAMPLE TECH CODE:	GSP	
LOCATION ID:	R-30		FIELD QC TYPE:	NA	
LOCATION TYPE:	MON		FIELD PREP:	F	
PORT:	SINGLE COMPLETION		SAMPLE USAGE:	INV	
			SCREEN/PORT DESC:		
FIELD MATRIX:	WG		EXCAVATED: YES/NO/NA		
COMPOSITE TYPE:	NA		COMPOSITE TIME INTERVAL:	NA	
			WATER FLOWING: YES/NO/NA		
BOREHOLE: YES/NO/NA	NA		BOREHOLE DECLINATION:	NA	
			BOREHOLE DIRECTION:	NA	

#	PRIORITY	ORDER	CNTNR	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
1	NA	WSP-GENINORG	1 LITER POLY	Ice	Y	NA
1		WSP-Met+B+SN +SR+U	1 LITER POLY	Nitric Acid (HNO3)		
1		WSP-NH3+NO3/ NO2+PO4	500 ML AMBER GLASS	Sulfuric Acid (H2SO4)		

SAMPLE DESC:

SAMPLE COMMENTS:

LOCATION DESC:

FIELD SCREENING/MEASUREMENT RESULTS:

COLLECTED BY (PRINT)

D. Woody

REVIEWED BY (PRINT)

W. Shan

RELINQUISHED BY	Date/Time	RECEIVED BY	Date/Time
(Printed Name) D. Woody	02/01/12	(Printed Name) D. Fern Sheerwood	02/01/12
(Signature) D. Woody	1415	(Signature) D. Fern Sheerwood	1415
RELINQUISHED BY	Date/Time	RECEIVED BY	Date/Time
(Printed Name)		(Printed Name)	
(Signature)		(Signature)	

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 3734

EVENT NAME: Ancho, MDA AB Mon. Group Sampling Q2, January 2012, 2011
Interim Plan rev. 1

SAMPLE ID: CAAN-12-2200

WORK ORDER:

AS PLANNED	AS COLLECTED	AS PLANNED	AS COLLECTED
DATE COLLECTED(MM/DD/YYYY):	2/1/2012	MEDIA:	WGR
TIME COLLECTED (HH:MM)	1245	SUB-MEDIA:	UA
PRS ID: Ancho	OK	SAMPLE TECH CODE:	GSP
LOCATION ID: R-30		FIELD QC TYPE:	ED
LOCATION TYPE: MON		FIELD PREP:	E
PORT: SINGLE COMPLETION		SAMPLE USAGE:	QC
		SCREEN/PORT DESC:	
FIELD MATRIX: WG		EXCAVATED: YES/NO/NA	
COMPOSITE TYPE: NA		COMPOSITE TIME INTERVAL: NA	
		WATER FLOWING: YES/NO/NA	
BOREHOLE: YES/NO/NA		BOREHOLE DECLINATION: NA	
		BOREHOLE DIRECTION: NA	

#	PRIORITY	ORDER	CNTNR	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
1	NA	WSP-GENINORG	1 LITER POLY	Ice	Y	NA
1		WSP-Met+B+SN+SR+U	1 LITER POLY	Nitric Acid (HNO3)	Y	
1		WSP-NH3+NO3/NO2+PO4	500 ML AMBER GLASS	Sulfuric Acid (H2SO4)	Y	

SAMPLE DESC: QC Sample of CAAN-12-2030

SAMPLE COMMENTS:

LOCATION DESC:

FIELD SCREENING/MEASUREMENT RESULTS:

COLLECTED BY (PRINT)

D. Woody

REVIEWED BY (PRINT)

W. Shaw

RELINQUISHED BY (Printed Name) D Woody (Signature) D Woody	Date/Time 01/02/12 1415	RECEIVED BY (Printed Name) SHAWN SHERWOOD (Signature) Shawn Sherwood	Date/Time 01/02/12 1415
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 3734

EVENT NAME: Ancho, MDA AB Mon. Group Sampling Q2, January 2012, 2011
Interim Plan rev. 1

(Signature)		(Signature)	ONS
RELINQUISHED BY	Date/Time	RECEIVED BY	Date/Time
(Printed Name) D. Woody	02/01/12	(Printed Name) JERRI SHERWOOD	12/01/12
(Signature) D. Woody	1415	(Signature) JERRI SHERWOOD	1415

3734

CAAN-12-2199

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 3734

EVENT NAME: Ancho, MDA AB Mon. Group Sampling Q2, January 2012, 2011
Interim Plan rev. 1

SAMPLE ID: CAAN-12-2199

WORK ORDER:

AS PLANNED		AS COLLECTED		AS PLANNED		AS COLLECTED	
DATE COLLECTED(MM/DD/YYYY):		2/1/2012		MEDIA:	WGR		OK
TIME COLLECTED (HH:MM)		1245		SUB-MEDIA:	UA		
PRS ID:	Ancho	OK		SAMPLE TECH CODE:	GSP		
LOCATION ID:	R-30			FIELD QC TYPE:	ED		
LOCATION TYPE:	MON			FIELD PREP:	UF		
PORT:	SINGLE COMPLETION			SAMPLE USAGE:	QC		
				SCREEN/PORT DESC:			
FIELD MATRIX:	WG			EXCAVATED: YES/NO/NA	NA		
COMPOSITE TYPE:	NA			COMPOSITE TIME INTERVAL:	NA		
				WATER FLOWING: YES/NO/NA	NA		
BOREHOLE: YES/NO/NA	NA			BOREHOLE DECLINATION:	NA		
				BOREHOLE DIRECTION:	NA		

#	PRIORITY	ORDER	CNTNR	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
2	NA	WSP-8260B-VOA	40 ML SEPTUM AMBER GLASS	Hydrochloric Acid (HCL)	Y	NA
1	NA	WSP-8270C-SVOA	1 LITER AMBER GLASS	Ice	Y	
1	NA	WSP-8321A-NMED HEXP	1 LITER AMBER GLASS	Ice	Y	
1	NA	WSP-GrossA/B	1 LITER POLY	None	Y	
2	NA	WSP-HEXMOD	1 LITER AMBER GLASS	Ice	Y	
1	NA	WSP-LL-H-3	1 LITER POLY	None	Y	
1	NA	WSP-RAD	1 GAL POLY	Nitric Acid (HNO3)	Y	
1	NA	WSP-TKN+TOC	500 ML AMBER GLASS	Sulfuric Acid (H2SO4)	Y	

SAMPLE DESC: QC Sample of CAAN-12-2031

SAMPLE COMMENTS:

LOCATION DESC:

FIELD SCREENING/MEASUREMENT RESULTS:

COLLECTED BY (PRINT)

J. Romero

REVIEWED BY (PRINT)

W. Jha

RELINQUISHED BY

(Printed Name)

Date/Time

RECEIVED BY

(Printed Name)

Date/Time

DATA VALIDATION COVER SHEET**5121-1****Data Validation Cover Sheet**

Records Use only

**Section I.**REQUEST NUMBER: 12-699 VALIDATION DATE: 03/06/12 LAB CODE: GELCONTRACT LABORATORY NAME: GEL Laboratories LLCVALIDATOR: Kevin A. Lambert ORGANIZATION: Analytical Quality Associates, Inc.

ANALYTICAL SUITE (CHECK ALL THAT APPLY):

- | | | | |
|--|--|---|---|
| <input type="checkbox"/> TPH-GRO | <input type="checkbox"/> HIGH EXPLOSIVES | <input type="checkbox"/> DIOXIN FURANS | <input checked="" type="checkbox"/> LCMSMS PERCHLORATES |
| <input type="checkbox"/> TPH-DRO | <input type="checkbox"/> METALS | <input type="checkbox"/> PCB CONGENERS | <input type="checkbox"/> ORGANOCHLORINE |
| <input type="checkbox"/> GENERAL CHEMISTRY | <input type="checkbox"/> RADIOCHEMISTRY | <input type="checkbox"/> LCMSMS HIGH EXPLOSIVES | <input type="checkbox"/> PESTICIDES/POLYCHLORINATED BIPHENYLS |
| <input type="checkbox"/> OTHER (DESCRIBE): _____ | | | |

Section II. Completeness Check

- | YES | NO | N/A | (CHECK ONE) | YES | NO | N/A | (CHECK ONE) |
|-------------------------------------|--------------------------|-------------------------------------|-----------------------------|-------------------------------------|--------------------------|-------------------------------------|--------------------------|
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 1. CHAIN-OF-CUSTODY FORM(S) | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 6. RAW/BSS DATA |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 2. CASE NARRATIVE | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 7. QUALITY CONTROL FORMS |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 3. SAMPLE RESULT FORMS | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 8. QUANTITATION REPORTS |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 4. SAMPLE CHROMATOGRAMS | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 9. TICS FORMS |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 5. STANDARD CHROMATOGRAMS | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 10. TICS MASS SPECTRA |

Comments/problems noted (include information about requests for further information submitted to the contract laboratory and agreed-upon date of resolution and contract laboratory point of contact):

1. It should be noted that the MS/MSD analyses were performed on a LANL sample from another RN and the parent sample raw data were not included in the data package. No sample data were qualified.

Reviewed by: Larry M. FukuiLevel: IDate: 3/6/12VALIDATOR'S SIGNATURE: Kevin A. Lambert DATE: 03/06/12

LC/MS/MS PERCHLORATE ANALYTICAL DATA VALIDATION CHECKLIST


5121-2

LC/MS/MS Perchlorate Analytical Data Validation Checklist

Records Use only



Yes No N/A				Assign Qualifier Listed Below If Criterion = Yes	
(Check One)				Non-detected Analyte	Detected Analyte
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	1. The Internal Standard (IS) relative retention time has shifted by more than 0.98 to 1.02 seconds.	R, PERC0	J, PERC0
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	2. Required IS retention time documentation is missing. Data may not be acceptable for use. Contact the SMO or external laboratory for information.	R, PERC0b	R, PERC0b
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	3. The IS are count is <25% of the expected value.	UJ, PERC1a	J, PERC1a
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	4. The IS area count is <70% but >25% of the average of that obtained from the calibration standards.	UJ, PERC1b	J, PERC1b
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	5. The IS area count is >130% of the average of that obtained from the calibration standards.	UJ, PERC1c	J, PERC1c
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	6. Required IS information is missing. Data may not be acceptable for use. Contact the SMO or external laboratory for information.	R, PERC1d	R, PERC1d
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	7. The sample result is $\leq 5X$ the concentration of the related analyte in the method blank.	U, PERC4	N/A
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	8. The affected analytes are considered estimated and biased high because this analyte was identified in the method blank but was $>5X$.	N/A	J+, PERC4a
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	9. The sample result is $\leq 5X$ the concentration of the related analyte in the trip blank, rinsate blank, and/or equipment blank.	U, PERC4d	N/A
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	10. Required method blank information is missing. Data may not be acceptable for use. Contact the SMO or external laboratory for information.	R, PERC4e	R, PERC4e
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	11. The affected results were not analyzed with a valid 5-point calibration curve and/or a standard at the reporting limit.	UJ, PERC7	J, PERC7
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	12. The affected analytes were analyzed with an initial calibration curve that exceeded the %RSD criteria and/or the associated multipoint calibration correlation coefficient is <0.99 .	UJ, R, PERC7a	J, PERC7a

LC/MS/MS PERCHLORATE ANALYTICAL DATA VALIDATION CHECKLIST		
5121-2		Records Use only
LC/MS/MS Perchlorate Analytical Data Validation Checklist		

Yes No N/A				Assign Qualifier Listed Below If Criterion = Yes	
(Check One)				Non-detected Analyte	Detected Analyte
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	13. The ICV and/or CCV were recovered outside the method limits.	UJ, R, PERC7c	J, PERC7c
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	14. The ICV and/or CCV were not analyzed at the appropriate method frequency.	UJ, R, PERC7d	J, PERC7d
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	15. Required calibration information is missing or samples were analyzed on an expired calibration. Contact the SMO or external laboratory for information.	R, PERC7f	R, PERC7f
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	16. The affected analyte is considered not detected because ion abundance ratios did not meet specifications.	N/A	R, PERC8
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	17. The ion ratio documentation is missing. Data may not be acceptable for use. Contact the SMO or external laboratory for information.	N/A	R, PERC8a
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	18. The holding time was >1 and ≤2 times the applicable holding time requirement.	UJ PERC9	J-, PERC9
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	19. The holding time was > 2 times the applicable holding time requirement.	R, PERC9a	J-, PERC9a
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	20. The LCS percent recovery was <10%. Follow the external laboratory limits.	R, PERC12	J-, PERC12
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	21. The LCS percent recovery was < the Lower Acceptance Limit but >10%. Follow the external laboratory limits.	UJ, PERC12a	J-, PERC12a
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	22. The LCS percent recovery was > the Upper Acceptance Limit. Follow the external laboratory limits.	N/A	J+, PERC12b
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	23. The LCS documentation is missing. Data may not be acceptable for use. Contact the SMO or external laboratory for information.	R, PERC12c	R, PERC12c
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	24. The MS/MSD percent recovery was <10%	R, PERC12d	R, PERC12d
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	25. The MS/MSD percent recovery was >10% but <75%	UJ, PERC12e	J, PERC12e
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	26. The MS/MSD percent recovery was >125%.	N/A	J+, PERC12f

LC/MS/MS PERCHLORATE ANALYTICAL DATA VALIDATION CHECKLIST

5121-2

LC/MS/MS Perchlorate Analytical Data Validation Checklist

Records Use only



Yes No N/A				Assign Qualifier Listed Below If Criterion = Yes	
(Check One)				Non-detected Analyte	Detected Analyte
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	27. The MS/MSD relative percent difference was >20%.	UJ, PERC12g	J, PERC12g
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	28. The affected analytes are considered suspect because the sample was diluted without any target analytes identified due to matrix interference. Qualify as Reject if the analytical laboratory cannot provide proof for matrix interference.	UJ, R, PERC15	N/A
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	29. The sample was diluted because target analytes were > the initial verification calibration.	UJ, PERC15a	J, PERC15a
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	30. The Contract Required Detection Limit check standard (CRI) sample did not pass method-acceptance limits.	UJ, R, PERC16	J, PERC16
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	31. The Interference Check Sample was not within $\pm 20\%$ of the known value.	UJ, PERC16a	J, PERC16a
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	32. The required CRI sample information is missing. Contact the SMO or external laboratory for information.	R, PERC16c	R, PERC16c
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	33. The LANL project chemist identified quality deficiencies in the reported data that require further qualification. This code can ONLY be used and/or under advisement by the LANL project chemist.	UJ, R, PERC19	J, R, PERC19
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	34. Duplicate, dilution, or reanalysis.	UJ, PERC88	J, PERC88

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Lab Code: GEL

Instrument: LCMSMS

Method: SW846 6850 Modified

Matrix: WATER

Extraction Batch ID: 1185768

Extraction Type: Filter/DAI

Sample Volume/Weight: 10.0 mL

Concentrated Extract Volume: 10.0

Client Sample No.

CAAN-12-2030

Date Received: 03-FEB-12

GEL Job No (SDG): 12-699

GEL Sample ID: 295268001

Date Filtered: 10-FEB-12

Injection 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	0.240	ug/L		1	11-FEB-12 13:40	per0211019a
	Perchlorate Isotope Ratio			3.31			1	11-FEB-12 13:40	per0211019a
14797-73-0	Perchlorate-101	.05	.2	0.234	ug/L		1	11-FEB-12 13:40	per0211019a
	Perchlorate-O(18)			0.499	ug/L		1	11-FEB-12 13:40	per0211019a

[^] 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 =

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

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: SW846 6850 ModifiedMatrix: WATERExtraction Batch ID: 1185768Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAAN-12-2200Date Received: 03-FEB-12GEL Job No (SDG): 12-699GEL Sample ID: 295268004Date Filtered: 10-FEB-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	0.238	ug/L		1	11-FEB-12 13:51	per0211020a
	Perchlorate Isotope Ratio			3.24			1	11-FEB-12 13:51	per0211020a
14797-73-0	Perchlorate-101	.05	.2	0.237	ug/L		1	11-FEB-12 13:51	per0211020a
	Perchlorate-O(18)			0.511	ug/L		1	11-FEB-12 13:51	per0211020a

[^] 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 =

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

DATA VALIDATION COVER SHEET**5118-1****Data Validation Cover Sheet**

Records Use only

**Section I.**REQUEST NUMBER: 12-699 VALIDATION DATE: 03/06/12 LAB CODE: GELCONTRACT LABORATORY NAME: GEL Laboratories LLCVALIDATOR: Kevin A. Lambert ORGANIZATION: Analytical Quality Associates, Inc.

ANALYTICAL SUITE (CHECK ALL THAT APPLY):

- | | | | |
|--|--|---|---|
| <input type="checkbox"/> TPH-GRO | <input type="checkbox"/> HIGH EXPLOSIVES | <input type="checkbox"/> DIOXIN FURANS | <input type="checkbox"/> LCMSMS PERCHLORATES |
| <input type="checkbox"/> TPH-DRO | <input checked="" type="checkbox"/> METALS | <input type="checkbox"/> PCB CONGENERS | <input type="checkbox"/> ORGANOCHLORINE |
| <input type="checkbox"/> GENERAL CHEMISTRY | <input type="checkbox"/> RADIOCHEMISTRY | <input type="checkbox"/> LCMSMS HIGH EXPLOSIVES | <input type="checkbox"/> PESTICIDES/POLYCHLORINATED BIPHENYLS |
| <input type="checkbox"/> OTHER (DESCRIBE): _____ | | | |

Section II. Completeness Check

- | YES | NO | N/A | (CHECK ONE) | YES | NO | N/A | (CHECK ONE) |
|-------------------------------------|--------------------------|-------------------------------------|-----------------------------|-------------------------------------|--------------------------|-------------------------------------|--------------------------|
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 1. CHAIN-OF-CUSTODY FORM(S) | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 6. RAW/BSS DATA |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 2. CASE NARRATIVE | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 7. QUALITY CONTROL FORMS |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 3. SAMPLE RESULT FORMS | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 8. QUANTITATION REPORTS |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 4. SAMPLE CHROMATOGRAMS | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 9. TICS FORMS |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 5. STANDARD CHROMATOGRAMS | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 10. TICS MASS SPECTRA |

Comments/problems noted (include information about requests for further information submitted to the contract laboratory and agreed-upon date of resolution and contract laboratory point of contact):

- In the MB, K was detected. The associated sample results were detects >5X but ≤50X the MB concentration and, thus, was qualified J,I4a.
- In the CCB, Mo and K were detected. All associated sample results were detects >5X the greatest blank concentrations and, thus, were not qualified.

