

AUXIER & ASSOCIATES, INC.

PAP-KAN

1428

**STANDARD LEVEL IV
REPORT OF ANALYSIS**

WORK ORDER #15-10098-OR

October 30, 2015

**EBERLINE ANALYTICAL/OAK RIDGE LABORATORY
OAK RIDGE, TN**

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**Eberline Services – Oak Ridge Laboratory
LABORATORY DATA SUPPORT CHECKLIST**


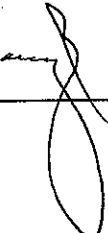
MP-001-3

Eberline Services Work Order # 15 - 10098

The checklist items listed below are to be initialed by appropriate staff upon completion/verification.

Date for Partial	Initials	Date	Initials	Checklist Items
		10-16-15	JEB	Sample Log-In
		10/20/15	JG	Data Compilation
		10/21/15	MLT	First Technical Data Review
	MSK 10/28/15	10/28/15	MSK	Second Technical Data Review
		10/29/15	EJT	Data Entry/Electronic Deliverable
		10/29/15	EJT	Case Narrative
		10/30/15	KBD	Electronic Deliverable Proof
		10/30/15	MSK	Samples Analyzed within Holding Time Yes? <input checked="" type="checkbox"/> No? <input type="checkbox"/>
		10/30/15	MSK	QA/QC Review
		10/20/15	EJT	Client in Possession of Data Electronic or Hard Copy
				Invoiced by Laboratory

Technical/Clerical Corrections, Signatures Needed, Problems, Etc	Date/Initials

Date package approved by:  _____
Laboratory Manager  10/30/15
Date

Copy No. _____

SECTION I
CHAIN OF CUSTODY
&
pH CHECK SHEET

Chain of Custody Record

No 7257

Eberline Services
601 Scarboro Road
Oak Ridge, TN 37830
(865) 481-0683 Phone • (865) 483-4621 Fax



Project Name: PAPI/KAN
 Send Report To: Cecilia Green/Auxier
 Address:
 9321 Cogdill Rd, Ste 1
 Knoxville, TN 37932
 Phone: 865-675-3669
 Fax: 865-675-3677

Project Number: 1428
 Sampler (Print Name): SSA
 Sampler (Print Name):
 Shipment Method: Federal Express
 Airbill Number:
 Laboratory Receiving:

15-10098
 REC'D OCT 14 2015
 15-10095
 Purchase Order #:
 Lab Sample ID (to be completed by lab)

Field Sample ID	Sample Date	Sample Time	Sample Matrix	Number of Containers	Total Suspended Solids	Total Dissolved Solids	Gross Alpha	Gross Beta	Isotopic Uranium	Isotopic Thorium	Comments, Special Instructions, etc.	Lab Sample ID (to be completed by lab)
KC86-051-U	10/2/15	14:40	W	1	X	X	X	X	X	X	Analyze TSS + DS	
KC86-051-L	10/2/15	15:55	W	1	X	X	X	X	X	X	Contact Cecilia Filter as directed.	
KC98-233	10/10	15:10pm									Analyze GA + GB contact Cecilia	
Trip Blank											Percent as directed	

Relinquished by: (Signature) *[Signature]*
 Received by: (Signature) *[Signature]*
 Date: 10/13/15
 Time: 1500

Relinquished by: (Signature) *[Signature]*
 Received by: (Signature) *[Signature]*
 Date: 10-15-15
 Time: 1430

Relinquished by: (Signature) *[Signature]*
 Received by: (Signature) *[Signature]*
 Date:
 Time:

Sample Custodian Remarks (Completed By Laboratory):
 Turnaround
 QA/QC Level
 Level I Routine
 Level II 24 Hour
 Level III 1 Week
 Other

Sample Receipt
 Total # Containers Received?
 COC Seals Present?
 COC Seals Intact?
 Received Containers Intact?
 Temperature?




Internal Chain of Custody

Work Order #	15-10098
Lab Deadline	10/21/2015
Analysis	GaGbt_ThSr - Level 4
Sample Matrix	Water

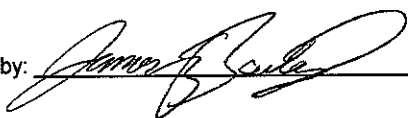
Comments	Sample Fraction	HP 210 / 270 Detector Activity	Storage Location
	04	36	W1.4
	05	34	W1.4

	Location (circle one)						Initials	Date
	Sample Storage	Rough Prep	Prep	Separations	Count Room			
Received by	<u>Sample Storage</u>	Rough Prep	Prep	Separations	Count Room	MIL	19 OCT 15	
Relinquished by	Sample Storage	Rough Prep	<u>Prep</u>	Separations	Count Room	Mn	19 OCT 15 0600	
Received by	Sample Storage	Rough Prep	Prep	Separations	<u>Count Room</u>	AG	10/19/15 0600	
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	<u>Count Room</u>	CB	10/19/15 1548	
Received by	<u>Sample Storage</u>	Rough Prep	Prep	Separations	Count Room			
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room			
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room			
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room			
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room			
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room			
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room			
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room			
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room			
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room			

	Sample Receiving Report (Volumes, pH, & CPM)	Internal Work Order
		15-10098
		Received By JBAILEY

FR	ClientID	# Btls	Comments	Matrix	Storage	Rec Vol Ttl	CPM Max	
01	LCS	0		WA	W1.4			
02	BLANK	0		WA	W1.4			
03	DUP	0		WA	W1.4			
04	KC86-051-U	1		WA	W1.4	3.76	36	
				Container Number	pH Orig	pH Final	Volume (L)	CPM
				1	7	7	3.7600	36
05	KC86-051-L	1		WA	W1.4	3.76	34	
				Container Number	pH Orig	pH Final	Volume (L)	CPM
				1	7	7	3.7600	34

JBA 10/16/15

Received by:  Date: 10-16-15

SECTION II
SAMPLE ACKNOWLEDGEMENT

Client Name Auxier & Associates, Inc.		Contract/PO PAP-KAN		Project Type Environmental	Date Received 10/16/2015	Required Turnaround Days 3		Eberline Services Work Order 15-10098
Project Name PAP-KAN		Client WO PAP-KAN		Sample Disp W	Lab Deadline 10/21/2015	Internal Deadline 10/21/2015		Client Deadline 10/21/2015
Internal ID	Client ID	Sample Date	Matrix	Storage	Gal			
01	LCS	10/16/15	WA	W1.4	X			1
02	BLANK	10/16/15	WA	W1.4	X			1
03	DUP	10/16/15	WA	W1.4	X			1
04	KC86-051-U	10/02/15 14:40	WA	W1.4	X			1
05	KC86-051-L	10/02/15 15:55	WA	W1.4	X			1
								0
								0
								0
								0
								0
								0
								0
								0
								0
								0
								0
								0
								0
								0
								0
Totals Per Analysis (non QA samples)						2	0	0

<p>EBERLINE SERVICES Sample Log In Report</p> <p>00009 EY 10/21/15</p>	<p>Oak Ridge Laboratory 601 Scarboro Rd. Oak Ridge, TN 37830</p> <p>Voice: (865) 481-0683 Fax: (865) 483-4621</p>	<p>Invoice</p> <p>Accounts Payable Auxier & Associates, Inc. 9821 Cogdill Drive #1 Knoxville, TN 37932</p> <p>Voice 885-675-3669 Fax 885-675-3677</p> <p>Contact Harvey Cohen 301-718-8900 Fax 301-718-8909</p>	<p>Report Data</p> <p>Cecilia Greene Auxier & Associates, Inc. 9821 Cogdill Road, Suite 1 Knoxville, TN 37830</p> <p>Voice 885-675-3669 Fax 885-675-3677</p>
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Eberline Services – Oak Ridge Laboratory

SAMPLE RECEIPT CHECKLIST
MP-001-2

WORK ORDER # 15 - 10098

SAMPLE MATRIX/MATRICES:

(CIRCLE ONE OR BOTH)

AQUEOUS NON-AQUEOUS

WERE SAMPLES:

(CIRCLE EITHER YES, NO, OR N/A)

Received in good condition?	<input checked="" type="radio"/> Y	N	
If aqueous, properly preserved	<input checked="" type="radio"/> Y	N	N/A

WERE CHAIN OF CUSTODY SEALS:

Present on outside of package?	<input checked="" type="radio"/> Y	N
Unbroken on outside of package?	<input checked="" type="radio"/> Y	N
Present on samples?	<input checked="" type="radio"/> Y	N
Unbroken on samples?	<input checked="" type="radio"/> Y	N
Was chain of custody present upon sample receipt?	<input checked="" type="radio"/> Y	N

IF THE RESPONSE TO ANY OF THE ABOVE IS NO, A DISCREPANT SAMPLE RECEIPT REPORT (DSR) HAS BEEN ISSUED.

