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STL

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Tel: 314 298 8566 Fax: 314 298 8757
www.stl-inc.com

ANALYTICAL REPORT

PROJECT NO. 5601

Li-Tungsten

Lot #: F7G050168

Ted Johnson

Environmental Chemical Corpora
1746 Cole Blvd
Bldg 21, Suite 350
Golden, CO 80401

TESTAMERICA LABORATORIES, INC. (FKA STL)

Ivan Vania
Project Manager

July 25, 2007

Case Narrative
LOT NUMBER: **F7G050168**

This report contains the analytical results for the sample received under chain of custody by STL St. Louis on July 5, 2007. This sample is associated with your Li-Tungsten project.

The analytical results included in this report meet all applicable quality control procedure requirements.

The test results in this report meet all NELAP requirements for parameters in which accreditations are held by STL St. Louis. Any exceptions to NELAP requirements are noted in the case narrative. The case narrative is an integral part of this report.

All chemical analysis results are based upon sample as received, wet weight, unless noted otherwise. All radiochemistry results are based upon sample as dried and ground with the exception of tritium, unless requested wet weight by the client.

Observations/Nonconformances
Reference the chain of custody and condition upon receipt report for any variations on receipt conditions and temperature of samples on receipt.

There were no nonconformances or observations noted with any analysis on this lot.

CUR 1738

Environmental Chemical Corporation
1746 Cole Blvd.
Bldg. 21, Suite 350
Lakewood, CO 80401
Phone: (303) 298-7607
Fax: (303) 298-7837

COC Number:

Customer Name: ECC – Li Tungsten
Address: 63 Herb Hill Road, Glen Cove, NY 11542

Contact: Theodore Johnson
Phone: (303) 472 - 8834
Fax: (516) 665- 8531

ECC Project Manager: Phil O'Dwyer
Address: 63 Herb Hill Road, Glen Cove, NY 11542

Phone: (614) 402 - 2020
Customer Project Name: Li Tungsten

SAMPLE NUMBER	DATE	TIME	TYPE	CLIENT SAMPLE IDENTIFIER	TESTS	CONTAINER(S)	MATRIX
5601-FSS-SU3-1011	6/22/2007	11:10	FSS	Parcel C	Ra-226/Ra-228, Iso-Th, Iso-U	1 Gallon Pl Bag	Soil
5601-FSS-SU3-1015	6/22/2007	11:10	FSS	Parcel C		1 Gallon Pl Bag	Soil
5601-FSS-SU3-1016	6/22/2007	11:10	FSS	Parcel C		1 Gallon Pl Bag	Soil
5601-FSS-SU9-1007	6/22/2007	11:00	FSS	Parcel C		1 Gallon Pl Bag	Soil
5601-FSS-SU9-1010	6/22/2007	11:25	FSS	Parcel C		1 Gallon Pl Bag	Soil
5601-FSS-SU9-1011	6/22/2007	10:45	FSS	Parcel C		1 Gallon Pl Bag	Soil
5601-FSS-SU9-1020	6/22/2007	11:25	FSS	Parcel C		1 Gallon Pl Bag	Soil
5601-FSS-SU9-1021	6/22/2007	11:25	FSS	Parcel C		1 Gallon Pl Bag	Soil
5601-FSS-SU9-10B1-1	6/29/2007	10:45	FSS	Parcel C		1 Gallon Pl Bag	Soil
5601-FSS-SU9-10B2-1	6/29/2007	10:50	FSS	Parcel C		1 Gallon Pl Bag	Soil
N/A							

Notes:
Ship to: Severn Trent Laboratory, St Louis
13715 Rider Trail N., Earth City, Mo 63045
Phone: 314-298-8566
Request Turnaround Time: 7 Day

7-2-07 MJ
~~Samples cooled below 4 C~~

Laboratory Receipt Information
Cooler/Container Intact? Yes____ No____
Samples Received At Below 4 C? Yes____ No____
Samples Containers Intact? Yes____ No____
Cooler/Container Custody Seal? Yes____ No____

CUSTODY TRANSFER RECORD

Relinquished By	Company	Date	Time	Received By	Company	Date	Time
Print: Ted Johnson Sign:	ECC	7/3/2007	16:15	Print: Brian Daniels	STL	7/5/07	09:5
Print:				Print:			
Print:				Print:			

STL

Lot #(s): F7G050148
- 1738 -

Condition Upon Receipt Form

Client: ECC
Quote No: 72311
COC/RFA No: N/A
Initiated By: BD
Date: 7/5/07
Time: 09:15

Shipping Information

Shipper Name: FE
Shipping # (s):*
1. 7996 6917 2256
2.
3.
4.
5.
6.
7.
8.
9.
10.

Multiple Packages Y (N)
Sample Temperature (s):**
1. ambient
2.
3.
4.
5.
6.
7.
8.
9.
10.

*Numbered shipping lines correspond to Numbered Sample Temp lines

**Sample must be received at 4°C ± 2°C- If not, note contents below. Temperature variance does NOT affect the following: Metals-Liquid or Rad tests- Liquid or Solids

Condition (Circle "Y" for yes, "N" for no and "N/A" for not applicable):

1.	Y (N)	Was sample received broken?	8.	(Y) N	Sample received with Chain of Custody?
2.	Y N (N/A)	Was sample received with proper pH[1]? (If not, make note below)	9.	(Y) N	Chain of Custody matches sample ID's on container(s)?
3.	Y N	If N/A-Was pH taken by original STL Lab?	10.	(Y) N	Are there custody seals present on cooler?
4.	(Y) N	Sample received in proper containers?	11.	Y (N) N/A	Do custody seals on cooler appear to be tampered with?
5.	(Y) N	Sample volume sufficient for analysis?	12.	Y (N)	Are there custody seals present on bottles?
6.	Y N (N/A)	Headspace in VOA or TOX liquid samples? (If Yes, note sample ID's below)	13.	Y N (N/A)	Do custody seals on bottles appear to be tampered with?
7.	(Y) N	Were contents of cooler frisked after opening, but before unpacking?	14.	Y N	Was Internal COC/Workshare received?

[1] For DOE-AL (Pantex, LANL, Sandia) sites, pH of ALL containers received must be verified, EXCEPT VOA, TOX and soils.

Notes:

Corrective Action:
- ☐ Client Contact Name: _____ Informed by: _____
- ☐ Sample(s) processed "as is"
- ☐ Sample(s) on hold until: _____ If released, notify: _____

Project Management Review: [signature] Date: 7-6-7

THIS FORM MUST BE COMPLETED AT THE TIME THE ITEMS ARE BEING CHECKED IN. IF ANY ITEM IS COMPLETED BY SOMEONE OTHER THAN THE INITIATOR, THEN THAT PERSON IS REQUIRED TO APPLY THEIR INITIAL AND THE DATE NEXT TO THAT ITEM.

METHODS SUMMARY

F7G050168

PARAMETER	ANALYTICAL METHOD	PREPARATION METHOD
Isotopic Thorium by Alpha Spectroscopy	EML A-01-R MOD	
Isotopic Uranium by Alpha Spectroscopy	EML A-01-R MOD	
Radium-226 by GFPC	EPA 903.0 MOD	
Radium-228 by GFPC	EPA 904 MOD	

References:

EML "ENVIRONMENTAL MEASUREMENTS LABORATORY PROCEDURES MANUAL" HASL-300 28TH EDITION, VOLUME I and II DEPARTMENT OF ENERGY

EPA "EASTERN ENVIRONMENTAL RADIATION FACILITY RADIOCHEMISTRY PROCEDURES MANUAL" US EPA EPA 520/5-84-006 AUGUST 1984

SAMPLE SUMMARY

F7G050168

WO #	SAMPLE#	CLIENT SAMPLE ID	SAMPLED DATE	SAMP TIME
J2C1G	001	5601-FSS-SU3-1011	06/22/07	11:10
J2C1V	002	5601-FSS-SU3-1015	06/22/07	11:10
J2C1W	003	5601-FSS-SU3-1016	06/22/07	11:10
J2C1X	004	5601-FSS-SU9-1007	06/22/07	11:00
J2C10	005	5601-FSS-SU9-1010	06/22/07	11:25
J2C11	006	5601-FSS-SU9-1011	06/22/07	10:45
J2C13	007	5601-FSS-SU9-1020	06/22/07	11:25
J2C15	008	5601-FSS-SU9-1021	06/22/07	11:25
J2C19	009	5601-FSS-SU9-10B1-1	06/29/07	10:45
J2C2D	010	5601-FSS-SU9-10B2-1	06/29/07	10:50

NOTE(S):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

Environmental Chemical Corporation

Client Sample ID: 5601-FSS-SU3-1011

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F7G050168-001
Work Order: J2C1G
Matrix: SOLID

Date Collected: 06/22/07 1110
Date Received: 07/05/07 0915

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Radium 226 by EPA 903.0 MOD				pCi/g		Batch # 7186382	Yld % 93
Radium (226)	1.12		0.26	1.00	0.16	07/05/07	07/24/07
Radium 228 by GFPC EPA 904 MOD				pCi/g		Batch # 7186384	Yld % 94
Radium 228	0.95	J	0.42	1.00	0.63	07/05/07	07/24/07
Iso URANIUM (LONG CT) DOE A-01-R MOD				pCi/g		Batch # 7190361	Yld % 90
Uranium 234	0.70		0.14	0.10	0.03	07/09/07	07/13/07
Uranium 235/236	0.014	J	0.019	0.100	0.013	07/09/07	07/13/07
Uranium 238	0.60		0.12	0.10	0.01	07/09/07	07/13/07
Iso THORIUM (LONG CT) DOE A-01-R MOD				pCi/g		Batch # 7190360	Yld % 90
Thorium 228	0.90		0.17	0.10	0.03	07/09/07	07/13/07
Thorium 230	0.86		0.17	0.10	0.02	07/09/07	07/13/07
Thorium 232	0.84		0.16	0.10	0.02	07/09/07	07/13/07

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC

J Result is greater than sample detection limit but less than stated reporting limit.

Environmental Chemical Corporation

Client Sample ID: 5601-FSS-SU3-1011 DUP

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F7G050168-001X
Work Order: J2C1G
Matrix: SOLID

Date Collected: 06/22/07 1110
Date Received: 07/05/07 0915

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Radium 226 by EPA 903.0 MOD				pCi/g		Batch # 7186382	Yld % 99
Radium (226)	**0.88**	J	**0.23**	1.00	**0.16**	07/05/07	07/24/07
Radium 228 by GFPC EPA 904 MOD				pCi/g		Batch # 7186384	Yld % 108
Radium 228	**0.62**	J	**0.35**	1.00	**0.55**	07/05/07	07/24/07
Iso THORIUM (LONG CT) DOE A-01-R MOD				pCi/g		Batch # 7190360	Yld % 90
Thorium 228	**0.96**		**0.19**	0.10	**0.03**	07/09/07	07/13/07
Thorium 230	**0.83**		**0.17**	0.10	**0.03**	07/09/07	07/13/07
Thorium 232	**0.87**		**0.17**	0.10	**0.01**	07/09/07	07/13/07
Iso URANIUM (LONG CT) DOE A-01-R MOD				pCi/g		Batch # 7190361	Yld % 92
Uranium 234	**0.69**		**0.14**	0.10	**0.03**	07/09/07	07/13/07
Uranium 235/236	0.022	U	0.023	0.100	0.025	07/09/07	07/13/07
Uranium 238	**0.74**		**0.14**	0.10	**0.02**	07/09/07	07/13/07

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC

J Result is greater than sample detection limit but less than stated reporting limit.
U Result is less than the sample detection limit.

Environmental Chemical Corporation

Client Sample ID: 5601-FSS-SU3-1015

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F7G050168-002
Work Order: J2C1V
Matrix: SOLID

Date Collected: 06/22/07 1110
Date Received: 07/05/07 0915

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Radium 226 by EPA 903.0 MOD				pCi/g		Batch # 7186382	Yld % 92
Radium (226)	0.94	J	0.23	1.00	0.18	07/05/07	07/24/07
Radium 228 by GFPC EPA 904 MOD				pCi/g		Batch # 7186384	Yld % 88
Radium 228	1.24		0.46	1.00	0.66	07/05/07	07/24/07
Iso URANIUM (LONG CT) DOE A-01-R MOD				pCi/g		Batch # 7190361	Yld % 97
Uranium 234	0.56		0.12	0.10	0.02	07/09/07	07/13/07
Uranium 235/236	0.046	J	0.031	0.100	0.012	07/09/07	07/13/07
Uranium 238	0.59		0.12	0.10	0.02	07/09/07	07/13/07
Iso THORIUM (LONG CT) DOE A-01-R MOD				pCi/g		Batch # 7190360	Yld % 89
Thorium 228	0.93		0.18	0.10	0.03	07/09/07	07/13/07
Thorium 230	0.78		0.16	0.10	0.02	07/09/07	07/13/07
Thorium 232	0.83		0.17	0.10	0.02	07/09/07	07/13/07

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC

J Result is greater than sample detection limit but less than stated reporting limit.

Environmental Chemical Corporation

Client Sample ID: 5601-FSS-SU3-1016

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F7G050168-003
Work Order: J2C1W
Matrix: SOLID

Date Collected: 06/22/07 1110
Date Received: 07/05/07 0915

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Radium 226 by EPA 903.0 MOD				pCi/g		Batch # 7186382	Yld % 80
Radium (226)	0.94	J	0.25	1.00	0.18	07/05/07	07/24/07
Radium 228 by GFPC EPA 904 MOD				pCi/g		Batch # 7186384	Yld % 76
Radium 228	1.36		0.54	1.00	0.79	07/05/07	07/24/07
Iso URANIUM (LONG CT) DOE A-01-R MOD				pCi/g		Batch # 7190361	Yld % 88
Uranium 234	0.67		0.14	0.10	0.02	07/09/07	07/13/07
Uranium 235/236	0.034	J	0.027	0.100	0.023	07/09/07	07/13/07
Uranium 238	0.75		0.15	0.10	0.01	07/09/07	07/13/07
Iso THORIUM (LONG CT) DOE A-01-R MOD				pCi/g		Batch # 7190360	Yld % 90
Thorium 228	0.89		0.17	0.10	0.03	07/09/07	07/13/07
Thorium 230	0.71		0.14	0.10	0.02	07/09/07	07/13/07
Thorium 232	0.82		0.16	0.10	0.01	07/09/07	07/13/07

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC

J Result is greater than sample detection limit but less than stated reporting limit.

Environmental Chemical Corporation

Client Sample ID: 5601-FSS-SU9-1007

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F7G050168-004
Work Order: J2C1X
Matrix: SOLID

Date Collected: 06/22/07 1100
Date Received: 07/05/07 0915

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Radium 226 by EPA 903.0 MOD				pCi/g		Batch # 7186382	Yld % 91
Radium (226)	0.82	J	0.23	1.00	0.18	07/05/07	07/24/07
Radium 228 by GFPC EPA 904 MOD				pCi/g		Batch # 7186384	Yld % 89
Radium 228	1.25		0.48	1.00	0.69	07/05/07	07/24/07
Iso URANIUM (LONG CT) DOE A-01-R MOD				pCi/g		Batch # 7190361	Yld % 87
Uranium 234	1.01		0.19	0.10	0.03	07/09/07	07/13/07
Uranium 235/236	0.060	J	0.037	0.100	0.014	07/09/07	07/13/07
Uranium 238	0.91		0.17	0.10	0.02	07/09/07	07/13/07
Iso THORIUM (LONG CT) DOE A-01-R MOD				pCi/g		Batch # 7190360	Yld % 87
Thorium 228	0.74		0.15	0.10	0.03	07/09/07	07/13/07
Thorium 230	0.71		0.15	0.10	0.03	07/09/07	07/13/07
Thorium 232	0.88		0.17	0.10	0.02	07/09/07	07/13/07

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC

J Result is greater than sample detection limit but less than stated reporting limit.

Environmental Chemical Corporation

Client Sample ID: 5601-FSS-SU9-1010

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F7G050168-005
Work Order: J2C10
Matrix: SOLID

Date Collected: 06/22/07 1125
Date Received: 07/05/07 0915

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Radium 226 by EPA 903.0 MOD				pCi/g		Batch # 7186382	Yld % 85
Radium (226)	0.94	J	0.25	1.00	0.17	07/05/07	07/24/07
Radium 228 by GFPC EPA 904 MOD				pCi/g		Batch # 7186384	Yld % 92
Radium 228	0.74	J	0.41	1.00	0.62	07/05/07	07/24/07
Iso URANIUM (LONG CT) DOE A-01-R MOD				pCi/g		Batch # 7190361	Yld % 98
Uranium 234	0.66		0.13	0.10	0.02	07/09/07	07/13/07
Uranium 235/236	0.022	J	0.021	0.100	0.021	07/09/07	07/13/07
Uranium 238	0.63		0.13	0.10	0.02	07/09/07	07/13/07
Iso THORIUM (LONG CT) DOE A-01-R MOD				pCi/g		Batch # 7190360	Yld % 91
Thorium 228	0.79		0.16	0.10	0.03	07/09/07	07/13/07
Thorium 230	0.77		0.15	0.10	0.02	07/09/07	07/13/07
Thorium 232	0.76		0.15	0.10	0.02	07/09/07	07/13/07

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC

J Result is greater than sample detection limit but less than stated reporting limit.

Environmental Chemical Corporation

Client Sample ID: 5601-FSS-SU9-1011

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F7G050168-006
Work Order: J2C11
Matrix: SOLID

Date Collected: 06/22/07 1045
Date Received: 07/05/07 0915

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Radium 226 by EPA 903.0 MOD				pCi/g		Batch # 7186382	Yld % 87
Radium (226)	1.17		0.27	1.00	0.15	07/05/07	07/24/07
Radium 228 by GFPC EPA 904 MOD				pCi/g		Batch # 7186384	Yld % 92
Radium 228	1.01		0.42	1.00	0.63	07/05/07	07/24/07
Iso URANIUM (LONG CT) DOE A-01-R MOD				pCi/g		Batch # 7190361	Yld % 95
Uranium 234	0.64		0.13	0.10	0.03	07/09/07	07/13/07
Uranium 235/236	0.026	J	0.023	0.100	0.020	07/09/07	07/13/07
Uranium 238	0.60		0.12	0.10	0.01	07/09/07	07/13/07
Iso THORIUM (LONG CT) DOE A-01-R MOD				pCi/g		Batch # 7190360	Yld % 90
Thorium 228	0.88		0.17	0.10	0.03	07/09/07	07/13/07
Thorium 230	0.61		0.13	0.10	0.02	07/09/07	07/13/07
Thorium 232	0.92		0.18	0.10	0.02	07/09/07	07/13/07

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC

J Result is greater than sample detection limit but less than stated reporting limit.

Environmental Chemical Corporation

Client Sample ID: 5601-FSS-SU9-1020

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F7G050168-007
Work Order: J2C13
Matrix: SOLID

Date Collected: 06/22/07 1125
Date Received: 07/05/07 0915

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Radium 226 by EPA 903.0 MOD				pCi/g		Batch # 7186382	Yld % 77
Radium (226)	1.19		0.29	1.00	0.19	07/05/07	07/24/07
Radium 228 by GFPC EPA 904 MOD				pCi/g		Batch # 7186384	Yld % 83
Radium 228	1.04		0.44	1.00	0.64	07/05/07	07/24/07
Iso URANIUM (LONG CT) DOE A-01-R MOD				pCi/g		Batch # 7190361	Yld % 95
Uranium 234	0.72		0.14	0.10	0.02	07/09/07	07/13/07
Uranium 235/236	0.047	J	0.032	0.100	0.013	07/09/07	07/13/07
Uranium 238	0.55		0.12	0.10	0.02	07/09/07	07/13/07
Iso THORIUM (LONG CT) DOE A-01-R MOD				pCi/g		Batch # 7190360	Yld % 86
Thorium 228	0.81		0.16	0.10	0.04	07/09/07	07/13/07
Thorium 230	0.76		0.15	0.10	0.02	07/09/07	07/13/07
Thorium 232	0.89		0.17	0.10	0.01	07/09/07	07/13/07

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC

J Result is greater than sample detection limit but less than stated reporting limit.

Environmental Chemical Corporation

Client Sample ID: 5601-FSS-SU9-1021

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F7G050168-008
Work Order: J2C15
Matrix: SOLID

Date Collected: 06/22/07 1125
Date Received: 07/05/07 0915

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Radium 226 by EPA 903.0 MOD				pCi/g		Batch # 7186382	Yld % 94
Radium (226)	0.74	J	0.22	1.00	0.19	07/05/07	07/24/07
Radium 228 by GFPC EPA 904 MOD				pCi/g		Batch # 7186384	Yld % 98
Radium 228	1.16		0.40	1.00	0.56	07/05/07	07/24/07
Iso URANIUM (LONG CT) DOE A-01-R MOD				pCi/g		Batch # 7190361	Yld % 94
Uranium 234	0.58		0.12	0.10	0.03	07/09/07	07/13/07
Uranium 235/236	0.016	U	0.020	0.100	0.025	07/09/07	07/13/07
Uranium 238	0.67		0.13	0.10	0.01	07/09/07	07/13/07
Iso THORIUM (LONG CT) DOE A-01-R MOD				pCi/g		Batch # 7190360	Yld % 85
Thorium 228	0.79		0.16	0.10	0.02	07/09/07	07/13/07
Thorium 230	0.72		0.15	0.10	0.02	07/09/07	07/13/07
Thorium 232	0.69		0.15	0.10	0.02	07/09/07	07/13/07

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC

J Result is greater than sample detection limit but less than stated reporting limit.
U Result is less than the sample detection limit.

Environmental Chemical Corporation

Client Sample ID: 5601-FSS-SU9-10B1-1

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F7G050168-009
Work Order: J2C19
Matrix: SOLID

Date Collected: 06/29/07 1045
Date Received: 07/05/07 0915

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Radium 226 by EPA 903.0 MOD				pCi/g		Batch # 7186382	Yld % 94
Radium (226)	0.84	J	0.22	1.00	0.16	07/05/07	07/24/07
Radium 228 by GFPC EPA 904 MOD				pCi/g		Batch # 7186384	Yld % 102
Radium 228	0.75	J	0.37	1.00	0.56	07/05/07	07/24/07
Iso URANIUM (LONG CT) DOE A-01-R MOD				pCi/g		Batch # 7190361	Yld % 78
Uranium 234	0.52		0.12	0.10	0.02	07/09/07	07/13/07
Uranium 235/236	0.023	J	0.026	0.100	0.016	07/09/07	07/13/07
Uranium 238	0.57		0.13	0.10	0.03	07/09/07	07/13/07
Iso THORIUM (LONG CT) DOE A-01-R MOD				pCi/g		Batch # 7190360	Yld % 88
Thorium 228	0.79		0.16	0.10	0.03	07/09/07	07/13/07
Thorium 230	0.72		0.15	0.10	0.02	07/09/07	07/13/07
Thorium 232	0.77		0.16	0.10	0.02	07/09/07	07/13/07

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC

J Result is greater than sample detection limit but less than stated reporting limit.

Environmental Chemical Corporation

Client Sample ID: 5601-FSS-SU9-10B2-1

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F7G050168-010
Work Order: J2C2D
Matrix: SOLID

Date Collected: 06/29/07 1050
Date Received: 07/05/07 0915

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Radium 226 by EPA 903.0 MOD				pCi/g		Batch # 7186382	Yld % 88
Radium (226)	0.99	J	0.26	1.00	0.19	07/05/07	07/24/07
Radium 228 by GFPC EPA 904 MOD				pCi/g		Batch # 7186384	Yld % 93
Radium 228	1.22		0.41	1.00	0.57	07/05/07	07/24/07
Iso URANIUM (LONG CT) DOE A-01-R MOD				pCi/g		Batch # 7190361	Yld % 92
Uranium 234	0.51		0.11	0.10	0.03	07/09/07	07/13/07
Uranium 235/236	0.029	J	0.026	0.100	0.028	07/09/07	07/13/07
Uranium 238	0.61		0.12	0.10	0.03	07/09/07	07/13/07
Iso THORIUM (LONG CT) DOE A-01-R MOD				pCi/g		Batch # 7190360	Yld % 91
Thorium 228	0.87		0.17	0.10	0.02	07/09/07	07/13/07
Thorium 230	0.72		0.15	0.10	0.02	07/09/07	07/13/07
Thorium 232	1.00		0.19	0.10	0.03	07/09/07	07/13/07

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC

J Result is greater than sample detection limit but less than stated reporting limit.

METHOD BLANK REPORT

Severn Trent Laboratories - Radiochemistry

Client Lot ID: F7G050168
Matrix: SOLID

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date	Lab Sample ID
Radium 226 by EPA 903.0 MOD			**pCi/g**	**Batch # 7186382**		**Yld % 89**		**F7G050000-382B**
Radium (226)	0.13	U	0.12	1.00	0.17	07/05/07	07/24/07	
Radium 228 by GFPC EPA 904 MOD			**pCi/g**	**Batch # 7186384**		**Yld % 96**		**F7G050000-384B**
Radium 228	0.35	U	0.36	1.00	0.59	07/05/07	07/24/07	
Iso THORIUM (LONG CT) DOE A-01-R MOD			**pCi/g**	**Batch # 7190360**		**Yld % 97**		**F7G090000-360B**
Thorium 228	**0.011**	**J**	**0.014**	0.100	**0.01**	**07/09/07**	**07/13/07**	
Thorium 230	0.015	U	0.017	0.100	0.021	07/09/07	07/13/07	
Thorium 232	-0.0009	U	0.0079	0.100	0.016	07/09/07	07/13/07	
Iso URANIUM (LONG CT) DOE A-01-R MOD			**pCi/g**	**Batch # 7190361**		**Yld % 90**		**F7G090000-361B**
Uranium 234	0.0029	U	0.0087	0.100	0.018	07/09/07	07/13/07	
Uranium 235/236	0.0	U	0.0	0.1	0.01	07/09/07	07/13/07	
Uranium 238	0.011	U	0.014	0.100	0.018	07/09/07	07/13/07	

NOTE(S)

Data are incomplete without the case narrative.

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Bold results are greater than the MDC

J Result is greater than sample detection limit but less than stated reporting limit.
U Result is less than the sample detection limit.

Laboratory Control Sample Report

Severn Trent Laboratories - Radiochemistry

Client Lot ID: F7G050168
Matrix: SOLID

Parameter	Spike Amount	Result	Total Uncert. (2 σ+/-)	MDC	% Yld	% Rec	Lab Sample ID / QC Control Limits
Radium 226 by EPA 903.0 MOD			**pCi/g**	**903.0 MOD**			**F7G050000-382C**
Radium (226)	11.2	11.6	1.4	0.2	95	104	(55 - 135)
	Batch #:	7186382		**Analysis Date:**	07/24/07		
Radium 228 by GFPC EPA 904 MOD			**pCi/g**	**904 MOD**			**F7G050000-384C**
Radium 228	8.77	8.1	1.1	0.7	89	93	(53 - 131)
	Batch #:	7186384		**Analysis Date:**	07/24/07		
Iso THORIUM (LONG CT) DOE A-01-R MOD			**pCi/g**	**A-01-R MOD**			**F7G090000-360C**
Thorium 230	58.5	57.8	8.9	0.3	88	99	(81 - 122)
	Batch #:	7190360		**Analysis Date:**	07/13/07		
Iso URANIUM (LONG CT) DOE A-01-R MOD			**pCi/g**	**A-01-R MOD**			**F7G090000-361C**
Uranium 234	19.6	19.4	3.3	0.3	94	99	(76 - 128)
Uranium 238	19.6	17.8	3.1	0.2	94	91	(74 - 125)
	Batch #:	7190361		**Analysis Date:**	07/13/07		

NOTE(S)

MDC is determined by instrument performance only
Calculations are performed before rounding to avoid round-off error in calculated results

DUPLICATE EVALUATION REPORT

Severn Trent Laboratories - Radiochemistry

Client Lot ID: F7G050168
Matrix: SOLID

Date Sampled: 06/22/07
Date Received: 07/05/07

Parameter	SAMPLE Result		Total Uncert. (2σ+/-)	% Yld	DUPLICATE Result		Total Uncert. (2 σ+/-)	% Yld	QC Sample ID Precision	
Radium 226 by EPA 903.0 MOD				**pCi/g**	**903.0 MOD**				**F7G050168-001**	
Radium (226)	**1.12**		**0.26**	93	**0.88**	J	**0.23**	99	24	%RPD
	Batch #:		7186382	(Sample)	7186382		(Duplicate)			
Radium 228 by GFPC EPA 904 MOD				**pCi/g**	**904 MOD**				**F7G050168-001**	
Radium 228	**0.95**	J	**0.42**	94	**0.62**	J	**0.35**	108	42	%RPD
	Batch #:		7186384	(Sample)	7186384		(Duplicate)			
Iso THORIUM (LONG CT) DOE A-01-R MOD				**pCi/g**	**A-01-R MOD**				**F7G050168-001**	
Thorium 228	**0.90**		**0.17**	90	**0.96**		**0.19**	90	7	%RPD
Thorium 230	**0.86**		**0.17**	90	**0.83**		**0.17**	90	3	%RPD
Thorium 232	**0.84**		**0.16**	90	**0.87**		**0.17**	90	4	%RPD
	Batch #:		7190360	(Sample)	7190360		(Duplicate)			
Iso URANIUM (LONG CT) DOE A-01-R MOD				**pCi/g**	**A-01-R MOD**				**F7G050168-001**	
Uranium 234	**0.70**		**0.14**	90	**0.69**		**0.14**	92	2	%RPD
Uranium 235/236	**0.014**	J	**0.019**	90	0.022	U	0.023	92	41	%RPD
Uranium 238	**0.60**		**0.12**	90	**0.74**		**0.14**	92	21	%RPD
	Batch #:		7190361	(Sample)	7190361		(Duplicate)			

NOTE(S)

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Calculations are performed before rounding to avoid round-off error in calculated results

J Result is greater than sample detection limit but less than stated reporting limit.
U Result is less than the sample detection limit.

ALPHA SPECTROSCOPY

Alpha Spectroscopy

Thorium

SEVERN TRENT STL

Analysis Report for Alpha Spectroscopy

Batch: 7190360 **Operator:** 403293

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Sample ID	Work Order #	Aliquot	Dilution	Sigma	Instrument	RunDateTime	RunDuration	TracerID	TracerAnalyte	TracerAdded	TracerYield
F7G050168-001	J2C1G1AE	2.0054	1.00	2.00	AV14	7 / 13 / 07 15:10	240.00	rad05-0088	Th-229	3.650E+000	90.01%
		g									

Analyte	Activity		CountUnc	TotalUnc	MDA	DLC
Th-228	8.963E-001	pCi/g	1.192E-001	1.737E-001	2.510E-002	7.230E-003
Th-229	1.480E+000	pCi/g	1.614E-001	2.080E-001	2.684E-002	8.093E-003
Th-230	8.585E-001	pCi/g	1.166E-001	1.680E-001	2.318E-002	6.265E-003
Th-232	8.356E-001	pCi/g	1.146E-001	1.643E-001	2.077E-002	5.090E-003

Sample ID	Work Order #	Aliquot	Dilution	Sigma	Instrument	RunDateTime	RunDuration	TracerID	TracerAnalyte	TracerAdded	TracerYield
F7G050168-001X	J2C1G1AH	2.0144	1.00	2.00	AV18	7 / 13 / 07 15:10	240.00	rad05-0088	Th-229	3.634E+000	89.52%
		g									

Analyte	Activity		CountUnc	TotalUnc	MDA	DLC
Th-228	9.628E-001	pCi/g	1.268E-001	1.869E-001	2.973E-002	9.288E-003
Th-229	1.465E+000	pCi/g	1.646E-001	2.084E-001	2.191E-002	5.369E-003
Th-230	8.334E-001	pCi/g	1.179E-001	1.674E-001	2.634E-002	7.588E-003
Th-232	8.703E-001	pCi/g	1.196E-001	1.725E-001	1.111E-002	0.000E+000

Sample ID	Work Order #	Aliquot	Dilution	Sigma	Instrument	RunDateTime	RunDuration	TracerID	TracerAnalyte	TracerAdded	TracerYield
F7G050168-002	J2C1V1AE	2.0017	1.00	2.00	AV22	7 / 13 / 07 15:10	240.00	rad05-0088	Th-229	3.657E+000	89.12%
		g									

Analyte	Activity		CountUnc	TotalUnc	MDA	DLC
Th-228	9.258E-001	pCi/g	1.244E-001	1.813E-001	2.974E-002	9.289E-003
Th-229	1.468E+000	pCi/g	1.653E-001	2.086E-001	2.636E-002	7.593E-003
Th-230	7.778E-001	pCi/g	1.136E-001	1.587E-001	2.190E-002	5.366E-003
Th-232	8.303E-001	pCi/g	1.172E-001	1.665E-001	2.419E-002	6.539E-003

Sample ID	Work Order #	Aliquot	Dilution	Sigma	Instrument	RunDateTime	RunDuration	TracerID	TracerAnalyte	TracerAdded	TracerYield
F7G050168-003	J2C1W1AE	2.0032	1.00	2.00	AV46	7 / 13 / 07 15:10	240.00	rad05-0088	Th-229	3.654E+000	89.52%
		g									

Analyte	Activity		CountUnc	TotalUnc	MDA	DLC
Th-228	8.929E-001	pCi/g	1.181E-001	1.720E-001	2.781E-002	8.688E-003
Th-229	1.474E+000	pCi/g	1.597E-001	2.059E-001	2.275E-002	6.151E-003
Th-230	7.072E-001	pCi/g	1.049E-001	1.443E-001	2.274E-002	6.147E-003
Th-232	8.218E-001	pCi/g	1.124E-001	1.610E-001	1.039E-002	0.000E+000

Sample ID	Work Order #	Aliquot	Dilution	Sigma	Instrument	RunDateTime	RunDuration	TracerID	TracerAnalyte	TracerAdded	TracerYield
F7G050168-004	J2C1X1AE	2.0121	1.00	2.00	AV47	7 / 13 / 07 15:10	240.00	rad05-0088	Th-229	3.638E+000	86.76%
		g									

Analyte	Activity		CountUnc	TotalUnc	MDA	DLC
Th-228	7.404E-001	pCi/g	1.108E-001	1.528E-001	2.942E-002	9.189E-003
Th-229	1.422E+000	pCi/g	1.639E-001	2.016E-001	2.406E-002	6.505E-003
Th-230	7.143E-001	pCi/g	1.086E-001	1.487E-001	2.606E-002	7.507E-003
Th-232	8.793E-001	pCi/g	1.198E-001	1.731E-001	2.155E-002	5.282E-003

Sample ID	Work Order #	Aliquot	Dilution	Sigma	Instrument	RunDateTime	RunDuration	TracerID	TracerAnalyte	TracerAdded	TracerYield
F7G050168-005	J2C101AE	2.0173	1.00	2.00	AV48	7 / 13 / 07 15:10	240.00	rad05-0088	Th-229	3.629E+000	90.81%
		g									

Analyte	Activity		CountUnc	TotalUnc	MDA	DLC
Th-228	7.889E-001	pCi/g	1.120E-001	1.578E-001	2.823E-002	8.819E-003
Th-229	1.484E+000	pCi/g	1.601E-001	2.085E-001	1.061E-002	0.000E+000
Th-230	7.698E-001	pCi/g	1.101E-001	1.545E-001	2.079E-002	5.095E-003
Th-232	7.582E-001	pCi/g	1.090E-001	1.526E-001	2.069E-002	5.069E-003

Sample ID	Work Order #	Aliquot	Dilution	Sigma	Instrument	RunDateTime	RunDuration	TracerID	TracerAnalyte	TracerAdded	TracerYield
F7G050168-006	J2C111AE	2.0100	1.00	2.00	AV50	7 / 13 / 07 15:10	240.00	rad05-0088	Th-229	3.642E+000	90.00%
		g									

Analyte	Activity		CountUnc	TotalUnc	MDA	DLC

Sample ID	Work Order #	Aliquot	Dilution	Sigma	Instrument	RunDateTime	RunDuration	TracerID	TracerAnalyte		TracerAdded	TracerYield
						Th-228	8.769E-001	pCi/g	1.173E-001	1.704E-001	2.792E-002	8.720E-003
						Th-229	1.476E+000	pCi/g	1.613E-001	2.076E-001	4.156E-002	1.554E-002
						Th-230	6.072E-001	pCi/g	9.715E-002	1.295E-001	1.761E-002	3.562E-003
						Th-232	9.231E-001	pCi/g	1.195E-001	1.767E-001	2.045E-002	5.013E-003
F7G050168-007	J2C131AE	2.0017	1.00	2.00	AV51	7 / 13 / 07 15:10	240.00	rad05-0088	Th-229		3.657E+000	86.03%
		g				Analyte	Activity		CountUnc	TotalUnc	MDA	DLC
						Th-228	8.125E-001	pCi/g	1.174E-001	1.646E-001	4.185E-002	1.542E-002
						Th-229	1.417E+000	pCi/g	1.644E-001	2.007E-001	2.937E-002	9.173E-003
						Th-230	7.580E-001	pCi/g	1.115E-001	1.550E-001	2.398E-002	6.483E-003
						Th-232	8.909E-001	pCi/g	1.201E-001	1.746E-001	1.096E-002	0.000E+000
F7G050168-008	J2C151AE	2.0141	1.00	2.00	AV56	7 / 13 / 07 15:10	240.00	rad05-0088	Th-229		3.634E+000	85.37%
		g				Analyte	Activity		CountUnc	TotalUnc	MDA	DLC
						Th-228	7.880E-001	pCi/g	1.159E-001	1.620E-001	2.493E-002	6.739E-003
						Th-229	1.398E+000	pCi/g	1.668E-001	2.001E-001	2.248E-002	5.509E-003
						Th-230	7.165E-001	pCi/g	1.106E-001	1.511E-001	2.494E-002	6.743E-003
						Th-232	6.940E-001	pCi/g	1.083E-001	1.471E-001	1.915E-002	3.873E-003
F7G050168-009	J2C191AE	2.0046	1.00	2.00	AV57	7 / 13 / 07 15:10	240.00	rad05-0088	Th-229		3.652E+000	87.90%
		g				Analyte	Activity		CountUnc	TotalUnc	MDA	DLC
						Th-228	7.890E-001	pCi/g	1.123E-001	1.582E-001	2.838E-002	8.864E-003
						Th-229	1.446E+000	pCi/g	1.620E-001	2.035E-001	3.357E-002	1.146E-002
						Th-230	7.176E-001	pCi/g	1.068E-001	1.472E-001	2.320E-002	6.272E-003
						Th-232	7.748E-001	pCi/g	1.103E-001	1.554E-001	1.781E-002	3.603E-003
F7G050168-010	J2C2D1AE	2.0052	1.00	2.00	AV63	7 / 13 / 07 15:10	240.00	rad05-0088	Th-229		3.651E+000	91.10%
		g				Analyte	Activity		CountUnc	TotalUnc	MDA	DLC
						Th-228	8.652E-001	pCi/g	1.165E-001	1.684E-001	2.073E-002	5.080E-003
						Th-229	1.498E+000	pCi/g	1.606E-001	2.099E-001	2.075E-002	5.086E-003
						Th-230	7.250E-001	pCi/g	1.067E-001	1.475E-001	2.074E-002	5.083E-003
						Th-232	1.002E+000	pCi/g	1.255E-001	1.886E-001	2.652E-002	7.996E-003
F7G090000-360B	J2H401AA	2.0000	1.00	2.00	AV45	7 / 13 / 07 15:10	240.00	rad05-0088	Th-229		3.660E+000	97.26%
		g				Analyte	Activity		CountUnc	TotalUnc	MDA	DLC
						Th-228	1.065E-002	pCi/g	1.230E-002	1.428E-002	9.609E-003	0.000E+000
						Th-229	1.604E+000	pCi/g	1.532E-001	2.196E-001	1.616E-002	3.269E-003
						Th-230	1.510E-002	pCi/g	1.704E-002	1.717E-002	2.093E-002	5.659E-003
						Th-232	-8.838E-004	pCi/g	3.535E-003	7.906E-003	1.607E-002	3.251E-003
F7G090000-360C	J2H401AC	0.1312	1.00	2.00	AV49	7 / 13 / 07 15:10	240.00	rad05-0088	Th-229		5.579E+001	87.59%
		g				Analyte	Activity		CountUnc	TotalUnc	MDA	DLC
						Th-228	1.446E+000	pCi/g	6.318E-001	6.634E-001	4.804E-001	1.611E-001
						Th-229	2.201E+001	pCi/g	2.432E+000	3.072E+000	3.987E-001	1.203E-001
						Th-230	5.776E+001	pCi/g	3.678E+000	8.881E+000	3.443E-001	9.309E-002
						Th-232	9.741E-001	pCi/g	4.831E-001	5.019E-001	2.643E-001	5.348E-002

Sample ID	Work Order #	Aliquot	Dilution	Sigma	Instrument	RunDateTime	RunDuration	TracerID	TracerAnalyte	TracerAdded	TracerYield

Laboratory Control Sample Information

Sample ID	WRKNO	RegionName	Activity	StdAdded	Recovery	LCL	UCL
F7G090000-360C	J2H401AC	Th-230	5.776E+001	5.850E+001	98.74%	81.00	122.00

Sample Duplicate Information

Sample ID	Analyte	Sample Activity	Dup Sample ID	Dup Activity	RPD	RER	DER	Qualifier
F7G050168-001	Th-228	8.963E-001	F7G050168-001X	9.628E-001	7.15%	1.844E-001	2.606E-001	
	Th-230	8.585E-001	F7G050168-001X	8.334E-001	2.96%	7.476E-002	1.057E-001	
	Th-232	8.356E-001	F7G050168-001X	8.703E-001	4.07%	1.030E-001	1.456E-001	

Matrix Spike Information

SampID	SampMSID	RegionName	Sample Activity	MS Activity	StdAdded	MSRecovery

TestAmerica STL

Daily Pulsers

Daily Pulser Check - Severn Trent Lab

Pulser Date: 7/13/2007

Detector	Date/Time	Gross Counts Result	Gross Counts Criteria		Gross Counts P/F	FWHM (keV) Result	FWHM (keV) Criteria	FWHM (keV) P/F	Pulser Center Result	Pulser Center Criteria		Pulser Center P/F	Energy (keV) Result	Energy (keV) Criteria		Energy (keV) P/F
AV12	07/13/2007 9:11	7628	7588.7	+/- 5%	Pass	14.0	10 - 20	Pass	221.8	230.0	+/- 5%	Pass	4999	5058.4	+/- 25%	Pass
AV14	07/13/2007 7:55	7649	7638.3	+/- 5%	Pass	13.1	10 - 20	Pass	222.0	227.0	+/- 5%	Pass	5001	5037.2	+/- 25%	Pass
AV15	07/13/2007 7:55	7646	7770.5	+/- 5%	Pass	13.4	10 - 20	Pass	223.0	226.9	+/- 5%	Pass	5008	5036.6	+/- 25%	Pass
AV18	07/13/2007 7:55	7717	7714.5	+/- 5%	Pass	14.5	10 - 20	Pass	223.1	226.9	+/- 5%	Pass	5008	5036.4	+/- 25%	Pass
AV19	07/13/2007 7:55	7718	7269.8	+/- 5%	FAIL	13.9	10 - 20	Pass	220.9	227.7	+/- 5%	Pass	4993	5041.9	+/- 25%	Pass
AV19 OOS	07/13/2007 7:55	7718	7269.8	+/- 5%	FAIL	13.9	10 - 20	Pass	220.9	227.7	+/- 5%	Pass	4993	5041.9	+/- 25%	Pass
AV20	07/13/2007 7:55	7717	7503.6	+/- 5%	Pass	13.9	10 - 20	Pass	225.0	226.0	+/- 5%	Pass	5022	5029.9	+/- 25%	Pass
AV20 OK	07/13/2007 7:55	7717	7503.6	+/- 5%	Pass	13.9	10 - 20	Pass	225.0	226.0	+/- 5%	Pass	5022	5029.9	+/- 25%	Pass
AV21	07/13/2007 7:55	7715	7550.9	+/- 5%	Pass	13.5	10 - 20	Pass	223.0	226.0	+/- 5%	Pass	5008	5029.6	+/- 25%	Pass
AV22	07/13/2007 7:54	7701	7691.4	+/- 5%	Pass	14.4	10 - 20	Pass	222.8	225.0	+/- 5%	Pass	5007	5022.4	+/- 25%	Pass
AV24	07/13/2007 7:54	7695	7354.0	+/- 5%	Pass	21.3	10 - 20	FAIL	223.9	226.9	+/- 5%	Pass	5015	5036.4	+/- 25%	Pass
AV24 OOS	07/13/2007 7:54	7695	7354.0	+/- 5%	Pass	21.3	10 - 20	FAIL	223.9	226.9	+/- 5%	Pass	5015	5036.4	+/- 25%	Pass
AV45	07/13/2007 7:54	7648	7593.5	+/- 5%	Pass	14.8	10 - 20	Pass	221.1	225.6	+/- 5%	Pass	4994	5026.9	+/- 25%	Pass
AV46	07/13/2007 7:54	7652	7722.7	+/- 5%	Pass	13.1	10 - 20	Pass	224.0	225.8	+/- 5%	Pass	5015	5028.0	+/- 25%	Pass
AV46 OK	07/13/2007 7:54	7652	7722.7	+/- 5%	Pass	13.1	10 - 20	Pass	224.0	225.8	+/- 5%	Pass	5015	5028.0	+/- 25%	Pass
AV47	07/13/2007 7:54	7640	7532.5	+/- 5%	Pass	14.9	10 - 20	Pass	219.0	226.0	+/- 5%	Pass	4979	5029.6	+/- 25%	Pass
AV47 OK	07/13/2007 7:54	7640	7532.5	+/- 5%	Pass	14.9	10 - 20	Pass	219.0	226.0	+/- 5%	Pass	4979	5029.6	+/- 25%	Pass
AV48	07/13/2007 7:55	7637	7717.5	+/- 5%	Pass	15.1	10 - 20	Pass	221.0	224.0	+/- 5%	Pass	4994	5015.2	+/- 25%	Pass
AV49	07/13/2007 7:55	7615	7703.4	+/- 5%	Pass	14.7	10 - 20	Pass	224.0	226.0	+/- 5%	Pass	5015	5029.5	+/- 25%	Pass
AV49 OK	07/13/2007 7:55	7615	7703.4	+/- 5%	Pass	14.7	10 - 20	Pass	224.0	226.0	+/- 5%	Pass	5015	5029.5	+/- 25%	Pass
AV50	07/13/2007 7:55	7577	7660.9	+/- 5%	Pass	14.7	10 - 20	Pass	225.1	227.0	+/- 5%	Pass	5023	5037.2	+/- 25%	Pass
AV50 OK	07/13/2007 7:55	7577	7660.9	+/- 5%	Pass	14.7	10 - 20	Pass	225.1	227.0	+/- 5%	Pass	5023	5037.2	+/- 25%	Pass
AV51	07/13/2007 7:55	7234	7070.5	+/- 5%	Pass	13.7	10 - 20	Pass	227.0	223.0	+/- 5%	Pass	5037	5007.6	+/- 25%	Pass
AV51 OK	07/13/2007 7:55	7234	7070.5	+/- 5%	Pass	13.7	10 - 20	Pass	227.0	223.0	+/- 5%	Pass	5037	5007.6	+/- 25%	Pass
AV52	07/13/2007 6:20	6994	7156.4	+/- 5%	Pass	12.9	10 - 20	Pass	224.1	225.0	+/- 5%	Pass	5016	5022.4	+/- 25%	Pass
AV53	07/13/2007 6:20	7356	7144.1	+/- 5%	Pass	13.4	10 - 20	Pass	224.0	223.0	+/- 5%	Pass	5015	5007.8	+/- 25%	Pass
AV54	07/13/2007 6:20	7350	7313.1	+/- 5%	Pass	13.7	10 - 20	Pass	230.0	226.0	+/- 5%	Pass	5059	5029.5	+/- 25%	Pass
AV55	07/13/2007 6:20	7351	7132.9	+/- 5%	Pass	13.2	10 - 20	Pass	221.9	226.0	+/- 5%	Pass	5000	5029.7	+/- 25%	Pass
AV56	07/13/2007 6:20	7348	7163.7	+/- 5%	Pass	13.3	10 - 20	Pass	222.0	222.0	+/- 5%	Pass	5001	5000.7	+/- 25%	Pass
AV57	07/13/2007 6:20	7338	7309.5	+/- 5%	Pass	14.4	10 - 20	Pass	223.1	222.0	+/- 5%	Pass	5009	5000.6	+/- 25%	Pass
AV58	07/13/2007 6:20	7336	7249.2	+/- 5%	Pass	14.7	10 - 20	Pass	221.1	223.0	+/- 5%	Pass	4994	5008.0	+/- 25%	Pass
AV59	07/13/2007 6:20	7315	7141.4	+/- 5%	Pass	17.8	10 - 20	Pass	291.0	284.0	+/- 5%	Pass	5501	5450.6	+/- 25%	Pass

Detector	Date/Time	Gross Counts Result	Gross Counts Criteria		Gross Counts P/F	FWHM (keV) Result	FWHM (keV) Criteria	FWHM (keV) P/F	Pulser Center Result	Pulser Center Criteria		Pulser Center P/F	Energy (keV) Result	Energy (keV) Criteria		Energy (keV) P/F
AV60	07/13/2007 6:20	7325	7019.7	+/- 5%	Pass	54.5	10 - 20	FAIL	222.4	223.0	+/- 5%	Pass	5003	5007.5	+/- 25%	Pass
AV60 005	07/13/2007 7:55	7209	7019.7	+/- 5%	Pass	61.0	10 - 20	FAIL	222.1	223.0	+/- 5%	Pass	5001	5007.5	+/- 25%	Pass
AV63	07/13/2007 7:55	7011	7120.8	+/- 5%	Pass	12.6	10 - 20	Pass	223.0	223.0	+/- 5%	Pass	5008	5007.9	+/- 25%	Pass
AV63 OK	07/13/2007 6:20	7317	7120.8	+/- 5%	Pass	33.7	10 - 20	FAIL	221.8	223.0	+/- 5%	Pass	4999	5007.9	+/- 25%	Pass
AV64	07/13/2007 6:20	7325	7153.7	+/- 5%	Pass	14.1	10 - 20	Pass	221.9	224.0	+/- 5%	Pass	5000	5015.3	+/- 25%	Pass
AV66	07/13/2007 6:20	7306	7165.5	+/- 5%	Pass	13.5	10 - 20	Pass	218.9	222.0	+/- 5%	Pass	4978	5000.5	+/- 25%	Pass
AV67	07/13/2007 6:20	7424	7128.1	+/- 5%	Pass	18.7	10 - 20	Pass	224.0	224.1	+/- 5%	Pass	5015	5015.6	+/- 25%	Pass
AV68	07/13/2007 6:20	7426	7259.5	+/- 5%	Pass	13.9	10 - 20	Pass	222.0	222.0	+/- 5%	Pass	5001	5000.8	+/- 25%	Pass
AV69	07/13/2007 6:20	7374	7305.4	+/- 5%	Pass	16.6	10 - 20	Pass	221.0	222.0	+/- 5%	Pass	4994	5000.6	+/- 25%	Pass
AV70	07/13/2007 6:20	7416	7406.5	+/- 5%	Pass	14.4	10 - 20	Pass	220.0	222.6	+/- 5%	Pass	4986	5004.7	+/- 25%	Pass
AV71	07/13/2007 6:20	7417	7187.3	+/- 5%	Pass	14.0	10 - 20	Pass	219.9	225.0	+/- 5%	Pass	4985	5022.7	+/- 25%	Pass
AV72	07/13/2007 6:20	7417	7090.0	+/- 5%	Pass	13.2	10 - 20	Pass	224.0	223.9	+/- 5%	Pass	5015	5014.6	+/- 25%	Pass
AV73	07/13/2007 7:55	7320	7251.3	+/- 5%	Pass	24.3	10 - 20	FAIL	223.2	225.0	+/- 5%	Pass	5009	5022.4	+/- 25%	Pass
AV73 005	07/13/2007 6:20	7409	7251.3	+/- 5%	Pass	23.8	10 - 20	FAIL	223.2	225.0	+/- 5%	Pass	5009	5022.4	+/- 25%	Pass
AV75	07/13/2007 6:20	7217	7267.9	+/- 5%	Pass	12.9	10 - 20	Pass	223.1	224.1	+/- 5%	Pass	5008	5015.5	+/- 25%	Pass
AV76	07/13/2007 6:20	7150	7374.3	+/- 5%	Pass	13.0	10 - 20	Pass	222.9	224.0	+/- 5%	Pass	5007	5015.2	+/- 25%	Pass
AV77	07/13/2007 6:20	7557	7497.1	+/- 5%	Pass	13.1	10 - 20	Pass	224.0	224.0	+/- 5%	Pass	5015	5015.4	+/- 25%	Pass
AV78	07/13/2007 6:20	7555	7183.8	+/- 5%	FAIL	13.5	10 - 20	Pass	221.9	223.3	+/- 5%	Pass	5000	5009.8	+/- 25%	Pass
AV78 OK	07/13/2007 7:55	6967	7183.8	+/- 5%	Pass	13.2	10 - 20	Pass	221.9	223.3	+/- 5%	Pass	5000	5009.8	+/- 25%	Pass
AV79	07/13/2007 6:20	7552	7349.7	+/- 5%	Pass	13.3	10 - 20	Pass	220.9	222.0	+/- 5%	Pass	4993	5000.4	+/- 25%	Pass
AV80	07/13/2007 6:20	7345	7226.4	+/- 5%	Pass	12.6	10 - 20	Pass	223.0	224.1	+/- 5%	Pass	5008	5015.5	+/- 25%	Pass
AV81	07/13/2007 6:20	7547	7453.4	+/- 5%	Pass	13.3	10 - 20	Pass	222.0	223.0	+/- 5%	Pass	5000	5008.1	+/- 25%	Pass
AV82	07/13/2007 6:20	7545	7529.2	+/- 5%	Pass	13.7	10 - 20	Pass	224.1	224.0	+/- 5%	Pass	5016	5015.2	+/- 25%	Pass
AV83	07/13/2007 6:20	7377	7523.7	+/- 5%	Pass	12.9	10 - 20	Pass	222.1	222.0	+/- 5%	Pass	5001	5000.4	+/- 25%	Pass
AV84	07/13/2007 6:20	7334	7637.7	+/- 5%	Pass	12.9	10 - 20	Pass	224.1	223.0	+/- 5%	Pass	5016	5007.7	+/- 25%	Pass
AV85	07/13/2007 6:20	7274	7549.7	+/- 5%	Pass	13.0	10 - 20	Pass	221.9	223.0	+/- 5%	Pass	5000	5008.0	+/- 25%	Pass
AV86	07/13/2007 6:20	7690	7679.0	+/- 5%	Pass	17.3	10 - 20	Pass	224.1	223.9	+/- 5%	Pass	5016	5014.3	+/- 25%	Pass
AV87	07/13/2007 6:20	7313	7512.4	+/- 5%	Pass	12.9	10 - 20	Pass	221.9	223.0	+/- 5%	Pass	5000	5007.7	+/- 25%	Pass
AV88	07/13/2007 6:20	7717	7716.1	+/- 5%	Pass	14.1	10 - 20	Pass	224.1	224.0	+/- 5%	Pass	5016	5015.4	+/- 25%	Pass
AV89	07/13/2007 6:20	7715	7553.8	+/- 5%	Pass	13.7	10 - 20	Pass	221.1	222.6	+/- 5%	Pass	4994	5004.7	+/- 25%	Pass
AV90	07/13/2007 6:21	7711	7474.4	+/- 5%	Pass	13.9	10 - 20	Pass	224.1	224.1	+/- 5%	Pass	5016	5015.6	+/- 25%	Pass
AV92	07/13/2007 6:21	7474	7358.9	+/- 5%	Pass	12.3	10 - 20	Pass	223.0	223.9	+/- 5%	Pass	5008	5014.6	+/- 25%	Pass
AV93	07/13/2007 6:21	7426	7393.5	+/- 5%	Pass	12.7	10 - 20	Pass	223.0	223.0	+/- 5%	Pass	5008	5008.3	+/- 25%	Pass
AV94	07/13/2007 6:21	7647	7477.9	+/- 5%	Pass	13.5	10 - 20	Pass	221.9	222.0	+/- 5%	Pass	5000	5000.5	+/- 25%	Pass
AV95	07/13/2007 6:21	7645	7432.4	+/- 5%	Pass	13.5	10 - 20	Pass	218.9	222.2	+/- 5%	Pass	4978	5001.9	+/- 25%	Pass
AV96	07/13/2007 9:11	7576	7654.3	+/- 5%	Pass	14.5	10 - 20	Pass	221.9	222.6	+/- 5%	Pass	5000	5005.3	+/- 25%	Pass

Detector	Date/Time	Gross Counts Result	Gross Counts Criteria	Gross Counts P/F	FWHM (keV) Result	FWHM (keV) Criteria	FWHM (keV) P/F	Pulser Center Result	Pulser Center Criteria	Pulser Center P/F	Energy (keV) Result	Energy (keV) Criteria	Energy (keV) P/F
AV97	07/13/2007 9:11	7569	7649.9 +/- 5%	Pass	14.5	10 - 20	Pass	222.9	223.8 +/- 5%	Pass	5007	5014.0 +/- 25%	Pass
AV98	07/13/2007 9:11	7566	7582.0 +/- 5%	Pass	13.5	10 - 20	Pass	222.9	223.0 +/- 5%	Pass	5007	5007.6 +/- 25%	Pass

TestAmerica STL

Run Log

Logbook No.: 2972

STL
St. Louis

Alpha Spectrometry Runlog

	Date	Batch #	Sample #	Detector	Count Time	Analyte	Setup Initials	Process Initials
1	7-12-07	7192384	F7F140207-013	46	240 min	Th	GS	WW
2			-013X	47				
3			F7G110000-384B	48				
4			-384C	49				
5	7/13/7	Daily	Bkg + Source	1 min	1-98	QA	SE	—
6		7186400	F7F280220-001	67	960 min	Pu	WW	WW
7			-001X	68				
8		7190361	F7G050168-001	46	240 min	U		WW
9			-001X	47				
10			-002	48				
11			-003	50				
12			-004	51				
13			-005	56				
14			-006	57				
15			-007	63				
16			-008	14				
17			-009	22				
18			-010	12				
19			F7G090000-361B	15				
20			-361C	21				
21		7190360	F7G050168-001	14		Th		WW
22			-001X	18				
23			-002	22				
24			-003	46				
25			-004	47				
26			-005	48				
27			-006	50				
28			-007	51				
29			-008	56				

Reviewed By: WW Date: 7/13/07

SOP References: STL-RD-0210 Rev 8 05/30/07. Form: SL-RAD-0030, Revised 7/07/06
QC Type Suffixes: B=Blank; C=Laboratory Control Sample; L=Laboratory Control Sample Duplicate; S=Matrix Spike; D=Matrix Spike Duplicate; X=Sample Duplicate

Logbook No.: 2972

STL
St. Louis

Alpha Spectrometry Runlog

	Date	Batch #	Sample #	Detector	Count Time	Analyte	Setup Initials	Process Initials
1	7/13/07	7190360	F7G050168-009	57	240min	Th	LW	LW
2			-010	63				
3			F7G090000-360B	45				
4			-360C	49				
5		7190361	F7G050168-010	20		U		LW
6	7-14-07	Daily	Pulsers	1-98	1 min.	QA	GS	—
7	7-14-07	7187160	F7G020127-001	19	240min.	Pu	GS	LW
8			-001X	18				
9			-002	22				
10			-003	20				
11			-004	46				
12			-005	47				
13			-006	48				
14			-007	50				
15			-008	51				
16			-009	56				
17			-010	57				
18			-011	63				
19			-012	67				
20			-013	68				
21			-014	12				
22			F7G060000-160B	71				
23			-160C	72				
24	7/16/07	Daily	Pulsers	1-98	1 min	QA	LW	—
25		7187163	F7G020127-001	12	240min	U		LW
26			-001X	14				
27			-002	18				
28			-003	20				
29			-004	22				

Reviewed By: LW Date: 7/15/07

SOP References: STL-RD-0210 Rev 8 05/30/07. Form: SL-RAD-0030, Revised 7/07/06
QC Type Suffixes: B=Blank; C=Laboratory Control Sample; L=Laboratory Control Sample Duplicate; S=Matrix Spike; D=Matrix Spike Duplicate; X=Sample Duplicate.