Reviewed by: Larry M. FukuiLevel: IDate: 3/6/12VALIDATOR'S SIGNATURE: Kevin A. Lambert DATE: 03/06/12

METALS ANALYTICAL DATA VALIDATION CHECKLIST

5118-2

Metals Analytical Data Validation Checklist

Records Use only



Yes	No	N/A		Assign Qualifier Listed Below If Criterion = Yes	
				Non-detected Analyte	Detected Analyte
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	1. The holding time was >1 and ≤2 times the applicable holding time requirement.	UJ, I9	J-, I9
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	2. The holding time was >2 times the applicable holding time requirement.	R, I9a	J-, I9a
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	3. The instrument performance sample did not pass method acceptance criteria.	R, I16	R, I16
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	4. The mass calibration is not within 0.1 amu or %RSD is >5% for any isotope (Be, Mg, Co, In, Pb).	UJ, I16a	J, I16a
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	5. Samples were analyzed outside specific method tune time criteria.	N/A	J, I16b
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	6. The required instrument performance sample information is missing. Contact the SMO or external laboratory for information.	R, I16c	R, I16c
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	7. The affected results were not analyzed with a valid 5-point calibration curve and/or a standard at the reporting limit.	UJ, R, I7	J, I7
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	8. The affected analytes were analyzed with an initial calibration curve that exceeded the %RSD criteria and/or the associated multipoint calibration correlation coefficient is <0.995.	UJ, I7a	J, I7a
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	9. The initial Calibration Verification (ICV) and/or Continuing Calibration Verification (CCV) were recovered outside the method-specific limits.	UJ, I7c	J, I7c
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	10. The ICV and/or CCV were not analyzed at the appropriate method frequency.	UJ, I7d	J, I7d
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	11. Required calibration information is missing or samples were analyzed on an expired calibration. Contact the SMO or external laboratory for information.	R, I7f	R, I7f
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	12. Metals interference check sample percent recover value is <50%.	R, I2	J-, I2

METALS ANALYTICAL DATA VALIDATION CHECKLIST

5118-2

Metals Analytical Data Validation Checklist

Records Use only



Yes No N/A				Assign Qualifier Listed Below If Criterion = Yes	
(Check One)				Non-detected Analyte	Detected Analyte
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	13. Metals interference check sample percent recovery value is $\geq 50\%$ and $< 80\%$	UJ, I2a	J-, I2a
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	14. Metals interference check sample percent recovery value is $> 120\%$.	N/A	J+, I2b
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	15. Metals interference check sample was not analyzed with the samples.	R, I2c	R, I2c
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	16. The sample result is $\leq 5X$ the concentration of the related analyte in the method blank.	U, I4	N/A
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	17. The affected analytes are considered estimated and biased high because this analyte was identified in the method blank but was $> 5X$.	N/A	J, I4a
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	18. The sample result is $\leq 5X$ the concentration of the related analyte in the instrument blank and continuing calibration blank.	U, I4b	N/A
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	19. Continuing calibration blanks were not analyzed at the appropriate method frequency.	UJ, I4c	J, I4c
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	20. The sample result is $\leq 5X$ the concentration of the related analyte in the trip blank, rinsate blank, or equipment blank.	U, I4d	N/A
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	21. Required method blank information is missing. Data may not be acceptable for use. Contact the SMO or external laboratory for information.	R, I4e	R, I4e
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	22. The associated matrix spike recovery was $< 10\%$. Follow the external laboratory limits located within the associated data package.	R, I6	R, I6
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	23. The associated matrix spike recovery was $<$ the LAL but $> 10\%$. Follow the external laboratory limits located within the associated data package.	UJ, I6a	J+, I6a
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	24. The associated matrix spike recovery was $>$ the UAL. Follow the external laboratory limits located within the associated data package.	UJ, I6b	J+, I6b

METALS ANALYTICAL DATA VALIDATION CHECKLIST

5118-2

Metals Analytical Data Validation Checklist

Records Use only



Yes No N/A				Assign Qualifier Listed Below If Criterion = Yes	
(Check One)				Non-detected Analyte	Detected Analyte
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	25. Required matrix spike information is missing. Data may not be acceptable for use. Contact the SMO or external laboratory for information. If the LCS information is present, do not Reject. Qualify data based on the LCS information.	R, I6c	R, I6c
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	26. The sample and the duplicate sample results were $\geq 5X$ the RL and the duplicate RPD was $>20\%$ for water samples and $>35\%$ for soil samples.	UJ, I10a	J, I10a
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	27. The duplicate sample was not prepared and/or analyzed with the samples for unspecified reasons. The duplicate information is missing. Data may not be acceptable for use. Contact the SMO or external laboratory for information.	UJ, I10d	J, I10d
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	28. The LCS percent recovery was $<10\%$. Follow the external laboratory limits located within the associated data package.	R, I12	R, I12
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	29. The LCS percent recover was $<$ the LAL but $>10\%$. Follow the external laboratory limits located within the associated data package.	UJ, I12a	J-, I12a
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	30. The LCS percent recovery was $>$ the UAL. Follow the external laboratory limits located within the associated data package.	N/A	J+, I12b
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	31. The LCS documentation is missing. Data may not be acceptable for use. Contact the SMO or external laboratory for information. Do not Reject if MS/MSD information is present. Qualify according to MS/MSD criteria.	R, I12c	R, I12c
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	32. The quantitating IS area count is $<10\%$ for metals window in relation to the initial calibration blank. Follow the method-specific windows.	R, I1a	J, I1a

METALS ANALYTICAL DATA VALIDATION CHECKLIST

5118-2

Metals Analytical Data Validation Checklist

Records Use only



Yes No N/A				Assign Qualifier Listed Below If Criterion = Yes	
(Check One)				Non-detected Analyte	Detected Analyte
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	33. The IS area count for the quantitating IS is <60% but >10% for metals window in relation to the initial calibration blank. Follow the method-specific windows.	UJ, I1b	J, I1b
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	34. The IS area count for the quantitating IS is >125% in relation to the metals initial calibration blank. Follow method-specific windows.	UJ, I1c	J, I1c
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	35. Required IS information is missing. Data may not be acceptable for use. Contact the SMO or external laboratory for information.	R, I1d	R, I1d
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	36. Serial dilution sample RPD was >10% and the sample result was >50X the MDL (>100X the MDL for ICPMS). Qualify ONLY the sample used for the serial dilution.	UJ, I18	J, I18
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	37. Serial dilution sample was not analyzed with the samples.	UJ, I18a	J, I18
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	38. The sample result was reported as detected between the IDL and the EDL.	N/A	J, I1
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	39. Duplicate, dilution, or reanalysis.	UJ, I88	J, I88
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	40. Qualification of data via data validation did not occur based on Quality Control requirements in this procedure. Adhere to the external laboratory qualifiers found within the Form I analytical data summary sheets generated by the external laboratory.	U, U_LAB	J, J_LAB, NQ, NQ
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	41. The LANL project chemist identified quality deficiencies in the reported data that require further qualification. This code can ONLY be used and/or under advisement by the LANL project chemist.	UJ, R, I19	J, R, I19

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 12-699

METHOD TYPE: EPA

SAMPLE ID: 295268001

CLIENT ID: CAAN-12-2030

CONTRACT: ESHL00210

MATRIX:WG

DATE RECEIVED 03-FEB-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	0.066	ug/L	U		AV	0.066	1	HG3	021512W1-5
7631-86-9	Silica	69.8	mg/L			P	0.053	1	OPTIMA	020912-1
7429-90-5	Aluminum	68	ug/L	U		P	68	1	OPTIMA	020912-1
7440-36-0	Antimony	1	ug/L	U		MS	1	1	ICPMS6	120208-2
7440-38-2	Arsenic	2.12	ug/L	J		MS	1.7	1	ICPMS6	120214-3
7440-39-3	Barium	13.7	ug/L			P	1	1	OPTIMA	020912-1
7440-41-7	Beryllium	1	ug/L	U		P	1	1	OPTIMA	020912-1
7440-42-8	Boron	15	ug/L	U		P	15	1	OPTIMA	020912-1
7440-43-9	Cadmium	0.11	ug/L	U		MS	0.11	1	ICPMS6	120208-2
7440-70-2	Calcium	10000	ug/L			P	50	1	OPTIMA	020912-1
7440-47-3	Chromium	3.98	ug/L	J		MS	2	1	ICPMS6	120208-2
7440-48-4	Cobalt	1	ug/L	U		P	1	1	OPTIMA	020912-1
7440-50-8	Copper	3	ug/L	U		P	3	1	OPTIMA	020912-1
7439-89-6	Iron	30	ug/L	U		P	30	1	OPTIMA	020912-1
7439-92-1	Lead	0.5	ug/L	U		MS	0.5	1	ICPMS6	120208-2
7439-95-4	Magnesium	3040	ug/L			P	110	1	OPTIMA	020912-1
7439-96-5	Manganese	2	ug/L	U		P	2	1	OPTIMA	020912-1
7439-98-7	Molybdenum	1.2	ug/L			MS	0.165	1	ICPMS6	120208-2
7440-02-0	Nickel	0.776	ug/L	J		MS	0.5	1	ICPMS6	120208-2
7440-09-7	Potassium	J,14a 1220	ug/L			P	50	1	OPTIMA	020912-1
7782-49-2	Selenium	1.5	ug/L	U		MS	1.5	1	ICPMS6	120214-3
7440-22-4	Silver	0.2	ug/L	U		MS	0.2	1	ICPMS6	120208-2
7440-23-5	Sodium	11600	ug/L			P	100	1	OPTIMA	020912-1
7440-24-6	Strontium	50.3	ug/L			P	1	1	OPTIMA	020912-1
7440-28-0	Thallium	0.45	ug/L	U		MS	0.45	1	ICPMS6	120208-2
7440-31-5	Tin	2.5	ug/L	U		P	2.5	1	OPTIMA	020912-1

KAL
03/06/12

EPA

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 12-699

METHOD TYPE: EPA

SAMPLE ID: 295268001

CLIENT ID: CAAN-12-2030

CONTRACT: ESHL00210

MATRIX:WG

DATE RECEIVED 03-FEB-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	0.527	ug/L			MS	0.067	1	ICPMS6	120215-4
7440-62-2	Vanadium	6.74	ug/L			P	1	1	OPTIMA	020912-1
7440-66-6	Zinc	3.3	ug/L	U		P	3.3	1	OPTIMA	020912-1
	Hardness as CaCO3	37.5	mg/L				0.453	1	CALC00	

***Analytical Methods:**

P EPA 200.7
MS EPA 200.8
AV EPA 245.1/245.2
AF EPA 1631E

KAL
03/06/12

EPA

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 12-699

METHOD TYPE: EPA

SAMPLE ID: 295268004

CLIENT ID: CAAN-12-2200

CONTRACT: ESHL00210

MATRIX:WG

DATE RECEIVED 03-FEB-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	0.066	ug/L	U		AV	0.066	1	HG3	021512W1-5
7631-86-9	Silica	69.8	mg/L			P	0.053	1	OPTIMA	020912-1
7429-90-5	Aluminum	68	ug/L	U		P	68	1	OPTIMA	020912-1
7440-36-0	Antimony	1	ug/L	U		MS	1	1	ICPMS6	120208-2
7440-38-2	Arsenic	1.7	ug/L	U		MS	1.7	1	ICPMS6	120214-3
7440-39-3	Barium	13.5	ug/L			P	1	1	OPTIMA	020912-1
7440-41-7	Beryllium	1	ug/L	U		P	1	1	OPTIMA	020912-1
7440-42-8	Boron	15	ug/L	U		P	15	1	OPTIMA	020912-1
7440-43-9	Cadmium	0.11	ug/L	U		MS	0.11	1	ICPMS6	120208-2
7440-70-2	Calcium	10000	ug/L			P	50	1	OPTIMA	020912-1
7440-47-3	Chromium	4.51	ug/L	J		MS	2	1	ICPMS6	120208-2
7440-48-4	Cobalt	1	ug/L	U		P	1	1	OPTIMA	020912-1
7440-50-8	Copper	3	ug/L	U		P	3	1	OPTIMA	020912-1
7439-89-6	Iron	30	ug/L	U		P	30	1	OPTIMA	020912-1
7439-92-1	Lead	0.5	ug/L	U		MS	0.5	1	ICPMS6	120208-2
7439-95-4	Magnesium	3060	ug/L			P	110	1	OPTIMA	020912-1
7439-96-5	Manganese	2	ug/L	U		P	2	1	OPTIMA	020912-1
7439-98-7	Molybdenum	1.19	ug/L			MS	0.165	1	ICPMS6	120208-2
7440-02-0	Nickel	0.677	ug/L	J		MS	0.5	1	ICPMS6	120208-2
7440-09-7	Potassium	J,14a 1230	ug/L			P	50	1	OPTIMA	020912-1
7782-49-2	Selenium	1.5	ug/L	U		MS	1.5	1	ICPMS6	120214-3
7440-22-4	Silver	0.2	ug/L	U		MS	0.2	1	ICPMS6	120208-2
7440-23-5	Sodium	11700	ug/L			P	100	1	OPTIMA	020912-1
7440-24-6	Strontium	50	ug/L			P	1	1	OPTIMA	020912-1
7440-28-0	Thallium	0.45	ug/L	U		MS	0.45	1	ICPMS6	120208-2
7440-31-5	Tin	2.5	ug/L	U		P	2.5	1	OPTIMA	020912-1

KAL
03/06/12

EPA

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 12-699

METHOD TYPE: EPA

SAMPLE ID: 295268004

CLIENT ID: CAAN-12-2200

CONTRACT: ESHL00210

MATRIX:WG

DATE RECEIVED 03-FEB-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	0.526	ug/L			MS	0.067	1	ICPMS6	120215-4
7440-62-2	Vanadium	6.51	ug/L			P	1	1	OPTIMA	020912-1
7440-66-6	Zinc	3.3	ug/L	U		P	3.3	1	OPTIMA	020912-1
	Hardness as CaCO3	37.7	mg/L				0.453	1	CALC00	

***Analytical Methods:**

P EPA 200.7
MS EPA 200.8
AV EPA 245.1/245.2
AF EPA 1631E

KAL
03/06/12

EPA

DATA VALIDATION COVER SHEET**5120-1****Data Validation Cover Sheet**

Records Use only

**Section I.**REQUEST NUMBER: 12-699 VALIDATION DATE: 03/06/12 LAB CODE: GELCONTRACT LABORATORY NAME: GEL Laboratories LLCVALIDATOR: Kevin A. Lambert ORGANIZATION: Analytical Quality Associates, Inc.

ANALYTICAL SUITE (CHECK ALL THAT APPLY):

- | | | | |
|---|--|---|--|
| <input type="checkbox"/> TPH-GRO | <input type="checkbox"/> HIGH EXPLOSIVES | <input type="checkbox"/> DIOXIN FURANS | <input type="checkbox"/> LCMSMS PERCHLORATES |
| <input type="checkbox"/> TPH-DRO | <input type="checkbox"/> METALS | <input type="checkbox"/> PCB CONGENERS | <input type="checkbox"/> ORGANOCHLORINE |
| <input checked="" type="checkbox"/> GENERAL CHEMISTRY | <input type="checkbox"/> RADIOCHEMISTRY | <input type="checkbox"/> LCMSMS HIGH EXPLOSIVES | PESTICIDES/POLYCHLORINATED BIPHENYLS |
| <input type="checkbox"/> OTHER (DESCRIBE): _____ | | | |

Section II. Completeness Check

- | YES | NO | N/A | (CHECK ONE) | YES | NO | N/A | (CHECK ONE) |
|-------------------------------------|--------------------------|-------------------------------------|-----------------------------|-------------------------------------|--------------------------|-------------------------------------|--------------------------|
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 1. CHAIN-OF-CUSTODY FORM(S) | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 6. RAW/BSS DATA |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 2. CASE NARRATIVE | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 7. QUALITY CONTROL FORMS |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 3. SAMPLE RESULT FORMS | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 8. QUANTITATION REPORTS |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 4. SAMPLE CHROMATOGRAMS | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 9. TICS FORMS |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 5. STANDARD CHROMATOGRAMS | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 10. TICS MASS SPECTRA |

Comments/problems noted (include information about requests for further information submitted to the contract laboratory and agreed-upon date of resolution and contract laboratory point of contact):

1. In the MB, TDS was detected. The associated sample results were detects $>5X$ but $\leq 50X$ the MB concentration and, thus, were qualified J,I4a.
2. The duplicate RPD value for TDS was $>20\%$, and both the parent sample and duplicate results were $\geq 5X$ the RL. The associated sample results were detects and, thus, were qualified J,I10a.
3. The samples for pH were analyzed beyond $2X$ the method specified HT. The associated sample results were qualified J-,I9a, based on professional judgment.
4. It should be noted that the parent samples for conductivity and alkalinity matrix QC analyses were LANL samples from others RN. No sample data were qualified as a result.

Reviewed by: Larry M. FukuiLevel: IDate: 3/6/12VALIDATOR'S SIGNATURE: Kevin A. Lambert DATE: 03/06/12

GENERAL CHEMISTRY ANALYTICAL DATA VALIDATION CHECKLIST

5120-2

General Chemistry Analytical Data Validation Checklist

Records Use only



Yes No N/A (Check One)				Assign Qualifier Listed Below If Criterion = Yes	
				Non-detected Analyte	Detected Analyte
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	1. The holding time was >1 and ≤2 times the applicable holding time requirement.	UJ, I9	J-, I9
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2. The holding time was >2 times the applicable holding time requirement.	R, I9a	J-, I9a
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	3. The affected analytes are regarded as rejected because the analytical holding time was exceeded.	R, I9b	R, I9b
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	4. The affected results were not analyzed with a valid 5-point calibration curve and/or a standard at the reporting limit.	UJ, R, I7	J, I7
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	5. The affected analytes were analyzed with an initial calibration curve that exceeded the %RSD criteria and/or the associated multipoint calibration correlation coefficient is <0.995.	UJ, I7a	J, I7a
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	6. The ICV and/or CCV were recovered outside the method specific limits.	UJ, I7c	J, I7c
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	7. The ICV and/or CCV were not analyzed at the appropriate method frequency.	UJ, I7d	J, I7d
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	8. Required calibration information is missing or samples were analyzed on an expired calibration. Contact the SMO or external laboratory for information.	R, I7f	R, I7f
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	9. The interference check sample percent recovery value is <50%.	R, I2	J-, I2
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	10. The interference check sample percent recovery value is ≥50% and <80%.	UJ, I2a	J-, I2a
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	11. The interference check sample percent recovery value is >120%.	N/A	J+, I2b
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	12. The interference check sample was not analyzed with the samples.	R, I2c	R, I2c
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	13. The sample result is ≤5X the concentration of the related analyte in the method blank.	U, I4	N/A

GENERAL CHEMISTRY ANALYTICAL DATA VALIDATION CHECKLIST

5120-2

General Chemistry Analytical Data Validation Checklist

Records Use only



Yes No N/A				Assign Qualifier Listed Below If Criterion = Yes	
(Check One)				Non-detected Analyte	Detected Analyte
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	14. The affected analytes are considered estimated and biased high because this analyte was identified in the method blank but was >5X.	N/A	J, I4a
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	15. The sample result is ≤5X the concentration of the related analyte in the instrument blank and continuing calibration blank.	U, I4b	N/A
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	16. Continuing calibration blanks were not analyzed at the appropriate method frequency.	UJ, I4c	J, I4c
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	17. The sample result is ≤5X the concentration of the related analyte in the trip blank, rinsate blank, or equipment blank.	U, I4d	N/A
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	18. Required method blank information is missing. Data may not be acceptable for use. Contact the SMO or external laboratory for information.	R, I4e	R, I4e
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	19. The associate matrix spike recovery was <10%. Follow the external laboratory limits located within the associated data package.	R, I6	R, I6
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	20. 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.	UJ, I6a	J-, I6a
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	21. The associated matrix spike recovery was above the Upper Acceptance Limit (UAL). Follow the external laboratory limits located within the associated data package.	UJ, I6b	J+, I6b
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	22. Required matrix spike information is missing. Data may not be acceptable for use. Contact the SMO or external laboratory for information. If LCS information is present, do not reject. Qualify data based on LCS information.	R, I6c	R, I6c
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	23. The sample and/or the duplicate sample results RPD is not within the acceptance limits. Follow the external laboratory limits located within the associated data package.	UJ, I10b	J, I10b

GENERAL CHEMISTRY ANALYTICAL DATA VALIDATION CHECKLIST

5120-2

General Chemistry Analytical Data Validation Checklist

Records Use only



Yes No N/A				Assign Qualifier Listed Below If Criterion = Yes	
(Check One)				Non-detected Analyte	Detected Analyte
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	24. The duplicate sample was not prepared and/or analyzed with the samples for unspecified reasons. The duplicate information is missing. Data may not be acceptable for use. Contact the SMO or external laboratory for information.	UJ, I10d	J, I10d
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	25. The LCS percent recovery was <10%. Follow the external laboratory limits located within the associated data package.	R, I12	R, I12
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	26. The LCS percent recover was < the LAL but >10%. Follow the external laboratory limits located within the associated data package.	UJ, I12a	J-, I12a
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	27. The LCS percent recovery was > the UAL. Follow the external laboratory limits located within the associated data package.	N/A	J+, I12b
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	28. The LCS documentation is missing. Data may not be acceptable for use. Contact the SMO or external laboratory for information. Do not Reject if MS/MSD information is present. Qualify according to MS/MSD criteria.	R, I12c	R, I12c
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	29. Duplicate, dilution, or reanalysis	UJ, I88	J, I88
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	30. The LANL project chemist identified quality deficiencies in the reported data that require further qualification. This code can ONLY be used and/or under advisement by the LANL project chemist.	UJ, R, I19	J, R, I19
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	31. Qualification of data via data validation does not occur based on Quality Control requirements in this procedure. Adhere to the external laboratory qualifiers found within the Form I analytical data summary sheets generated by the external laboratory.	U, U_LAB	J, J_LAB NQ, NQ (no qualification)

GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: February 27, 2012

Company : Los Alamos National Laboratory
Address : TA-03, SM271, Drop Pt. 02U, Rm111

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

Client SDG: 12-699

Client Sample ID: CAAN-12-2030
Sample ID: 295268001
Matrix: WG
Collect Date: 01-FEB-12 12:00
Receive Date: 03-FEB-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		117		1.00	1.00	umhos/cm	1	LXA1	02/08/12	1529	1186762	1
Electrode Analysis												
EPA 150.1 pH "As Received"												
pH at Temp 8.00C	H	8.04	J-,l9a	0.010	0.100	SU	1	TXT1	02/06/12	1402	1185822	2
Ion Chromatography												
EPA 300.0 Anions Liquid 28 day "As Received"												
Bromide	J	0.0775		0.066	0.200	mg/L	1	MAR1	02/13/12	1613	1185336	3
Chloride		1.60		0.066	0.200	mg/L	1					
Fluoride		0.246		0.033	0.100	mg/L	1					
Sulfate		1.90		0.100	0.400	mg/L	1					
Solids Analysis												
EPA 160.1 Solids, Dissolved-F "As Received"												
Total Dissolved Solids		82.9	J,l4a	3.40	14.3	mg/L		LYG1	02/08/12	0934	1186676	4
Titration Analysis												
EPA 310.1 Total Alkalinity "As Received"												
Alkalinity, Total as CaCO3		54.9		0.725	1.00	mg/L		LXA1	02/07/12	1602	1186112	5
Carbonate alkalinity (CaCO3)	U	ND		0.725	1.00	mg/L						

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 120.1	
2	EPA 150.1	
3	EPA 300.0	
4	EPA 160.1	
5	EPA 310.1	

KAL
03/06/12

GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: February 27, 2012

Company : Los Alamos National Laboratory
Address : TA-03, SM271, Drop Pt. 02U, Rm111

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

Client SDG: 12-699

Client Sample ID: CAAN-12-2200
Sample ID: 295268004
Matrix: WG
Collect Date: 01-FEB-12 12:00
Receive Date: 03-FEB-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		118		1.00	1.00	umhos/cm	1	LXA1	02/08/12	1537	1186762	1
Electrode Analysis												
EPA 150.1 pH "As Received"												
pH at Temp 7.50C	H	8.08	J-,l9a	0.010	0.100	SU	1	TXT1	02/06/12	1406	1185822	2
Ion Chromatography												
EPA 300.0 Anions Liquid 28 day "As Received"												
Bromide	J	0.0721		0.066	0.200	mg/L	1	MAR1	02/13/12	1734	1185336	3
Chloride		1.61		0.066	0.200	mg/L	1					
Fluoride		0.245		0.033	0.100	mg/L	1					
Sulfate		1.87		0.100	0.400	mg/L	1					
Solids Analysis												
EPA 160.1 Solids, Dissolved-F "As Received"												
Total Dissolved Solids		126	J,l4a	3.40	14.3	mg/L		LYG1	02/08/12	0934	1186676	4
Titration Analysis												
EPA 310.1 Total Alkalinity "As Received"												
Alkalinity, Total as CaCO3		54.9		0.725	1.00	mg/L		LXA1	02/07/12	1606	1186112	5
Carbonate alkalinity (CaCO3)	U	ND		0.725	1.00	mg/L						

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 120.1	
2	EPA 150.1	
3	EPA 300.0	
4	EPA 160.1	
5	EPA 310.1	

KAL
03/06/12

DATA VALIDATION COVER SHEET**5119-1****Data Validation Cover Sheet**

Records Use only

**Section I.**REQUEST NUMBER: 12-699 VALIDATION DATE: 03/06/12 LAB CODE: GELCONTRACT LABORATORY NAME: GEL Laboratories LLCVALIDATOR: Kevin A. Lambert ORGANIZATION: Analytical Quality Associates, Inc.