REMARKS: _____

SIGNATURE: *James E. Barber* DATE: 10-16-15

SECTION III
CASE NARRATIVE



EBERLINE ANALYTICAL CORPORATION
601 SCARBORO ROAD
OAK RIDGE, TENNESSEE 37830
PHONE (865) 481-0683
FAX (865) 483-4621

EBS-OR-39886

October 30, 2015

Cecilia Greene
USA ENV LP/Auxier & Associates, Inc.
9821 Cogdill Road, Suite 1
Knoxville, TN 37932

CASE NARRATIVE
Work Order# 15-10098-OR

SAMPLE RECEIPT

This work order contains two water samples received 10/15/2015 and re-logged at the client's request 10/16/2015. These samples were analyzed for Gross Alpha/Beta.

<u>CLIENT ID</u>	<u>LAB ID</u>
KC86-051-U	15-10098-04
KC86-051-L	15-10098-05

ANALYTICAL METHODS

Gross Alpha/Beta was analyzed using EPA Method 900.0 Modified.

ANALYTICAL RESULTS

Combined Standard Uncertainty is reported at 2-sigma value.

Minimum Detectable Activity (MDA) values for data represented in this report are sample-specific. MDA measurements are determined based on factors and conditions including instrument settings, aliquot size and matrix type.

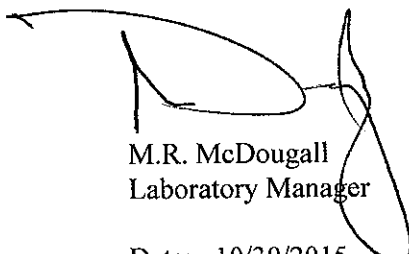
GROSS ALPHA & BETA

Samples were prepared by evaporation of representative volumetric aliquots acidified with HNO₃. Reduced samples were then transferred to steel planchets for final evaporation to dryness and flaming. Samples were then counted on a gas proportional counter. Results were corrected as required for inherent self-absorption based on residual mass present.

Samples demonstrated acceptable results for all Gross Alpha and Beta analyses. The Gross Alpha and Beta method blank demonstrated acceptable results. Results for the Gross Alpha and Beta duplicate demonstrated a high relative percent difference; however, normalized difference is within acceptable limits for the analytical technique. Results for the Gross Alpha and Beta laboratory control sample demonstrated an acceptable percent recovery.

CERTIFICATION OF ACCURACY

I certify that this data report is in compliance with the terms and conditions of the Purchase Order, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the cognizant project manager or his/her designee to be accurate as verified by the following signature.



M.R. McDougall
Laboratory Manager

Date: 10/30/2015

Eberline Analytical wants and encourages your feedback regarding our performance providing radioanalytical services. Please visit <http://www.eberlineservices.com/client.htm> to provide us with feedback on our services.

SECTION IV
ANALYTICAL RESULTS SUMMARY

Eberline Analytical

Final Report of Analysis

Cecilia Greene
Auxier & Associates, Inc.
 9821 Cogdill Road, Suite 1
 Knoxville, TN 37830

Work Order Details:

SDG: **15-10098**
 Purchase Order: **PAP-KAN**
 Analysis Category: **ENVIRONMENTAL**
 Sample Matrix: **WA**

Report To:

Report To: **Cecilia Greene**
Auxier & Associates, Inc.
 9821 Cogdill Road, Suite 1
 Knoxville, TN 37830

Lab ID	Sample Type	Client ID	Sample Date	Receipt Date	Analysis Date	Batch ID	Analyte	Method	Result	CU	CSU	MDA	CV	Report Units
15-10098-01	LCS	KNOWN	10/16/15 00:00	10/16/2015	10/18/2015	15-10098	Gross Alpha	EPA 900.0 Modified	2.68E+02	1.15E+01				pCi/l
15-10098-01	LCS	SPIKE	10/16/15 00:00	10/16/2015	10/18/2015	15-10098	Gross Alpha	EPA 900.0 Modified	2.89E+02	3.77E+00	3.12E+01	1.88E-01	1.93E-01	pCi/l
15-10098-02	MBL	BLANK	10/16/15 00:00	10/16/2015	10/18/2015	15-10098	Gross Alpha	EPA 900.0 Modified	-1.20E-01	1.14E-01	1.14E-01	3.24E-01	3.30E-01	pCi/l
15-10098-03	DUP	KC86-051-U	10/02/15 14:40	10/16/2015	10/18/2015	15-10098	Gross Alpha	EPA 900.0 Modified	2.56E+00	1.48E+00	1.50E+00	2.45E+00	7.83E-01	pCi/l
15-10098-04	DO	KC86-051-U	10/02/15 14:40	10/16/2015	10/18/2015	15-10098	Gross Alpha	EPA 900.0 Modified	4.01E+00	1.38E+00	1.45E+00	1.23E+00	5.15E-01	pCi/l
15-10098-05	TRG	KC86-051-L	10/02/15 15:55	10/16/2015	10/18/2015	15-10098	Gross Alpha	EPA 900.0 Modified	2.71E+00	1.41E+00	1.44E+00	1.95E+00	6.59E-01	pCi/l
15-10098-01	LCS	KNOWN	10/16/15 00:00	10/16/2015	10/18/2015	15-10098	Gross Beta	EPA 900.0 Modified	2.93E+02	8.78E+00				pCi/l
15-10098-01	LCS	SPIKE	10/16/15 00:00	10/16/2015	10/18/2015	15-10098	Gross Beta	EPA 900.0 Modified	2.74E+02	3.11E+00	3.80E+01	6.02E-01	1.39E+00	pCi/l
15-10098-02	MBL	BLANK	10/16/15 00:00	10/16/2015	10/18/2015	15-10098	Gross Beta	EPA 900.0 Modified	-2.34E-02	2.79E-01	2.79E-01	5.98E-01	1.39E+00	pCi/l
15-10098-03	DUP	KC86-051-U	10/02/15 14:40	10/16/2015	10/18/2015	15-10098	Gross Beta	EPA 900.0 Modified	3.10E+00	1.51E+00	1.57E+00	2.87E+00	5.00E+00	pCi/l
15-10098-04	DO	KC86-051-U	10/02/15 14:40	10/16/2015	10/18/2015	15-10098	Gross Beta	EPA 900.0 Modified	7.53E-01	1.61E+00	1.61E+00	3.31E+00	6.50E+00	pCi/l
15-10098-05	TRG	KC86-051-L	10/02/15 15:55	10/16/2015	10/18/2015	15-10098	Gross Beta	EPA 900.0 Modified	2.39E+00	1.97E+00	2.00E+00	3.98E+00	7.96E+00	pCi/l

CU=Counting Uncertainty; CSU=Combined Standard Uncertainty (2-sigma); MDA=Minimal Detected Activity; LCS=Laboratory Control Sample; MBL=Blank; DUP=Duplicate; TRG=Normal Sample; DO=Duplicate Original; CV=Critical Value



EBERLINE
SERVICES

EBERLINE ANALYTICAL CORPORATION
 601 SCARBORO ROAD OAK RIDGE, TN 37830 865/481-0683 FAX 865/483-4621

SECTION V
ANALYTICAL STANDARDS

ANALYTICS



Am-4

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318 · U.S.A.