240min LL or R 7/24/07

SEVERN TRENT **STL**

Prep Report for:

Thorium, Isotopic by Alpha Spectroscopy

Batch: 7190360 **Prep Analyst:** 403301

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

SampID	WRKNO	Aliquot	Dilution	Adj Aliquot	TracerID	TracerAnalyte	TracerAliquot	Low Level
F7G050168-001	J2C1G1AE	2.0054E+000 g	1.00	2.0054E+000 g	rad05-0088	Th-229	0.10	N
F7G050168-001X	J2C1G1AH	2.0144E+000 g	1.00	2.0144E+000 g	rad05-0088	Th-229	0.10	N
F7G050168-002	J2C1V1AE	2.0017E+000 g	1.00	2.0017E+000 g	rad05-0088	Th-229	0.10	N
F7G050168-003	J2C1W1AE	2.0032E+000 g	1.00	2.0032E+000 g	rad05-0088	Th-229	0.10	N
F7G050168-004	J2C1X1AE	2.0121E+000 g	1.00	2.0121E+000 g	rad05-0088	Th-229	0.10	N
F7G050168-005	J2C101AE	2.0173E+000 g	1.00	2.0173E+000 g	rad05-0088	Th-229	0.10	N
F7G050168-006	J2C111AE	2.0100E+000 g	1.00	2.0100E+000 g	rad05-0088	Th-229	0.10	N
F7G050168-007	J2C131AE	2.0017E+000 g	1.00	2.0017E+000 g	rad05-0088	Th-229	0.10	N
F7G050168-008	J2C151AE	2.0141E+000 g	1.00	2.0141E+000 g	rad05-0088	Th-229	0.10	N
F7G050168-009	J2C191AE	2.0046E+000 g	1.00	2.0046E+000 g	rad05-0088	Th-229	0.10	N
F7G050168-010	J2C2D1AE	2.0052E+000 g	1.00	2.0052E+000 g	rad05-0088	Th-229	0.10	N
F7G090000-360B	J2H401AA	2.0000E+000 g	1.00	2.0000E+000 g	rad05-0088	Th-229	0.10	N
F7G090000-360C	J2H401AC	1.3120E-001 g	1.00	1.3120E-001 g	rad05-0088	Th-229	0.10	N

14
18
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57
63
45
49

X

Spike Information

Sample ID	Standard ID	Analyte	Std Conc	Aliquot	Ref Date	StdAdded
F7G090000-360C	TRM-3_IsoTh	TH-230	1.299E+002 dpm/g	0.13 g	5/29/2003 12:00:00AM	5.850E+001 pCi/g

Spiked By: [signature] Spike Verified By: BS Spike Date: 7/9/07

SampID	WRKNO	Aliquot	Dilution	Adj Aliquot	TracerID	TracerAnalyte	TracerAliquot	Low Level

Standard Operating Procedures

	SOPNumber	Title	Revision
☐	STL-RC-0002	Planchet Preparation For Radiochemistry And Radiological Screening Analysis	4.00
☐	STL-RC-0003	Drying And Grinding Of Soil And Solid Samples	6.00
☐	STL-RC-0004	Preparation Of Soil, Sludge, And Filter Paper Samples For Radiochemical Analysis	10.00
☐	STL-RC-0090	Preparation Of Samples For Sequential Determination Of Isotopic Americium, Currium, Neptunium, Plutonium, Tho	4.00
☒	STL-RC-0100	Actinide Coprecipitation	9.00
☐	STL-RC-0232	Isotopic Thorium And/oR Neptunium in Water, Soil, Sludge, and Filters by Eichrom TEVA Separation Resins	7.00
☐	STL-RC-0238	Isotopic Uranium By Eichrom UTEVA Resin for Water, Soil, Sludge and Filters	7.00
☐	STL-RC-0240	Isotopic Americium, Curium, Plutonium, Thorium, and Uranium in Water, Soil, Sludge and Filters by Eichrome Sepa	5.00
☐	STL-RC-0241	Isotopic Americium, Plutonium, Curium, and Uranium in Water, Soil, Sludge and Filters by Eichrome Uteva and Tr	3.00
☒	STL-RC-0242	Isotopic Thorium, Plutonium and Uranium in Water, Soil, Sludge and Filters by Eichrome Separation Resin	6.00
☐	STL-RD-0201	Daily Operations Of An Alpha Spectroscopy System	2.00
☐	STL-RD-0203	Calibration And Maintenance Of A Alpha Spectroscopy System	1.00

KW per BS	7/12/07	BS	7/13/07
Column Analyst	Date	Coprecipitated By	Precip Date
KW	7/16/07		
Reviewed By	Review Date		
BS	7/13/07	KW	7/13/07
Analyst/Relenquished By	Release Date	Received By	Receipt Date

ST SEVERN TRENT STL

Alpha-Spectroscopy Analysis Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
7:11:31PM 7/13/2007

Analyst: 60040

Sample

Sample Name: F7G050168-001
SampleType: Sample
: J2C1G1AE
Sample Collection Date: 6/22/2007 11:10:00AM
Comment:

Spectrum #1 Analysis #1
Sample Weight : 2.0054g
Aliquot: N/A Aliquot Fraction: N/A
Lab Preparation:

Batch

Batch Name: 7190360
:
Description:

Client Name: Undefined
Client Contact:

Tracer

Tracer Name: Rad05-0088_Th229
Tracer Activity: 73.20 DPM/mL x (Vol.)0.10 mL = 7.32 DPM
Tracer Ref. Date: 3/19/2007 8:41:39AM

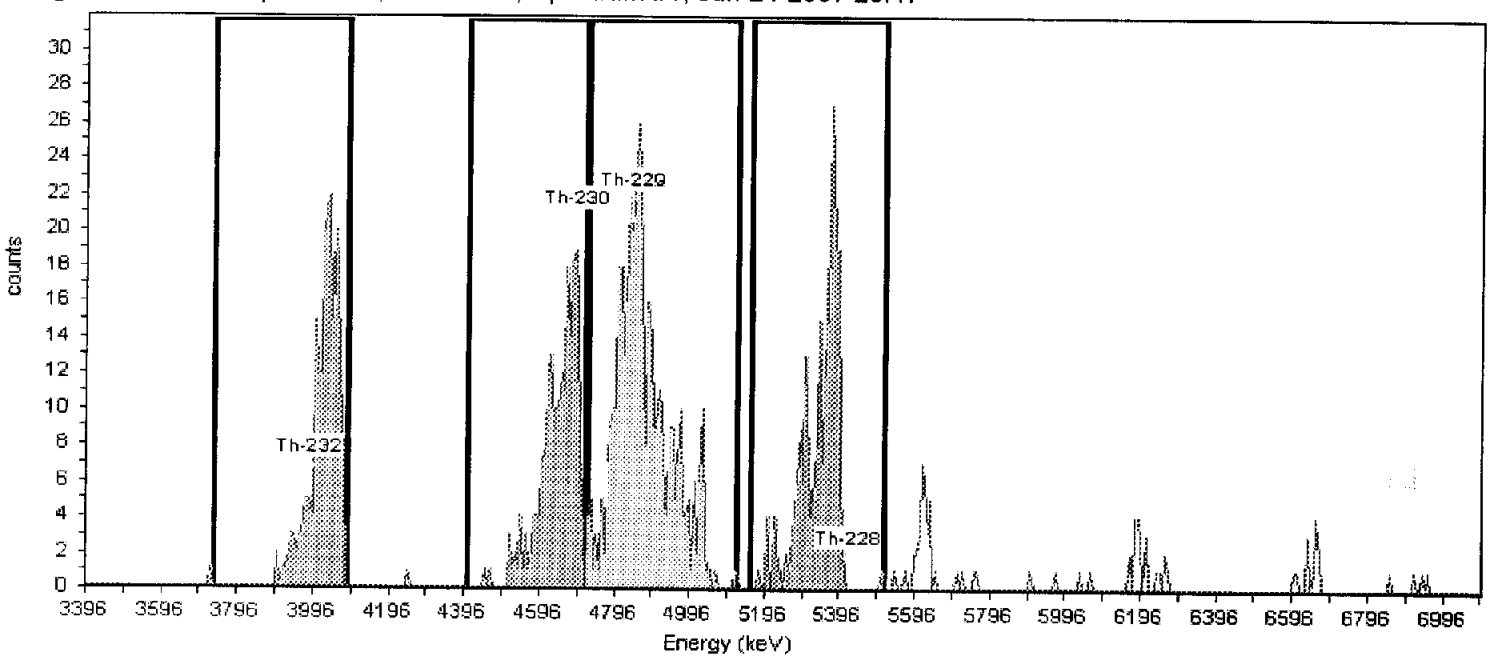
Tracer Nuclide: Th-229
Tracer Recovery: 90.01%

Acquisition

Detector: AV14
Serial Number: 41-172C4
Acquisition Start Date: 7/13/2007 3:10:31PM
Live Time: 240.00 min.
Real Time: 240.00 min.
Background Date: 6/24/2007 8:47:33PM

Calibration Name: June2007_AV14
Calibration Date: 6/26/2007 4:49:06PM
Energy Cal Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch²
Efficiency: 26.51% +/- 0.28% TPU(2 sigma)

Background Info: Sample: AV14; Det: AV14; Spectrum #1; Jun-24-2007 20:47



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = ThROI
Decay Correction: 7/13/2007 3:08:40PM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Thorium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
Th-232	3984.265	3730.172	4085.902	39.829	100.2	214.00	0.5000	214	8.356E-001	1.643E-001	5.090E-003	2.077E-002
Th-230	4688.465	4405.333	4717.504	27.189	99.7	219.00	0.7500	218	8.585E-001	1.680E-001	6.265E-003	2.318E-002
Th-229	4840.921	4724.764	5124.053	101.768	99.6	419.00	1.2500	418	1.480E+000	2.080E-001	8.093E-003	2.684E-002
Th-228	5421.705	5160.352	5516.082	54.249	99.8	229.00	1.0000	228	8.963E-001	1.737E-001	7.230E-003	2.510E-002

ST SEVERN TRENT STL

Alpha-Spectroscopy Analysis Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
9:27:24AM 7/16/2007

Analyst: 60040

Sample

Sample Name: F7G050168-001X
SampleType: Sample
: J2C1G1AH
Sample Collection Date: 6/22/2007 11:10:00AM
Comment:

Spectrum #1 Analysis #1
Sample Weight : 2.0144g
Aliquot: N/A Aliquot Fraction: N/A
Lab Preparation:

Batch

Batch Name: 7190360
:
Description:

Client Name: Undefined
Client Contact:

Tracer

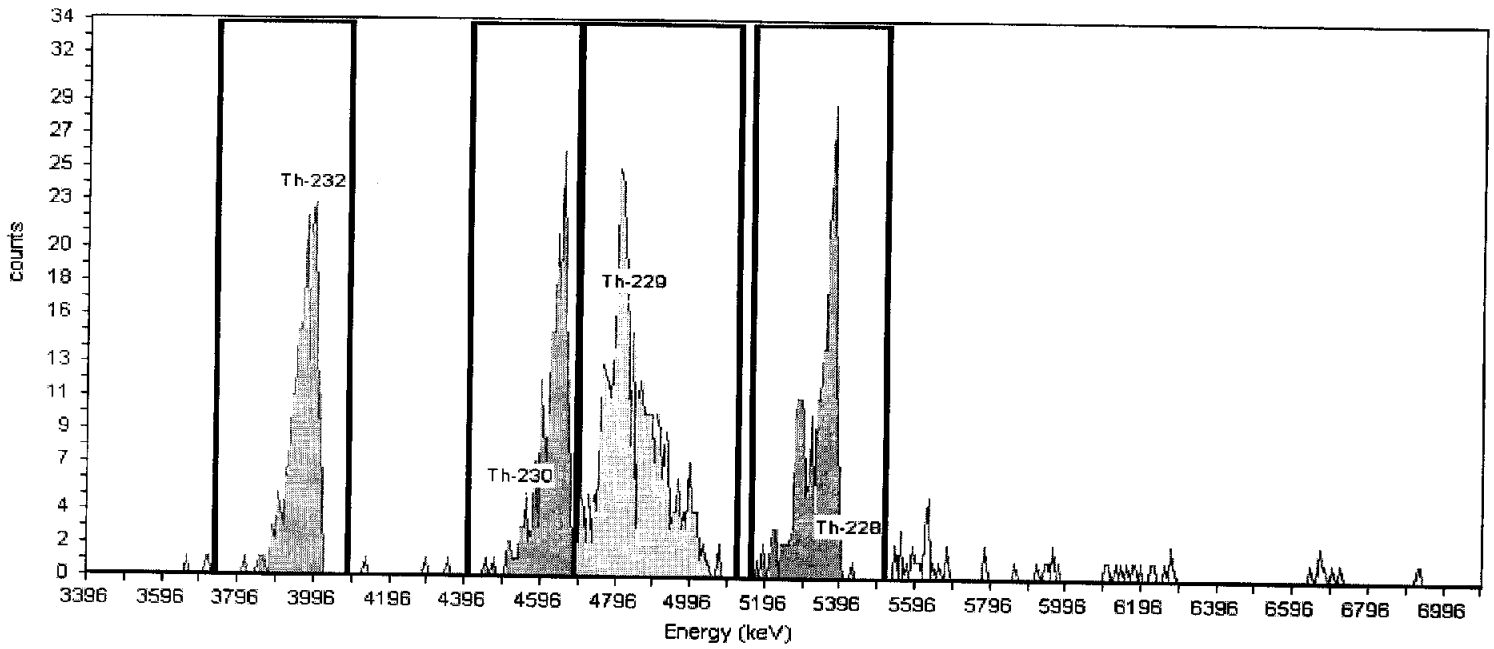
Tracer Name: Rad05-0088_Th229
Tracer Activity: 73.20 DPM/mL x (Vol.)0.10 mL = 7.32 DPM
Tracer Ref. Date: 3/19/2007 8:41:39AM

Tracer Nuclide: Th-229
Tracer Recovery: 89.52%

Acquisition

Detector: AV18
Serial Number: 41-172C6
Acquisition Start Date: 7/13/2007 3:10:32PM
Live Time: 240.00 min.
Real Time: 240.01 min.
Background Date: 6/24/2007 8:47:36PM
Background Info: Sample: AV18; Det: AV18; Spectrum #1; Jun-24-2007 20:47

Calibration Name: June2007_AV18
Calibration Date: 6/26/2007 7:41:40PM
Energy Cal: Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 25.30% +/- 0.27% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = ThROI
Decay Correction: 7/13/2007 3:08:40PM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Thorium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
Th-232	3984.265	3730.172	4085.902	72.546	100.2	212.00	0.0000	212	8.703E-001	1.725E-001	0.000E+000	1.111E-002
Th-230	4546.899	4405.333	4688.465	21.942	99.7	203.00	1.0000	202	8.334E-001	1.674E-001	7.588E-003	2.634E-002
Th-229	4840.921	4695.725	5124.053	74.533	99.6	397.00	0.5000	397	1.465E+000	2.084E-001	5.369E-003	2.191E-002
Th-228	5421.705	5160.352	5516.082	50.935	99.8	235.00	1.5000	234	9.628E-001	1.869E-001	9.288E-003	2.973E-002

Manual integration
Stulting ow 7/16/07

SEVERN TRENT STL

Alpha-Spectroscopy Analysis Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 9:28:27AM 7/16/2007

Sample

Sample Name: F7G050168-002
SampleType: Sample
: J2C1V1AE
Sample Collection Date: 6/22/2007 11:10:00AM
Comment:

Spectrum #1 Analysis #1
Sample Weight : 2.0017g
Aliquot: N/A Aliquot Fraction: N/A
Lab Preparation:

Batch

Batch Name: 7190360
:
Description:

Client Name: Undefined
Client Contact:

Tracer

Tracer Name: Rad05-0088_Th229
Tracer Activity: 73.20 DPM/mL x (Vol.)0.10 mL = 7.32 DPM
Tracer Ref. Date: 3/19/2007 8:41:39AM

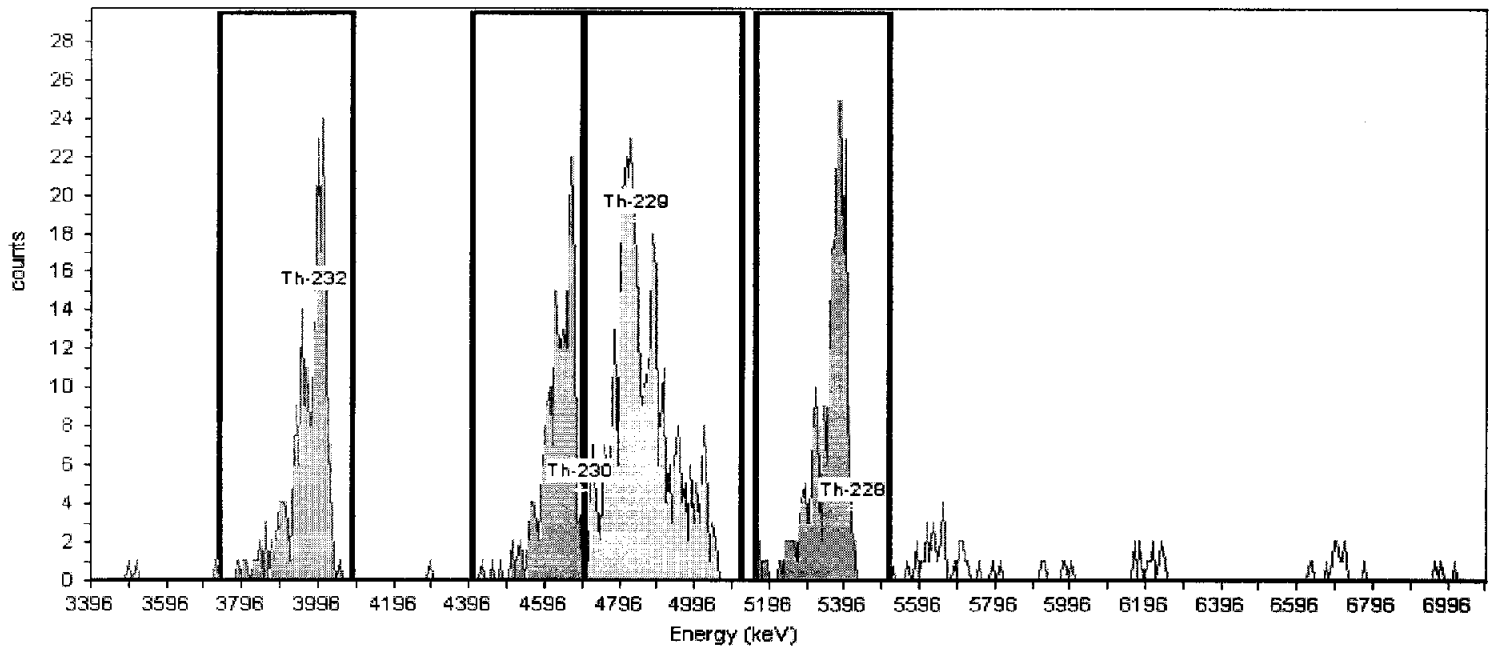
Tracer Nuclide: Th-229
Tracer Recovery: 89.12%

Acquisition

Detector: AV22
Serial Number: 41-172Q5
Acquisition Start Date: 7/13/2007 3:10:30PM
Live Time: 240.00 min.
Real Time: 240.01 min.
Background Date: 6/24/2007 8:47:42PM

Calibration Name: June2007_AV22
Calibration Date: 6/26/2007 10:35:39PM
Energy Cal: Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 25.58% +/- 0.27% TPU(2 sigma)

Background Info: Sample: AV22; Det: AV22; Spectrum #1; Jun-24-2007 20:47



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = ThROI
Decay Correction: 7/13/2007 3:08:40PM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Thorium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
Th-232	3984.265	3730.172	4085.902	79.895	100.2	203.00	0.7500	202	8.303E-001	1.665E-001	6.539E-003	2.419E-002
Th-230	4688.465	4405.333	4695.725	24.472	99.7	189.00	0.5000	189	7.778E-001	1.587E-001	5.366E-003	2.190E-002
Th-229	4840.921	4702.985	5124.053	118.079	99.6	400.00	1.0000	399	1.468E+000	2.086E-001	7.593E-003	2.636E-002
Th-228	5421.705	5160.352	5516.082	53.990	99.8	226.00	1.5000	225	9.258E-001	1.813E-001	9.289E-003	2.974E-002

manual integration
Shelling on 7/16/07

SEVERN TRENT **STL**

Alpha-Spectroscopy Analysis Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 9:29:53AM 7/16/2007

Sample

Sample Name: F7G050168-003
SampleType: Sample
: J2C1W1AE
Sample Collection Date: 6/22/2007 11:10:00AM
Comment:

Spectrum #1 Analysis #1
Sample Weight : 2.0032g
Aliquot: N/A Aliquot Fraction: N/A
Lab Preparation:

Batch

Batch Name: 7190360
:
Description:

Client Name: Undefined
Client Contact:

Tracer

Tracer Name: Rad05-0088_Th229
Tracer Activity: 73.20 DPM/mL x (Vol.)0.10 mL = 7.32 DPM
Tracer Ref. Date: 3/19/2007 8:41:39AM

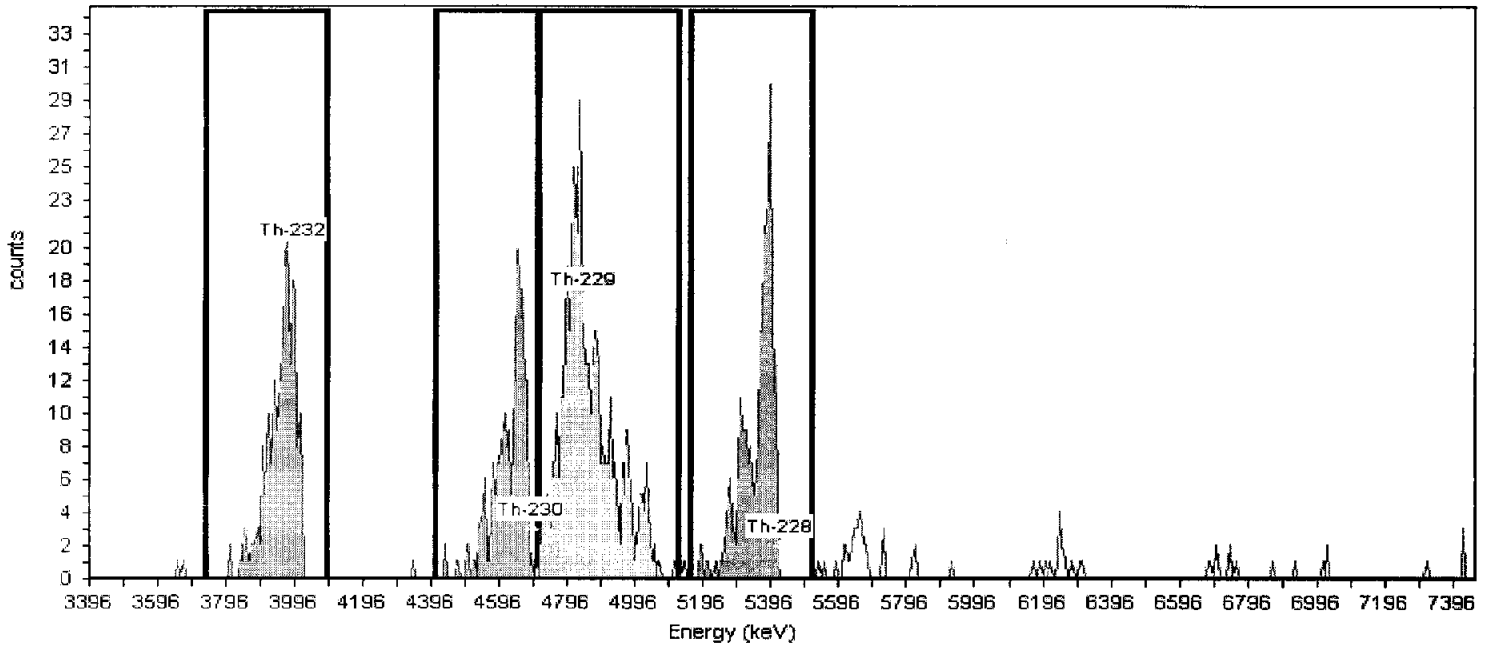
Tracer Nuclide: Th-229
Tracer Recovery: 89.52%

Acquisition

Detector: AV46
Serial Number: AV46
Acquisition Start Date: 7/13/2007 3:10:36PM
Live Time: 240.00 min.
Real Time: 240.00 min.
Background Date: 6/24/2007 8:47:33PM

Calibration Name: June2007_AV46
Calibration Date: 6/27/2007 5:43:34AM
Energy Cal: Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 27.20% +/- 0.28% TPU(2 sigma)

Background Info: Sample: AV46; Det: AV46; Spectrum #1; Jun-24-2007 20:47



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = ThROI
Decay Correction: 7/13/2007 3:08:40PM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Thorium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
Th-232	3984.265	3730.172	4085.902	78.061	100.2	214.00	0.0000	214	8.218E-001	1.610E-001	0.000E+000	1.039E-002
Th-230	4688.465	4405.333	4702.985	39.950	99.7	184.00	0.7500	183	7.072E-001	1.443E-001	6.147E-003	2.274E-002
Th-229	4840.921	4710.245	5124.053	98.620	99.6	427.00	0.7500	426	1.474E+000	2.059E-001	6.151E-003	2.275E-002
Th-228	5421.705	5160.352	5516.082	50.326	99.8	233.00	1.5000	232	8.929E-001	1.720E-001	8.688E-003	2.781E-002

Manual integration
Shukong 7/16/07

SEVERN TRENT **STL**

Alpha-Spectroscopy Analysis Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 9:30:33AM 7/16/2007

Sample

Sample Name: F7G050168-004
SampleType: Sample
: J2C1X1AE
Sample Collection Date: 6/22/2007 11:00:00AM
Comment:

Spectrum #1 Analysis #1
Sample Weight : 2.0121g
Aliquot: N/A Aliquot Fraction: N/A
Lab Preparation:

Batch

Batch Name: 7190360
:
Description:

Client Name: Undefined
Client Contact:

Tracer

Tracer Name: Rad05-0088_Th229
Tracer Activity: 73.20 DPM/mL x (Vol.)0.10 mL = 7.32 DPM
Tracer Ref. Date: 3/19/2007 8:41:39AM

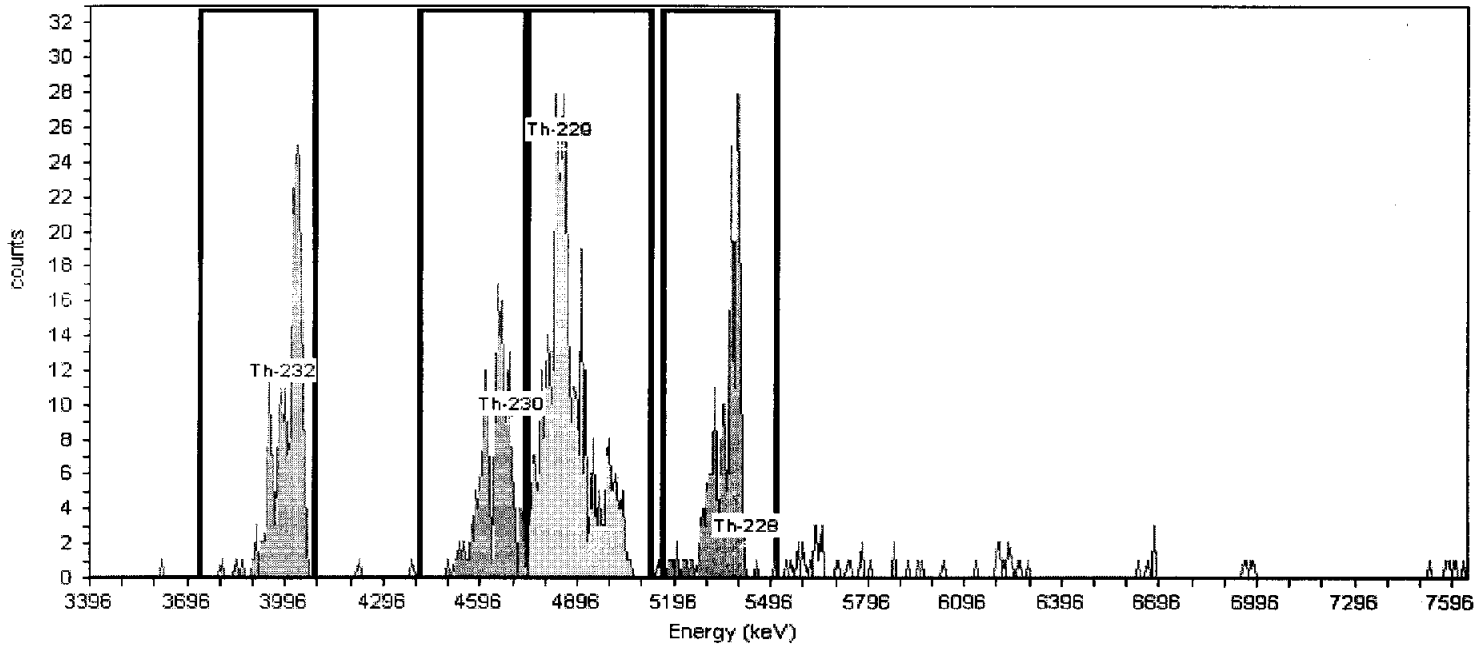
Tracer Nuclide: Th-229
Tracer Recovery: 86.76%

Acquisition

Detector: AV47
Serial Number: AV47
Acquisition Start Date: 7/13/2007 3:10:37PM
Live Time: 240.00 min.
Real Time: 240.00 min.
Background Date: 6/24/2007 8:47:35PM

Calibration Name: June2007_AV47
Calibration Date: 6/27/2007 5:43:18AM
Energy Cal: Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 26.42% +/- 0.26% TPU(2 sigma)

Background Info: Sample: AV47; Det: AV47; Spectrum #1; Jun-24-2007 20:47



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = ThROI
Decay Correction: 7/13/2007 3:08:40PM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Thorium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
Th-232	3984.265	3730.172	4085.902	58.835	100.2	217.00	0.5000	217	8.793E-001	1.731E-001	5.282E-003	2.155E-002
Th-230	4688.465	4405.333	4732.024	93.161	99.7	176.00	1.0000	175	7.143E-001	1.487E-001	7.507E-003	2.606E-002
Th-229	4840.921	4739.284	5124.053	71.724	99.6	402.00	0.7500	401	1.422E+000	2.016E-001	6.505E-003	2.406E-002
Th-228	5421.705	5160.352	5516.082	47.259	99.8	183.00	1.5000	182	7.404E-001	1.528E-001	9.189E-003	2.942E-002

Manual integration
Smitting 7/16/07

SEVERN TRENT **STL**

Alpha-Spectroscopy Analysis Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 9:31:09AM 7/16/2007

Sample

Sample Name: F7G050168-005
SampleType: Sample
: J2C101AE
Sample Collection Date: 6/22/2007 11:25:00AM
Comment:

Spectrum #1 Analysis #1
Sample Weight : 2.0173g
Aliquot: N/A Aliquot Fraction: N/A
Lab Preparation:

Batch

Batch Name: 7190360
:
Description:

Client Name: Undefined
Client Contact:

Tracer

Tracer Name: Rad05-0088_Th229
Tracer Activity: 73.20 DPM/mL x (Vol.)0.10 mL = 7.32 DPM
Tracer Ref. Date: 3/19/2007 8:41:39AM

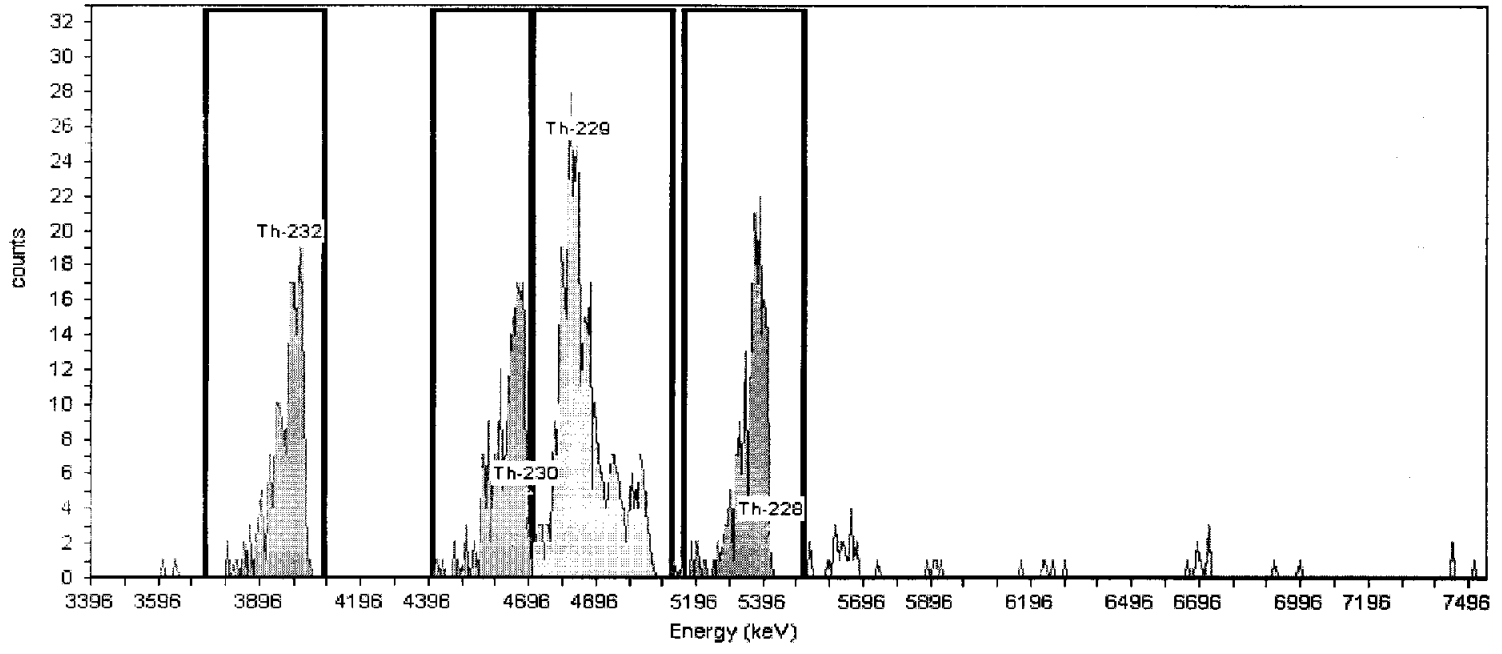
Tracer Nuclide: Th-229
Tracer Recovery: 90.81%

Acquisition

Detector: AV48
Serial Number: AV48
Acquisition Start Date: 7/13/2007 3:10:38PM
Live Time: 240.00 min.
Real Time: 240.00 min.
Background Date: 6/24/2007 8:47:37PM

Calibration Name: June2007_AV48
Calibration Date: 6/27/2007 11:52:00AM
Energy Cal: Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 26.23% +/- 0.28% TPU(2 sigma)

Background Info: Sample: AV48; Det: AV48; Spectrum #1; Jun-24-2007 20:47



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = ThROI
Decay Correction: 7/13/2007 3:08:40PM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Thorium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
Th-232	3984.265	3730.172	4085.902	66.974	100.2	195.00	0.5000	195	7.582E-001	1.526E-001	5.069E-003	2.069E-002
Th-230	4688.465	4405.333	4702.985	26.044	99.7	197.00	0.5000	197	7.698E-001	1.545E-001	5.095E-003	2.079E-002
Th-229	4840.921	4695.725	5124.053	85.335	99.6	417.00	0.0000	417	1.484E+000	2.085E-001	0.000E+000	1.061E-002
Th-228	5421.705	5160.352	5516.082	58.776	99.8	203.00	1.5000	202	7.889E-001	1.578E-001	8.819E-003	2.823E-002

manual integration
Shifting 7/16/07

ST SEVERN TRENT STL

Alpha-Spectroscopy Analysis Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 7:11:14PM 7/13/2007

Sample

Sample Name: F7G050168-006
SampleType: Sample
: J2C111AE
Sample Collection Date: 6/22/2007 10:45:00AM
Comment:

Spectrum #1 Analysis #1
Sample Weight : 2.0100g
Aliquot: N/A Aliquot Fraction: N/A
Lab Preparation:

Batch

Batch Name: 7190360
:
Description:

Client Name: Undefined
Client Contact:

Tracer

Tracer Name: Rad05-0088_Th229
Tracer Activity: 73.20 DPM/mL x (Vol.)0.10 mL = 7.32 DPM
Tracer Ref. Date: 3/19/2007 8:41:39AM

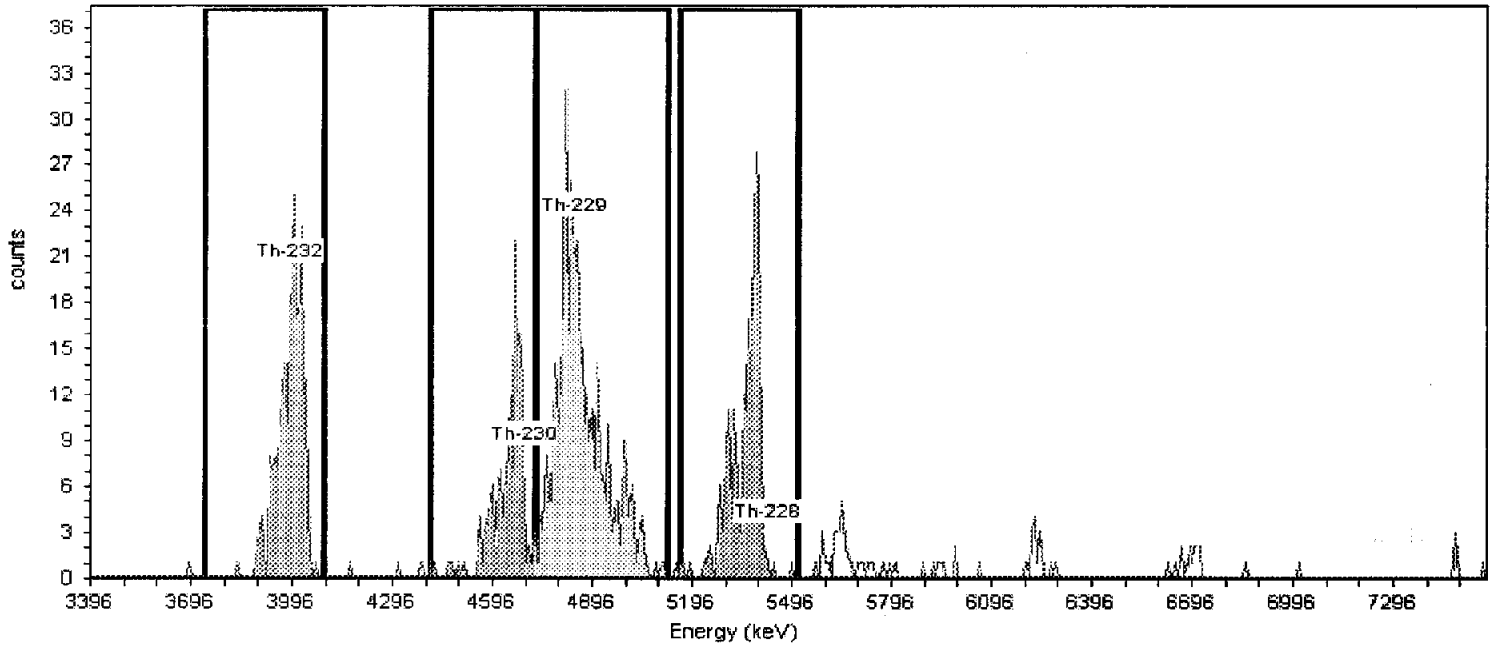
Tracer Nuclide: Th-229
Tracer Recovery: 90.00%

Acquisition

Detector: AV50
Serial Number: AV50
Acquisition Start Date: 7/13/2007 3:10:40PM
Live Time: 240.00 min.
Real Time: 240.00 min.
Background Date: 6/24/2007 8:47:41PM

Calibration Name: June2007_AV50
Calibration Date: 6/27/2007 11:52:12AM
Energy Cal Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 26.87% +/- 0.27% TPU(2 sigma)

Background Info: Sample: AV50; Det: AV50; Spectrum #1; Jun-24-2007 20:47



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = ThROI
Decay Correction: 7/13/2007 3:08:40PM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Thorium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
Th-232	3984.265	3730.172	4085.902	70.096	100.2	240.00	0.5000	240	9.231E-001	1.767E-001	5.013E-003	2.045E-002
Th-230	4688.465	4405.333	4717.504	39.369	99.7	157.00	0.2500	157	6.072E-001	1.295E-001	3.562E-003	1.761E-002
Th-229	4840.921	4724.764	5124.053	81.195	99.6	428.00	4.7500	423	1.476E+000	2.076E-001	1.554E-002	4.156E-002
Th-228	5421.705	5160.352	5516.082	53.007	99.8	228.00	1.5000	227	8.769E-001	1.704E-001	8.720E-003	2.792E-002

ST SEVERN TRENT **STL**

Alpha-Spectroscopy Analysis Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
9:34:31AM 7/16/2007

Analyst: 60040

Sample

Sample Name: F7G050168-007
SampleType: Sample
: J2C131AE
Sample Collection Date: 6/22/2007 11:25:00AM
Comment:

Spectrum #1 Analysis #1
Sample Weight : 2.0017g
Aliquot: N/A Aliquot Fraction: N/A
Lab Preparation:

Batch

Batch Name: 7190360
:
Description:

Client Name: Undefined
Client Contact:

Tracer

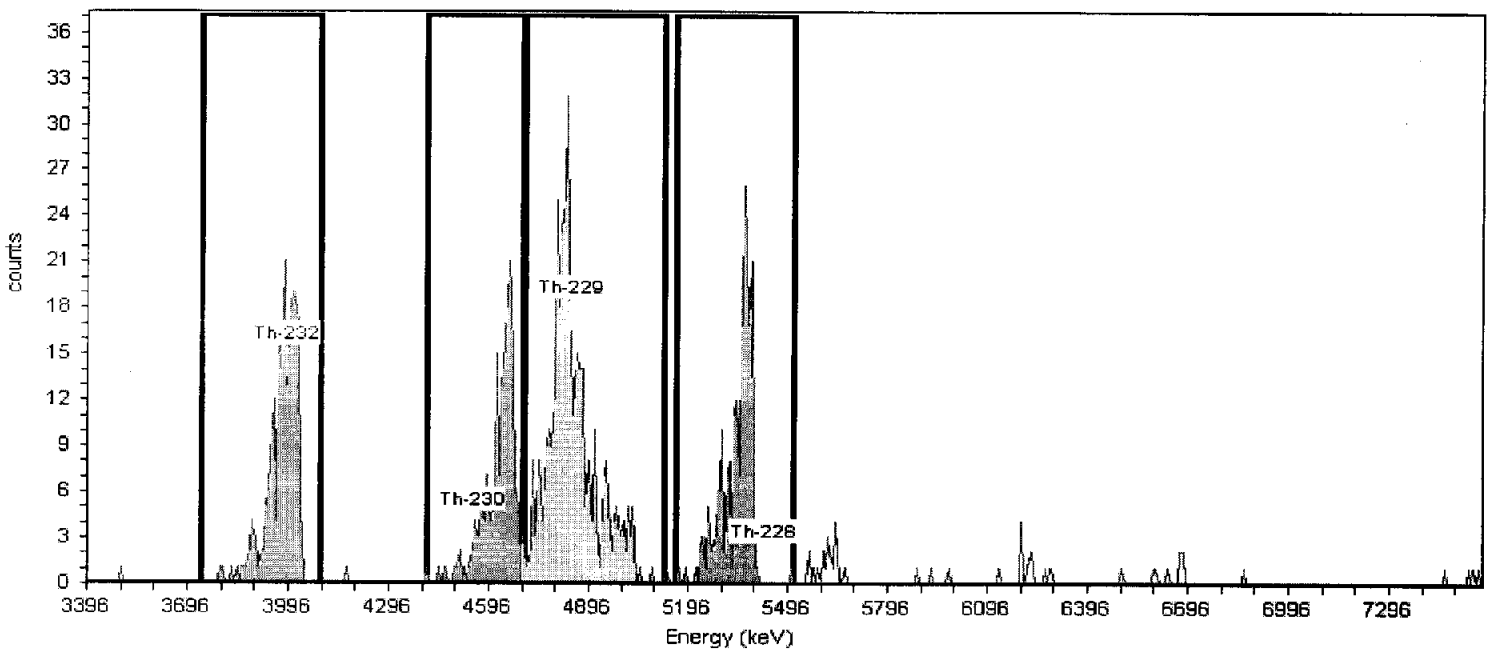
Tracer Name: Rad05-0088_Th229
Tracer Activity: 73.20 DPM/mL x (Vol.)0.10 mL = 7.32 DPM
Tracer Ref. Date: 3/19/2007 8:41:39AM

Tracer Nuclide: Th-229
Tracer Recovery: 86.03%

Acquisition

Detector: AV51
Serial Number:
Acquisition Start Date: 7/13/2007 3:10:41PM
Live Time: 240.00 min.
Real Time: 240.00 min.
Background Date: 6/24/2007 8:47:43PM
Background Info: Sample: AV51; Det: AV51; Spectrum #1; Jun-24-2007 20:47

Calibration Name: June2007_AV51
Calibration Date: 6/27/2007 12:06:05PM
Energy Cal: Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 26.86% +/- 0.26% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = ThROI
Decay Correction: 7/13/2007 3:08:40PM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Thorium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
Th-232	3984.265	3730.172	4085.902	80.299	100.2	220.00	0.0000	220	8.909E-001	1.746E-001	0.000E+000	1.096E-002
Th-230	4546.899	4405.333	4695.725	28.952	99.7	187.00	0.7500	186	7.580E-001	1.550E-001	6.483E-003	2.398E-002
Th-229	4840.921	4702.985	5124.053	76.798	99.6	406.00	1.5000	405	1.417E+000	2.007E-001	9.173E-003	2.937E-002
Th-228	5421.705	5160.352	5516.082	52.573	99.8	204.00	4.2500	200	8.125E-001	1.646E-001	1.542E-002	4.185E-002

manual integration
Shifting 7/16/07

SEVERN TRENT **STL**

Alpha-Spectroscopy Analysis Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 7:11:24PM 7/13/2007

Sample

Sample Name: F7G050168-008
SampleType: Sample
: J2C151AE
Sample Collection Date: 6/22/2007 11:25:00AM
Comment:

Spectrum #1 Analysis #1
Sample Weight : 2.0141g
Aliquot: N/A Aliquot Fraction: N/A
Lab Preparation:

Batch

Batch Name: 7190360
:
Description:

Client Name: Undefined
Client Contact:

Tracer

Tracer Name: Rad05-0088_Th229
Tracer Activity: 73.20 DPM/mL x (Vol.)0.10 mL = 7.32 DPM
Tracer Ref. Date: 3/19/2007 8:41:39AM

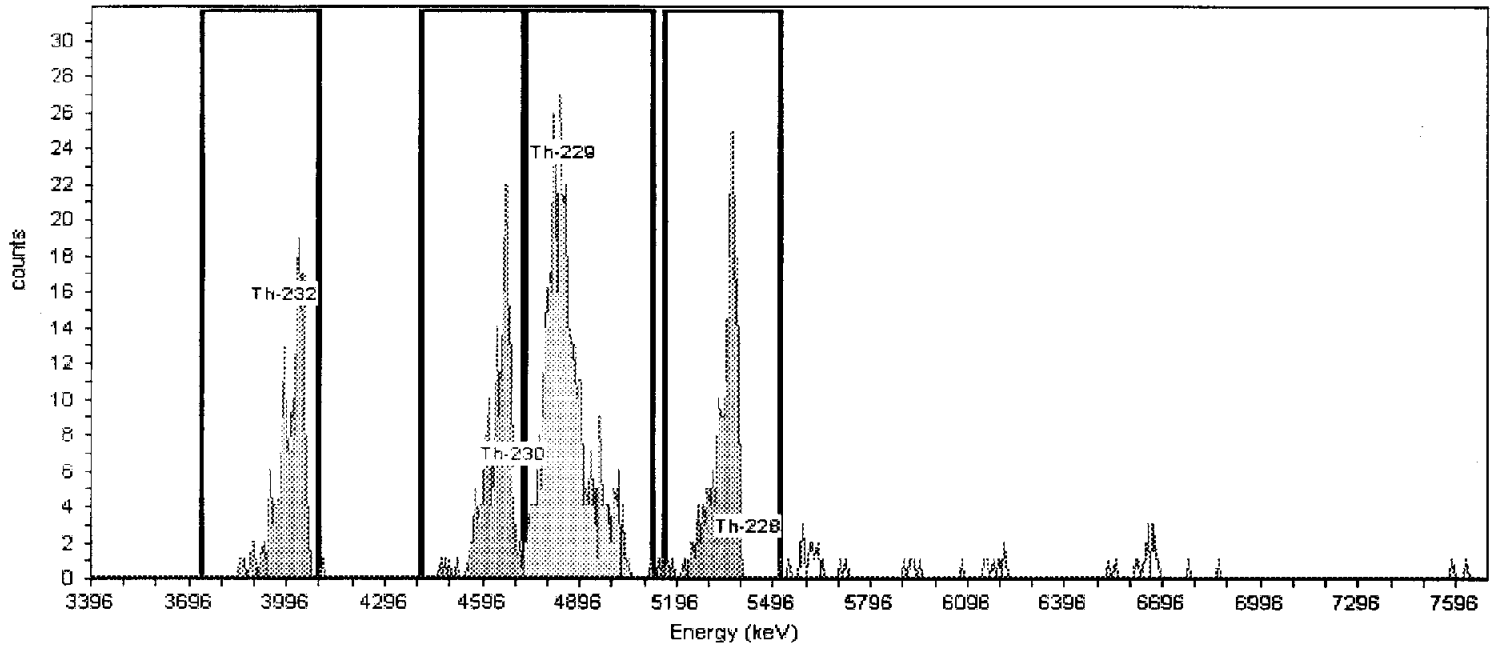
Tracer Nuclide: Th-229
Tracer Recovery: 85.37%

Acquisition

Detector: AV56
Serial Number:
Acquisition Start Date: 7/13/2007 3:10:42PM
Live Time: 240.00 min.
Real Time: 240.00 min.
Background Date: 6/24/2007 8:47:52PM

Calibration Name: June2007_AV56
Calibration Date: 6/27/2007 5:43:24AM
Energy Cal Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 25.86% +/- 0.27% TPU(2 sigma)

Background Info: Sample: AV56; Det: AV56; Spectrum #1; Jun-24-2007 20:47



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = ThROI
Decay Correction: 7/13/2007 3:08:40PM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Thorium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
Th-232	3984.265	3730.172	4085.902	73.571	100.2	165.00	0.2500	165	6.940E-001	1.471E-001	3.873E-003	1.915E-002
Th-230	4688.465	4405.333	4717.504	42.908	99.7	170.00	0.7500	169	7.165E-001	1.511E-001	6.743E-003	2.494E-002
Th-229	4840.921	4724.764	5124.053	96.021	99.6	387.00	0.5000	387	1.398E+000	2.001E-001	5.509E-003	2.248E-002
Th-228	5421.705	5160.352	5516.082	51.804	99.8	187.00	0.7500	186	7.880E-001	1.620E-001	6.739E-003	2.493E-002

ST SEVERN TRENT **STL**

Alpha-Spectroscopy Analysis Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
9:36:42AM 7/16/2007

Analyst: 60040

Sample

Sample Name: F7G050168-009
SampleType: Sample
: J2C191AE
Sample Collection Date: 6/29/2007 10:45:00AM
Comment:

Spectrum #1 Analysis #1
Sample Weight : 2.0046g
Aliquot: N/A Aliquot Fraction: N/A
Lab Preparation:

Batch

Batch Name: 7190360
:
Description:

Client Name: Undefined
Client Contact:

Tracer

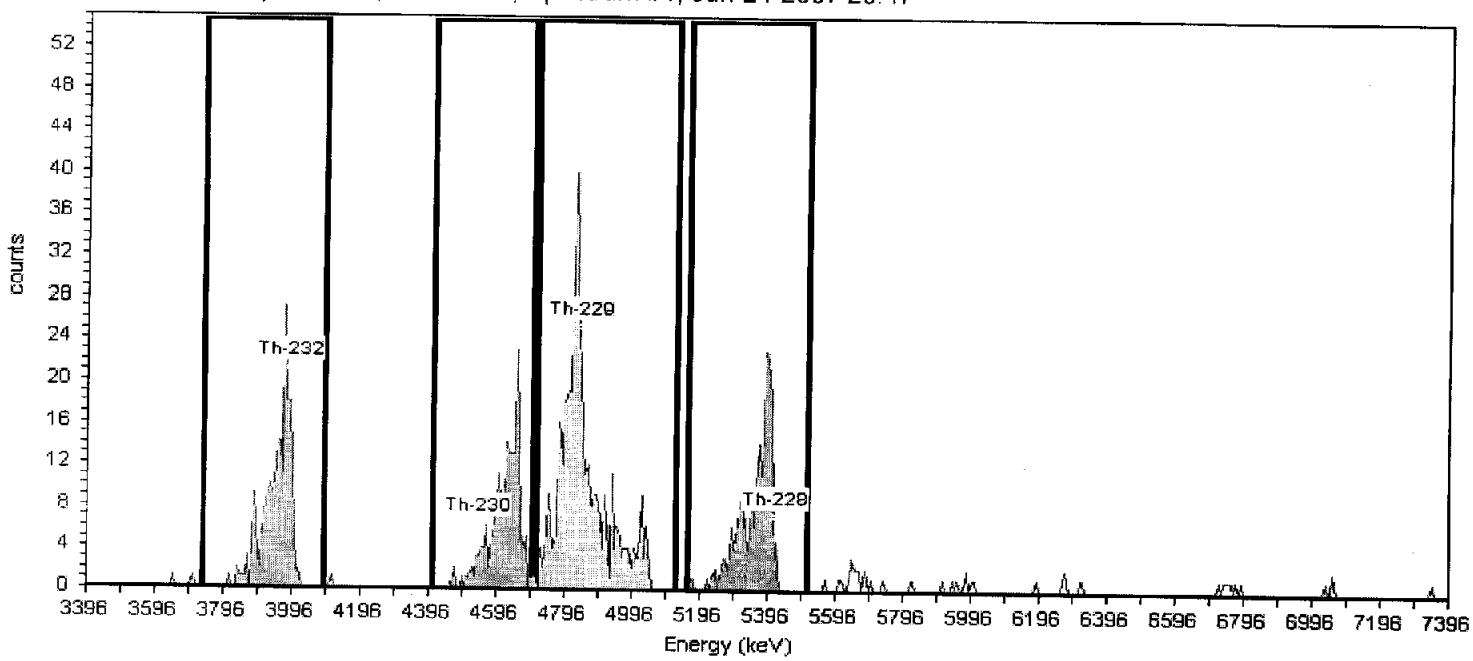
Tracer Name: Rad05-0088_Th229
Tracer Activity: 73.20 DPM/mL x (Vol.)0.10 mL = 7.32 DPM
Tracer Ref. Date: 3/19/2007 8:41:39AM

Tracer Nuclide: Th-229
Tracer Recovery: 87.90%

Acquisition

Detector: AV57
Serial Number:
Acquisition Start Date: 7/13/2007 3:10:42PM
Live Time: 240.00 min.
Real Time: 240.00 min.
Background Date: 6/24/2007 8:47:54PM
Background Info: Sample: AV57; Det: AV57; Spectrum #1; Jun-24-2007 20:47

Calibration Name: June2007_AV57
Calibration Date: 6/27/2007 5:43:29AM
Energy Cal: Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 27.13% +/- 0.29% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = ThROI
Decay Correction: 7/13/2007 3:08:40PM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Thorium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
Th-232	3984.265	3730.172	4085.902	71.941	100.2	198.00	0.2500	198	7.748E-001	1.554E-001	3.603E-003	1.781E-002
Th-230	4546.899	4405.333	4702.985	81.365	99.7	183.00	0.7500	182	7.176E-001	1.472E-001	6.272E-003	2.320E-002
Th-229	4840.921	4710.245	5124.053	66.797	99.6	420.00	2.5000	418	1.446E+000	2.035E-001	1.146E-002	3.357E-002
Th-228	5421.705	5160.352	5516.082	54.691	99.8	202.00	1.5000	201	7.890E-001	1.582E-001	8.864E-003	2.838E-002

Manual integration
Shiloong 7/16/07

ST SEVERN TRENT **STL**

Alpha-Spectroscopy Analysis Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 7:11:41PM 7/13/2007

Sample

Sample Name: F7G050168-010
SampleType: Sample
: J2C2D1AE
Sample Collection Date: 6/29/2007 10:50:00AM
Comment:

Spectrum #1 Analysis #1
Sample Weight : 2.0052g
Aliquot: N/A Aliquot Fraction: N/A
Lab Preparation:

Batch

Batch Name: 7190360
:
Description:

Client Name: Undefined
Client Contact:

Tracer

Tracer Name: Rad05-0088_Th229
Tracer Activity: 73.20 DPM/mL x (Vol.)0.10 mL = 7.32 DPM
Tracer Ref. Date: 3/19/2007 8:41:39AM

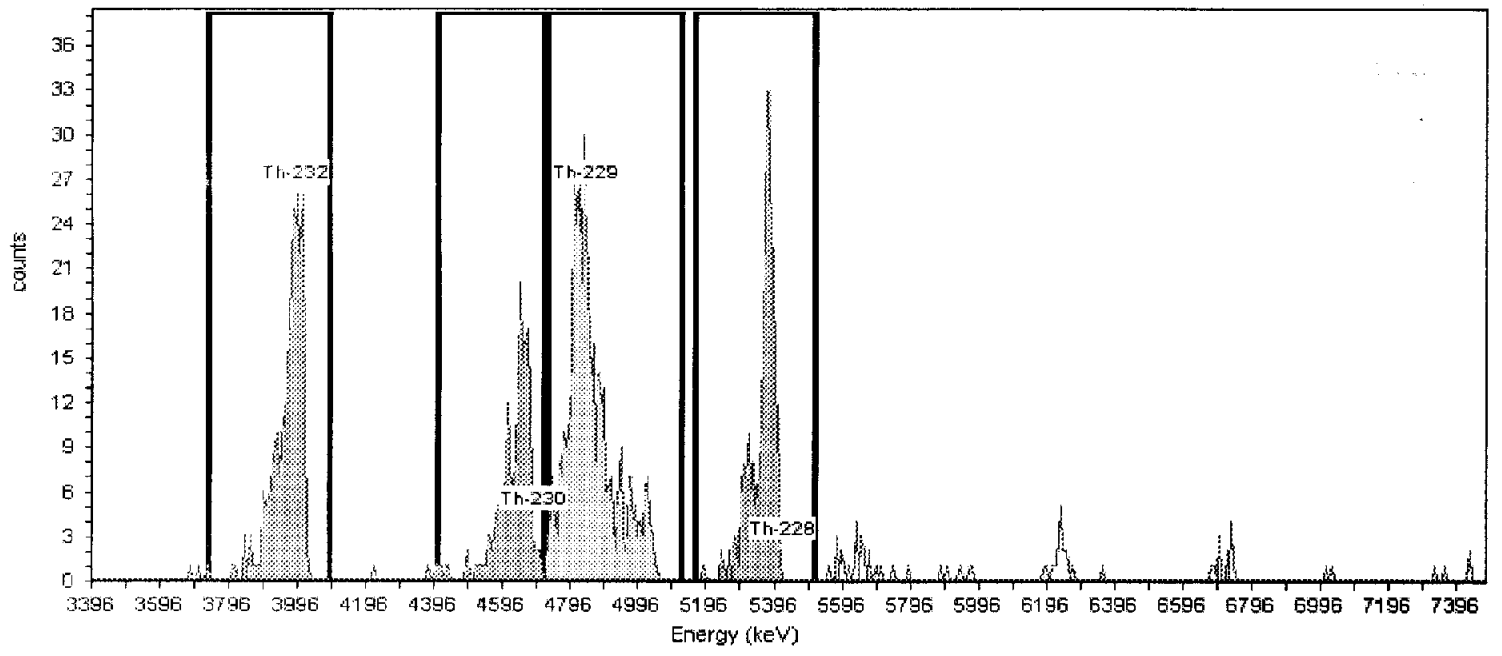
Tracer Nuclide: Th-229
Tracer Recovery: 91.10%

Acquisition

Detector: AV63
Serial Number:
Acquisition Start Date: 7/13/2007 3:10:43PM
Live Time: 240.00 min.
Real Time: 240.57 min.
Background Date: 6/24/2007 8:48:03PM

Calibration Name: June2007_AV63
Calibration Date: 6/27/2007 4:56:51PM
Energy Cal Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 26.37% +/- 0.26% TPU(2 sigma)

Background Info: Sample: AV63; Det: AV63; Spectrum #1; Jun-24-2007 20:48



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = ThROI
Decay Correction: 7/13/2007 3:08:40PM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Thorium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
Th-232	3984.265	3730.172	4085.902	57.454	100.2	259.00	1.2500	258	1.002E+000	1.886E-001	7.996E-003	2.652E-002
Th-230	4688.465	4405.333	4717.504	71.152	99.7	186.00	0.5000	186	7.250E-001	1.475E-001	5.083E-003	2.074E-002
Th-229	4840.921	4724.764	5124.053	81.001	99.6	421.00	0.5000	421	1.498E+000	2.099E-001	5.086E-003	2.075E-002
Th-228	5421.705	5160.352	5516.082	50.032	99.8	222.00	0.5000	222	8.652E-001	1.684E-001	5.080E-003	2.073E-002

STL SEVERN TRENT

STL Alpha-Spectroscopy Analysis Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 9:38:09AM 7/16/2007

Sample

Sample Name: F7G090000-360B
SampleType: Blank
: J2H401AA
Sample Collection Date: 6/22/2007 11:10:00AM
Comment:

Spectrum #1 Analysis #1
Sample Weight : 2.0000g
Aliquot: N/A Aliquot Fraction: N/A
Lab Preparation:

Batch

Batch Name: 7190360
:
Description:

Client Name: Undefined
Client Contact:

Tracer

Tracer Name: Rad05-0088_Th229
Tracer Activity: 73.20 DPM/mL x (Vol.)0.10 mL = 7.32 DPM
Tracer Ref. Date: 3/19/2007 8:41:39AM

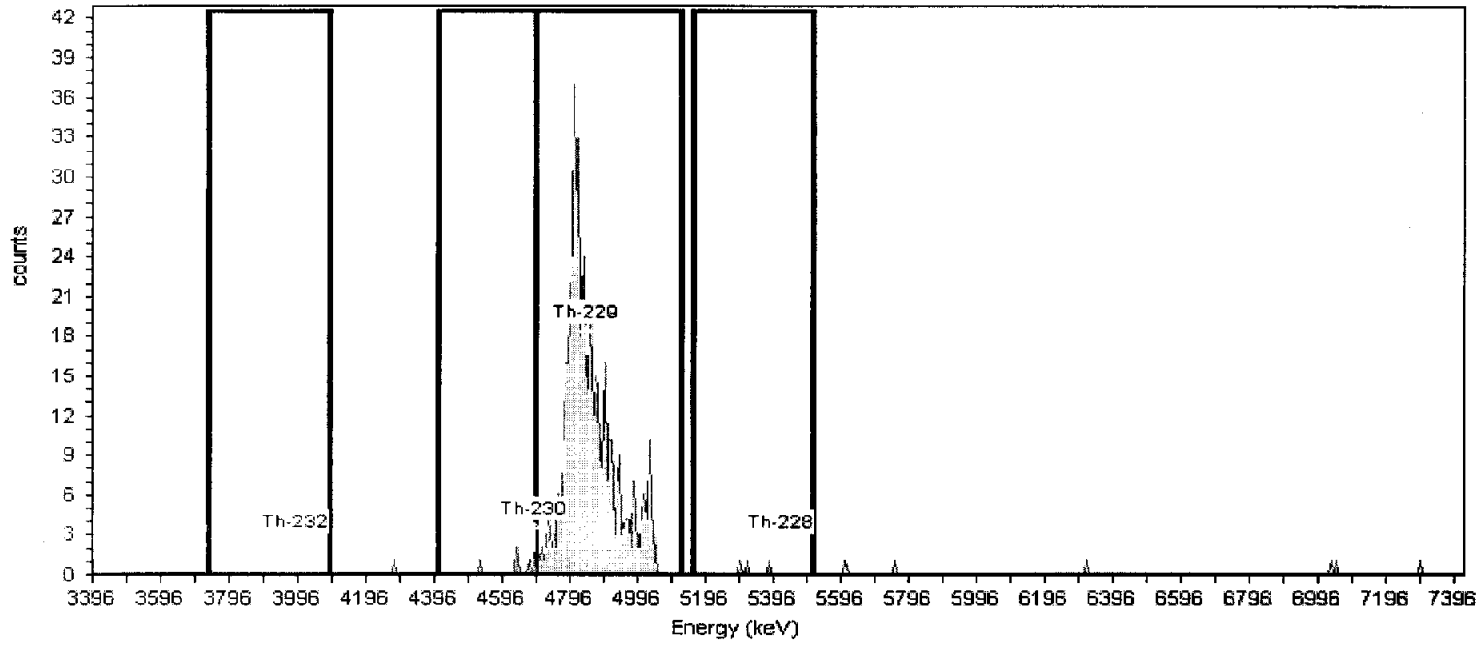
Tracer Nuclide: Th-229
Tracer Recovery: 97.26%

Acquisition

Detector: AV45
Serial Number: AV45
Acquisition Start Date: 7/13/2007 3:10:35PM
Live Time: 240.00 min.
Real Time: 240.00 min.
Background Date: 6/24/2007 8:47:32PM

Calibration Name: June2007_AV45
Calibration Date: 6/27/2007 11:52:06AM
Energy Cal: Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 27.24% +/- 0.29% TPU(2 sigma)

Background Info: Sample: AV45; Det: AV45; Spectrum #1; Jun-24-2007 20:47



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = ThROI
Decay Correction: 7/13/2007 3:08:40PM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Thorium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
Th-232	3984.265	3730.172	4085.902	.000	100.2	0.00	0.2500	0	-8.838E-004	7.906E-003	3.251E-003	1.607E-002
Th-230	4688.465	4405.333	4695.725	24.137	99.7	5.00	0.7500	4	1.510E-002	1.717E-002	5.659E-003	2.093E-002
Th-229	4840.921	4695.725	5124.053	75.478	99.6	464.00	0.2500	464	1.604E+000	2.196E-001	3.269E-003	1.616E-002
Th-228	5421.705	5160.352	5516.082	39.422	99.8	3.00	0.0000	3	1.065E-002	1.428E-002	0.000E+000	9.609E-003

manual integration
Shifting cw 7/16/07

ST SEVERN TRENT STL

Alpha-Spectroscopy Analysis Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 7:11:18PM 7/13/2007

Sample

Sample Name: F7G090000-360C
SampleType: Control
: J2H401AC
Sample Collection Date: 6/22/2007 11:10:00AM
Comment:

Spectrum #1 Analysis #1
Sample Weight : 0.1312g
Aliquot: N/A Aliquot Fraction: N/A
Lab Preparation:

Batch

Batch Name: 7190360
:
Description:

Client Name: Undefined
Client Contact:

Tracer

Tracer Name: Rad05-0088_Th229
Tracer Activity: 73.20 DPM/mL x (Vol.)0.10 mL = 7.32 DPM
Tracer Ref. Date: 3/19/2007 8:41:39AM

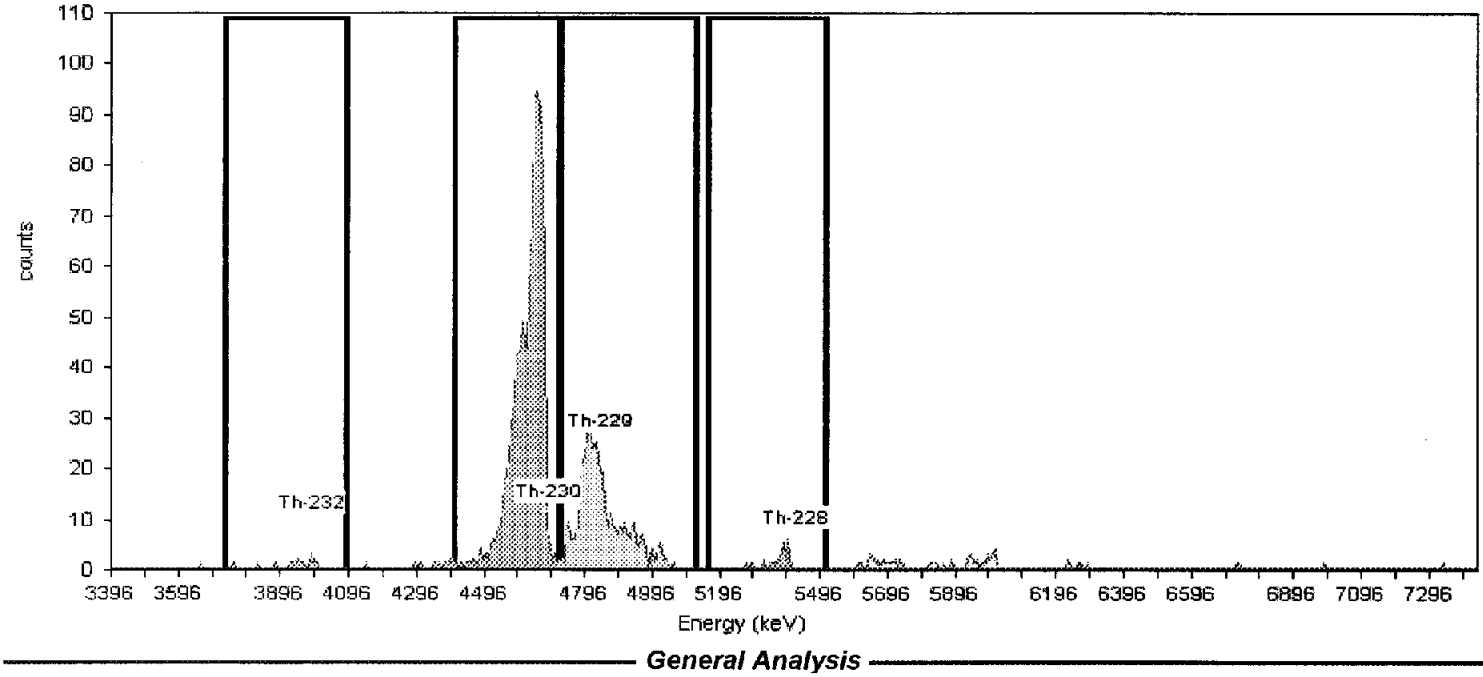
Tracer Nuclide: Th-229
Tracer Recovery: 87.59%

Acquisition

Detector: AV49
Serial Number: AV49
Acquisition Start Date: 7/13/2007 3:10:39PM
Live Time: 240.00 min.
Real Time: 240.00 min.
Background Date: 6/24/2007 8:47:38PM

Calibration Name: July2007
Calibration Date: 7/11/2007 6:09:04PM
Energy Cal Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 28.03% +/- 0.30% TPU(2 sigma)

Background Info: Sample: AV49; Det: AV49; Spectrum #1; Jun-24-2007 20:47



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = ThROI
Decay Correction: 7/13/2007 3:08:40PM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Thorium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
Th-232	3984.265	3730.172	4085.902	89.120	100.2	17.00	0.2500	17	9.741E-001	5.019E-001	5.348E-002	2.643E-001
Th-230	4688.465	4405.333	4717.504	67.472	99.7	989.00	0.7500	988	5.776E+001	8.881E+000	9.309E-002	3.443E-001
Th-229	4840.921	4724.764	5124.053	77.311	99.6	431.00	1.2500	430	2.201E+001	3.072E+000	1.202E-001	3.987E-001
Th-228	5421.705	5160.352	5516.082	45.357	99.8	27.00	2.2500	25	1.446E+000	6.634E-001	1.611E-001	4.804E-001

Alpha Spectroscopy

Uranium

SEVERN TRENT STL

Analysis Report for Alpha Spectroscopy

Batch: 7190361 **Operator:** 403293

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Sample ID	Work Order #	Aliquot	Dilution	Sigma	Instrument	RunDateTime	RunDuration	TracerID	TracerAnalyte	TracerAdded	TracerYield
F7G050168-001	J2C1G1AD	2.0054 g	1.00	2.00	AV46	7/13/07 10:56	240.00	rad04-0093	U-232	5.482E+000	90.28%