ANALYTICAL SUITE (CHECK ALL THAT APPLY):

- | | | | |
|--|--|---|--|
| <input type="checkbox"/> TPH-GRO | <input type="checkbox"/> HIGH EXPLOSIVES | <input type="checkbox"/> DIOXIN FURANS | <input type="checkbox"/> LCMSMS PERCHLORATES |
| <input type="checkbox"/> TPH-DRO | <input type="checkbox"/> METALS | <input type="checkbox"/> PCB CONGENERS | <input type="checkbox"/> ORGANOCHLORINE |
| <input type="checkbox"/> GENERAL CHEMISTRY | <input checked="" type="checkbox"/> RADIOCHEMISTRY | <input type="checkbox"/> LCMSMS HIGH EXPLOSIVES | PESTICIDES/POLYCHLORINATED BIPHENYLS |
| <input type="checkbox"/> OTHER (DESCRIBE): _____ | | | |

Section II. Completeness Check

- | YES | NO | N/A | (CHECK ONE) | YES | NO | N/A | (CHECK ONE) |
|-------------------------------------|--------------------------|-------------------------------------|-----------------------------|-------------------------------------|--------------------------|-------------------------------------|--------------------------|
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 1. CHAIN-OF-CUSTODY FORM(S) | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 6. RAW/BSS DATA |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 2. CASE NARRATIVE | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 7. QUALITY CONTROL FORMS |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 3. SAMPLE RESULT FORMS | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 8. QUANTITATION REPORTS |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 4. SAMPLE CHROMATOGRAMS | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 9. TICS FORMS |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 5. STANDARD CHROMATOGRAMS | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 10. TICS MASS SPECTRA |

Comments/problems noted (include information about requests for further information submitted to the contract laboratory and agreed-upon date of resolution and contract laboratory point of contact):

- The alpha spec Am-243 tracer %R for sample CAAN-12-2199 was < the laboratory LAL. The Am-241 result was an ND and, thus, was not qualified.
- It should be noted that the parent samples for all matrix QC analyses except gamma spec and gross alpha/beta were LANL samples from other RNs. No sample data were qualified as a result.

Reviewed by: Larry M. FukuiLevel: IDate: 3/6/12VALIDATOR'S SIGNATURE: Kevin A. Lambert DATE: 03/06/12

RAD ANALYTICAL DATA VALIDATION CHECKLIST

5119-2

Rad Analytical Data Validation Checklist

Records Use only



Yes No N/A				Assign Qualifier Listed Below If Criterion = Yes	
(Check One)				Non-detected Analyte	Detected Analyte
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	1. The holding time was >1 and ≤2 times the applicable holding time requirement.	UJ, R9	J-, R9
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	2. The holding time was >2 times the applicable holding time requirement.	R, R9a	J-, R9a
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	3. The results for the affected analytes are considered not detected (U) because the associated sample concentration was less than or equal to the MDC.	U, R5	N/A
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	4. The analyte should be regarded as rejected because spectral interferences prevent positive identification of the analytes.	R, R5a	R, R5a
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	5. The MDC and/or TPU documentation is missing. Data may not be acceptable for use. Contact the SMO or external laboratory for information.	R, R5b	J-, R5b
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	6. The results for the affected analytes should be regarded as not detected (U) because the associated sample concentration was less than 3X the 1 sigma TPU.	U, R11	N/A
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	7. The sample result is ≤5X the concentration of the related analyte in the method blank.	U, R4	N/A
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	8. The affected analytes are considered estimated and biased high because this analyte was identified in the method blank but was >5X.	N/A	J, R4a
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	9. The sample result is ≤5X the concentration of the related analyte in the trip blank, rinsate blank, or equipment blank.	U, R4d	N/A
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	10. Required method blank information is missing. Data may not be acceptable for use. Contact the SMO or external laboratory for information.	R, R4e	R, R4e
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	11. The tracer is <10%R. Follow the external laboratory limits located within the associated data package. Tracer%R is not applicable for Gamma Spectroscopy.	R, R3	R, R3

RAD ANALYTICAL DATA VALIDATION CHECKLIST

5119-2

Rad Analytical Data Validation Checklist

Records Use only



Yes No N/A				Assign Qualifier Listed Below If Criterion = Yes	
(Check One)				Non-detected Analyte	Detected Analyte
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	12. The tracer is < the Lower Acceptance Level (LAL) but $\geq 10\%R$. Follow the external laboratory limits located within the associated data package. Tracer%R is not applicable for Gamma Spectroscopy.	UJ, R3a	J-, R3a
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	13. The Tracer%R value is > the Upper Acceptance Limit (UAL). Follow the external laboratory limits located within the associated data package. Tracer%R is not applicable for Gamma Spectroscopy.	N/A	J+, R3b
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	14. Required tracer information is missing. Data may not be acceptable for use. Contact the SMO or external laboratory for information. Tracer%R is not applicable for Gamma Spectroscopy.	R, R3d	R, R3d
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	15. The LCS percent recovery was <10%. Follow the external laboratory limits located within the associated data package.	R, R12	R, R12
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	16. The LCS percent recovery was < the LAL but >10%. Follow the external laboratory limits located within the associated data package.	UJ, R12a	J-, R12a
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	17. The LCS percent recovery was > the UAL. Follow the external laboratory limits located within the associated data package.	N/A	J+, R12b
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	18. The LCS documentation is missing. Data may not be acceptable for use. Contact the SMO or external laboratory for information.	R, R12c	R, R12c
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	19. Associated duplicate sample has DER or RER > the analytical laboratory's acceptance limits.	R, R10	J, J10
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	20. The duplicate sample was not prepared and/or analyzed with the samples for unspecified reasons. The duplicate information is missing. Data may not be acceptable for use. Contact the SMO or external laboratory for information.	R, R6	R, R6

RAD ANALYTICAL DATA VALIDATION CHECKLIST

5119-2

Rad Analytical Data Validation Checklist

Records Use only



Yes No N/A (Check One)				Assign Qualifier Listed Below If Criterion = Yes	
				Non-detected Analyte	Detected Analyte
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	21. The associated matrix spike recovery was <10%. Follow the external laboratory limits. MS/MSD is not applicable to Gamma Spectroscopy.	R, R6	R, R6
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	22. The associated matrix spike recovery was <10%. Follow the external laboratory limits. MS/MSD is not applicable to Gamma Spectroscopy.	UJ, R6a	J-, R6a
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	23. The associated matrix spike recovery was above the UAL. Follow the external laboratory limits. MS/MSD is not applicable to Gamma Spectroscopy.	UJ, R6b	J+, R6b
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	24. Required matrix spike information is missing. Data may not be acceptable for use. Contact the SMO or external laboratory for information. If LCS information is present, do not Reject. Qualify data based on LCS information. MS/MSD is not applicable to Gamma Spectroscopy.	R, R6c	R, R6c
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	25. Duplicate, dilution, or reanalysis.	UJ, R88	J, R88
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	26. The LANL project chemist identified quality deficiencies in the reported data that require further qualification. This code can ONLY be used and/or under advisement by the LANL project chemist.	UJ, R, R19	J, R, R19
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	27. Quantification of data via data validation did not occur based on Quality Control requirements in this procedure. Adhere to the external laboratory qualifiers found within the Form I analytical data summary sheets generated by the external laboratory.	U, U_LAB	J, J_LAB NQ, NQ

GEL LABORATORIES LLC

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

Certificate of Analysis

Company : Los Alamos National Laboratory
Address : TA-03, SM271, Drop Pt. 02U, Rm111

Los Alamos, New Mexico 87545

Report Date: February 23, 2012

Contact: Ms. Joylene Valdez

Project: LANL-WQH Water Samples

Client Sample ID: CAAN-12-2031
Sample ID: 295268002
Matrix: WG
Collect Date: 01-FEB-12
Receive Date: 03-FEB-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	-0.0021	+/-0.00557	0.0427	+/-0.00557	0.050	pCi/L		DXM2	02/10/12	2111	1184126	1
<i>Alphaspec Pu, Liquid "As Received"</i>													
Plutonium-238	U	0.00847	+/-0.0102	0.0356	+/-0.0102	0.050	pCi/L		DXM2	02/10/12	2043	1184128	2
Plutonium-239/240	U	0.00565	+/-0.00565	0.0415	+/-0.00565	0.050	pCi/L						
<i>Alphaspec U, Liquid "As Received"</i>													
Uranium-234		0.249	+/-0.0345	0.0898	+/-0.0383	1.00	pCi/L		DXM2	02/10/12	2114	1184129	3
Uranium-235/236	U	0.00483	+/-0.00483	0.0476	+/-0.00484	1.00	pCi/L						
Uranium-238		0.211	+/-0.0287	0.0682	+/-0.0321	0.500	pCi/L						
Rad Gamma Spec Analysis													
<i>Gammasespec "As Received"</i>													
Cesium-137	U	1.90	+/-1.26	4.96	+/-1.26	8.00	pCi/L		KXG3	02/10/12	1838	1186207	4
Cobalt-60	U	-0.747	+/-1.29	4.62	+/-1.29	8.00	pCi/L						
Neptunium-237	U	-5.04	+/-2.88	9.11	+/-2.88	10.0	pCi/L						
Potassium-40	U	1.52	+/-17.9	71.0	+/-17.9	10.0	pCi/L						
Sodium-22	U	-1.55	+/-1.57	5.34	+/-1.57	10.0	pCi/L						
Rad Gas Flow Proportional Counting													
<i>GFPC, Sr90, liquid "As Received"</i>													
Strontium-90	U	-0.167	+/-0.0981	0.423	+/-0.0982	0.500	pCi/L		JXR1	02/22/12	1647	1185966	5
<i>WSP-GrossA/B "As Received"</i>													
Beta	U	0.251	+/-0.632	2.33	+/-0.632	3.00	pCi/L		DXF3	02/14/12	1937	1185980	6
Alpha	U	0.191	+/-0.412	1.85	+/-0.412	3.00	pCi/L		DXF3	02/15/12	2139	1185980	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"	1184126	79.9	(50%-105%)
Plutonium-242 Tracer	Alphaspec Pu, Liquid "As Received"	1184128	74.8	(50%-105%)
Uranium-232 Tracer	Alphaspec U, Liquid "As Received"	1184129	54.8	(50%-105%)
Strontium Carrier	GFPC, Sr90, liquid "As Received"	1185966	98.9	(50%-105%)

KAL
03/06/12

GEL LABORATORIES LLC

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

Certificate of Analysis

Company : Los Alamos National Laboratory
Address : TA-03, SM271, Drop Pt. 02U, Rm111

Los Alamos, New Mexico 87545

Report Date: February 23, 2012

Contact: Ms. Joylene Valdez

Project: LANL-WQH Water Samples

Client Sample ID: CAAN-12-2199

Sample ID: 295268003

Matrix: WG

Collect Date: 01-FEB-12

Receive Date: 03-FEB-12

Collector: Client

Project: ESHL00210

Client ID: ARSL001

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
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Rad Alpha Spec Analysis

Alphaspec Am241 Liquid "As Received"

Americium-241	U	0.00361	+/-0.00361	0.0732	+/-0.00361	0.050	pCi/L		DXM2	02/10/12	2111	1184126	1
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Alphaspec Pu, Liquid "As Received"

Plutonium-238	U	-0.00913	+/-0.0118	0.0383	+/-0.0118	0.050	pCi/L		DXM2	02/10/12	2043	1184128	2
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Plutonium-239/240	U	0.00304	+/-0.00527	0.0447	+/-0.00527	0.050	pCi/L						
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Alphaspec U, Liquid "As Received"

Uranium-234		0.263	+/-0.0306	0.0717	+/-0.0351	1.00	pCi/L		DXM2	02/10/12	2115	1184129	3
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Uranium-235/236	U	0.0193	+/-0.00862	0.038	+/-0.00871	1.00	pCi/L						
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Uranium-238		0.147	+/-0.0227	0.0544	+/-0.0246	0.500	pCi/L						
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Rad Gamma Spec Analysis

Gammasspec "As Received"

Cesium-137	U	-0.623	+/-1.28	4.59	+/-1.28	8.00	pCi/L		KXG3	02/13/12	1051	1186207	4
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Cobalt-60	U	-0.529	+/-1.20	4.53	+/-1.20	8.00	pCi/L						
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Neptunium-237	U	-1.37	+/-2.91	9.89	+/-2.91	10.0	pCi/L						
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Potassium-40	U	-0.0833	+/-18.0	69.0	+/-18.0	10.0	pCi/L						
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Sodium-22	U	0.793	+/-1.18	4.96	+/-1.18	10.0	pCi/L						
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Rad Gas Flow Proportional Counting

GFPC, Sr90, liquid "As Received"

Strontium-90	U	0.362	+/-0.150	0.485	+/-0.153	0.500	pCi/L		JXR1	02/15/12	2035	1185966	5
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WSP-GrossA/B "As Received"

Beta	U	0.426	+/-0.633	2.27	+/-0.634	3.00	pCi/L		DXF3	02/14/12	1938	1185980	6
------	---	-------	----------	------	----------	------	-------	--	------	----------	------	---------	---

Alpha		1.63	+/-0.673	1.56	+/-0.689	3.00	pCi/L		DXF3	02/15/12	2139	1185980	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"	1184126	44.4 *	(50%-105%)
Plutonium-242 Tracer		Alphaspec Pu, Liquid "As Received"	1184128	68.0	(50%-105%)
Uranium-232 Tracer		Alphaspec U, Liquid "As Received"	1184129	70.0	(50%-105%)
Strontium Carrier		GFPC, Sr90, liquid "As Received"	1185966	90.0	(50%-105%)

KAL
03/06/12

Thursday, February 02, 2012

LAB CHAIN OF CUSTODY DOCUMENT NUMBER: 12-699C

LOS ALAMOS

REQUEST NUMBER: 12-699

NATIONAL LABORATORY

ATTN: Valerie Davis

TURNAROUND/REPORT DUE: 3/3/2012

General Engineering Laboratories, Inc., Charleston, SC.

TURNAROUND REQ'D: 30

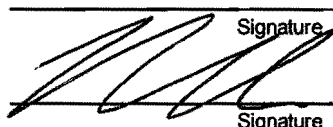
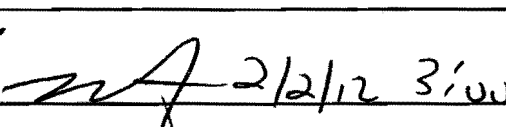
2040 Savage Rd

Charleston, SC 29407

LAB REQUEST COMMENTS:

SAMPLE ID	CTNR	CTNR DESC	ORDER	PRESERV	MATRIX
CAAN-12-2030	1	POLY	WSP-GENINORG	Ice	WG
CAAN-12-2030	1	POLY	WSP-Met+B+SN+SR+U	Nitric Acid (HNO3)	WG
CAAN-12-2031	1	POLY	WSP-GrossA/B	None	WG
CAAN-12-2031	1	POLY	WSP-RAD	Nitric Acid (HNO3)	WG
CAAN-12-2031	1	POLY	Ra226+228	Nitric Acid (HNO3)	WG
CAAN-12-2199	1	POLY	WSP-GrossA/B	None	WG
CAAN-12-2199	1	POLY	WSP-RAD	Nitric Acid (HNO3)	WG
CAAN-12-2200	1	POLY	WSP-GENINORG	Ice	WG
CAAN-12-2200	1	POLY	WSP-Met+B+SN+SR+U	Nitric Acid (HNO3)	WG

Relinquished By:	Date	Time	Received By:	Date	Time
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	Signature		Signature		
	Signature	2/2/12 3:00	Signature		
	Signature		Signature		

Received for DISPOSAL By:	Date	Time	Remarks:
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Signature

Thursday, February 02, 2012

REQUEST NUMBER: 12-699

PRIORITY	METHOD CODE	CNTNR	SAMPLE ID	SAMPLE MATRIX	DATE SAMPLED	SPECIAL INSTRUCTIONS
	EPA:310.1	1	CAAN-12-2030	WG	2/1/2012	
		1	CAAN-12-2200	WG	2/1/2012	
	EPA:900	1	CAAN-12-2031	WG	2/1/2012	
		1	CAAN-12-2199	WG	2/1/2012	
	EPA:901.1	1	CAAN-12-2031	WG	2/1/2012	
		1	CAAN-12-2199	WG	2/1/2012	
	EPA:903.1	1	CAAN-12-2031	WG	2/1/2012	
	EPA:904	1	CAAN-12-2031	WG	2/1/2012	
	EPA:905.0	1	CAAN-12-2031	WG	2/1/2012	
		1	CAAN-12-2199	WG	2/1/2012	
	HASL-300:AM-241	1	CAAN-12-2031	WG	2/1/2012	
		1	CAAN-12-2199	WG	2/1/2012	
	HASL-300:ISOPU	1	CAAN-12-2031	WG	2/1/2012	
		1	CAAN-12-2199	WG	2/1/2012	
	HASL-300:ISOU	1	CAAN-12-2031	WG	2/1/2012	
		1	CAAN-12-2199	WG	2/1/2012	
	SM:A2340B	1	CAAN-12-2030	WG	2/1/2012	
		1	CAAN-12-2200	WG	2/1/2012	
	SW-846:6010B	1	CAAN-12-2030	WG	2/1/2012	
		1	CAAN-12-2200	WG	2/1/2012	
	SW-846:6020	1	CAAN-12-2030	WG	2/1/2012	
		1	CAAN-12-2200	WG	2/1/2012	
	SW-846:6850	1	CAAN-12-2030	WG	2/1/2012	
		1	CAAN-12-2200	WG	2/1/2012	

Thursday, February 02, 2012

REQUEST NUMBER: 12-699

**LOS ALAMOS
NATIONAL LABORATORY**

ATTN: Valerie Davis

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

These Samples are on:

LANL Request Number: 12-699
Per Agreement Number: 126310011
Project Cost Code: MR1A015AGWJ0

Please analyse the enclosed samples
according to the schedule indicated:

SHIP DATE: 2/2/2012**TURNAROUND/REPORT DUE: 3/3/2012****TURNAROUND REQ'D: 30 Days****RAD SCREENING: Yes, Below Background****LAB REQUEST COMMENTS:**

LANL ER SMO CONTACT:

Signature: 

PRIORITY	METHOD CODE	CNTNR	SAMPLE ID	SAMPLE MATRIX	DATE SAMPLED	SPECIAL INSTRUCTIONS
	EPA:120.1	1	CAAN-12-2030	WG	2/1/2012	
		1	CAAN-12-2200	WG	2/1/2012	
	EPA:150.1	1	CAAN-12-2030	WG	2/1/2012	
		1	CAAN-12-2200	WG	2/1/2012	
	EPA:160.1	1	CAAN-12-2030	WG	2/1/2012	
		1	CAAN-12-2200	WG	2/1/2012	
	EPA:245.2	1	CAAN-12-2030	WG	2/1/2012	
		1	CAAN-12-2200	WG	2/1/2012	
	EPA:300.0	1	CAAN-12-2030	WG	2/1/2012	
		1	CAAN-12-2200	WG	2/1/2012	



February 08, 2012

www.gel.com

Ms. Joylene Valdez
Los Alamos National Laboratory
TA-03, SM271, Drop Pt. 02U, Rm111
Los Alamos, New Mexico 87545

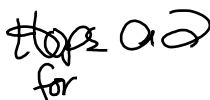
Re: LANL-WQH Water Samples
Work Order: 295268
SDG: 12-699

Dear Ms. Valdez:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the following analytical results for the sample(s) we received on February 03, 2012, and analyzed for General Chemistry, Metals, Perchlorates by LCMSMS and Radiochemistry. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

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

Sincerely,



Valerie Davis
Project Manager

Purchase Order: 63641-10
Chain of Custody: 12-699
Enclosures



ARS International (63641-10)
LANL-WQH Water Samples
Work Order #: 295268
SDG: 12-699

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Case Narrative

**Case Narrative for
ARS International (63641-10)
LANL-WQH Water Samples
Workorder #: 295268
SDG # : 12-699**

February 28, 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 February 03, 2012 for analysis. Please see attached email for discrepancies. The samples were screened according to GEL Standard Operating Procedure. All sample containers arrived without any visible signs of tampering or breakage. The containers for Gross A/B were preserved prior to analysis. Shipping container temperature was within specification (0 - 6C). Shipping container temperatures were checked, documented, and within specifications. The containers for radiochemistry were received with a temperature of 16C.