Phone (404) 352-8677
Fax (404) 352-2837

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

52094-416

Am-241 10 mL Liquid in Flame Sealed Vial

This standard radionuclide source was prepared gravimetrically from a calibrated master liquid radionuclide solution source. The master source was calibrated by liquid scintillation counting.

ANALYTICS maintains traceability to the National Institute of Standards and Technology through Measurements Assurance Programs as described in USNRC Reg. Guide 4.15, Revision 1.

ISOTOPE:	Am-241
ACTIVITY (dps):	1.975 E+05
HALF-LIFE:	432.2 years
CALIBRATION DATE:	March 19, 1996 12:00 EST
TOTAL ERROR:	3.0%
SYSTEMATIC ERROR:	2.37%
RANDOM ERROR:	0.63%

10.01177 grams of solution 1M HCl.

P O NUMBER OR3830, Item 1

SOURCE PREPARED BY: Kare O'Brien Beverly
K. O. Beverly, Radiochemist

Q A APPROVED: DM. Poling 4-26-96

: 00017



QUALITY CONTROL PROGRAM
MP-009

Rev.8; 1/10/03
Title: Radioactive Reference Standards Solutions & Records

EBERLINE SERVICES - OAK RIDGE LABORATORY
RADIOACTIVE REFERENCE STANDARD SOLUTIONS
SECONDARY DILUTION (RE-CERTIFICATION)

Solution Reference # Analytcs:52094-416 Date 8/5/2015 0:00
Solution # A/E-7 (alpha)

Principal Radionuclide ²⁴¹Amencium Half Life, Years 4.322E+02 Half Life, Days 1.579E+05

Radionuclide of Interest ²⁴¹Am Reference Date 3/19/1996 0:00
Parent Solution Conc. 1.19E+04 dpm/ml

Chemical Composition of Standard Solution
²⁴¹AmCl₃ in 1M HCL

Dilution Instructions: Dilution Solvent Used 1 M HNO₃

SECONDARY VOLUMETRIC DILUTION

Vol. Parent Solution: 60.0000 ml
Total Activity: 7.1100E+05 dpm Final Activity Concentration: 7.1100E+02 dpm/ml
Final Volume: 1000.00 ml

NOTES:

This activity concentration is based on the original reference date listed above. All activities are corrected to the date and time of analysis by the laboratory data processing software.

Expiration Date: August 4, 2016

Verified & Approved By: [Signature]

Date: 8/5/15

QC Approval: [Signature]

Date: 8/5/15

SR-46
13 uhm



National Institute of Standards & Technology Certificate

Standard Reference Material 4234A Strontium-90 Radioactivity Standard

This Standard Reference Material (SRM) consists of radioactive strontium-90 chloride, non-radioactive strontium chloride, non-radioactive yttrium chloride, and hydrochloric acid dissolved in 5 mL of distilled water. The solution is contained in a flame-sealed NIST borosilicate-glass ampoule. The SRM is intended for the calibration of beta-particle counting instruments and for the monitoring of radiochemical procedures.

Radiological Hazard

The SRM ampoule contains strontium-90 with a total activity of approximately 13 MBq. Strontium-90 decays by beta-particle emission to yttrium-90, which also decays by beta-particle emission. None of the beta particles escape from the SRM ampoule. The beta particles emitted from strontium-90 and yttrium-90 produce bremsstrahlung photons with energies up to 2 MeV. Most of these photons escape from the SRM ampoule and can represent a radiation hazard. Approximate unshielded dose rates at several distances (as of the reference time) are given in note [a]*. Appropriate shielding and/or distance should be used to minimize personnel exposure. The SRM should be used only by persons qualified to handle radioactive material.

Chemical Hazard

The SRM ampoule contains hydrochloric acid (HCl) with a concentration of 1 mole per liter of water. The solution is corrosive and represents a health hazard if it comes in contact with eyes or skin. If the ampoule is to be opened to transfer the solution, the recommended procedure is given on page 2. The ampoule should be opened only by persons qualified to handle both radioactive material and strong acid solution.

Storage and Handling

The SRM should be stored and used at a temperature between 5 and 65 °C. The solution in an unopened ampoule should remain stable and homogeneous until at least March 2005.

The ampoule (or any subsequent container) should always be clearly marked as containing radioactive material. If the ampoule is transported it should be packed, marked, labeled, and shipped in accordance with the applicable national, international, and carrier regulations. The solution in the ampoule is a dangerous good (hazardous material) both because of the radioactivity and because of the strong acid.

Preparation

This Standard Reference Material was prepared in the Physics Laboratory, Ionizing Radiation Division, Radioactivity Group, J.M.R. Hutchinson, Group Leader. The overall technical direction and physical measurements leading to certification were provided by L.L. Lucas of the Radioactivity Group and D.B. Golas, Nuclear Energy Institute Research Associate.

The support aspects involved in the preparation, certification, and issuance of this SRM were coordinated through the Standard Reference Materials Program by N.M. Trahey.

Gaithersburg, Maryland 20899
May 1995 (Text only revised November 1997)

Thomas E. Gills, Chief
Standard Reference Materials Program



QUALITY CONTROL PROGRAM
QCP-009

Rev.7; 9/29/99
Title: Radioactive Reference Standards Solutions & Records

EBERLINE SERVICES - OAK RIDGE LABORATORY
RADIOACTIVE REFERENCE STANDARD SOLUTIONS
SECONDARY DILUTION (RE-CERTIFICATION)

Solution Reference # QCP-009-1-A
NIST 4234A

Date 8/5/2015 0:00
Solution # A/B-7 (beta)

Principal Radionuclide

Half Life, Years

Half Life, Days

⁹⁰Strontium

2.878E+03

1.051E+04

Radionuclide of Interest

⁹⁰Sr

Reference Date

3/13/1995 0:00

Parent Solution Conc. 1.52E+06 dpm/ml

The beta activity of solution reflects the original ⁹⁰Strontium concentration and an equal concentration of ⁹⁰Yttrium.

Chemical Composition of Standard Solution

⁹⁰SrCl₂ in 1 M HCl

Dilution Instructions:

Dilution Solvent Used

1 M HNO₃

SECONDARY VOLUMETRIC DILUTION

Vol. Parent Solution: 0.5000 ml

Total Activity: 7.5764E+05 dpm

Final Volume: 1000.00 ml

Final Activity Concentration: 7.5764E+02 dpm/ml

This activity concentration is based on the original reference date listed above. All activities are corrected to the date and time of analysis by the laboratory data processing software.

NOTES:

Expiration Date: August 4, 2016

Verified & Approved By

Date: 08/05/15

QC Approval

Date: 8/5/15

SECTION VI
QUALITY CONTROL SAMPLE RESULTS SUMMARY

WO	Analysis	Run	Activity Units	Aliquot Units	Client Name
15-10098	GaGbt_ThSr	1	pCi	I	Auxier & Associates, Inc.