Analyte	Activity		CountUnc	TotalUnc	MDA	DLC
U-232	2.048E+000	pCi/g	1.862E-001	2.660E-001	2.752E-002	8.596E-003
U-234	6.979E-001	pCi/g	1.040E-001	1.381E-001	2.604E-002	7.853E-003
U-235	1.426E-002	pCi/g	1.646E-002	1.910E-002	1.286E-002	0.000E+000
U-238	6.022E-001	pCi/g	9.582E-002	1.241E-001	1.031E-002	0.000E+000

Sample ID	Work Order #	Aliquot	Dilution	Sigma	Instrument	RunDateTime	RunDuration	TracerID	TracerAnalyte	TracerAdded	TracerYield
F7G050168-001X	J2C1G1AJ	2.0144 g	1.00	2.00	AV47	7/13/07 10:56	240.00	rad04-0093	U-232	5.458E+000	91.62%

Analyte	Activity		CountUnc	TotalUnc	MDA	DLC
U-232	2.069E+000	pCi/g	1.865E-001	2.694E-001	2.461E-002	7.088E-003
U-234	6.856E-001	pCi/g	1.036E-001	1.369E-001	2.630E-002	7.931E-003
U-235	2.160E-002	pCi/g	2.251E-002	2.269E-002	2.547E-002	6.242E-003
U-238	7.410E-001	pCi/g	1.071E-001	1.443E-001	2.043E-002	5.006E-003

Sample ID	Work Order #	Aliquot	Dilution	Sigma	Instrument	RunDateTime	RunDuration	TracerID	TracerAnalyte	TracerAdded	TracerYield
F7G050168-002	J2C1V1AD	2.0017 g	1.00	2.00	AV48	7/13/07 10:56	240.00	rad04-0093	U-232	5.492E+000	96.73%

Analyte	Activity		CountUnc	TotalUnc	MDA	DLC
U-232	2.198E+000	pCi/g	1.833E-001	2.836E-001	2.180E-002	5.894E-003
U-234	5.619E-001	pCi/g	9.138E-002	1.168E-001	1.683E-002	3.405E-003
U-235	4.608E-002	pCi/g	2.914E-002	3.114E-002	1.247E-002	0.000E+000
U-238	5.932E-001	pCi/g	9.393E-002	1.213E-001	1.961E-002	4.806E-003

Sample ID	Work Order #	Aliquot	Dilution	Sigma	Instrument	RunDateTime	RunDuration	TracerID	TracerAnalyte	TracerAdded	TracerYield
F7G050168-003	J2C1W1AD	2.0032 g	1.00	2.00	AV50	7/13/07 10:56	240.00	rad04-0093	U-232	5.488E+000	87.52%

Analyte	Activity		CountUnc	TotalUnc	MDA	DLC
U-232	1.988E+000	pCi/g	1.909E-001	2.607E-001	3.513E-002	1.217E-002
U-234	6.728E-001	pCi/g	1.040E-001	1.365E-001	2.119E-002	5.193E-003
U-235	3.354E-002	pCi/g	2.676E-002	2.712E-002	2.258E-002	4.569E-003
U-238	7.491E-001	pCi/g	1.093E-001	1.474E-001	1.078E-002	0.000E+000

Sample ID	Work Order #	Aliquot	Dilution	Sigma	Instrument	RunDateTime	RunDuration	TracerID	TracerAnalyte	TracerAdded	TracerYield
F7G050168-004	J2C1X1AD	2.0121 g	1.00	2.00	AV51	7/13/07 10:56	240.00	rad04-0093	U-232	5.464E+000	86.54%

Analyte	Activity		CountUnc	TotalUnc	MDA	DLC
U-232	1.957E+000	pCi/g	1.910E-001	2.571E-001	3.304E-002	1.108E-002
U-234	1.014E+000	pCi/g	1.286E-001	1.855E-001	3.045E-002	9.783E-003
U-235	6.005E-002	pCi/g	3.467E-002	3.694E-002	1.354E-002	0.000E+000
U-238	9.140E-001	pCi/g	1.213E-001	1.709E-001	1.824E-002	3.690E-003

Sample ID	Work Order #	Aliquot	Dilution	Sigma	Instrument	RunDateTime	RunDuration	TracerID	TracerAnalyte	TracerAdded	TracerYield
F7G050168-005	J2C101AD	2.0173 g	1.00	2.00	AV56	7/13/07 10:56	240.00	rad04-0093	U-232	5.450E+000	97.58%

Analyte	Activity		CountUnc	TotalUnc	MDA	DLC
U-232	2.201E+000	pCi/g	1.824E-001	2.842E-001	2.357E-002	6.789E-003
U-234	6.594E-001	pCi/g	9.898E-002	1.308E-001	1.960E-002	4.804E-003
U-235	2.183E-002	pCi/g	2.106E-002	2.125E-002	2.089E-002	4.227E-003
U-238	6.304E-001	pCi/g	9.698E-002	1.268E-001	2.354E-002	6.780E-003

Sample ID	Work Order #	Aliquot	Dilution	Sigma	Instrument	RunDateTime	RunDuration	TracerID	TracerAnalyte	TracerAdded	TracerYield
F7G050168-006	J2C111AD	2.0100 g	1.00	2.00	AV57	7/13/07 10:56	240.00	rad04-0093	U-232	5.470E+000	95.14%

Analyte	Activity		CountUnc	TotalUnc	MDA	DLC

Sample ID	Work Order #	Aliquot	Dilution	Sigma	Instrument	RunDateTime	RunDuration	TracerID	TracerAnalyte	TracerAdded	TracerYield
						U-232	2.154E+000 pCi/g		1.813E-001	2.771E-001	2.864E-002	9.420E-003
						U-234	6.433E-001 pCi/g		9.739E-002	1.280E-001	2.614E-002	8.164E-003
						U-235	2.593E-002 pCi/g		2.255E-002	2.280E-002	2.050E-002	4.147E-003
						U-238	6.004E-001 pCi/g		9.321E-002	1.215E-001	9.788E-003	0.000E+000
F7G050168-007	J2C131AD	2.0017	1.00	2.00	AV63	7 / 13 / 07 10:56	240.00	rad04-0093	U-232		5.492E+000	94.69%
		g				Analyte	Activity		CountUnc	TotalUnc	MDA	DLC
						U-232	2.152E+000 pCi/g		1.847E-001	2.783E-001	1.995E-002	4.890E-003
						U-234	7.168E-001 pCi/g		1.041E-001	1.396E-001	1.997E-002	4.893E-003
						U-235	4.682E-002 pCi/g		2.961E-002	3.165E-002	1.267E-002	0.000E+000
						U-238	5.539E-001 pCi/g		9.152E-002	1.164E-001	1.993E-002	4.884E-003
F7G050168-008	J2C151AD	2.0141	1.00	2.00	AV14	7 / 13 / 07 10:56	240.00	rad04-0093	U-232		5.459E+000	93.83%
		g				Analyte	Activity		CountUnc	TotalUnc	MDA	DLC
						U-232	2.119E+000 pCi/g		1.839E-001	2.745E-001	2.210E-002	5.974E-003
						U-234	5.827E-001 pCi/g		9.459E-002	1.212E-001	2.842E-002	9.132E-003
						U-235	1.635E-002 pCi/g		1.982E-002	1.993E-002	2.479E-002	6.074E-003
						U-238	6.705E-001 pCi/g		1.002E-001	1.330E-001	1.014E-002	0.000E+000
F7G050168-009	J2C191AD	2.0046	1.00	2.00	AV22	7 / 13 / 07 10:56	240.00	rad04-0093	U-232		5.484E+000	78.29%
		g				Analyte	Activity		CountUnc	TotalUnc	MDA	DLC
						U-232	1.777E+000 pCi/g		2.063E-001	2.411E-001	3.192E-002	9.627E-003
						U-234	5.178E-001 pCi/g		9.895E-002	1.215E-001	2.487E-002	6.093E-003
						U-235	2.332E-002 pCi/g		2.332E-002	2.627E-002	1.578E-002	0.000E+000
						U-238	5.670E-001 pCi/g		1.036E-001	1.292E-001	2.755E-002	7.448E-003
F7G050168-010	J2C2D1AD	2.0052	1.00	2.00	AV20	7 / 13 / 07 15:18	240.00	rad04-0093	U-232		5.483E+000	92.13%
		g				Analyte	Activity		CountUnc	TotalUnc	MDA	DLC
						U-232	2.090E+000 pCi/g		1.851E-001	2.709E-001	3.096E-002	1.038E-002
						U-234	5.123E-001 pCi/g		8.915E-002	1.113E-001	2.979E-002	9.798E-003
						U-235	2.930E-002 pCi/g		2.610E-002	2.638E-002	2.762E-002	7.466E-003
						U-238	6.081E-001 pCi/g		9.637E-002	1.246E-001	2.563E-002	7.731E-003
F7G090000-361B	J2H421AA	2.0000	1.00	2.00	AV15	7 / 13 / 07 10:56	240.00	rad04-0093	U-232		5.497E+000	90.44%
		g				Analyte	Activity		CountUnc	TotalUnc	MDA	DLC
						U-232	2.057E+000 pCi/g		1.876E-001	2.678E-001	2.282E-002	6.170E-003
						U-234	2.907E-003 pCi/g		8.668E-003	8.677E-003	1.762E-002	3.565E-003
						U-235	0.000E+000 pCi/g		0.000E+000	0.000E+000	1.305E-002	0.000E+000
						U-238	1.064E-002 pCi/g		1.395E-002	1.402E-002	1.758E-002	3.558E-003
F7G090000-361C	J2H421AC	0.1312	1.00	2.00	AV21	7 / 13 / 07 10:56	240.00	rad04-0093	U-232		8.380E+001	94.15%
		g				Analyte	Activity		CountUnc	TotalUnc	MDA	DLC
						U-232	3.265E+001 pCi/g		2.826E+000	4.227E+000	3.678E-001	1.059E-001
						U-234	1.935E+001 pCi/g		2.114E+000	3.284E+000	2.620E-001	5.301E-002
						U-235	9.326E-001 pCi/g		5.173E-001	5.503E-001	1.941E-001	0.000E+000
						U-238	1.778E+001 pCi/g		2.023E+000	3.071E+000	1.557E-001	0.000E+000

Sample ID	Work Order #	Aliquot	Dilution	Sigma	Instrument	RunDateTime	RunDuration	TracerID	TracerAnalyte	TracerAdded	TracerYield

Laboratory Control Sample Information

Sample ID	WRKNO	RegionName	Activity	StdAdded	Recovery	LCL	UCL
F7G090000-361C	J2H421AC	U-234	1.935E+001	1.960E+001	98.75%	76.00	128.00
	J2H421AC	U-238	1.778E+001	1.960E+001	90.70%	74.00	125.00

Sample Duplicate Information

Sample ID	Analyte	Sample Activity	Dup Sample ID	Dup Activity	RPD	RER	DER	Qualifier
F7G050168-001	U-234	6.979E-001	F7G050168-001X	6.856E-001	1.78%	4.482E-002	6.339E-002	
	U-235	1.426E-002	F7G050168-001X	2.160E-002	40.95%	1.757E-001	2.476E-001	NA: Activity < MDA
	U-238	6.022E-001	F7G050168-001X	7.410E-001	20.67%	5.172E-001	7.294E-001	

Matrix Spike Information

SampID	SampMSID	RegionName	Sample Activity	MS Activity	StdAdded	MSRecovery

TestAmerica STL

Daily Pulsers

Daily Pulser Check - Severn Trent Lab

Pulser Date: 7/13/2007

Detector	Date/Time	Gross Counts Result	Gross Counts Criteria	P/F	FWHM (keV) Result	FWHM (keV) Criteria	P/F	Pulser Center Result	Pulser Center Criteria	P/F	Energy (keV) Result	Energy (keV) Criteria	P/F
AV12	07/13/2007 9:11	7628	7588.7 +/- 5%	Pass	14.0	10 - 20	Pass	221.8	230.0 +/- 5%	Pass	4999	5058.4 +/- 25%	Pass
AV14	07/13/2007 7:55	7649	7638.3 +/- 5%	Pass	13.1	10 - 20	Pass	222.0	227.0 +/- 5%	Pass	5001	5037.2 +/- 25%	Pass
AV15	07/13/2007 7:55	7646	7770.5 +/- 5%	Pass	13.4	10 - 20	Pass	223.0	226.9 +/- 5%	Pass	5008	5036.6 +/- 25%	Pass
AV18	07/13/2007 7:55	7717	7714.5 +/- 5%	Pass	14.5	10 - 20	Pass	223.1	226.9 +/- 5%	Pass	5008	5036.4 +/- 25%	Pass
AV19	07/13/2007 7:55	7718	7269.8 +/- 5%	FAIL	13.9	10 - 20	Pass	220.9	227.7 +/- 5%	Pass	4993	5041.9 +/- 25%	Pass
AV19 OOS	07/13/2007 7:55	7718	7269.8 +/- 5%	FAIL	13.9	10 - 20	Pass	220.9	227.7 +/- 5%	Pass	4993	5041.9 +/- 25%	Pass
AV20	07/13/2007 7:55	7717	7503.6 +/- 5%	Pass	13.9	10 - 20	Pass	225.0	226.0 +/- 5%	Pass	5022	5029.9 +/- 25%	Pass
AV20 ok	07/13/2007 7:55	7717	7503.6 +/- 5%	Pass	13.9	10 - 20	Pass	225.0	226.0 +/- 5%	Pass	5022	5029.9 +/- 25%	Pass
AV21	07/13/2007 7:55	7715	7550.9 +/- 5%	Pass	13.5	10 - 20	Pass	223.0	226.0 +/- 5%	Pass	5008	5029.6 +/- 25%	Pass
AV22	07/13/2007 7:54	7701	7691.4 +/- 5%	Pass	14.4	10 - 20	Pass	222.8	225.0 +/- 5%	Pass	5007	5022.4 +/- 25%	Pass
AV24	07/13/2007 7:54	7695	7354.0 +/- 5%	Pass	21.3	10 - 20	FAIL	223.9	226.9 +/- 5%	Pass	5015	5036.4 +/- 25%	Pass
AV24 OOS	07/13/2007 7:54	7695	7354.0 +/- 5%	Pass	21.3	10 - 20	FAIL	223.9	226.9 +/- 5%	Pass	5015	5036.4 +/- 25%	Pass
AV45	07/13/2007 7:54	7648	7593.5 +/- 5%	Pass	14.8	10 - 20	Pass	221.1	225.6 +/- 5%	Pass	4994	5026.9 +/- 25%	Pass
AV46	07/13/2007 7:54	7652	7722.7 +/- 5%	Pass	13.1	10 - 20	Pass	224.0	225.8 +/- 5%	Pass	5015	5028.0 +/- 25%	Pass
AV46 ok	07/13/2007 7:54	7652	7722.7 +/- 5%	Pass	13.1	10 - 20	Pass	224.0	225.8 +/- 5%	Pass	5015	5028.0 +/- 25%	Pass
AV47	07/13/2007 7:54	7640	7532.5 +/- 5%	Pass	14.9	10 - 20	Pass	219.0	226.0 +/- 5%	Pass	4979	5029.6 +/- 25%	Pass
AV47 ok	07/13/2007 7:54	7640	7532.5 +/- 5%	Pass	14.9	10 - 20	Pass	219.0	226.0 +/- 5%	Pass	4979	5029.6 +/- 25%	Pass
AV48	07/13/2007 7:55	7637	7717.5 +/- 5%	Pass	15.1	10 - 20	Pass	221.0	224.0 +/- 5%	Pass	4994	5015.2 +/- 25%	Pass
AV49	07/13/2007 7:55	7615	7703.4 +/- 5%	Pass	14.7	10 - 20	Pass	224.0	226.0 +/- 5%	Pass	5015	5029.5 +/- 25%	Pass
AV49 ok	07/13/2007 7:55	7615	7703.4 +/- 5%	Pass	14.7	10 - 20	Pass	224.0	226.0 +/- 5%	Pass	5015	5029.5 +/- 25%	Pass
AV50	07/13/2007 7:55	7577	7660.9 +/- 5%	Pass	14.7	10 - 20	Pass	225.1	227.0 +/- 5%	Pass	5023	5037.2 +/- 25%	Pass
AV50 ok	07/13/2007 7:55	7577	7660.9 +/- 5%	Pass	14.7	10 - 20	Pass	225.1	227.0 +/- 5%	Pass	5023	5037.2 +/- 25%	Pass
AV51	07/13/2007 7:55	7234	7070.5 +/- 5%	Pass	13.7	10 - 20	Pass	227.0	223.0 +/- 5%	Pass	5037	5007.6 +/- 25%	Pass
AV51 ok	07/13/2007 7:55	7234	7070.5 +/- 5%	Pass	13.7	10 - 20	Pass	227.0	223.0 +/- 5%	Pass	5037	5007.6 +/- 25%	Pass
AV52	07/13/2007 6:20	6994	7156.4 +/- 5%	Pass	12.9	10 - 20	Pass	224.1	225.0 +/- 5%	Pass	5016	5022.4 +/- 25%	Pass
AV53	07/13/2007 6:20	7356	7144.1 +/- 5%	Pass	13.4	10 - 20	Pass	224.0	223.0 +/- 5%	Pass	5015	5007.8 +/- 25%	Pass
AV54	07/13/2007 6:20	7350	7313.1 +/- 5%	Pass	13.7	10 - 20	Pass	230.0	226.0 +/- 5%	Pass	5059	5029.5 +/- 25%	Pass
AV55	07/13/2007 6:20	7351	7132.9 +/- 5%	Pass	13.2	10 - 20	Pass	221.9	226.0 +/- 5%	Pass	5000	5029.7 +/- 25%	Pass
AV56	07/13/2007 6:20	7348	7163.7 +/- 5%	Pass	13.3	10 - 20	Pass	222.0	222.0 +/- 5%	Pass	5001	5000.7 +/- 25%	Pass
AV57	07/13/2007 6:20	7338	7309.5 +/- 5%	Pass	14.4	10 - 20	Pass	223.1	222.0 +/- 5%	Pass	5009	5000.6 +/- 25%	Pass
AV58	07/13/2007 6:20	7336	7249.2 +/- 5%	Pass	14.7	10 - 20	Pass	221.1	223.0 +/- 5%	Pass	4994	5008.0 +/- 25%	Pass
AV59	07/13/2007 6:20	7315	7141.4 +/- 5%	Pass	17.8	10 - 20	Pass	291.0	284.0 +/- 5%	Pass	5501	5450.6 +/- 25%	Pass

Detector	Date/Time	Gross Counts Result	Gross Counts Criteria		Gross Counts P/F	FWHM (keV) Result	FWHM (keV) Criteria	FWHM (keV) P/F	Pulser Center Result	Pulser Center Criteria		Pulser Center P/F	Energy (keV) Result	Energy (keV) Criteria		Energy (keV) P/F
AV60	07/13/2007 6:20	7325	7019.7	+/- 5%	Pass	54.5	10 - 20	FAIL	222.4	223.0	+/- 5%	Pass	5003	5007.5	+/- 25%	Pass
AV60 005	07/13/2007 7:55	7209	7019.7	+/- 5%	Pass	61.0	10 - 20	FAIL	222.1	223.0	+/- 5%	Pass	5001	5007.5	+/- 25%	Pass
AV63	07/13/2007 7:55	7011	7120.8	+/- 5%	Pass	12.6	10 - 20	Pass	223.0	223.0	+/- 5%	Pass	5008	5007.9	+/- 25%	Pass
AV63 ok	07/13/2007 6:20	7317	7120.8	+/- 5%	Pass	33.7	10 - 20	FAIL	221.8	223.0	+/- 5%	Pass	4999	5007.9	+/- 25%	Pass
AV64	07/13/2007 6:20	7325	7153.7	+/- 5%	Pass	14.1	10 - 20	Pass	221.9	224.0	+/- 5%	Pass	5000	5015.3	+/- 25%	Pass
AV66	07/13/2007 6:20	7306	7165.5	+/- 5%	Pass	13.5	10 - 20	Pass	218.9	222.0	+/- 5%	Pass	4978	5000.5	+/- 25%	Pass
AV67	07/13/2007 6:20	7424	7128.1	+/- 5%	Pass	18.7	10 - 20	Pass	224.0	224.1	+/- 5%	Pass	5015	5015.6	+/- 25%	Pass
AV68	07/13/2007 6:20	7426	7259.5	+/- 5%	Pass	13.9	10 - 20	Pass	222.0	222.0	+/- 5%	Pass	5001	5000.8	+/- 25%	Pass
AV69	07/13/2007 6:20	7374	7305.4	+/- 5%	Pass	16.6	10 - 20	Pass	221.0	222.0	+/- 5%	Pass	4994	5000.6	+/- 25%	Pass
AV70	07/13/2007 6:20	7416	7406.5	+/- 5%	Pass	14.4	10 - 20	Pass	220.0	222.6	+/- 5%	Pass	4986	5004.7	+/- 25%	Pass
AV71	07/13/2007 6:20	7417	7187.3	+/- 5%	Pass	14.0	10 - 20	Pass	219.9	225.0	+/- 5%	Pass	4985	5022.7	+/- 25%	Pass
AV72	07/13/2007 6:20	7417	7090.0	+/- 5%	Pass	13.2	10 - 20	Pass	224.0	223.9	+/- 5%	Pass	5015	5014.6	+/- 25%	Pass
AV73	07/13/2007 7:55	7320	7251.3	+/- 5%	Pass	24.3	10 - 20	FAIL	223.2	225.0	+/- 5%	Pass	5009	5022.4	+/- 25%	Pass
AV73 005	07/13/2007 6:20	7409	7251.3	+/- 5%	Pass	23.8	10 - 20	FAIL	223.2	225.0	+/- 5%	Pass	5009	5022.4	+/- 25%	Pass
AV75	07/13/2007 6:20	7217	7267.9	+/- 5%	Pass	12.9	10 - 20	Pass	223.1	224.1	+/- 5%	Pass	5008	5015.5	+/- 25%	Pass
AV76	07/13/2007 6:20	7150	7374.3	+/- 5%	Pass	13.0	10 - 20	Pass	222.9	224.0	+/- 5%	Pass	5007	5015.2	+/- 25%	Pass
AV77	07/13/2007 6:20	7557	7497.1	+/- 5%	Pass	13.1	10 - 20	Pass	224.0	224.0	+/- 5%	Pass	5015	5015.4	+/- 25%	Pass
AV78	07/13/2007 6:20	7555	7183.8	+/- 5%	FAIL	13.5	10 - 20	Pass	221.9	223.3	+/- 5%	Pass	5000	5009.8	+/- 25%	Pass
AV78 ok	07/13/2007 7:55	6967	7183.8	+/- 5%	Pass	13.2	10 - 20	Pass	221.9	223.3	+/- 5%	Pass	5000	5009.8	+/- 25%	Pass
AV79	07/13/2007 6:20	7552	7349.7	+/- 5%	Pass	13.3	10 - 20	Pass	220.9	222.0	+/- 5%	Pass	4993	5000.4	+/- 25%	Pass
AV80	07/13/2007 6:20	7345	7226.4	+/- 5%	Pass	12.6	10 - 20	Pass	223.0	224.1	+/- 5%	Pass	5008	5015.5	+/- 25%	Pass
AV81	07/13/2007 6:20	7547	7453.4	+/- 5%	Pass	13.3	10 - 20	Pass	222.0	223.0	+/- 5%	Pass	5000	5008.1	+/- 25%	Pass
AV82	07/13/2007 6:20	7545	7529.2	+/- 5%	Pass	13.7	10 - 20	Pass	224.1	224.0	+/- 5%	Pass	5016	5015.2	+/- 25%	Pass
AV83	07/13/2007 6:20	7377	7523.7	+/- 5%	Pass	12.9	10 - 20	Pass	222.1	222.0	+/- 5%	Pass	5001	5000.4	+/- 25%	Pass
AV84	07/13/2007 6:20	7334	7637.7	+/- 5%	Pass	12.9	10 - 20	Pass	224.1	223.0	+/- 5%	Pass	5016	5007.7	+/- 25%	Pass
AV85	07/13/2007 6:20	7274	7549.7	+/- 5%	Pass	13.0	10 - 20	Pass	221.9	223.0	+/- 5%	Pass	5000	5008.0	+/- 25%	Pass
AV86	07/13/2007 6:20	7690	7679.0	+/- 5%	Pass	17.3	10 - 20	Pass	224.1	223.9	+/- 5%	Pass	5016	5014.3	+/- 25%	Pass
AV87	07/13/2007 6:20	7313	7512.4	+/- 5%	Pass	12.9	10 - 20	Pass	221.9	223.0	+/- 5%	Pass	5000	5007.7	+/- 25%	Pass
AV88	07/13/2007 6:20	7717	7716.1	+/- 5%	Pass	14.1	10 - 20	Pass	224.1	224.0	+/- 5%	Pass	5016	5015.4	+/- 25%	Pass
AV89	07/13/2007 6:20	7715	7553.8	+/- 5%	Pass	13.7	10 - 20	Pass	221.1	222.6	+/- 5%	Pass	4994	5004.7	+/- 25%	Pass
AV90	07/13/2007 6:21	7711	7474.4	+/- 5%	Pass	13.9	10 - 20	Pass	224.1	224.1	+/- 5%	Pass	5016	5015.6	+/- 25%	Pass
AV92	07/13/2007 6:21	7474	7358.9	+/- 5%	Pass	12.3	10 - 20	Pass	223.0	223.9	+/- 5%	Pass	5008	5014.6	+/- 25%	Pass
AV93	07/13/2007 6:21	7426	7393.5	+/- 5%	Pass	12.7	10 - 20	Pass	223.0	223.0	+/- 5%	Pass	5008	5008.3	+/- 25%	Pass
AV94	07/13/2007 6:21	7647	7477.9	+/- 5%	Pass	13.5	10 - 20	Pass	221.9	222.0	+/- 5%	Pass	5000	5000.5	+/- 25%	Pass
AV95	07/13/2007 6:21	7645	7432.4	+/- 5%	Pass	13.5	10 - 20	Pass	218.9	222.2	+/- 5%	Pass	4978	5001.9	+/- 25%	Pass
AV96	07/13/2007 9:11	7576	7654.3	+/- 5%	Pass	14.5	10 - 20	Pass	221.9	222.6	+/- 5%	Pass	5000	5005.3	+/- 25%	Pass

Detector	Date/Time	Gross Counts Result	Gross Counts Criteria	Gross Counts P/F	FWHM (keV) Result	FWHM (keV) Criteria	FWHM (keV) P/F	Pulser Center Result	Pulser Center Criteria	Pulser Center P/F	Energy (keV) Result	Energy (keV) Criteria	Energy (keV) P/F
AV97	07/13/2007 9:11	7569	7649.9 +/- 5%	Pass	14.5	10 - 20	Pass	222.9	223.8 +/- 5%	Pass	5007	5014.0 +/- 25%	Pass
AV98	07/13/2007 9:11	7566	7582.0 +/- 5%	Pass	13.5	10 - 20	Pass	222.9	223.0 +/- 5%	Pass	5007	5007.6 +/- 25%	Pass

TestAmerica STL

Run Log

Logbook No.: 2972

STL
St. Louis

Alpha Spectrometry Runlog

	Date	Batch #	Sample #	Detector	Count Time	Analyte	Setup Initials	Process Initials
1	7-12-07	7192384	F7F140207-013	46	240 min	Th	GS	UW
2			-013X	47				
3			F7G110000-384B	45				
4			-384C	49				
5	7/13/7	Daily	Bkg + Source	1 min	1-98	QA	SE	—
6		7186400	F7F280220-001	67	960 min	Pu	UW	UW
7			-001X	68				
8		7190361	F7G050168-001	46	240 min	U		UW
9			-001X	47				
10			-002	48				
11			-003	50				
12			-004	51				
13			-005	56				
14			-006	57				
15			-007	63				
16			-008	14				
17			-009	22				
18			-010	12				
19			F7G090000-361B	15				
20			-361C	21				
21		7190360	F7G050168-001	14		Th		UW
22			-001X	18				
23			-002	22				
24			-003	46				
25			-004	47				
26			-005	48				
27			-006	50				
28			-007	51				
29			-008	56				

Reviewed By: UW Date: 7/13/07

SOP References: STL-RD-0210 Rev 8 05/30/07. Form: SL-RAD-0030, Revised 7/07/06
QC Type Suffixes: B=Blank; C=Laboratory Control Sample; L=Laboratory Control Sample Duplicate; S=Matrix Spike; D=Matrix Spike Duplicate; X=Sample Duplicate.

Logbook No.: 2972

STL
St. Louis

Alpha Spectrometry Runlog

	Date	Batch #	Sample #	Detector	Count Time	Analyte	Setup Initials	Process Initials
1	7/13/07	7190360	F7G050168-009	57	240min	Th	LW	LW
2			-010	63				
3			F7G090000-3603	45				
4			-3600	49				
5		7190361	F7G050168-010	20		U		LW
6	7-14-07	Daily	Pulsar	1-98	1 min.	QA	GS	—
7	7-14-07	7187160	F7G020127-001	19	240min.	Pu	GS	LW
8			-001X	18				
9			-002	22				
10			-003	20				
11			-004	46				
12			-005	47				
13			-006	48				
14			-007	50				
15			-008	51				
16			-009	56				
17			-010	57				
18			-011	63				
19			-012	67				
20			-013	68				
21			-014	12				
22			F7G060000-1603	71				
23			-1600	72				
24	7/15/07	Daily	Pulsers	1-98	1 min	QA	LW	—
25		7187163	F7G020127-001	12	240min	U		LW
26			-001X	14				
27			-002	16				
28			-003	20				
29			-004	22				

Reviewed By: LW Date: 7/15/07

SOP References: STL-RD-0210 Rev 8 05/30/07. Form: SL-RAD-0030, Revised 7/07/06
QC Type Suffixes: B=Blank; C=Laboratory Control Sample; L=Laboratory Control Sample Duplicate; S=Matrix Spike; D=Matrix Spike Duplicate; X=Sample Duplicate.

240min LL or R 7/24/07

SEVERN TRENT **STL**

Prep Report for:

Uranium, Isotopic by Alpha Spectroscopy

Batch: 7190361 **Prep Analyst:** 403301

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

SampID	WRKNO	Aliquot	Dilution	Adj Aliquot	TracerID	TracerAnalyte	TracerAliquot	Low Level X
F7G050168-001	J2C1G1AD	2.0054E+000 g 46	1.00	2.0054E+000 g	rad04-0093	U-232	0.10	N
F7G050168-001X	J2C1G1AJ	2.0144E+000 g 47	1.00	2.0144E+000 g	rad04-0093	U-232	0.10	N
F7G050168-002	J2C1V1AD	2.0017E+000 g 48	1.00	2.0017E+000 g	rad04-0093	U-232	0.10	N
F7G050168-003	J2C1W1AD	2.0032E+000 g 50	1.00	2.0032E+000 g	rad04-0093	U-232	0.10	N
F7G050168-004	J2C1X1AD	2.0121E+000 g 51	1.00	2.0121E+000 g	rad04-0093	U-232	0.10	N
F7G050168-005	J2C101AD	2.0173E+000 g 56	1.00	2.0173E+000 g	rad04-0093	U-232	0.10	N
F7G050168-006	J2C111AD	2.0100E+000 g 57	1.00	2.0100E+000 g	rad04-0093	U-232	0.10	N
F7G050168-007	J2C131AD	2.0017E+000 g 63	1.00	2.0017E+000 g	rad04-0093	U-232	0.10	N
F7G050168-008	J2C151AD	2.0141E+000 g 14 ~~24~~ mw 7/13/07	1.00	2.0141E+000 g	rad04-0093	U-232	0.10	N
F7G050168-009	J2C191AD	2.0046E+000 g 22	1.00	2.0046E+000 g	rad04-0093	U-232	0.10	N
F7G050168-010	J2C2D1AD	2.0052E+000 g 12	1.00	2.0052E+000 g	rad04-0093	U-232 Pulser on mw 7/13/07 RC=1420	0.10	N
F7G090000-361B	J2H421AA	2.0000E+000 g 15	1.00	2.0000E+000 g	rad04-0093	U-232	0.10	N
F7G090000-361C	J2H421AC	1.3120E-001 g 21	1.00	1.3120E-001 g	rad04-0093	U-232	0.10	N

Spike Information

Sample ID	Standard ID	Analyte	Std Conc	Aliquot	Ref Date	StdAdded
F7G090000-361C	TRM-3_IsoU	U-234	4.351E+001 dpm/g	0.13 g	5/29/2003 12:00:00AM	1.960E+001 pCi/g
F7G090000-361C	TRM-3_IsoU	U-238	4.351E+001 dpm/g	0.13 g	5/29/2003 12:00:00AM	1.960E+001 pCi/g

Spiked By: [signature] Spike Verified By: BS Spike Date: 7/9/07

SampID	WRKNO	Aliquot	Dilution	Adj Aliquot	TracerID	TracerAnalyte	TracerAliquot	Low Level

Standard Operating Procedures

	SOPNumber	Title	Revision
☐	STL-RC-0002	Planchet Preparation For Radiochemistry And Radiological Screening Analysis	4.00
☐	STL-RC-0003	Drying And Grinding Of Soil And Solid Samples	6.00
☐	STL-RC-0004	Preparation Of Soil, Sludge, And Filter Paper Samples For Radiochemical Analysis	10.00
☐	STL-RC-0090	Preparation Of Samples For Sequential Determination Of Isotopic Americium, Currium, Neptunium, Plutonium, Tho	4.00
☒	STL-RC-0100	Actinide Coprecipitation	9.00
☐	STL-RC-0232	Isotopic Thorium And/oR Neptunium in Water, Soil, Sludge, and Filters by Eichrom TEVA Separation Resins	7.00
☐	STL-RC-0238	Isotopic Uranium By Eichrom UTEVA Resin for Water, Soil, Sludge and Filters	7.00
☐	STL-RC-0240	Isotopic Americium, Curium, Plutonium, Thorium, and Uranium in Water, Soil, Sludge and Filters by Eichrome Sepa	5.00
☐	STL-RC-0241	Isotopic Americium, Plutonium, Curium, and Uranium in Water, Soil, Sludge and Filters by Eichrome Uteva and Tr	3.00
☒	STL-RC-0242	Isotopic Thorium, Plutonium and Uranium in Water, Soil, Sludge and Filters by Eichrome Separation Resin	6.00
☐	STL-RD-0201	Daily Operations Of An Alpha Spectroscopy System	2.00
☐	STL-RD-0203	Calibration And Maintenance Of A Alpha Spectroscopy System	1.00

KW per BS	7/12/07	BS	7/13/07
Column Analyst	Date	Coprecipitated By	Precip Date
LW	7/16/07		
Reviewed By	Review Date		
BS	7/13/07	LW	7/13/07
Analyst/Relenquished By	Release Date	Received By	Receipt Date

SEVERN TRENT **STL**

Alpha-Spectroscopy Analysis Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 2:57:32PM 7/13/2007

Sample

Sample Name: F7G050168-001
SampleType: Sample
: J2C1G1AD
Sample Collection Date: 6/22/2007 11:10:00AM
Comment:

Spectrum #1 Analysis #1
Sample Weight : 2.0054g
Aliquot: N/A Aliquot Fraction: N/A
Lab Preparation:

Batch

Batch Name: 7190361
:
Description:

Client Name: Undefined
Client Contact:

Tracer

Tracer Name: Rad04-0093_U232
Tracer Activity: 101.00 DPM/mL x (Vol.)0.10 mL = 10.10 DPM
Tracer Ref. Date: 4/27/2007 12:05:46PM

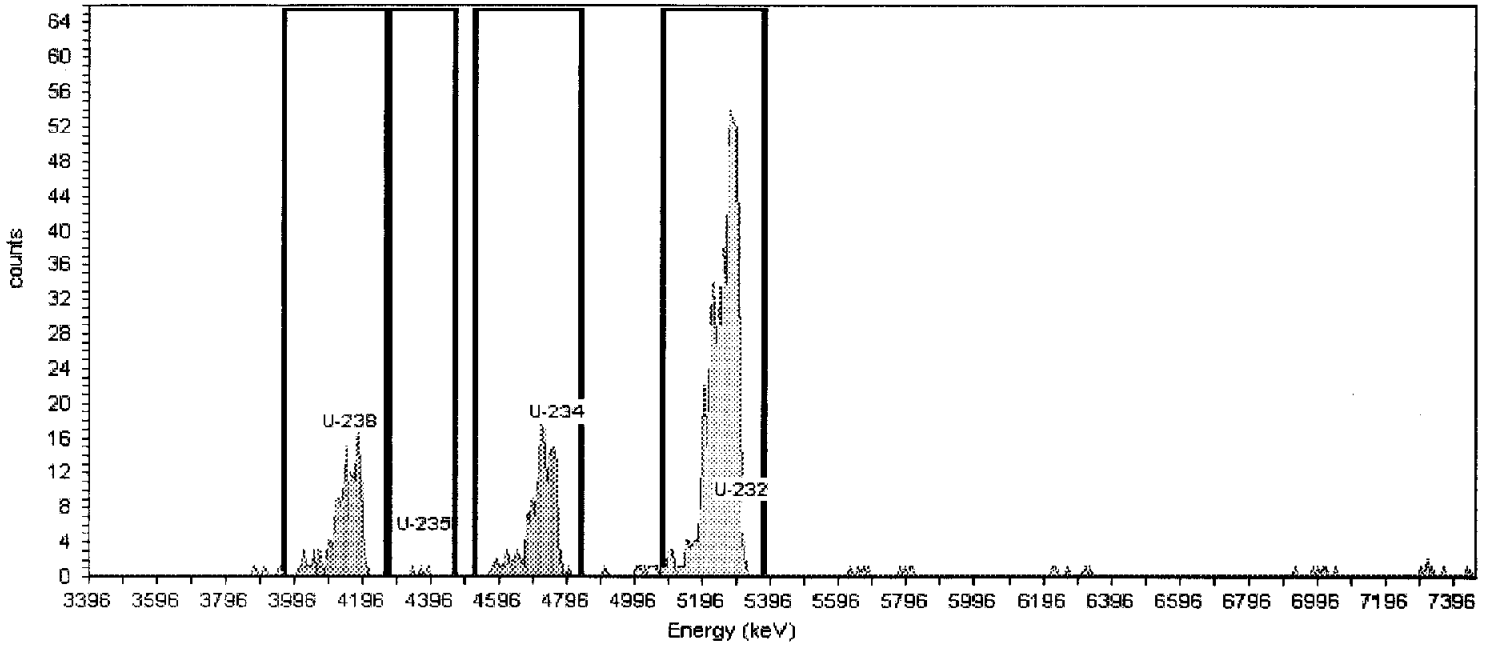
Tracer Nuclide: U-232
Tracer Recovery: 90.28%

Acquisition

Detector: AV46
Serial Number: AV46
Acquisition Start Date: 7/13/2007 10:56:55AM
Live Time: 240.00 min.
Real Time: 240.00 min.
Background Date: 6/24/2007 8:47:33PM

Calibration Name: June2007_AV46
Calibration Date: 6/27/2007 5:43:34AM
Energy Cal Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 27.20% +/- 0.28% TPU(2 sigma)

Background Info: Sample: AV46; Det: AV46; Spectrum #1; Jun-24-2007 20:47



General Analysis

Analysis Method: ROI Analysis, Set Name = UROI
Decay Correction: 7/13/2007 10:54:59AM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Uranium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
U-238	4158.500	3962.485	4260.137	82.099	100.0	158.00	0.0000	158	6.022E-001	1.241E-001	0.000E+000	1.031E-002
U-235	4376.294	4267.397	4463.412	60.987	80.2	3.00	0.0000	3	1.426E-002	1.910E-002	0.000E+000	1.286E-002
U-234	4761.063	4521.490	4833.661	74.830	99.8	184.00	1.2500	183	6.979E-001	1.381E-001	7.853E-003	2.604E-002
U-232	5312.808	5073.234	5378.146	86.780	100.1	596.00	1.5000	595	2.048E+000	2.660E-001	8.596E-003	2.752E-002

ST SEVERN TRENT STL

Alpha-Spectroscopy Analysis Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040

2:57:18PM 7/13/2007

Sample

Sample Name: F7G050168-001X
SampleType: Sample
: J2C1G1AJ
Sample Collection Date: 6/22/2007 11:10:00AM
Comment:

Spectrum #1 Analysis #1
Sample Weight : 2.0144g
Aliquot: N/A Aliquot Fraction: N/A
Lab Preparation:

Batch

Batch Name: 7190361
:
Description:

Client Name: Undefined
Client Contact:

Tracer

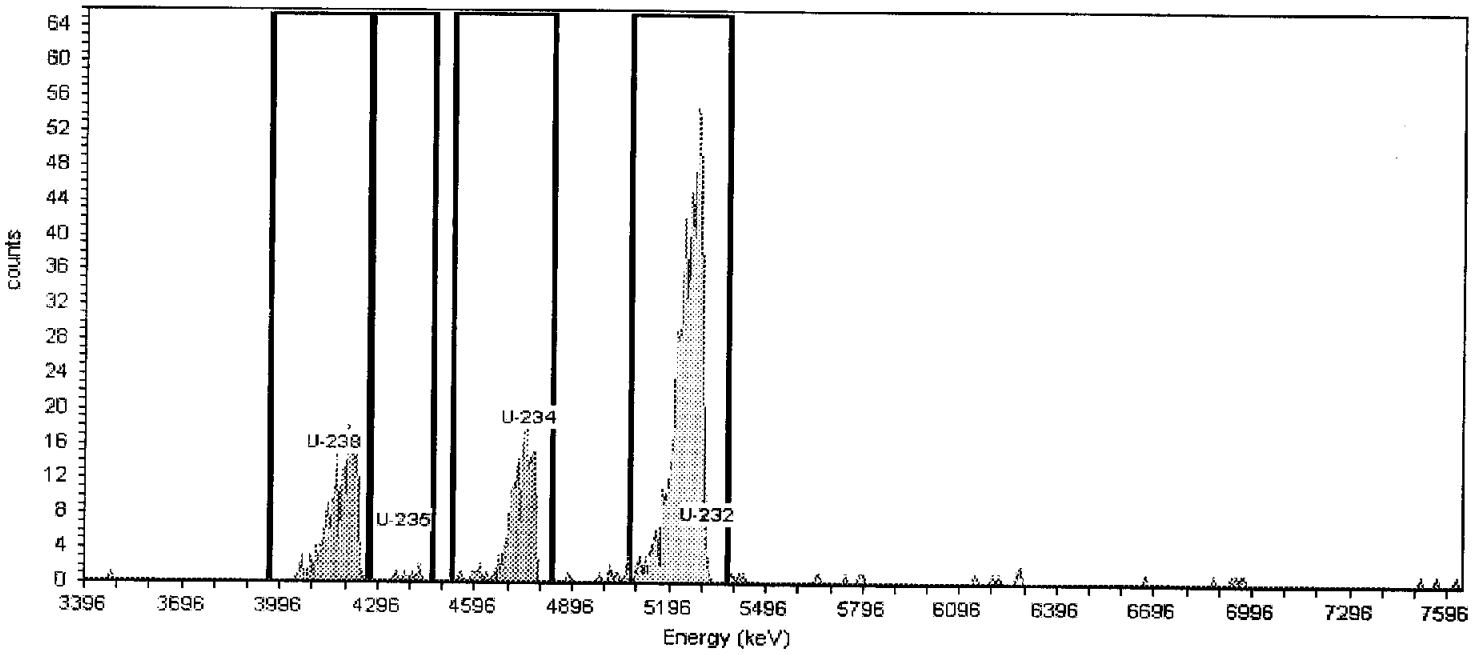
Tracer Name: Rad04-0093_U232
Tracer Activity: 101.00 DPM/mL x (Vol.)0.10 mL = 10.10 DPM
Tracer Ref. Date: 4/27/2007 12:05:46PM

Tracer Nuclide: U-232
Tracer Recovery: 91.62%

Acquisition

Detector: AV47
Serial Number: AV47
Acquisition Start Date: 7/13/2007 10:56:39AM
Live Time: 240.00 min.
Real Time: 240.00 min.
Background Date: 6/24/2007 8:47:35PM
Background Info: Sample: AV47; Det: AV47; Spectrum #1; Jun-24-2007 20:47

Calibration Name: June2007_AV47
Calibration Date: 6/27/2007 5:43:18AM
Energy Cal Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 26.42% +/- 0.26% TPU(2 sigma)



General Analysis

Analysis Method: ROI Analysis, Set Name = UROI
Decay Correction: 7/13/2007 10:54:59AM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Uranium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
U-238	4158.500	3962.485	4260.137	35.197	100.0	193.00	0.5000	193	7.410E-001	1.443E-001	5.006E-003	2.043E-002
U-235	4376.294	4267.397	4463.412	79.913	80.2	5.00	0.5000	5	2.160E-002	2.269E-002	6.242E-003	2.547E-002
U-234	4761.063	4521.490	4833.661	77.342	99.8	179.00	1.2500	178	6.856E-001	1.369E-001	7.931E-003	2.630E-002
U-232	5312.808	5073.234	5378.146	84.787	100.1	587.00	1.0000	586	2.069E+000	2.694E-001	7.088E-003	2.461E-002

SEVERN TRENT **STL**

Alpha-Spectroscopy Analysis Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 2:57:36PM 7/13/2007

Sample

Sample Name: F7G050168-002
SampleType: Sample
: J2C1V1AD
Sample Collection Date: 6/22/2007 11:10:00AM
Comment:

Spectrum #1 Analysis #1
Sample Weight : 2.0017g
Aliquot: N/A Aliquot Fraction: N/A
Lab Preparation:

Batch

Batch Name: 7190361
:
Description:

Client Name: Undefined
Client Contact:

Tracer

Tracer Name: Rad04-0093_U232
Tracer Activity: 101.00 DPM/mL x (Vol.)0.10 mL = 10.10 DPM
Tracer Ref. Date: 4/27/2007 12:05:46PM

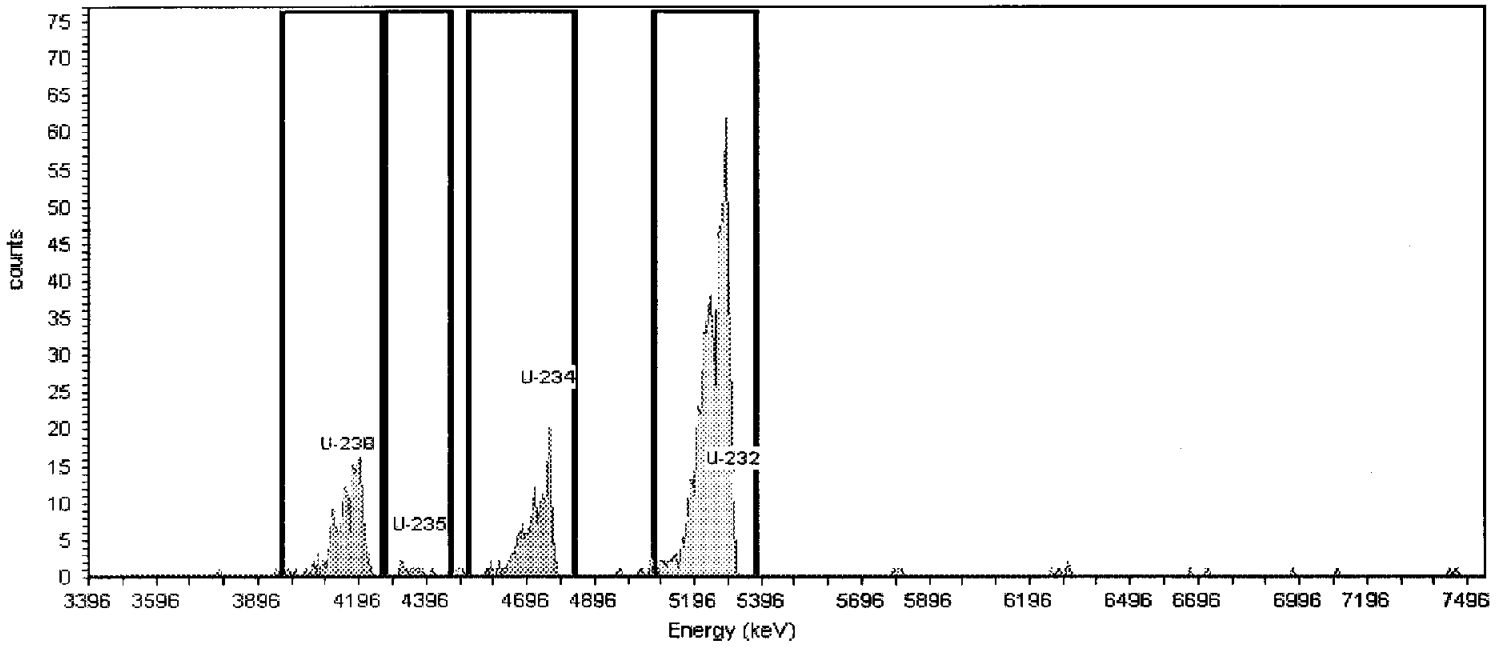
Tracer Nuclide: U-232
Tracer Recovery: 96.73%

Acquisition

Detector: AV48
Serial Number: AV48
Acquisition Start Date: 7/13/2007 10:56:40AM
Live Time: 240.00 min.
Real Time: 240.00 min.
Background Date: 6/24/2007 8:47:37PM

Calibration Name: June2007_AV48
Calibration Date: 6/27/2007 11:52:00AM
Energy Cal Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 26.23% +/- 0.28% TPU(2 sigma)

Background Info: Sample: AV48; Det: AV48; Spectrum #1; Jun-24-2007 20:47



General Analysis

Analysis Method: ROI Analysis, Set Name = UROI
Decay Correction: 7/13/2007 10:54:59AM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Uranium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
U-238	4158.500	3962.485	4260.137	83.719	100.0	161.00	0.5000	161	5.932E-001	1.213E-001	4.806E-003	1.961E-002
U-235	4376.294	4267.397	4463.412	18.260	80.2	10.00	0.0000	10	4.608E-002	3.114E-002	0.000E+000	1.247E-002
U-234	4761.063	4521.490	4833.661	89.869	99.8	152.00	0.2500	152	5.619E-001	1.168E-001	3.405E-003	1.683E-002
U-232	5312.808	5073.234	5378.146	92.403	100.1	615.00	0.7500	614	2.198E+000	2.836E-001	5.894E-003	2.180E-002

Alpha-Spectroscopy Analysis Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 2:57:41PM 7/13/2007

Sample

Sample Name: F7G050168-003
SampleType: Sample
: J2C1W1AD
Sample Collection Date: 6/22/2007 11:10:00AM
Comment:

Spectrum #1 Analysis #1
Sample Weight : 2.0032g
Aliquot: N/A Aliquot Fraction: N/A
Lab Preparation:

Batch

Batch Name: 7190361
:
Description:

Client Name: Undefined
Client Contact:

Tracer

Tracer Name: Rad04-0093_U232
Tracer Activity: 101.00 DPM/mL x (Vol.)0.10 mL = 10.10 DPM
Tracer Ref. Date: 4/27/2007 12:05:46PM

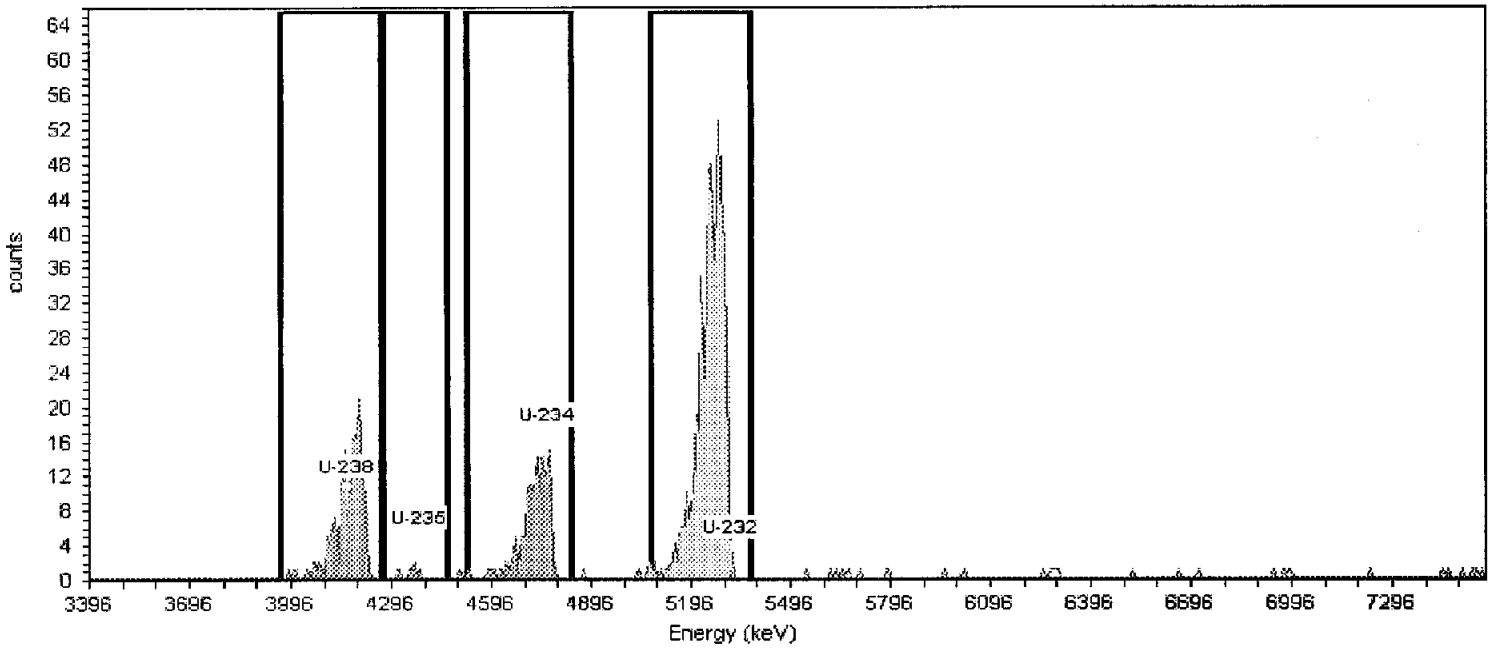
Tracer Nuclide: U-232
Tracer Recovery: 87.52%

Acquisition

Detector: AV50
Serial Number: AV50
Acquisition Start Date: 7/13/2007 10:56:41AM
Live Time: 240.00 min.
Real Time: 240.00 min.
Background Date: 6/24/2007 8:47:41PM

Calibration Name: June2007_AV50
Calibration Date: 6/27/2007 11:52:12AM
Energy Cal Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 26.87% +/- 0.27% TPU(2 sigma)

Background Info: Sample: AV50; Det: AV50; Spectrum #1; Jun-24-2007 20:47



General Analysis

Analysis Method: ROI Analysis, Set Name = UROI
Decay Correction: 7/13/2007 10:54:59AM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Uranium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
U-238	4158.500	3962.485	4260.137	68.421	100.0	188.00	0.0000	188	7.491E-001	1.474E-001	0.000E+000	1.078E-002
U-235	4376.294	4267.397	4463.412	61.392	80.2	7.00	0.2500	7	3.354E-002	2.712E-002	4.569E-003	2.258E-002
U-234	4761.063	4521.490	4833.661	81.246	99.8	169.00	0.5000	169	6.728E-001	1.365E-001	5.193E-003	2.119E-002
U-232	5312.808	5073.234	5378.146	79.790	100.1	572.00	2.7500	569	1.988E+000	2.607E-001	1.217E-002	3.513E-002

ST SEVERN TRENT **STL**

Alpha-Spectroscopy Analysis Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 2:57:44PM 7/13/2007

Sample

Sample Name: F7G050168-004
SampleType: Sample
: J2C1X1AD
Sample Collection Date: 6/22/2007 11:00:00AM
Comment:

Spectrum #1 Analysis #1
Sample Weight : 2.0121g
Aliquot: N/A Aliquot Fraction: N/A
Lab Preparation:

Batch

Batch Name: 7190361
:
Description:

Client Name: Undefined
Client Contact:

Tracer

Tracer Name: Rad04-0093_U232
Tracer Activity: 101.00 DPM/mL x (Vol.)0.10 mL = 10.10 DPM
Tracer Ref. Date: 4/27/2007 12:05:46PM

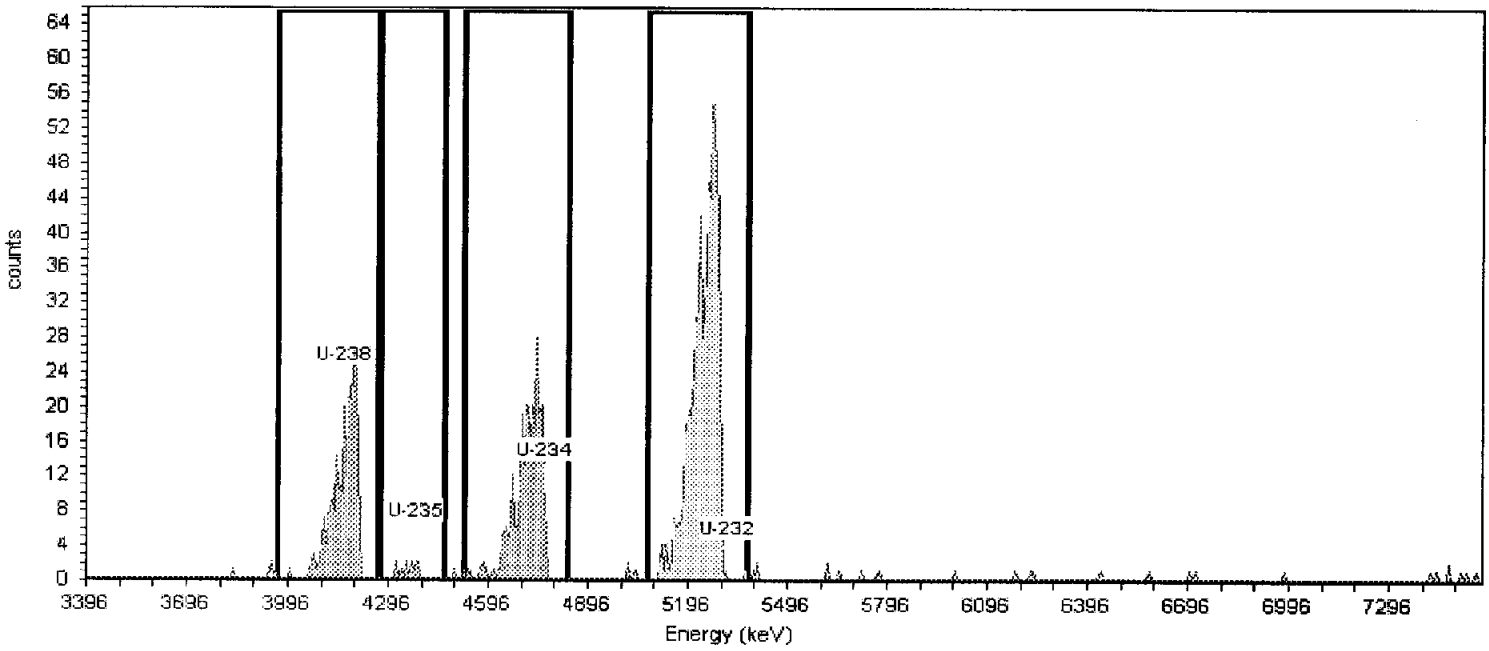
Tracer Nuclide: U-232
Tracer Recovery: 86.54%

Acquisition

Detector: AV51
Serial Number:
Acquisition Start Date: 7/13/2007 10:56:42AM
Live Time: 240.00 min.
Real Time: 240.00 min.
Background Date: 6/24/2007 8:47:43PM

Calibration Name: June2007_AV51
Calibration Date: 6/27/2007 12:06:05PM
Energy Cal Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 26.86% +/- 0.26% TPU(2 sigma)

Background Info: Sample: AV51; Det: AV51; Spectrum #1; Jun-24-2007 20:47



General Analysis

Analysis Method: ROI Analysis, Set Name = UROI
Decay Correction: 7/13/2007 10:54:59AM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Uranium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
U-238	4158.500	3962.485	4260.137	66.534	100.0	228.00	0.2500	228	9.140E-001	1.709E-001	3.690E-003	1.824E-002
U-235	4376.294	4267.397	4463.412	69.263	80.2	12.00	0.0000	12	6.005E-002	3.694E-002	0.000E+000	1.354E-002
U-234	4761.063	4521.490	4833.661	79.016	99.8	254.00	1.7500	252	1.014E+000	1.855E-001	9.783E-003	3.045E-002
U-232	5312.808	5073.234	5378.146	86.168	100.1	565.00	2.2500	563	1.957E+000	2.571E-001	1.108E-002	3.304E-002

SEVERN TRENT **STL**

Alpha-Spectroscopy Analysis Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 — 2:57:48PM 7/13/2007

Sample

Sample Name: F7G050168-005
SampleType: Sample
: J2C101AD
Sample Collection Date: 6/22/2007 11:25:00AM
Comment:

Spectrum #1 Analysis #1
Sample Weight : 2.0173g
Aliquot: N/A Aliquot Fraction: N/A
Lab Preparation:

Batch

Batch Name: 7190361
:
Description:

Client Name: Undefined
Client Contact:

Tracer

Tracer Name: Rad04-0093_U232
Tracer Activity: 101.00 DPM/mL x (Vol.)0.10 mL = 10.10 DPM
Tracer Ref. Date: 4/27/2007 12:05:46PM

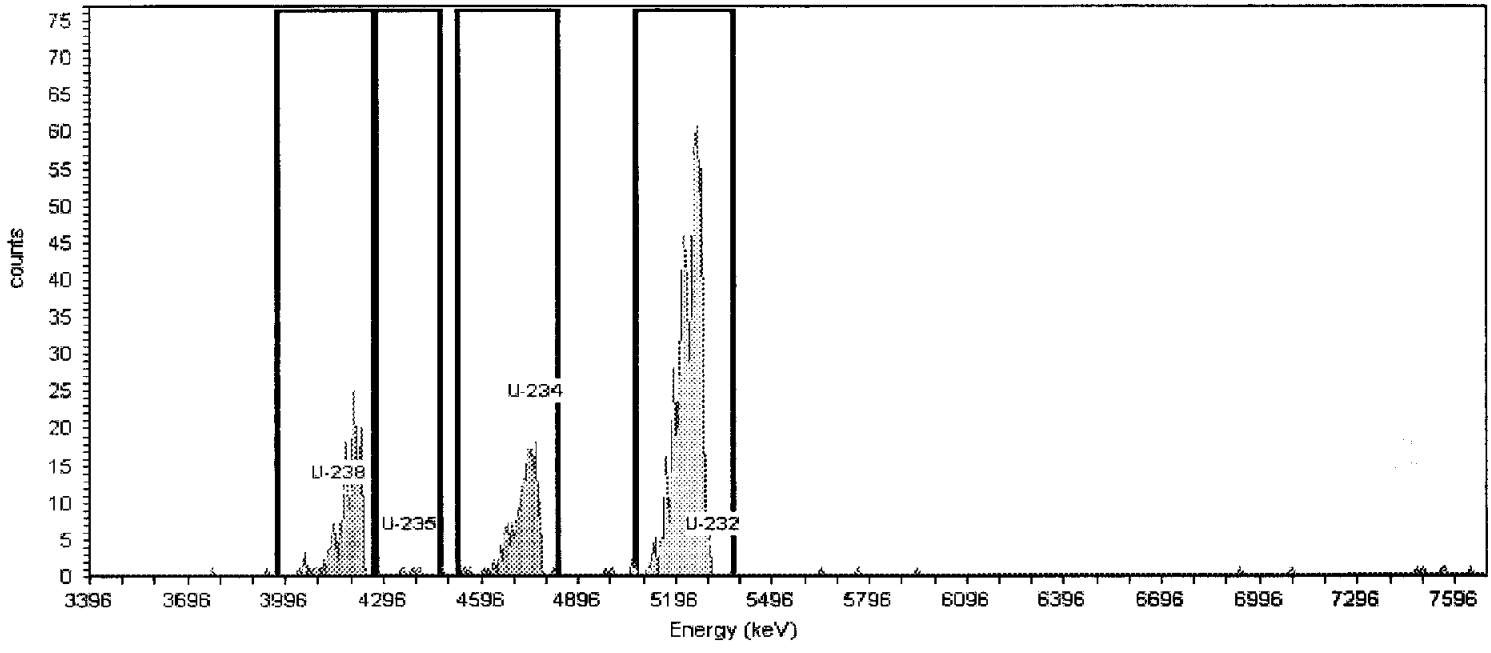
Tracer Nuclide: U-232
Tracer Recovery: 97.58%

Acquisition

Detector: AV56
Serial Number:
Acquisition Start Date: 7/13/2007 10:56:43AM
Live Time: 240.00 min.
Real Time: 240.00 min.
Background Date: 6/24/2007 8:47:52PM

Calibration Name: June2007_AV56
Calibration Date: 6/27/2007 5:43:24AM
Energy Cal Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 25.86% +/- 0.27% TPU(2 sigma)

Background Info: Sample: AV56; Det: AV56; Spectrum #1; Jun-24-2007 20:47



General Analysis

Analysis Method: ROI Analysis, Set Name = UROI
Decay Correction: 7/13/2007 10:54:59AM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Uranium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
U-238	4158.500	3962.485	4260.137	36.946	100.0	172.00	1.0000	171	6.304E-001	1.268E-001	6.780E-003	2.354E-002
U-235	4376.294	4267.397	4463.412	17.234	80.2	5.00	0.2500	5	2.183E-002	2.125E-002	4.227E-003	2.089E-002
U-234	4761.063	4521.490	4833.661	64.324	99.8	179.00	0.5000	179	6.594E-001	1.308E-001	4.804E-003	1.960E-002
U-232	5312.808	5073.234	5378.146	86.335	100.1	612.00	1.0000	611	2.201E+000	2.842E-001	6.789E-003	2.357E-002

SEVERN TRENT **STL**

Alpha-Spectroscopy Analysis Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 2:56:49PM 7/13/2007

Sample

Sample Name: F7G050168-006
SampleType: Sample
: J2C111AD
Sample Collection Date: 6/22/2007 10:45:00AM
Comment:

Spectrum #1 Analysis #1
Sample Weight : 2.0100g
Aliquot: N/A Aliquot Fraction: N/A
Lab Preparation:

Batch

Batch Name: 7190361
:
Description:

Client Name: Undefined
Client Contact:

Tracer

Tracer Name: Rad04-0093_U232
Tracer Activity: 101.00 DPM/mL x (Vol.)0.10 mL = 10.10 DPM
Tracer Ref. Date: 4/27/2007 12:05:46PM