Sample Identification The laboratory received the following samples:

<u>Laboratory ID</u>	<u>Client ID</u>
295268001	CAAN-12-2030
295268002	CAAN-12-2031
295268003	CAAN-12-2199
295268004	CAAN-12-2200

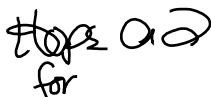
Case Narrative

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

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



Valerie Davis
Project Manager

List of current GEL Certifications as of 28 February 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	LA110008
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

Thursday, February 02, 2012

LAB CHAIN OF CUSTODY DOCUMENT NUMBER: 12-699C

LOS ALAMOS

REQUEST NUMBER: 12-699

NATIONAL LABORATORY

ATTN: Valerie Davis

TURNAROUND/REPORT DUE: 3/3/2012

General Engineering Laboratories, Inc., Charleston, SC.

TURNAROUND REQ'D: 30

2040 Savage Rd

Charleston, SC 29407

LAB REQUEST COMMENTS:

295268

SAMPLE ID	CTNR	CTNR DESC	ORDER	PRESERV	MATRIX
CAAN-12-2030	1	POLY	WSP-GENINORG	Ice	WG
CAAN-12-2030	1	POLY	WSP-Met+B+SN+SR+U	Nitric Acid (HNO3)	WG
CAAN-12-2031	1	POLY	WSP-GrossA/B	None	WG
CAAN-12-2031	1	POLY	WSP-RAD	Nitric Acid (HNO3)	WG
CAAN-12-2031	1	POLY	Ra226+228	Nitric Acid (HNO3)	WG
CAAN-12-2199	1	POLY	WSP-GrossA/B	None	WG
CAAN-12-2199	1	POLY	WSP-RAD	Nitric Acid (HNO3)	WG
CAAN-12-2200	1	POLY	WSP-GENINORG	Ice	WG
CAAN-12-2200	1	POLY	WSP-Met+B+SN+SR+U	Nitric Acid (HNO3)	WG

Relinquished By:


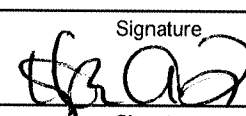
Date

Time

Received By:

Date

Time

 Signature
 Signature
 2/2/12 3:00 020311 @ 0845

Signature

Signature

Received for DISPOSAL By: Date

Time

Remarks:

Signature

Thursday, February 02, 2012

**LOS ALAMOS
NATIONAL LABORATORY**

ATTN: Valerie Davis

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

These Samples are on:


LANL Request Number: 12-699
Per Agreement Number: 126310011
Project Cost Code: MR1A015AGWJ0

Please analyse the enclosed samples
according to the schedule indicated:

SHIP DATE: 2/2/2012
TURNAROUND/REPORT DUE: 3/3/2012
TURNAROUND REQ'D: 30 Days

RAD SCREENING: Yes, Below Background
LAB REQUEST COMMENTS:

LANL ER SMO CONTACT:

Signature: 

PRIORITY	METHOD CODE	CNTNR	SAMPLE ID	SAMPLE MATRIX	DATE SAMPLED	SPECIAL INSTRUCTIONS
	EPA:120.1	1	CAAN-12-2030	WG	2/1/2012	
		1	CAAN-12-2200	WG	2/1/2012	
	EPA:150.1	1	CAAN-12-2030	WG	2/1/2012	
		1	CAAN-12-2200	WG	2/1/2012	
	EPA:160.1	1	CAAN-12-2030	WG	2/1/2012	
		1	CAAN-12-2200	WG	2/1/2012	
	EPA:245.2	1	CAAN-12-2030	WG	2/1/2012	
		1	CAAN-12-2200	WG	2/1/2012	
	EPA:300.0	1	CAAN-12-2030	WG	2/1/2012	
		1	CAAN-12-2200	WG	2/1/2012	

Hard Copy Required

Page 2 of 2

Thursday, February 02, 2012

REQUEST NUMBER: 12-699

PRIORITY	METHOD CODE	CNTNR	SAMPLE ID	SAMPLE MATRIX	DATE SAMPLED	SPECIAL INSTRUCTIONS
	EPA:310.1	1	CAAN-12-2030	WG	2/1/2012	
		1	CAAN-12-2200	WG	2/1/2012	
	EPA:900	1	CAAN-12-2031	WG	2/1/2012	
		1	CAAN-12-2199	WG	2/1/2012	
	EPA:901.1	1	CAAN-12-2031	WG	2/1/2012	
		1	CAAN-12-2199	WG	2/1/2012	
	EPA:903.1	1	CAAN-12-2031	WG	2/1/2012	
	EPA:904	1	CAAN-12-2031	WG	2/1/2012	
	EPA:905.0	1	CAAN-12-2031	WG	2/1/2012	
		1	CAAN-12-2199	WG	2/1/2012	
	HASL-300:AM-241	1	CAAN-12-2031	WG	2/1/2012	
		1	CAAN-12-2199	WG	2/1/2012	
	HASL-300:ISOPU	1	CAAN-12-2031	WG	2/1/2012	
		1	CAAN-12-2199	WG	2/1/2012	
	HASL-300:ISOU	1	CAAN-12-2031	WG	2/1/2012	
		1	CAAN-12-2199	WG	2/1/2012	
	SM:A2340B	1	CAAN-12-2030	WG	2/1/2012	
		1	CAAN-12-2200	WG	2/1/2012	
	SW-846:6010B	1	CAAN-12-2030	WG	2/1/2012	
		1	CAAN-12-2200	WG	2/1/2012	
	SW-846:6020	1	CAAN-12-2030	WG	2/1/2012	
		1	CAAN-12-2200	WG	2/1/2012	
	SW-846:6850	1	CAAN-12-2030	WG	2/1/2012	
		1	CAAN-12-2200	WG	2/1/2012	

Final Page of REQUEST NUMBER 12-699



SAMPLE RECEIPT & REVIEW FORM

Client: LANL		SDG/AR/COC/Work Order: 12-699	
Received By: HOPE TAYLOR		Date Received: 03 February 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): 20cpm
Classified Radioactive II or III by RSO?		X	If yes, Were swipes taken of sample containers < action levels?
COC/Samples marked containing PCBs?		X	
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) *all temperatures are recorded in Celsius 4-5, 16
2a Daily check performed and passed on IR temperature gun?	X			Temperature Device Serial #: 61524646 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: ID CAAN-12-2031 and 2199 for Gross A/B If Preservation added, Lot#: K33025
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: TIME NOT NOTATED ON CHAIN OF CUSTODY
11 Number of containers received match number indicated on COC?			X	Sample ID's affected: Lab did not receive a container for Ra226+Ra228 for ID CAAN-12-2031.
12 Are sample containers identifiable as GEL provided?			X	
13 COC form is properly signed in relinquished/received sections?	X			
14 Carrier and tracking number.	X			Circle Applicable: FedEx Air FedEx Ground UPS Field Services Courier Other 7209 7856 3090 4C 7209 7856 3104 4C 7209 7856 3115 5C 7209 7856 3089 16C

Comments (Use Continuation Form if needed):

Subject: Sample Receipt for 020312

From: Hope Taylor <Hope.Taylor@gel.com>

Date: 2/3/2012 3:27 PM

To: "Keith R. Greene" <kgreene@lanl.gov>, Joylene Valdez <joylenev@lanl.gov>, LANL@amrad.com, "team.davis" <team.davis@gel.com>

Good afternoon all,

The containers for Gross A/B were preserved prior to analysis.

RN 12-699 Lab did not receive a container for Ra226+Ra228 for ID CAAN-12-2031. Please advise

RN 12-705 Lab received one vial for WSTLA-12-1558 chain indicates two.

RN 12-704 Lab received two containers for CAAN-12-2027 and 2035 for HEXP chain indicates three.

RN 12-700 Lab received one container each for IDs CAAN-12-2199 and 2201 for HEXP and SVOA chain indicates three each. Also, for ID CAAN-12-2032 received one container for 8260 chain indicates two.

Thanks

--

Hope Taylor
Project Manager Assistant
GEL Laboratories, LLC
2040 Savage Road
Charleston, SC 29407
Direct: 843.769.7376 ext. 4778
Main: 843.556.8171
Fax: 843.766.1178
E-mail: hop01200@gel.com
Web: www.gel.com

Subject: RE: Ra226+Ra228

From: "Greene, Keith R" <kgreene@lanl.gov>

Date: 2/8/2012 10:35 AM

To: Hope Taylor <Hope.Taylor@gel.com>

CC: "LANL@amrad.com" <LANL@amrad.com>, "team.davis" <team.davis@gel.com>

Number 1, please excluded Joy from all future e-mails as she does not work at the SMO anymore.

For 12-712, 12-719 and 12-699 cancel the Ra-226+228 as they were not collected.
For 12-727 analyze the Gross a/b but cancel the ra226+228 bottle.

-----Original Message-----

From: Hope Taylor [<mailto:Hope.Taylor@gel.com>]

Sent: Wednesday, February 08, 2012 7:19 AM

To: Greene, Keith R

Cc: Valdez, Joylene F; LANL@amrad.com; team.davis

Subject: Ra226+Ra228

Good morning Keith,

We did not receive the containers for the Ra226+Ra228 for below IDs.
Since we received Rad (gallon) and Gross A/B (1000 ml) containers and you did not respond to the issues on the day of receipt the Ra226+Ra228 was not canceled.

Sample Receipt for 020412: RN#12-712, 719 the lab did not receive
Ra226+228 containers for CAAN-12-2024, CAWA-12-2018.

Sample Receipt for 020312: RN 12-699 Lab did not receive a container for Ra226+Ra228
for ID CAAN-12-2031.

I just want to clarify if you would like the Ra226+Ra228 canceled for RN
12-727 ID CAWA-12-2023 received on 020712. We received a Rad and a Gross A/B containers
for this ID also.

Thanks

--

Hope Taylor

Project Manager Assistant

GEL Laboratories, LLC

2040 Savage Road

Charleston, SC 29407

Direct: 843.769.7376 ext. 4778

Main: 843.556.8171

Fax: 843.766.1178

E-mail: hop01200@gel.com

Web: www.gel.com

IGIN ID: SAFA (505) 665-9968
JOYLENE VALDEZ
S ALAMOS NATL LAB
00 BLDG 1237 DPU 03

S ALAMOS, NM 87545
UNITED STATES US

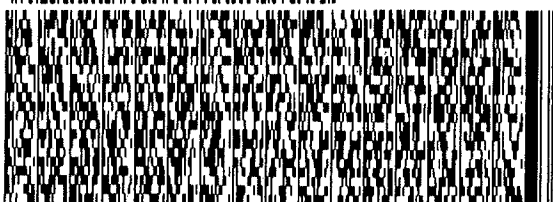
SHIP DATE: 02FEB12
ACTWGT: 50.0 LB MAN
CAD: 0014176/CAFE2511

BILL SENDER

ALERIE DAVIS
GENERAL ENGINEERING LAB
040 SAVAGE RD

HARLESTON SC 29407

(843) 556-8171
REF: 8H010AMR1A015AGWJO



FedEx
Express



J11131106060125

2 of 2
S# 7209 7856 3090

Trk# 7209 7856 3089

FRI - 03 FEB A1
PRIORITY OVERNIGHT

0201

XX CHSA

29407
SC-US CHS

NPDES



DO NOT LIFT USING

IGIN ID: SAFA (505) 665-9968
JOYLENE VALDEZ
S ALAMOS NATL LAB
00 BLDG 1237 DPU 03

S ALAMOS, NM 87545
UNITED STATES US

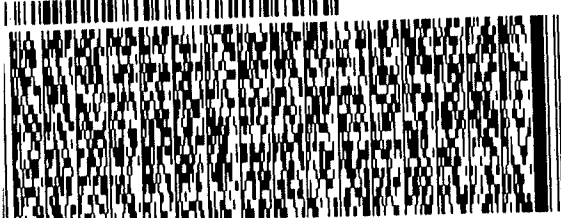
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CAD: 0014176/CAFE2511

BILL SENDER

ALERIE DAVIS
GENERAL ENGINEERING LAB
040 SAVAGE RD

HARLESTON SC 29407

(843) 556-8171
REF: 8H010AMR3A02244M00



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RK# 7209 7856 3115

FRI - 03 FEB A1
PRIORITY OVERNIGHT

29407
SC-US CHS

XX CHSA

ORIGIN ID: SAFA (505) 665-9968
JOYLENE VALDEZ
LOS ALAMOS NATL LAB
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545
UNITED STATES US

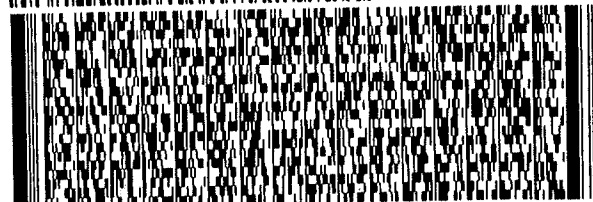
SHIP DATE: 02FEB12
ACTWGT: 52.0 LB MAN
CAD: 0014176/CAFE2511

BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 556-8171
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TRK# 7209 7856 3104

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PRIORITY OVERNIGHT

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SC-US CHS

Part of 155143-434 RITZ 08/10



ORIGIN ID: SAFA (505) 665-9968
JOYLENE VALDEZ
LOS ALAMOS NATL LAB
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545
UNITED STATES US

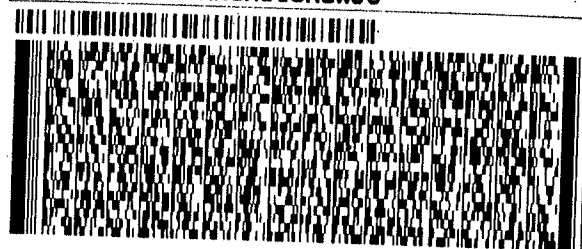
SHIP DATE: 02FEB12
ACTWGT: 55.0 LB MAN
CAD: 0014176/CAFE2511

BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 556-8171
REF: 8H010AMR1A015AGWJO



FedEx
Express



J11131106060125

TRK# 7209 7856 3089

HH MASTER HH

FRI - 03 FEB A1
PRIORITY OVERNIGHT

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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 12-699**

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: 1185769

Prep Batch Number: 1185768

Sample Analysis

Sample ID	Client ID
295268001	CAAN-12-2030
295268004	CAAN-12-2200
1202593083	Interference Check Sample (ICS)
1202593079	Method Blank (MB)
1202593080	Laboratory Control Sample (LCS)
1202593081	295075001(BuckmanPZ-12-2179) Matrix Spike (MS)
1202593082	295075001(BuckmanPZ-12-2179) 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

Client sample 295075001 (BuckmanPZ-12-2179) from SDG 12-688 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 except for dilutions.

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

Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG 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: 12-699 GEL Work Order: 295268

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: Herbert Maier

Date: 14 FEB 2012

Title: Data Validator

Sample Data Summary

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample No.

CAAN-12-2030Lab Code: GELDate Received: 03-FEB-12Instrument: LCMSMSGEL Job No (SDG): 12-699Method: SW846 6850 ModifiedGEL Sample ID: 295268001Matrix: WATERDate Filtered: 10-FEB-12Extraction Batch ID: 1185768Injection Volume (uL): 20Extraction Type: Filter/DAISample Volume/Weight: 10.0 mL%Solids: Concentrated Extract Volume: 10.0

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.240	ug/L		1	11-FEB-12 13:40	per0211019a
	Perchlorate Isotope Ratio			3.31			1	11-FEB-12 13:40	per0211019a
14797-73-0	Perchlorate-101	.05	.2	0.234	ug/L		1	11-FEB-12 13:40	per0211019a
	Perchlorate-O(18)			0.499	ug/L		1	11-FEB-12 13:40	per0211019a

^ 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: 1185768Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAAN-12-2200Date Received: 03-FEB-12GEL Job No (SDG): 12-699GEL Sample ID: 295268004Date Filtered: 10-FEB-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	0.238	ug/L		1	11-FEB-12 13:51	per0211020a
	Perchlorate Isotope Ratio			3.24			1	11-FEB-12 13:51	per0211020a
14797-73-0	Perchlorate-101	.05	.2	0.237	ug/L		1	11-FEB-12 13:51	per0211020a
	Perchlorate-O(18)			0.511	ug/L		1	11-FEB-12 13:51	per0211020a

^ 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): 12-699

Extract Batch Code: 1185768

Date Filtered: 10-FEB-12

Matrix: WATER

Sample ID: 1202593080

Analyte^	True	Found	Units	%Rec	Q	Control Limits
Perchlorate	0.200	.205	ug/L	102		85 - 115
Perchlorate Isotope Ratio		3.3				-
Perchlorate-101	0.200	.2	ug/L	100		85 - 115
Perchlorate-O(18)		.504	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): 12-699

Extract Batch Code: 1185768

Date Extracted: 10-FEB-12

GEL MS/PS ID: 1202593081

Client ID: BuckmanPZ-12-2179

GEL MSD/PSD ID: 1202593082

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	0.630	ug/L	0.823	96.5	.817	93.3	.8	30	75 - 125
Perchlorate Isotope Ratio	0	3.20		3.26		3.26		.00599		-
Perchlorate-101	0.200	0.636	ug/L	0.813	88.7	.807	85.5	.794	30	75 - 125
Perchlorate-O(18)	0	0.554	ug/L	0.538		.54		.343		-

^ 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: 1185768Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

MBDate Received: 10-FEB-12GEL Job No (SDG): 12-699GEL Sample ID: 1202593079Date Filtered: 10-FEB-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	11-FEB-12 12:23	per0211012a
	Perchlorate Isotope Ratio						1	11-FEB-12 12:23	per0211012a
14797-73-0	Perchlorate-101	.05	.2	0.050	ug/L	U	1	11-FEB-12 12:23	per0211012a
	Perchlorate-O(18)			0.496	ug/L		1	11-FEB-12 12:23	per0211012a

^ 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: 1185768Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

LCSDate Received: 10-FEB-12GEL Job No (SDG): 12-699GEL Sample ID: 1202593080Date Filtered: 10-FEB-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	0.205	ug/L		1	11-FEB-12 12:34	per0211013a
	Perchlorate Isotope Ratio			3.3			1	11-FEB-12 12:34	per0211013a
14797-73-0	Perchlorate-101	.05	.2	0.200	ug/L		1	11-FEB-12 12:34	per0211013a
	Perchlorate-O(18)			0.504	ug/L		1	11-FEB-12 12:34	per0211013a

^ 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: 1185768Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

ICS

Date Received:

GEL Job No (SDG): 12-699GEL Sample ID: 1202593083Date Filtered: 10-FEB-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	0.215	ug/L		1	11-FEB-12 12:45	per0211014a
	Perchlorate Isotope Ratio			3.05			1	11-FEB-12 12:45	per0211014a
14797-73-0	Perchlorate-101	.05	.2	0.228	ug/L		1	11-FEB-12 12:45	per0211014a
	Perchlorate-O(18)			0.541	ug/L		1	11-FEB-12 12:45	per0211014a

^ 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: 1185768Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

BuckmanPZ-12-2179MSDate Received: 01-FEB-12GEL Job No (SDG): 12-699GEL Sample ID: 1202593081Date Filtered: 10-FEB-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	0.823	ug/L		1	11-FEB-12 13:07	per0211016a
	Perchlorate Isotope Ratio			3.26			1	11-FEB-12 13:07	per0211016a
14797-73-0	Perchlorate-101	.05	.2	0.813	ug/L		1	11-FEB-12 13:07	per0211016a
	Perchlorate-O(18)			0.538	ug/L		1	11-FEB-12 13:07	per0211016a

^ 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: 1185768Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

BuckmanPZ-12-2179MSDDate Received: 01-FEB-12GEL Job No (SDG): 12-699GEL Sample ID: 1202593082Date Filtered: 10-FEB-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	0.817	ug/L		1	11-FEB-12 13:18	per0211017a
	Perchlorate Isotope Ratio			3.26			1	11-FEB-12 13:18	per0211017a
14797-73-0	Perchlorate-101	.05	.2	0.807	ug/L		1	11-FEB-12 13:18	per0211017a
	Perchlorate-O(18)			0.540	ug/L		1	11-FEB-12 13:18	per0211017a

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

*Concentration =

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

Metals Analysis

Case Narrative

**Metals Fractional Narrative
ARS International (ARSL)
SDG 12-699**

Sample Analysis

Sample ID	Client ID
295268001	CAAN-12-2030
295268004	CAAN-12-2200
1202592568	Method Blank (MB) ICP
1202592569	Laboratory Control Sample (LCS)
1202592572	295268001(CAAN-12-2030L) Serial Dilution (SD)
1202592570	295268001(CAAN-12-2030D) Sample Duplicate (DUP)
1202592571	295268001(CAAN-12-2030S) Matrix Spike (MS)
1202592577	Method Blank (MB) ICP-MS
1202592578	Laboratory Control Sample (LCS)
1202592581	295268001(CAAN-12-2030L) Serial Dilution (SD)
1202592579	295268001(CAAN-12-2030D) Sample Duplicate (DUP)
1202592580	295268001(CAAN-12-2030S) Matrix Spike (MS)
1202593219	Method Blank (MB) CVAA
1202593220	Laboratory Control Sample (LCS)
1202593244	295268001(CAAN-12-2030L) Serial Dilution (SD)
1202593221	295268001(CAAN-12-2030D) Sample Duplicate (DUP)
1202593222	295268001(CAAN-12-2030S) Matrix Spike (MS)

Method/Analysis Information

Analytical Batch:	1185538, 1185541, 1185821 and 1191850
Prep Batch :	1185537, 1185539 and 1185819
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: 295268001 (CAAN-12-2030).