Laboratory Control Sample

Analyte	LCS Measured	CSU Measured	LCS Expected	Uncert. Expected	Known	Known Error	Result	CSU	Standard ID	Standard ACT (dpm)	Standard Error	Standard Added (g)
GROSS ALPHA_TH	105.51%	11.00%	100.00%	4.30%	2.68E+02	1.15E+01	2.83E+02	3.12E+01	A/B-07	5.96E+02	4.30E+00	1.00E+00
GROSS BETA_SR	93.59%	13.87%	100.00%	3.00%	2.93E+02	8.78E+00	2.74E+02	3.80E+01	A/B-07	6.49E+02	3.00E+00	1.00E+00

Matrix Spike

Analyte	Normalized Difference	MS Actual % Rec	Expected MS Result	Expected MS Uncert	Actual MS Result	Actual MS CSU	Sample Result	Sample CSU	Sample Aliquot	Standard ID	Standard ACT (dpm)	Standard Error %	Standard Added (g)

Replicate Sample

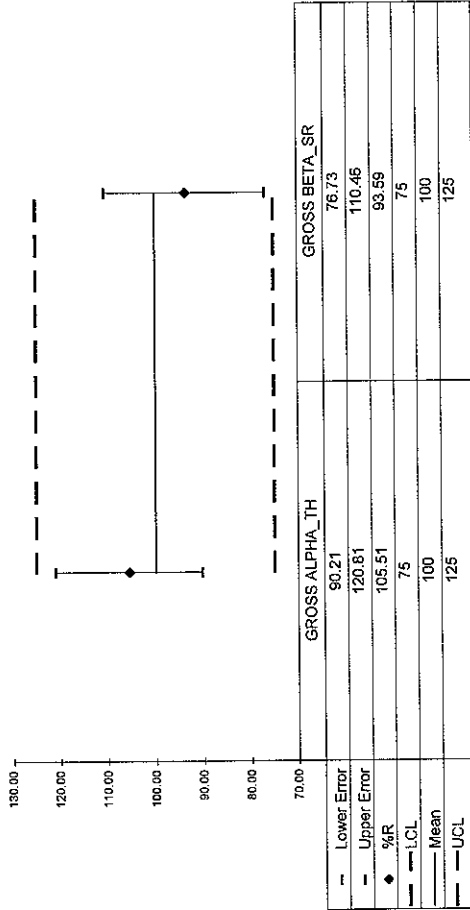
Analyte	Normalized Difference	RPD	Original Result	Original CSU	Replicate Result	Replicate CSU	LCS Relative Bias	LCS % R	MS % R	MS ND	Rep RPD	Rep ND
GROSS ALPHA_TH	1.36	44.16	4.01E+00	1.45E+00	2.58E+00	1.50E+00	1.06	OK			NA	OK
GROSS BETA_SR	2.04	121.84	7.53E-01	1.61E+00	3.10E+00	1.57E+00	0.94	OK			NA	OK

QC Summary

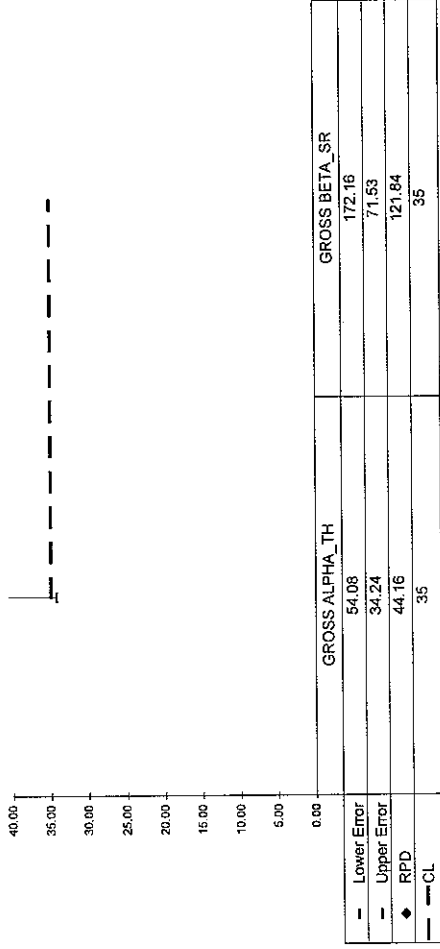
Analyte	Normalized Difference	RPD	Original Result	Original CSU	Replicate Result	Replicate CSU	LCS Relative Bias	LCS % R	MS % R	MS ND	Rep RPD	Rep ND
GROSS ALPHA_TH	1.36	44.16	4.01E+00	1.45E+00	2.58E+00	1.50E+00	1.06	OK			NA	OK
GROSS BETA_SR	2.04	121.84	7.53E-01	1.61E+00	3.10E+00	1.57E+00	0.94	OK			NA	OK

WO	Analysis	Run	Activity Units	Aliquot Units	Client Name
15-10098	GaGbT_ThSr	1	pCi	1	Auxier & Associates, Inc.

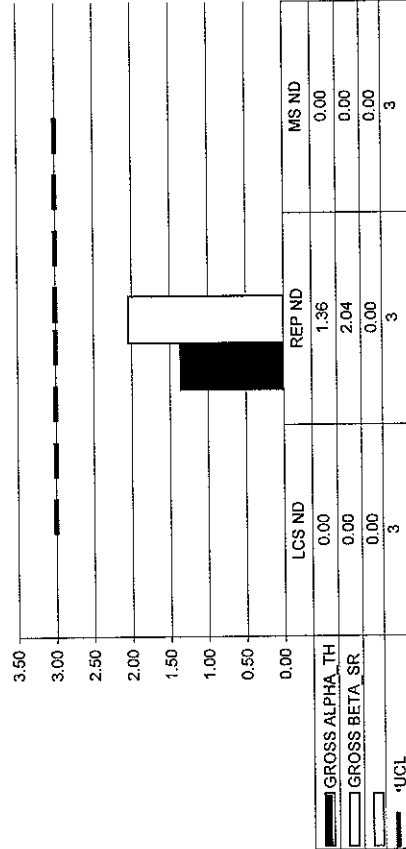
LCS % Recovery



Replicate Sample RPD




Normalized Difference




No Matrix Spike

SECTION VII
LABORATORY TECHNICIAN'S NOTES
& RUNLOGS

 EBERLINE SERVICES Work Order Analysis Notes	Oak Ridge Laboratory 601 Scarboro Rd. Oak Ridge, TN 37830 Voice: 865.481.0683 www.eberlineservices.com	Internal Work Order	15-10098
		Analysis Code	GaGbT_ThSr
		Run Number	1

#	Date	Dept	User	Notes
1	10/19/15 02:30	PREP	MHIGHTOWER	Ran TDS/TSS to determine aliquot. Aliquoted samples, dried, nitrated, transferred to tared planchets, dried, flamed, re-weighed, and submitted to count room.