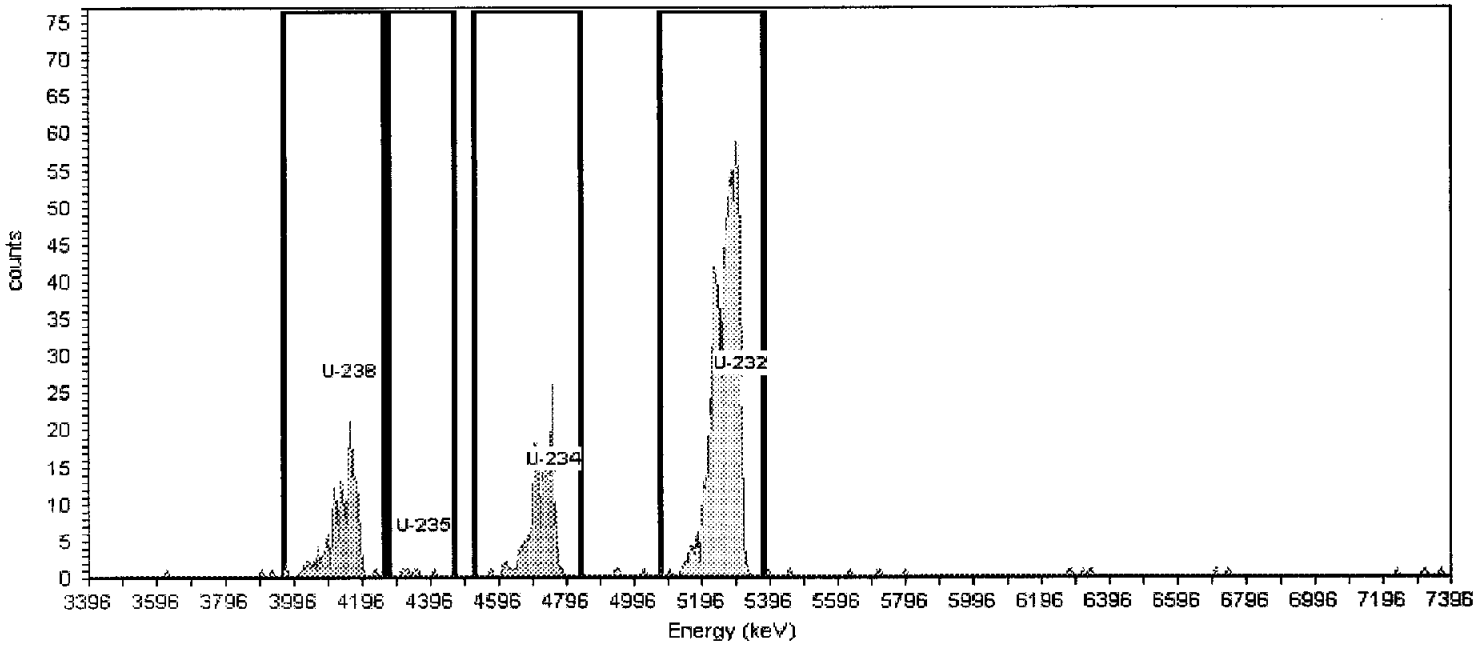
Tracer Nuclide: U-232
Tracer Recovery: 95.14%

Acquisition

Detector: AV57
Serial Number:
Acquisition Start Date: 7/13/2007 10:56:44AM
Live Time: 240.00 min.
Real Time: 240.00 min.
Background Date: 6/24/2007 8:47:54PM

Calibration Name: June2007_AV57
Calibration Date: 6/27/2007 5:43:29AM
Energy Cal Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 27.13% +/- 0.29% TPU(2 sigma)

Background Info: Sample: AV57; Det: AV57; Spectrum #1; Jun-24-2007 20:47



General Analysis

Analysis Method: ROI Analysis, Set Name = UROI
Decay Correction: 7/13/2007 10:54:59AM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Uranium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
U-238	4158.500	3962.485	4260.137	77.339	100.0	166.00	0.0000	166	6.004E-001	1.215E-001	0.000E+000	9.788E-003
U-235	4376.294	4267.397	4463.412	18.408	80.2	6.00	0.2500	6	2.593E-002	2.280E-002	4.147E-003	2.050E-002
U-234	4761.063	4521.490	4833.661	78.936	99.8	179.00	1.5000	178	6.433E-001	1.280E-001	8.164E-003	2.614E-002
U-232	5312.808	5073.234	5378.146	84.703	100.1	627.00	2.0000	625	2.154E+000	2.771E-001	9.420E-003	2.864E-002

SEVERN TRENT **STL**

Alpha-Spectroscopy Analysis Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 2:58:01PM 7/13/2007

Sample

Sample Name: F7G050168-007
SampleType: Sample
: J2C131AD
Sample Collection Date: 6/22/2007 11:25:00AM
Comment:

Spectrum #1 Analysis #1
Sample Weight : 2.0017g
Aliquot: N/A Aliquot Fraction: N/A
Lab Preparation:

Batch

Batch Name: 7190361
:
Description:

Client Name: Undefined
Client Contact:

Tracer

Tracer Name: Rad04-0093_U232
Tracer Activity: 101.00 DPM/mL x (Vol.)0.10 mL = 10.10 DPM
Tracer Ref. Date: 4/27/2007 12:05:46PM

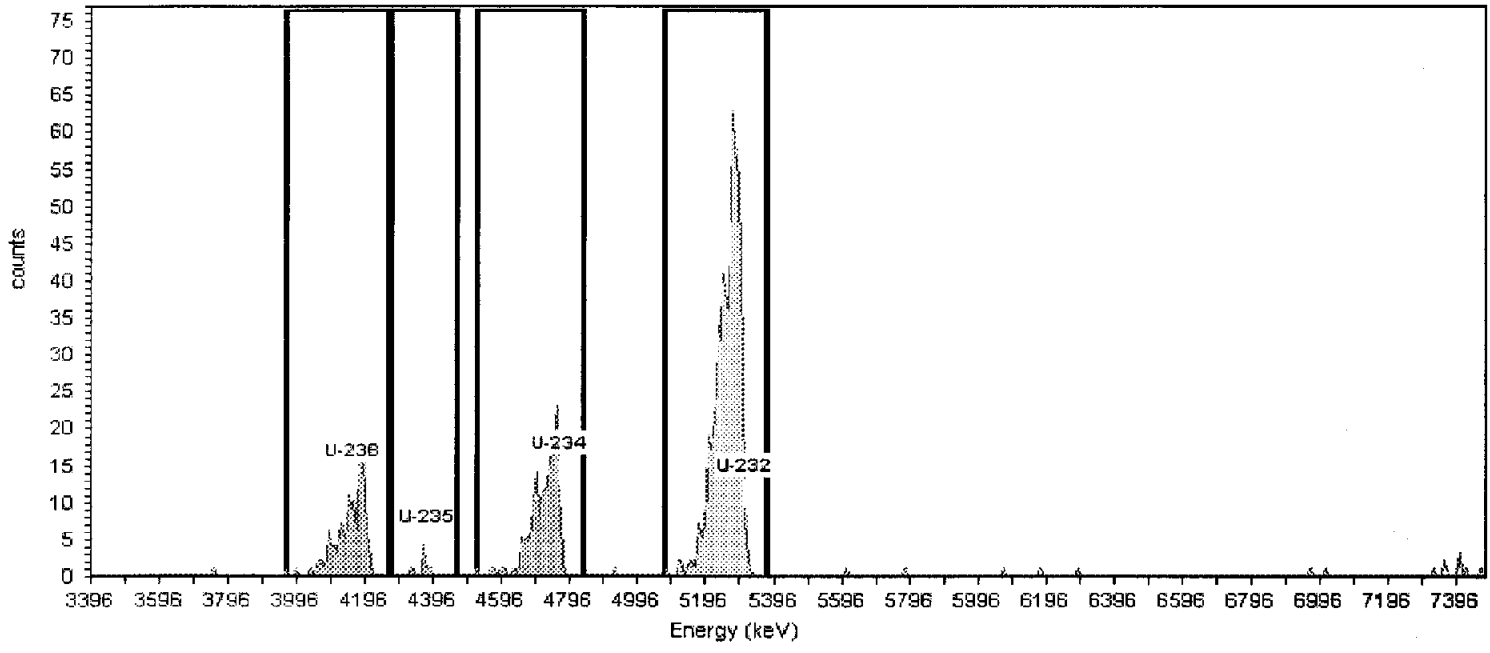
Tracer Nuclide: U-232
Tracer Recovery: 94.69%

Acquisition

Detector: AV63
Serial Number:
Acquisition Start Date: 7/13/2007 10:56:45AM
Live Time: 240.00 min.
Real Time: 240.93 min.
Background Date: 6/24/2007 8:48:03PM

Calibration Name: June2007_AV63
Calibration Date: 6/27/2007 4:56:51PM
Energy Cal Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 26.37% +/- 0.26% TPU(2 sigma)

Background Info: Sample: AV63; Det: AV63; Spectrum #1; Jun-24-2007 20:48



General Analysis

Analysis Method: ROI Analysis, Set Name = UROI
Decay Correction: 7/13/2007 10:54:59AM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Uranium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
U-238	4158.500	3962.485	4260.137	73.619	100.0	148.00	0.5000	148	5.539E-001	1.164E-001	4.884E-003	1.993E-002
U-235	4376.294	4267.397	4463.412	19.782	80.2	10.00	0.0000	10	4.682E-002	3.165E-002	0.000E+000	1.267E-002
U-234	4761.063	4521.490	4833.661	77.540	99.8	191.00	0.5000	191	7.168E-001	1.396E-001	4.893E-003	1.997E-002
U-232	5312.808	5073.234	5378.146	79.414	100.1	605.00	0.5000	605	2.152E+000	2.783E-001	4.890E-003	1.995E-002

SEVERN TRENT **STL**

Alpha-Spectroscopy Analysis Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 2:57:51PM 7/13/2007

Sample

Sample Name: F7G050168-008
SampleType: Sample
: J2C151AD
Sample Collection Date: 6/22/2007 11:25:00AM
Comment:

Spectrum #1 Analysis #1
Sample Weight : 2.0141g
Aliquot: N/A Aliquot Fraction: N/A
Lab Preparation:

Batch

Batch Name: 7190361
:
Description:

Client Name: Undefined
Client Contact:

Tracer

Tracer Name: Rad04-0093_U232
Tracer Activity: 101.00 DPM/mL x (Vol.)0.10 mL = 10.10 DPM
Tracer Ref. Date: 4/27/2007 12:05:46PM

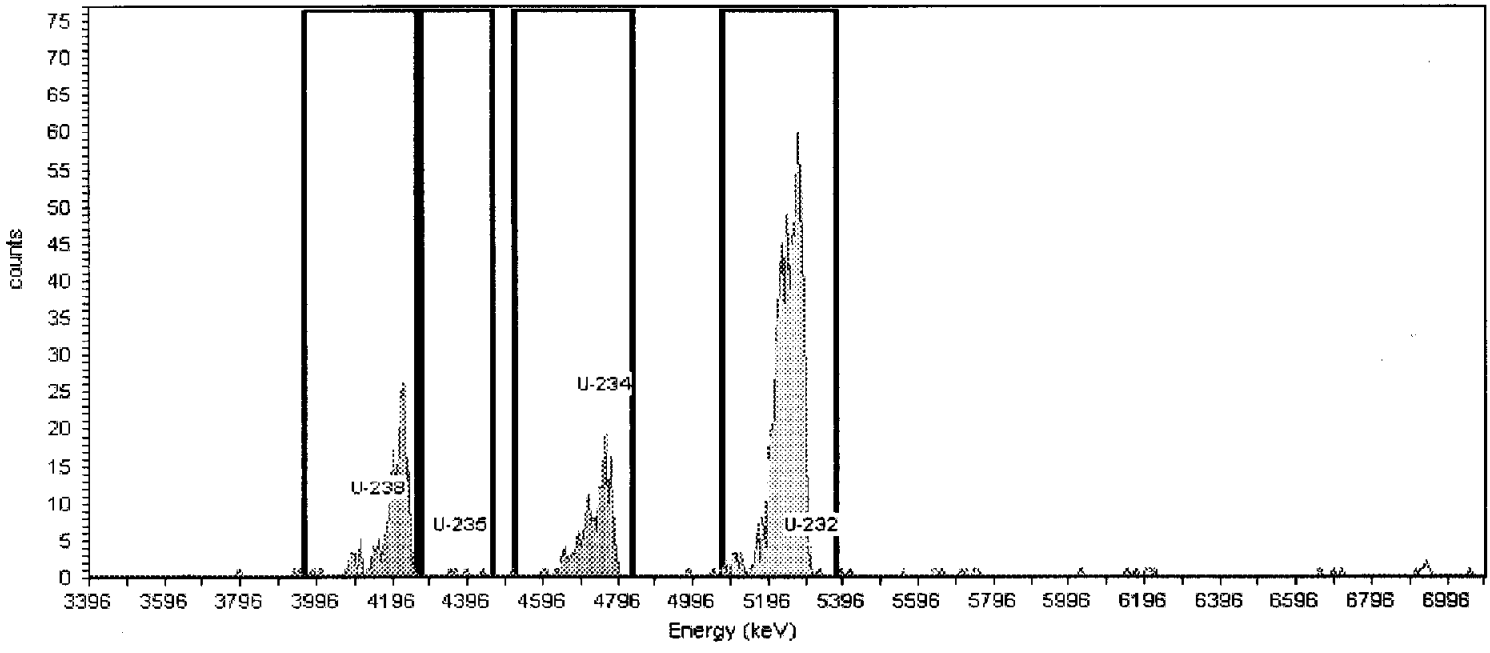
Tracer Nuclide: U-232
Tracer Recovery: 93.83%

Acquisition

Detector: AV14
Serial Number: 41-172C4
Acquisition Start Date: 7/13/2007 10:56:51AM
Live Time: 240.00 min.
Real Time: 240.61 min.
Background Date: 6/24/2007 8:47:33PM

Calibration Name: June2007_AV14
Calibration Date: 6/26/2007 4:49:06PM
Energy Cal Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 26.51% +/- 0.28% TPU(2 sigma)

Background Info: Sample: AV14; Det: AV14; Spectrum #1; Jun-24-2007 20:47



General Analysis

Analysis Method: ROI Analysis, Set Name = UROI
Decay Correction: 7/13/2007 10:54:59AM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Uranium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
U-238	4158.500	3962.485	4260.137	22.672	100.0	179.00	0.0000	179	6.705E-001	1.330E-001	0.000E+000	1.014E-002
U-235	4376.294	4267.397	4463.412	29.039	80.2	4.00	0.5000	4	1.635E-002	1.993E-002	6.074E-003	2.479E-002
U-234	4761.063	4521.490	4833.661	85.001	99.8	157.00	1.7500	155	5.827E-001	1.212E-001	9.132E-003	2.842E-002
U-232	5312.808	5073.234	5378.146	84.648	100.1	603.00	0.7500	602	2.119E+000	2.745E-001	5.974E-003	2.210E-002

ST SEVERN TRENT **STL**

Alpha-Spectroscopy Analysis Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
2:57:15PM 7/13/2007

Analyst: 60040

Sample

Sample Name: F7G050168-009
SampleType: Sample
: J2C191AD
Sample Collection Date: 6/29/2007 10:45:00AM
Comment:

Spectrum #1 Analysis #1
Sample Weight : 2.0046g
Aliquot: N/A Aliquot Fraction: N/A
Lab Preparation:

Batch

Batch Name: 7190361
:
Description:

Client Name: Undefined
Client Contact:

Tracer

Tracer Name: Rad04-0093_U232
Tracer Activity: 101.00 DPM/mL x (Vol.)0.10 mL = 10.10 DPM
Tracer Ref. Date: 4/27/2007 12:05:46PM

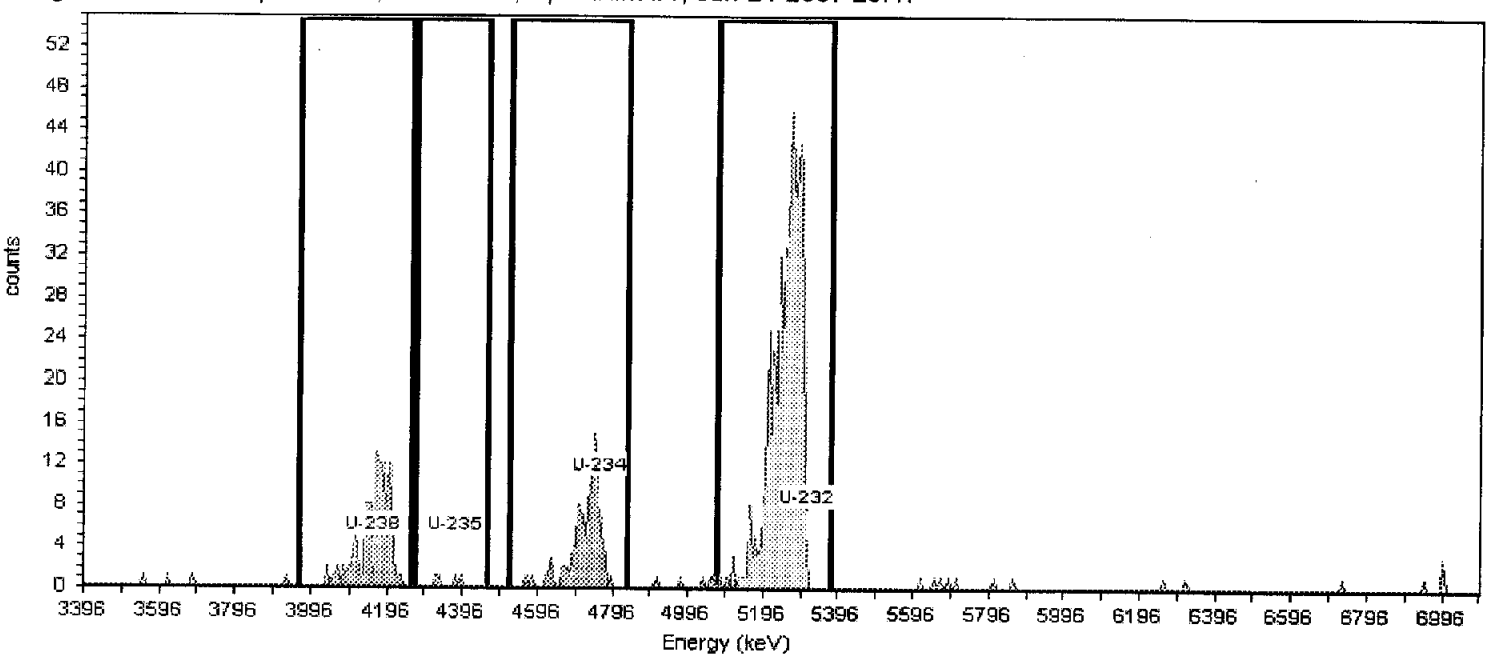
Tracer Nuclide: U-232
Tracer Recovery: 78.29%

Acquisition

Detector: AV22
Serial Number: 41-172Q5
Acquisition Start Date: 7/13/2007 10:56:53AM
Live Time: 240.00 min.
Real Time: 240.00 min.
Background Date: 6/24/2007 8:47:42PM

Calibration Name: June2007_AV22
Calibration Date: 6/26/2007 10:35:39PM
Energy Cal Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 25.58% +/- 0.27% TPU(2 sigma)

Background Info: Sample: AV22; Det: AV22; Spectrum #1; Jun-24-2007 20:47



General Analysis

Analysis Method: ROI Analysis, Set Name = UROI
Decay Correction: 7/13/2007 10:54:59AM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Uranium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
U-238	4158.500	3962.485	4260.137	63.774	100.0	122.00	0.7500	121	5.670E-001	1.292E-001	7.448E-003	2.755E-002
U-235	4376.294	4267.397	4463.412	16.958	80.2	4.00	0.0000	4	2.332E-002	2.627E-002	0.000E+000	1.578E-002
U-234	4761.063	4521.490	4833.661	68.847	99.8	111.00	0.5000	111	5.178E-001	1.215E-001	6.093E-003	2.487E-002
U-232	5312.808	5073.234	5378.146	79.672	100.1	486.00	1.2500	485	1.777E+000	2.411E-001	9.627E-003	3.192E-002

SEVERN TRENT **STL**

Alpha-Spectroscopy Analysis Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 — 7:18:51PM 7/13/2007

Sample

Sample Name: F7G050168-010
SampleType: Sample
: J2C2D1AD
Sample Collection Date: 6/29/2007 10:50:00AM
Comment:

Spectrum #2 Analysis #1
Sample Weight : 2.0052g
Aliquot: N/A Aliquot Fraction: N/A
Lab Preparation:

Batch

Batch Name: 7190361
:
Description:

Client Name: Undefined
Client Contact:

Tracer

Tracer Name: Rad04-0093_U232
Tracer Activity: 101.00 DPM/mL x (Vol.)0.10 mL = 10.10 DPM
Tracer Ref. Date: 4/27/2007 12:05:46PM

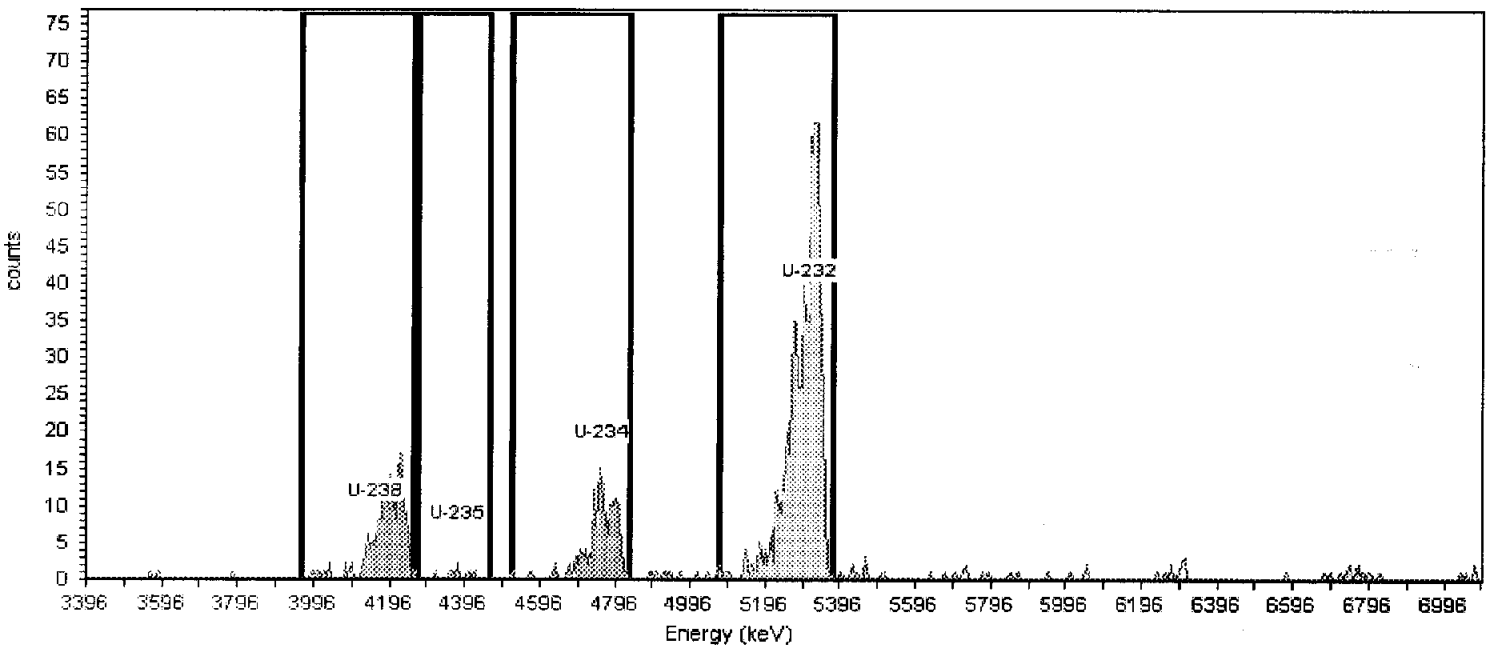
Tracer Nuclide: U-232
Tracer Recovery: 92.13%

Acquisition

Detector: AV20
Serial Number: 41-172R2
Acquisition Start Date: 7/13/2007 3:18:36PM
Live Time: 240.00 min.
Real Time: 240.01 min.
Background Date: 6/24/2007 8:47:39PM

Calibration Name: June2007_AV20
Calibration Date: 6/26/2007 7:42:04PM
Energy Cal Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 27.02% +/- 0.27% TPU(2 sigma)

Background Info: Sample: AV20; Det: AV20; Spectrum #1; Jun-24-2007 20:47



General Analysis

Analysis Method: ROI Analysis, Set Name = UROI
Decay Correction: 7/13/2007 10:54:59AM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Uranium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
U-238	4158.500	3962.485	4260.137	24.895	100.0	163.00	1.2500	162	6.081E-001	1.246E-001	7.731E-003	2.563E-002
U-235	4376.294	4267.397	4463.412	68.791	80.2	7.00	0.7500	6	2.930E-002	2.638E-002	7.466E-003	2.762E-002
U-234	4761.063	4521.490	4833.661	59.765	99.8	138.00	2.0000	136	5.123E-001	1.113E-001	9.798E-003	2.979E-002
U-232	5312.808	5073.234	5378.146	45.715	100.1	605.00	2.2500	603	2.090E+000	2.709E-001	1.038E-002	3.096E-002

SEVERN TRENT **STL**

Alpha-Spectroscopy Analysis Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 — 2:57:54PM 7/13/2007

Sample

Sample Name: F7G090000-361B
SampleType: Blank
: J2H421AA
Sample Collection Date: 6/22/2007 11:10:00AM
Comment:

Spectrum #1 Analysis #1
Sample Weight : 2.0000g
Aliquot: N/A Aliquot Fraction: N/A
Lab Preparation:

Batch

Batch Name: 7190361
:
Description:

Client Name: Undefined
Client Contact:

Tracer

Tracer Name: Rad04-0093_U232
Tracer Activity: 101.00 DPM/mL x (Vol.)0.10 mL = 10.10 DPM
Tracer Ref. Date: 4/27/2007 12:05:46PM

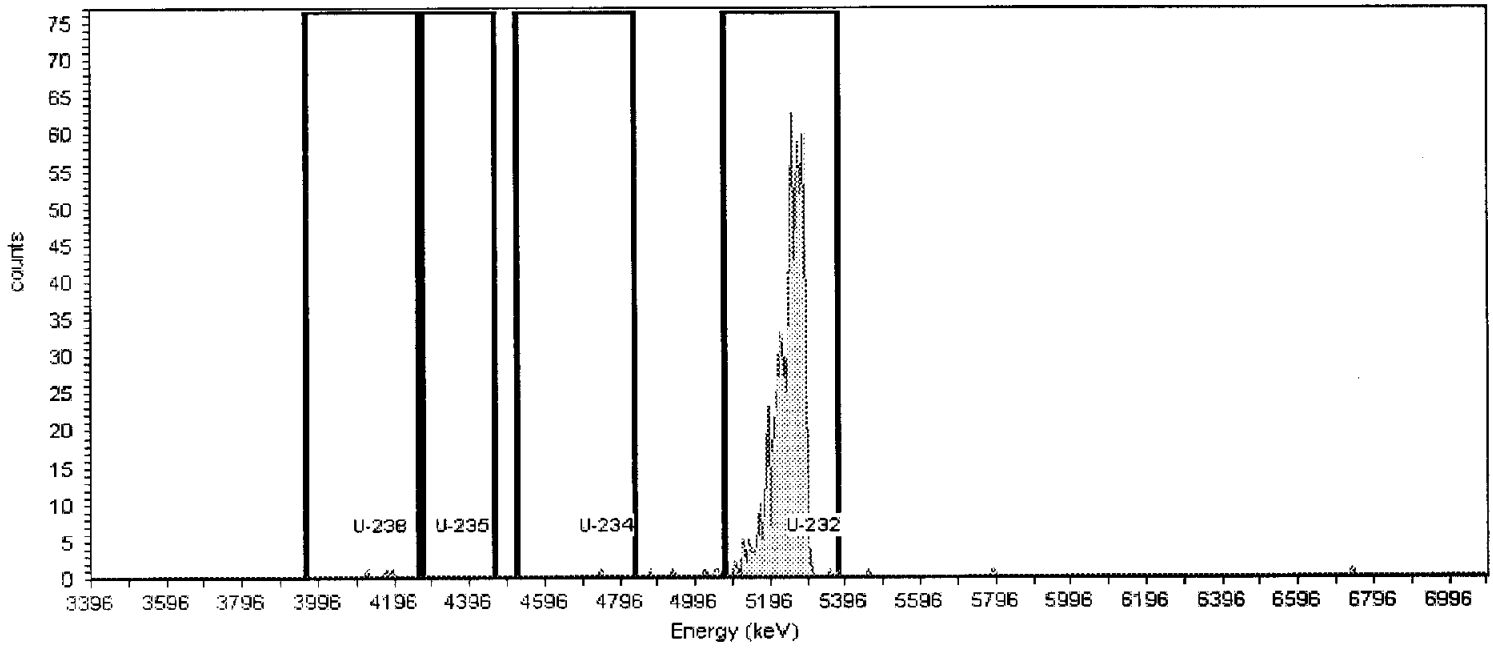
Tracer Nuclide: U-232
Tracer Recovery: 90.44%

Acquisition

Detector: AV15
Serial Number: 41-172C5
Acquisition Start Date: 7/13/2007 10:56:52AM
Live Time: 240.00 min.
Real Time: 240.61 min.
Background Date: 6/24/2007 8:47:34PM

Calibration Name: June2007_AV15
Calibration Date: 6/26/2007 10:35:50PM
Energy Cal Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 26.82% +/- 0.29% TPU(2 sigma)

Background Info: Sample: AV15; Det: AV15; Spectrum #1; Jun-24-2007 20:47



General Analysis

Analysis Method: ROI Analysis, Set Name = UROI
Decay Correction: 7/13/2007 10:54:59AM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Uranium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
U-234	4761.063	4521.490	4833.661	43.286	99.8	1.00	0.2500	1	2.907E-003	8.677E-003	3.565E-003	1.762E-002
U-232	5312.808	5073.234	5378.146	65.599	100.1	588.00	0.7500	587	2.057E+000	2.678E-001	6.170E-003	2.282E-002
U-238	4158.500	3962.485	4260.137	86.460	100.0	3.00	0.2500	3	1.064E-002	1.402E-002	3.558E-003	1.758E-002
U-235	4376.294	4267.397	4463.412	.000	80.2	0.00	0.0000	0	0.000E+000	0.000E+000	0.000E+000	1.305E-002

SEVERN TRENT **STL**

Alpha-Spectroscopy Analysis Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
2:57:09PM 7/13/2007

Analyst: 60040

Sample

Sample Name: F7G090000-361C
SampleType: Control
: J2H421AC
Sample Collection Date: 6/22/2007 11:10:00AM
Comment:

Spectrum #1 Analysis #1
Sample Weight : 0.1312g
Aliquot: N/A Aliquot Fraction: N/A
Lab Preparation:

Batch

Batch Name: 7190361
:
Description:

Client Name: Undefined
Client Contact:

Tracer

Tracer Name: Rad04-0093_U232
Tracer Activity: 101.00 DPM/mL x (Vol.)0.10 mL = 10.10 DPM
Tracer Ref. Date: 4/27/2007 12:05:46PM

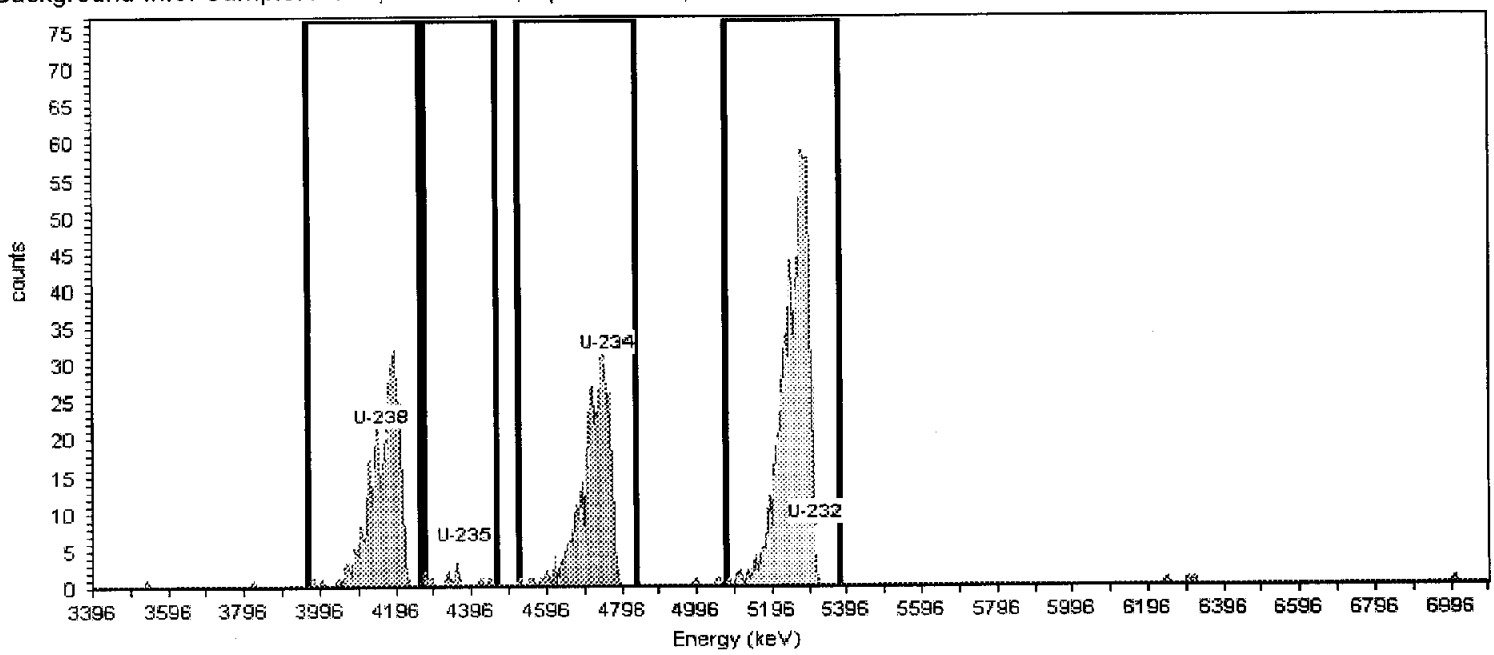
Tracer Nuclide: U-232
Tracer Recovery: 94.15%

Acquisition

Detector: AV21
Serial Number: 41-172C7
Acquisition Start Date: 7/13/2007 10:56:53AM
Live Time: 240.00 min.
Real Time: 240.00 min.
Background Date: 6/24/2007 8:47:41PM

Calibration Name: June2007_AV21
Calibration Date: 6/26/2007 10:35:28PM
Energy Cal Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 26.41% +/- 0.26% TPU(2 sigma)

Background Info: Sample: AV21; Det: AV21; Spectrum #1; Jun-24-2007 20:47



General Analysis

Analysis Method: ROI Analysis, Set Name = UROI
Decay Correction: 7/13/2007 10:54:59AM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Uranium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
U-238	4158.500	3962.485	4260.137	81.401	100.0	309.00	0.0000	309	1.778E+001	3.071E+000	0.000E+000	1.557E-001
U-235	4376.294	4267.397	4463.412	17.918	80.2	13.00	0.0000	13	9.326E-001	5.503E-001	0.000E+000	1.941E-001
U-234	4761.063	4521.490	4833.661	75.518	99.8	336.00	0.2500	336	1.935E+001	3.284E+000	5.301E-002	2.620E-001
U-232	5312.808	5073.234	5378.146	78.855	100.1	603.00	1.0000	602	3.265E+001	4.227E+000	1.059E-001	3.678E-001

TestAmerica STL

Monthly Background
June 2007
Alpha Vision

ST SEVERN TRENT **STL**

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:59:28PM 6/25/2007

Analyst: 60040

Sample

Sample Name: AV1 Spectrum #1 Analysis #1

Comment:

Batch

Batch Name: June2007

Description:

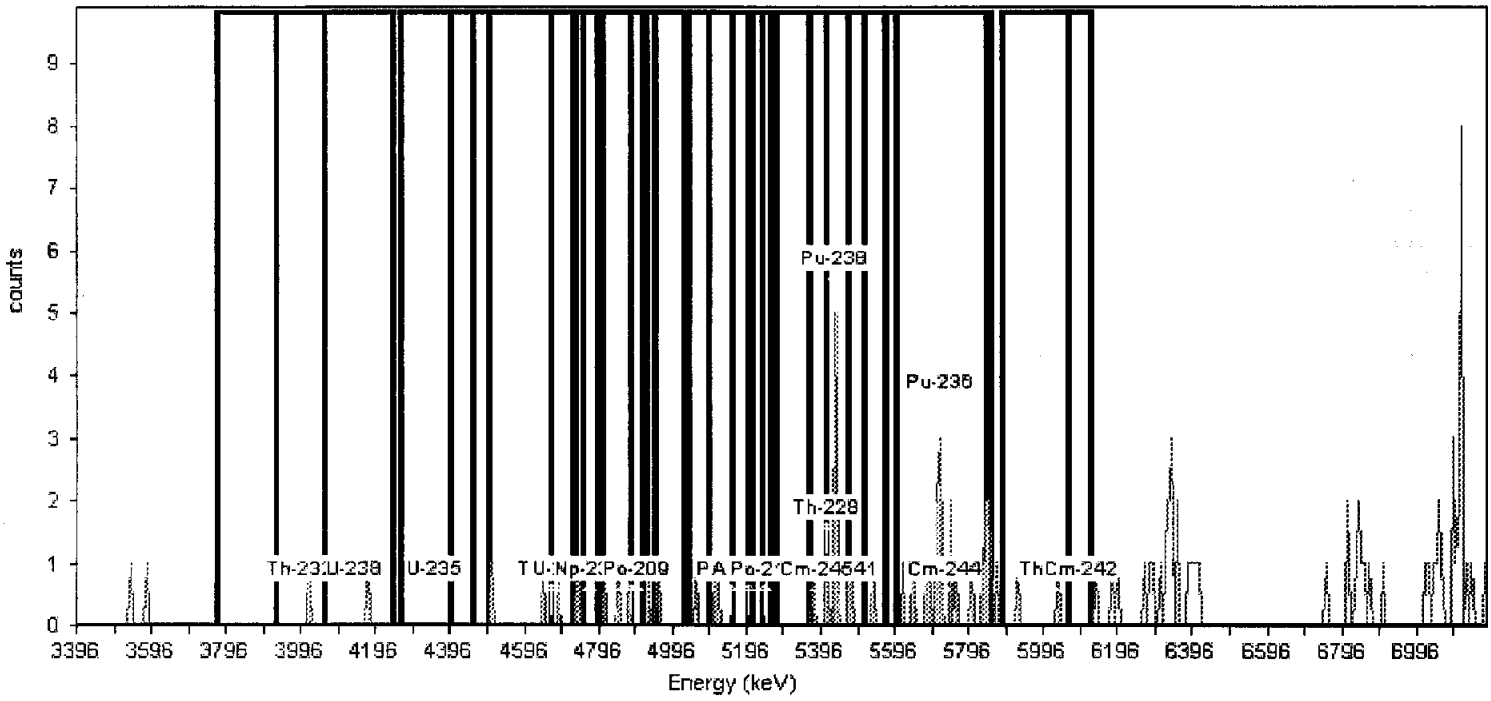
Acquisition

Detector: AV1 , SN: 41-158W6
Acquisition Start Date: 6/24/2007 8:49:05PM
Live Time: 960.00 min.
Real Time: 960.02 min.
Calibration Name: May2007_AV1
Calibration Date: 5/30/2007 6:46:28AM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 26.53% +/- 0.26% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI Nuclide Library: Background ROI Library

Total Background Counts: 105.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	1.00	1.042E-003	1.473E-003
U-238	4.14	3.93	4.24	2.00	2.083E-003	1.804E-003
U-235	4.35	4.26	4.46	0.00	0.000E+000	1.473E-003
Th-230	4.67	4.40	4.73	3.00	3.125E-003	2.083E-003
U-234	4.70	4.50	4.80	4.00	4.167E-003	2.329E-003
Pu-242	4.88	4.67	4.93	6.00	6.250E-003	2.756E-003
Th-229	4.84	4.72	5.10	7.00	7.292E-003	2.946E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	4.00	4.167E-003	2.329E-003
Am-243	5.20	5.03	5.28	3.00	3.125E-003	2.083E-003
U-232	5.23	5.04	5.37	3.00	3.125E-003	2.083E-003
Th-228	5.41	5.16	5.47	9.00	9.375E-003	3.294E-003
Po-210	5.25	5.20	5.26	0.00	0.000E+000	1.473E-003
Pu-238	5.44	5.24	5.52	10.00	1.042E-002	3.455E-003
Am-241	5.45	5.27	5.57	11.00	1.146E-002	3.608E-003
Cm-245	5.39	5.36	5.41	2.00	2.083E-003	1.804E-003
Pu-236	5.72	5.57	5.84	17.00	1.771E-002	4.419E-003
Cm-244	5.73	5.60	5.86	20.00	2.083E-002	4.774E-003
Th-227	6.02	5.89	6.13	2.00	2.083E-003	1.804E-003
Cm-242	6.10	6.07	6.13	0.00	0.000E+000	1.473E-003

ST SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:59:31PM 6/25/2007

Analyst: 60040

Sample

Sample Name: AV2 Spectrum #1 Analysis #1

Comment:

Batch

Batch Name: June2007

Description:

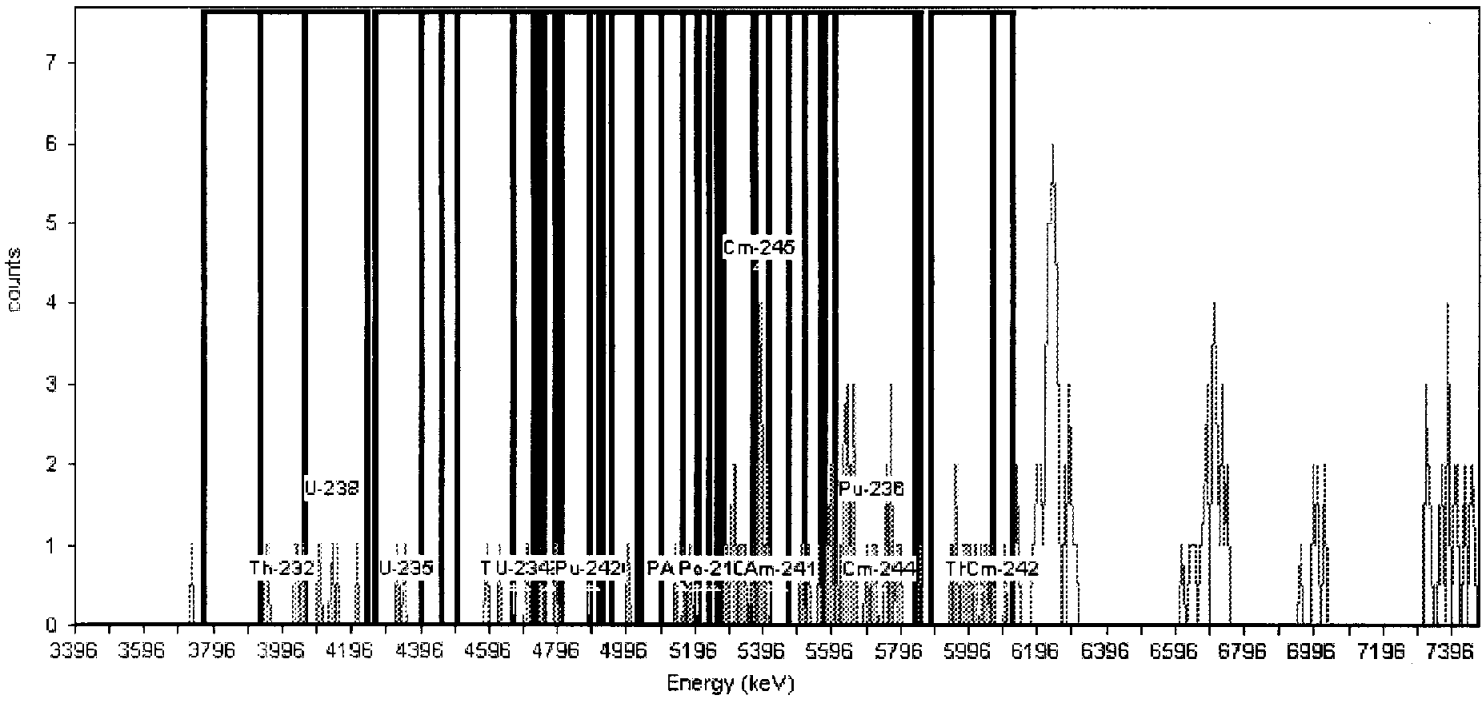
Acquisition

Detector: AV2 , SN: 41-158W7
Acquisition Start Date: 6/24/2007 8:49:07PM
Live Time: 960.00 min.
Real Time: 960.02 min.
Calibration Name: May2007_AV2
Calibration Date: 5/30/2007 11:40:33AM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 26.09% +/- 0.28% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI Nuclide Library: Background ROI Library

Total Background Counts: 187.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-229	4.84	4.72	5.10	3.00	3.125E-003	2.083E-003
Np-237	4.77	4.75	4.79	1.00	1.042E-003	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	4.00	4.167E-003	2.329E-003
Am-243	5.20	5.03	5.28	3.00	3.125E-003	2.083E-003
U-232	5.23	5.04	5.37	13.00	1.354E-002	3.898E-003
Th-228	5.41	5.16	5.47	20.00	2.083E-002	4.774E-003
Po-210	5.25	5.20	5.26	0.00	0.000E+000	1.473E-003
Pu-238	5.44	5.24	5.52	19.00	1.979E-002	4.658E-003
Am-241	5.45	5.27	5.57	21.00	2.187E-002	4.886E-003
Cm-245	5.39	5.36	5.41	9.00	9.375E-003	3.294E-003
Pu-236	5.72	5.57	5.84	26.00	2.708E-002	5.413E-003
Cm-244	5.73	5.60	5.86	23.00	2.396E-002	5.103E-003
Th-227	6.02	5.89	6.13	13.00	1.354E-002	3.898E-003
Cm-242	6.10	6.07	6.13	2.00	2.083E-003	1.804E-003
Th-232	3.99	3.77	4.06	4.00	4.167E-003	2.329E-003
U-238	4.14	3.93	4.24	8.00	8.333E-003	3.125E-003
U-235	4.35	4.26	4.46	2.00	2.083E-003	1.804E-003
Th-230	4.67	4.40	4.73	3.00	3.125E-003	2.083E-003
U-234	4.70	4.50	4.80	5.00	5.208E-003	2.552E-003
Pu-242	4.88	4.67	4.93	3.00	3.125E-003	2.083E-003

ST SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:59:35PM 6/25/2007

Analyst: 60040

Sample

Sample Name: AV3
Comment:

Spectrum #1 Analysis #1

Batch

Batch Name: June2007
Description:

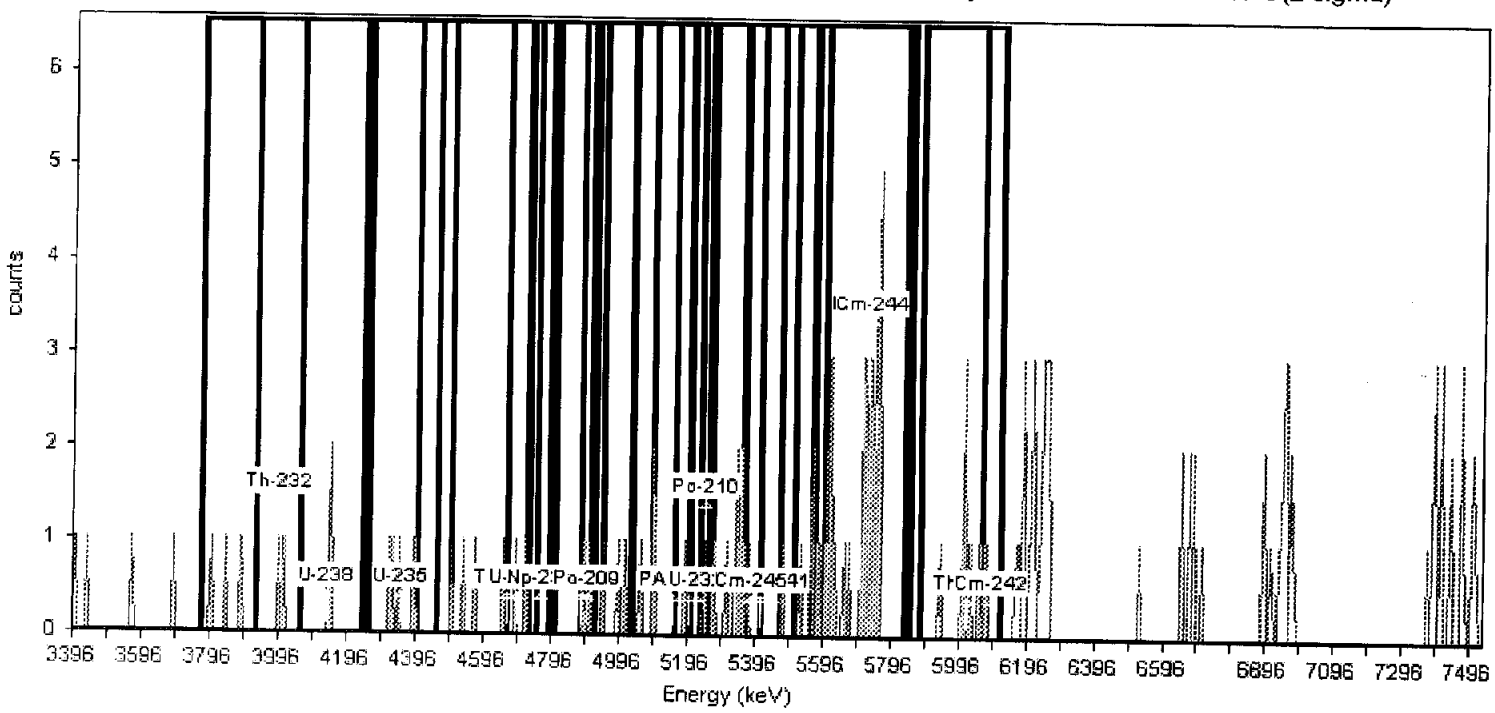
Acquisition

Detector: AV3 , SN: 41-158X5
Acquisition Start Date: 6/24/2007 8:49:09PM
Live Time: 960.00 min.
Real Time: 960.02 min.
Calibration Name: May2007_AV3
Calibration Date: 5/30/2007 11:40:40AM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch²

Efficiency: 27.11% +/- 0.29% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 153.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	5.00	5.208E-003	2.552E-003
U-238	4.14	3.93	4.24	4.00	4.167E-003	2.329E-003
U-235	4.35	4.26	4.46	4.00	4.167E-003	2.329E-003
Th-230	4.67	4.40	4.73	6.00	6.250E-003	2.756E-003
U-234	4.70	4.50	4.80	6.00	6.250E-003	2.756E-003
Pu-242	4.88	4.67	4.93	4.00	4.167E-003	2.329E-003
Th-229	4.84	4.72	5.10	9.00	9.375E-003	3.294E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	2.00	2.083E-003	1.804E-003
Pu-239	5.15	4.95	5.21	9.00	9.375E-003	3.294E-003
Am-243	5.20	5.03	5.28	7.00	7.292E-003	2.946E-003
U-232	5.23	5.04	5.37	15.00	1.563E-002	4.167E-003
Th-228	5.41	5.16	5.47	12.00	1.250E-002	3.756E-003
Po-210	5.25	5.20	5.26	1.00	1.042E-003	1.473E-003
Pu-238	5.44	5.24	5.52	12.00	1.250E-002	3.756E-003
Am-241	5.45	5.27	5.57	14.00	1.458E-002	4.034E-003
Cm-245	5.39	5.36	5.41	3.00	3.125E-003	2.083E-003
Pu-236	5.72	5.57	5.84	34.00	3.542E-002	6.163E-003
Cm-244	5.73	5.60	5.86	32.00	3.333E-002	5.984E-003
Th-227	6.02	5.89	6.13	9.00	9.375E-003	3.294E-003
Cm-242	6.10	6.07	6.13	2.00	2.083E-003	1.804E-003

ST SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:59:38PM 6/25/2007

Analyst: 60040

Sample

Sample Name: AV4
Comment:

Spectrum #1 Analysis #1

Batch

Batch Name: June2007
Description:

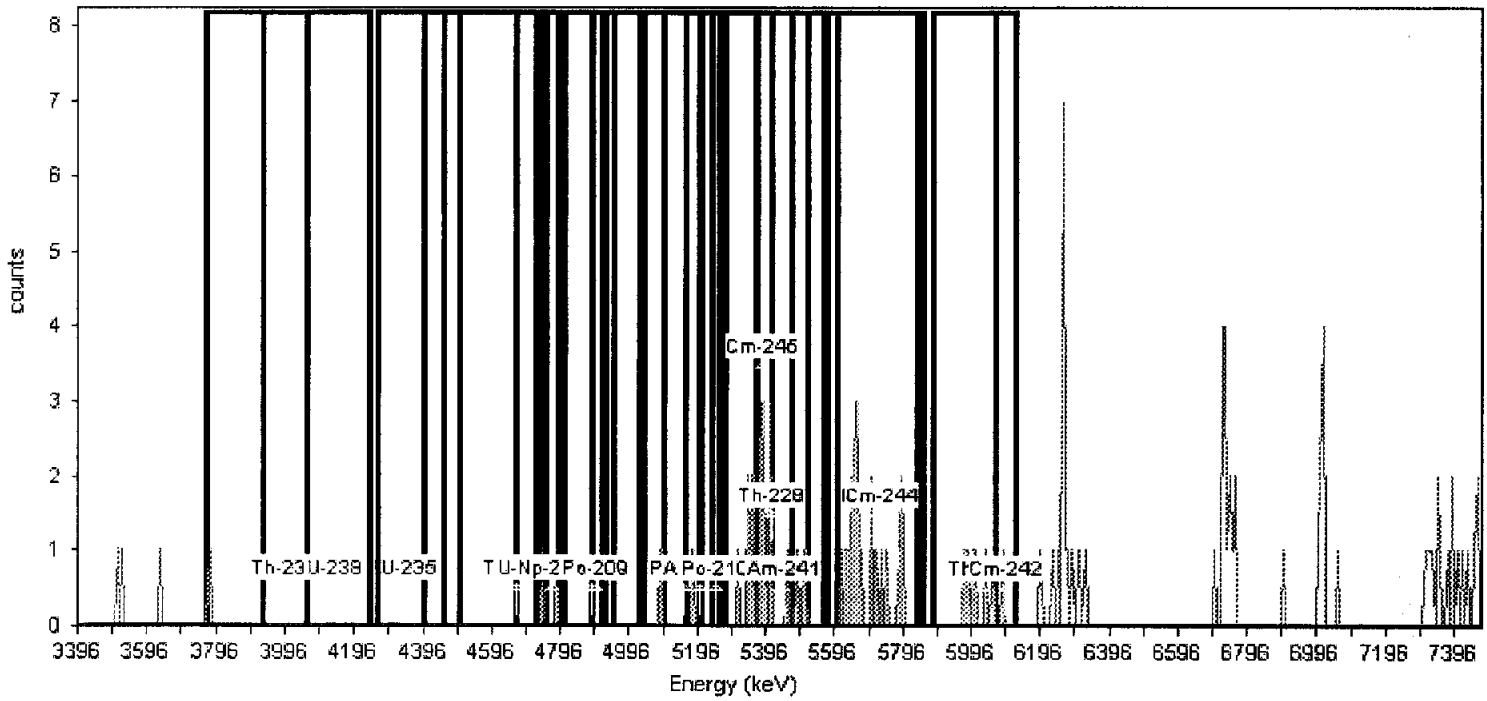
Acquisition

Detector: AV4 , SN: 41-172B5
Acquisition Start Date: 6/24/2007 8:49:10PM
Live Time: 960.00 min.
Real Time: 960.02 min.
Calibration Name: May2007_AV4
Calibration Date: 5/30/2007 11:40:49AM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 26.79% +/- 0.27% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 112.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	1.00	1.042E-003	1.473E-003
U-238	4.14	3.93	4.24	0.00	0.000E+000	1.473E-003
U-235	4.35	4.26	4.46	0.00	0.000E+000	1.473E-003
Th-230	4.67	4.40	4.73	0.00	0.000E+000	1.473E-003
U-234	4.70	4.50	4.80	2.00	2.083E-003	1.804E-003
Pu-242	4.88	4.67	4.93	2.00	2.083E-003	1.804E-003
Th-229	4.84	4.72	5.10	3.00	3.125E-003	2.083E-003
Np-237	4.77	4.75	4.79	1.00	1.042E-003	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	2.00	2.083E-003	1.804E-003
Am-243	5.20	5.03	5.28	2.00	2.083E-003	1.804E-003
U-232	5.23	5.04	5.37	8.00	8.333E-003	3.125E-003
Th-228	5.41	5.16	5.47	18.00	1.875E-002	4.541E-003
Po-210	5.25	5.20	5.26	0.00	0.000E+000	1.473E-003
Pu-238	5.44	5.24	5.52	19.00	1.979E-002	4.658E-003
Am-241	5.45	5.27	5.57	19.00	1.979E-002	4.658E-003
Cm-245	5.39	5.36	5.41	10.00	1.042E-002	3.455E-003
Pu-236	5.72	5.57	5.84	21.00	2.187E-002	4.886E-003
Cm-244	5.73	5.60	5.86	21.00	2.187E-002	4.886E-003
Th-227	6.02	5.89	6.13	8.00	8.333E-003	3.125E-003
Cm-242	6.10	6.07	6.13	1.00	1.042E-003	1.473E-003

ST SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:59:41PM 6/25/2007

Analyst: 60040

Sample

Sample Name: AV6
Comment:

Spectrum #1 Analysis #1

Batch

Batch Name: June2007
Description:

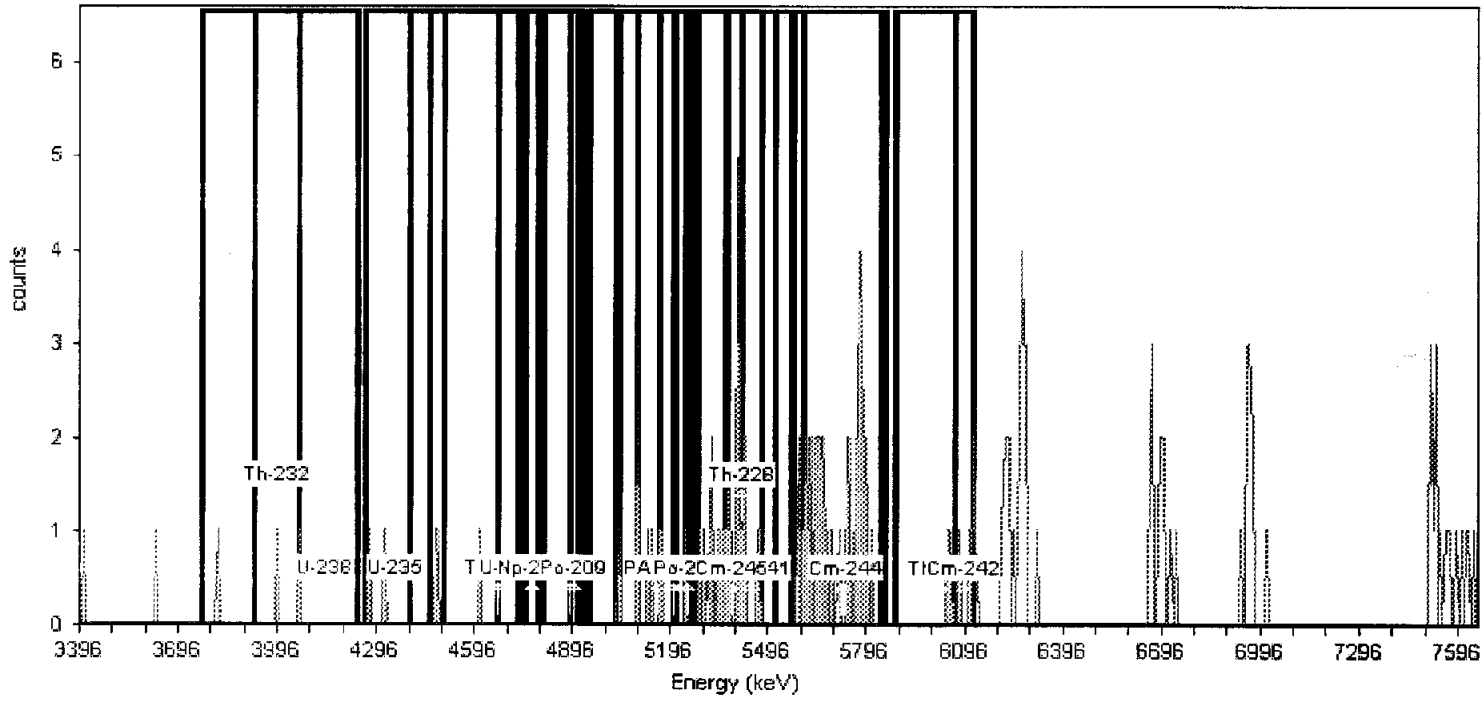
Acquisition

Detector: AV6 , SN:
Acquisition Start Date: 6/24/2007 8:47:26PM
Live Time: 960.00 min.
Real Time: 960.02 min.
Calibration Name: May2007_AV6
Calibration Date: 5/30/2007 2:03:32PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 26.99% +/- 0.28% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 143.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	3.00	3.125E-003	2.083E-003
U-238	4.14	3.93	4.24	2.00	2.083E-003	1.804E-003
U-235	4.35	4.26	4.46	2.00	2.083E-003	1.804E-003
Th-230	4.67	4.40	4.73	2.00	2.083E-003	1.804E-003
U-234	4.70	4.50	4.80	1.00	1.042E-003	1.473E-003
Pu-242	4.88	4.67	4.93	0.00	0.000E+000	1.473E-003
Th-229	4.84	4.72	5.10	4.00	4.167E-003	2.329E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	8.00	8.333E-003	3.125E-003
Am-243	5.20	5.03	5.28	9.00	9.375E-003	3.294E-003
U-232	5.23	5.04	5.37	19.00	1.979E-002	4.658E-003
Th-228	5.41	5.16	5.47	25.00	2.604E-002	5.311E-003
Po-210	5.25	5.20	5.26	1.00	1.042E-003	1.473E-003
Pu-238	5.44	5.24	5.52	23.00	2.396E-002	5.103E-003
Am-241	5.45	5.27	5.57	22.00	2.292E-002	4.996E-003
Cm-245	5.39	5.36	5.41	11.00	1.146E-002	3.608E-003
Pu-236	5.72	5.57	5.84	36.00	3.750E-002	6.336E-003
Cm-244	5.73	5.60	5.86	34.00	3.542E-002	6.163E-003
Th-227	6.02	5.89	6.13	6.00	6.250E-003	2.756E-003
Cm-242	6.10	6.07	6.13	4.00	4.167E-003	2.329E-003

ST SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:59:44PM 6/25/2007

Analyst: 60040

Sample

Sample Name: AV7
Comment:

Spectrum #1 Analysis #1

Batch

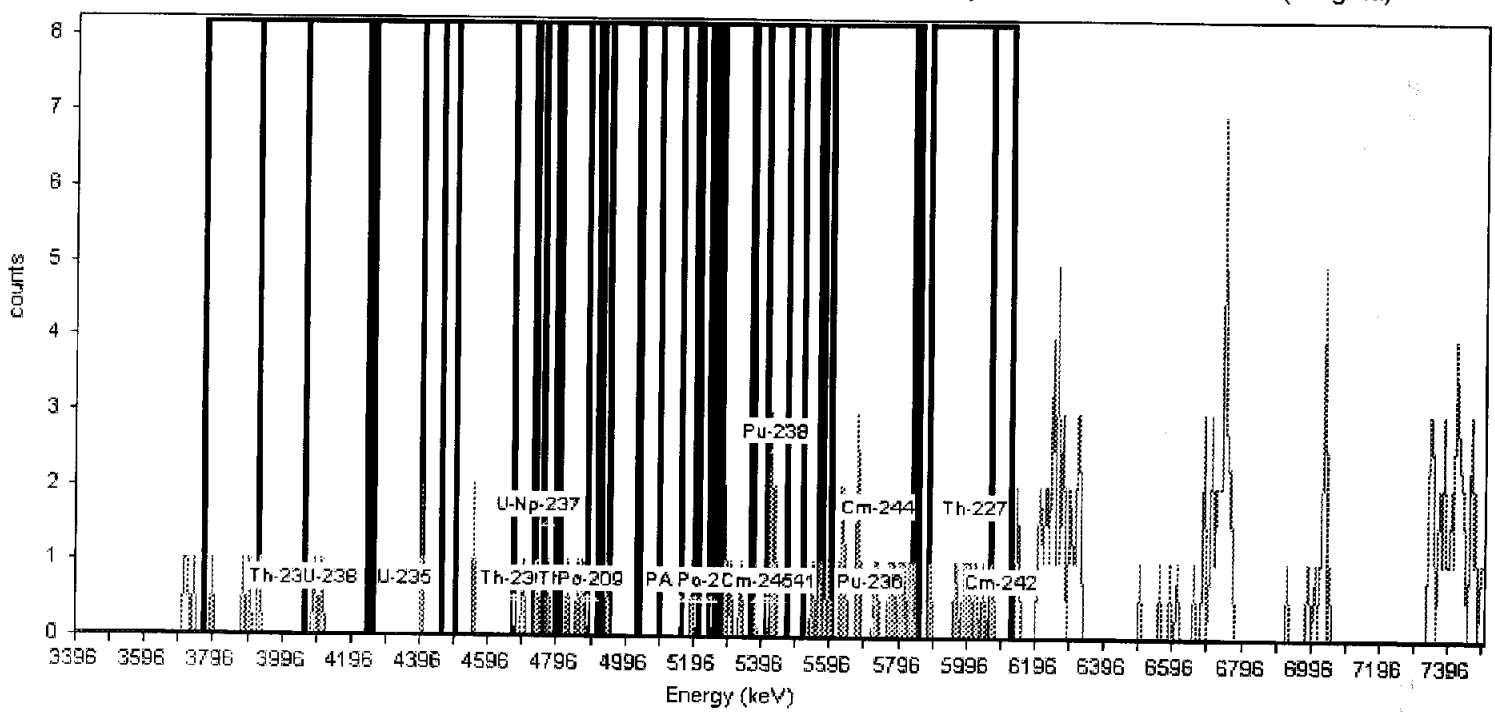
Batch Name: June2007
Description:

Acquisition

Detector: AV7 , SN: 41-158X6
Acquisition Start Date: 6/24/2007 8:47:27PM
Live Time: 960.00 min.
Real Time: 960.02 min.
Calibration Name: May2007_AV7
Calibration Date: 5/30/2007 2:04:05PM

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch²

Efficiency: 26.98% +/- 0.29% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 187.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	4.00	4.167E-003	2.329E-003
U-238	4.14	3.93	4.24	3.00	3.125E-003	2.083E-003
U-235	4.35	4.26	4.46	2.00	2.083E-003	1.804E-003
Th-230	4.67	4.40	4.73	6.00	6.250E-003	2.756E-003
U-234	4.70	4.50	4.80	6.00	6.250E-003	2.756E-003
Pu-242	4.88	4.67	4.93	7.00	7.292E-003	2.946E-003
Th-229	4.84	4.72	5.10	7.00	7.292E-003	2.946E-003
Np-237	4.77	4.75	4.79	1.00	1.042E-003	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	1.00	1.042E-003	1.473E-003
Am-243	5.20	5.03	5.28	1.00	1.042E-003	1.473E-003
U-232	5.23	5.04	5.37	5.00	5.208E-003	2.552E-003
Th-228	5.41	5.16	5.47	12.00	1.250E-002	3.756E-003
Po-210	5.25	5.20	5.26	0.00	0.000E+000	1.473E-003
Pu-238	5.44	5.24	5.52	11.00	1.146E-002	3.608E-003
Am-241	5.45	5.27	5.57	13.00	1.354E-002	3.898E-003
Cm-245	5.39	5.36	5.41	1.00	1.042E-003	1.473E-003
Pu-236	5.72	5.57	5.84	21.00	2.187E-002	4.886E-003
Cm-244	5.73	5.60	5.86	19.00	1.979E-002	4.658E-003
Th-227	6.02	5.89	6.13	11.00	1.146E-002	3.608E-003
Cm-242	6.10	6.07	6.13	2.00	2.083E-003	1.804E-003

ST

SEVERN TRENT **STL**

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:59:47PM 6/25/2007

Analyst: 60040

Sample

Sample Name: AV8 Spectrum #1 Analysis #1

Comment:

Batch

Batch Name: June2007

Description:

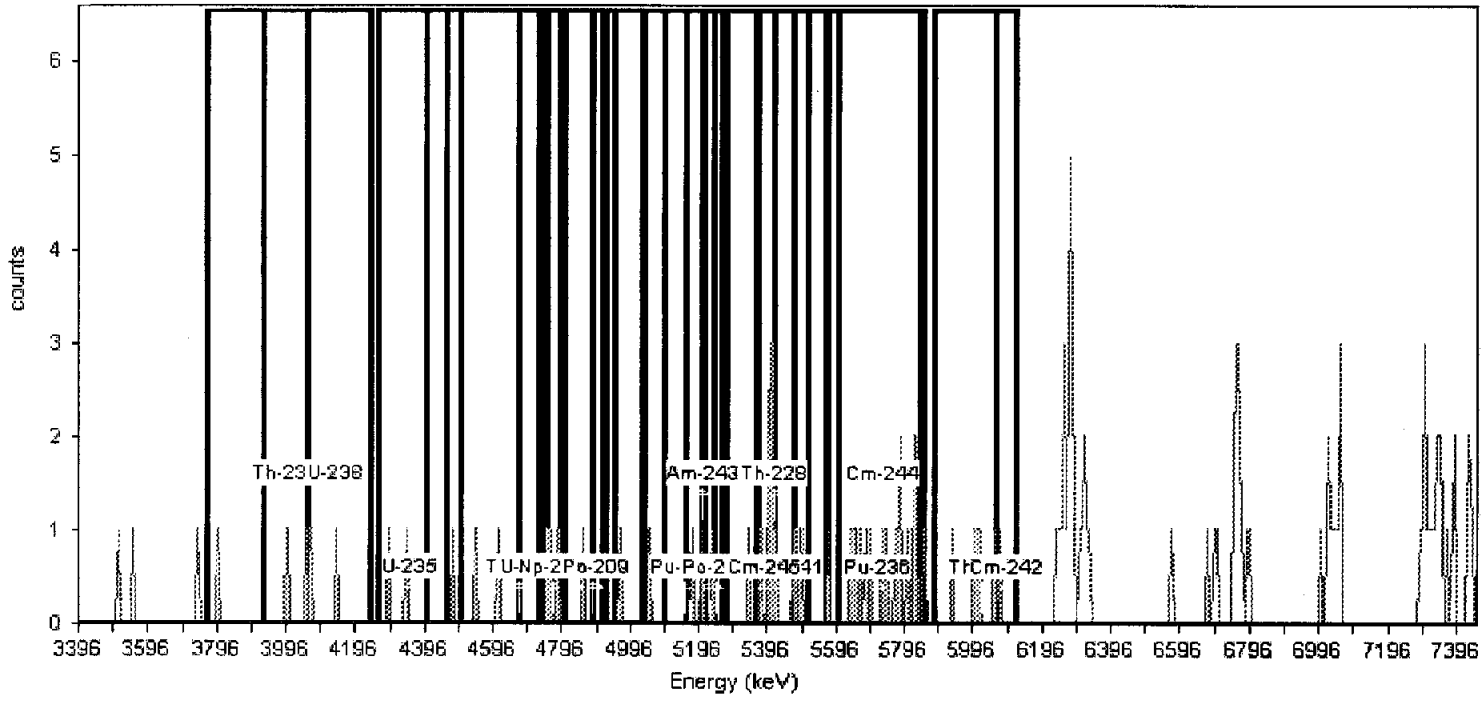
Acquisition

Detector: AV8 , SN: 41-158X1
Acquisition Start Date: 6/24/2007 8:47:27PM
Live Time: 960.00 min.
Real Time: 960.02 min.
Calibration Name: May2007_AV8
Calibration Date: 5/30/2007 2:04:13PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.13% +/- 0.28% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI Nuclide Library: Background ROI Library

Total Background Counts: 127.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	4.00	4.167E-003	2.329E-003
U-238	4.14	3.93	4.24	5.00	5.208E-003	2.552E-003
U-235	4.35	4.26	4.46	2.00	2.083E-003	1.804E-003
Th-230	4.67	4.40	4.73	3.00	3.125E-003	2.083E-003
U-234	4.70	4.50	4.80	5.00	5.208E-003	2.552E-003
Pu-242	4.88	4.67	4.93	4.00	4.167E-003	2.329E-003
Th-229	4.84	4.72	5.10	6.00	6.250E-003	2.756E-003
Np-237	4.77	4.75	4.79	3.00	3.125E-003	2.083E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	4.00	4.167E-003	2.329E-003
Am-243	5.20	5.03	5.28	4.00	4.167E-003	2.329E-003
U-232	5.23	5.04	5.37	5.00	5.208E-003	2.552E-003
Th-228	5.41	5.16	5.47	13.00	1.354E-002	3.898E-003
Po-210	5.25	5.20	5.26	2.00	2.083E-003	1.804E-003
Pu-238	5.44	5.24	5.52	12.00	1.250E-002	3.756E-003
Am-241	5.45	5.27	5.57	12.00	1.250E-002	3.756E-003
Cm-245	5.39	5.36	5.41	7.00	7.292E-003	2.946E-003
Pu-236	5.72	5.57	5.84	16.00	1.667E-002	4.295E-003
Cm-244	5.73	5.60	5.86	16.00	1.667E-002	4.295E-003
Th-227	6.02	5.89	6.13	6.00	6.250E-003	2.756E-003
Cm-242	6.10	6.07	6.13	1.00	1.042E-003	1.473E-003

SEVERN TRENT **STL**

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:59:51PM 6/25/2007

Analyst: 60040

Sample

Sample Name: AV9
Comment:

Spectrum #1 Analysis #1

Batch

Batch Name: June2007
Description:

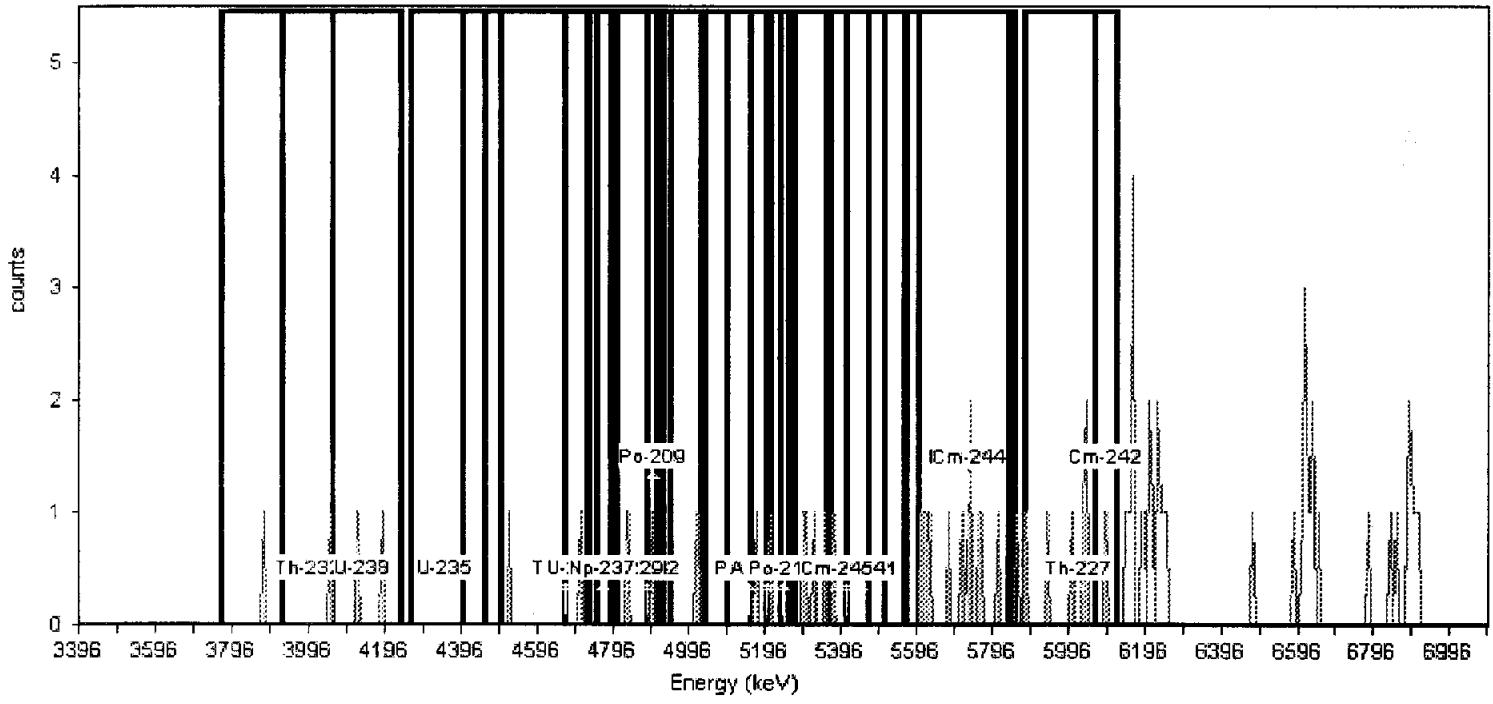
Acquisition

Detector: AV9 , SN: 41-172R1
Acquisition Start Date: 6/24/2007 8:47:28PM
Live Time: 960.00 min.
Real Time: 960.01 min.
Calibration Name: May2007_AV9
Calibration Date: 5/30/2007 11:40:25AM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 26.63% +/- 0.26% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 74.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	2.00	2.083E-003	1.804E-003
U-238	4.14	3.93	4.24	3.00	3.125E-003	2.083E-003
U-235	4.35	4.26	4.46	0.00	0.000E+000	1.473E-003
Th-230	4.67	4.40	4.73	2.00	2.083E-003	1.804E-003
U-234	4.70	4.50	4.80	2.00	2.083E-003	1.804E-003
Pu-242	4.88	4.67	4.93	3.00	3.125E-003	2.083E-003
Th-229	4.84	4.72	5.10	4.00	4.167E-003	2.329E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	1.00	1.042E-003	1.473E-003
Pu-239	5.15	4.95	5.21	4.00	4.167E-003	2.329E-003
Am-243	5.20	5.03	5.28	2.00	2.083E-003	1.804E-003
U-232	5.23	5.04	5.37	6.00	6.250E-003	2.756E-003
Th-228	5.41	5.16	5.47	7.00	7.292E-003	2.946E-003
Po-210	5.25	5.20	5.26	1.00	1.042E-003	1.473E-003
Pu-238	5.44	5.24	5.52	5.00	5.208E-003	2.552E-003
Am-241	5.45	5.27	5.57	5.00	5.208E-003	2.552E-003
Cm-245	5.39	5.36	5.41	1.00	1.042E-003	1.473E-003
Pu-236	5.72	5.57	5.84	12.00	1.250E-002	3.756E-003
Cm-244	5.73	5.60	5.86	12.00	1.250E-002	3.756E-003
Th-227	6.02	5.89	6.13	7.00	7.292E-003	2.946E-003
Cm-242	6.10	6.07	6.13	1.00	1.042E-003	1.473E-003

ST SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:59:54PM 6/25/2007

Analyst: 60040

Sample

Sample Name: AV11
Comment:

Spectrum #1 Analysis #1

Batch

Batch Name: June2007
Description:

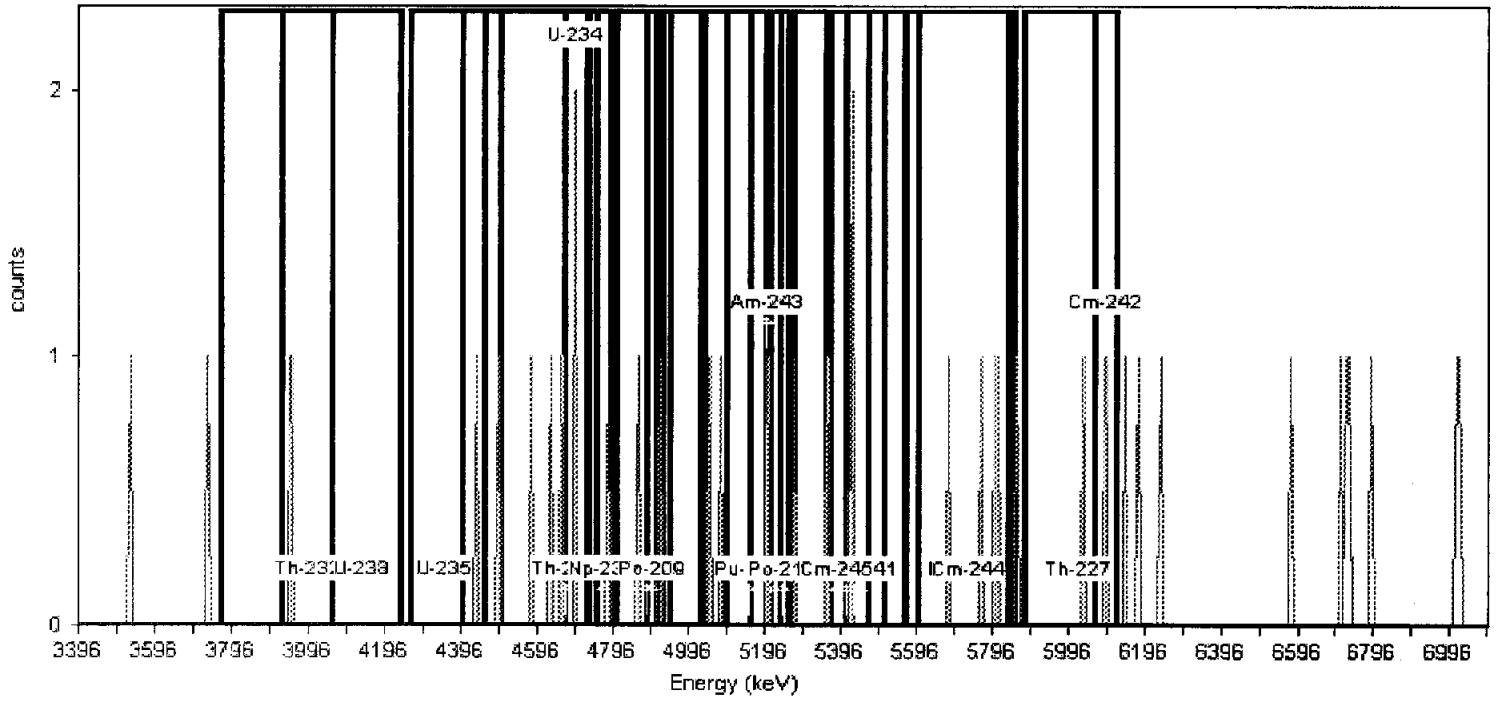
Acquisition

Detector: AV11 , SN: 41-172Q3
Acquisition Start Date: 6/24/2007 8:47:29PM
Live Time: 960.00 min.
Real Time: 960.01 min.
Calibration Name: May2007_AV11
Calibration Date: 5/10/2007 5:27:44PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.30% +/- 0.29% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 37.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	1.00	1.042E-003	1.473E-003
U-238	4.14	3.93	4.24	1.00	1.042E-003	1.473E-003
U-235	4.35	4.26	4.46	1.00	1.042E-003	1.473E-003
Th-230	4.67	4.40	4.73	7.00	7.292E-003	2.946E-003
U-234	4.70	4.50	4.80	6.00	6.250E-003	2.756E-003
Pu-242	4.88	4.67	4.93	5.00	5.208E-003	2.552E-003
Th-229	4.84	4.72	5.10	5.00	5.208E-003	2.552E-003
Np-237	4.77	4.75	4.79	1.00	1.042E-003	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	3.00	3.125E-003	2.083E-003
Am-243	5.20	5.03	5.28	4.00	4.167E-003	2.329E-003
U-232	5.23	5.04	5.37	5.00	5.208E-003	2.552E-003
Th-228	5.41	5.16	5.47	5.00	5.208E-003	2.552E-003
Po-210	5.25	5.20	5.26	1.00	1.042E-003	1.473E-003
Pu-238	5.44	5.24	5.52	4.00	4.167E-003	2.329E-003
Am-241	5.45	5.27	5.57	4.00	4.167E-003	2.329E-003
Cm-245	5.39	5.36	5.41	1.00	1.042E-003	1.473E-003
Pu-236	5.72	5.57	5.84	4.00	4.167E-003	2.329E-003
Cm-244	5.73	5.60	5.86	4.00	4.167E-003	2.329E-003
Th-227	6.02	5.89	6.13	2.00	2.083E-003	1.804E-003
Cm-242	6.10	6.07	6.13	1.00	1.042E-003	1.473E-003

STL SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:59:57PM 6/25/2007

Analyst: 60040

Sample

Sample Name: AV12 Spectrum #1 Analysis #1

Comment:

Batch

Batch Name: June2007

Description:

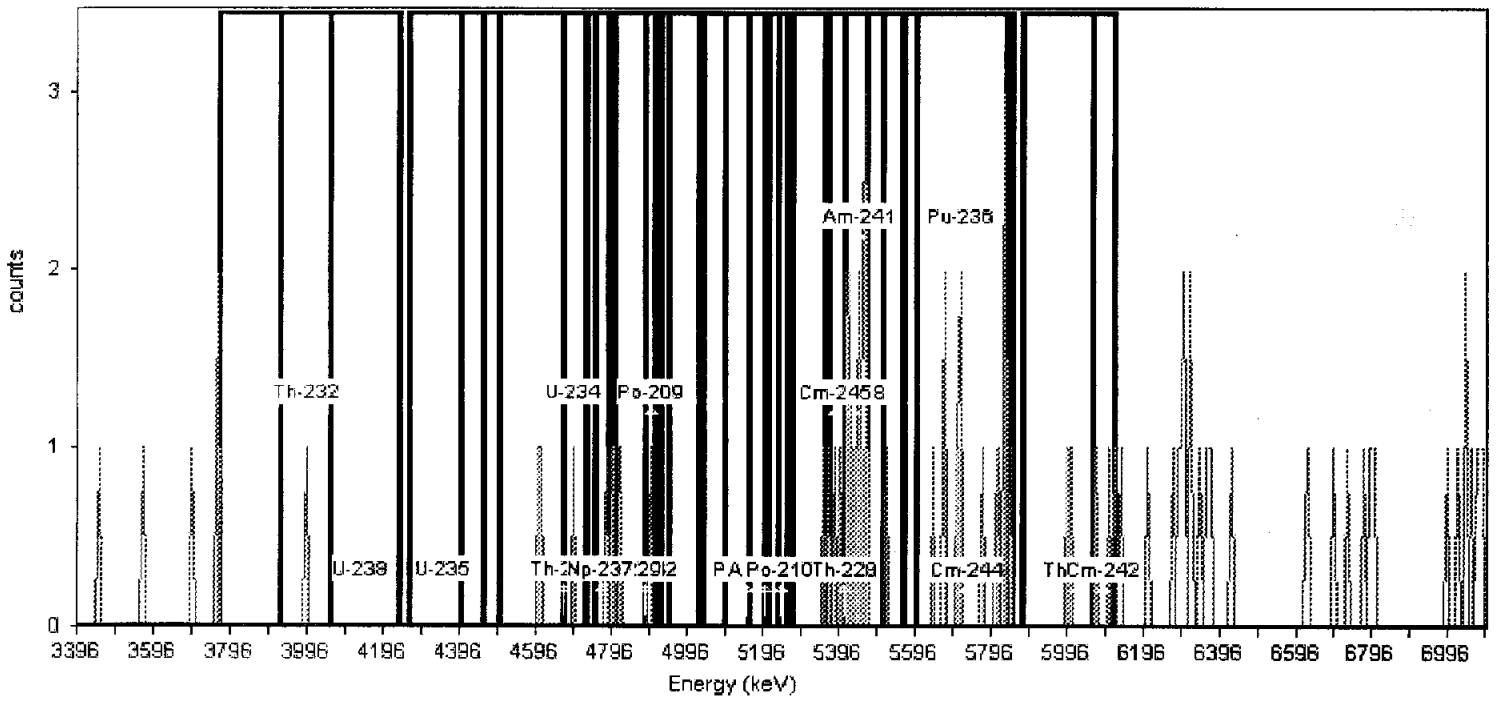
Acquisition

Detector: AV12 , SN: 41-172Q2
Acquisition Start Date: 6/24/2007 8:47:30PM
Live Time: 960.00 min.
Real Time: 960.01 min.
Calibration Name: May2007_AV12
Calibration Date: 5/30/2007 4:35:05PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 26.52% +/- 0.27% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_Background Nuclide Library: Background ROI Library

Total Background Counts: 80.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	1.00	1.042E-003	1.473E-003
U-238	4.14	3.93	4.24	1.00	1.042E-003	1.473E-003
U-235	4.35	4.26	4.46	0.00	0.000E+000	1.473E-003
Th-230	4.67	4.40	4.73	3.00	3.125E-003	2.083E-003
U-234	4.70	4.50	4.80	5.00	5.208E-003	2.552E-003
Pu-242	4.88	4.67	4.93	5.00	5.208E-003	2.552E-003
Th-229	4.84	4.72	5.10	4.00	4.167E-003	2.329E-003
Np-237	4.77	4.75	4.79	1.00	1.042E-003	1.473E-003
Po-209	4.90	4.88	4.91	1.00	1.042E-003	1.473E-003
Pu-239	5.15	4.95	5.21	0.00	0.000E+000	1.473E-003
Am-243	5.20	5.03	5.28	0.00	0.000E+000	1.473E-003
U-232	5.23	5.04	5.37	2.00	2.083E-003	1.804E-003
Th-228	5.41	5.16	5.47	17.00	1.771E-002	4.419E-003
Po-210	5.25	5.20	5.26	0.00	0.000E+000	1.473E-003
Pu-238	5.44	5.24	5.52	17.00	1.771E-002	4.419E-003
Am-241	5.45	5.27	5.57	18.00	1.875E-002	4.541E-003
Cm-245	5.39	5.36	5.41	3.00	3.125E-003	2.083E-003
Pu-236	5.72	5.57	5.84	12.00	1.250E-002	3.756E-003
Cm-244	5.73	5.60	5.86	13.00	1.354E-002	3.898E-003
Th-227	6.02	5.89	6.13	5.00	5.208E-003	2.552E-003
Cm-242	6.10	6.07	6.13	3.00	3.125E-003	2.083E-003

ST

SEVERN TRENT **STL**

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040

1:00:00PM 6/25/2007

Sample

Sample Name: AV13

Spectrum #1 Analysis #1

Comment:

Batch

Batch Name: June2007

Description:

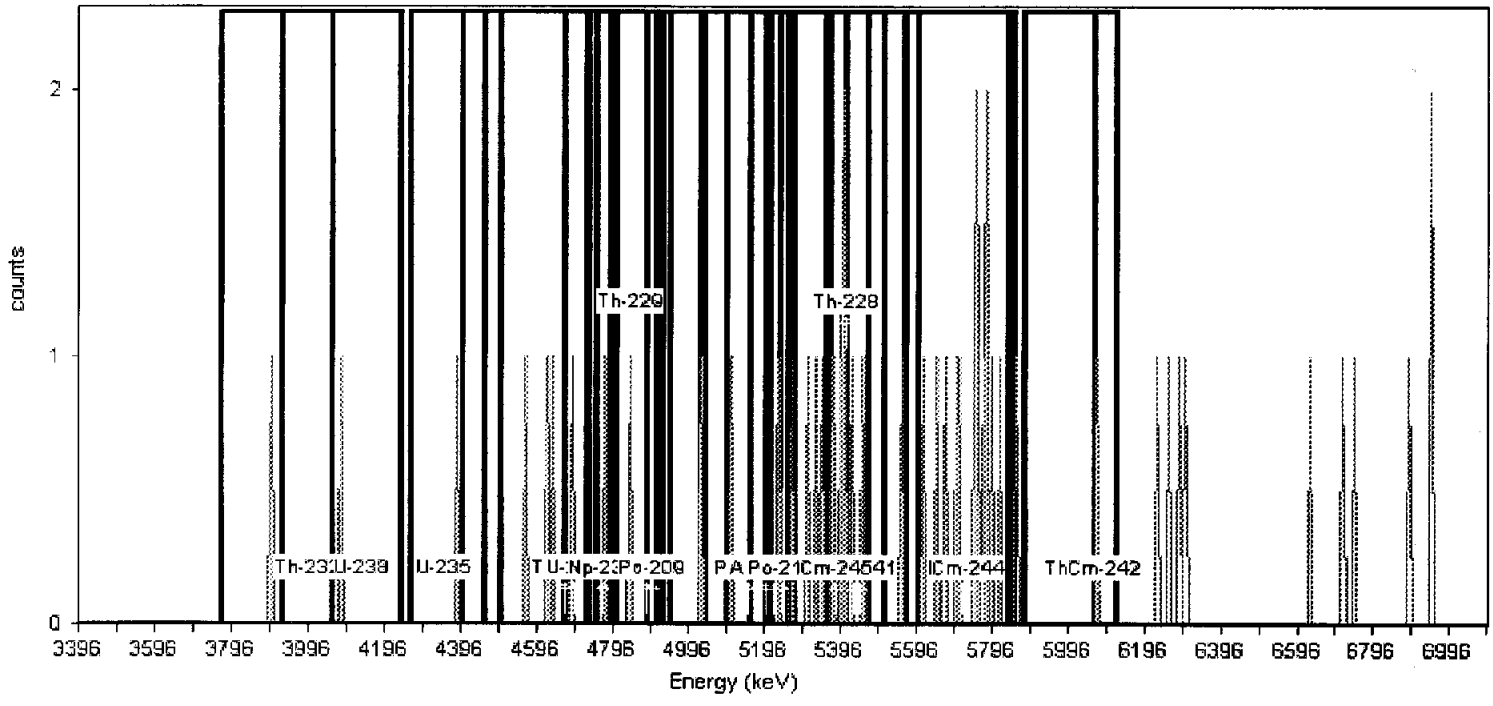
Acquisition

Detector: AV13 , SN: 41-172Q1
Acquisition Start Date: 6/24/2007 8:47:31PM
Live Time: 960.00 min.
Real Time: 960.01 min.
Calibration Name: May2007_AV13
Calibration Date: 5/30/2007 2:03:40PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.01% +/- 0.27% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI

Nuclide Library: Background ROI Library

Total Background Counts: 50.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	1.00	1.042E-003	1.473E-003
U-238	4.14	3.93	4.24	1.00	1.042E-003	1.473E-003
U-235	4.35	4.26	4.46	1.00	1.042E-003	1.473E-003
Th-230	4.67	4.40	4.73	4.00	4.167E-003	2.329E-003
U-234	4.70	4.50	4.80	5.00	5.208E-003	2.552E-003
Pu-242	4.88	4.67	4.93	3.00	3.125E-003	2.083E-003
Th-229	4.84	4.72	5.10	3.00	3.125E-003	2.083E-003
Np-237	4.77	4.75	4.79	1.00	1.042E-003	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	2.00	2.083E-003	1.804E-003
Am-243	5.20	5.03	5.28	5.00	5.208E-003	2.552E-003
U-232	5.23	5.04	5.37	7.00	7.292E-003	2.946E-003
Th-228	5.41	5.16	5.47	13.00	1.354E-002	3.898E-003
Po-210	5.25	5.20	5.26	2.00	2.083E-003	1.804E-003
Pu-238	5.44	5.24	5.52	12.00	1.250E-002	3.756E-003
Am-241	5.45	5.27	5.57	12.00	1.250E-002	3.756E-003
Cm-245	5.39	5.36	5.41	5.00	5.208E-003	2.552E-003
Pu-236	5.72	5.57	5.84	13.00	1.354E-002	3.898E-003
Cm-244	5.73	5.60	5.86	13.00	1.354E-002	3.898E-003
Th-227	6.02	5.89	6.13	1.00	1.042E-003	1.473E-003
Cm-242	6.10	6.07	6.13	1.00	1.042E-003	1.473E-003

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 1:00:04PM 6/25/2007

Sample

Sample Name: AV14 Spectrum #1 Analysis #1

Comment:

Batch

Batch Name: June2007

Description:

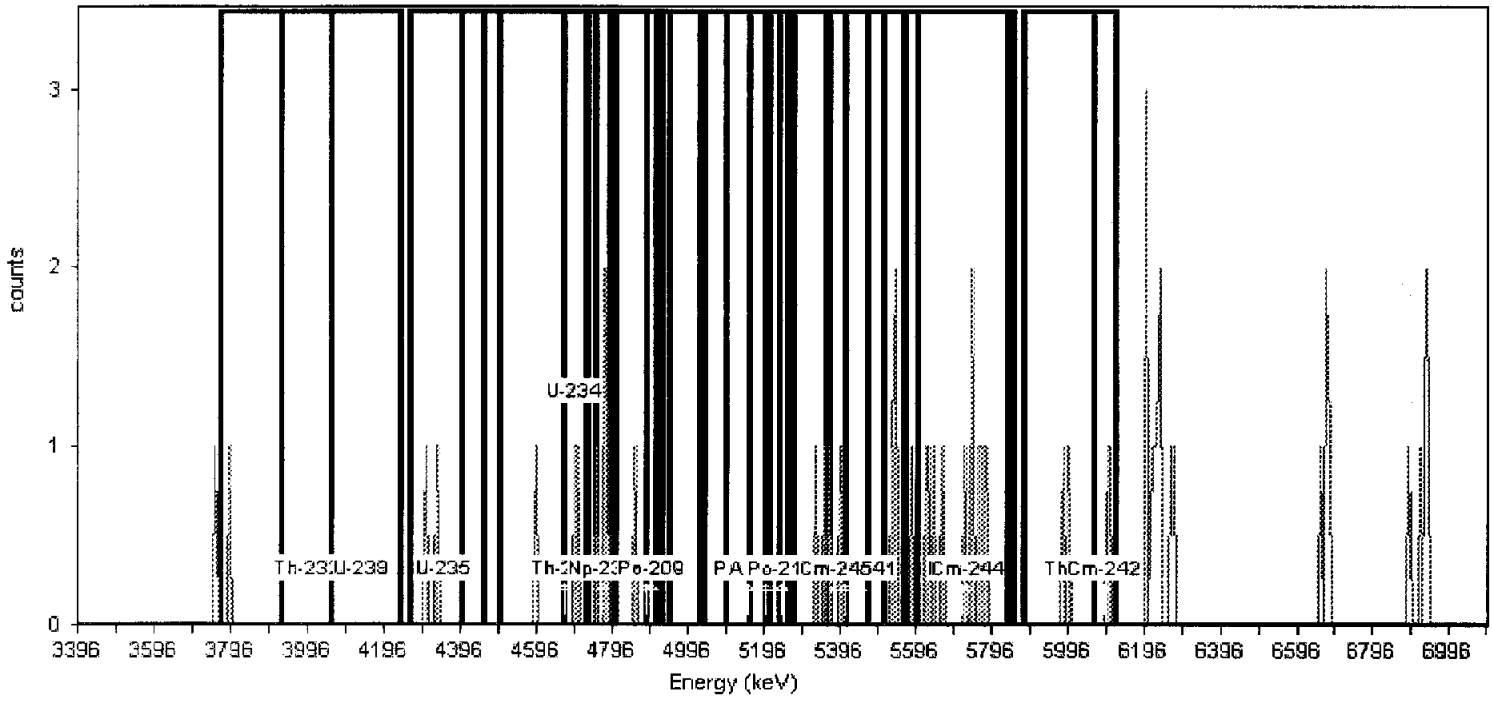
Acquisition

Detector: AV14 , SN: 41-172C4
Acquisition Start Date: 6/24/2007 8:47:33PM
Live Time: 960.00 min.
Real Time: 960.01 min.
Calibration Name: May2007_AV14
Calibration Date: 5/30/2007 4:34:58PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 26.38% +/- 0.28% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_Background Nuclide Library: Background ROI Library

Total Background Counts: 54.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	1.00	1.042E-003	1.473E-003
U-238	4.14	3.93	4.24	0.00	0.000E+000	1.473E-003
U-235	4.35	4.26	4.46	2.00	2.083E-003	1.804E-003
Th-230	4.67	4.40	4.73	3.00	3.125E-003	2.083E-003
U-234	4.70	4.50	4.80	7.00	7.292E-003	2.946E-003
Pu-242	4.88	4.67	4.93	7.00	7.292E-003	2.946E-003
Th-229	4.84	4.72	5.10	5.00	5.208E-003	2.552E-003
Np-237	4.77	4.75	4.79	4.00	4.167E-003	2.329E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	0.00	0.000E+000	1.473E-003
Am-243	5.20	5.03	5.28	0.00	0.000E+000	1.473E-003
U-232	5.23	5.04	5.37	3.00	3.125E-003	2.083E-003
Th-228	5.41	5.16	5.47	4.00	4.167E-003	2.329E-003
Po-210	5.25	5.20	5.26	0.00	0.000E+000	1.473E-003
Pu-238	5.44	5.24	5.52	4.00	4.167E-003	2.329E-003
Am-241	5.45	5.27	5.57	7.00	7.292E-003	2.946E-003
Cm-245	5.39	5.36	5.41	2.00	2.083E-003	1.804E-003
Pu-236	5.72	5.57	5.84	12.00	1.250E-002	3.756E-003
Cm-244	5.73	5.60	5.86	11.00	1.146E-002	3.608E-003
Th-227	6.02	5.89	6.13	4.00	4.167E-003	2.329E-003
Cm-242	6.10	6.07	6.13	2.00	2.083E-003	1.804E-003

SEVERN TRENT **STL**

Alpha Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040

1:00:07PM 6/25/2007

Sample

Sample Name: AV15

Spectrum #1 Analysis #1

Comment:

Batch

Batch Name: June2007

Description:

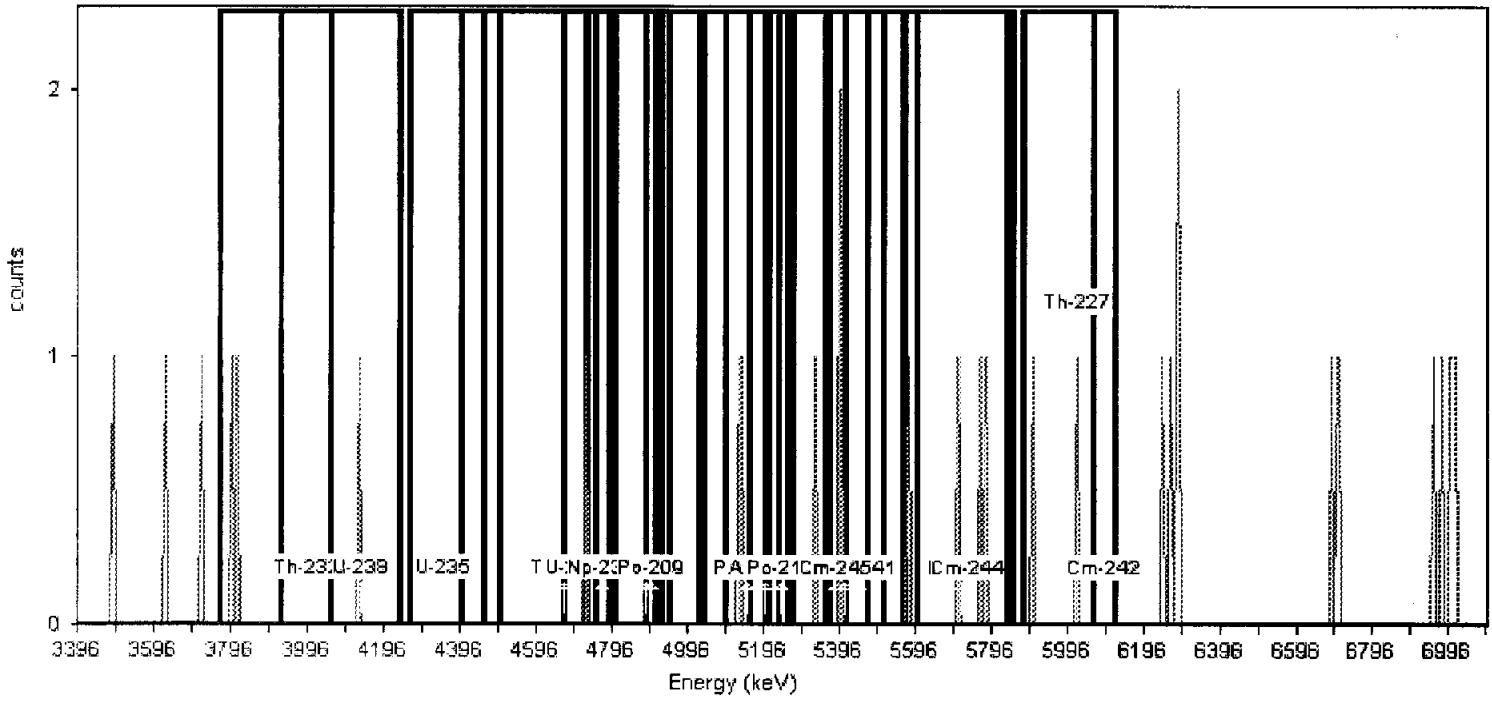
Acquisition

Detector: AV15 , SN: 41-172C5
Acquisition Start Date: 6/24/2007 8:47:34PM
Live Time: 960.00 min.
Real Time: 960.01 min.
Calibration Name: May2007_AV15
Calibration Date: 5/11/2007 1:31:46PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 23.19% +/- 0.24% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI

Nuclide Library: Background ROI Library

Total Background Counts: 31.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	2.00	2.083E-003	1.804E-003
U-238	4.14	3.93	4.24	1.00	1.042E-003	1.473E-003
U-235	4.35	4.26	4.46	0.00	0.000E+000	1.473E-003
Th-230	4.67	4.40	4.73	1.00	1.042E-003	1.473E-003
U-234	4.70	4.50	4.80	1.00	1.042E-003	1.473E-003
Pu-242	4.88	4.67	4.93	1.00	1.042E-003	1.473E-003
Th-229	4.84	4.72	5.10	1.00	1.042E-003	1.473E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	2.00	2.083E-003	1.804E-003
Am-243	5.20	5.03	5.28	2.00	2.083E-003	1.804E-003
U-232	5.23	5.04	5.37	3.00	3.125E-003	2.083E-003
Th-228	5.41	5.16	5.47	3.00	3.125E-003	2.083E-003
Po-210	5.25	5.20	5.26	0.00	0.000E+000	1.473E-003
Pu-238	5.44	5.24	5.52	3.00	3.125E-003	2.083E-003
Am-241	5.45	5.27	5.57	3.00	3.125E-003	2.083E-003
Cm-245	5.39	5.36	5.41	2.00	2.083E-003	1.804E-003
Pu-236	5.72	5.57	5.84	4.00	4.167E-003	2.329E-003
Cm-244	5.73	5.60	5.86	3.00	3.125E-003	2.083E-003
Th-227	6.02	5.89	6.13	2.00	2.083E-003	1.804E-003
Cm-242	6.10	6.07	6.13	0.00	0.000E+000	1.473E-003

SEVERN TRENT **STL**

Alpha Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
1:00:10PM 6/25/2007

Analyst: 60040

Sample

Sample Name: AV18
Comment:

Spectrum #1 Analysis #1

Batch

Batch Name: June2007
Description:

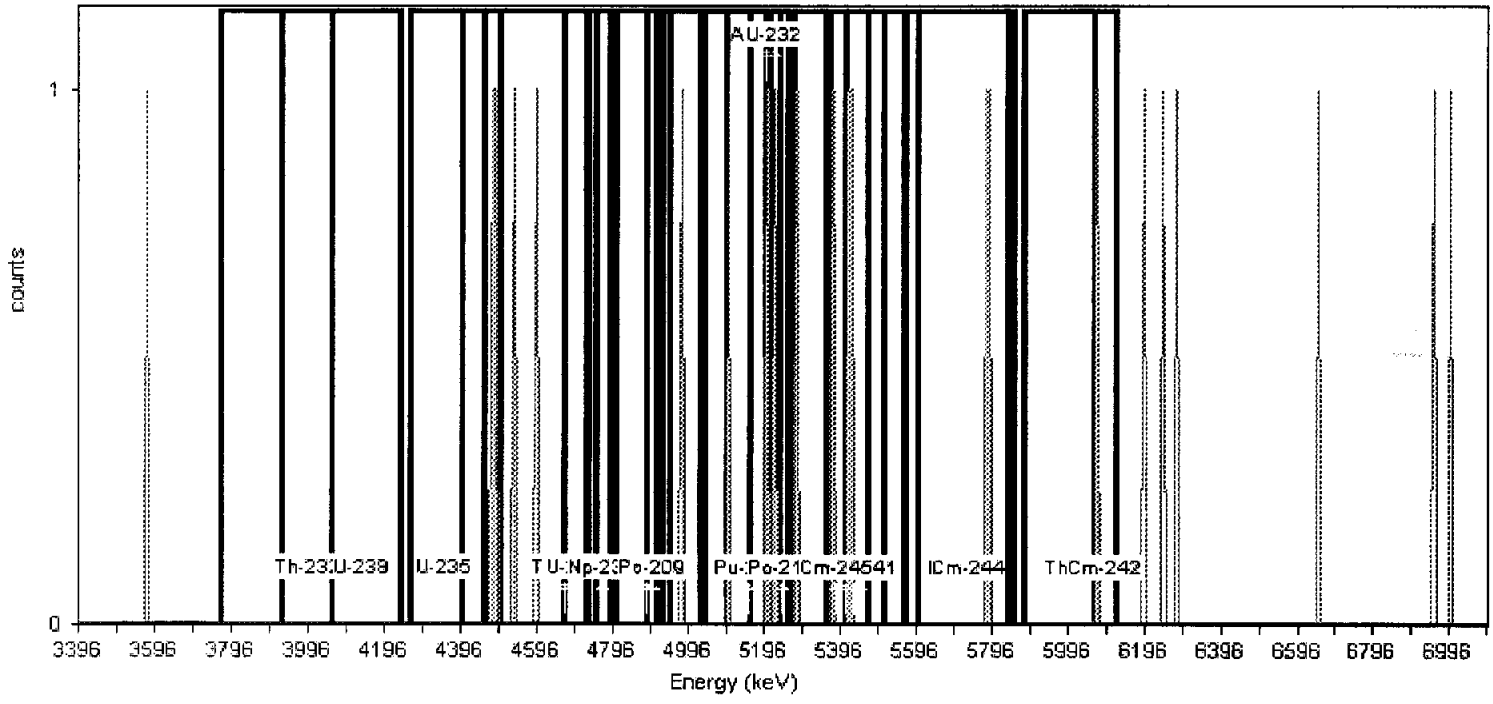
Acquisition

Detector: AV18 , SN: 41-172C6
Acquisition Start Date: 6/24/2007 8:47:36PM
Live Time: 960.00 min.
Real Time: 960.03 min.
Calibration Name: May2007_AV18
Calibration Date: 5/30/2007 7:20:05PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 25.33% +/- 0.27% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 22.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	0.00	0.000E+000	1.473E-003
U-238	4.14	3.93	4.24	0.00	0.000E+000	1.473E-003
U-235	4.35	4.26	4.46	0.00	0.000E+000	1.473E-003
Th-230	4.67	4.40	4.73	4.00	4.167E-003	2.329E-003
U-234	4.70	4.50	4.80	2.00	2.083E-003	1.804E-003
Pu-242	4.88	4.67	4.93	0.00	0.000E+000	1.473E-003
Th-229	4.84	4.72	5.10	1.00	1.042E-003	1.473E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	3.00	3.125E-003	2.083E-003
Am-243	5.20	5.03	5.28	3.00	3.125E-003	2.083E-003
U-232	5.23	5.04	5.37	4.00	4.167E-003	2.329E-003
Th-228	5.41	5.16	5.47	6.00	6.250E-003	2.756E-003
Po-210	5.25	5.20	5.26	2.00	2.083E-003	1.804E-003
Pu-238	5.44	5.24	5.52	4.00	4.167E-003	2.329E-003
Am-241	5.45	5.27	5.57	4.00	4.167E-003	2.329E-003
Cm-245	5.39	5.36	5.41	1.00	1.042E-003	1.473E-003
Pu-236	5.72	5.57	5.84	2.00	2.083E-003	1.804E-003
Cm-244	5.73	5.60	5.86	2.00	2.083E-003	1.804E-003
Th-227	6.02	5.89	6.13	1.00	1.042E-003	1.473E-003
Cm-242	6.10	6.07	6.13	1.00	1.042E-003	1.473E-003

STL SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 1:00:13PM 6/25/2007

Sample

Sample Name: AV19 Spectrum #1 Analysis #1

Comment:

Batch

Batch Name: June2007

Description:

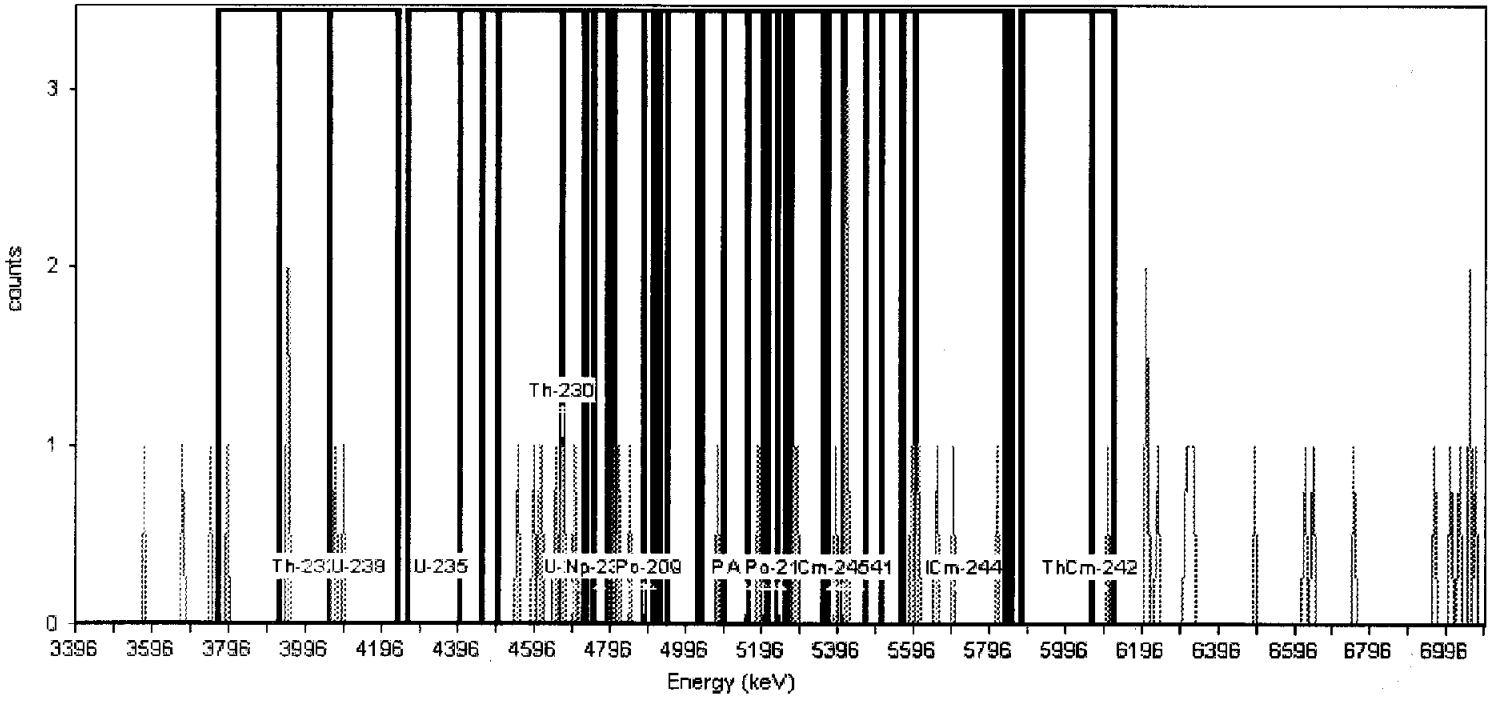
Acquisition

Detector: AV19 , SN: 41-172Q6
Acquisition Start Date: 6/24/2007 8:47:38PM
Live Time: 960.00 min.
Real Time: 960.03 min.
Calibration Name: May2007_AV19
Calibration Date: 5/30/2007 4:35:11PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 25.87% +/- 0.28% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI Nuclide Library: Background ROI Library

Total Background Counts: 50.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	3.00	3.125E-003	2.083E-003
U-238	4.14	3.93	4.24	4.00	4.167E-003	2.329E-003
U-235	4.35	4.26	4.46	0.00	0.000E+000	1.473E-003
Th-230	4.67	4.40	4.73	8.00	8.333E-003	3.125E-003
U-234	4.70	4.50	4.80	9.00	9.375E-003	3.294E-003
Pu-242	4.88	4.67	4.93	6.00	6.250E-003	2.756E-003
Th-229	4.84	4.72	5.10	4.00	4.167E-003	2.329E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	2.00	2.083E-003	1.804E-003
Am-243	5.20	5.03	5.28	2.00	2.083E-003	1.804E-003
U-232	5.23	5.04	5.37	4.00	4.167E-003	2.329E-003
Th-228	5.41	5.16	5.47	7.00	7.292E-003	2.946E-003
Po-210	5.25	5.20	5.26	0.00	0.000E+000	1.473E-003
Pu-238	5.44	5.24	5.52	6.00	6.250E-003	2.756E-003
Am-241	5.45	5.27	5.57	6.00	6.250E-003	2.756E-003
Cm-245	5.39	5.36	5.41	1.00	1.042E-003	1.473E-003
Pu-236	5.72	5.57	5.84	5.00	5.208E-003	2.552E-003
Cm-244	5.73	5.60	5.86	4.00	4.167E-003	2.329E-003
Th-227	6.02	5.89	6.13	1.00	1.042E-003	1.473E-003
Cm-242	6.10	6.07	6.13	1.00	1.042E-003	1.473E-003

SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 1:00:16PM 6/25/2007

Sample

Sample Name: AV20 Spectrum #1 Analysis #1

Comment:

Batch

Batch Name: June2007

Description:

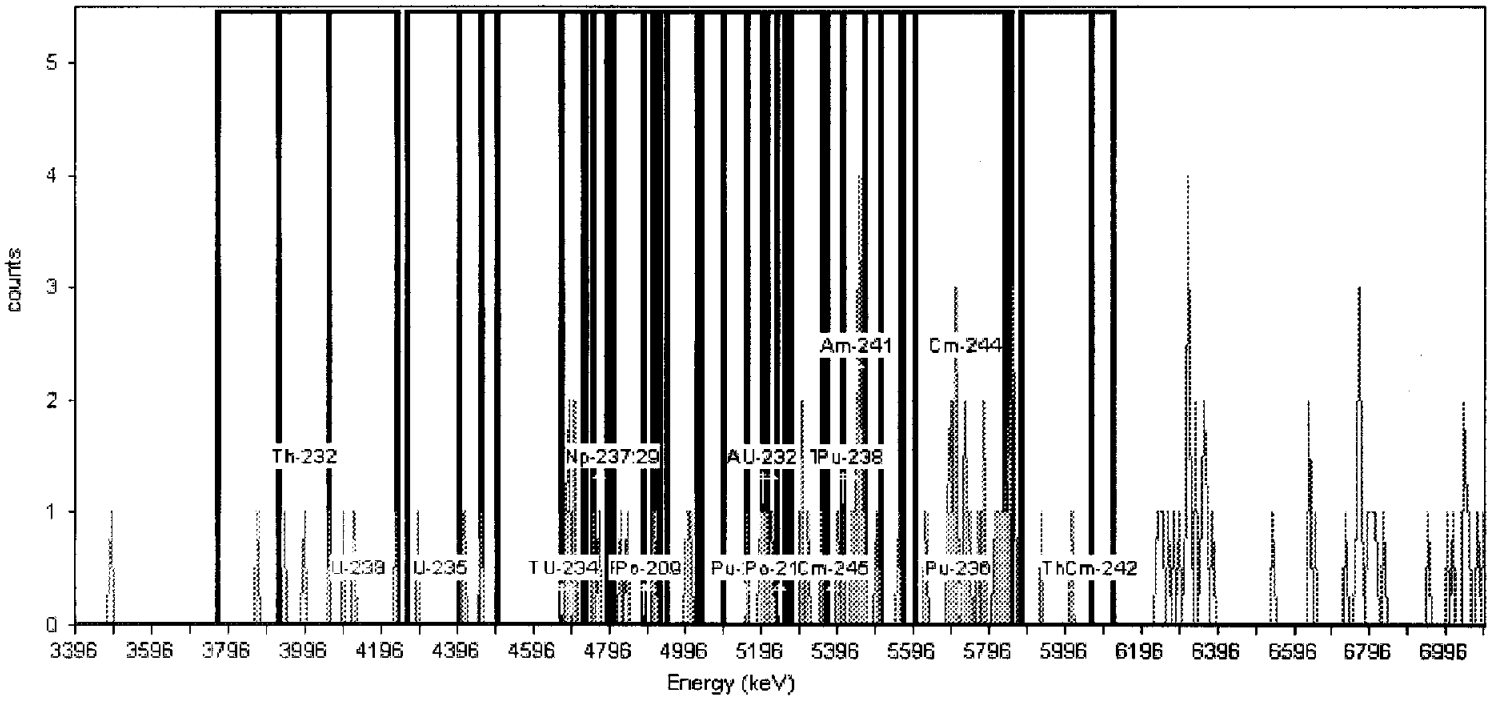
Acquisition

Detector: AV20 , SN: 41-172R2
Acquisition Start Date: 6/24/2007 8:47:39PM
Live Time: 960.00 min.
Real Time: 960.03 min.
Calibration Name: May2007_AV20
Calibration Date: 5/30/2007 7:20:28PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.14% +/- 0.28% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundRoi Nuclide Library: Background ROI Library

Total Background Counts: 118.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	4.00	4.167E-003	2.329E-003
U-238	4.14	3.93	4.24	6.00	6.250E-003	2.756E-003
U-235	4.35	4.26	4.46	3.00	3.125E-003	2.083E-003
Th-230	4.67	4.40	4.73	7.00	7.292E-003	2.946E-003
U-234	4.70	4.50	4.80	7.00	7.292E-003	2.946E-003
Pu-242	4.88	4.67	4.93	10.00	1.042E-002	3.455E-003
Th-229	4.84	4.72	5.10	7.00	7.292E-003	2.946E-003
Np-237	4.77	4.75	4.79	2.00	2.083E-003	1.804E-003
Po-209	4.90	4.88	4.91	1.00	1.042E-003	1.473E-003
Pu-239	5.15	4.95	5.21	6.00	6.250E-003	2.756E-003
Am-243	5.20	5.03	5.28	5.00	5.208E-003	2.552E-003
U-232	5.23	5.04	5.37	9.00	9.375E-003	3.294E-003
Th-228	5.41	5.16	5.47	21.00	2.187E-002	4.886E-003
Po-210	5.25	5.20	5.26	3.00	3.125E-003	2.083E-003
Pu-238	5.44	5.24	5.52	17.00	1.771E-002	4.419E-003
Am-241	5.45	5.27	5.57	18.00	1.875E-002	4.541E-003
Cm-245	5.39	5.36	5.41	2.00	2.083E-003	1.804E-003
Pu-236	5.72	5.57	5.84	20.00	2.083E-002	4.774E-003
Cm-244	5.73	5.60	5.86	23.00	2.396E-002	5.103E-003
Th-227	6.02	5.89	6.13	2.00	2.083E-003	1.804E-003
Cm-242	6.10	6.07	6.13	0.00	0.000E+000	1.473E-003

SEVERN TRENT **STL**

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 1:00:20PM 6/25/2007

Sample

Sample Name: AV21 Spectrum #1 Analysis #1

Comment:

Batch

Batch Name: June2007

Description:

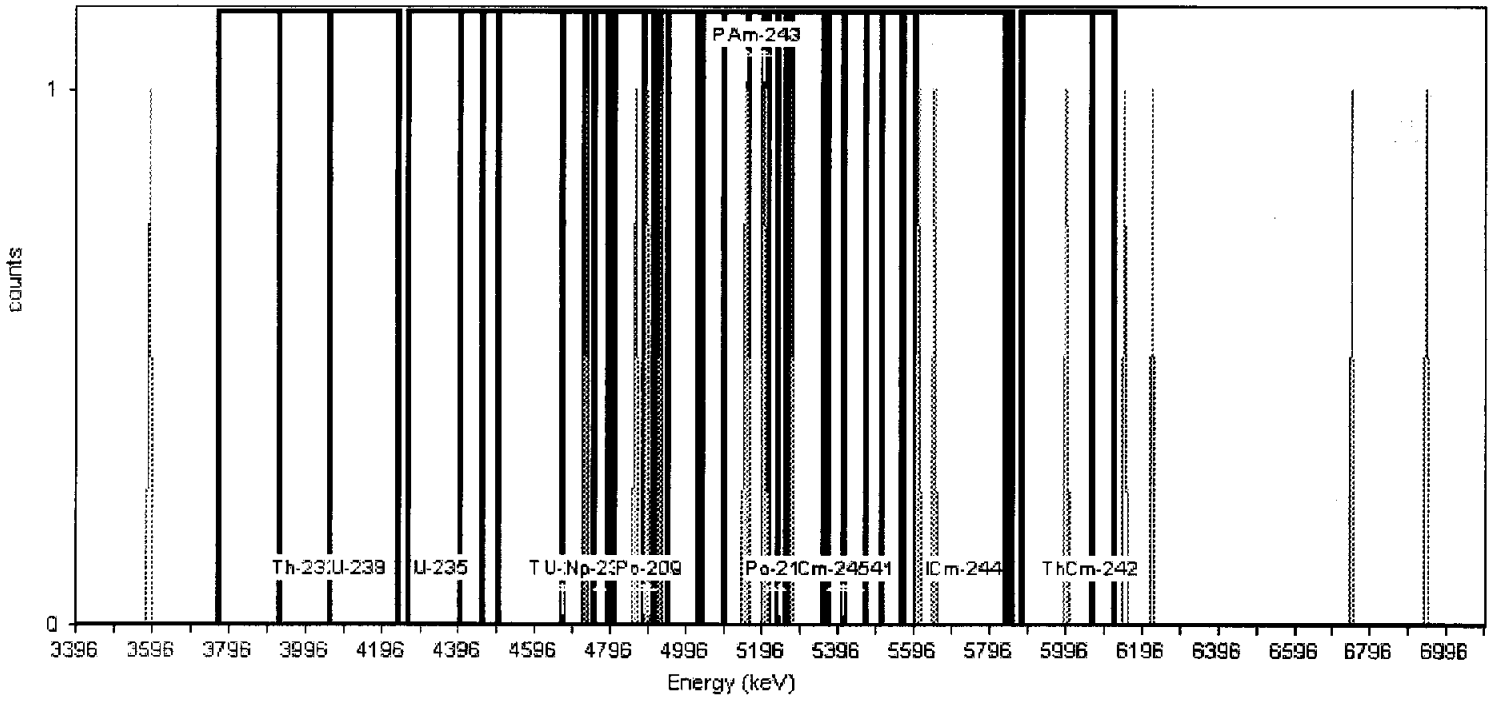
Acquisition

Detector: AV21 , SN: 41-172C7
Acquisition Start Date: 6/24/2007 8:47:41PM
Live Time: 960.00 min.
Real Time: 960.03 min.
Calibration Name: May2007_AV21
Calibration Date: 5/30/2007 4:34:50PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 26.24% +/- 0.26% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundRoi Nuclide Library: Background ROI Library

Total Background Counts: 16.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	0.00	0.000E+000	1.473E-003
U-238	4.14	3.93	4.24	0.00	0.000E+000	1.473E-003
U-235	4.35	4.26	4.46	0.00	0.000E+000	1.473E-003
Th-230	4.67	4.40	4.73	1.00	1.042E-003	1.473E-003
U-234	4.70	4.50	4.80	1.00	1.042E-003	1.473E-003
Pu-242	4.88	4.67	4.93	4.00	4.167E-003	2.329E-003
Th-229	4.84	4.72	5.10	4.00	4.167E-003	2.329E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	1.00	1.042E-003	1.473E-003
Pu-239	5.15	4.95	5.21	3.00	3.125E-003	2.083E-003
Am-243	5.20	5.03	5.28	4.00	4.167E-003	2.329E-003
U-232	5.23	5.04	5.37	4.00	4.167E-003	2.329E-003
Th-228	5.41	5.16	5.47	3.00	3.125E-003	2.083E-003
Po-210	5.25	5.20	5.26	1.00	1.042E-003	1.473E-003
Pu-238	5.44	5.24	5.52	1.00	1.042E-003	1.473E-003
Am-241	5.45	5.27	5.57	1.00	1.042E-003	1.473E-003
Cm-245	5.39	5.36	5.41	0.00	0.000E+000	1.473E-003
Pu-236	5.72	5.57	5.84	2.00	2.083E-003	1.804E-003
Cm-244	5.73	5.60	5.86	2.00	2.083E-003	1.804E-003
Th-227	6.02	5.89	6.13	1.00	1.042E-003	1.473E-003
Cm-242	6.10	6.07	6.13	0.00	0.000E+000	1.473E-003

SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 1:00:23PM 6/25/2007

Sample

Sample Name: AV22 Spectrum #1 Analysis #1

Comment:

Batch

Batch Name: June2007

Description:

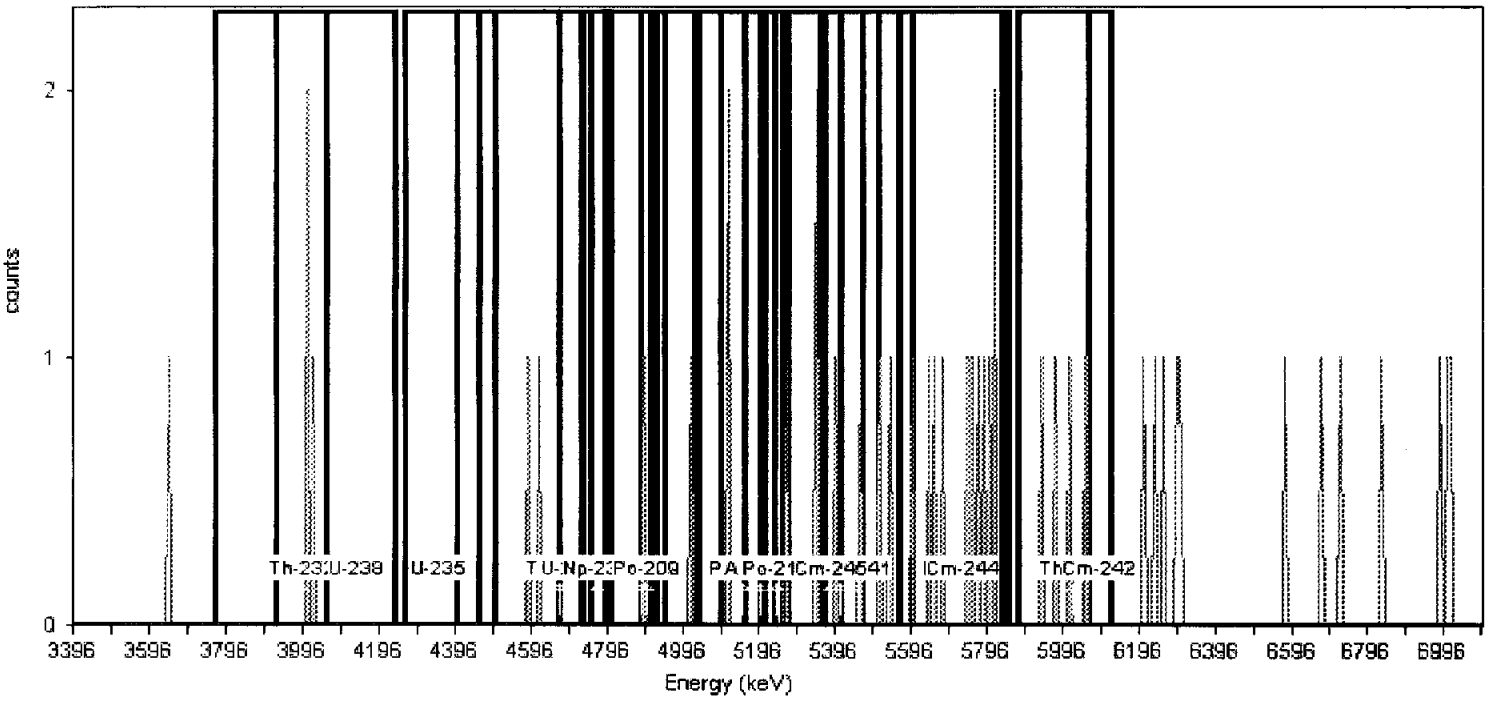
Acquisition

Detector: AV22 , SN: 41-172Q5
Acquisition Start Date: 6/24/2007 8:47:42PM
Live Time: 960.00 min.
Real Time: 960.03 min.
Calibration Name: May2007_AV22
Calibration Date: 5/30/2007 9:46:58PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 25.98% +/- 0.28% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_Background Nuclide Library: Background ROI Library