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:  Date: 02/28/12

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: 12-699 GEL Work Order: 295268

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



02/28/12

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 12-699

METHOD TYPE: EPA

SAMPLE ID: 295268001

CLIENT ID: CAAN-12-2030

CONTRACT: ESHL00210

MATRIX:WG

DATE RECEIVED 03-FEB-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	0.066	ug/L	U		AV	0.066	1	HG3	021512W1-5
7631-86-9	Silica	69.8	mg/L			P	0.053	1	OPTIMA	020912-1
7429-90-5	Aluminum	68	ug/L	U		P	68	1	OPTIMA	020912-1
7440-36-0	Antimony	1	ug/L	U		MS	1	1	ICPMS6	120208-2
7440-38-2	Arsenic	2.12	ug/L	J		MS	1.7	1	ICPMS6	120214-3
7440-39-3	Barium	13.7	ug/L			P	1	1	OPTIMA	020912-1
7440-41-7	Beryllium	1	ug/L	U		P	1	1	OPTIMA	020912-1
7440-42-8	Boron	15	ug/L	U		P	15	1	OPTIMA	020912-1
7440-43-9	Cadmium	0.11	ug/L	U		MS	0.11	1	ICPMS6	120208-2
7440-70-2	Calcium	10000	ug/L			P	50	1	OPTIMA	020912-1
7440-47-3	Chromium	3.98	ug/L	J		MS	2	1	ICPMS6	120208-2
7440-48-4	Cobalt	1	ug/L	U		P	1	1	OPTIMA	020912-1
7440-50-8	Copper	3	ug/L	U		P	3	1	OPTIMA	020912-1
7439-89-6	Iron	30	ug/L	U		P	30	1	OPTIMA	020912-1
7439-92-1	Lead	0.5	ug/L	U		MS	0.5	1	ICPMS6	120208-2
7439-95-4	Magnesium	3040	ug/L			P	110	1	OPTIMA	020912-1
7439-96-5	Manganese	2	ug/L	U		P	2	1	OPTIMA	020912-1
7439-98-7	Molybdenum	1.2	ug/L			MS	0.165	1	ICPMS6	120208-2
7440-02-0	Nickel	0.776	ug/L	J		MS	0.5	1	ICPMS6	120208-2
7440-09-7	Potassium	1220	ug/L			P	50	1	OPTIMA	020912-1
7782-49-2	Selenium	1.5	ug/L	U		MS	1.5	1	ICPMS6	120214-3
7440-22-4	Silver	0.2	ug/L	U		MS	0.2	1	ICPMS6	120208-2
7440-23-5	Sodium	11600	ug/L			P	100	1	OPTIMA	020912-1
7440-24-6	Strontium	50.3	ug/L			P	1	1	OPTIMA	020912-1
7440-28-0	Thallium	0.45	ug/L	U		MS	0.45	1	ICPMS6	120208-2
7440-31-5	Tin	2.5	ug/L	U		P	2.5	1	OPTIMA	020912-1

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 12-699

METHOD TYPE: EPA

SAMPLE ID: 295268001

CLIENT ID: CAAN-12-2030

CONTRACT: ESHL00210

MATRIX:WG

DATE RECEIVED 03-FEB-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	0.527	ug/L			MS	0.067	1	ICPMS6	120215-4
7440-62-2	Vanadium	6.74	ug/L			P	1	1	OPTIMA	020912-1
7440-66-6	Zinc	3.3	ug/L	U		P	3.3	1	OPTIMA	020912-1
	Hardness as CaCO3	37.5	mg/L				0.453	1	CALC00	

***Analytical Methods:**

P EPA 200.7
MS EPA 200.8
AV EPA 245.1/245.2
AF EPA 1631E

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 12-699

METHOD TYPE: EPA

SAMPLE ID: 295268004

CLIENT ID: CAAN-12-2200

CONTRACT: ESHL00210

MATRIX:WG

DATE RECEIVED 03-FEB-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	0.066	ug/L	U		AV	0.066	1	HG3	021512W1-5
7631-86-9	Silica	69.8	mg/L			P	0.053	1	OPTIMA	020912-1
7429-90-5	Aluminum	68	ug/L	U		P	68	1	OPTIMA	020912-1
7440-36-0	Antimony	1	ug/L	U		MS	1	1	ICPMS6	120208-2
7440-38-2	Arsenic	1.7	ug/L	U		MS	1.7	1	ICPMS6	120214-3
7440-39-3	Barium	13.5	ug/L			P	1	1	OPTIMA	020912-1
7440-41-7	Beryllium	1	ug/L	U		P	1	1	OPTIMA	020912-1
7440-42-8	Boron	15	ug/L	U		P	15	1	OPTIMA	020912-1
7440-43-9	Cadmium	0.11	ug/L	U		MS	0.11	1	ICPMS6	120208-2
7440-70-2	Calcium	10000	ug/L			P	50	1	OPTIMA	020912-1
7440-47-3	Chromium	4.51	ug/L	J		MS	2	1	ICPMS6	120208-2
7440-48-4	Cobalt	1	ug/L	U		P	1	1	OPTIMA	020912-1
7440-50-8	Copper	3	ug/L	U		P	3	1	OPTIMA	020912-1
7439-89-6	Iron	30	ug/L	U		P	30	1	OPTIMA	020912-1
7439-92-1	Lead	0.5	ug/L	U		MS	0.5	1	ICPMS6	120208-2
7439-95-4	Magnesium	3060	ug/L			P	110	1	OPTIMA	020912-1
7439-96-5	Manganese	2	ug/L	U		P	2	1	OPTIMA	020912-1
7439-98-7	Molybdenum	1.19	ug/L			MS	0.165	1	ICPMS6	120208-2
7440-02-0	Nickel	0.677	ug/L	J		MS	0.5	1	ICPMS6	120208-2
7440-09-7	Potassium	1230	ug/L			P	50	1	OPTIMA	020912-1
7782-49-2	Selenium	1.5	ug/L	U		MS	1.5	1	ICPMS6	120214-3
7440-22-4	Silver	0.2	ug/L	U		MS	0.2	1	ICPMS6	120208-2
7440-23-5	Sodium	11700	ug/L			P	100	1	OPTIMA	020912-1
7440-24-6	Strontium	50	ug/L			P	1	1	OPTIMA	020912-1
7440-28-0	Thallium	0.45	ug/L	U		MS	0.45	1	ICPMS6	120208-2
7440-31-5	Tin	2.5	ug/L	U		P	2.5	1	OPTIMA	020912-1

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 12-699

METHOD TYPE: EPA

SAMPLE ID: 295268004

CLIENT ID: CAAN-12-2200

CONTRACT: ESHL00210

MATRIX:WG

DATE RECEIVED 03-FEB-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	0.526	ug/L			MS	0.067	1	ICPMS6	120215-4
7440-62-2	Vanadium	6.51	ug/L			P	1	1	OPTIMA	020912-1
7440-66-6	Zinc	3.3	ug/L	U		P	3.3	1	OPTIMA	020912-1
	Hardness as CaCO3	37.7	mg/L				0.453	1	CALC00	

***Analytical Methods:**

P EPA 200.7
MS EPA 200.8
AV EPA 245.1/245.2
AF EPA 1631E

Quality Control Summary

METALS
-3b-
PREPARATION BLANK SUMMARY

SDG NO. 12-699
Contract: ESHL00210
Matrix: WG

<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>
1202592568	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	104	ug/L	+/-150	J	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
1202592577	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
1202593219	Mercury	0.066	ug/L	+/-0.2	U	AV	0.066	0.2

***Analytical Methods:**

P EPA 200.7
MS EPA 200.8
AV EPA 245.1/245.2
AF EPA 1631E

METALS

-5a-

Matrix Spike Summary

SDG NO. 12-699

Client ID: CAAN-12-2030S

Contract: ESHL00210

Level: Low

Matrix: WATER

% Solids:

Sample ID: 295268001

Spike ID: 1202592571

<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	5040		68	U	5000	101		P
Barium	ug/L	75-125	506		13.7		500	98.5		P
Beryllium	ug/L	75-125	499		1	U	500	99.7		P
Boron	ug/L	75-125	503		15	U	500	98.4		P
Calcium	ug/L	75-125	14900		10000		5000	97.8		P
Cobalt	ug/L	75-125	490		1	U	500	97.9		P
Copper	ug/L	75-125	514		3	U	500	103		P
Iron	ug/L	75-125	5180		30	U	5000	104		P
Magnesium	ug/L	75-125	8150		3040		5000	102		P
Manganese	ug/L	75-125	490		2	U	500	97.9		P
Potassium	ug/L	75-125	6200		1220		5000	99.5		P
Silica	mg/L		78.4		69.8		10.7	80.4	N/A	P
Sodium	ug/L	75-125	16900		11600		5000	105		P
Strontium	ug/L	75-125	560		50.3		500	102		P
Tin	ug/L	75-125	486		2.5	U	500	97.2		P
Vanadium	ug/L	75-125	508		6.74		500	100		P
Zinc	ug/L	75-125	481		3.3	U	500	95.9		P

*Analytical Methods:

P EPA 200.7
MS EPA 200.8
AV EPA 245.1/245.2
AF EPA 1631E

METALS

-5a-

Matrix Spike Summary

SDG NO. 12-699

Client ID: CAAN-12-2030S

Contract: ESHL00210

Level: Low

Matrix: WATER

% Solids:

Sample ID: 295268001

Spike ID: 1202592580

<u>Analyte</u>	<u>Units</u>	<u>Acceptance Limit</u>	<u>Spiked Result</u>	<u>C</u>	<u>Sample Result</u>	<u>C</u>	<u>Spike Added</u>	<u>% Recovery</u>	<u>Qual</u>	<u>M*</u>
Antimony	ug/L	75-125	200		1	U	200	99.9		MS
Arsenic	ug/L	75-125	80		2.12	J	80	97.3		MS
Cadmium	ug/L	75-125	10.6		0.11	U	10	106		MS
Chromium	ug/L	75-125	50.4		3.98	J	50	92.8		MS
Lead	ug/L	75-125	38.6		0.5	U	40	96.4		MS
Molybdenum	ug/L	75-125	50.4		1.2		50	98.3		MS
Nickel	ug/L	75-125	46.7		0.776	J	50	91.9		MS
Selenium	ug/L	75-125	20		1.5	U	20	99.8		MS
Silver	ug/L	75-125	50.1		0.2	U	50	100		MS
Thallium	ug/L	75-125	90.8		0.45	U	100	90.6		MS
Uranium	ug/L	75-125	52.2		0.527		50	103		MS

*Analytical Methods:

P EPA 200.7
 MS EPA 200.8
 AV EPA 245.1/245.2
 AF EPA 1631E

METALS

-5a-

Matrix Spike Summary

SDG NO. 12-699 Client ID: CAAN-12-2030S

Contract: ESHL00210 Level: Low

Matrix: WATER % Solids:

Sample ID: 295268001 Spike ID: 1202593222

<u>Analyte</u>	<u>Units</u>	<u>Acceptance Limit</u>	<u>Spiked Result</u>	<u>C</u>	<u>Sample Result</u>	<u>C</u>	<u>Spike Added</u>	<u>% Recovery</u>	<u>Qual</u>	<u>M*</u>
Mercury	ug/L	75-125	2.06		0.066	U	2	103		AV

*Analytical Methods:

P	EPA 200.7
MS	EPA 200.8
AV	EPA 245.1/245.2
AF	EPA 1631E

Metals
–6–
Duplicate Sample Summary

SDG No.: 12–699

Lab Code: GEL

Contract: ESHL00210

Client ID: CAAN–12–2030D

Matrix: LIQUID

Level: Low

Sample ID: 295268001

Duplicate ID: 1202592570

Percent Solids for Dup: N/A

Analyte	Units	Acceptance Limit	Sample Result	C	Duplicate Result	C	RPD	Qual	M*
Aluminum	ug/L		68 U		68 U				P
Barium	ug/L	+/-5	13.7		13.5		1.57		P
Beryllium	ug/L		1 U		1 U				P
Boron	ug/L		15 U		15 U				P
Calcium	ug/L	+/-20%	10000		10000		.319		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%	3040		3060		.623		P
Manganese	ug/L		2 U		2 U				P
Potassium	ug/L	+/-20%	1220		1220		.09		P
Silica	mg/L	+/-20%	69.8		69.8		.116		P
Sodium	ug/L	+/-20%	11600		11600		.353		P
Strontium	ug/L	+/-20%	50.3		50		.508		P
Tin	ug/L		2.5 U		2.5 U				P
Vanadium	ug/L	+/-5	6.74		6.69		.663		P
Zinc	ug/L		3.3 U		3.3 U				P

*Analytical Methods:

P EPA 200.7
MS EPA 200.8
AV EPA 245.1/245.2
AF EPA 1631E

Metals
–6–
Duplicate Sample Summary

SDG No.: 12–699

Lab Code: GEL

Contract: ESHL00210

Client ID: CAAN–12–2030D

Matrix: LIQUID

Level: Low

Sample ID: 295268001

Duplicate ID: 1202592579

Percent Solids for Dup: N/A

Analyte	Units	Acceptance Limit	Sample Result	C	Duplicate Result	C	RPD	Qual	M*
Antimony	ug/L		1 U		1 U				MS
Arsenic	ug/L		2.12 J		1.7 U		200		MS
Cadmium	ug/L		0.11 U		0.11 U				MS
Chromium	ug/L	+/-10	3.98 J		4.31 J		7.91		MS
Lead	ug/L		0.5 U		0.5 U				MS
Molybdenum	ug/L	+/- .5	1.2		1.21		.75		MS
Nickel	ug/L	+/-2	0.776 J		0.698 J		10.6		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	0.527		0.517		1.92		MS

*Analytical Methods:

P EPA 200.7
MS EPA 200.8
AV EPA 245.1/245.2
AF EPA 1631E

Metals
–6–
Duplicate Sample Summary

SDG No.: 12–699**Lab Code:** GEL**Contract:** ESHL00210**Client ID:** CAAN–12–2030D**Matrix:** LIQUID**Level:** Low**Sample ID:** 295268001**Duplicate ID:** 1202593221**Percent Solids for Dup:** N/A

Analyte	Units	Acceptance Limit	Sample Result	C	Duplicate Result	C	RPD	Qual	M*
Mercury	ug/L		0.066 U		0.066 U				AV

***Analytical Methods:**

P EPA 200.7
MS EPA 200.8
AV EPA 245.1/245.2
AF EPA 1631E

METALS

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Laboratory Control Sample Summary

SDG NO. 12-699

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>
1202592569								
	Aluminum	ug/L	5000	5220		104	80-120	P
	Barium	ug/L	500	515		103	80-120	P
	Beryllium	ug/L	500	511		102	80-120	P
	Boron	ug/L	500	508		102	80-120	P
	Calcium	ug/L	5000	5420		108	80-120	P
	Cobalt	ug/L	500	513		103	80-120	P
	Copper	ug/L	500	521		104	80-120	P
	Iron	ug/L	5000	5330		107	80-120	P
	Magnesium	ug/L	5000	5330		107	80-120	P
	Manganese	ug/L	500	514		103	80-120	P
	Potassium	ug/L	5000	5250		105	80-120	P
	Silica	mg/L	10.7	10.7		99.9	80-120	P
	Sodium	ug/L	5000	5410		108	80-120	P
	Strontium	ug/L	500	528		106	80-120	P
	Tin	ug/L	500	507		101	80-120	P
	Vanadium	ug/L	500	524		105	80-120	P
	Zinc	ug/L	500	502		100	80-120	P

*Analytical Methods:

P EPA 200.7
 MS EPA 200.8
 AV EPA 245.1/245.2
 AF EPA 1631E

METALS

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Laboratory Control Sample Summary

SDG NO. 12-699

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>
1202592578								
	Antimony	ug/L	50	52.4		105	80-120	MS
	Arsenic	ug/L	50	51.9		104	80-120	MS
	Cadmium	ug/L	50	52.9		106	80-120	MS
	Chromium	ug/L	50	50.9		102	80-120	MS
	Lead	ug/L	50	49.3		98.5	80-120	MS
	Molybdenum	ug/L	50	51.5		103	80-120	MS
	Nickel	ug/L	50	50.9		102	80-120	MS
	Selenium	ug/L	50	53.3		107	80-120	MS
	Silver	ug/L	50	52.5		105	80-120	MS
	Thallium	ug/L	50	46		92.1	80-120	MS
	Uranium	ug/L	50	54		108	80-120	MS

*Analytical Methods:

P EPA 200.7
MS EPA 200.8
AV EPA 245.1/245.2
AF EPA 1631E

METALS

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Laboratory Control Sample Summary

SDG NO. 12-699

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>
1202593220	Mercury	ug/L	2	2.01		100	85-115	AV

*Analytical Methods:

P EPA 200.7
MS EPA 200.8
AV EPA 245.1/245.2
AF EPA 1631E

METALS

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Serial Dilution Sample Summary

SDG NO. 12-699 Client ID: CAAN-12-2030L

Contract: ESHL00210

Matrix: LIQUID Level: Low

Sample ID: 295268001 Serial Dilution ID: 1202592572

<u>Analyte</u>	<u>Initial Value</u> ug/L	<u>C</u>	<u>Serial Value</u> ug/L	<u>C</u>	<u>% Difference</u>	<u>Qual</u>	<u>Acceptance Limit</u>	<u>M*</u>
Aluminum	68	U	340	U				P
Barium	13.7		14.2	J	3.97			P
Beryllium	1	U	5	U				P
Boron	15	U	75	U				P
Calcium	10000		9760		2.59		10	P
Cobalt	1	U	5	U				P
Copper	3	U	15	U				P
Iron	30	U	150	U				P
Magnesium	3040		3010		.89			P
Manganese	2	U	10	U				P
Potassium	1220		1260		3.47			P
Silica	69800		69700		.076		10	P
Sodium	11600		11600		.00862		10	P
Strontium	50.3		50.4		.284		10	P
Tin	2.5	U	12.5	U				P
Vanadium	6.74		7.26	J	7.82			P
Zinc	3.3	U	16.5	U				P

*Analytical Methods:

P EPA 200.7
MS EPA 200.8
AV EPA 245.1/245.2
AF EPA 1631E

METALS

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Serial Dilution Sample Summary

SDG NO. 12-699

Client ID: CAAN-12-2030L

Contract: ESHL00210

Matrix: LIQUID

Level: Low

Sample ID: 295268001

Serial Dilution ID: 1202592581

<u>Analyte</u>	<u>Initial Value</u> ug/L	<u>C</u>	<u>Serial Value</u> ug/L	<u>C</u>	<u>% Difference</u>	<u>Qual</u>	<u>Acceptance Limit</u>	<u>M*</u>
Antimony	1	U	5	U				MS
Arsenic	2.12	J	8.5	U	100			MS
Cadmium	.11	U	.55	U				MS
Chromium	3.98	J	10	U	100			MS
Lead	.5	U	2.5	U				MS
Molybdenum	1.2		1.33	J	10.8			MS
Nickel	.776	J	2.5	U	100			MS
Selenium	1.5	U	7.5	U				MS
Silver	.2	U	1	U				MS
Thallium	.45	U	2.25	U				MS
Uranium	.527		.6	J	13.9			MS

*Analytical Methods:

P EPA 200.7
MS EPA 200.8
AV EPA 245.1/245.2
AF EPA 1631E

METALS

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Serial Dilution Sample Summary

SDG NO. 12-699 **Client ID:** CAAN-12-2030L**Contract:** ESHL00210**Matrix:** LIQUID **Level:** Low**Sample ID:** 295268001 **Serial Dilution ID:** 1202593244

<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	.066	U	.33	U				AV

***Analytical Methods:**

P EPA 200.7
MS EPA 200.8
AV EPA 245.1/245.2
AF EPA 1631E

General Chem Analysis

Case Narrative

**General Chemistry Narrative
ARS International (ARSL)
SDG 12-699**

Method/Analysis Information

Product: **Specific Conductivity**

Analytical Batch: 1186762 **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
295268001	CAAN-12-2030
295268004	CAAN-12-2200
1202595412	Laboratory Control Sample (LCS)
1202595413	294676003(CAWA-12-1983) Sample Duplicate (DUP)

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

SOP Reference

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

Calibration Verification Information

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

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: 294676003 (CAWA-12-1983).