MH 19 OCT 15

 <p>EBERLINE SERVICES</p> <p>Reagents Used in an Analysis</p>		Internal Work Order		
		15-10098		
		Analysis Code		Run
		GaGbT_ThSr		1
Reagent ID	Reagent Name	Reagent Concentration	Analyst ID	Date Recorded
016403D12	Nitric Acid	3N	MHIGHTOWER	10/19/2015

LB4110 Aqua

Date	Sample #	Client	Location	CT Volume Analyzed	Spec
10/15	1510081AD(4.5)	Parsons	0740	Blng	L10
10/15	1510081AD(1)	Parsons	0740	su	L10
10/15	1510054RA(1)	USA	0942	2h	RA8
10/15	1510054RA(2-4)	USA	0941	2h	RA8
10/15	1510035RA(1)	USA	1044	2h	RA8
10/16/15	Daily Bkgd	Lab	0609	1 hr	OPB
10/17/15	Daily Bkgd	Lab	0552	1 hr	OPB
10/19/15	Daily Eff Check	Lab	0732	30m	αβ
10/19/15	1510010SR(1-4)	WCH	0822	2 hr	Sr
10/19/15	1510019RA(1-10)	Mr. Pisani	0934	2 hr	Ra-228
10/19/15				1 hr	AB
10/19/15	1510010SR(1-4)	Unitech	1159	1 hr	TOT Sr
10/19/15	1510098AB(1-5)	Auxier	1345	2 hr	αβ

SECTION VIII
ANALYTICAL DATA (GROSS ALPHA/BETA)

Work Order	15-10098
Analysis Code	GaGbT_ThSr
Run	1
Date Received	10/16/2015
Lab Deadline	10/21/2015
Client	Auxier & Associates, Inc.
Project	PAP-KAN
Report Level	4
Activity Units	pCi
Aliquot Units	l
Matrix	WA
Method	EPA 900.0 Modified
Instrument Type	Alpha/Beta GPC
Radiometric Tracer	
Radiometric Sol#	
Tracer Act (dpm/g)	
Carrier	
Carrier Conc (mg/ml)	

Internal Fraction	Sample Desc	Client ID	Login CPM	Sample Date	Sample Aliquot
01	LCS	LCS		10/16/15 00:00	1.0000E+00
02	MBL	BLANK		10/16/15 00:00	1.0000E+00
03	DUP	KC86-051-U	36	10/02/15 14:40	2.0000E-01
04	DO	KC86-051-U	36	10/02/15 14:40	2.0000E-01
05	TRG	KC86-051-L	34	10/02/15 15:55	1.7000E-01

* SAF1 is used for Gross Alpha and all other radionuclides. SAF2 is used for Gross Beta only. ^ Indicates estimated SAF value.
** Actual mass exceeded the calibration curve range. Results should be qualified as appropriate.

000000

Internal Fraction	Sample Desc	Tracer Aliquot (g)	Tracer Total ACT (dpm)	Radiometric Tracer (pCi)	Radiometric % Rec	Grav Carrier Added (ml)	Grav Filter Tare (g)	Grav Filter Final (g)	Grav Filter Net (g)	Grav % Rec	Mean % Rec	SAF 1*	SAF 2*
01	LCS				0.00		7.5870	7.5872	0.0002			1.00	1.00
02	MBL				0.00		7.6081	7.6082	0.0001			1.00	1.00
03	DUP				0.00		7.4707	7.5144	0.0437			1.00	1.00
04	DO				0.00		7.6070	7.6470	0.0400			1.00	1.00
05	TRG				0.00		7.6053	7.6485	0.0432			1.00	1.00

* SAF1 is used for Gross Alpha and all other radionuclides. SAF2 is used for Gross Beta only. ^ Indicates estimated SAF value.
 ** Actual mass exceeded the calibration curve range. Results should be qualified as appropriate.

: 00030

Internal Fraction	Sample Desc	Rough Prep Date	Rough Prep By	Prep Date	Prep By	Sep t0 Date/Time	Sep t0 By	Sep t1 Date/Time	Sep t1 By
01	LCS			10/19/15 02:33	MHIGHTOWER				
02	MBL			10/19/15 02:33	MHIGHTOWER				
03	DUP			10/19/15 02:33	MHIGHTOWER				
04	DO			10/19/15 02:33	MHIGHTOWER				
05	TRG			10/19/15 02:33	MHIGHTOWER				

* SAF1 is used for Gross Alpha and all other radionuclides. SAF2 is used for Gross Beta only. ^ Indicates estimated SAF value.
** Actual mass exceeded the calibration curve range. Results should be qualified as appropriate.

 Run	1
	Analysis Code
Eberline Services Work Order	15-10098
Client	Auxier & Associates, Inc.

Lab Fraction	Nuclide	Sample Desc	Client Identification	Activity Units	Results	Error Estimate	MDA	LCS Known	LCS %R	LCS Flag	RPD Flag	MDA Flag	Blank Flag
01	GROSS ALPHA	LCS	LCS	pCi/l	2.83E+02	3.77E+00	1.88E-01	2.68E+02	105.51	OK		OK	
02	GROSS ALPHA	MBL	BLANK	pCi/l	-1.20E-01	1.14E-01	3.24E-01					OK	OK
03	GROSS ALPHA	DUP	KC86-051-U	pCi/l	2.56E+00	1.48E+00	2.45E+00				NA	OK	
04	GROSS ALPHA	DO	KC86-051-U	pCi/l	4.01E+00	1.38E+00	1.23E+00					OK	
05	GROSS ALPHA	TRG	KC86-051-L	pCi/l	2.71E+00	1.41E+00	1.95E+00					OK	

25000

Lab Fraction	Nuclide	Sample Desc	Sample Date	Sample Aliquot	Radiometric % Rec	Grav % Rec	Mean % Rec	SAF	Sep 10 Date/Time	Sep 11 Date/Time
01	GROSS ALPHA	LCS	10/16/15 00:00	1.00E+00	0.00	0.00	0.00	1.00		
02	GROSS ALPHA	MBL	10/16/15 00:00	1.00E+00	0.00	0.00	0.00	1.00		
03	GROSS ALPHA	DUP	10/02/15 14:40	2.00E-01	0.00	0.00	0.00	1.76		
04	GROSS ALPHA	DO	10/02/15 14:40	2.00E-01	0.00	0.00	0.00	1.66		
05	GROSS ALPHA	TRG	10/02/15 15:55	1.70E-01	0.00	0.00	0.00	1.74		

Client: Auxier & Associates, Inc.

Eberline Services Work Order 15-10098

Analysis Code GaGbT

Run 1



0000000

Run	1
	GaGbt
Analysis Code	GaGbt
Eberline Services Work Order	15-10098
Client	Auxier & Associates, Inc.

Lab Fraction	Nuclide	Sample Desc	Counting Date/Time	Halfife (days)	Detect	Carrier	Count Time	Counts	Bkg CPM	Eff
01	GROSS ALPHA	LCS	10/18/15 23:45		LB4110A	A3	120	21674	0.033333333	0.2872
02	GROSS ALPHA	MBL	10/18/15 23:45		LB4110A	B1	120	5	0.116666667	0.2821
03	GROSS ALPHA	DUP	10/18/15 23:45		LB4110A	B2	120	32	0.083333333	0.2835
04	GROSS ALPHA	DO	10/18/15 23:45		LB4110A	B3	120	38	0.016666667	0.2804
05	GROSS ALPHA	TRG	10/18/15 23:45		LB4110A	B4	120	24	0.033333333	0.2843

		Run	1
Analysis Code GaGbT			
Eberline Services Work Order 15-10098			
Client Auxier & Associates, Inc.			

Lab Fraction	Nuclide	Sample Desc	Client Identification	Activity Units	Results	Error Estimate	MDA	LCS Known	LCS %R	LCS Flag	RPD Flag	MDA Flag	Blank Flag
01	GROSS BETA	LCS	LCS	pCi/l	2.74E+02	3.11E+00	6.02E-01	2.93E+02	93.69	OK		OK	
02	GROSS BETA	MBL	BLANK	pCi/l	-2.34E-02	2.79E-01	5.99E-01					OK	OK
03	GROSS BETA	DUP	KC86-051-U	pCi/l	3.10E+00	1.51E+00	2.87E+00				NA	OK	
04	GROSS BETA	DO	KC86-051-U	pCi/l	7.53E-01	1.61E+00	3.31E+00					OK	
05	GROSS BETA	TRG	KC86-051-L	pCi/l	2.39E+00	1.97E+00	3.96E+00					OK	

Count Room Report
Client: Auxier Associates, Inc.