Total Background Counts: 45.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	3.00	3.125E-003	2.083E-003
U-238	4.14	3.93	4.24	3.00	3.125E-003	2.083E-003
U-235	4.35	4.26	4.46	0.00	0.000E+000	1.473E-003
Th-230	4.67	4.40	4.73	2.00	2.083E-003	1.804E-003
U-234	4.70	4.50	4.80	2.00	2.083E-003	1.804E-003
Pu-242	4.88	4.67	4.93	1.00	1.042E-003	1.473E-003
Th-229	4.84	4.72	5.10	2.00	2.083E-003	1.804E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	1.00	1.042E-003	1.473E-003
Pu-239	5.15	4.95	5.21	3.00	3.125E-003	2.083E-003
Am-243	5.20	5.03	5.28	3.00	3.125E-003	2.083E-003
U-232	5.23	5.04	5.37	5.00	5.208E-003	2.552E-003
Th-228	5.41	5.16	5.47	5.00	5.208E-003	2.552E-003
Po-210	5.25	5.20	5.26	0.00	0.000E+000	1.473E-003
Pu-238	5.44	5.24	5.52	6.00	6.250E-003	2.756E-003
Am-241	5.45	5.27	5.57	7.00	7.292E-003	2.946E-003
Cm-245	5.39	5.36	5.41	1.00	1.042E-003	1.473E-003
Pu-236	5.72	5.57	5.84	12.00	1.250E-002	3.756E-003
Cm-244	5.73	5.60	5.86	12.00	1.250E-002	3.756E-003
Th-227	6.02	5.89	6.13	4.00	4.167E-003	2.329E-003
Cm-242	6.10	6.07	6.13	0.00	0.000E+000	1.473E-003

ST SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
1:00:26PM 6/25/2007

Analyst: 60040

Sample

Sample Name: AV24
Comment:

Spectrum #1 Analysis #1

Batch

Batch Name: June2007
Description:

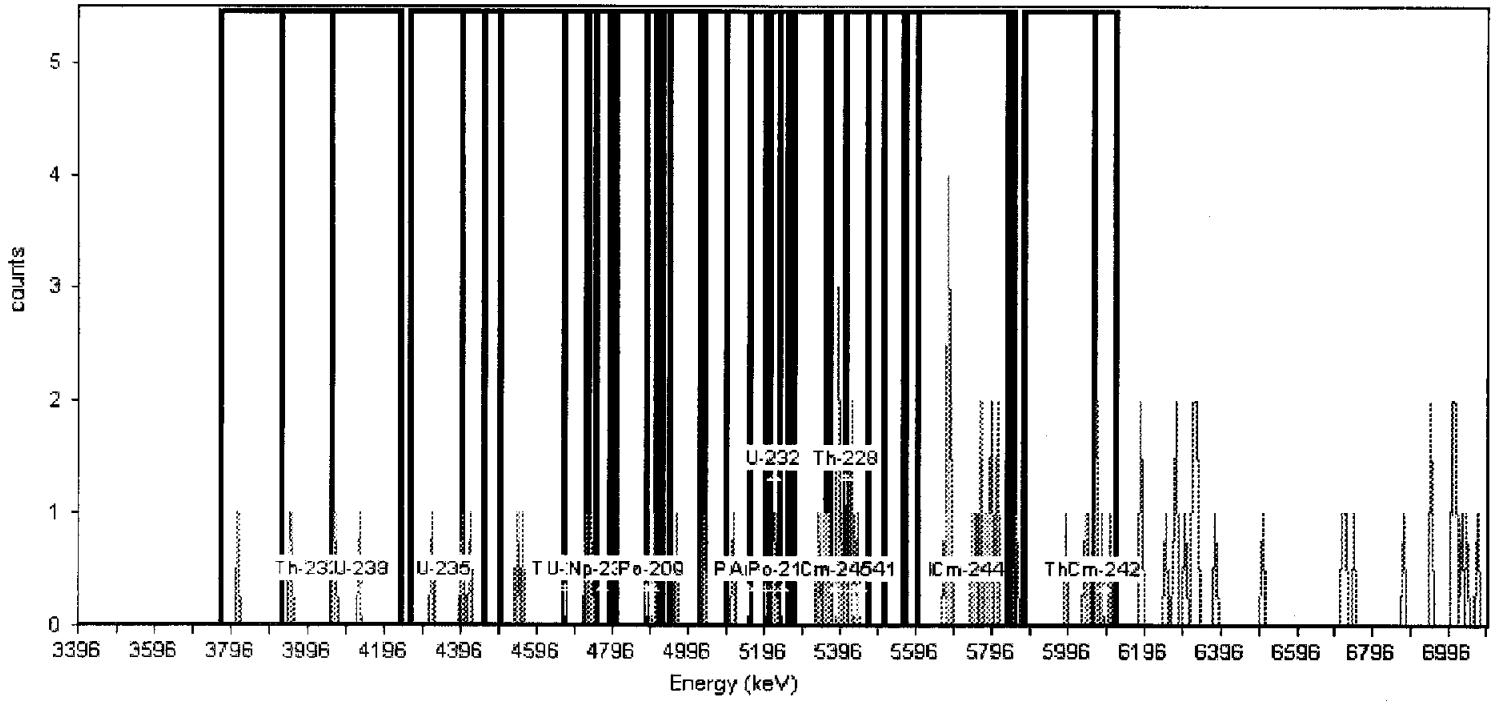
Acquisition

Detector: AV24 , SN: 41-172R5
Acquisition Start Date: 6/24/2007 8:47:43PM
Live Time: 960.00 min.
Real Time: 960.03 min.
Calibration Name: May2007_AV24
Calibration Date: 5/30/2007 9:47:24PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 26.51% +/- 0.27% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 80.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	2.00	2.083E-003	1.804E-003
U-238	4.14	3.93	4.24	3.00	3.125E-003	2.083E-003
U-235	4.35	4.26	4.46	3.00	3.125E-003	2.083E-003
Th-230	4.67	4.40	4.73	5.00	5.208E-003	2.552E-003
U-234	4.70	4.50	4.80	4.00	4.167E-003	2.329E-003
Pu-242	4.88	4.67	4.93	3.00	3.125E-003	2.083E-003
Th-229	4.84	4.72	5.10	5.00	5.208E-003	2.552E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	1.00	1.042E-003	1.473E-003
Pu-239	5.15	4.95	5.21	3.00	3.125E-003	2.083E-003
Am-243	5.20	5.03	5.28	3.00	3.125E-003	2.083E-003
U-232	5.23	5.04	5.37	7.00	7.292E-003	2.946E-003
Th-228	5.41	5.16	5.47	13.00	1.354E-002	3.898E-003
Po-210	5.25	5.20	5.26	1.00	1.042E-003	1.473E-003
Pu-238	5.44	5.24	5.52	12.00	1.250E-002	3.756E-003
Am-241	5.45	5.27	5.57	12.00	1.250E-002	3.756E-003
Cm-245	5.39	5.36	5.41	7.00	7.292E-003	2.946E-003
Pu-236	5.72	5.57	5.84	17.00	1.771E-002	4.419E-003
Cm-244	5.73	5.60	5.86	17.00	1.771E-002	4.419E-003
Th-227	6.02	5.89	6.13	7.00	7.292E-003	2.946E-003
Cm-242	6.10	6.07	6.13	4.00	4.167E-003	2.329E-003

SEVERN TRENT **STL**

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 1:00:29PM 6/25/2007

Sample

Sample Name: AV45 Spectrum #1 Analysis #1

Comment:

Batch

Batch Name: June2007

Description:

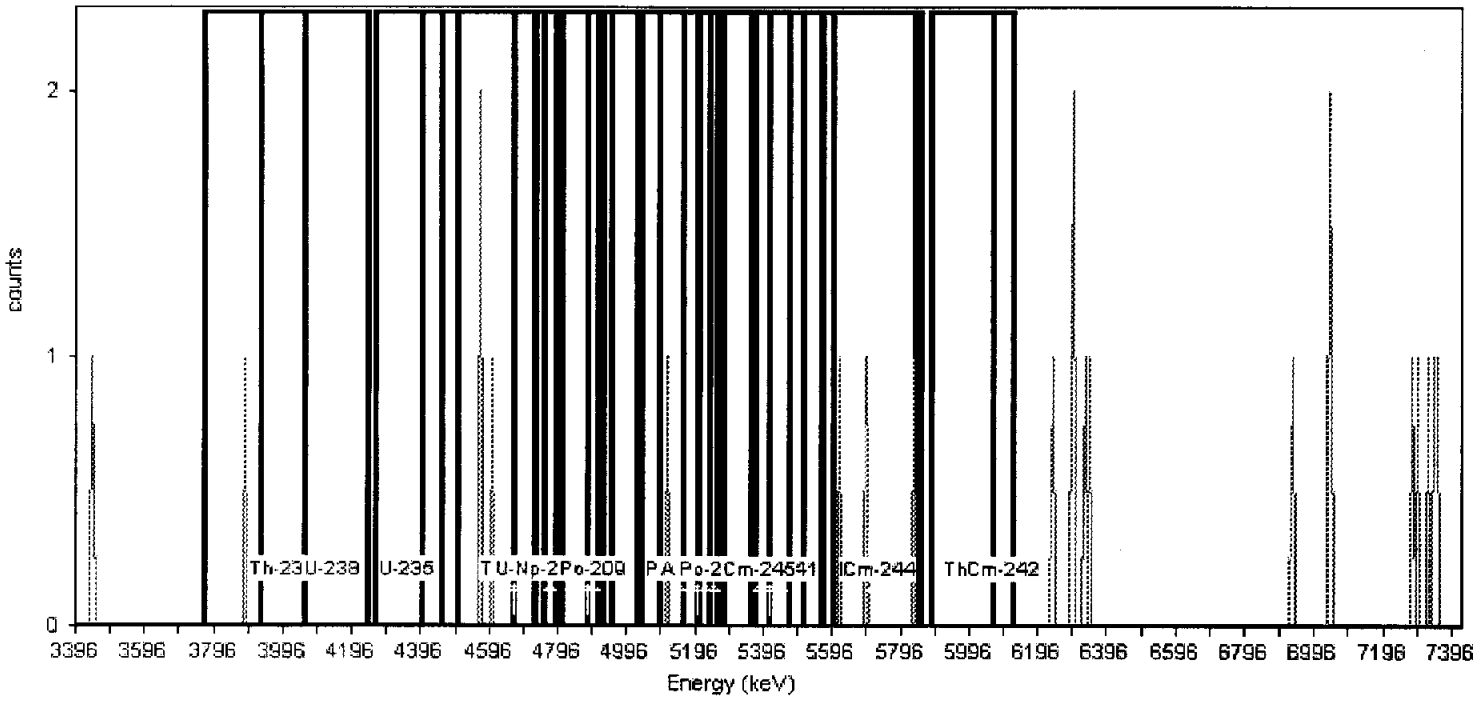
Acquisition

Detector: AV45 , SN: AV45
Acquisition Start Date: 6/24/2007 8:47:32PM
Live Time: 960.00 min.
Real Time: 960.01 min.
Calibration Name: May2007_AV45a
Calibration Date: 6/5/2007 11:47:08AM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.05% +/- 0.29% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI Nuclide Library: Background ROI Library

Total Background Counts: 22.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	1.00	1.042E-003	1.473E-003
U-238	4.14	3.93	4.24	0.00	0.000E+000	1.473E-003
U-235	4.35	4.26	4.46	0.00	0.000E+000	1.473E-003
Th-230	4.67	4.40	4.73	3.00	3.125E-003	2.083E-003
U-234	4.70	4.50	4.80	3.00	3.125E-003	2.083E-003
Pu-242	4.88	4.67	4.93	0.00	0.000E+000	1.473E-003
Th-229	4.84	4.72	5.10	0.00	0.000E+000	1.473E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	1.00	1.042E-003	1.473E-003
Am-243	5.20	5.03	5.28	1.00	1.042E-003	1.473E-003
U-232	5.23	5.04	5.37	1.00	1.042E-003	1.473E-003
Th-228	5.41	5.16	5.47	0.00	0.000E+000	1.473E-003
Po-210	5.25	5.20	5.26	0.00	0.000E+000	1.473E-003
Pu-238	5.44	5.24	5.52	0.00	0.000E+000	1.473E-003
Am-241	5.45	5.27	5.57	0.00	0.000E+000	1.473E-003
Cm-245	5.39	5.36	5.41	0.00	0.000E+000	1.473E-003
Pu-236	5.72	5.57	5.84	3.00	3.125E-003	2.083E-003
Cm-244	5.73	5.60	5.86	3.00	3.125E-003	2.083E-003
Th-227	6.02	5.89	6.13	0.00	0.000E+000	1.473E-003
Cm-242	6.10	6.07	6.13	0.00	0.000E+000	1.473E-003

STL SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
1:00:32PM 6/25/2007

Analyst: 60040

Sample

Sample Name: AV46
Comment:

Spectrum #1 Analysis #1

Batch

Batch Name: June2007
Description:

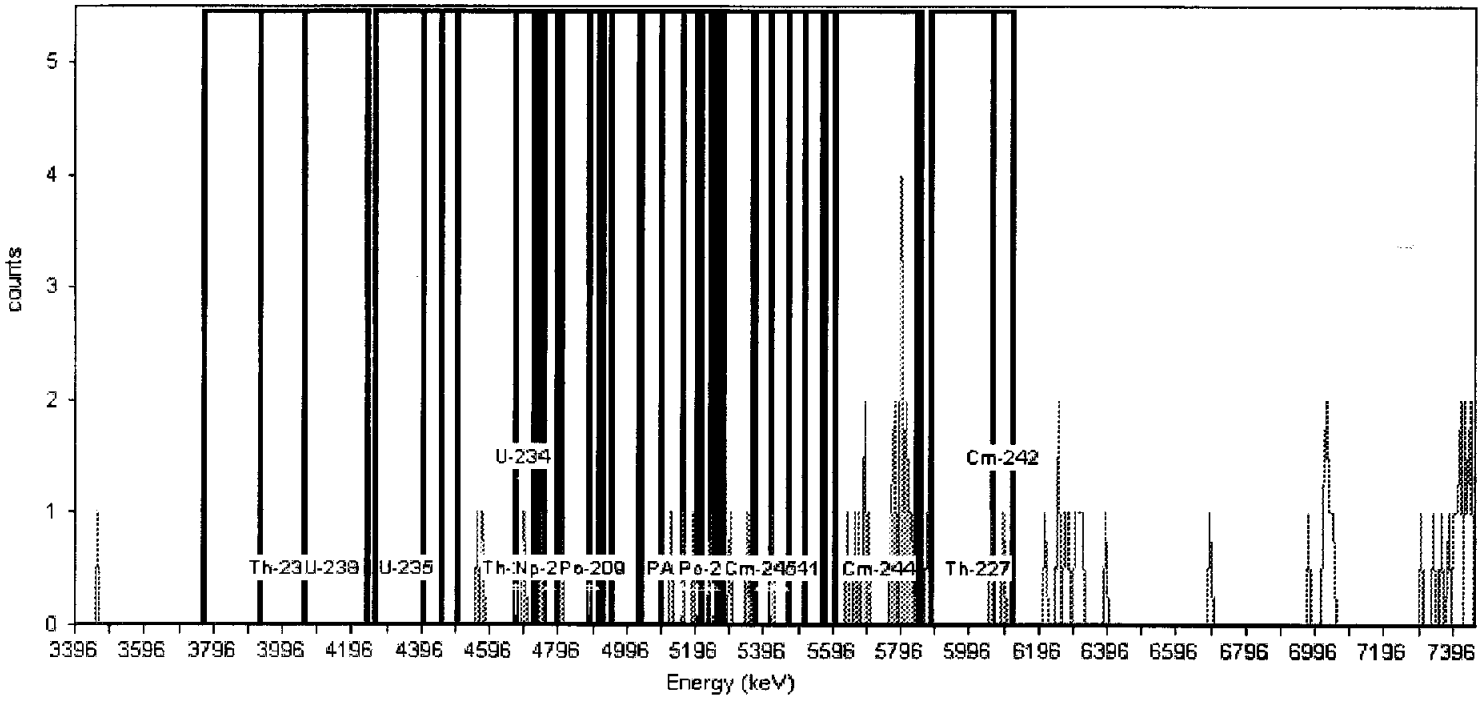
Acquisition

Detector: AV46 , SN: AV46
Acquisition Start Date: 6/24/2007 8:47:33PM
Live Time: 960.00 min.
Real Time: 960.01 min.
Calibration Name: May2007_AV46
Calibration Date: 5/31/2007 5:50:48AM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.26% +/- 0.28% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 66.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	0.00	0.000E+000	1.473E-003
U-238	4.14	3.93	4.24	0.00	0.000E+000	1.473E-003
U-235	4.35	4.26	4.46	0.00	0.000E+000	1.473E-003
Th-230	4.67	4.40	4.73	3.00	3.125E-003	2.083E-003
U-234	4.70	4.50	4.80	5.00	5.208E-003	2.552E-003
Pu-242	4.88	4.67	4.93	3.00	3.125E-003	2.083E-003
Th-229	4.84	4.72	5.10	2.00	2.083E-003	1.804E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	3.00	3.125E-003	2.083E-003
Am-243	5.20	5.03	5.28	4.00	4.167E-003	2.329E-003
U-232	5.23	5.04	5.37	6.00	6.250E-003	2.756E-003
Th-228	5.41	5.16	5.47	6.00	6.250E-003	2.756E-003
Po-210	5.25	5.20	5.26	1.00	1.042E-003	1.473E-003
Pu-238	5.44	5.24	5.52	4.00	4.167E-003	2.329E-003
Am-241	5.45	5.27	5.57	3.00	3.125E-003	2.083E-003
Cm-245	5.39	5.36	5.41	0.00	0.000E+000	1.473E-003
Pu-236	5.72	5.57	5.84	18.00	1.875E-002	4.541E-003
Cm-244	5.73	5.60	5.86	18.00	1.875E-002	4.541E-003
Th-227	6.02	5.89	6.13	2.00	2.083E-003	1.804E-003
Cm-242	6.10	6.07	6.13	1.00	1.042E-003	1.473E-003

STL SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 1:00:36PM 6/25/2007

Sample

Sample Name: AV47 Spectrum #1 Analysis #1

Comment:

Batch

Batch Name: June2007

Description:

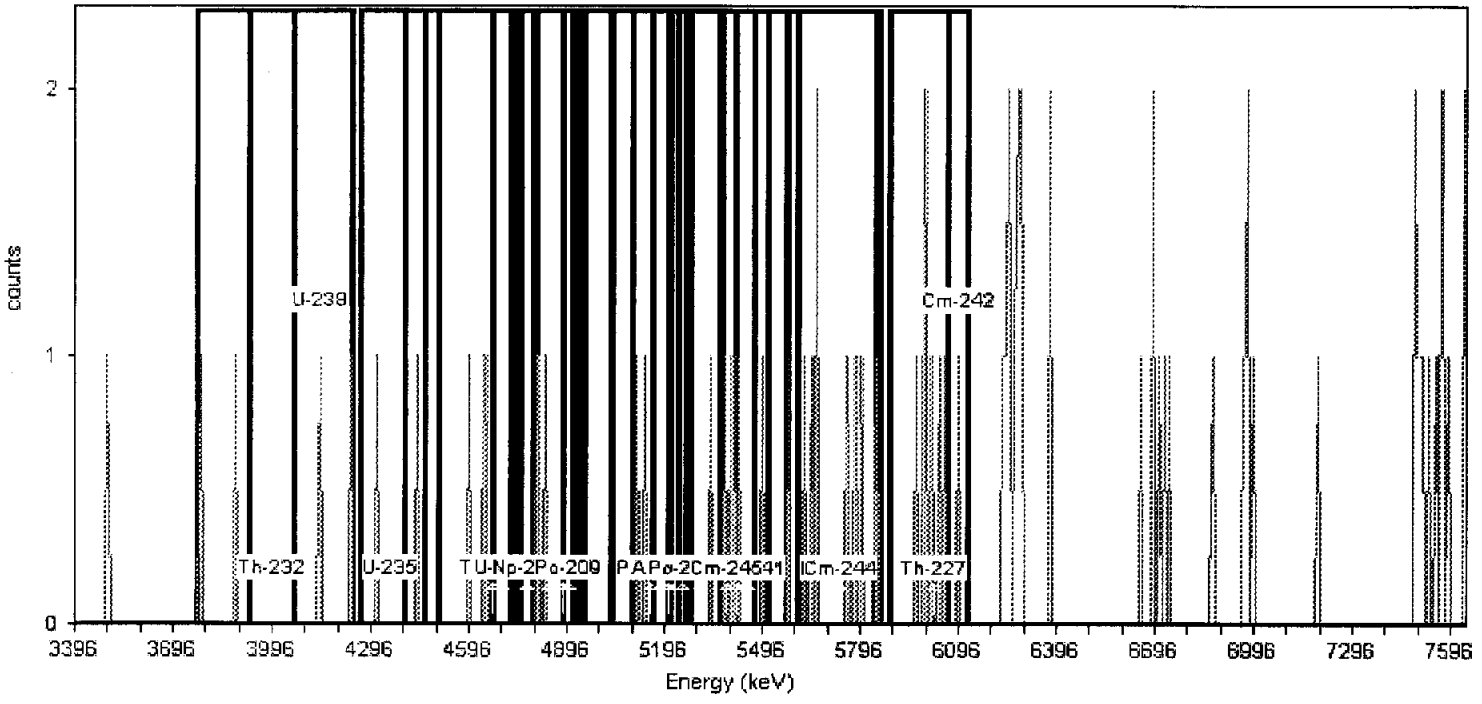
Acquisition

Detector: AV47 , SN: AV47
Acquisition Start Date: 6/24/2007 8:47:35PM
Live Time: 960.00 min.
Real Time: 960.01 min.
Calibration Name: May2007_AV47
Calibration Date: 5/30/2007 7:19:55PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 26.30% +/- 0.26% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI Nuclide Library: Background ROI Library

Total Background Counts: 78.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	2.00	2.083E-003	1.804E-003
U-238	4.14	3.93	4.24	2.00	2.083E-003	1.804E-003
U-235	4.35	4.26	4.46	2.00	2.083E-003	1.804E-003
Th-230	4.67	4.40	4.73	4.00	4.167E-003	2.329E-003
U-234	4.70	4.50	4.80	4.00	4.167E-003	2.329E-003
Pu-242	4.88	4.67	4.93	2.00	2.083E-003	1.804E-003
Th-229	4.84	4.72	5.10	2.00	2.083E-003	1.804E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	2.00	2.083E-003	1.804E-003
Am-243	5.20	5.03	5.28	2.00	2.083E-003	1.804E-003
U-232	5.23	5.04	5.37	3.00	3.125E-003	2.083E-003
Th-228	5.41	5.16	5.47	5.00	5.208E-003	2.552E-003
Po-210	5.25	5.20	5.26	0.00	0.000E+000	1.473E-003
Pu-238	5.44	5.24	5.52	6.00	6.250E-003	2.756E-003
Am-241	5.45	5.27	5.57	6.00	6.250E-003	2.756E-003
Cm-245	5.39	5.36	5.41	3.00	3.125E-003	2.083E-003
Pu-236	5.72	5.57	5.84	10.00	1.042E-002	3.455E-003
Cm-244	5.73	5.60	5.86	9.00	9.375E-003	3.294E-003
Th-227	6.02	5.89	6.13	8.00	8.333E-003	3.125E-003
Cm-242	6.10	6.07	6.13	1.00	1.042E-003	1.473E-003

SEVERN TRENT **STL**

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 1:00:39PM 6/25/2007

Sample

Sample Name: AV48 Spectrum #1 Analysis #1

Comment:

Batch

Batch Name: June2007

Description:

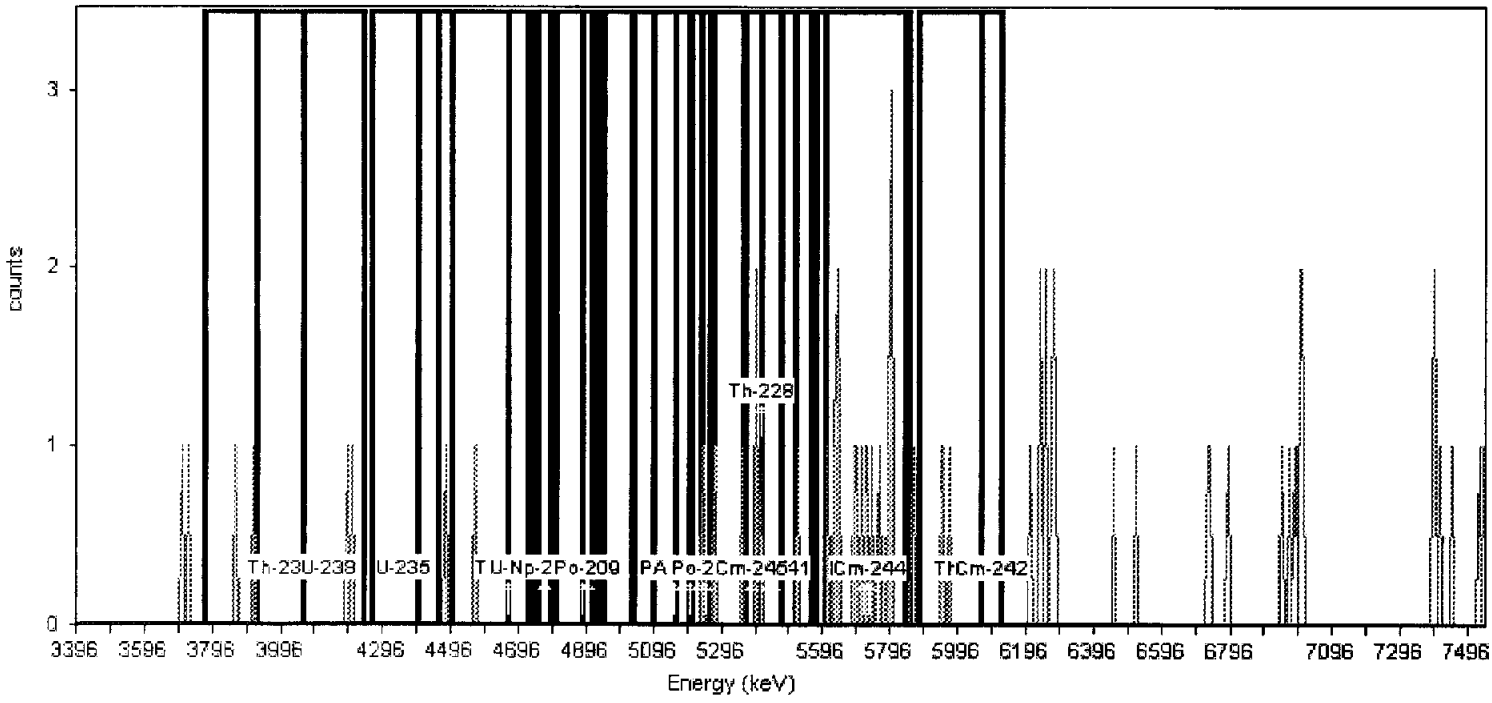
Acquisition

Detector: AV48 , SN: AV48
Acquisition Start Date: 6/24/2007 8:47:37PM
Live Time: 960.00 min.
Real Time: 960.01 min.
Calibration Name: May2007_AV48
Calibration Date: 5/31/2007 5:50:38AM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 26.04% +/- 0.28% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI Nuclide Library: Background ROI Library

Total Background Counts: 60.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	2.00	2.083E-003	1.804E-003
U-238	4.14	3.93	4.24	2.00	2.083E-003	1.804E-003
U-235	4.35	4.26	4.46	0.00	0.000E+000	1.473E-003
Th-230	4.67	4.40	4.73	2.00	2.083E-003	1.804E-003
U-234	4.70	4.50	4.80	1.00	1.042E-003	1.473E-003
Pu-242	4.88	4.67	4.93	0.00	0.000E+000	1.473E-003
Th-229	4.84	4.72	5.10	0.00	0.000E+000	1.473E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	0.00	0.000E+000	1.473E-003
Am-243	5.20	5.03	5.28	2.00	2.083E-003	1.804E-003
U-232	5.23	5.04	5.37	3.00	3.125E-003	2.083E-003
Th-228	5.41	5.16	5.47	6.00	6.250E-003	2.756E-003
Po-210	5.25	5.20	5.26	1.00	1.042E-003	1.473E-003
Pu-238	5.44	5.24	5.52	6.00	6.250E-003	2.756E-003
Am-241	5.45	5.27	5.57	6.00	6.250E-003	2.756E-003
Cm-245	5.39	5.36	5.41	3.00	3.125E-003	2.083E-003
Pu-236	5.72	5.57	5.84	15.00	1.563E-002	4.167E-003
Cm-244	5.73	5.60	5.86	15.00	1.563E-002	4.167E-003
Th-227	6.02	5.89	6.13	2.00	2.083E-003	1.804E-003
Cm-242	6.10	6.07	6.13	0.00	0.000E+000	1.473E-003

STL SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 1:00:42PM 6/25/2007

Sample

Sample Name: AV49 Spectrum #1 Analysis #1

Comment:

Batch

Batch Name: June2007

Description:

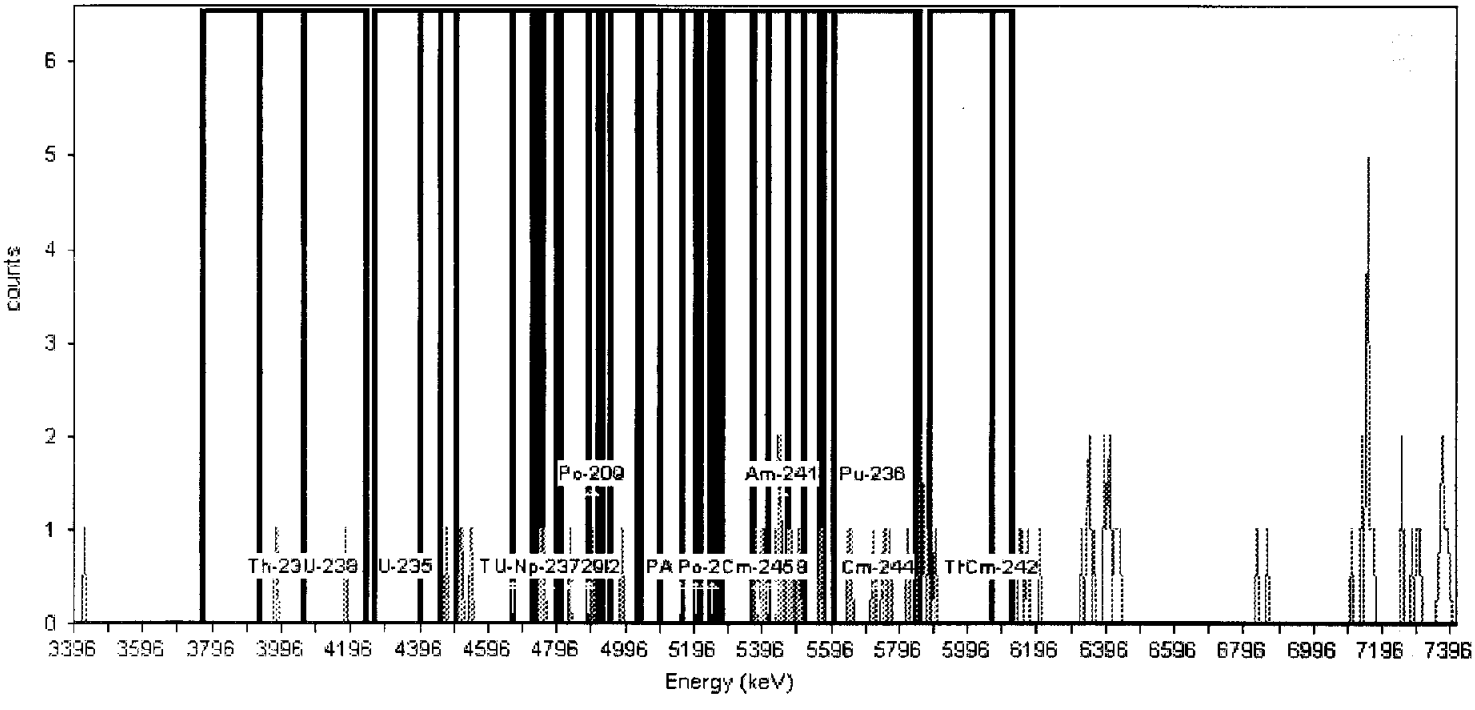
Acquisition

Detector: AV49 , SN: AV49
Acquisition Start Date: 6/24/2007 8:47:38PM
Live Time: 960.00 min.
Real Time: 960.01 min.
Calibration Name: May2007_AV49
Calibration Date: 5/30/2007 7:20:17PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.81% +/- 0.30% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_Background Nuclide Library: Background ROI Library

Total Background Counts: 74.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	1.00	1.042E-003	1.473E-003
U-238	4.14	3.93	4.24	2.00	2.083E-003	1.804E-003
U-235	4.35	4.26	4.46	0.00	0.000E+000	1.473E-003
Th-230	4.67	4.40	4.73	3.00	3.125E-003	2.083E-003
U-234	4.70	4.50	4.80	4.00	4.167E-003	2.329E-003
Pu-242	4.88	4.67	4.93	4.00	4.167E-003	2.329E-003
Th-229	4.84	4.72	5.10	5.00	5.208E-003	2.552E-003
Np-237	4.77	4.75	4.79	1.00	1.042E-003	1.473E-003
Po-209	4.90	4.88	4.91	1.00	1.042E-003	1.473E-003
Pu-239	5.15	4.95	5.21	1.00	1.042E-003	1.473E-003
Am-243	5.20	5.03	5.28	0.00	0.000E+000	1.473E-003
U-232	5.23	5.04	5.37	0.00	0.000E+000	1.473E-003
Th-228	5.41	5.16	5.47	7.00	7.292E-003	2.946E-003
Po-210	5.25	5.20	5.26	0.00	0.000E+000	1.473E-003
Pu-238	5.44	5.24	5.52	9.00	9.375E-003	3.294E-003
Am-241	5.45	5.27	5.57	10.00	1.042E-002	3.455E-003
Cm-245	5.39	5.36	5.41	3.00	3.125E-003	2.083E-003
Pu-236	5.72	5.57	5.84	7.00	7.292E-003	2.946E-003
Cm-244	5.73	5.60	5.86	8.00	8.333E-003	3.125E-003
Th-227	6.02	5.89	6.13	1.00	1.042E-003	1.473E-003
Cm-242	6.10	6.07	6.13	0.00	0.000E+000	1.473E-003

ST SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
1:00:45PM 6/25/2007

Analyst: 60040

Sample

Sample Name: AV50 Spectrum #1 Analysis #1

Comment:

Batch

Batch Name: June2007

Description:

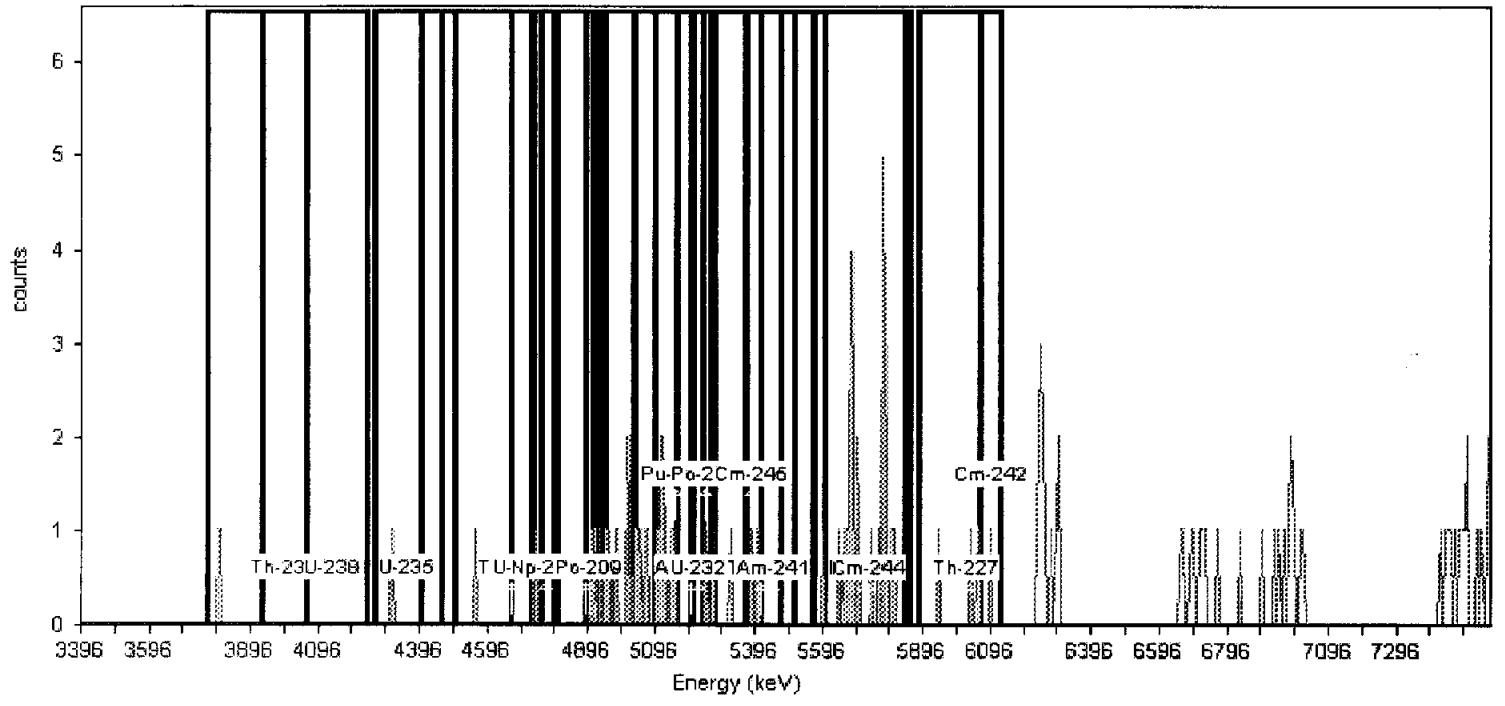
Acquisition

Detector: AV50 , SN: AV50
Acquisition Start Date: 6/24/2007 8:47:41PM
Live Time: 960.00 min.
Real Time: 960.01 min.
Calibration Name: may2007_AV50
Calibration Date: 5/31/2007 11:30:35AM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.28% +/- 0.28% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI Nuclide Library: Background ROI Library

Total Background Counts: 106.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	2.00	2.083E-003	1.804E-003
U-238	4.14	3.93	4.24	0.00	0.000E+000	1.473E-003
U-235	4.35	4.26	4.46	1.00	1.042E-003	1.473E-003
Th-230	4.67	4.40	4.73	1.00	1.042E-003	1.473E-003
U-234	4.70	4.50	4.80	2.00	2.083E-003	1.804E-003
Pu-242	4.88	4.67	4.93	4.00	4.167E-003	2.329E-003
Th-229	4.84	4.72	5.10	14.00	1.458E-002	4.034E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	2.00	2.083E-003	1.804E-003
Pu-239	5.15	4.95	5.21	17.00	1.771E-002	4.419E-003
Am-243	5.20	5.03	5.28	14.00	1.458E-002	4.034E-003
U-232	5.23	5.04	5.37	15.00	1.563E-002	4.167E-003
Th-228	5.41	5.16	5.47	6.00	6.250E-003	2.756E-003
Po-210	5.25	5.20	5.26	1.00	1.042E-003	1.473E-003
Pu-238	5.44	5.24	5.52	6.00	6.250E-003	2.756E-003
Am-241	5.45	5.27	5.57	5.00	5.208E-003	2.552E-003
Cm-245	5.39	5.36	5.41	3.00	3.125E-003	2.083E-003
Pu-236	5.72	5.57	5.84	25.00	2.604E-002	5.311E-003
Cm-244	5.73	5.60	5.86	24.00	2.500E-002	5.208E-003
Th-227	6.02	5.89	6.13	4.00	4.167E-003	2.329E-003
Cm-242	6.10	6.07	6.13	1.00	1.042E-003	1.473E-003

ST SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 1:00:49PM 6/25/2007

Sample

Sample Name: AV51 Spectrum #1 Analysis #1

Comment:

Batch

Batch Name: June2007

Description:

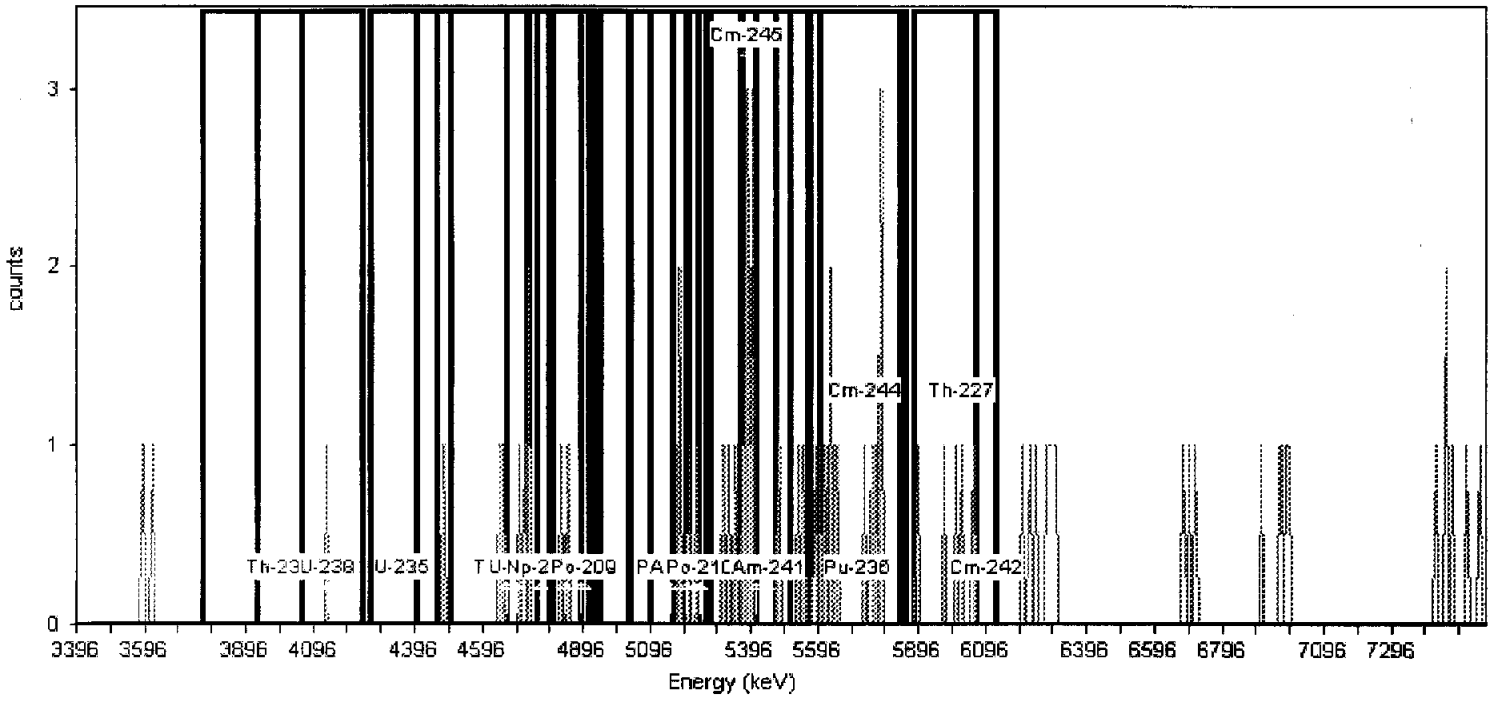
Acquisition

Detector: AV51 , SN:
Acquisition Start Date: 6/24/2007 8:47:43PM
Live Time: 960.00 min.
Real Time: 960.02 min.
Calibration Name: May2007_AV51
Calibration Date: 5/30/2007 9:46:48PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 26.95% +/- 0.27% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_Background ROI Nuclide Library: Background ROI Library

Total Background Counts: 72.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	0.00	0.000E+000	1.473E-003
U-238	4.14	3.93	4.24	1.00	1.042E-003	1.473E-003
U-235	4.35	4.26	4.46	0.00	0.000E+000	1.473E-003
Th-230	4.67	4.40	4.73	7.00	7.292E-003	2.946E-003
U-234	4.70	4.50	4.80	6.00	6.250E-003	2.756E-003
Pu-242	4.88	4.67	4.93	6.00	6.250E-003	2.756E-003
Th-229	4.84	4.72	5.10	4.00	4.167E-003	2.329E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	3.00	3.125E-003	2.083E-003
Am-243	5.20	5.03	5.28	4.00	4.167E-003	2.329E-003
U-232	5.23	5.04	5.37	8.00	8.333E-003	3.125E-003
Th-228	5.41	5.16	5.47	16.00	1.667E-002	4.295E-003
Po-210	5.25	5.20	5.26	2.00	2.083E-003	1.804E-003
Pu-238	5.44	5.24	5.52	13.00	1.354E-002	3.898E-003
Am-241	5.45	5.27	5.57	15.00	1.563E-002	4.167E-003
Cm-245	5.39	5.36	5.41	9.00	9.375E-003	3.294E-003
Pu-236	5.72	5.57	5.84	14.00	1.458E-002	4.034E-003
Cm-244	5.73	5.60	5.86	13.00	1.354E-002	3.898E-003
Th-227	6.02	5.89	6.13	5.00	5.208E-003	2.552E-003
Cm-242	6.10	6.07	6.13	0.00	0.000E+000	1.473E-003

SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
1:00:52PM 6/25/2007

Analyst: 60040

Sample

Sample Name: AV52
Comment:

Spectrum #1 Analysis #1

Batch

Batch Name: June2007
Description:

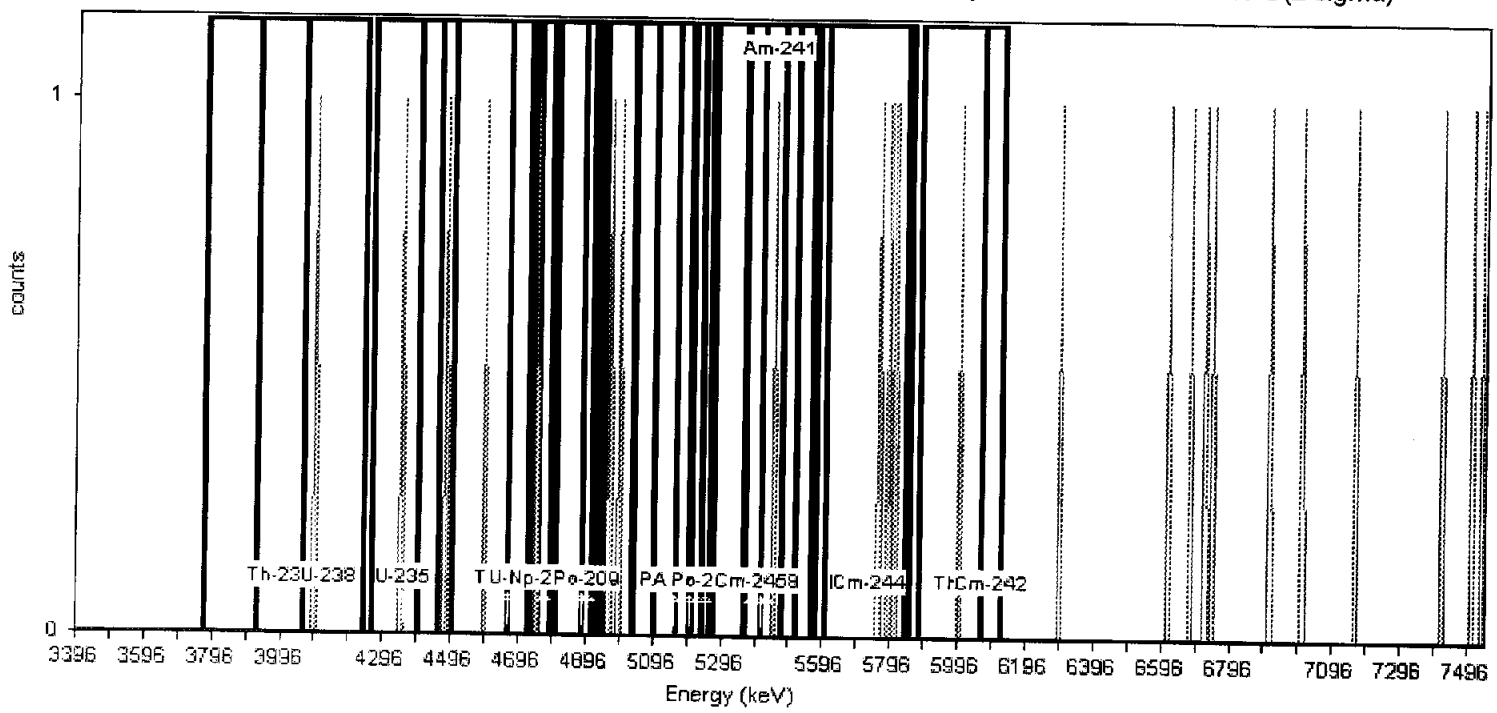
Acquisition

Detector: AV52 , SN:
Acquisition Start Date: 6/24/2007 8:47:45PM
Live Time: 960.00 min.
Real Time: 960.02 min.
Calibration Name: May2007_AV52a
Calibration Date: 5/10/2007 5:28:33PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch²

Efficiency: 27.47% +/- 0.28% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_Background Nuclide Library: Background ROI Library
Total Background Counts: 24.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	0.00	0.000E+000	1.473E-003
U-238	4.14	3.93	4.24	1.00	1.042E-003	1.473E-003
U-235	4.35	4.26	4.46	1.00	1.042E-003	1.473E-003
Th-230	4.67	4.40	4.73	2.00	2.083E-003	1.804E-003
U-234	4.70	4.50	4.80	2.00	2.083E-003	1.804E-003
Pu-242	4.88	4.67	4.93	1.00	1.042E-003	1.473E-003
Th-229	4.84	4.72	5.10	3.00	3.125E-003	2.083E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	2.00	2.083E-003	1.804E-003
Am-243	5.20	5.03	5.28	0.00	0.000E+000	1.473E-003
U-232	5.23	5.04	5.37	0.00	0.000E+000	1.473E-003
Th-228	5.41	5.16	5.47	1.00	1.042E-003	1.473E-003
Po-210	5.25	5.20	5.26	0.00	0.000E+000	1.473E-003
Pu-238	5.44	5.24	5.52	1.00	1.042E-003	1.473E-003
Am-241	5.45	5.27	5.57	1.00	1.042E-003	1.473E-003
Cm-245	5.39	5.36	5.41	0.00	0.000E+000	1.473E-003
Pu-236	5.72	5.57	5.84	4.00	4.167E-003	2.329E-003
Cm-244	5.73	5.60	5.86	4.00	4.167E-003	2.329E-003
Th-227	6.02	5.89	6.13	1.00	1.042E-003	1.473E-003
Cm-242	6.10	6.07	6.13	0.00	0.000E+000	1.473E-003

SEVERN TRENT **STL**

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 1:00:55PM 6/25/2007

Sample

Sample Name: AV53 Spectrum #1 Analysis #1

Comment:

Batch

Batch Name: June2007

Description:

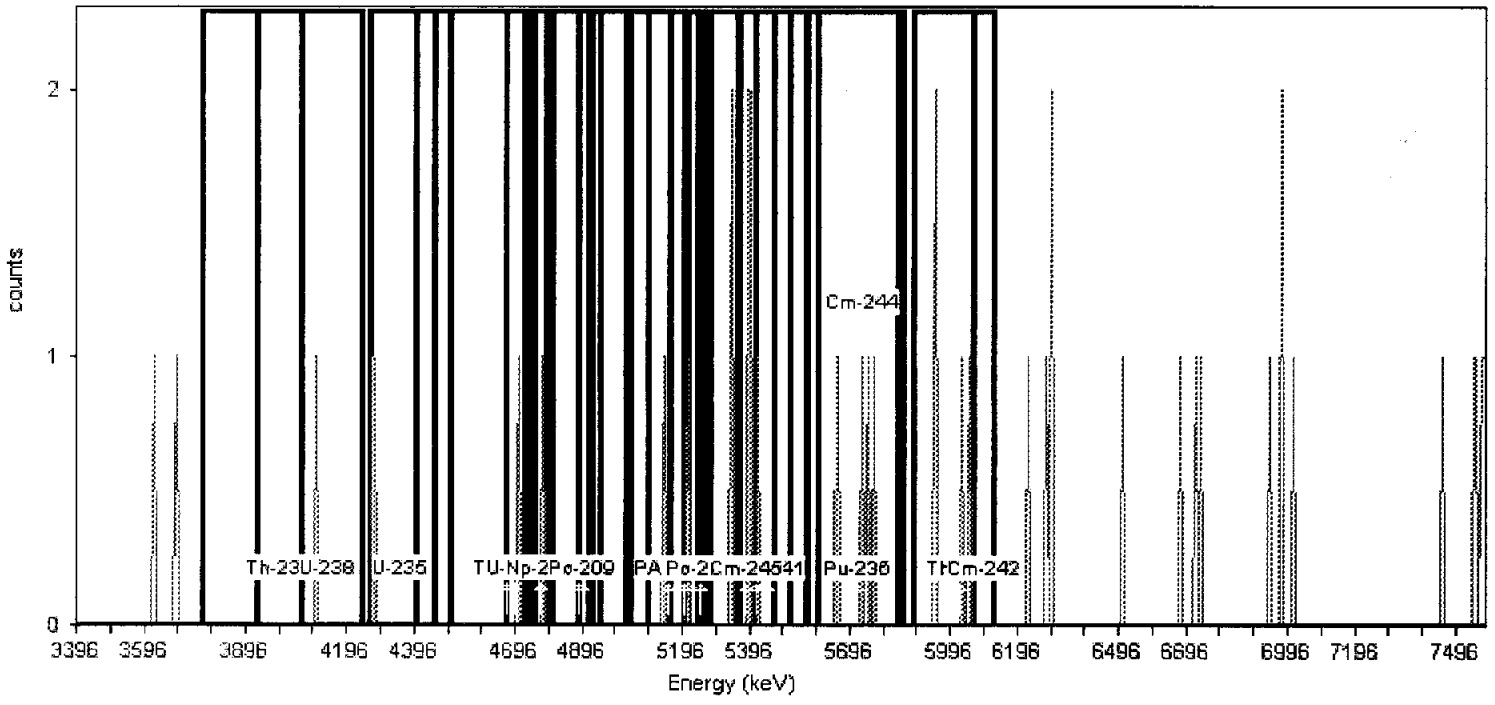
Acquisition

Detector: AV53 , SN:
Acquisition Start Date: 6/24/2007 8:47:47PM
Live Time: 960.00 min.
Real Time: 960.02 min.
Calibration Name: May2007_AV53
Calibration Date: 5/30/2007 9:47:14PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.57% +/- 0.30% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI Nuclide Library: Background ROI Library

Total Background Counts: 42.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	0.00	0.000E+000	1.473E-003
U-238	4.14	3.93	4.24	1.00	1.042E-003	1.473E-003
U-235	4.35	4.26	4.46	2.00	2.083E-003	1.804E-003
Th-230	4.67	4.40	4.73	1.00	1.042E-003	1.473E-003
U-234	4.70	4.50	4.80	2.00	2.083E-003	1.804E-003
Pu-242	4.88	4.67	4.93	2.00	2.083E-003	1.804E-003
Th-229	4.84	4.72	5.10	1.00	1.042E-003	1.473E-003
Np-237	4.77	4.75	4.79	1.00	1.042E-003	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	2.00	2.083E-003	1.804E-003
Am-243	5.20	5.03	5.28	2.00	2.083E-003	1.804E-003
U-232	5.23	5.04	5.37	4.00	4.167E-003	2.329E-003
Th-228	5.41	5.16	5.47	8.00	8.333E-003	3.125E-003
Po-210	5.25	5.20	5.26	1.00	1.042E-003	1.473E-003
Pu-238	5.44	5.24	5.52	7.00	7.292E-003	2.946E-003
Am-241	5.45	5.27	5.57	7.00	7.292E-003	2.946E-003
Cm-245	5.39	5.36	5.41	4.00	4.167E-003	2.329E-003
Pu-236	5.72	5.57	5.84	5.00	5.208E-003	2.552E-003
Cm-244	5.73	5.60	5.86	5.00	5.208E-003	2.552E-003
Th-227	6.02	5.89	6.13	4.00	4.167E-003	2.329E-003
Cm-242	6.10	6.07	6.13	0.00	0.000E+000	1.473E-003

STL SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
1:00:58PM 6/25/2007

Analyst: 60040

Sample

Sample Name: AV54 Spectrum #1 Analysis #1

Comment:

Batch

Batch Name: June2007

Description:

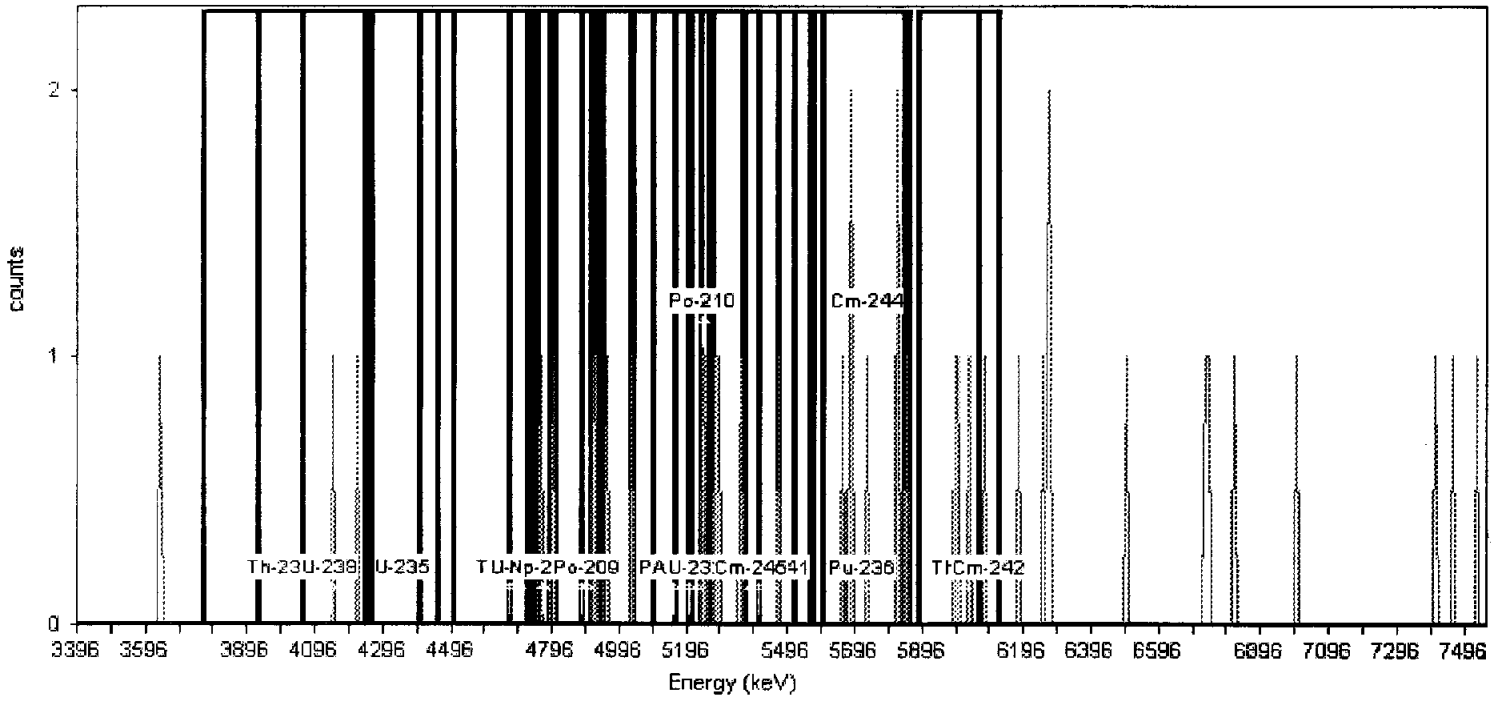
Acquisition

Detector: AV54 , SN:
Acquisition Start Date: 6/24/2007 8:47:48PM
Live Time: 960.00 min.
Real Time: 960.02 min.
Calibration Name: May2007_AV54
Calibration Date: 5/31/2007 1:56:02PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 26.62% +/- 0.27% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI Nuclide Library: Background ROI Library

Total Background Counts: 40.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	0.00	0.000E+000	1.473E-003
U-238	4.14	3.93	4.24	2.00	2.083E-003	1.804E-003
U-235	4.35	4.26	4.46	0.00	0.000E+000	1.473E-003
Th-230	4.67	4.40	4.73	0.00	0.000E+000	1.473E-003
U-234	4.70	4.50	4.80	2.00	2.083E-003	1.804E-003
Pu-242	4.88	4.67	4.93	3.00	3.125E-003	2.083E-003
Th-229	4.84	4.72	5.10	5.00	5.208E-003	2.552E-003
Np-237	4.77	4.75	4.79	1.00	1.042E-003	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	2.00	2.083E-003	1.804E-003
Am-243	5.20	5.03	5.28	2.00	2.083E-003	1.804E-003
U-232	5.23	5.04	5.37	4.00	4.167E-003	2.329E-003
Th-228	5.41	5.16	5.47	5.00	5.208E-003	2.552E-003
Po-210	5.25	5.20	5.26	1.00	1.042E-003	1.473E-003
Pu-238	5.44	5.24	5.52	5.00	5.208E-003	2.552E-003
Am-241	5.45	5.27	5.57	4.00	4.167E-003	2.329E-003
Cm-245	5.39	5.36	5.41	0.00	0.000E+000	1.473E-003
Pu-236	5.72	5.57	5.84	8.00	8.333E-003	3.125E-003
Cm-244	5.73	5.60	5.86	9.00	9.375E-003	3.294E-003
Th-227	6.02	5.89	6.13	4.00	4.167E-003	2.329E-003
Cm-242	6.10	6.07	6.13	1.00	1.042E-003	1.473E-003

ST SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
1:01:05PM 6/25/2007

Analyst: 60040

Sample

Sample Name: AV55
Comment:

Spectrum #1 Analysis #1

Batch

Batch Name: June2007
Description:

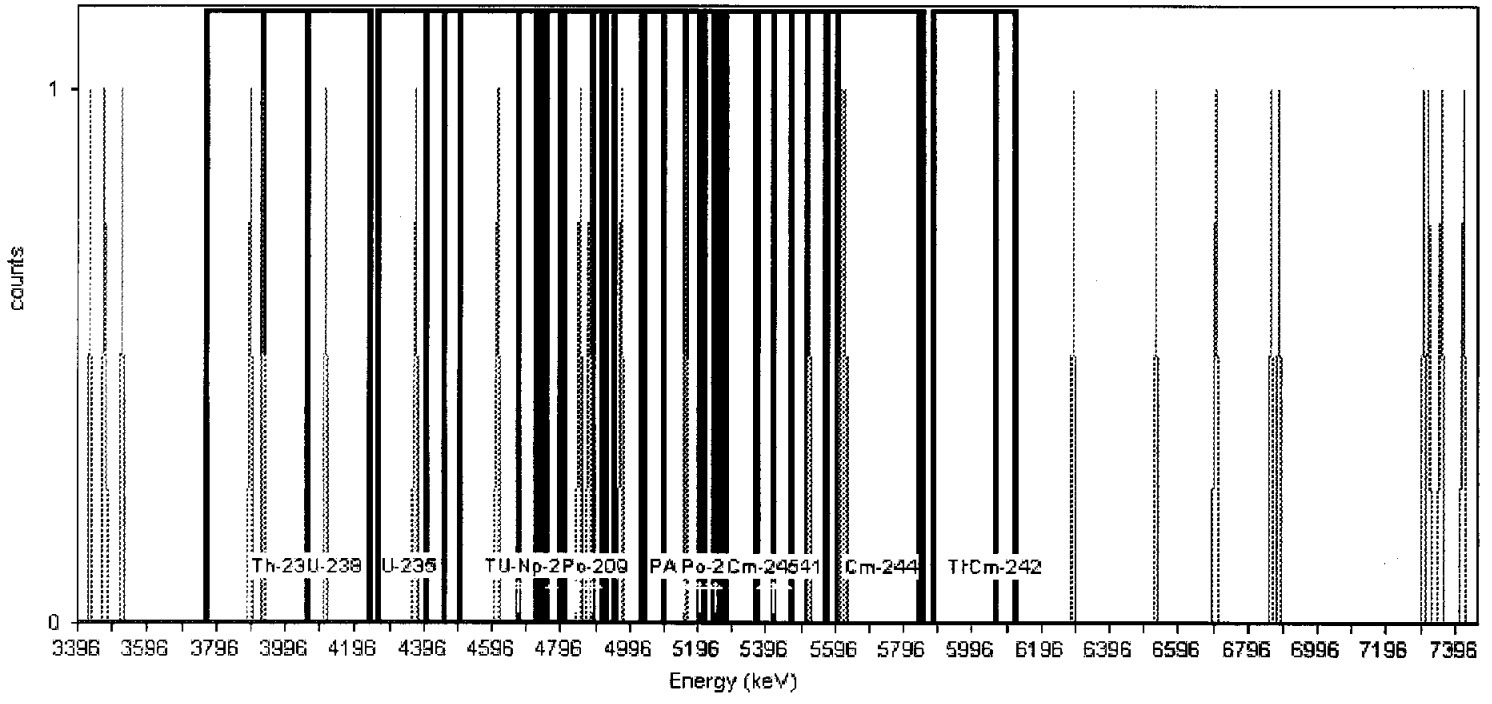
Acquisition

Detector: AV55 , SN:
Acquisition Start Date: 6/24/2007 8:47:50PM
Live Time: 960.00 min.
Real Time: 960.02 min.
Calibration Name: May2007_AV55
Calibration Date: 5/10/2007 5:31:35PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 26.95% +/- 0.27% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI Nuclide Library: Background ROI Library
Total Background Counts: 24.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	2.00	2.083E-003	1.804E-003
U-238	4.14	3.93	4.24	2.00	2.083E-003	1.804E-003
U-235	4.35	4.26	4.46	1.00	1.042E-003	1.473E-003
Th-230	4.67	4.40	4.73	1.00	1.042E-003	1.473E-003
U-234	4.70	4.50	4.80	1.00	1.042E-003	1.473E-003
Pu-242	4.88	4.67	4.93	2.00	2.083E-003	1.804E-003
Th-229	4.84	4.72	5.10	3.00	3.125E-003	2.083E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	2.00	2.083E-003	1.804E-003
Am-243	5.20	5.03	5.28	1.00	1.042E-003	1.473E-003
U-232	5.23	5.04	5.37	1.00	1.042E-003	1.473E-003
Th-228	5.41	5.16	5.47	1.00	1.042E-003	1.473E-003
Po-210	5.25	5.20	5.26	0.00	0.000E+000	1.473E-003
Pu-238	5.44	5.24	5.52	0.00	0.000E+000	1.473E-003
Am-241	5.45	5.27	5.57	1.00	1.042E-003	1.473E-003
Cm-245	5.39	5.36	5.41	0.00	0.000E+000	1.473E-003
Pu-236	5.72	5.57	5.84	2.00	2.083E-003	1.804E-003
Cm-244	5.73	5.60	5.86	2.00	2.083E-003	1.804E-003
Th-227	6.02	5.89	6.13	0.00	0.000E+000	1.473E-003
Cm-242	6.10	6.07	6.13	0.00	0.000E+000	1.473E-003