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

A DER was not required 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: 1185822 **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
295268001	CAAN-12-2030
295268004	CAAN-12-2200
1202593226	Laboratory Control Sample (LCS)
1202593229	295268001(CAAN-12-2030) Sample Duplicate (DUP)

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

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-008 REV# 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: 295268001 (CAAN-12-2030).

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

The following samples from this sample group were received by the lab outside of the method specified holding time: 295268001 (CAAN-12-2030) and 295268004 (CAAN-12-2200).

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: 1048396 1202593229 (CAAN-12-2030), 295268001 (CAAN-12-2030) and 295268004 (CAAN-12-2200).

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: 1185336

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
295268001	CAAN-12-2030
295268004	CAAN-12-2200
1202592080	Method Blank (MB)
1202592081	295268001(CAAN-12-2030) Sample Duplicate (DUP)
1202592082	295268001(CAAN-12-2030) Post Spike (PS)
1202592083	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# 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 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: 295268001 (CAAN-12-2030).

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**

A DER was not required 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: 1202592081 (CAAN-12-2030), 1202592082 (CAAN-12-2030), 295268001 (CAAN-12-2030) and 295268004 (CAAN-12-2200).

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: 1186676

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
295268001	CAAN-12-2030
295268004	CAAN-12-2200
1202595227	Method Blank (MB)
1202595228	295268001(CAAN-12-2030) Sample Duplicate (DUP)
1202595232	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: 295268001 (CAAN-12-2030).

Duplicate Relative Percent Difference (RPD) Statement

The Relative Percent Difference (RPD) between the sample and duplicate falls outside of the established acceptance limits because of the heterogeneous matrix of the sample: 1202595228 (CAAN-12-2030) and 295268001 (CAAN-12-2030).

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**

The following DER was generated for this SDG: 1050449 1202595228 (CAAN-12-2030).

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: 1186112 **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
295268001	CAAN-12-2030
295268004	CAAN-12-2200
1202594058	Laboratory Control Sample (LCS)
1202594062	Method Blank (MB)
1202594063	294676002(CAWA-12-1967) Sample Duplicate (DUP)
1202594064	294676002(CAWA-12-1967) Matrix Spike (MS)

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

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-033 REV# 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 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: 294676002 (CAWA-12-1967).

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**

A DER was not required 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: 29Feb12

Sample Data Summary

GEL LABORATORIES LLC

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Certificate of Analysis Report for

ARSL001 ARS International (63641-10)

Client SDG: 12-699 GEL Work Order: 295268

The Qualifiers in this report are defined as follows:

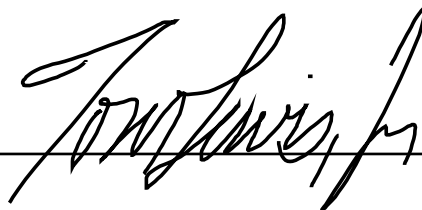
- * A quality control analyte recovery is outside of specified acceptance criteria
- ** Analyte is a surrogate compound
- H Analytical holding time was exceeded
- J Value is estimated
- U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

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

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Certificate of Analysis

Report Date: February 27, 2012

Company : Los Alamos National Laboratory
Address : TA-03, SM271, Drop Pt. 02U, Rm111

Los Alamos, New Mexico 87545

Contact: Ms. Joylene Valdez
Project: LANL-WQH Water Samples

Client SDG: 12-699

Client Sample ID: CAAN-12-2030
Sample ID: 295268001
Matrix: WG
Collect Date: 01-FEB-12 12:00
Receive Date: 03-FEB-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		117	1.00	1.00	umhos/cm	1	LXA1	02/08/12	1529	1186762	1
Electrode Analysis											
EPA 150.1 pH "As Received"											
pH at Temp 8.00C	H	8.04	0.010	0.100	SU	1	TXT1	02/06/12	1402	1185822	2
Ion Chromatography											
EPA 300.0 Anions Liquid 28 day "As Received"											
Bromide	J	0.0775	0.066	0.200	mg/L	1	MAR1	02/13/12	1613	1185336	3
Chloride		1.60	0.066	0.200	mg/L	1					
Fluoride		0.246	0.033	0.100	mg/L	1					
Sulfate		1.90	0.100	0.400	mg/L	1					
Solids Analysis											
EPA 160.1 Solids, Dissolved-F "As Received"											
Total Dissolved Solids		82.9	3.40	14.3	mg/L		LYG1	02/08/12	0934	1186676	4
Titration Analysis											
EPA 310.1 Total Alkalinity "As Received"											
Alkalinity, Total as CaCO3		54.9	0.725	1.00	mg/L		LXA1	02/07/12	1602	1186112	5
Carbonate alkalinity (CaCO3)	U	ND	0.725	1.00	mg/L						

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 120.1	
2	EPA 150.1	
3	EPA 300.0	
4	EPA 160.1	
5	EPA 310.1	

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: February 27, 2012

Company : Los Alamos National Laboratory
Address : TA-03, SM271, Drop Pt. 02U, Rm111

Los Alamos, New Mexico 87545

Contact: Ms. Joylene Valdez
Project: LANL-WQH Water Samples

Client SDG: 12-699

Client Sample ID: CAAN-12-2200
Sample ID: 295268004
Matrix: WG
Collect Date: 01-FEB-12 12:00
Receive Date: 03-FEB-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		118	1.00	1.00	umhos/cm	1	LXA1	02/08/12	1537	1186762	1
Electrode Analysis											
EPA 150.1 pH "As Received"											
pH at Temp 7.50C	H	8.08	0.010	0.100	SU	1	TXT1	02/06/12	1406	1185822	2
Ion Chromatography											
EPA 300.0 Anions Liquid 28 day "As Received"											
Bromide	J	0.0721	0.066	0.200	mg/L	1	MAR1	02/13/12	1734	1185336	3
Chloride		1.61	0.066	0.200	mg/L	1					
Fluoride		0.245	0.033	0.100	mg/L	1					
Sulfate		1.87	0.100	0.400	mg/L	1					
Solids Analysis											
EPA 160.1 Solids, Dissolved-F "As Received"											
Total Dissolved Solids		126	3.40	14.3	mg/L		LYG1	02/08/12	0934	1186676	4
Titration Analysis											
EPA 310.1 Total Alkalinity "As Received"											
Alkalinity, Total as CaCO3		54.9	0.725	1.00	mg/L		LXA1	02/07/12	1606	1186112	5
Carbonate alkalinity (CaCO3)	U	ND	0.725	1.00	mg/L						

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 120.1	
2	EPA 150.1	
3	EPA 300.0	
4	EPA 160.1	
5	EPA 310.1	

Quality Control Summary

GEL LABORATORIES LLC

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

QC Summary

Report Date: February 27, 2012

Page 1 of 3

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

Contact: Ms. Joylene Valdez

Workorder: 295268

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Conductivity Analysis											
Batch	1186762										
QC1202595413	294676003	DUP									
Conductivity			143	143	umhos/cm	0.210		(0%-10%)	LXA1	02/08/12	15:21
QC1202595412	LCS										
Conductivity	1410			1400	umhos/cm		99.4	(95%-105%)		02/08/12	15:14
Electrode Analysis											
Batch	1185822										
QC1202593229	295268001	DUP									
pH		H	8.04	H	8.07	SU	0.372	(0%-10%)	TXT1	02/06/12	14:05
QC1202593226	LCS										
pH	7.00			7.01	SU		100	(99%-101%)		02/06/12	14:01
Ion Chromatography											
Batch	1185336										
QC1202592081	295268001	DUP									
Bromide		J	0.0775	J	0.0733	mg/L	5.57 ^	(+/-0.200)	MAR1	02/13/12	16:40
Chloride			1.60		1.61	mg/L	0.991	(0%-20%)			
Fluoride			0.246		0.248	mg/L	0.971 ^	(+/-0.100)			
Sulfate			1.90		1.91	mg/L	0.189 ^	(+/-0.400)			
QC1202592083	LCS										
Bromide	2.50				2.53	mg/L		101	(90%-110%)	02/13/12	15:46
Chloride	10.0				9.71	mg/L		97.1	(90%-110%)		
Fluoride	5.00				5.01	mg/L		100	(90%-110%)		
Sulfate	20.0				19.7	mg/L		98.6	(90%-110%)		
QC1202592080	MB										
Bromide				U	ND	mg/L				02/13/12	15:19
Chloride				U	ND	mg/L					
Fluoride				U	ND	mg/L					
Sulfate				U	ND	mg/L					
QC1202592082	295268001	PS									
Bromide	2.50	J	0.0775		2.46	mg/L		95.4	(90%-110%)	02/13/12	17:07
Chloride	10.0		1.60		11.2	mg/L		95.7	(90%-110%)		
Fluoride	5.00		0.246		5.06	mg/L		96.3	(90%-110%)		
Sulfate	20.0		1.90		20.9	mg/L		95.1	(90%-110%)		
Solids Analysis											
Batch	1186676										
QC1202595228	295268001	DUP									
Total Dissolved Solids			82.9		120	mg/L	43.5*	(0%-10%)	LYG1	02/08/12	09:34
QC1202595232	LCS										
Total Dissolved Solids	300				301	mg/L		100	(95%-105%)	02/08/12	09:34
QC1202595227	MB										
Total Dissolved Solids			J		4.29	mg/L				02/08/12	09:34
Titration Analysis											

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QC Summary

Workorder: 295268

Page 2 of 3

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Titration Analysis											
Batch	1186112										
QC1202594063	294676002	DUP									
Alkalinity, Total as CaCO3		53.8		53.8	mg/L	0.00		(0%-20%)	LXA1	02/07/12	14:54
Carbonate alkalinity (CaCO3)	U	ND	U	ND	mg/L	N/A					
QC1202594058	LCS										
Alkalinity, Total as CaCO3	50.0			51.2	mg/L		102	(90%-110%)		02/07/12	14:46
QC1202594062	MB										
Alkalinity, Total as CaCO3			U	ND	mg/L					02/07/12	14:39
Carbonate alkalinity (CaCO3)			U	ND	mg/L						
QC1202594064	294676002	MS									
Alkalinity, Total as CaCO3	50.0	53.8		105	mg/L		101	(80%-120%)		02/07/12	14:56

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.
- 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

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QC Summary

Workorder: 295268

Page 3 of 3

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
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. 08-FEB-12	Division: Industrial	Quality Criteria: Specifications	Type: Process
Instrument Type: ELECTRODE	Test / Method: EPA 150.1	Matrix Type: Liquid	Client Code: ESHL, UCOR
Batch ID: 1185822	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 295268(12-699),295272(12-703),295337,295389(12-712),295393(12-719) Application Issues: Sample received out of holding			
Specification and Requirements		DER Disposition:	
Exception Description:			
1. Sample received out of holding: 295268 001,004 295272 002,004 295337 002,007,013 295389 002 295393 002 QC 1202593227DUP,1202593229DUP		Samples received out of holding	

Originator's Name:
Travis Tola 08-FEB-12

Data Validator/Group Leader:
Elzbieta Szulc 13-FEB-12

DATA EXCEPTION REPORT			
Mo.Day Yr. 14-FEB-12	Division: Industrial	Quality Criteria: Specifications	Type: Process
Instrument Type: BALANCE	Test / Method: EPA 160.1	Matrix Type: Liquid	Client Code: ESHL, INEL, UCOR, UDSL
Batch ID: 1186676	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 295182,295268(12-699),295272(12-703),295289,295337,295349(10512-01_WCH),295389(12-712) Application Issues: Failed RPD for DUP			
Specification and Requirements Exception Description:		DER Disposition:	
1. Failed RPD for DUP: QC 1202595228DUP		1.The Relative Percent Difference (RPD) between the sample and duplicate falls outside of the established acceptance limits because of the heterogeneous matrix of the sample	

Originator's Name:
Lisa Gregory 14-FEB-12

Data Validator/Group Leader:
Elzbieta Szulc 14-FEB-12

Radiological Analysis

Radiochemistry Case Narrative
ARS International (ARSL)
SDG 12-699
Work Order 295268

"
"
"

Method/Analysis Information

"

Product: Alphaspec Am241 Liquid

Cpcn\decn'O gjf <" FQG'GO N'J CUN/522.'Co /27/TE'O qf hgf

Cpcn\decn'Dcvej 'P wo dgt<" 33: 6348"

"

Sample ID " " " " Client ID

4; 748: 224" " ECCP/34/4253

4; 748: 225" " " " ECCP/34/43; ;

34247: ; 5; 6" " " " O gjf 'Drcpn' " O D+

34247: ; 5; 7" " " " 4; 7229223 *Dwemo cpR\ /34/4397+Uco r rg'F wr rlecvg' " F WR+

34247: ; 5; 8" " " " Ncdqtcvqt { 'Eqpvtqn\Uco r rg' " NEU+

"

Vj g'uco r ngu'lp'y ku'UF I 'y gtg'cpcn\ | gf "qp'cp' \$cu'tgegkxgf \$'dcuku0"

"

SOP Reference

Rtqegf wtg'hqt'r tgr ctcvkqp.'cpcn\ uku'cpf 'tgr qt vki 'qh'cpcn\ decn'f cvc'ctg'eqpvtqmgf 'd { 'I GN'Ncdqtcvqtkgu'NNE'cu
Ucpf ctf 'Qr gtcvki 'Rtqegf wtg' " UQR+0Vj g'f cvc'f kucwugf 'lp'y ku'pcttcvkxg'j cu'dggp'cpcn\ | gf 'lp'ceeqtf cpeg'y kj
I N/TCF/C/233'TGX%430"

Calibration Information:

"

Calibration Information

Cm'lpkkn'cpf "eqpvpwki "ecrkdtevkqp'tgs vktgo gpw'j cxg'dggp'o g'0Ecrkdtevkqp'ctg'r gthqto gf 'o qpy n' 'wukpi
o kzgf 'cm'j c'ucpf ctf u'eqo r tkugf 'qh'y g'hqmjy kpi <I f/36: . 'P r/459.'cpf 'Eo /4660"

"

Standards Information

Ucpf ctf "uqnwkp'u'ht'y g'ug'cpcn\ uku'ctg'P KUV'tcegcdng'qt'xgtk hgf 'y kj "c'P KUV'tcegcdng'ucpf ctf 'cpf "wugf
dghqtg'y g'g'zr kcvkp'f cvgu0"

"

Sample Geometry

Cm'eqwvki "uqtegu'y gtg'r tgr ctgf 'lp'y g'uco g'i gqo gwt { 'cu'y g'ecrkdtevkqp'ucpf ctf u0'

Quality Control (QC) Information:

"

Blank Information

Cks wqu'ht'uco r ngu'34247: ; 5; 6" " O D+ 'cpf '34247: ; 5; 8" " NEU+ 'y gtg'ej cpi gf 'q'302'r gt'erkpvtgs wgu0"

"

Designated QC

Vj g'hqmjy kpi "uco r rg'y cu'wugf 'ht'S E<4; 7229223 " " Dwemo cpR\ /34/4397+0Vj g'S E'y cu'htqo 'CTUN'y qtm
qtf gt'4; 72290"

"

QC Information""

Cm'qh'ij g'S E'uco r ngu'o gg'v'ij g'tgs wkt gf "ceegr vcepg'hko ku'y kj 'ij g'hqmy lpi "gzegr vkpu<T ghgt'v'q'F c'v
Gzegr vkp"Tr qtv"FT-0"

"

CSU""

Vj g'drcpnlt guw'ku'iguu'ij cp'3(87"ko gu'ij g'E UW0"

Technical Information:""

"

Holding Time""

Cm'uco r ng'r tqegf wt gu'hqt'ij ku'uco r ng'ugv'y gt g'r gthqto gf 'y kj kp'ij g'tgs wkt gf 'j qrf lpi "ko g0"

"

Sample Re-prep/Re-analysis""

P qpg'qh'ij g'uco r ngu'lp'ij ku'uco r ng'ugv'tgs wkt gf 't gr tgr "qt'tgcpcn(uku0"

Miscellaneous Information:""

"

Data Exception (DER) Documentation""

F c'v"gzegr vkp'tgr qtv'ctg'i gpgtcvgf "q'f qewo gpv'cp{ 'r tqegf wtcr'cpqo crku'ij cv'o c{ 'f g'xlc'v'htqo 't ghgt gpegf
UQR'qt'eqptcewcnlf qewo gpw0Vj g'hqmy lpi 'F GT'y cu'i gpgtcvgf 'hqt'ij ku'UF I <"
F GT"326; ; 56'y cu'i gpgtcvgf 'f w'q'TF N'iguu'ij cp'O F C'cpf 'H'k'k'g'f 'Tgeqxgt{ 'hqt'U'wtqi cv'qt'Vtcegt030
Uco r ngu'4; 7229224'cpf '4; 748: 225'f q'pqv'o gg'v'ij g'engpv'tcegt{"k'grf 'tgs wkt go gpw'qh'72"q'327'r gtegpv040
Uco r ngu'4; 7229224.'4; 748: 225.'cpf "34247: ; 5; 7'f q'pqv'o gg'v'ij g'f g'vev'kp'hko ku'hqt'Co /463030Uco r ngu'f q
j cxg'w'cegt{"k'grf u'i tgcvt'ij cp'47'r gtegpv'cpf'cej k'x'g'f'o qtg'ij cp'622'w'cegt'eqwpw0Uco r ngu'y gt g'eqwpv'gf 'ij g
o czko wo 'eqwpv'ko g'qh'3222'o k'pwgu'lp'qtf gt'q'cej k'x'g'ij g'dguv'r quukdr'O F E'au0Rtqlgev'O cpci gt'pqv'k'g'f .
Tgr qt vkpi 'tguwmu040Uco r ngu'4; 7229224'cpf '4; 748: 225'f q'pqv'o gg'v'ij g'f g'vev'kp'hko ku'f w'ij g'hqy gt'w'cegt
{k'grf 'tgeqxgt'k'g'f'cu'y gmi'cu'ij g'j ki j 'ucpf ctf 'f g'xlc'v'htqo 'ij g'drcpnlt qr w'v'kp0Uco r ng'34247: ; 5; 7'cnu'f'f qgu
pqv'o gg'v'ij g'f g'vev'kp'hko ku'f w'ij g'ij ki j 'ucpf ctf 'f g'xlc'v'htqo 'ij g'drcpnlt qr w'v'kp0Y j gp'c'drcpm
r qr w'v'kp'ku'r gthqto gf . 'ij g'O F E'ku'i tgcvt'ij cp'ij g'TF N'f w'ij g'ij ki j 'ucpf ctf 'f g'xlc'v'htqo r ngu'y gt g
eqwpv'gf 'ij g'o czko wo 'eqwpv'ko g'qh'3222'o k'pwgu'lp'qtf gt'q'cej k'x'g'ij g'dguv'r quukdr'O F E'au0Rtqlgev'O cpci gt
pqv'k'g'f . "Tgr qt vkpi 'tguwmu0"

"

Manual Integration""

P q'o cpwcnlp'gi tcv'kp'u'y gt g'r gthqto gf "qp'f c'v'kp'ij ku'd'cv'ej 0"

"

Additional Comments""

Vj g'O F Eu'ctg'ecre w'v'gf "wukpi "c'drcpnlt qr w'v'kp0"

"

Blank Decision Level""

Vj g'drcpnlt guw'ku'iguu'ij cp'ij g'f gekukqp'rgxgr0'

Qualifier Information""

"

O cpwcn's w'v'htgu'y gt g'pqv'tgs wkt gf 0"

"

"

"

Method/Analysis Information""

"

Product:

Alphaspec Pu, Liquid

Cpcn(v'ecniO gyj qf <

F QG'GO N'J CUN/522.'Rw/33/TE'O qf k'k'g'f

Cpcn(v'ecniD'cv'ej 'P wo dgt <

33: 634: "

"