15-10098-GaGbT_ThSr-1 (pCi/l) in WA
Tracer ID:

Internal Fraction	Sample Desc	Client ID	Sample Date	Sample Aliquot	Tracer Aliquot (g)	Tracer ACT (dpm)	Radiometric Tracer (pCi)	Radiometric % Rec	SAF 1*	SAF 2*
01	LCS	LCS	10/16/15 00:00	1.0000				0.00	1.00	1.00
02	MBL	BLANK	10/16/15 00:00	1.0000				0.00	1.00	1.00
03	DUP	KC86-051-U	10/02/15 14:40	0.2000				0.00	1.00	1.00
04	DO	KC86-051-U	10/02/15 14:40	0.2000				0.00	1.00	1.00
05	TRG	KC86-051-L	10/02/15 15:55	0.1700				0.00	1.00	1.00

Spike and Tracer Worksheet

Internal Work Order		Run	Analysis Code		Date	Technician		Technician Initials		Witness Initials			
15-10098		1	GaGbT_ThSr		10/19/2015 2:33	MHIGHTOWER		MK					
LCS & Matrix Spikes													
Isotope	Sol #	Activity dpm/g	Solution Date	Approx Addition	LCS Volume Used (g)	MS Volume Used (g)	LCS Volume Used (g)	MSD Volume Used (g)	LCS Known pCi	MS Error Estimate	LCS Error Estimate	MSD Added pCi	Error Estimate
Am-241	A/B-07	596.000	10/19/2015	0.790	0.9999		268.44		0.00	0.000	0.000	0.00	0.000
SrY-90	A/B-07	649.430	10/19/2015	0.850	0.9999		292.51		0.00	0.000	0.000	0.00	0.000
TC-99 MS	TC-2a	22043.636	7/5/2014	U-1									
Tracers													
fraction	Isotope	Sol #	Activity dpm/g	Solution Date	Volume Used (g)	Approx Addition	Tracer						
							Balance Printer Tapes						
							LCS						
							Matrix Spike						

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Aliquot Worksheet

Work Order		Run		Analysis Code		Rpt Units		Lab Deadline		Technician	
15-10098		1		GaGBT_ThSr		liters		10/21/2015		MHIGHTOWER	

Lab Fraction	Auxier & Associates, Inc.		Sample		Muffle Data		Dilution Data			Aliquot Data		MS Aliquot Data		H-3 Solids Only	
	Client ID	LCS	Type	Sample	Ratio Post/Pre	No of Dils	Dil Factor	Ratio	Aliquot	Net Equiv	Aliquot	Net Equiv	Water Added (ml)	H3 Dist Aliq	
01	LCS	LCS	LCS						1.0000E+00	1.0000E+00					
02	BLANK	MBL	MBL						1.0000E+00	1.0000E+00					
03	KC86-051-J	DUP	DUP						2.0000E-01	2.0000E-01					
04	KC86-051-J	DO	DO						2.0000E-01	2.0000E-01					
05	KC86-051-L	TRG	TRG						1.7000E-01	1.7000E-01					

Comments

Technician: Mr Date: 10/19/15



Gravimetric Worksheet

Work Order	Run	Analysis Code	Gravimetric Carrier	Carrier Conc (mg/ml)	Technician
15-10098	1	GaGbT_ThSr			MHIGHTOWER

TRetec Fraction	Auxier & Associates, Inc. Client ID	Sample Type	Carrier Data Carrier Added (ml)	Filter Data			Gravimetric % Recovery
				Filter Tare (g)	Filter Final (g)	Filter Net (g)	
01	LCS	LCS		7.5870	7.5872	0.0002	
02	BLANK	MBL		7.6081	7.6082	0.0001	
03	DUP	DUP		7.4707	7.5144	0.0437	
04	KC86-051-J	DO		7.6070	7.6470	0.0400	
05	KC86-051-L	TRG		7.6053	7.6485	0.0432	

Technician: _____ Date: 10/19/15

TDS / TSS Worksheet

Work Order	Run	Analysis Code	Technician
15-10098	1	GaGbT_ThSr	MHIGHTOWER

TRetec Fraction	Auxier & Associates, Inc.		Aliquot ml	Filter Data			TDS/TSS (mg/L)	Maximum Aliq (mL)
	Client ID			Filter Tare (g)	Filter Final (g)	Filter Net (g)		
04	KC86-051-U		5.0000	7.5990	7.6012	0.0022	440.0000	227.27
05	KC86-051-L		5.0000	7.4620	7.4648	0.0028	560.0000	178.57

Technician: Date: 10/19/15

2019/15
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Detector ID	Sample ID	Alpha	Beta	Count Time	Voltage	TOD
B3	1510098-04	38	193	120	1410	10/19/15 01:45
B4	1510098-05	24	228	120	1410	10/19/15 01:45
B2	1510098-03	32	206	120	1410	10/19/15 01:45
A3	1510098-01	21674	40503	120	1410	10/19/15 01:45
B1	1510098-02	5	165	120	1410	10/19/15 01:45

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GPC Detector Report
(ALL Backgrounds)

AG
10/19/15

Detector	Alpha/Beta	Calibration Date	Count Date	Bkg CPM	PFW	LCL	Mean	UCL
LB4110A - A1	Alpha	11/18/2007	10/19/2015	1.67E-02	P	-1.83E+01	2.23E-01	1.87E+01
LB4110A - A2	Alpha	11/18/2007	10/19/2015	1.00E-01	P	-1.55E+01	2.01E-01	1.59E+01
LB4110A - A3	Alpha	11/18/2007	10/19/2015	5.00E-02	P	-1.51E+01	1.77E-01	1.55E+01
LB4110A - A4	Alpha	11/18/2007	10/19/2015	1.17E-01	P	-1.60E+01	1.85E-01	1.64E+01
LB4110A - B1	Alpha	11/18/2007	10/19/2015	6.67E-02	P	-8.69E-02	7.19E-02	2.31E-01
LB4110A - B2	Alpha	11/18/2007	10/19/2015	1.00E-01	P	-6.92E-02	7.57E-02	2.21E-01
LB4110A - B3	Alpha	11/18/2007	10/19/2015	3.33E-02	P	-6.23E-02	5.68E-02	1.76E-01
LB4110A - B4	Alpha	11/18/2007	10/19/2015	1.50E-01	P	-1.22E-01	7.68E-02	2.75E-01
LB4110A - C1	Alpha	11/18/2007	10/19/2015	3.33E-02	P	-1.30E-01	8.70E-02	3.04E-01
LB4110A - C2	Alpha	11/18/2007	10/19/2015	1.67E-02	P	-1.57E-01	7.81E-02	3.14E-01
LB4110A - C3	Alpha	11/18/2007	10/19/2015	1.67E-02	P	-1.56E-01	8.96E-02	3.35E-01
LB4110A - C4	Alpha	11/18/2007	10/19/2015	5.00E-02	P	-6.48E-02	6.98E-02	2.05E-01
LB4110A - D1	Alpha	11/18/2007	10/19/2015	8.33E-02	P	-5.34E-02	7.76E-02	2.09E-01
LB4110A - D2	Alpha	11/18/2007	10/19/2015	1.50E-01	P	-6.60E-02	5.96E-02	1.85E-01
LB4110A - D3	Alpha	11/18/2007	10/19/2015	3.33E-02	P	-5.27E-02	6.36E-02	1.80E-01
LB4110A - D4	Alpha	11/18/2007	10/19/2015	6.67E-02	P	-6.39E-02	6.81E-02	2.00E-01
LB4110R - A1	Alpha	11/24/2006	10/15/2015	1.67E-01	P	-9.11E-02	9.48E-02	2.81E-01
LB4110R - A2	Alpha	11/24/2006	10/15/2015	1.67E-02	P	-8.24E-02	7.04E-02	2.23E-01
LB4110R - A3	Alpha	11/24/2006	10/15/2015	1.67E-01	P	-6.75E-02	8.18E-02	2.31E-01
LB4110R - A4	Alpha	11/24/2006	10/15/2015	5.00E-02	P	-5.07E-02	6.88E-02	1.88E-01
LB4110R - B1	Alpha	11/24/2006	10/15/2015	2.00E-01	P	-8.57E-02	6.23E-02	2.10E-01
LB4110R - B2	Alpha	11/24/2006	10/15/2015	2.17E-01	P	-2.81E+01	3.29E-01	2.88E+01
LB4110R - B3	Alpha	11/24/2006	10/15/2015	2.83E-01	P	-6.37E-02	7.21E-02	2.08E-01
LB4110R - B4	Alpha	11/24/2006	10/15/2015	3.33E-02	P	-5.91E-02	6.75E-02	1.94E-01
LB4110R - C1	Alpha	11/24/2006	10/15/2015	1.83E-01	P	-7.25E-02	7.20E-02	2.16E-01
LB4110R - C2	Alpha	11/24/2006	10/15/2015	2.33E-01	P	-7.41E-02	6.64E-02	2.07E-01
LB4110R - C3	Alpha	11/24/2006	10/15/2015	1.50E-01	P	-7.88E-02	8.39E-02	2.47E-01
LB4110R - C4	Alpha	11/24/2006	10/15/2015	2.33E-01	P	-5.87E-02	7.68E-02	2.12E-01
LB4110R - D1	Alpha	11/24/2006	11/1/2014	0.00E+00	P	-1.06E-01	6.70E-02	2.40E-01
LB4110R - D2	Alpha	11/24/2006	11/1/2014	0.00E+00	P	-8.23E-02	6.65E-02	2.15E-01
LB4110R - D3	Alpha	11/24/2006	11/1/2014	0.00E+00	P	-8.71E-02	6.63E-02	2.20E-01
LB4110R - D4	Alpha	11/24/2006	11/1/2014	0.00E+00	P	-8.04E-02	7.08E-02	2.22E-01
LB5100 - 1	Alpha	7/10/2006	10/26/2007	5.00E-02	P	-1.56E-02	9.58E-02	2.07E-01