SEVERN TRENT **STL**

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 1:01:02PM 6/25/2007

Sample

Sample Name: AV56 Spectrum #1 Analysis #1

Comment:

Batch

Batch Name: June2007

Description:

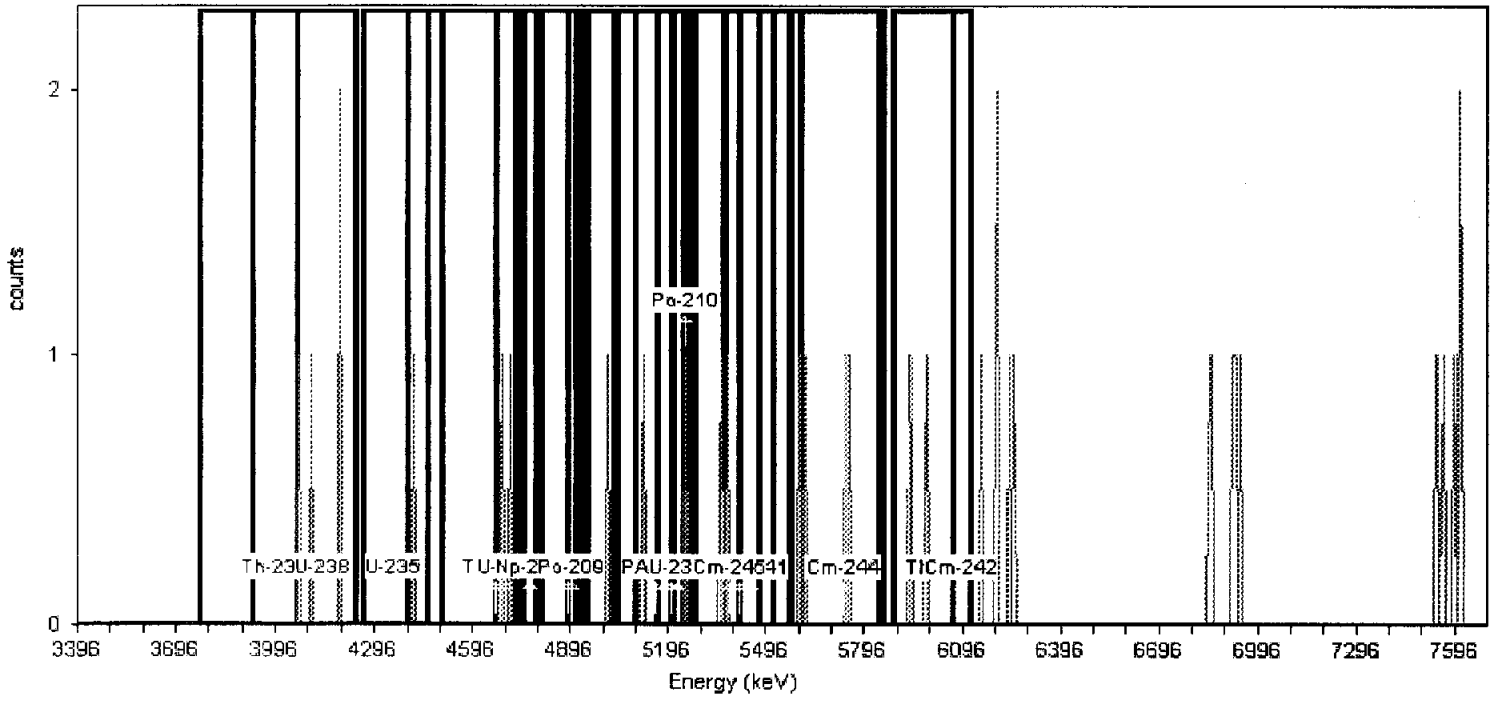
Acquisition

Detector: AV56 , SN:
Acquisition Start Date: 6/24/2007 8:47:52PM
Live Time: 960.00 min.
Real Time: 960.02 min.
Calibration Name: May2007_AV56
Calibration Date: 5/31/2007 11:30:45AM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 25.81% +/- 0.27% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI Nuclide Library: Background ROI Library

Total Background Counts: 36.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	0.00	0.000E+000	1.473E-003
U-238	4.14	3.93	4.24	4.00	4.167E-003	2.329E-003
U-235	4.35	4.26	4.46	1.00	1.042E-003	1.473E-003
Th-230	4.67	4.40	4.73	3.00	3.125E-003	2.083E-003
U-234	4.70	4.50	4.80	2.00	2.083E-003	1.804E-003
Pu-242	4.88	4.67	4.93	2.00	2.083E-003	1.804E-003
Th-229	4.84	4.72	5.10	1.00	1.042E-003	1.473E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	2.00	2.083E-003	1.804E-003
Am-243	5.20	5.03	5.28	2.00	2.083E-003	1.804E-003
U-232	5.23	5.04	5.37	3.00	3.125E-003	2.083E-003
Th-228	5.41	5.16	5.47	3.00	3.125E-003	2.083E-003
Po-210	5.25	5.20	5.26	1.00	1.042E-003	1.473E-003
Pu-238	5.44	5.24	5.52	3.00	3.125E-003	2.083E-003
Am-241	5.45	5.27	5.57	2.00	2.083E-003	1.804E-003
Cm-245	5.39	5.36	5.41	1.00	1.042E-003	1.473E-003
Pu-236	5.72	5.57	5.84	4.00	4.167E-003	2.329E-003
Cm-244	5.73	5.60	5.86	3.00	3.125E-003	2.083E-003
Th-227	6.02	5.89	6.13	2.00	2.083E-003	1.804E-003
Cm-242	6.10	6.07	6.13	0.00	0.000E+000	1.473E-003

ST SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
1:01:08PM 6/25/2007

Analyst: 60040

Sample

Sample Name: AV57

Spectrum #1 Analysis #1

Comment:

Batch

Batch Name: June2007

Description:

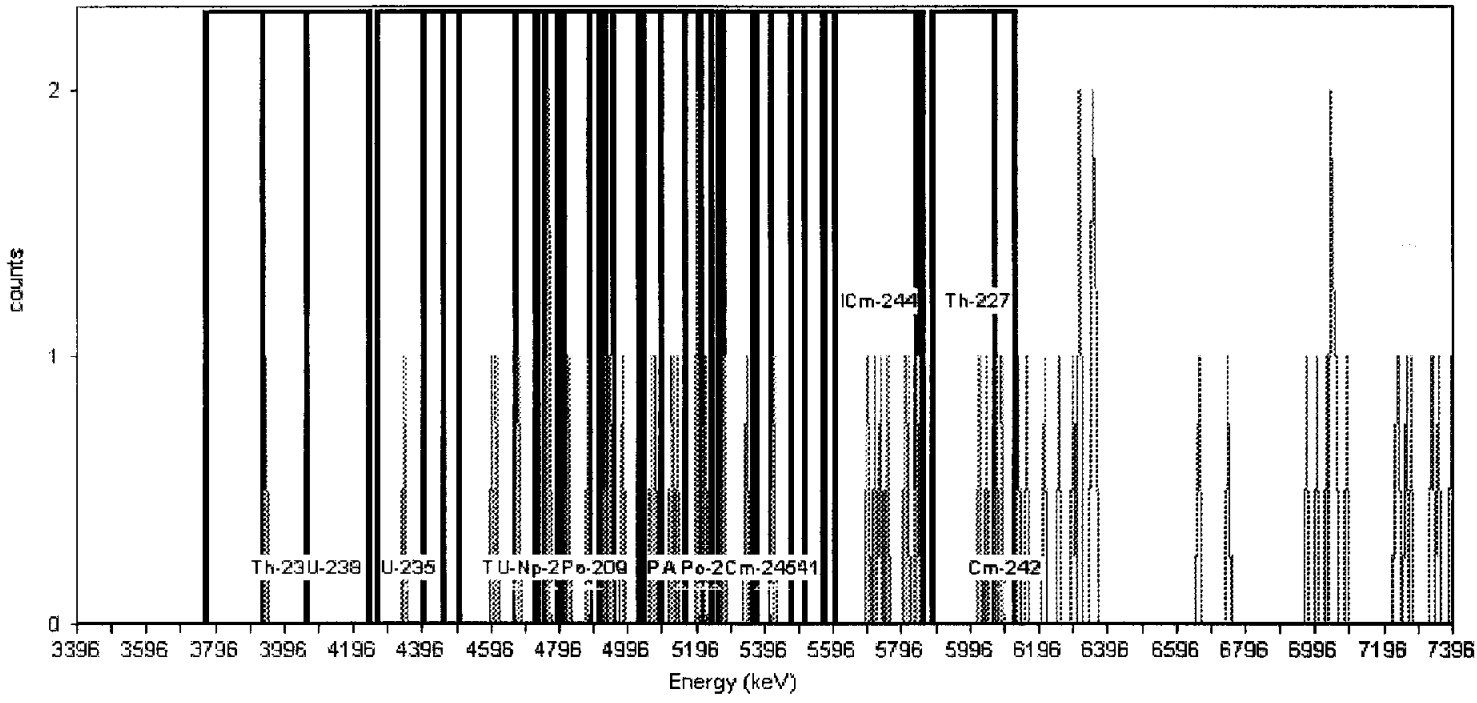
Acquisition

Detector: AV57 , SN:
Acquisition Start Date: 6/24/2007 8:47:54PM
Live Time: 960.00 min.
Real Time: 960.02 min.
Calibration Name: May2007_AV57
Calibration Date: 5/31/2007 5:50:44AM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.18% +/- 0.29% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI

Nuclide Library: Background ROI Library

Total Background Counts: 64.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	1.00	1.042E-003	1.473E-003
U-238	4.14	3.93	4.24	1.00	1.042E-003	1.473E-003
U-235	4.35	4.26	4.46	1.00	1.042E-003	1.473E-003
Th-230	4.67	4.40	4.73	3.00	3.125E-003	2.083E-003
U-234	4.70	4.50	4.80	5.00	5.208E-003	2.552E-003
Pu-242	4.88	4.67	4.93	6.00	6.250E-003	2.756E-003
Th-229	4.84	4.72	5.10	9.00	9.375E-003	3.294E-003
Np-237	4.77	4.75	4.79	2.00	2.083E-003	1.804E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	7.00	7.292E-003	2.946E-003
Am-243	5.20	5.03	5.28	8.00	8.333E-003	3.125E-003
U-232	5.23	5.04	5.37	9.00	9.375E-003	3.294E-003
Th-228	5.41	5.16	5.47	6.00	6.250E-003	2.756E-003
Po-210	5.25	5.20	5.26	1.00	1.042E-003	1.473E-003
Pu-238	5.44	5.24	5.52	3.00	3.125E-003	2.083E-003
Am-241	5.45	5.27	5.57	3.00	3.125E-003	2.083E-003
Cm-245	5.39	5.36	5.41	0.00	0.000E+000	1.473E-003
Pu-236	5.72	5.57	5.84	7.00	7.292E-003	2.946E-003
Cm-244	5.73	5.60	5.86	7.00	7.292E-003	2.946E-003
Th-227	6.02	5.89	6.13	4.00	4.167E-003	2.329E-003
Cm-242	6.10	6.07	6.13	2.00	2.083E-003	1.804E-003

ST SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
1:01:11PM 6/25/2007

Analyst: 60040

Sample

Sample Name: AV58 Spectrum #1 Analysis #1

Comment:

Batch

Batch Name: June2007

Description:

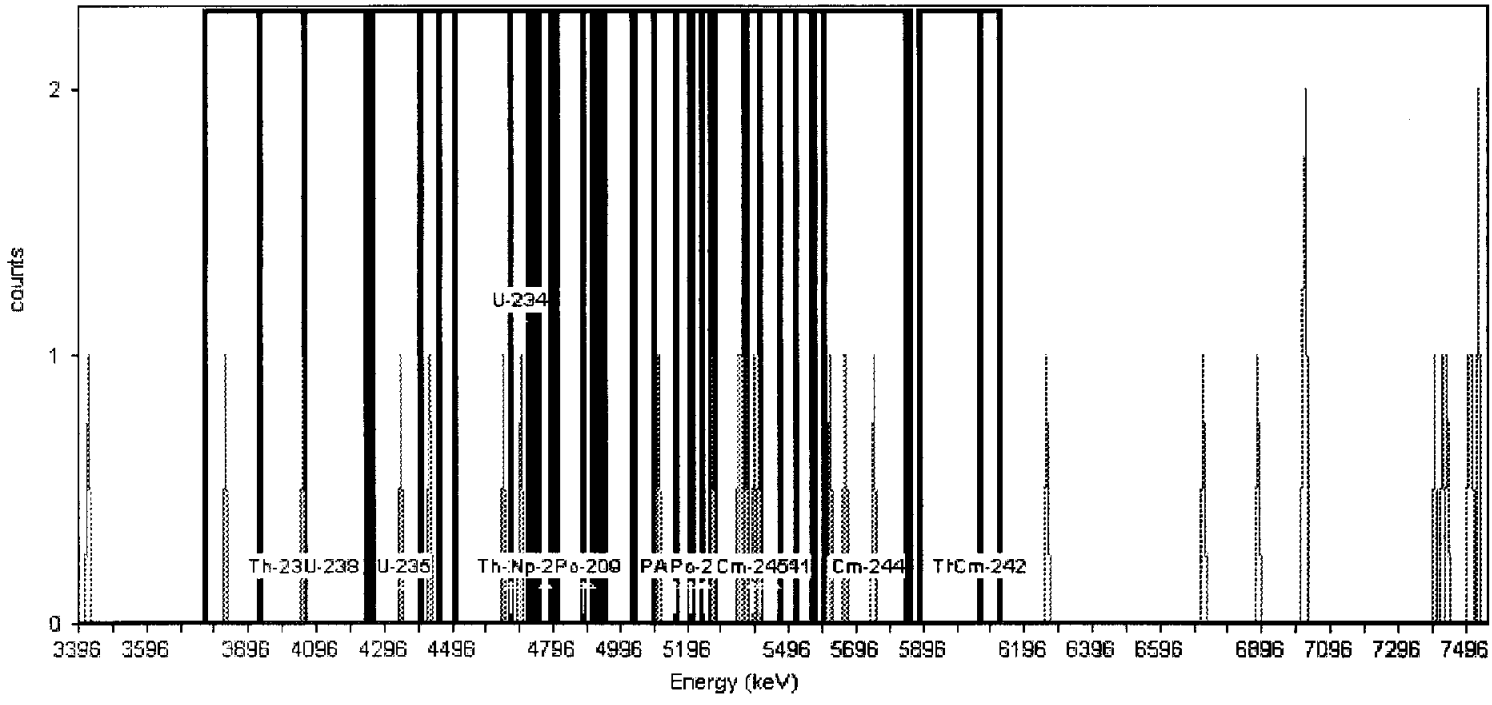
Acquisition

Detector: AV58 , SN:
Acquisition Start Date: 6/24/2007 8:47:56PM
Live Time: 960.00 min.
Real Time: 960.02 min.
Calibration Name: May2007_AV58
Calibration Date: 5/31/2007 4:34:25PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.38% +/- 0.28% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI Nuclide Library: Background ROI Library

Total Background Counts: 31.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	2.00	2.083E-003	1.804E-003
U-238	4.14	3.93	4.24	1.00	1.042E-003	1.473E-003
U-235	4.35	4.26	4.46	2.00	2.083E-003	1.804E-003
Th-230	4.67	4.40	4.73	3.00	3.125E-003	2.083E-003
U-234	4.70	4.50	4.80	2.00	2.083E-003	1.804E-003
Pu-242	4.88	4.67	4.93	1.00	1.042E-003	1.473E-003
Th-229	4.84	4.72	5.10	0.00	0.000E+000	1.473E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	1.00	1.042E-003	1.473E-003
Am-243	5.20	5.03	5.28	2.00	2.083E-003	1.804E-003
U-232	5.23	5.04	5.37	5.00	5.208E-003	2.552E-003
Th-228	5.41	5.16	5.47	6.00	6.250E-003	2.756E-003
Po-210	5.25	5.20	5.26	0.00	0.000E+000	1.473E-003
Pu-238	5.44	5.24	5.52	6.00	6.250E-003	2.756E-003
Am-241	5.45	5.27	5.57	6.00	6.250E-003	2.756E-003
Cm-245	5.39	5.36	5.41	3.00	3.125E-003	2.083E-003
Pu-236	5.72	5.57	5.84	4.00	4.167E-003	2.329E-003
Cm-244	5.73	5.60	5.86	4.00	4.167E-003	2.329E-003
Th-227	6.02	5.89	6.13	0.00	0.000E+000	1.473E-003
Cm-242	6.10	6.07	6.13	0.00	0.000E+000	1.473E-003

ST

SEVERN TRENT **STL**

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 1:01:14PM 6/25/2007

Sample

Sample Name: AV59 Spectrum #1 Analysis #1

Comment:

Batch

Batch Name: June2007

Description:

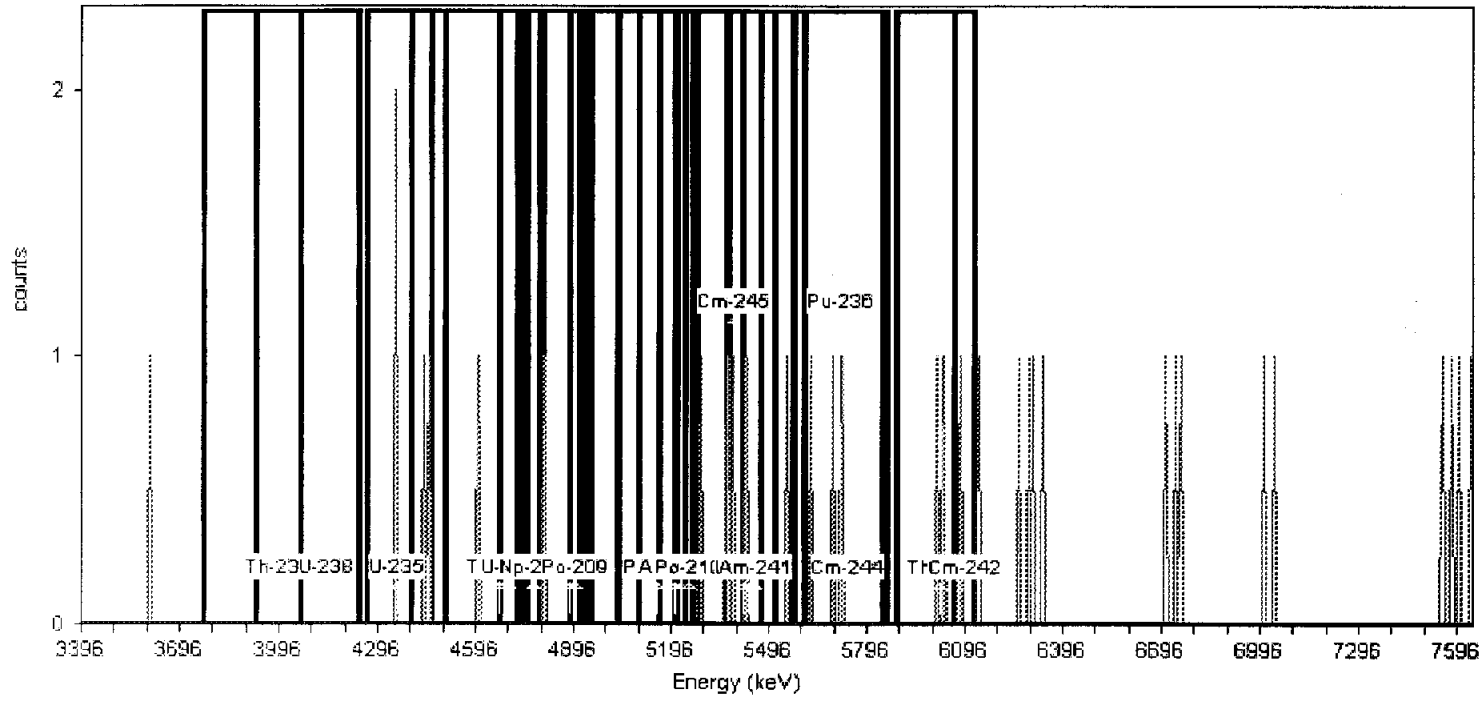
Acquisition

Detector: AV59 , SN:
Acquisition Start Date: 6/24/2007 8:47:57PM
Live Time: 960.00 min.
Real Time: 960.09 min.
Calibration Name: May2007_AV59
Calibration Date: 5/31/2007 5:50:53AM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.00% +/- 0.27% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI Nuclide Library: Background ROI Library

Total Background Counts: 34.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	0.00	0.000E+000	1.473E-003
U-238	4.14	3.93	4.24	0.00	0.000E+000	1.473E-003
U-235	4.35	4.26	4.46	4.00	4.167E-003	2.329E-003
Th-230	4.67	4.40	4.73	3.00	3.125E-003	2.083E-003
U-234	4.70	4.50	4.80	2.00	2.083E-003	1.804E-003
Pu-242	4.88	4.67	4.93	1.00	1.042E-003	1.473E-003
Th-229	4.84	4.72	5.10	1.00	1.042E-003	1.473E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	0.00	0.000E+000	1.473E-003
Am-243	5.20	5.03	5.28	0.00	0.000E+000	1.473E-003
U-232	5.23	5.04	5.37	3.00	3.125E-003	2.083E-003
Th-228	5.41	5.16	5.47	6.00	6.250E-003	2.756E-003
Po-210	5.25	5.20	5.26	0.00	0.000E+000	1.473E-003
Pu-238	5.44	5.24	5.52	6.00	6.250E-003	2.756E-003
Am-241	5.45	5.27	5.57	7.00	7.292E-003	2.946E-003
Cm-245	5.39	5.36	5.41	3.00	3.125E-003	2.083E-003
Pu-236	5.72	5.57	5.84	3.00	3.125E-003	2.083E-003
Cm-244	5.73	5.60	5.86	3.00	3.125E-003	2.083E-003
Th-227	6.02	5.89	6.13	3.00	3.125E-003	2.083E-003
Cm-242	6.10	6.07	6.13	1.00	1.042E-003	1.473E-003

ST SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
1:01:18PM 6/25/2007

Analyst: 60040

Sample

Sample Name: AV60
Comment:

Spectrum #1 Analysis #1

Batch

Batch Name: June2007
Description:

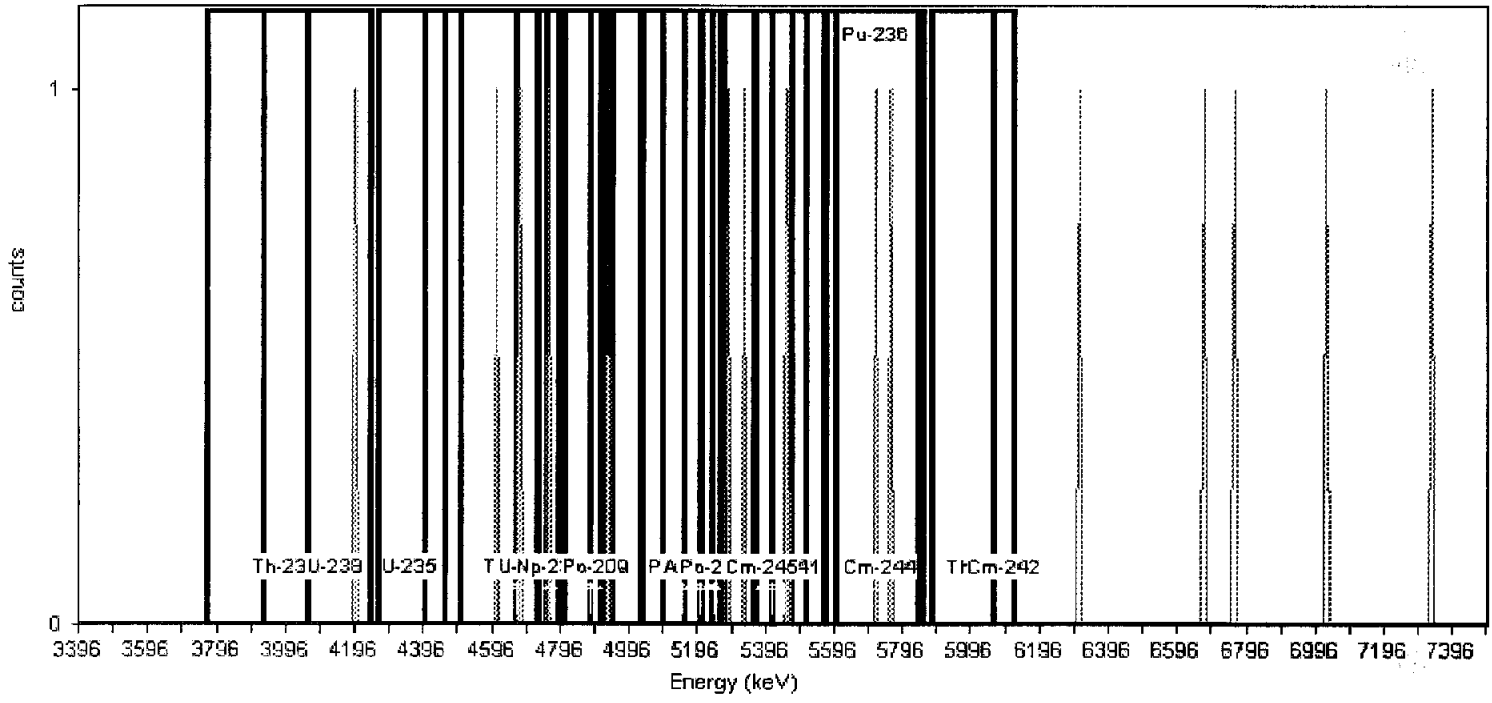
Acquisition

Detector: AV60 , SN:
Acquisition Start Date: 6/24/2007 8:47:59PM
Live Time: 960.00 min.
Real Time: 960.09 min.
Calibration Name: May2007_AV60a
Calibration Date: 6/5/2007 11:47:17AM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch²

Efficiency: 25.89% +/- 0.28% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 15.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	0.00	0.000E+000	1.473E-003
U-238	4.14	3.93	4.24	1.00	1.042E-003	1.473E-003
U-235	4.35	4.26	4.46	0.00	0.000E+000	1.473E-003
Th-230	4.67	4.40	4.73	2.00	2.083E-003	1.804E-003
U-234	4.70	4.50	4.80	3.00	3.125E-003	2.083E-003
Pu-242	4.88	4.67	4.93	2.00	2.083E-003	1.804E-003
Th-229	4.84	4.72	5.10	2.00	2.083E-003	1.804E-003
Np-237	4.77	4.75	4.79	1.00	1.042E-003	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	0.00	0.000E+000	1.473E-003
Am-243	5.20	5.03	5.28	0.00	0.000E+000	1.473E-003
U-232	5.23	5.04	5.37	2.00	2.083E-003	1.804E-003
Th-228	5.41	5.16	5.47	3.00	3.125E-003	2.083E-003
Po-210	5.25	5.20	5.26	0.00	0.000E+000	1.473E-003
Pu-238	5.44	5.24	5.52	3.00	3.125E-003	2.083E-003
Am-241	5.45	5.27	5.57	3.00	3.125E-003	2.083E-003
Cm-245	5.39	5.36	5.41	0.00	0.000E+000	1.473E-003
Pu-236	5.72	5.57	5.84	2.00	2.083E-003	1.804E-003
Cm-244	5.73	5.60	5.86	2.00	2.083E-003	1.804E-003
Th-227	6.02	5.89	6.13	0.00	0.000E+000	1.473E-003
Cm-242	6.10	6.07	6.13	0.00	0.000E+000	1.473E-003

SEVERN TRENT **STL**

Alpha Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 1:01:21PM 6/25/2007

Sample

Sample Name: AV63 Spectrum #1 Analysis #1

Comment:

Batch

Batch Name: June2007

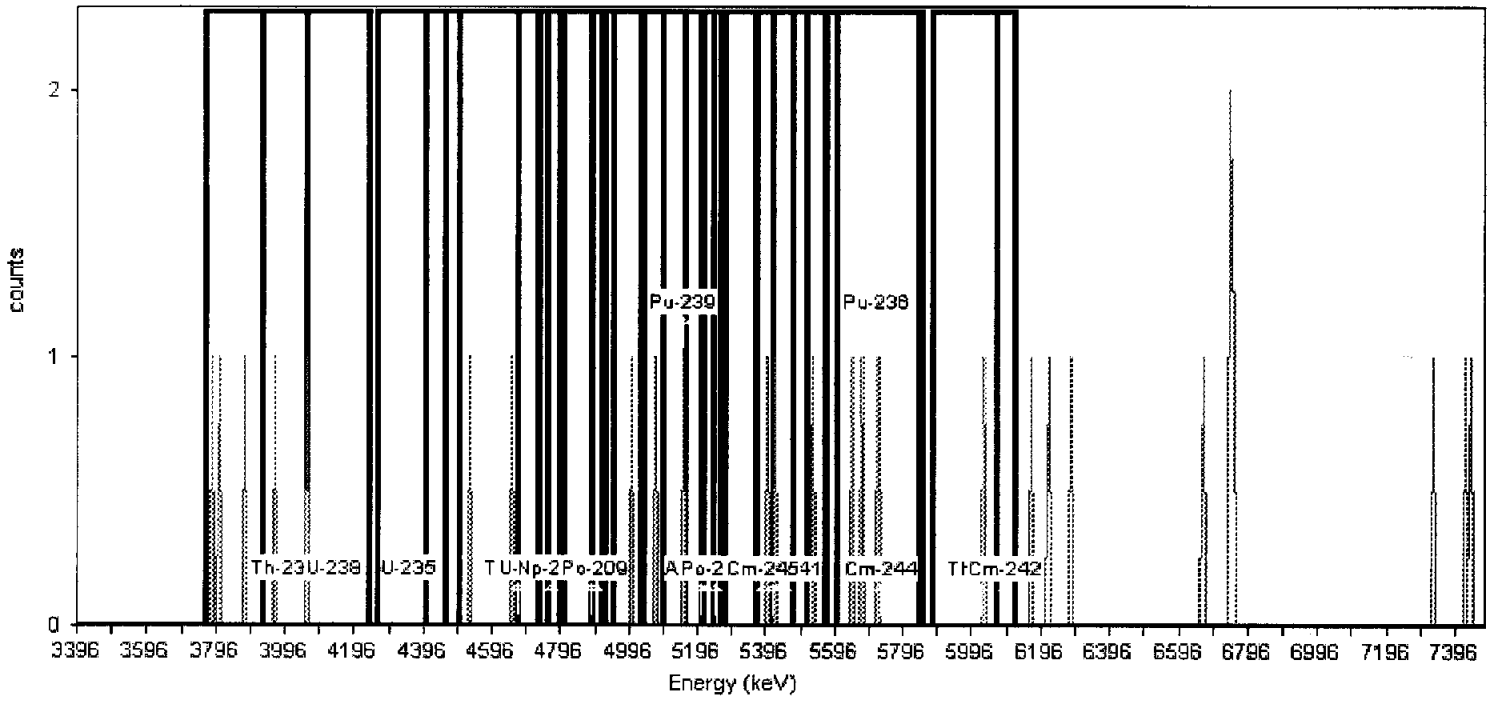
Description:

Acquisition

Detector: AV63 , SN:
Acquisition Start Date: 6/24/2007 8:48:03PM
Live Time: 960.00 min.
Real Time: 960.09 min.
Calibration Name: May2007_AV63
Calibration Date: 6/1/2007 3:36:09PM

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 26.17% +/- 0.26% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI Nuclide Library: Background ROI Library

Total Background Counts: 28.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	5.00	5.208E-003	2.552E-003
U-238	4.14	3.93	4.24	2.00	2.083E-003	1.804E-003
U-235	4.35	4.26	4.46	0.00	0.000E+000	1.473E-003
Th-230	4.67	4.40	4.73	2.00	2.083E-003	1.804E-003
U-234	4.70	4.50	4.80	2.00	2.083E-003	1.804E-003
Pu-242	4.88	4.67	4.93	0.00	0.000E+000	1.473E-003
Th-229	4.84	4.72	5.10	2.00	2.083E-003	1.804E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	3.00	3.125E-003	2.083E-003
Am-243	5.20	5.03	5.28	2.00	2.083E-003	1.804E-003
U-232	5.23	5.04	5.37	2.00	2.083E-003	1.804E-003
Th-228	5.41	5.16	5.47	2.00	2.083E-003	1.804E-003
Po-210	5.25	5.20	5.26	0.00	0.000E+000	1.473E-003
Pu-238	5.44	5.24	5.52	2.00	2.083E-003	1.804E-003
Am-241	5.45	5.27	5.57	3.00	3.125E-003	2.083E-003
Cm-245	5.39	5.36	5.41	1.00	1.042E-003	1.473E-003
Pu-236	5.72	5.57	5.84	4.00	4.167E-003	2.329E-003
Cm-244	5.73	5.60	5.86	4.00	4.167E-003	2.329E-003
Th-227	6.02	5.89	6.13	1.00	1.042E-003	1.473E-003
Cm-242	6.10	6.07	6.13	0.00	0.000E+000	1.473E-003

STL SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 1:01:24PM 6/25/2007

Sample

Sample Name: AV64 Spectrum #1 Analysis #1

Comment:

Batch

Batch Name: June2007

Description:

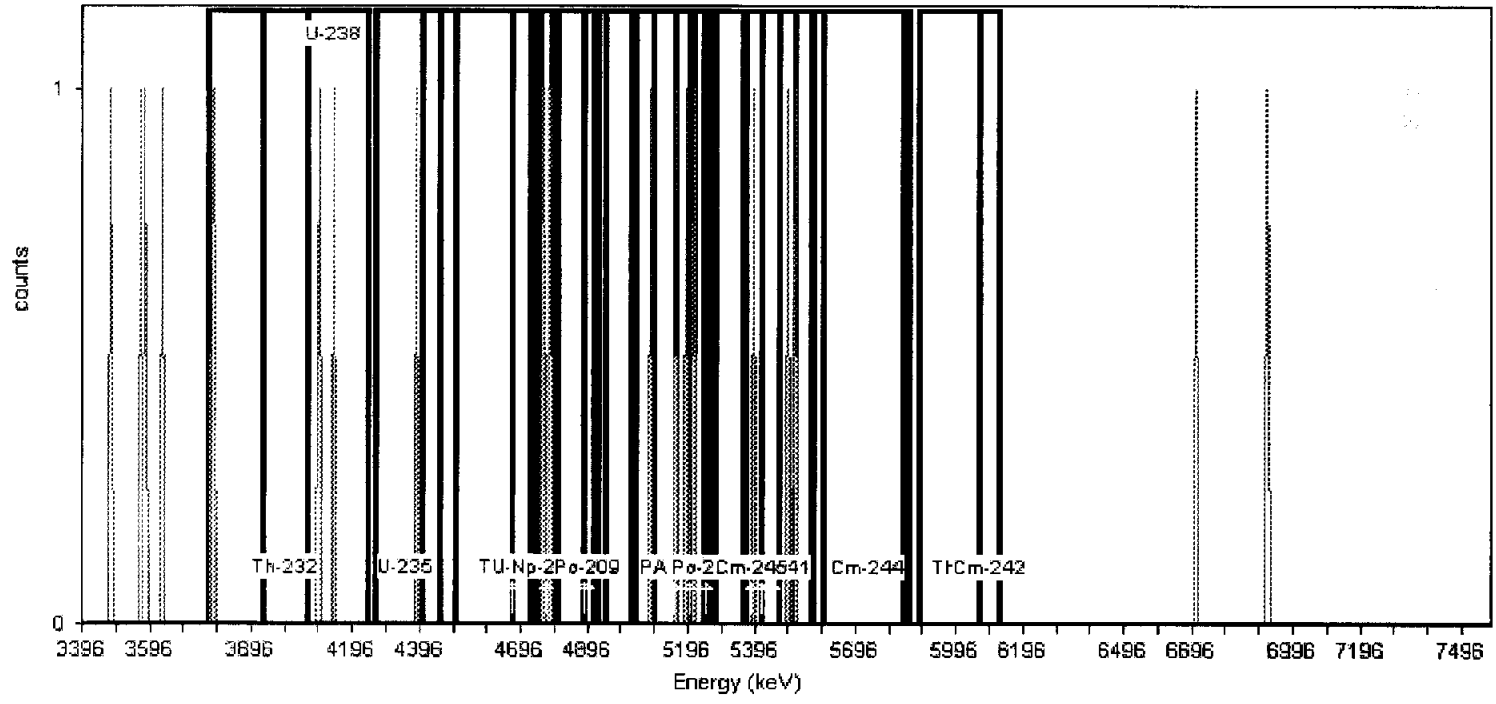
Acquisition

Detector: AV64 , SN:
Acquisition Start Date: 6/24/2007 8:48:04PM
Live Time: 960.00 min.
Real Time: 960.09 min.
Calibration Name: May2007_AV64
Calibration Date: 6/1/2007 3:36:17PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 25.54% +/- 0.27% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI Nuclide Library: Background ROI Library

Total Background Counts: 20.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	1.00	1.042E-003	1.473E-003
U-238	4.14	3.93	4.24	2.00	2.083E-003	1.804E-003
U-235	4.35	4.26	4.46	1.00	1.042E-003	1.473E-003
Th-230	4.67	4.40	4.73	0.00	0.000E+000	1.473E-003
U-234	4.70	4.50	4.80	3.00	3.125E-003	2.083E-003
Pu-242	4.88	4.67	4.93	3.00	3.125E-003	2.083E-003
Th-229	4.84	4.72	5.10	4.00	4.167E-003	2.329E-003
Np-237	4.77	4.75	4.79	3.00	3.125E-003	2.083E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	4.00	4.167E-003	2.329E-003
Am-243	5.20	5.03	5.28	4.00	4.167E-003	2.329E-003
U-232	5.23	5.04	5.37	4.00	4.167E-003	2.329E-003
Th-228	5.41	5.16	5.47	4.00	4.167E-003	2.329E-003
Po-210	5.25	5.20	5.26	1.00	1.042E-003	1.473E-003
Pu-238	5.44	5.24	5.52	3.00	3.125E-003	2.083E-003
Am-241	5.45	5.27	5.57	3.00	3.125E-003	2.083E-003
Cm-245	5.39	5.36	5.41	1.00	1.042E-003	1.473E-003
Pu-236	5.72	5.57	5.84	0.00	0.000E+000	1.473E-003
Cm-244	5.73	5.60	5.86	0.00	0.000E+000	1.473E-003
Th-227	6.02	5.89	6.13	0.00	0.000E+000	1.473E-003
Cm-242	6.10	6.07	6.13	0.00	0.000E+000	1.473E-003

STL SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 1:01:27PM 6/25/2007

Sample

Sample Name: AV66 Spectrum #1 Analysis #1

Comment:

Batch

Batch Name: June2007

Description:

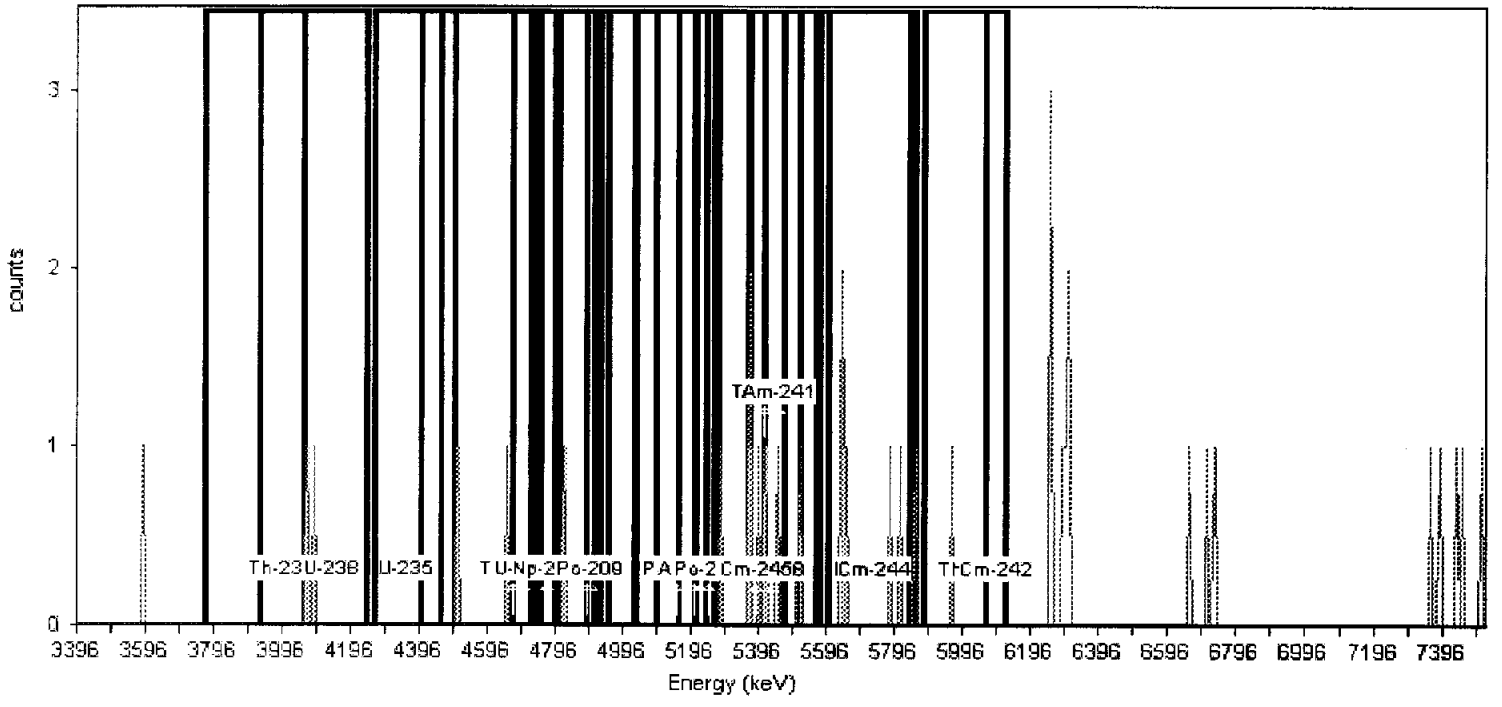
Acquisition

Detector: AV66 , SN:
Acquisition Start Date: 6/24/2007 8:48:07PM
Live Time: 960.00 min.
Real Time: 960.09 min.
Calibration Name: May2007_AV66a
Calibration Date: 5/31/2007 8:22:48PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.46% +/- 0.28% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundRoi Nuclide Library: Background ROI Library

Total Background Counts: 38.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	0.00	0.000E+000	1.473E-003
U-238	4.14	3.93	4.24	2.00	2.083E-003	1.804E-003
U-235	4.35	4.26	4.46	0.00	0.000E+000	1.473E-003
Th-230	4.67	4.40	4.73	2.00	2.083E-003	1.804E-003
U-234	4.70	4.50	4.80	2.00	2.083E-003	1.804E-003
Pu-242	4.88	4.67	4.93	1.00	1.042E-003	1.473E-003
Th-229	4.84	4.72	5.10	1.00	1.042E-003	1.473E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	0.00	0.000E+000	1.473E-003
Am-243	5.20	5.03	5.28	0.00	0.000E+000	1.473E-003
U-232	5.23	5.04	5.37	4.00	4.167E-003	2.329E-003
Th-228	5.41	5.16	5.47	7.00	7.292E-003	2.946E-003
Po-210	5.25	5.20	5.26	0.00	0.000E+000	1.473E-003
Pu-238	5.44	5.24	5.52	8.00	8.333E-003	3.125E-003
Am-241	5.45	5.27	5.57	8.00	8.333E-003	3.125E-003
Cm-245	5.39	5.36	5.41	5.00	5.208E-003	2.552E-003
Pu-236	5.72	5.57	5.84	6.00	6.250E-003	2.756E-003
Cm-244	5.73	5.60	5.86	7.00	7.292E-003	2.946E-003
Th-227	6.02	5.89	6.13	1.00	1.042E-003	1.473E-003
Cm-242	6.10	6.07	6.13	0.00	0.000E+000	1.473E-003

ST SEVERN TRENT **STL**

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
1:01:30PM 6/25/2007

Analyst: 60040

Sample

Sample Name: AV67
Comment:

Spectrum #1 Analysis #1

Batch

Batch Name: June2007
Description:

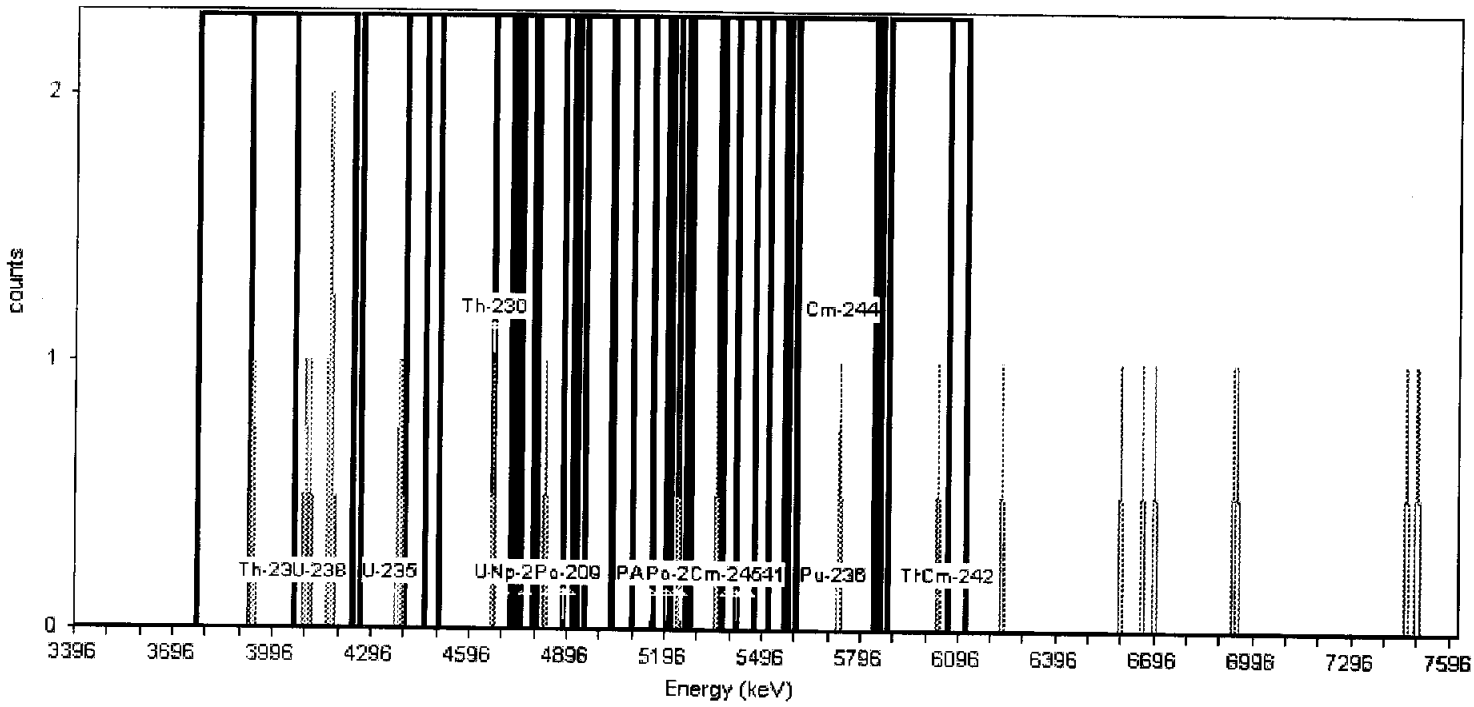
Acquisition

Detector: AV67 , SN:
Acquisition Start Date: 6/24/2007 8:48:08PM
Live Time: 960.00 min.
Real Time: 960.02 min.
Calibration Name: May2007_AV67
Calibration Date: 5/31/2007 11:30:19AM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.43% +/- 0.27% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 23.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	1.00	1.042E-003	1.473E-003
U-238	4.14	3.93	4.24	6.00	6.250E-003	2.756E-003
U-235	4.35	4.26	4.46	2.00	2.083E-003	1.804E-003
Th-230	4.67	4.40	4.73	1.00	1.042E-003	1.473E-003
U-234	4.70	4.50	4.80	1.00	1.042E-003	1.473E-003
Pu-242	4.88	4.67	4.93	2.00	2.083E-003	1.804E-003
Th-229	4.84	4.72	5.10	1.00	1.042E-003	1.473E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	0.00	0.000E+000	1.473E-003
Am-243	5.20	5.03	5.28	1.00	1.042E-003	1.473E-003
U-232	5.23	5.04	5.37	2.00	2.083E-003	1.804E-003
Th-228	5.41	5.16	5.47	2.00	2.083E-003	1.804E-003
Po-210	5.25	5.20	5.26	1.00	1.042E-003	1.473E-003
Pu-238	5.44	5.24	5.52	2.00	2.083E-003	1.804E-003
Am-241	5.45	5.27	5.57	1.00	1.042E-003	1.473E-003
Cm-245	5.39	5.36	5.41	0.00	0.000E+000	1.473E-003
Pu-236	5.72	5.57	5.84	1.00	1.042E-003	1.473E-003
Cm-244	5.73	5.60	5.86	1.00	1.042E-003	1.473E-003
Th-227	6.02	5.89	6.13	1.00	1.042E-003	1.473E-003
Cm-242	6.10	6.07	6.13	0.00	0.000E+000	1.473E-003

ST SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
1:01:34PM 6/25/2007

Analyst: 60040

Sample

Sample Name: AV68
Comment:

Spectrum #1 Analysis #1

Batch

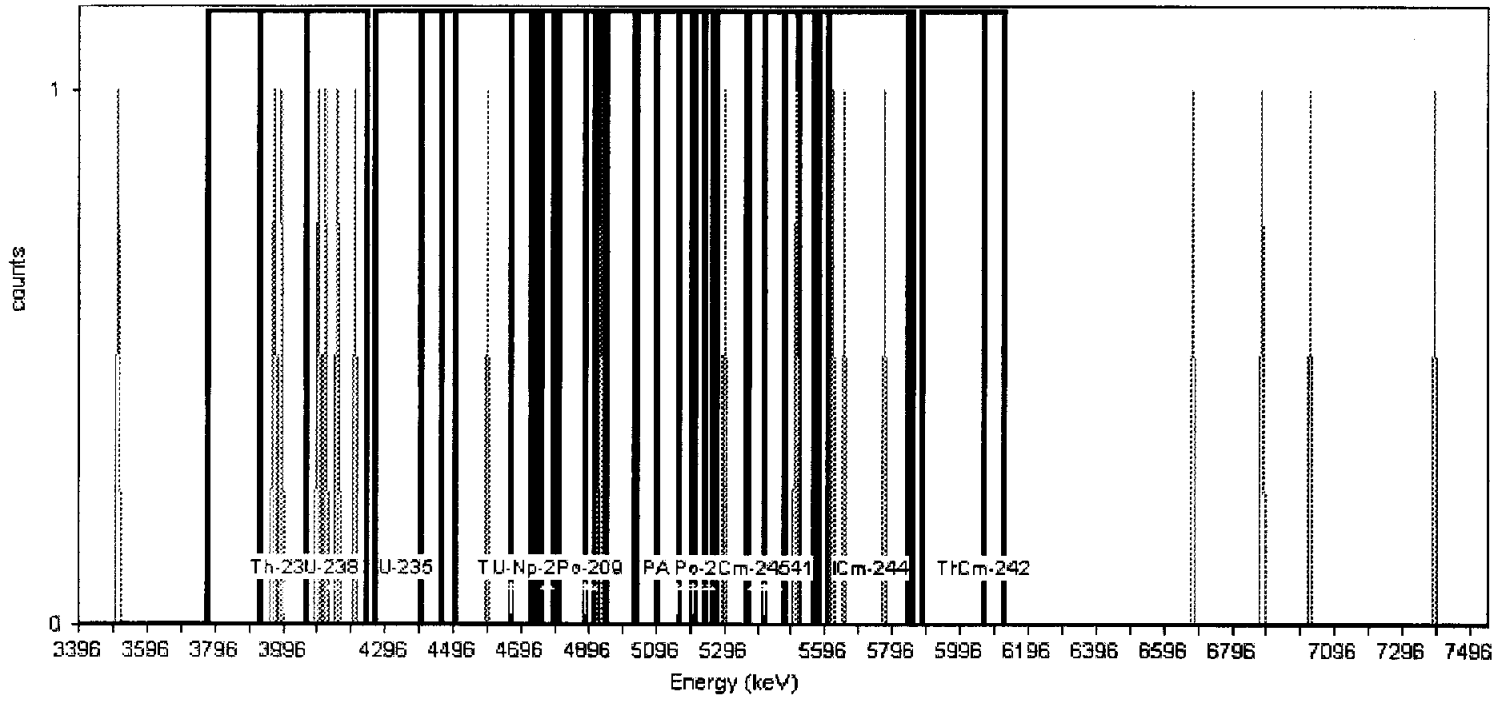
Batch Name: June2007
Description:

Acquisition

Detector: AV68 , SN:
Acquisition Start Date: 6/24/2007 8:48:10PM
Live Time: 960.00 min.
Real Time: 960.02 min.
Calibration Name: May2007_AV68
Calibration Date: 5/31/2007 1:55:51PM

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch²

Efficiency: 26.78% +/- 0.28% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 18.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	2.00	2.083E-003	1.804E-003
U-238	4.14	3.93	4.24	6.00	6.250E-003	2.756E-003
U-235	4.35	4.26	4.46	0.00	0.000E+000	1.473E-003
Th-230	4.67	4.40	4.73	1.00	1.042E-003	1.473E-003
U-234	4.70	4.50	4.80	1.00	1.042E-003	1.473E-003
Pu-242	4.88	4.67	4.93	1.00	1.042E-003	1.473E-003
Th-229	4.84	4.72	5.10	1.00	1.042E-003	1.473E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	0.00	0.000E+000	1.473E-003
Am-243	5.20	5.03	5.28	0.00	0.000E+000	1.473E-003
U-232	5.23	5.04	5.37	1.00	1.042E-003	1.473E-003
Th-228	5.41	5.16	5.47	1.00	1.042E-003	1.473E-003
Po-210	5.25	5.20	5.26	0.00	0.000E+000	1.473E-003
Pu-238	5.44	5.24	5.52	2.00	2.083E-003	1.804E-003
Am-241	5.45	5.27	5.57	2.00	2.083E-003	1.804E-003
Cm-245	5.39	5.36	5.41	0.00	0.000E+000	1.473E-003
Pu-236	5.72	5.57	5.84	3.00	3.125E-003	2.083E-003
Cm-244	5.73	5.60	5.86	3.00	3.125E-003	2.083E-003
Th-227	6.02	5.89	6.13	0.00	0.000E+000	1.473E-003
Cm-242	6.10	6.07	6.13	0.00	0.000E+000	1.473E-003

ST SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
1:01:37PM 6/25/2007

Analyst: 60040

Sample

Sample Name: AV69
Comment:

Spectrum #1 Analysis #1

Batch

Batch Name: June2007
Description:

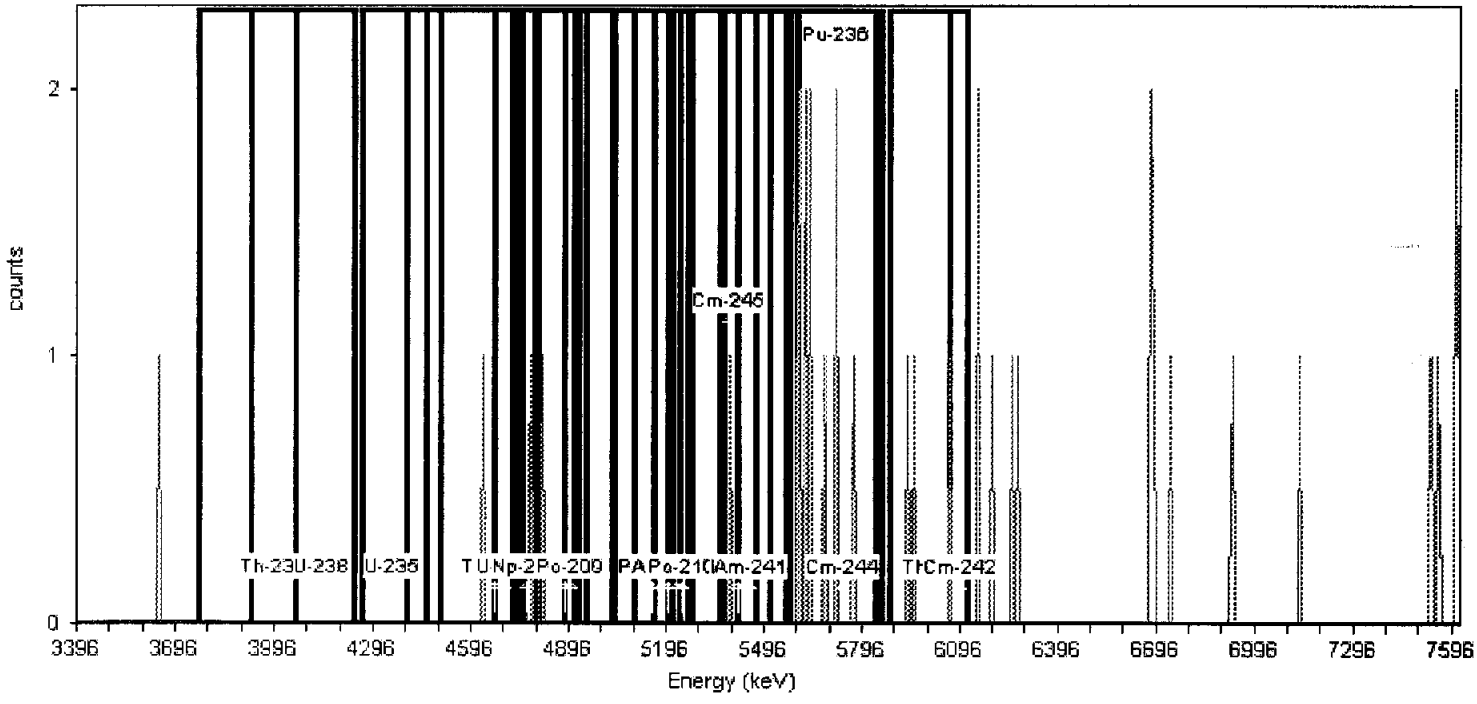
Acquisition

Detector: AV69 , SN:
Acquisition Start Date: 6/24/2007 8:48:12PM
Live Time: 960.00 min.
Real Time: 960.02 min.
Calibration Name: May2007_AV69
Calibration Date: 5/31/2007 11:30:54AM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 28.13% +/- 0.30% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 37.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	0.00	0.000E+000	1.473E-003
U-238	4.14	3.93	4.24	0.00	0.000E+000	1.473E-003
U-235	4.35	4.26	4.46	0.00	0.000E+000	1.473E-003
Th-230	4.67	4.40	4.73	1.00	1.042E-003	1.473E-003
U-234	4.70	4.50	4.80	2.00	2.083E-003	1.804E-003
Pu-242	4.88	4.67	4.93	2.00	2.083E-003	1.804E-003
Th-229	4.84	4.72	5.10	2.00	2.083E-003	1.804E-003
Np-237	4.77	4.75	4.79	1.00	1.042E-003	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	0.00	0.000E+000	1.473E-003
Am-243	5.20	5.03	5.28	0.00	0.000E+000	1.473E-003
U-232	5.23	5.04	5.37	0.00	0.000E+000	1.473E-003
Th-228	5.41	5.16	5.47	2.00	2.083E-003	1.804E-003
Po-210	5.25	5.20	5.26	0.00	0.000E+000	1.473E-003
Pu-238	5.44	5.24	5.52	2.00	2.083E-003	1.804E-003
Am-241	5.45	5.27	5.57	2.00	2.083E-003	1.804E-003
Cm-245	5.39	5.36	5.41	2.00	2.083E-003	1.804E-003
Pu-236	5.72	5.57	5.84	11.00	1.146E-002	3.608E-003
Cm-244	5.73	5.60	5.86	11.00	1.146E-002	3.608E-003
Th-227	6.02	5.89	6.13	3.00	3.125E-003	2.083E-003
Cm-242	6.10	6.07	6.13	1.00	1.042E-003	1.473E-003

SEVERN TRENT **STL**

Alpha Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 1:01:40PM 6/25/2007

Sample

Sample Name: AV70 Spectrum #1 Analysis #1

Comment:

Batch

Batch Name: June2007

Description:

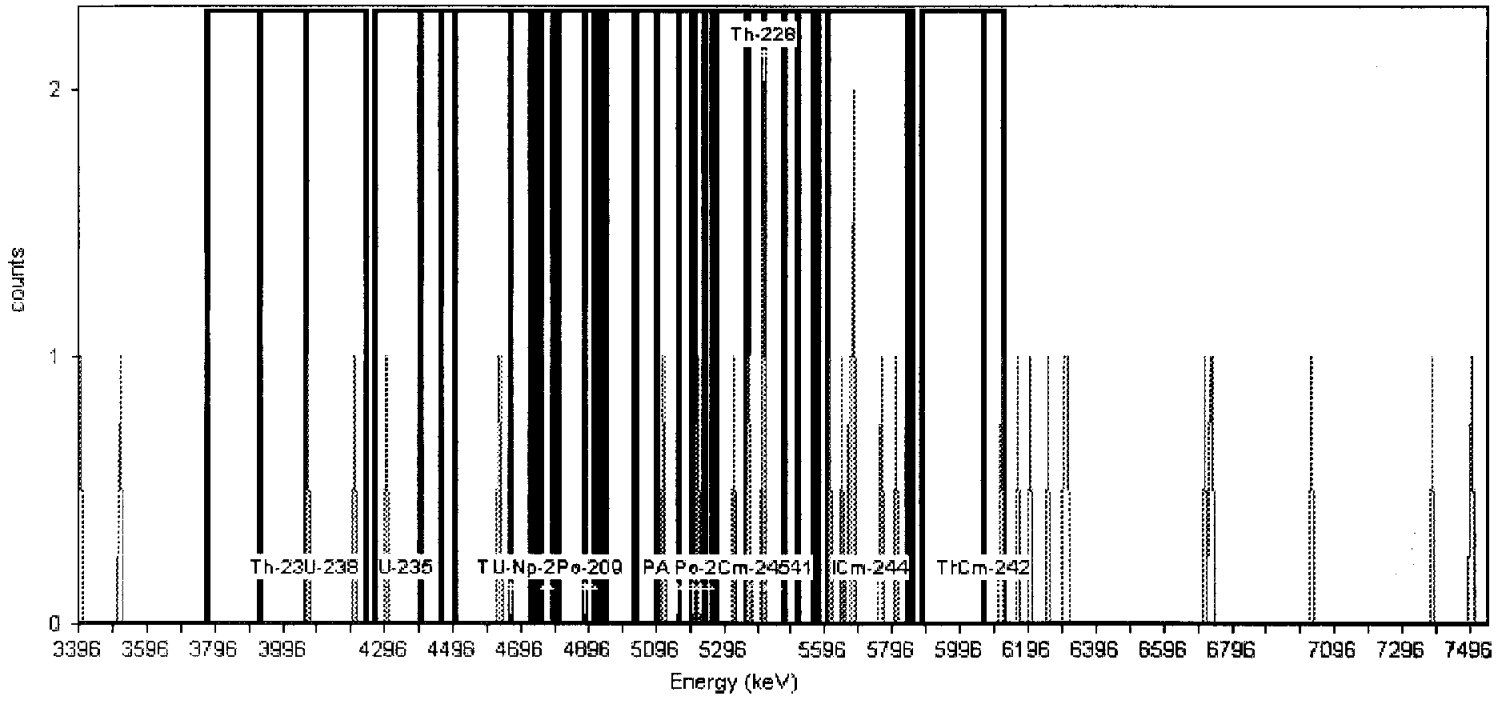
Acquisition

Detector: AV70 , SN:
Acquisition Start Date: 6/24/2007 8:48:14PM
Live Time: 960.00 min.
Real Time: 960.02 min.
Calibration Name: May2007_AV70a
Calibration Date: 6/1/2007 5:26:03AM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch²

Efficiency: 27.14% +/- 0.28% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI Nuclide Library: Background ROI Library