Sample ID "Client ID

4; 748: 224" " ECCP/34/4253

4; 748: 225" "ECCP/34/43; ;

34247: ; 623"O D+ qf "Drcpni

34247: ; 624"4; 7229223*Dwen cpR\ /34/4397+Uco r ng'F w rlecvg'F WR+

34247: ; 625"Ncdqtcvt { 'EqpwtqriUco r ng'NEU+

"

Vj g'uco r ngu'lp'y ku'UF I 'y gtg'cpcn| gf 'qp'cp'\$cu'tgeglxgf '\$dcuku0"

"

SOP Reference"

Rtqegf wtg'hqt'r tgr ctvqkp.'cpcn{ uku'cpf 'tgr qt vpi 'qh'cpcn{ vcehf cve'ctg'eqpwtqmgf 'd{ 'I GN'Ncdqtcvtkgu'NNE"cu

Ucpf ctf 'Qr gtcvpi 'Rtqegf wtg'*UQR+0Vj g'f cve'f kuewugf 'lp'y ku'pcttcvkg'j cu'dggp'cpcn| gf 'lp'ceeqtfcpeg'y kj

I N/TCF/C/233"TGX%430"

Calibration Information:"

"

Calibration Information"

Cm'lpkklc'cpf 'eqpvtqkp' 'ecrldtcvqp'tgs wktgo gpw'j cxg'dggp'o gv0Ecrldtcvqp'ctg'r gthqto gf 'o qpj n{ 'wukpi

o kzgl'crr j c'ucpf ctf u'eqo r tkugf 'qh'y g'hqmy lpi <I f/36: . 'P r/459.'cpf 'Eo /4660"

"

Standards Information"

Ucpf ctf 'uqnvkpu'hqt'y gug'cpcn{ uku'ctg'P KUV'tcegcdng'qt'xgtkhgf 'y kj 'c'P KUV'tcegcdng'ucpf ctf 'cpf 'wugf

dghqtg'y g'gzzr kcvkp'f cvu0"

"

Sample Geometry"

Cm'eqwvpi 'uqwegu'y gtg'r tgr ctgf 'lp'y g'uco g'i gqo gvt { 'cu'y g'ecrldtcvqp'ucpf ctf u0'

Quality Control (QC) Information:"

"

Blank Information"

Crls wqu'hqt'uco r ngu'34247: ; 623"*O D+cpf '34247: ; 625"*NEU+y gtg'ej cpi gf 'vq'302'r gt'erkgpv'tgs wgu0"

"

Designated QC"

Vj g'hqmy lpi 'uco r ng'y cu'wugf 'hqt'S E<4; 7229223"*Dwen cpR\ /34/4397+0Vj g'S E'y cu'ltqo 'CTUN'y qtm

qtf gt'4; 72290"

"

QC Information"

Cm'qh'y g'S E'uco r ngu'o gv'y g'tgs wktgf 'ceegr vpeg'hko ku0"

""

"

CSU"

Vj g'drcpnitguw/ku'guu'y cp'3087'ko gu'y g'E UW0"

Technical Information:"

"

Holding Time"

Cm'uco r ng'r tqegf wtgu'hqt'y ku'uco r ng'ugv'y gtg'r gthqto gf 'y kj lp'y g'tgs wktgf 'j qrf lpi 'ko g0"

"

Sample Re-prep/Re-analysis"

P qpg'qh'y g'uco r ngu'lp'y ku'uco r ng'ugv'tgs wktgf 'tgr tgr 'qt'tgcpcn{ uku0"

!!

F

!!

P

!!

v

!!

v

"

11

11

"

"

11

"

11

R

"

C

"

III

Page 89 of 109

"

Sample Geometry"

Cm'eqwp'kpi 'uqwegu'y gtg'r tgr ctgf 'lp'yj g'uco g'i gqo gvt { 'cu'yj g'ecrkdctv'kqp'uxcpf ctf u0'

Quality Control (QC) Information:"

"

Blank Information"

Crls wqu'hqt'uco r ngu'34247: ; 626"*O D+cpf "34247: ; 628"*NEU+y gtg'ej cpi gf 'vq'302'r gt'erkgpv'tgs wgu0"

"

Designated QC"

Vj g'hqmqy kpi 'uco r ng'y cu'wugf 'hqt'S E<4; 7229223"*Dwen0 cpR\ /34/4397+0Vj g'S E'y cu'ltqo 'CTUN'y qtm qtf gt'4; 72290"

"

QC Information"

Cm'qh'yj g'S E'uco r ngu'o gv'yj g'tgs wktgf 'ceegr wpeg'hko ku0"

"

CSU"

Vj g'drcpnlt guwn'ku'ngu'yj cp'3087'vko gu'yj g'E UW0'

Technical Information:"

"

Holding Time"

Cm'uco r ng'r tqegf wgu'hqt'yj ku'uco r ng'ugv'y gtg'r gthqto gf 'y kj kp'yj g'tgs wktgf 'j qrf kpi 'vko g0"

"

Sample Re-prep/Re-analysis"

P qpg'qh'yj g'uco r ngu'kp'yj ku'uco r ng'ugv'tgs wktgf 'tgr tgr 'qt'tgcpcn{ uku0"

Miscellaneous Information:"

"

Data Exception (DER) Documentation"

F cvc'gzegr v'kqp'tgr qtw'ctg'i gpgtcvgf 'vq'f qewo gpv'cp{ 'r tqegf wcn'cpqo crlgu'yj cv'o c{ 'f gxkcyg'ltqo 'tghgtgpegf UQR'qt'eqpvtcewcnlf qewo gpw0C'f cvc'gzegr v'kqp'tgr qtv'*F GT+y cu'pqvi gpgtcvgf 'hqt'yj ku'UF I 0"

"

Manual Integration"

P q'o cpwcnlpvgi tcv'kpu'y gtg'r gthqto gf 'qp'f cvc'kp'yj ku'dcvej 0"

"

Additional Comments"

Vj g'OF Eu'ctg'ecre wcv'gf 'wukpi 'c'drcpnlt qr wcv'kqp0"

"

Blank Decision Level"

Vj g'drcpnlt guwn'ku'ngu'yj cp'yj g'f gekukqp'rgxgr0'

Qualifier Information"

"

O cpwcnl's wcn'ltgtu'y gtg'pqv'tgs wktgf 0"

"

"

"

Method/Analysis Information"

"

Product: Gammaspec

Cpcn\ v'ecni'O gvj qf <' GRC"; 2308

Cpcn\ v'ecni'Dcvej 'P wo dgt<' 33: 8429"

"

Sample ID ""Client ID

4; 748: 224" " ECCP/34/4253

4; 748: 225" ""ECCP/34/43; ;

34247; 6438""O gj qf 'Drcpnl'O D+

34247; 6439""4; 748: 224*ECCP/34/4253+Uco r rg'F wr dcevg*F WR+

34247; 643: ""Ncdqtcvqt { 'EqpvtqnlUco r rg*NEU+

"

Vj g'uco r rgu'lp'yj ku'UF I 'y gtg'cpcn| gf 'qp'cp'\$cu'tgeglxgf '\$dcuku0"

"

SOP Reference""

Rtqegf wtg'ht'r tgr ctckqp.'cpcn| uku'cpf 'tgr qtckpi 'qh'cpcn| vcehf cve'ctg'eqpvtqmgf 'd { 'I GN'Ncdqtcvqtkgu'NNE'cu

Ucpf ctf 'Qr gtcckpi 'Rtqegf wtg'*UQR+0Vj g'f cve'f kuewugf 'lp'yj ku'pcttcckg'j cu'dggp'cpcn| gf 'lp'ceeqtfcpeg'y kj

I N/TCF/C/235'TGX%450"

Calibration Information:"

"

Calibration Information""

Cmlpkckn'cpf 'eqpckpki 'eckdtckqp'tgs wktgo gpw'j cxg'dggp'o g0Vj g'lpkckn'Eckdtckqpuy gtg'r gthqto gf 'lp

Cr tkl'4233.'P qxgo dgt '4233'cpf 'Lcpwt { '42340"

"

Standards Information""

Ucpf ctf 'uqnckqp'ht'yj gug'cpcn| uku'ctg'P KUV'tcegcdng'qt 'xgtkhgf 'y kj 'c'P KUV'tcegcdng'ucpf ctf 'cpf 'wugf

dghqtg'yj g'gzcckqp'f cvu0"

"

Sample Geometry""

Cml'eqpckpi 'uqwegu'y gtg'r tgr ctgf 'lp'yj g'uco g'i gqo gvt { 'cu'yj g'eckdtckqp'ucpf ctf u0'

Quality Control (QC) Information:"

"

Blank Information""

Vj g'drcpnlxqno g'ku'tgr tgupeckg'qh'yj g'uco r rg'xqno g'lp'yj ku'dcej 0"

"

Designated QC""

Vj g'hqmyj lpi 'uco r rg'y cu'wugf 'ht'S E<4; 748: 224*ECCP/34/4253+0Vj g'S E'y cu'htqo 'CTUN'y qtnlqtf gt

4; 748: 0"

"

QC Information""

Cml'qh'yj g'S E'uco r rgu'o gv'yj g'tgs wktgf 'ceegr wpeg'hko ku0"

"

CSU""

Vj g'drcpnltguwn/ku'guu'yj cp'3087'ko gu'yj g'E UW0'

Technical Information:"

"

Holding Time""

Cml'uco r rg'r tqegf wtgu'ht'yj ku'uco r rg'ugv'y gtg'r gthqto gf 'y kj lp'yj g'tgs wktgf 'j qrf lpi 'ko g0"

"

Sample Re-prep/Re-analysis""

P qp'g'qh'yj g'uco r rgu'lp'yj ku'uco r rg'ugv'tgs wktgf 'tgr tgr 'qt'tgcpcn| uku0"

Miscellaneous Information:"

"

Data Exception (DER) Documentation""

F c v " g z e g r v k p t g r q t w t g i g p g t c v g f " v q f q e w o g p v c p { ' r t q e g f w t c n c p q o c n k u " y c v o c { ' f g x l c v g h t q o " t g h t g p e g f U Q R " q t " e q p t c e w c n f q e w o g p w 0 C " f c v " g z e g r v k p t g r q t v * F G T + y c u p q v i g p g t c v g f " h t " y k u U F I 0 "

Additional Comments"

C f f k k p c n e q o o g p w y g t g p q v t g s w k g f " h t " y k u u c o r r g u g 0 "

Blank Decision Level"

V j g d r c p n i t g u w n k u h g u u y c p y j g f g e k u k p h g x g r 0 "

Qualifier Information"

O c p w c n i s w c n h g t u y g t g p q v t g s w k g f 0 "

Method/Analysis Information"

Product: GFPC, Sr90, liquid

C p c n f v e c n i O g j q f < G R C " ; 27 0 2 " O q f k h g f

C p c n f v e c n i D c v e j " P w o d g t < 33: 7; 88"

Sample ID "Client ID

4; 748: 224" " ECCP /34/4253

4; 748: 225" " ECCP /34/43; ;

34247; 5892" " O g j q f " D r c p m i " O D +

34247; 5893" " 4; 75: ; 223 * ECCP /34/4246 + " U c o r r g " F w r d e c v g " F W R +

34247; 5894" " 4; 75: ; 223 * ECCP /34/4246 + " O c v t k z " U r k n g " O U +

34247; 5895" " N e d q t c v q t { " E q p v t q n i U c o r r g " N E U +

SOP Reference"

R t q e g f w t g h t " r t g r c t c v k p . " c p c n f u k u c p f " t g r q t v k p i " q h c p c n f v e c n i f c v c t g e q p v t q n g f " d { " I G N " N e d q t c v q t k u " N N E " c u U c p f c t f " Q r g t c v k p i " R t q e g f w t g " U Q R + 0 V j g f c v " f k u e w u n g f " l p " y k u p c t t c v k g j c u d g g p " c p c n f g f l p " c e e q t f c p e g y k j I N T C F / C / 226 " T G X % 360 "

Calibration Information:"

Calibration Information"

C m l p k k c n c p f " e q p v k p w k p i " e c n k d t c v k p t g s w k g o g p w i j c x g d g g p o g v 0 V j g l p k k c n i E c n k d t c v k p y c u r g t h q t o g f l p O c t e j " 42330 "

Standards Information"

U c p f c t f " u q n w k p u h t " y g u g c p c n f u k u c t g P K U V " t c e g c d r g q t x g t k h g f " y k j " c P K U V " t c e g c d r g u c p f c t f c p f w u g f d g h t g y j g z r k c v k p f c v g u 0 "

Sample Geometry"

C m l e q w p k p i " u q w t e g u y g t g r t g r c t g f l p y j g u c o g i g q o g v t { " c u y j g e c n k d t c v k p u c p f c t f u 0 "

Quality Control (QC) Information:"

"

Blank Information""

Crls wqvu'hqt'uco r ngu'34247; 5892*O D+cpf'34247; 5895*NEU+y gtg'ej cpi gf'vq'302'r gt'erkpvt's wgu0"

"

Designated QC""

Vj g'hqmqy lpi'uco r ng'y cu'wugf'hqt'S E<4; 75: ; 223*ECCP/34/4246+0Vj g'S E'y cu'ltqo'CTUN'y qtmqtf gt 4; 75: ; 0"

"

QC Information""

Cm'qh'ij g'S E'uco r ngu'o gv'ij g'tgs wktgf'ceegr vpeg'hko ku0"

"

CSU""

Vj g'drcpnltguwv'ku'iguu'y cp'3087'ko gu'ij g'E UW0'

Technical Information:"

"

Holding Time""

Cm'uco r ng'r tqegf wtgu'hqt'yj ku'uco r ng'ugv'y gtg'r gthqto gf'y kj kp'yj g'tgs wktgf'j qrf lpi'ko g0"

"

Sample Re-prep/Re-analysis""

Uco r ng'4; 748: 224*ECCP/34/4253+y cu'tgeqwpvgf'f wg'vq'j ki j 'O F E 0Vj g'tgeqwpv'ku'tgr qtvf 0Uco r ng 34247; 5893*ECCP/34/4246+y cu'tgeqwpvgf'f wg'vq'c'uwur gev'f'hcng'r quksxg0Vj g'tgeqwpv'ku'tgr qtvf 0"

"

Chemical Recoveries""

Cm'ej go lecn'tgeqxtgu'o ggv'ij g'tgs wktgf'ceegr vpeg'hko ku'hqt'yj ku'uco r ng'ugv0"

Miscellaneous Information:"

"

Data Exception (DER) Documentation""

F cvc'gzegr vqp'tgr qtu'ctg'i gpgtcvgf'vq'f qewo gpv'cp{ 'r tqegf wtcr'cpqo crku'yj cv'o c{ 'f gxk'wg'ltqo 'tghgtgpegf UQR'qt'eqpwtcewcnlf qewo gpw0C'f cvc'gzegr vqp'tgr qtv*F GT +y cu'pqv'i gpgtcvgf'hqt'yj ku'UF I 0"

"

Additional Comments""

Vj g'o ctkz'ur lng.'34247; 5894*ECCP/34/4246+.'crls wqv'y cu'tgf wegf'vq'eqpugt'xg'uco r ng'xqmw g0"

"

Blank Decision Level""

Vj g'drcpnltguwv'ku'iguu'y cp'yj g'f gekukqp'rgxgr0'

Qualifier Information""

"

O cpwcn's wcn'ltgtu'y gtg'pqv'tgs wktgf 0"

"

"

"

Method/Analysis Information""

"

Product:	WSP-GrossA/B
Cpcn\ vlcniO gjj qf <	GRC"; 220 IUY : 68"; 532
Cpcn\ vlcniDcvej 'P wo dgt <	33: 7; : 2"

"

Sample ID ""Client ID

4; 748: 224" " ECCP/34/4253

4; 748: 225" ""ECCP/34/43; ;

34247; 5939""O gj qf "Drcpnl"O D+

34247; 593: ""4; 748: 224"ECCP/34/4253+"Uco r rg"F wr rdecvg"F WR+

34247; 593; ""4; 748: 224"ECCP/34/4253+"O cwtlz"Ur lng"O U+

34247; 5942""4; 748: 224"ECCP/34/4253+"O cwtlz"Ur lng"F wr rdecvg"O UF +

34247; 5943""Ncdqtcvqt { "Eqpvtqnl"Uco r rg"NEU+

"

Vj g'uco r ngu'lp'yj ku'UF I 'y gtg'cpcn| gf 'qp'cp"\$cu'tgeglxgf \$"dcuku0"

"

SOP Reference""

Rtqegf wtg'htq'r tgr ctcvqp.'cpcn|uku'cpf 'tgr qt vpi 'qh'cpcn| vce n'f c v'ctg'eqpvtqmgf "d { 'I GN'Ncdqtcvqtkgu'NNE"cu Ucpf ctf "Qr gtcvpi "Rtqegf wtg"UQR+0Vj g'f c v'f k u e w u g f 'lp'yj ku'pcttcvkg'j cu'dggp'cpcn| gf 'lp'ceeqtf cpeg'y kj I N/TCF/C/223"TGX%360"

Calibration Information:"

"

Calibration Information""

Cm'lpk'kci'cpf "eqpvpwpi "ecrkdtecvqp'tgs wktgo gpw'j cxg'dggp"o g'0Vj g'lpk'kci'Ecrkdtecvqp'y cu'r gthqto gf 'lp Ugr vgo dgt"42330Vj g'f kuetko lpcvqp'ugwpi u'ctg'ecrkdtecvgf 'lp'dgvc'f kuetko lpcvpi "o qf g'vq'tgf weg'dgvc"vq'crr j c etquwcm0"

"

Standards Information""

Ucpf ctf "uqnwkpup'htq'yj gug'cpcn|uku'ctg"P KU V"tcegcdrg"qt'xgtk'htgf "y kj "c"P KU V"tcegcdrg'uvcpf ctf "cpf "wugf dghqtg'yj g'gzr ktcvqp'f cvgu0"

"

Sample Geometry""

Cm'eqwvpi "uqwegu'y gtg'r tgr ctgf "lp'yj g'uco g'i gqo gvt { "cu'yj g'ecrkdtecvqp'uvcpf ctf u0'

Quality Control (QC) Information:"

"

Blank Information""

Crls wqu'htq'uco r ngu'34247; 5939"O D+"cpf "34247; 5943"NEU+y gtg'ej cpi gf "vq'302'r gt'erlcpv'tgs wgun0"

"

Designated QC""

Vj g'hqmqy lpi "uco r rg'y cu'wugf 'htq'S E<4; 748: 224"ECCP/34/4253+0Vj g'S E'y cu'htqo "CTUN'y qtm'qtf gt 4; 748: 0"

"

QC Information""

Cm'qh'yj g'S E'uco r ngu'o gv'yj g'tgs wktgf "ceegr vcpag'hko ku0"

"

CSU""

Vj g'drcpnl'tguw'ku'ngu'yj cp"3087"ko gu'yj g'E UW0'

Technical Information:"

"

Holding Time""

Cm'uco r rg'r tqegf wtgu'htq'yj ku'uco r rg'ugv'y gtg'r gthqto gf "y kj lp'yj g'tgs wktgf "j qrf lpi "ko g0"

"

Sample Re-prep/Re-analysis""

P qp g'qh'yj g'uco r ngu'lp'yj ku'uco r rg'ugv'tgs wktgf "tgr tgr "qt'tgcpcn|uku0"

"

Chemical Recoveries""

Cmlej go lecnlgeqxtgkgo'o gg'vj g'tgs wktgf "ceegr vcepg'hko ku'hqt 'vj ku'uco r ng'ugv0"

"

Gross Alpha/Beta Preparation Information""

J ki j 'j { i tqeqlr le'ucn'eqpvgpv'lp"gxcr qtcvgf "uco r ngu'ecp'ecwug'vj g'uco r ng'o cuu'vq'hxewwcv'f vg'vq'o qkuwtg
cduqtr vqp0Vq"o kpo k g'vj ku'lpvgtgtgpeg.'vj g'ucnu'ctg'eqpxgtvgf "vq'qz kf gu'd{ 'j gcvkpi 'vj g'uco r ng'wvf gt'c'hco g
wpkic'f wntgf "eqrqt'ku'qdvclpgf 0Vj g'eqpxgtukp"vq'qz kf gu'wcdkkl gu'vj g'uco r ng'y gli j v'cpf "gpwtgu'vj cv'r tqr gt
cr j c ldgc"ghlekpelgu'ctg'cuuki pgf 'hqt'gcej "uco r ng0Xqrcvkg'tcf kqkuqqr gu'qh'ectdqp.'j { f tqi gp.'gej pgvko .
r qnplko "cpf "egukwo "o c{ "dg'hqu'f wtkpi "uco r ng'j gcvkpi ."gur gekm{ "vq'c'f wntgf "j gcv0Hqt'vj ku'uco r ng'ugv'vj g
r tgr ctgf "r rpej gv'y cu'eqwpgf 'hqt'dgc"cevkxk{ "dghqtg'dgkpi 'hco gf 0Chgt'hco kpi ."vj g'r rpej gv'y cu'eqwpgf 'hqt
cr j c"cevkxk{ 0"