GPC Detector Report
(ALL Backgrounds)

AG
10/19/15

Detector	Alpha/Beta	Calibration Date	Count Date	Bkg CPM	PPW	LCL	Mean	UCL
LB4110A - A1	Beta	11/18/2007	10/19/2015	1.15E+00	P	-2.48E+02	6.44E+00	2.61E+02
LB4110A - A2	Beta	11/18/2007	10/19/2015	1.33E+00	P	-2.59E+01	2.57E+00	3.10E+01
LB4110A - A3	Beta	11/18/2007	10/19/2015	1.43E+00	P	-4.29E+01	2.47E+00	4.78E+01
LB4110A - A4	Beta	11/18/2007	10/19/2015	5.97E+00	F	-2.69E+01	4.17E+00	3.52E+01
LB4110A - B1	Beta	11/18/2007	10/19/2015	1.58E+00	P	-8.91E+00	2.87E+00	1.46E+01
LB4110A - B2	Beta	11/18/2007	10/19/2015	1.28E+00	P	-6.40E+00	1.86E+00	1.01E+01
LB4110A - B3	Beta	11/18/2007	10/19/2015	1.17E+00	P	-2.83E-01	1.41E+00	3.11E+00
LB4110A - B4	Beta	11/18/2007	10/19/2015	1.15E+00	P	-6.37E+00	1.87E+00	1.01E+01
LB4110A - C1	Beta	11/18/2007	10/19/2015	1.32E+00	P	-4.54E+00	1.94E+00	8.42E+00
LB4110A - C2	Beta	11/18/2007	10/19/2015	9.50E-01	P	4.04E-01	1.27E+00	2.13E+00
LB4110A - C3	Beta	11/18/2007	10/19/2015	1.37E+00	P	4.63E-01	1.56E+00	2.66E+00
LB4110A - C4	Beta	11/18/2007	10/19/2015	1.15E+00	P	-1.51E+00	1.91E+00	5.33E+00
LB4110A - D1	Beta	11/18/2007	10/19/2015	1.72E+00	P	-2.09E+00	2.40E+00	6.89E+00
LB4110A - D2	Beta	11/18/2007	10/19/2015	4.45E+00	F	-3.87E+00	2.42E+00	8.71E+00
LB4110A - D3	Beta	11/18/2007	10/19/2015	4.32E+00	F	2.06E-01	4.07E+00	7.92E+00
LB4110A - D4	Beta	11/18/2007	10/19/2015	7.30E+00	F	-7.53E+00	2.57E+00	1.27E+01
LB4110R - A1	Beta	11/24/2006	10/15/2015	1.27E+00	P	-5.32E+01	3.17E+00	5.95E+01
LB4110R - A2	Beta	11/24/2006	10/15/2015	6.50E-01	P	-4.20E+01	1.94E+00	4.59E+01
LB4110R - A3	Beta	11/24/2006	10/15/2015	1.32E+00	P	-3.90E+01	2.45E+00	4.39E+01
LB4110R - A4	Beta	11/24/2006	10/15/2015	1.12E+00	P	-3.86E+01	2.11E+00	4.29E+01
LB4110R - B1	Beta	11/24/2006	10/15/2015	1.50E+00	P	-4.08E+01	1.89E+00	4.46E+01
LB4110R - B2	Beta	11/24/2006	10/15/2015	1.58E+00	P	-5.97E+04	4.88E+02	6.06E+04
LB4110R - B3	Beta	11/24/2006	10/15/2015	1.53E+00	P	-4.07E+01	2.35E+00	4.55E+01
LB4110R - B4	Beta	11/24/2006	10/15/2015	8.83E-01	P	-4.10E+01	1.76E+00	4.45E+01
LB4110R - C1	Beta	11/24/2006	10/15/2015	1.70E+00	P	-4.09E+01	2.58E+00	4.61E+01
LB4110R - C2	Beta	11/24/2006	10/15/2015	2.02E+00	F	-4.08E+01	2.47E+00	4.57E+01
LB4110R - C3	Beta	11/24/2006	10/15/2015	1.65E+00	P	-4.12E+01	2.27E+00	4.57E+01
LB4110R - C4	Beta	11/24/2006	10/15/2015	1.93E+00	P	-4.66E+01	2.59E+00	5.17E+01
LB4110R - D1	Beta	11/24/2006	11/1/2014	0.00E+00	P	-4.36E+01	5.31E+00	5.43E+01
LB4110R - D2	Beta	11/24/2006	11/1/2014	0.00E+00	P	-4.67E+01	1.79E+00	5.03E+01
LB4110R - D3	Beta	11/24/2006	11/1/2014	0.00E+00	P	-5.02E+01	5.28E+00	6.07E+01
LB4110R - D4	Beta	11/24/2006	11/1/2014	0.00E+00	P	-4.64E+01	2.13E+00	5.07E+01
LB5100 - 1	Beta	7/10/2006	10/26/2007	4.52E+00	F	-3.19E-01	1.58E+00	3.48E+00

GPC Detector Report
(ALL Efficiencies)

AG
10/19/15

Detector	Alpha/Beta	Calibration Date	Count Date	Eff	PFW	LCL	Mean	UCL
LB4110A - A1	Alpha	11/18/2007	10/19/2015	0.2301	P	0.0233	0.2201	0.4170
LB4110A - A2	Alpha	11/18/2007	10/19/2015	0.2114	P	-0.0135	0.1813	0.3761
LB4110A - A3	Alpha	11/18/2007	10/19/2015	0.1961	P	-0.0343	0.1733	0.3809
LB4110A - A4	Alpha	11/18/2007	10/19/2015	0.2272	P	-0.0133	0.1940	0.4014
LB4110A - B1	Alpha	11/18/2007	10/19/2015	0.2125	P	0.1939	0.2225	0.2512
LB4110A - B2	Alpha	11/18/2007	10/19/2015	0.2201	P	0.1881	0.2179	0.2477
LB4110A - B3	Alpha	11/18/2007	10/19/2015	0.2399	P	0.1423	0.2324	0.3225
LB4110A - B4	Alpha	11/18/2007	10/19/2015	0.2252	P	0.2048	0.2332	0.2617
LB4110A - C1	Alpha	11/18/2007	10/19/2015	0.2086	P	0.1971	0.2191	0.2412
LB4110A - C2	Alpha	11/18/2007	10/19/2015	0.2200	P	0.1997	0.2246	0.2496
LB4110A - C3	Alpha	11/18/2007	10/19/2015	0.2491	P	0.2247	0.2485	0.2722
LB4110A - C4	Alpha	11/18/2007	10/19/2015	0.2179	P	0.1984	0.2243	0.2502
LB4110A - D1	Alpha	11/18/2007	10/19/2015	0.2216	P	0.1796	0.2287	0.2777
LB4110A - D2	Alpha	11/18/2007	10/19/2015	0.2507	P	0.2021	0.2542	0.3062
LB4110A - D3	Alpha	11/18/2007	10/19/2015	0.2560	P	0.2068	0.2599	0.3131
LB4110A - D4	Alpha	11/18/2007	10/19/2015	0.1900	P	0.1499	0.1962	0.2425
LB4110R - A1	Alpha	11/24/2006	10/15/2015	0.2233	P	0.1212	0.2378	0.3544
LB4110R - A2	Alpha	11/24/2006	10/15/2015	0.2038	P	0.1845	0.2177	0.2508
LB4110R - A3	Alpha	11/24/2006	10/15/2015	0.2036	P	0.1920	0.2225	0.2530
LB4110R - A4	Alpha	11/24/2006	10/15/2015	0.2386	P	0.2118	0.2436	0.2753
LB4110R - B1	Alpha	11/24/2006	10/15/2015	0.1865	P	0.1663	0.2204	0.2746
LB4110R - B2	Alpha	11/24/2006	10/15/2015	0.1886	P	0.1628	0.2122	0.2617
LB4110R - B3	Alpha	11/24/2006	10/15/2015	0.2324	P	0.1948	0.2419	0.2890
LB4110R - B4	Alpha	11/24/2006	10/15/2015	0.2099	P	0.1778	0.2266	0.2753
LB4110R - C1	Alpha	11/24/2006	10/15/2015	0.2058	P	0.1794	0.2129	0.2464
LB4110R - C2	Alpha	11/24/2006	10/15/2015	0.2055	P	0.1881	0.2214	0.2547
LB4110R - C3	Alpha	11/24/2006	10/15/2015	0.2265	P	0.2028	0.2369	0.2710
LB4110R - C4	Alpha	11/24/2006	10/15/2015	0.2003	P	0.1759	0.2177	0.2596
LB4110R - D1	Alpha	11/24/2006	11/1/2014	0.0000	W	-0.0281	0.1904	0.4089
LB4110R - D2	Alpha	11/24/2006	11/1/2014	0.0000	W	-0.0314	0.2165	0.4644
LB4110R - D3	Alpha	11/24/2006	11/1/2014	0.0000	W	-0.0308	0.2127	0.4562
LB4110R - D4	Alpha	11/24/2006	11/1/2014	0.0000	W	-0.0260	0.1714	0.3689
LB5100 - 1	Alpha	7/10/2006	10/26/2007	0.3368	P	0.3332	0.3455	0.3578

GPC Detector Report
(ALL Efficiencies)

AG
10/19/15

Detector	Alpha/Beta	Calibration Date	Count Date	Eff	PFW	LCL	Mean	UCL
LB4110A - A1	Beta	11/18/2007	10/19/2015	0.5396	P	0.2610	0.5625	0.8640
LB4110A - A2	Beta	11/18/2007	10/19/2015	0.4765	P	0.2069	0.4674	0.7278
LB4110A - A3	Beta	11/18/2007	10/19/2015	0.4687	P	0.1483	0.4665	0.7848
LB4110A - A4	Beta	11/18/2007	10/19/2015	0.5371	P	0.1984	0.5081	0.8178
LB4110A - B1	Beta	11/18/2007	10/19/2015	0.5292	P	0.4671	0.5344	0.6016
LB4110A - B2	Beta	11/18/2007	10/19/2015	0.5228	P	0.4676	0.5266	0.5856
LB4110A - B3	Beta	11/18/2007	10/19/2015	0.5979	P	0.3487	0.5462	0.7436
LB4110A - B4	Beta	11/18/2007	10/19/2015	0.5491	P	0.4959	0.5563	0.6168
LB4110A - C1	Beta	11/18/2007	10/19/2015	0.4878	P	0.4388	0.5122	0.5857
LB4110A - C2	Beta	11/18/2007	10/19/2015	0.5321	P	0.4056	0.5190	0.6323
LB4110A - C3	Beta	11/18/2007	10/19/2015	0.6265	P	0.5281	0.6002	0.6723
LB4110A - C4	Beta	11/18/2007	10/19/2015	0.5463	P	0.4555	0.5360	0.6164
LB4110A - D1	Beta	11/18/2007	10/19/2015	0.6661	P	0.3814	0.5791	0.7768
LB4110A - D2	Beta	11/18/2007	10/19/2015	0.6409	P	0.4420	0.5989	0.7558
LB4110A - D3	Beta	11/18/2007	10/19/2015	0.6451	P	0.4853	0.6197	0.7542
LB4110A - D4	Beta	11/18/2007	10/19/2015	0.4876	P	0.3589	0.4727	0.5866
LB4110R - A1	Beta	11/24/2006	10/15/2015	0.5598	P	0.4864	0.5706	0.6548
LB4110R - A2	Beta	11/24/2006	10/15/2015	0.5149	P	0.4282	0.5126	0.5970
LB4110R - A3	Beta	11/24/2006	10/15/2015	0.5119	P	0.4579	0.5394	0.6209
LB4110R - A4	Beta	11/24/2006	10/15/2015	0.6156	P	0.5118	0.5959	0.6799
LB4110R - B1	Beta	11/24/2006	10/15/2015	0.4844	P	0.4266	0.5365	0.6464
LB4110R - B2	Beta	11/24/2006	10/15/2015	0.4802	P	-63.4394	0.0038	63.4469
LB4110R - B3	Beta	11/24/2006	10/15/2015	0.6028	P	0.4855	0.5959	0.7064
LB4110R - B4	Beta	11/24/2006	10/15/2015	0.5369	P	0.4453	0.5467	0.6480
LB4110R - C1	Beta	11/24/2006	10/15/2015	0.4747	P	0.4160	0.5001	0.5843
LB4110R - C2	Beta	11/24/2006	10/15/2015	0.5197	P	0.4365	0.5342	0.6319
LB4110R - C3	Beta	11/24/2006	10/15/2015	0.5670	P	0.4867	0.5744	0.6621
LB4110R - C4	Beta	11/24/2006	10/15/2015	0.5195	P	0.4354	0.5252	0.6150
LB4110R - D1	Beta	11/24/2006	11/1/2014	0.0000	W	-0.0678	0.4553	0.9785
LB4110R - D2	Beta	11/24/2006	11/1/2014	0.0000	W	-0.0756	0.5116	1.0989
LB4110R - D3	Beta	11/24/2006	11/1/2014	0.0000	W	-0.0736	0.4969	1.0674
LB4110R - D4	Beta	11/24/2006	11/1/2014	0.0000	W	-0.0630	0.4090	0.8811
LB5100 - 1	Beta	7/10/2006	10/26/2007	0.4428	F	0.4555	0.4731	0.4906