Miscellaneous Information:""

"

Data Exception (DER) Documentation""

Fcv"gzegr vqp'tgr qtw'ctg'i gpgtcvgf "vq'f qewo gpv'cp{ 'r tqegf wtn'cpqo crkgu'vj cv'o c{ 'f gxkcv'htqo 'tghgtgpegf
UQR'qt'eqptcewcnlf qewo gpv0C'f cvc"gzegr vqp'tgr qtv"F GT +y cu'pqv'i gpgtcvgf 'hqt'vj ku'UF I 0"

"

Additional Comments""

Vj g'o cvtkz'ur kng'cpf "o cvtkz'ur kng'f w rlecvg."34247; 593; "ECCP/34/4253+cpf"34247; 5942"ECCP/34/4253+
crks wqu'y gtg'tgf wegf "vq'eqpugt'xg'uco r ng'xqno g0"

"

Blank Decision Level""

Vj g'drcpnlt guw'ku'hguu'vj cp'vj g'f gekukqp'igxgr0'

Qualifier Information""

"

O cpwcn's wcn'htgu'y gtg'pqv'tgs wktgf 0"

"

"

"

Certification Statement""

"

Y j gtg'vj g'cpcn{ vlcrl'o gvj qf "j cu'dggp'r gthqto gf "wvf gt'P GNCR'egt vlcrcvqp.'vj g'cpcn{ uku'j cu'o gv'cnl'qh'vj g
tgs wktgo gpw'qh'vj g'P GNCE'ucpf ctf "wprguu'qvj gty kug'pqvgf "lp'vj g'cpcn{ vlcrl'ecug'pcttcvkg0'

GEL LABORATORIES LLC

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Qualifier Definition Report for

ARSL001 ARS International (63641-10)

Client SDG: 12-699 GEL Work Order: 295268

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: 28 FEB 2012

Title: Analyst I

DATA EXCEPTION REPORT

Mo.Day Yr. 13-FEB-12	Division: Radiochemistry	Quality Criteria: Specifications	Type: Process
Instrument Type: ALPHA SPECTROMETER	Test / Method: DOE EML HASL-300, Am-05-RC Modified	Matrix Type: Liquid	Client Code: ESHL
Batch ID: 1184126	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 295007(12-683),295075(12-688),295268(12-699),295272(12-703) Application Issues: RDL less than MDA Failed Recovery for Surrogate or Tracer			
Specification and Requirements Exception Description:		DER Disposition:	
1. Samples 295007002 and 295268003 do not meet the client tracer yield requirements of 50 to 105 percent. 2. Samples 295007002, 295268003, and 1202589395 do not meet the detection limits for Am-241.		1. Samples do have tracer yields greater than 25 percent and achieved more than 400 tracer counts. Samples were counted the maximum count time of 1000 minutes in order to achieve the best possible MDC's. Project Manager notified, Reporting results. 2. Samples 295007002 and 295268003 do not meet the detection limits due the lower tracer yield recoveries, as well as the high standard deviation from the blank population. Sample 1202589395 also does not meet the detection limits due to the high standard deviation from the blank population. When a blank population is performed, the MDC is greater than the RDL due to the high standard deviation. Samples were counted the maximum count time of 1000 minutes in order to achieve the best possible MDC's. Project Manager notified, Reporting results.	

Originator's Name:

Jessica Downey 13-FEB-12

Data Validator/Group Leader:

Scott Moreland 13-FEB-12

Sample Data Summary

GEL LABORATORIES LLC

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

Certificate of Analysis

Company : Los Alamos National Laboratory
Address : TA-03, SM271, Drop Pt. 02U, Rm111

Los Alamos, New Mexico 87545

Contact: Ms. Joylene Valdez

Project: LANL-WQH Water Samples

Report Date: February 23, 2012

Client Sample ID: CAAN-12-2031
Sample ID: 295268002
Matrix: WG
Collect Date: 01-FEB-12
Receive Date: 03-FEB-12
Collector: Client

Project: ESHL00210
Client ID: ARSL001

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
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Rad Alpha Spec Analysis

Alphaspec Am241 Liquid "As Received"

Americium-241	U	-0.0021	+/-0.00557	0.0427	+/-0.00557	0.050	pCi/L		DXM2	02/10/12	2111	1184126	1
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Alphaspec Pu, Liquid "As Received"

Plutonium-238	U	0.00847	+/-0.0102	0.0356	+/-0.0102	0.050	pCi/L		DXM2	02/10/12	2043	1184128	2
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Plutonium-239/240	U	0.00565	+/-0.00565	0.0415	+/-0.00565	0.050	pCi/L						
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Alphaspec U, Liquid "As Received"

Uranium-234		0.249	+/-0.0345	0.0898	+/-0.0383	1.00	pCi/L		DXM2	02/10/12	2114	1184129	3
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Uranium-235/236	U	0.00483	+/-0.00483	0.0476	+/-0.00484	1.00	pCi/L						
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Uranium-238		0.211	+/-0.0287	0.0682	+/-0.0321	0.500	pCi/L						
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Rad Gamma Spec Analysis

Gammasespec "As Received"

Cesium-137	U	1.90	+/-1.26	4.96	+/-1.26	8.00	pCi/L		KXG3	02/10/12	1838	1186207	4
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Cobalt-60	U	-0.747	+/-1.29	4.62	+/-1.29	8.00	pCi/L						
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Neptunium-237	U	-5.04	+/-2.88	9.11	+/-2.88	10.0	pCi/L						
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Potassium-40	U	1.52	+/-17.9	71.0	+/-17.9	10.0	pCi/L						
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Sodium-22	U	-1.55	+/-1.57	5.34	+/-1.57	10.0	pCi/L						
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Rad Gas Flow Proportional Counting

GFPC, Sr90, liquid "As Received"

Strontium-90	U	-0.167	+/-0.0981	0.423	+/-0.0982	0.500	pCi/L		JXR1	02/22/12	1647	1185966	5
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WSP-GrossA/B "As Received"

Beta	U	0.251	+/-0.632	2.33	+/-0.632	3.00	pCi/L		DXF3	02/14/12	1937	1185980	6
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Alpha	U	0.191	+/-0.412	1.85	+/-0.412	3.00	pCi/L		DXF3	02/15/12	2139	1185980	7
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The following Analytical Methods were performed

Method	Description
1	DOE EML HASL-300, Am-05-RC Modified
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	EPA 901.1
5	EPA 905.0 Modified
6	EPA 900.0/SW846 9310
7	EPA 900.0/SW846 9310

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Americium-243 Tracer	Alphaspec Am241 Liquid "As Received"	1184126	79.9	(50%-105%)
Plutonium-242 Tracer	Alphaspec Pu, Liquid "As Received"	1184128	74.8	(50%-105%)
Uranium-232 Tracer	Alphaspec U, Liquid "As Received"	1184129	54.8	(50%-105%)
Strontium Carrier	GFPC, Sr90, liquid "As Received"	1185966	98.9	(50%-105%)

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Certificate of Analysis

Company : Los Alamos National Laboratory
Address : TA-03, SM271, Drop Pt. 02U, Rm111

Los Alamos, New Mexico 87545

Contact: Ms. Joylene Valdez

Project: LANL-WQH Water Samples

Client Sample ID: CAAN-12-2031

Sample ID: 295268002

Report Date: February 23, 2012

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).

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Certificate of Analysis

Company : Los Alamos National Laboratory
Address : TA-03, SM271, Drop Pt. 02U, Rm111

Los Alamos, New Mexico 87545

Report Date: February 23, 2012

Contact: Ms. Joylene Valdez

Project: LANL-WQH Water Samples

Client Sample ID: CAAN-12-2199

Sample ID: 295268003

Matrix: WG

Collect Date: 01-FEB-12

Receive Date: 03-FEB-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	0.00361	+/-0.00361	0.0732	+/-0.00361	0.050	pCi/L		DXM2	02/10/12	2111	1184126	1
<i>Alphaspec Pu, Liquid "As Received"</i>													
Plutonium-238	U	-0.00913	+/-0.0118	0.0383	+/-0.0118	0.050	pCi/L		DXM2	02/10/12	2043	1184128	2
Plutonium-239/240	U	0.00304	+/-0.00527	0.0447	+/-0.00527	0.050	pCi/L						
<i>Alphaspec U, Liquid "As Received"</i>													
Uranium-234		0.263	+/-0.0306	0.0717	+/-0.0351	1.00	pCi/L		DXM2	02/10/12	2115	1184129	3
Uranium-235/236	U	0.0193	+/-0.00862	0.038	+/-0.00871	1.00	pCi/L						
Uranium-238		0.147	+/-0.0227	0.0544	+/-0.0246	0.500	pCi/L						
Rad Gamma Spec Analysis													
<i>Gammasespec "As Received"</i>													
Cesium-137	U	-0.623	+/-1.28	4.59	+/-1.28	8.00	pCi/L		KXG3	02/13/12	1051	1186207	4
Cobalt-60	U	-0.529	+/-1.20	4.53	+/-1.20	8.00	pCi/L						
Neptunium-237	U	-1.37	+/-2.91	9.89	+/-2.91	10.0	pCi/L						
Potassium-40	U	-0.0833	+/-18.0	69.0	+/-18.0	10.0	pCi/L						
Sodium-22	U	0.793	+/-1.18	4.96	+/-1.18	10.0	pCi/L						
Rad Gas Flow Proportional Counting													
<i>GFPC, Sr90, liquid "As Received"</i>													
Strontium-90	U	0.362	+/-0.150	0.485	+/-0.153	0.500	pCi/L		JXR1	02/15/12	2035	1185966	5
<i>WSP-GrossA/B "As Received"</i>													
Beta	U	0.426	+/-0.633	2.27	+/-0.634	3.00	pCi/L		DXF3	02/14/12	1938	1185980	6
Alpha		1.63	+/-0.673	1.56	+/-0.689	3.00	pCi/L		DXF3	02/15/12	2139	1185980	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"	1184126	44.4 *	(50%-105%)
Plutonium-242 Tracer	Alphaspec Pu, Liquid "As Received"	1184128	68.0	(50%-105%)
Uranium-232 Tracer	Alphaspec U, Liquid "As Received"	1184129	70.0	(50%-105%)
Strontium Carrier	GFPC, Sr90, liquid "As Received"	1185966	90.0	(50%-105%)

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Certificate of Analysis

Company : Los Alamos National Laboratory
Address : TA-03, SM271, Drop Pt. 02U, Rm111

Los Alamos, New Mexico 87545

Contact: Ms. Joylene Valdez

Project: LANL-WQH Water Samples

Client Sample ID: CAAN-12-2199

Sample ID: 295268003

Report Date: February 23, 2012

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: February 23, 2012

Page 1 of 6

Client : Los Alamos National Laboratory
TA-03, SM271, Drop Pt. 02U, Rm

Contact: Los Alamos, New Mexico
Ms. Joylene Valdez

Workorder: 295268

Parmname	NOM	Sample	Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time
Rad Alpha Spec											
Batch	1184126										
QC1202589395	295007001	DUP									
Americium-241	U	0.0199	U	0.0282	pCi/L	0.261		(0-1)	DXM2	02/10/1223:46	
	Uncert:	+/-0.00688		+/-0.00891							
	TPU:	+/-0.00693		+/-0.009							
	Yield:	83.2		62.8							
QC1202589396	LCS										
Americium-241	1.42			1.47	pCi/L		104	(80%-120%)			
	Uncert:			+/-0.0535							
	TPU:			+/-0.0814							
	Yield:			72.7							
QC1202589394	MB										
Americium-241			U	-0.00628	pCi/L						
	Uncert:			+/-0.00554							
	TPU:			+/-0.00554							
	Yield:			61.4							
Batch	1184128										
QC1202589402	295007001	DUP									
Plutonium-238	U	-0.0192	U	0.00286	pCi/L	0.660		(0-1)	DXM2	02/10/1220:46	
	Uncert:	+/-0.0139		+/-0.00286							
	TPU:	+/-0.0139		+/-0.00286							
	Yield:	53.6		73.1							
Plutonium-239/240	U	-0.00384	U	0.00286	pCi/L	0.175		(0-1)			
	Uncert:	+/-0.0127		+/-0.00639							
	TPU:	+/-0.0127		+/-0.00639							
	Yield:	53.6		73.1							
QC1202589403	LCS										
Plutonium-238			U	0.00472	pCi/L			(80%-120%)		02/10/1220:46	
	Uncert:			+/-0.00747							
	TPU:			+/-0.00747							
	Yield:			70.5							
Plutonium-239/240	2.03			1.83	pCi/L		90.1	(80%-120%)			
	Uncert:			+/-0.0662							
	TPU:			+/-0.110							
	Yield:			70.5							
QC1202589401	MB										
Plutonium-238			U	0.00721	pCi/L					02/10/1220:43	
	Uncert:			+/-0.00636							
	TPU:			+/-0.00637							
	Yield:			68.8							
Plutonium-239/240			U	0.00	pCi/L						
	Uncert:			+/-0.00589							
	TPU:			+/-0.00589							
	Yield:			68.8							

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QC Summary

Workorder: 295268

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Parmname	NOM	Sample	Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time
Rad Alpha Spec											
Batch	1184129										
QC1202589405	295007001	DUP									
Uranium-234		0.367		0.329	pCi/L	0.200		(0-1)	DXM2	02/10/1221:15	
		Uncert:	+/-0.0468	+/-0.0357							
		TPU:	+/-0.0536	+/-0.0419							
		Yield:	40.7	58.2							
Uranium-235/236		U	0.0129	U 0.00449	pCi/L	0.248		(0-1)			
		Uncert:	+/-0.00913	+/-0.00778							
		TPU:	+/-0.00918	+/-0.00778							
		Yield:	40.7	58.2							
Uranium-238		0.172		0.207	pCi/L	0.270		(0-1)			
		Uncert:	+/-0.0309	+/-0.0279							
		TPU:	+/-0.0332	+/-0.0311							
		Yield:	40.7	58.2							
QC1202589406	LCS										
Uranium-234				2.43	pCi/L					02/10/1221:15	
		Uncert:		+/-0.075							
		TPU:		+/-0.174							
		Yield:		72.0							
Uranium-235/236				0.137	pCi/L						
		Uncert:		+/-0.0197							
		TPU:		+/-0.0216							
		Yield:		72.0							
Uranium-238	2.59			2.61	pCi/L		101	(80%-120%)			
		Uncert:		+/-0.0778							
		TPU:		+/-0.186							
		Yield:		72.0							
QC1202589404	MB										
Uranium-234			U	-0.00444	pCi/L					02/10/1221:15	
		Uncert:		+/-0.0063							
		TPU:		+/-0.0063							
		Yield:		67.6							
Uranium-235/236			U	0.00312	pCi/L						
		Uncert:		+/-0.00312							
		TPU:		+/-0.00312							
		Yield:		67.6							
Uranium-238			U	0.0101	pCi/L						
		Uncert:		+/-0.00618							
		TPU:		+/-0.00621							
		Yield:		67.6							
Rad Gamma Spec											
Batch	1186207										
QC1202594217	295268002	DUP									
Cesium-137		U	1.90	U -0.185	pCi/L	0.449		(0-1)	KXG3	02/11/1210:56	
		Uncert:	+/-1.26	+/-1.07							
		TPU:	+/-1.26	+/-1.07							
Cobalt-60		U	-0.747	U 1.24	pCi/L	0.411		(0-1)			
		Uncert:	+/-1.29	+/-1.13							
		TPU:	+/-1.29	+/-1.13							

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QC Summary

Workorder: 295268

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Parmname	NOM	Sample	Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time
Rad Gamma Spec											
Batch	1186207										
Neptunium-237	U	-5.04	U	0.417	pCi/L	0.521		(0-1)			
	Uncert:	+/-2.88		+/-2.36							
	TPU:	+/-2.88		+/-2.36							
Potassium-40	U	1.52	U	-13.2	pCi/L	0.221		(0-1)			
	Uncert:	+/-17.9		+/-15.5							
	TPU:	+/-17.9		+/-15.5							
Sodium-22	U	-1.55	U	0.537	pCi/L	0.387		(0-1)			
	Uncert:	+/-1.57		+/-1.13							
	TPU:	+/-1.57		+/-1.13							
QC1202594218 LCS											
Americium-241	2790			2690	pCi/L		96.4	(80%-120%)		02/11/12	12:13
	Uncert:			+/-150							
	TPU:			+/-150							
Cesium-137	6200			6380	pCi/L		103	(80%-120%)			
	Uncert:			+/-274							
	TPU:			+/-274							
Cobalt-60	6250			6370	pCi/L		102	(80%-120%)			
	Uncert:			+/-266							
	TPU:			+/-266							
Neptunium-237			U	-9.98	pCi/L						
	Uncert:			+/-23.8							
	TPU:			+/-23.8							
Potassium-40			U	-9.69	pCi/L						
	Uncert:			+/-57.5							
	TPU:			+/-57.5							
Sodium-22			U	5.13	pCi/L						
	Uncert:			+/-9.48							
	TPU:			+/-9.48							
QC1202594216 MB											
Cesium-137			U	0.157	pCi/L					02/11/12	10:54
	Uncert:			+/-1.33							
	TPU:			+/-1.33							
Cobalt-60			U	0.126	pCi/L						
	Uncert:			+/-1.11							
	TPU:			+/-1.11							
Neptunium-237			U	-1.25	pCi/L						
	Uncert:			+/-1.89							
	TPU:			+/-1.89							
Potassium-40			U	-8.04	pCi/L						
	Uncert:			+/-12.9							
	TPU:			+/-12.9							
Sodium-22			U	-0.981	pCi/L						
	Uncert:			+/-0.990							
	TPU:			+/-0.990							
Rad Gas Flow											
Batch	1185966										
QC1202593671 295389001 DUP											
Strontium-90	U	0.129	U	0.113	pCi/L	0.0276		(0-1)	JXR1	02/17/12	16:33

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QC Summary

Workorder: 295268

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Parmname	NOM	Sample	Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time
Rad Gas Flow											
Batch	1185966										
		Uncert:	+/-0.146	+/-0.135							
		TPU:	+/-0.147	+/-0.135							
		Yield:	78.9	93.3							
QC1202593673 LCS											
Strontium-90	24.6			25.7	pCi/L		104	(80%-120%)		02/15/1221:03	
		Uncert:		+/-0.711							
		TPU:		+/-2.16							
		Yield:		84.4							
QC1202593670 MB											
Strontium-90			U	-0.0644	pCi/L					02/15/1220:36	
		Uncert:		+/-0.0666							
		TPU:		+/-0.0666							
		Yield:		70.0							
QC1202593672 295389001 MS											
Strontium-90	123	U	0.129	149	pCi/L		121	(75%-125%)		02/15/1221:03	
		Uncert:	+/-0.146	+/-3.78							
		TPU:	+/-0.147	+/-12.4							
		Yield:	78.9	87.8							
Batch	1185980										
QC1202593718 295268002 DUP											
Alpha		U	0.191	1.75	pCi/L	0.624		(0-1)	DXF3	02/16/1220:36	
		Uncert:	+/-0.412	+/-0.824							
		TPU:	+/-0.412	+/-0.837							
Beta		U	0.251	0.897	pCi/L	0.249		(0-1)		02/14/1219:38	
		Uncert:	+/-0.632	+/-0.662							
		TPU:	+/-0.632	+/-0.666							
QC1202593721 LCS											
Alpha	12.0			13.3	pCi/L		110	(80%-120%)		02/16/1220:36	
		Uncert:		+/-0.662							
		TPU:		+/-1.30							
Beta	49.2			54.3	pCi/L		110	(80%-120%)		02/14/1219:39	
		Uncert:		+/-0.946							
		TPU:		+/-4.59							
QC1202593717 MB											
Alpha			U	0.015	pCi/L					02/16/1220:36	
		Uncert:		+/-0.0568							
		TPU:		+/-0.0569							
Beta			U	-0.0669	pCi/L					02/14/1219:38	
		Uncert:		+/-0.0838							
		TPU:		+/-0.0838							
QC1202593719 295268002 MS											
Alpha	241	U	0.191	268	pCi/L		111	(75%-125%)		02/16/1220:36	
		Uncert:	+/-0.412	+/-13.6							
		TPU:	+/-0.412	+/-26.3							
Beta	984	U	0.251	1070	pCi/L		109	(75%-125%)		02/14/1219:38	
		Uncert:	+/-0.632	+/-18.9							
		TPU:	+/-0.632	+/-90.8							
QC1202593720 295268002 MSD											
Alpha	241	U	0.191	281	pCi/L	0.118	117	(0-1)		02/16/1220:36	

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QC Summary

Workorder: 295268

Page 5 of 6

Parmname	NOM	Sample	Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time
Rad Gas Flow											
Batch	1185980										
		Uncert:	+/-0.412	+/-14.4							
		TPU:	+/-0.412	+/-27.6							
Beta	984	U	0.251	1120	pCi/L	0.132	114	(0-1)		02/14/12	19:39
		Uncert:	+/-0.632	+/-19.5							
		TPU:	+/-0.632	+/-95.0							

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.

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QC Summary

Workorder: 295268

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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.