Total Background Counts: 32.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	0.00	0.000E+000	1.473E-003
U-238	4.14	3.93	4.24	2.00	2.083E-003	1.804E-003
U-235	4.35	4.26	4.46	1.00	1.042E-003	1.473E-003
Th-230	4.67	4.40	4.73	1.00	1.042E-003	1.473E-003
U-234	4.70	4.50	4.80	1.00	1.042E-003	1.473E-003
Pu-242	4.88	4.67	4.93	0.00	0.000E+000	1.473E-003
Th-229	4.84	4.72	5.10	0.00	0.000E+000	1.473E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	1.00	1.042E-003	1.473E-003
Am-243	5.20	5.03	5.28	2.00	2.083E-003	1.804E-003
U-232	5.23	5.04	5.37	4.00	4.167E-003	2.329E-003
Th-228	5.41	5.16	5.47	5.00	5.208E-003	2.552E-003
Po-210	5.25	5.20	5.26	1.00	1.042E-003	1.473E-003
Pu-238	5.44	5.24	5.52	4.00	4.167E-003	2.329E-003
Am-241	5.45	5.27	5.57	4.00	4.167E-003	2.329E-003
Cm-245	5.39	5.36	5.41	3.00	3.125E-003	2.083E-003
Pu-236	5.72	5.57	5.84	8.00	8.333E-003	3.125E-003
Cm-244	5.73	5.60	5.86	8.00	8.333E-003	3.125E-003
Th-227	6.02	5.89	6.13	1.00	1.042E-003	1.473E-003
Cm-242	6.10	6.07	6.13	1.00	1.042E-003	1.473E-003

SEVERN TRENT **STL**

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 1:01:43PM 6/25/2007

Sample

Sample Name: AV71 Spectrum #1 Analysis #1

Comment:

Batch

Batch Name: June2007

Description:

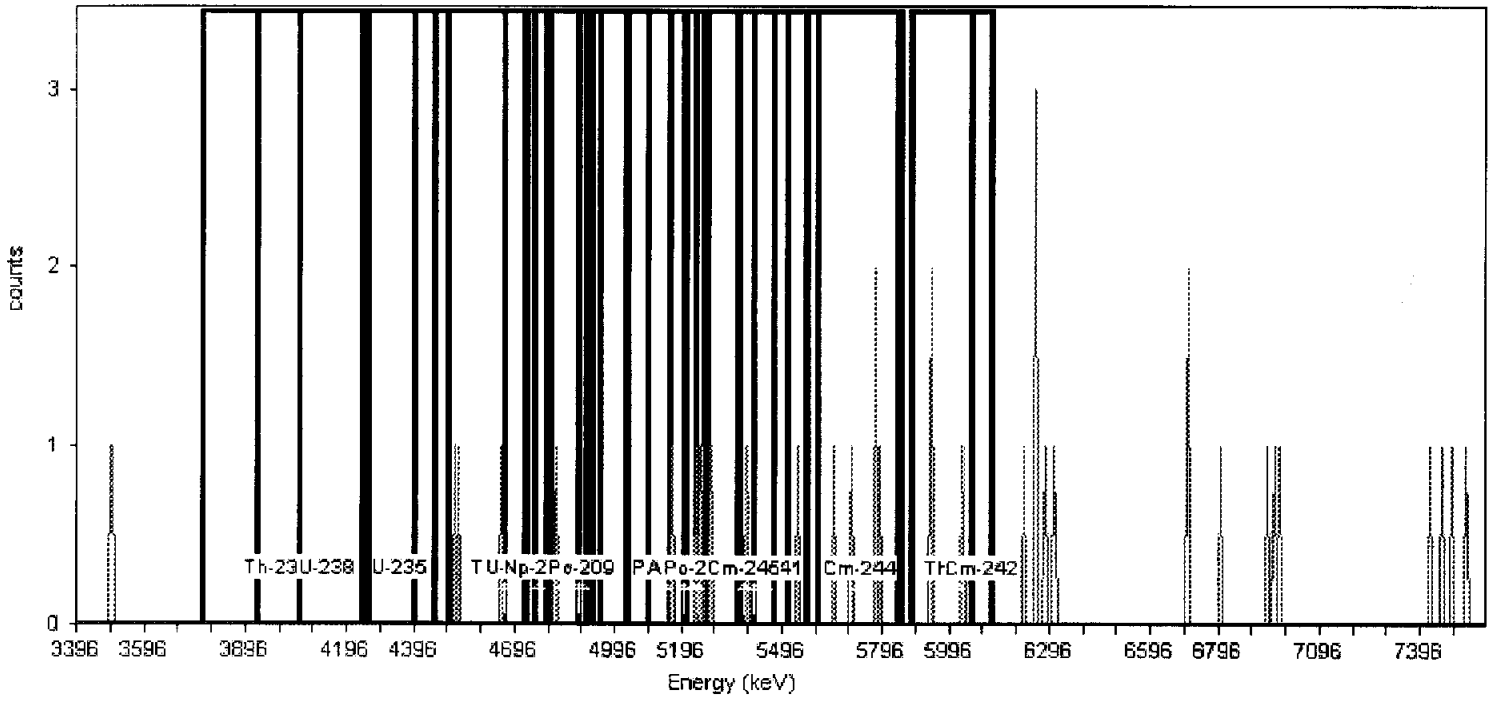
Acquisition

Detector: AV71 , SN:
Acquisition Start Date: 6/24/2007 8:48:15PM
Live Time: 960.00 min.
Real Time: 960.02 min.
Calibration Name: May2007_AV71
Calibration Date: 5/31/2007 1:55:45PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.45% +/- 0.27% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI Nuclide Library: Background ROI Library

Total Background Counts: 37.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	0.00	0.000E+000	1.473E-003
U-238	4.14	3.93	4.24	0.00	0.000E+000	1.473E-003
U-235	4.35	4.26	4.46	0.00	0.000E+000	1.473E-003
Th-230	4.67	4.40	4.73	3.00	3.125E-003	2.083E-003
U-234	4.70	4.50	4.80	3.00	3.125E-003	2.083E-003
Pu-242	4.88	4.67	4.93	1.00	1.042E-003	1.473E-003
Th-229	4.84	4.72	5.10	1.00	1.042E-003	1.473E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	1.00	1.042E-003	1.473E-003
Am-243	5.20	5.03	5.28	3.00	3.125E-003	2.083E-003
U-232	5.23	5.04	5.37	4.00	4.167E-003	2.329E-003
Th-228	5.41	5.16	5.47	5.00	5.208E-003	2.552E-003
Po-210	5.25	5.20	5.26	2.00	2.083E-003	1.804E-003
Pu-238	5.44	5.24	5.52	4.00	4.167E-003	2.329E-003
Am-241	5.45	5.27	5.57	3.00	3.125E-003	2.083E-003
Cm-245	5.39	5.36	5.41	1.00	1.042E-003	1.473E-003
Pu-236	5.72	5.57	5.84	5.00	5.208E-003	2.552E-003
Cm-244	5.73	5.60	5.86	5.00	5.208E-003	2.552E-003
Th-227	6.02	5.89	6.13	3.00	3.125E-003	2.083E-003
Cm-242	6.10	6.07	6.13	0.00	0.000E+000	1.473E-003

ST SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 1:01:46PM 6/25/2007

Sample

Sample Name: AV72 Spectrum #1 Analysis #1

Comment:

Batch

Batch Name: June2007

Description:

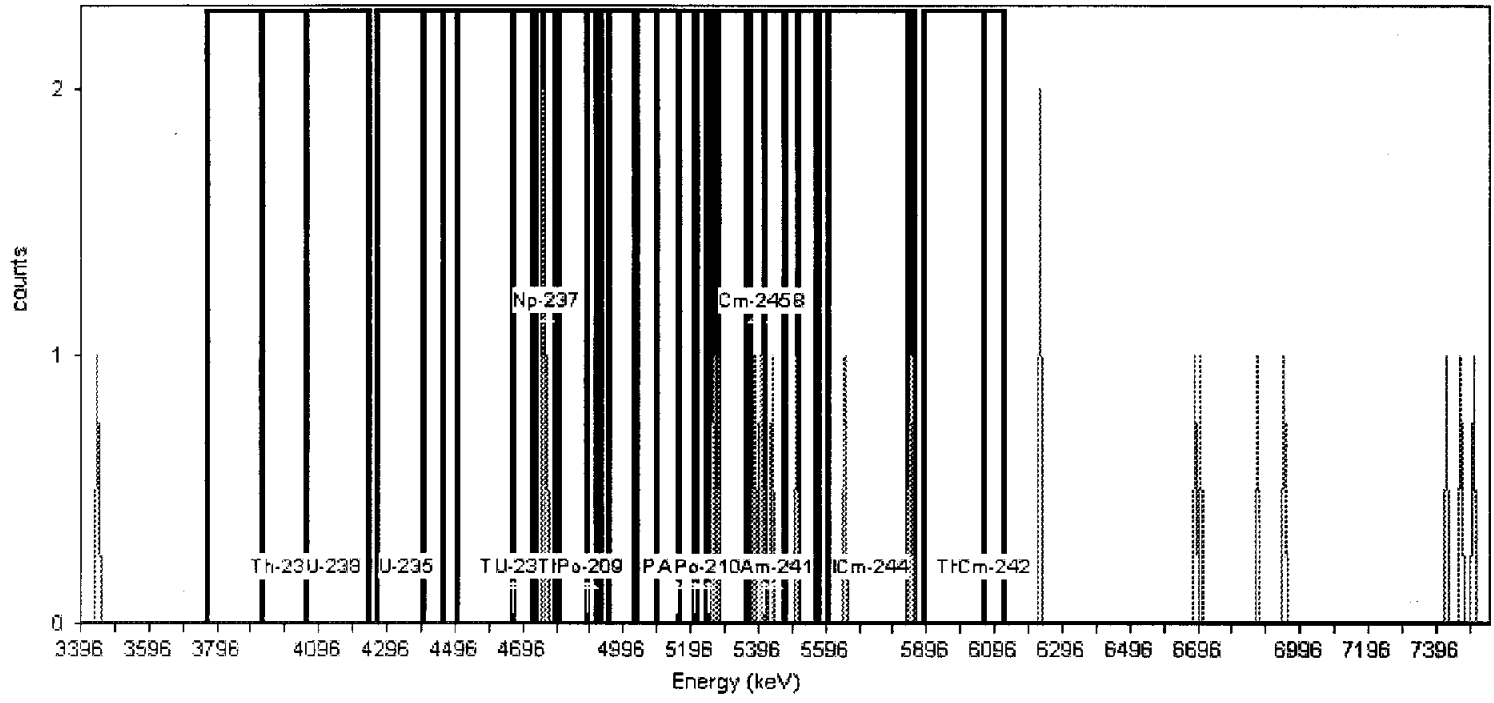
Acquisition

Detector: AV72 , SN:
Acquisition Start Date: 6/24/2007 8:48:17PM
Live Time: 960.00 min.
Real Time: 960.02 min.
Calibration Name: May2007_AV72
Calibration Date: 5/31/2007 4:34:19PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 26.60% +/- 0.28% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI Nuclide Library: Background ROI Library

Total Background Counts: 22.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	0.00	0.000E+000	1.473E-003
U-238	4.14	3.93	4.24	0.00	0.000E+000	1.473E-003
U-235	4.35	4.26	4.46	0.00	0.000E+000	1.473E-003
Th-230	4.67	4.40	4.73	0.00	0.000E+000	1.473E-003
U-234	4.70	4.50	4.80	3.00	3.125E-003	2.083E-003
Pu-242	4.88	4.67	4.93	3.00	3.125E-003	2.083E-003
Th-229	4.84	4.72	5.10	3.00	3.125E-003	2.083E-003
Np-237	4.77	4.75	4.79	3.00	3.125E-003	2.083E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	0.00	0.000E+000	1.473E-003
Am-243	5.20	5.03	5.28	2.00	2.083E-003	1.804E-003
U-232	5.23	5.04	5.37	2.00	2.083E-003	1.804E-003
Th-228	5.41	5.16	5.47	6.00	6.250E-003	2.756E-003
Po-210	5.25	5.20	5.26	1.00	1.042E-003	1.473E-003
Pu-238	5.44	5.24	5.52	7.00	7.292E-003	2.946E-003
Am-241	5.45	5.27	5.57	6.00	6.250E-003	2.756E-003
Cm-245	5.39	5.36	5.41	3.00	3.125E-003	2.083E-003
Pu-236	5.72	5.57	5.84	1.00	1.042E-003	1.473E-003
Cm-244	5.73	5.60	5.86	2.00	2.083E-003	1.804E-003
Th-227	6.02	5.89	6.13	0.00	0.000E+000	1.473E-003
Cm-242	6.10	6.07	6.13	0.00	0.000E+000	1.473E-003

SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 1:01:50PM 6/25/2007

Sample

Sample Name: AV73 Spectrum #1 Analysis #1

Comment:

Batch

Batch Name: June2007

Description:

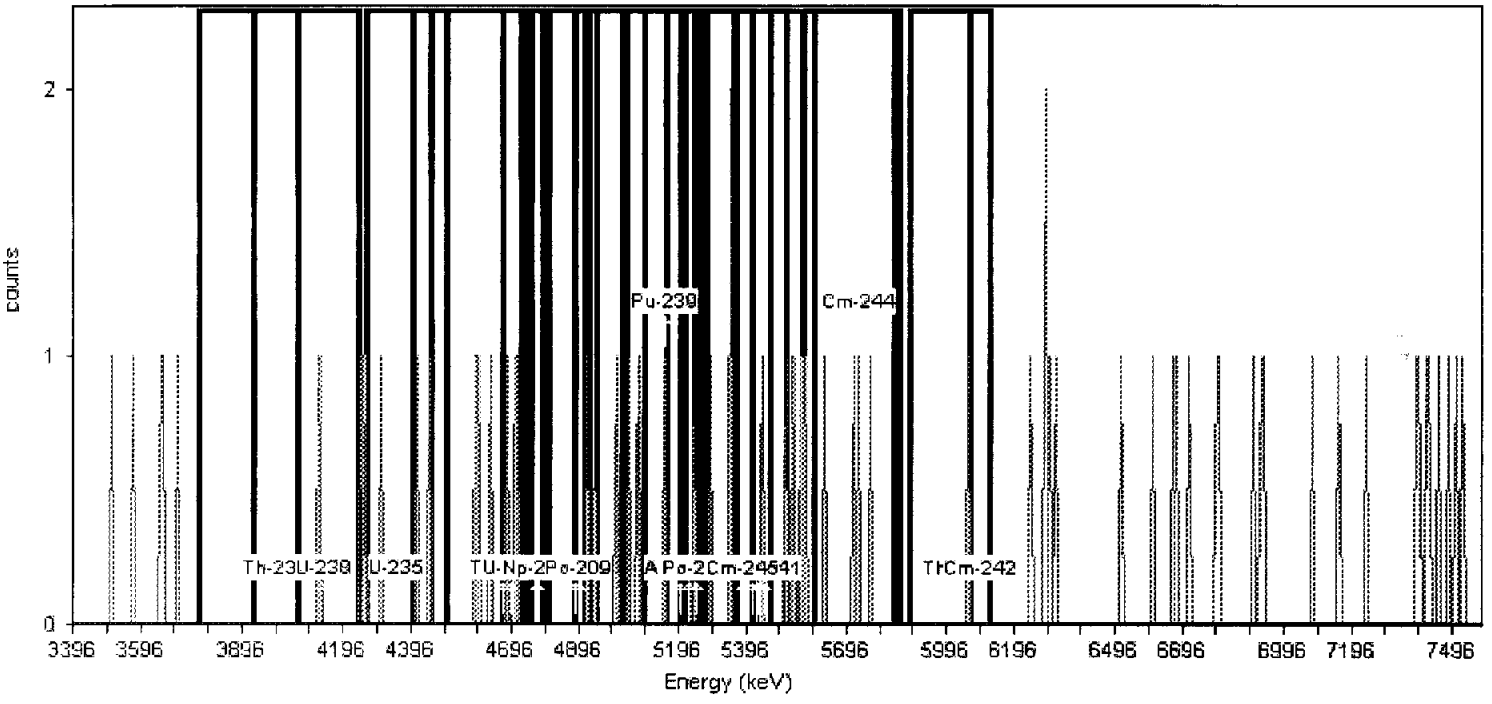
Acquisition

Detector: AV73 , SN:
Acquisition Start Date: 6/24/2007 8:48:19PM
Live Time: 960.00 min.
Real Time: 960.02 min.
Calibration Name: May2007_AV73
Calibration Date: 5/31/2007 1:55:56PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.42% +/- 0.29% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundRO Nuclide Library: Background ROI Library

Total Background Counts: 64.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	0.00	0.000E+000	1.473E-003
U-238	4.14	3.93	4.24	1.00	1.042E-003	1.473E-003
U-235	4.35	4.26	4.46	3.00	3.125E-003	2.083E-003
Th-230	4.67	4.40	4.73	8.00	8.333E-003	3.125E-003
U-234	4.70	4.50	4.80	6.00	6.250E-003	2.756E-003
Pu-242	4.88	4.67	4.93	4.00	4.167E-003	2.329E-003
Th-229	4.84	4.72	5.10	5.00	5.208E-003	2.552E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	4.00	4.167E-003	2.329E-003
Am-243	5.20	5.03	5.28	4.00	4.167E-003	2.329E-003
U-232	5.23	5.04	5.37	7.00	7.292E-003	2.946E-003
Th-228	5.41	5.16	5.47	5.00	5.208E-003	2.552E-003
Po-210	5.25	5.20	5.26	1.00	1.042E-003	1.473E-003
Pu-238	5.44	5.24	5.52	6.00	6.250E-003	2.756E-003
Am-241	5.45	5.27	5.57	8.00	8.333E-003	3.125E-003
Cm-245	5.39	5.36	5.41	0.00	0.000E+000	1.473E-003
Pu-236	5.72	5.57	5.84	5.00	5.208E-003	2.552E-003
Cm-244	5.73	5.60	5.86	4.00	4.167E-003	2.329E-003
Th-227	6.02	5.89	6.13	1.00	1.042E-003	1.473E-003
Cm-242	6.10	6.07	6.13	0.00	0.000E+000	1.473E-003

SEVERN TRENT **STL**

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:58:16PM 6/25/2007

Analyst: 60040

Sample

Sample Name: AV75 Spectrum #1 Analysis #1

Comment:

Batch

Batch Name: June2007

Description:

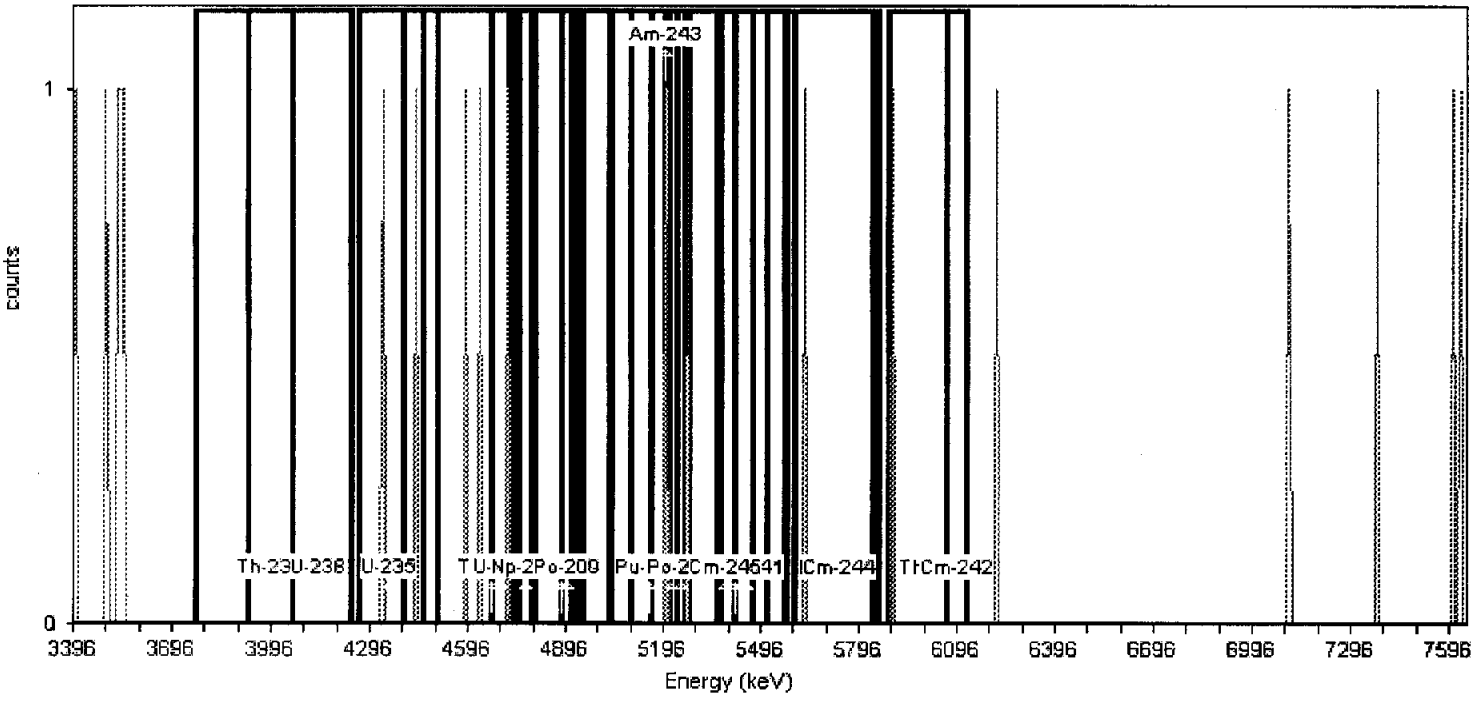
Acquisition

Detector: AV75 , SN: 46-033P6
Acquisition Start Date: 6/24/2007 8:48:22PM
Live Time: 960.00 min.
Real Time: 960.02 min.
Calibration Name: May2007_AV75
Calibration Date: 5/29/2007 11:40:36AM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 26.53% +/- 0.26% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI Nuclide Library: Background ROI Library

Total Background Counts: 19.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	0.00	0.000E+000	1.473E-003
U-238	4.14	3.93	4.24	0.00	0.000E+000	1.473E-003
U-235	4.35	4.26	4.46	2.00	2.083E-003	1.804E-003
Th-230	4.67	4.40	4.73	4.00	4.167E-003	2.329E-003
U-234	4.70	4.50	4.80	3.00	3.125E-003	2.083E-003
Pu-242	4.88	4.67	4.93	1.00	1.042E-003	1.473E-003
Th-229	4.84	4.72	5.10	0.00	0.000E+000	1.473E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	1.00	1.042E-003	1.473E-003
Am-243	5.20	5.03	5.28	2.00	2.083E-003	1.804E-003
U-232	5.23	5.04	5.37	2.00	2.083E-003	1.804E-003
Th-228	5.41	5.16	5.47	2.00	2.083E-003	1.804E-003
Po-210	5.25	5.20	5.26	1.00	1.042E-003	1.473E-003
Pu-238	5.44	5.24	5.52	1.00	1.042E-003	1.473E-003
Am-241	5.45	5.27	5.57	1.00	1.042E-003	1.473E-003
Cm-245	5.39	5.36	5.41	0.00	0.000E+000	1.473E-003
Pu-236	5.72	5.57	5.84	1.00	1.042E-003	1.473E-003
Cm-244	5.73	5.60	5.86	1.00	1.042E-003	1.473E-003
Th-227	6.02	5.89	6.13	1.00	1.042E-003	1.473E-003
Cm-242	6.10	6.07	6.13	0.00	0.000E+000	1.473E-003

SEVERN TRENT **STL**

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:58:19PM 6/25/2007

Analyst: 60040

Sample

Sample Name: AV76
Comment:

Spectrum #1 Analysis #1

Batch

Batch Name: June2007
Description:

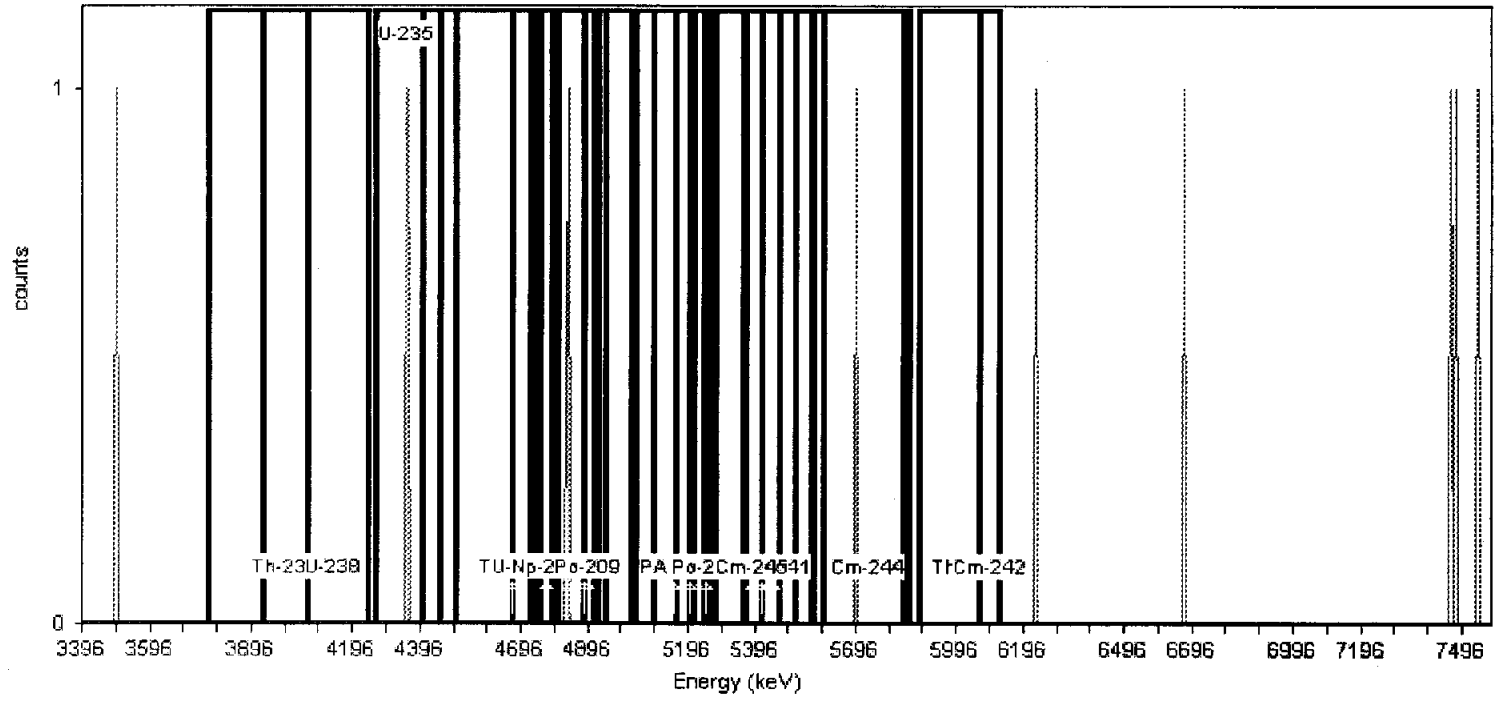
Acquisition

Detector: AV76 , SN: 46-033Q4
Acquisition Start Date: 6/24/2007 8:48:24PM
Live Time: 960.00 min.
Real Time: 960.02 min.
Calibration Name: May2007_AV76
Calibration Date: 5/29/2007 11:40:59AM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 26.47% +/- 0.28% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 9.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	0.00	0.000E+000	1.473E-003
U-238	4.14	3.93	4.24	0.00	0.000E+000	1.473E-003
U-235	4.35	4.26	4.46	1.00	1.042E-003	1.473E-003
Th-230	4.67	4.40	4.73	0.00	0.000E+000	1.473E-003
U-234	4.70	4.50	4.80	0.00	0.000E+000	1.473E-003
Pu-242	4.88	4.67	4.93	1.00	1.042E-003	1.473E-003
Th-229	4.84	4.72	5.10	1.00	1.042E-003	1.473E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	0.00	0.000E+000	1.473E-003
Am-243	5.20	5.03	5.28	0.00	0.000E+000	1.473E-003
U-232	5.23	5.04	5.37	0.00	0.000E+000	1.473E-003
Th-228	5.41	5.16	5.47	0.00	0.000E+000	1.473E-003
Po-210	5.25	5.20	5.26	0.00	0.000E+000	1.473E-003
Pu-238	5.44	5.24	5.52	0.00	0.000E+000	1.473E-003
Am-241	5.45	5.27	5.57	0.00	0.000E+000	1.473E-003
Cm-245	5.39	5.36	5.41	0.00	0.000E+000	1.473E-003
Pu-236	5.72	5.57	5.84	1.00	1.042E-003	1.473E-003
Cm-244	5.73	5.60	5.86	1.00	1.042E-003	1.473E-003
Th-227	6.02	5.89	6.13	0.00	0.000E+000	1.473E-003
Cm-242	6.10	6.07	6.13	0.00	0.000E+000	1.473E-003

STL SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:58:26PM 6/25/2007

Analyst: 60040

Sample

Sample Name: AV77
Comment:

Spectrum #1 Analysis #1

Batch

Batch Name: June2007
Description:

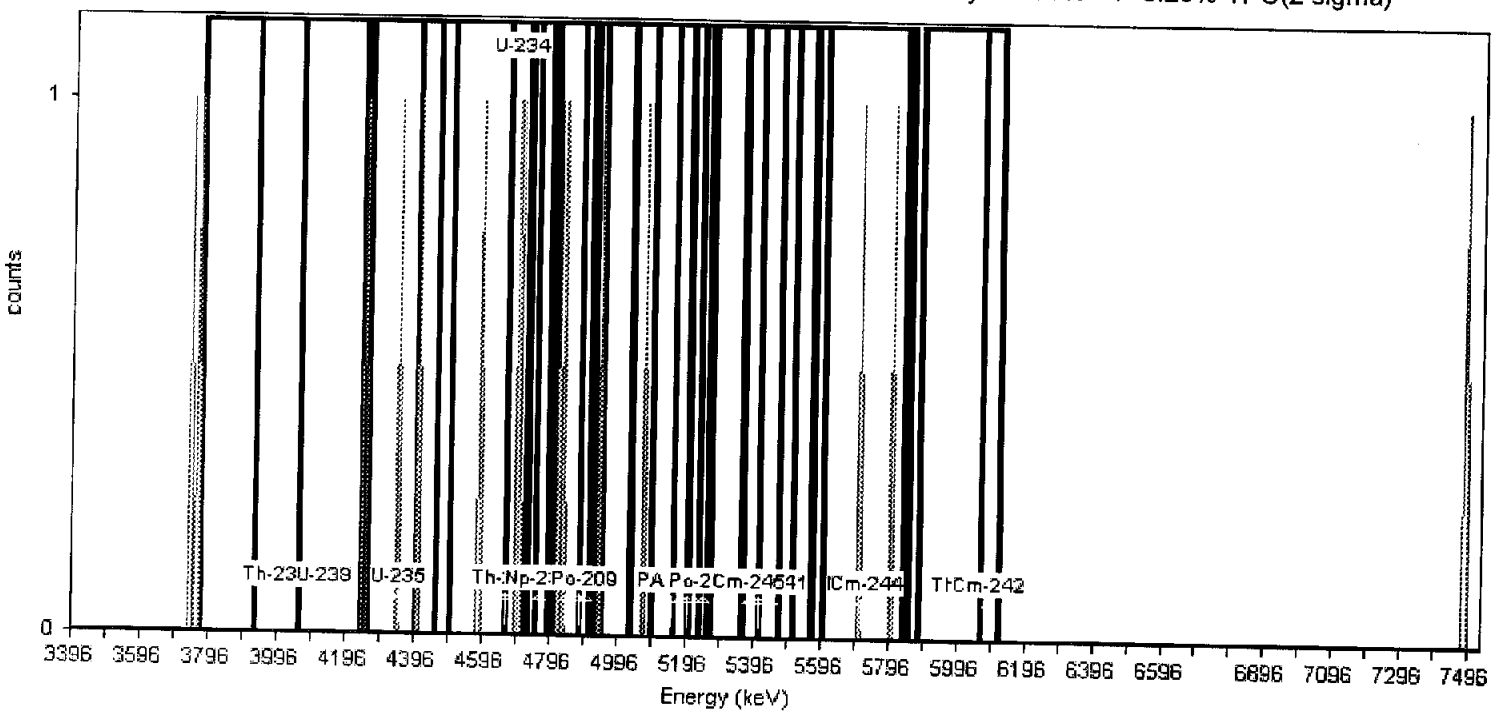
Acquisition

Detector: AV77 , SN: 46-033Q7
Acquisition Start Date: 6/24/2007 8:48:26PM
Live Time: 960.00 min.
Real Time: 960.02 min.
Calibration Name: May2007_AV77
Calibration Date: 5/29/2007 11:41:11AM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch²

Efficiency: 26.70% +/- 0.29% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 15.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	0.00	0.000E+000	1.473E-003
U-238	4.14	3.93	4.24	0.00	0.000E+000	1.473E-003
U-235	4.35	4.26	4.46	2.00	2.083E-003	1.804E-003
Th-230	4.67	4.40	4.73	4.00	4.167E-003	2.329E-003
U-234	4.70	4.50	4.80	3.00	3.125E-003	2.083E-003
Pu-242	4.88	4.67	4.93	4.00	4.167E-003	2.329E-003
Th-229	4.84	4.72	5.10	4.00	4.167E-003	2.329E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	1.00	1.042E-003	1.473E-003
Am-243	5.20	5.03	5.28	1.00	1.042E-003	1.473E-003
U-232	5.23	5.04	5.37	1.00	1.042E-003	1.473E-003
Th-228	5.41	5.16	5.47	0.00	0.000E+000	1.473E-003
Po-210	5.25	5.20	5.26	0.00	0.000E+000	1.473E-003
Pu-238	5.44	5.24	5.52	0.00	0.000E+000	1.473E-003
Am-241	5.45	5.27	5.57	0.00	0.000E+000	1.473E-003
Cm-245	5.39	5.36	5.41	0.00	0.000E+000	1.473E-003
Pu-236	5.72	5.57	5.84	2.00	2.083E-003	1.804E-003
Cm-244	5.73	5.60	5.86	2.00	2.083E-003	1.804E-003
Th-227	6.02	5.89	6.13	0.00	0.000E+000	1.473E-003
Cm-242	6.10	6.07	6.13	0.00	0.000E+000	1.473E-003

SEVERN TRENT **STL**

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:58:29PM 6/25/2007

Analyst: 60040

Sample

Sample Name: AV78 Spectrum #1 Analysis #1
Comment:

Batch

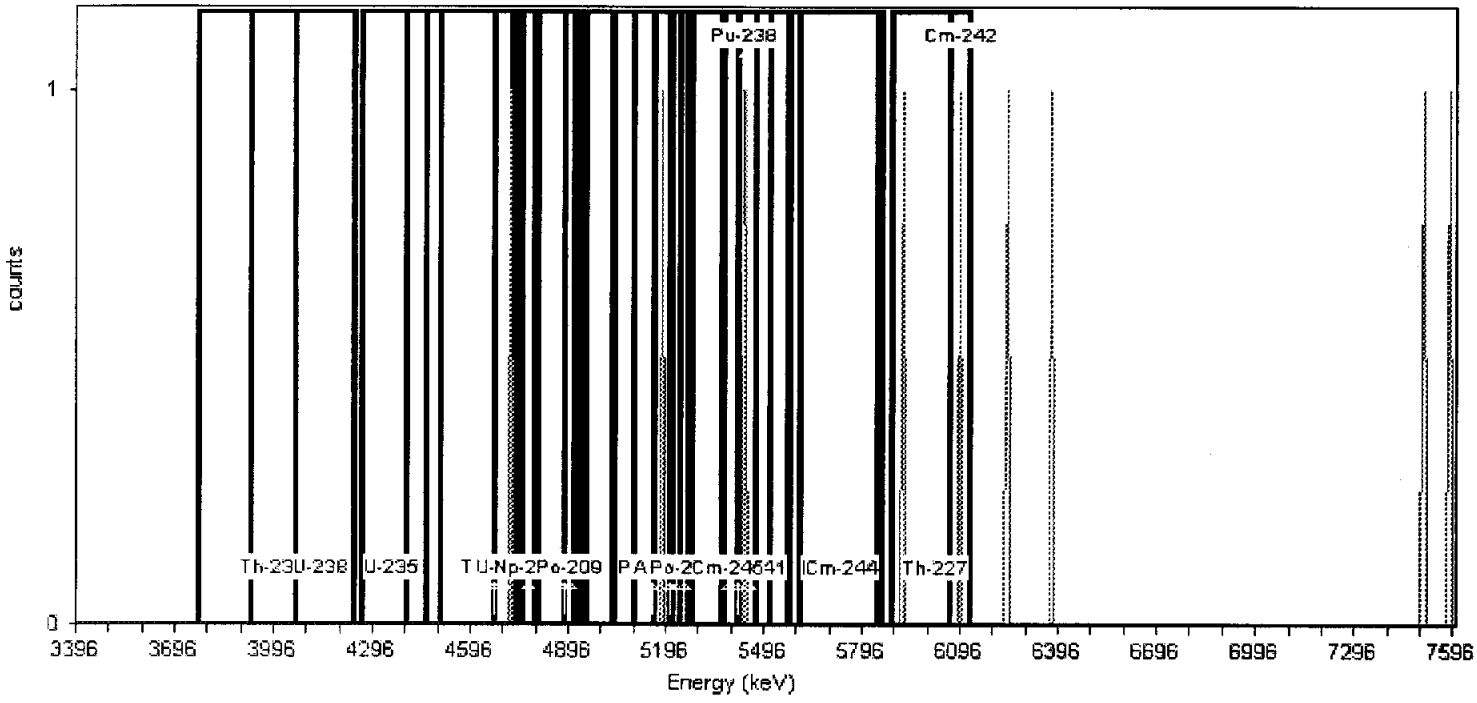
Batch Name: June2007
Description:

Acquisition

Detector: AV78 , SN: 46-033FF4
Acquisition Start Date: 6/24/2007 8:48:28PM
Live Time: 960.00 min.
Real Time: 960.02 min.
Calibration Name: May2007_AV78
Calibration Date: 5/29/2007 11:41:23AM

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 26.88% +/- 0.27% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI Nuclide Library: Background ROI Library
Total Background Counts: 9.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	0.00	0.000E+000	1.473E-003
U-238	4.14	3.93	4.24	0.00	0.000E+000	1.473E-003
U-235	4.35	4.26	4.46	0.00	0.000E+000	1.473E-003
Th-230	4.67	4.40	4.73	1.00	1.042E-003	1.473E-003
U-234	4.70	4.50	4.80	1.00	1.042E-003	1.473E-003
Pu-242	4.88	4.67	4.93	1.00	1.042E-003	1.473E-003
Th-229	4.84	4.72	5.10	0.00	0.000E+000	1.473E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	1.00	1.042E-003	1.473E-003
Am-243	5.20	5.03	5.28	1.00	1.042E-003	1.473E-003
U-232	5.23	5.04	5.37	1.00	1.042E-003	1.473E-003
Th-228	5.41	5.16	5.47	2.00	2.083E-003	1.804E-003
Po-210	5.25	5.20	5.26	0.00	0.000E+000	1.473E-003
Pu-238	5.44	5.24	5.52	1.00	1.042E-003	1.473E-003
Am-241	5.45	5.27	5.57	1.00	1.042E-003	1.473E-003
Cm-245	5.39	5.36	5.41	0.00	0.000E+000	1.473E-003
Pu-236	5.72	5.57	5.84	0.00	0.000E+000	1.473E-003
Cm-244	5.73	5.60	5.86	0.00	0.000E+000	1.473E-003
Th-227	6.02	5.89	6.13	2.00	2.083E-003	1.804E-003
Cm-242	6.10	6.07	6.13	1.00	1.042E-003	1.473E-003

SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:58:39PM 6/25/2007

Analyst: 60040

Sample

Sample Name: AV79
Comment:

Spectrum #1 Analysis #1

Batch

Batch Name: June2007
Description:

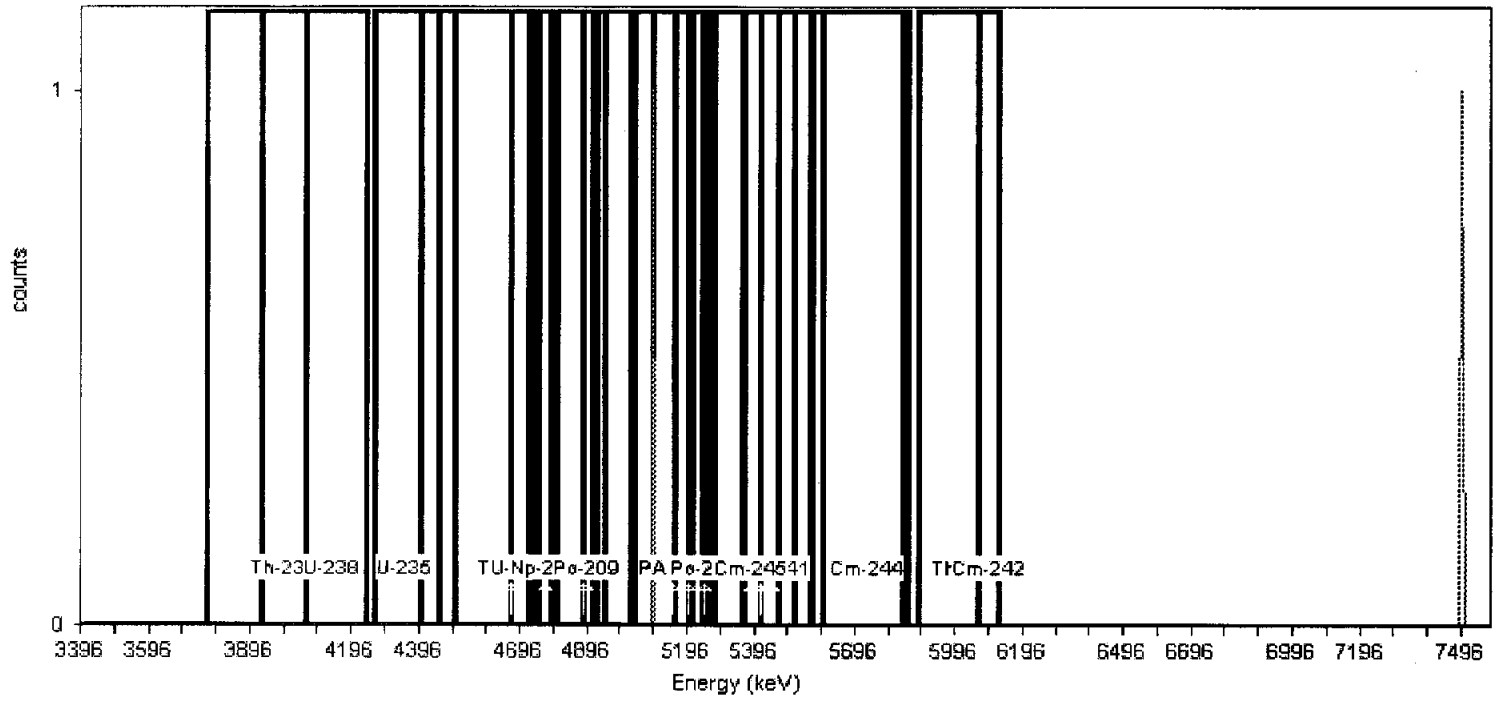
Acquisition

Detector: AV79 , SN: 46-033Q5
Acquisition Start Date: 6/24/2007 8:48:29PM
Live Time: 960.00 min.
Real Time: 960.02 min.
Calibration Name: May2007_AV79
Calibration Date: 5/29/2007 2:22:47PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.25% +/- 0.27% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 2.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	0.00	0.000E+000	1.473E-003
U-238	4.14	3.93	4.24	0.00	0.000E+000	1.473E-003
U-235	4.35	4.26	4.46	0.00	0.000E+000	1.473E-003
Th-230	4.67	4.40	4.73	0.00	0.000E+000	1.473E-003
U-234	4.70	4.50	4.80	0.00	0.000E+000	1.473E-003
Pu-242	4.88	4.67	4.93	0.00	0.000E+000	1.473E-003
Th-229	4.84	4.72	5.10	1.00	1.042E-003	1.473E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	1.00	1.042E-003	1.473E-003
Am-243	5.20	5.03	5.28	1.00	1.042E-003	1.473E-003
U-232	5.23	5.04	5.37	1.00	1.042E-003	1.473E-003
Th-228	5.41	5.16	5.47	0.00	0.000E+000	1.473E-003
Po-210	5.25	5.20	5.26	0.00	0.000E+000	1.473E-003
Pu-238	5.44	5.24	5.52	0.00	0.000E+000	1.473E-003
Am-241	5.45	5.27	5.57	0.00	0.000E+000	1.473E-003
Cm-245	5.39	5.36	5.41	0.00	0.000E+000	1.473E-003
Pu-236	5.72	5.57	5.84	0.00	0.000E+000	1.473E-003
Cm-244	5.73	5.60	5.86	0.00	0.000E+000	1.473E-003
Th-227	6.02	5.89	6.13	0.00	0.000E+000	1.473E-003
Cm-242	6.10	6.07	6.13	0.00	0.000E+000	1.473E-003

ST SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:58:42PM 6/25/2007

Analyst: 60040

Sample

Sample Name: AV80
Comment:

Spectrum #1 Analysis #1

Batch

Batch Name: June2007
Description:

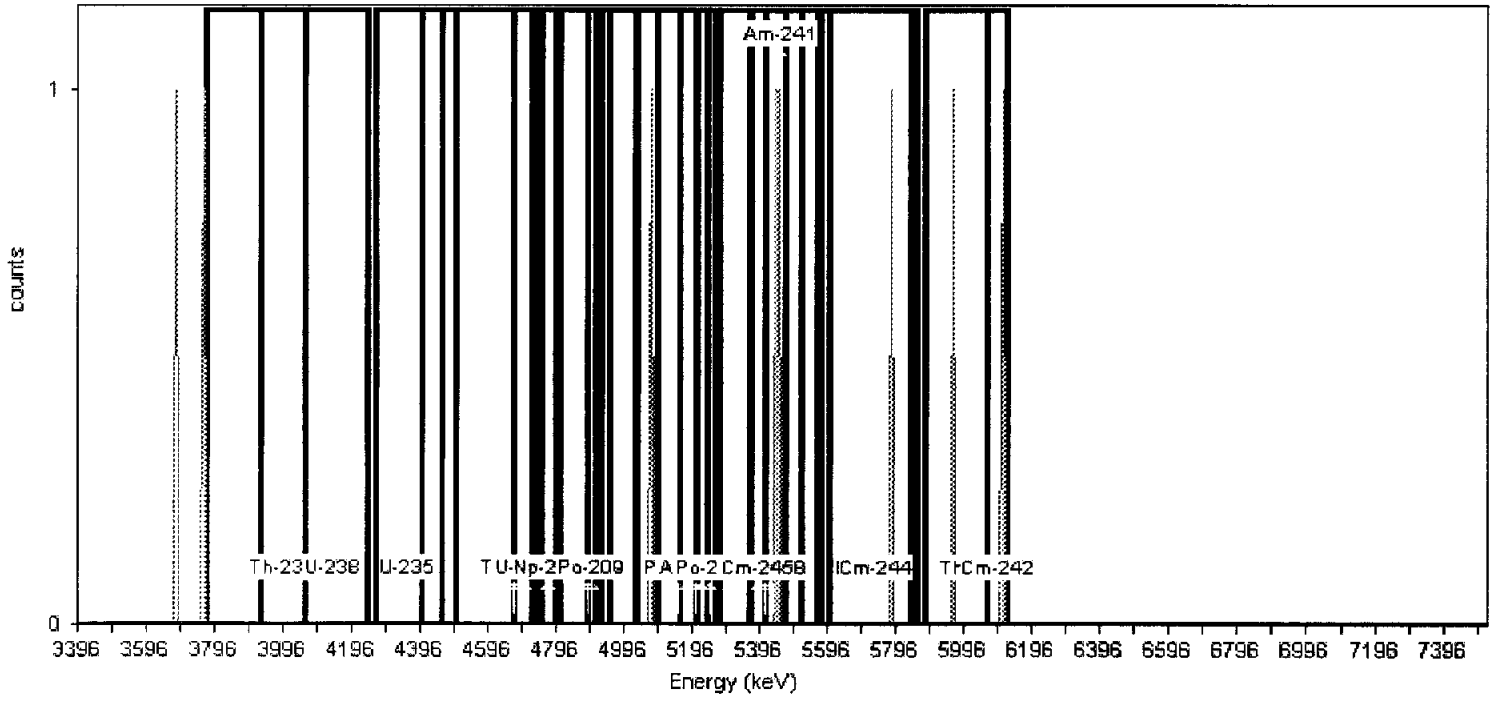
Acquisition

Detector: AV80 , SN: 46-03305
Acquisition Start Date: 6/24/2007 8:48:31PM
Live Time: 960.00 min.
Real Time: 960.02 min.
Calibration Name: May2007_AV80
Calibration Date: 5/29/2007 2:22:56PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 25.95% +/- 0.28% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundRoi
Nuclide Library: Background ROI Library
Total Background Counts: 8.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	0.00	0.000E+000	1.473E-003
U-238	4.14	3.93	4.24	0.00	0.000E+000	1.473E-003
U-235	4.35	4.26	4.46	0.00	0.000E+000	1.473E-003
Th-230	4.67	4.40	4.73	0.00	0.000E+000	1.473E-003
U-234	4.70	4.50	4.80	0.00	0.000E+000	1.473E-003
Pu-242	4.88	4.67	4.93	0.00	0.000E+000	1.473E-003
Th-229	4.84	4.72	5.10	1.00	1.042E-003	1.473E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	1.00	1.042E-003	1.473E-003
Am-243	5.20	5.03	5.28	1.00	1.042E-003	1.473E-003
U-232	5.23	5.04	5.37	1.00	1.042E-003	1.473E-003
Th-228	5.41	5.16	5.47	2.00	2.083E-003	1.804E-003
Po-210	5.25	5.20	5.26	0.00	0.000E+000	1.473E-003
Pu-238	5.44	5.24	5.52	2.00	2.083E-003	1.804E-003
Am-241	5.45	5.27	5.57	2.00	2.083E-003	1.804E-003
Cm-245	5.39	5.36	5.41	0.00	0.000E+000	1.473E-003
Pu-236	5.72	5.57	5.84	1.00	1.042E-003	1.473E-003
Cm-244	5.73	5.60	5.86	1.00	1.042E-003	1.473E-003
Th-227	6.02	5.89	6.13	2.00	2.083E-003	1.804E-003
Cm-242	6.10	6.07	6.13	1.00	1.042E-003	1.473E-003

SEVERN TRENT **STL**

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:58:49PM 6/25/2007

Analyst: 60040

Sample

Sample Name: AV81
Comment:

Spectrum #1 Analysis #1

Batch

Batch Name: June2007
Description:

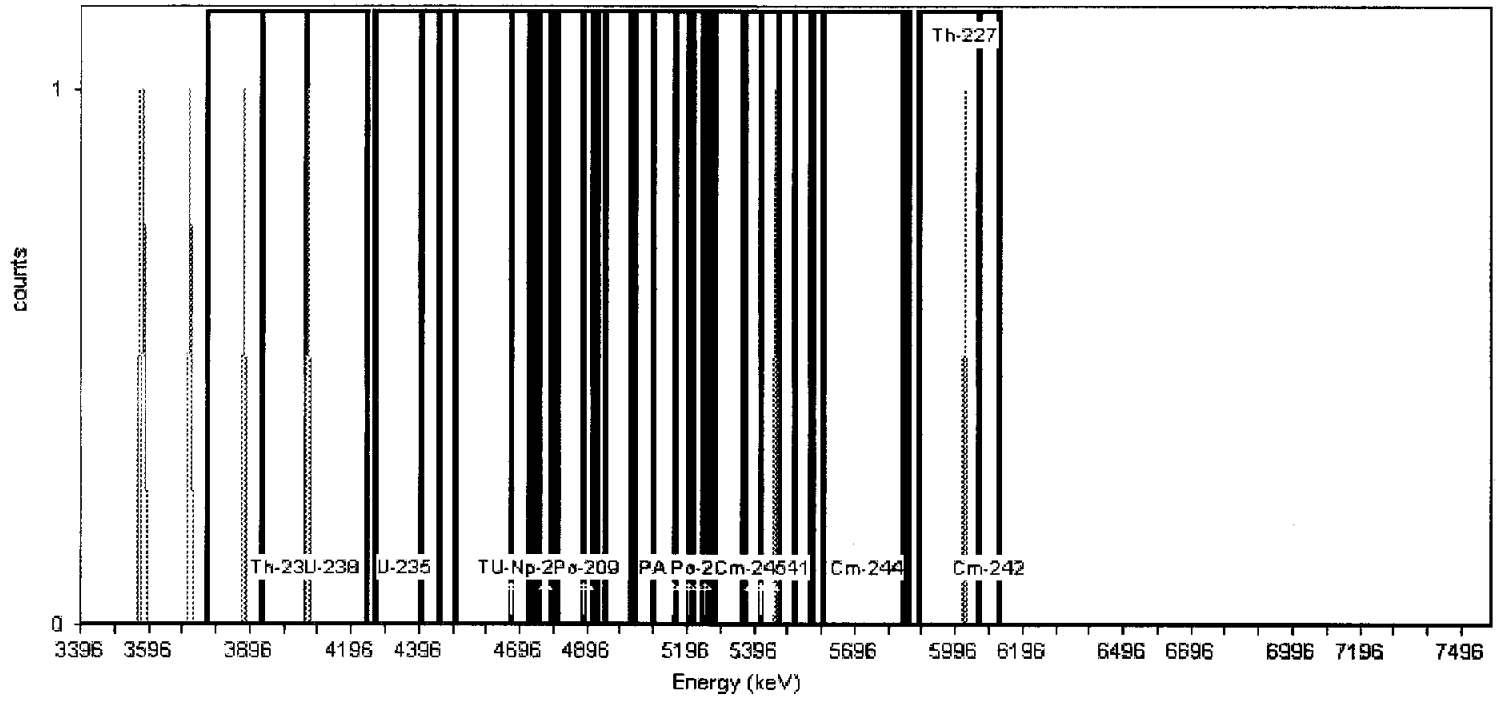
Acquisition

Detector: AV81 , SN: 46-03307
Acquisition Start Date: 6/24/2007 8:48:33PM
Live Time: 960.00 min.
Real Time: 960.02 min.
Calibration Name: May2007_AV81
Calibration Date: 5/29/2007 2:23:02PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.13% +/- 0.29% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 7.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	1.00	1.042E-003	1.473E-003
U-238	4.14	3.93	4.24	1.00	1.042E-003	1.473E-003
U-235	4.35	4.26	4.46	0.00	0.000E+000	1.473E-003
Th-230	4.67	4.40	4.73	0.00	0.000E+000	1.473E-003
U-234	4.70	4.50	4.80	0.00	0.000E+000	1.473E-003
Pu-242	4.88	4.67	4.93	0.00	0.000E+000	1.473E-003
Th-229	4.84	4.72	5.10	0.00	0.000E+000	1.473E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	0.00	0.000E+000	1.473E-003
Am-243	5.20	5.03	5.28	0.00	0.000E+000	1.473E-003
U-232	5.23	5.04	5.37	0.00	0.000E+000	1.473E-003
Th-228	5.41	5.16	5.47	1.00	1.042E-003	1.473E-003
Po-210	5.25	5.20	5.26	0.00	0.000E+000	1.473E-003
Pu-238	5.44	5.24	5.52	1.00	1.042E-003	1.473E-003
Am-241	5.45	5.27	5.57	1.00	1.042E-003	1.473E-003
Cm-245	5.39	5.36	5.41	0.00	0.000E+000	1.473E-003
Pu-236	5.72	5.57	5.84	0.00	0.000E+000	1.473E-003
Cm-244	5.73	5.60	5.86	0.00	0.000E+000	1.473E-003
Th-227	6.02	5.89	6.13	1.00	1.042E-003	1.473E-003
Cm-242	6.10	6.07	6.13	0.00	0.000E+000	1.473E-003

SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:58:55PM 6/25/2007

Analyst: 60040

Sample

Sample Name: AV82
Comment:

Spectrum #1 Analysis #1

Batch

Batch Name: June2007
Description:

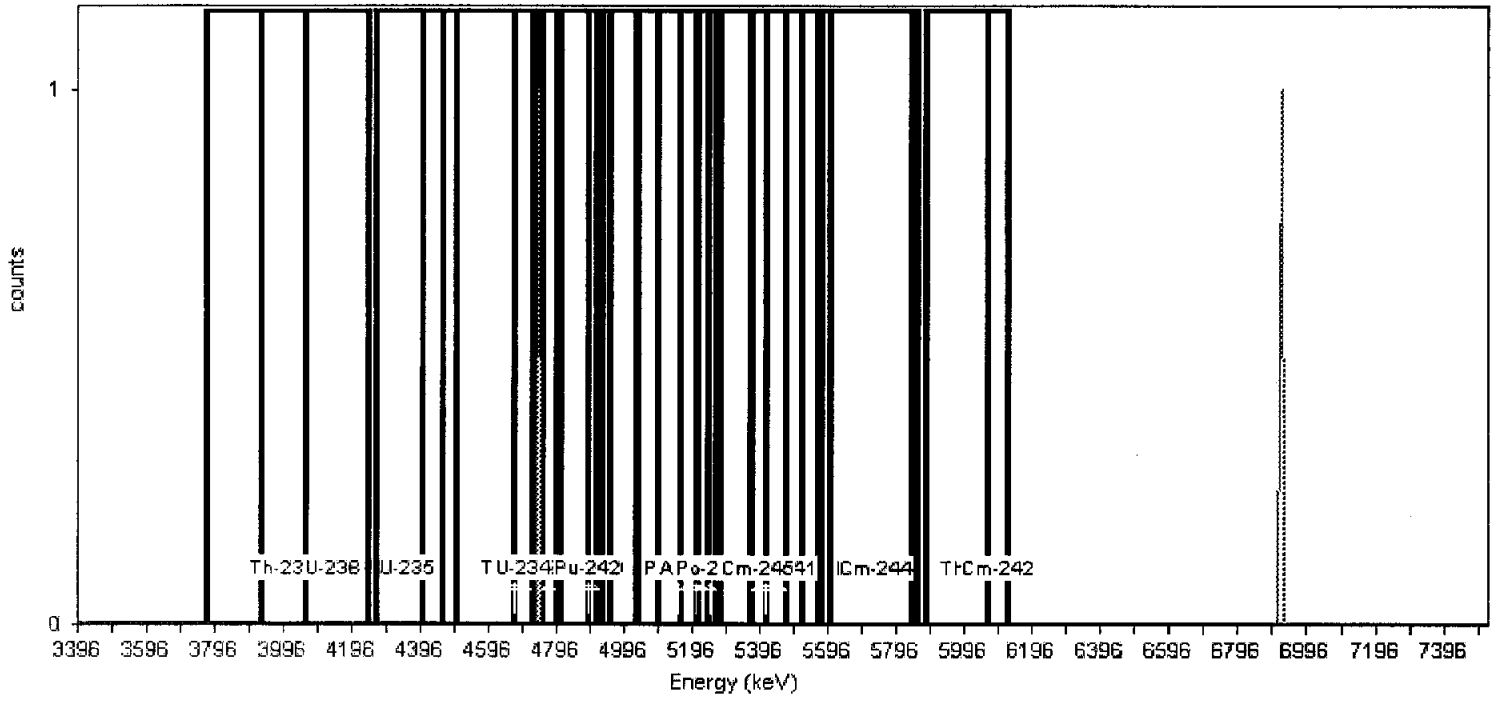
Acquisition

Detector: AV82 , SN: 46-032EE5
Acquisition Start Date: 6/24/2007 8:48:35PM
Live Time: 960.00 min.
Real Time: 960.02 min.
Calibration Name: May2007_AV82
Calibration Date: 5/29/2007 2:23:09PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 26.61% +/- 0.27% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 2.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-229	4.84	4.72	5.10	1.00	1.042E-003	1.473E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	0.00	0.000E+000	1.473E-003
Am-243	5.20	5.03	5.28	0.00	0.000E+000	1.473E-003
U-232	5.23	5.04	5.37	0.00	0.000E+000	1.473E-003
Th-228	5.41	5.16	5.47	0.00	0.000E+000	1.473E-003
Po-210	5.25	5.20	5.26	0.00	0.000E+000	1.473E-003
Pu-238	5.44	5.24	5.52	0.00	0.000E+000	1.473E-003
Am-241	5.45	5.27	5.57	0.00	0.000E+000	1.473E-003
Cm-245	5.39	5.36	5.41	0.00	0.000E+000	1.473E-003
Pu-236	5.72	5.57	5.84	0.00	0.000E+000	1.473E-003
Cm-244	5.73	5.60	5.86	0.00	0.000E+000	1.473E-003
Th-227	6.02	5.89	6.13	0.00	0.000E+000	1.473E-003
Cm-242	6.10	6.07	6.13	0.00	0.000E+000	1.473E-003
Th-232	3.99	3.77	4.06	0.00	0.000E+000	1.473E-003
U-238	4.14	3.93	4.24	0.00	0.000E+000	1.473E-003
U-235	4.35	4.26	4.46	0.00	0.000E+000	1.473E-003
Th-230	4.67	4.40	4.73	0.00	0.000E+000	1.473E-003
U-234	4.70	4.50	4.80	1.00	1.042E-003	1.473E-003
Pu-242	4.88	4.67	4.93	1.00	1.042E-003	1.473E-003

ST SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:59:02PM 6/25/2007

Analyst: 60040

Sample

Sample Name: AV83
Comment:

Spectrum #1 Analysis #1

Batch

Batch Name: June2007
Description:

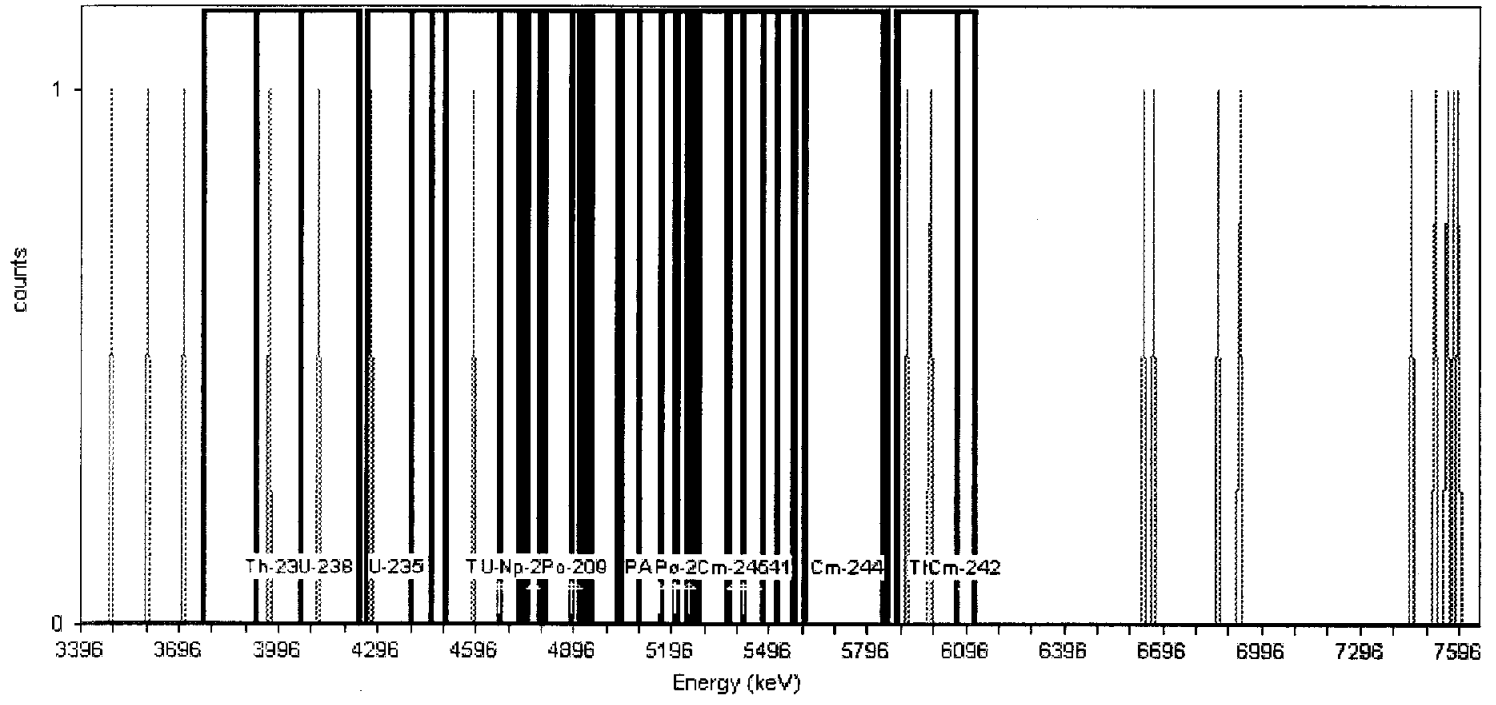
Acquisition

Detector: AV83 , SN: 46-03306
Acquisition Start Date: 6/24/2007 8:48:36PM
Live Time: 960.00 min.
Real Time: 960.02 min.
Calibration Name: May2007_AV83
Calibration Date: 5/29/2007 4:48:19PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 26.74% +/- 0.26% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 18.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	1.00	1.042E-003	1.473E-003
U-238	4.14	3.93	4.24	2.00	2.083E-003	1.804E-003
U-235	4.35	4.26	4.46	1.00	1.042E-003	1.473E-003
Th-230	4.67	4.40	4.73	1.00	1.042E-003	1.473E-003
U-234	4.70	4.50	4.80	1.00	1.042E-003	1.473E-003
Pu-242	4.88	4.67	4.93	0.00	0.000E+000	1.473E-003
Th-229	4.84	4.72	5.10	0.00	0.000E+000	1.473E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	0.00	0.000E+000	1.473E-003
Am-243	5.20	5.03	5.28	0.00	0.000E+000	1.473E-003
U-232	5.23	5.04	5.37	0.00	0.000E+000	1.473E-003
Th-228	5.41	5.16	5.47	0.00	0.000E+000	1.473E-003
Po-210	5.25	5.20	5.26	0.00	0.000E+000	1.473E-003
Pu-238	5.44	5.24	5.52	0.00	0.000E+000	1.473E-003
Am-241	5.45	5.27	5.57	0.00	0.000E+000	1.473E-003
Cm-245	5.39	5.36	5.41	0.00	0.000E+000	1.473E-003
Pu-236	5.72	5.57	5.84	0.00	0.000E+000	1.473E-003
Cm-244	5.73	5.60	5.86	0.00	0.000E+000	1.473E-003
Th-227	6.02	5.89	6.13	2.00	2.083E-003	1.804E-003
Cm-242	6.10	6.07	6.13	0.00	0.000E+000	1.473E-003

SEVERN TRENT **STL**

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:59:08PM 6/25/2007

Analyst: 60040

Sample

Sample Name: AV84 Spectrum #1 Analysis #1

Comment:

Batch

Batch Name: June2007

Description:

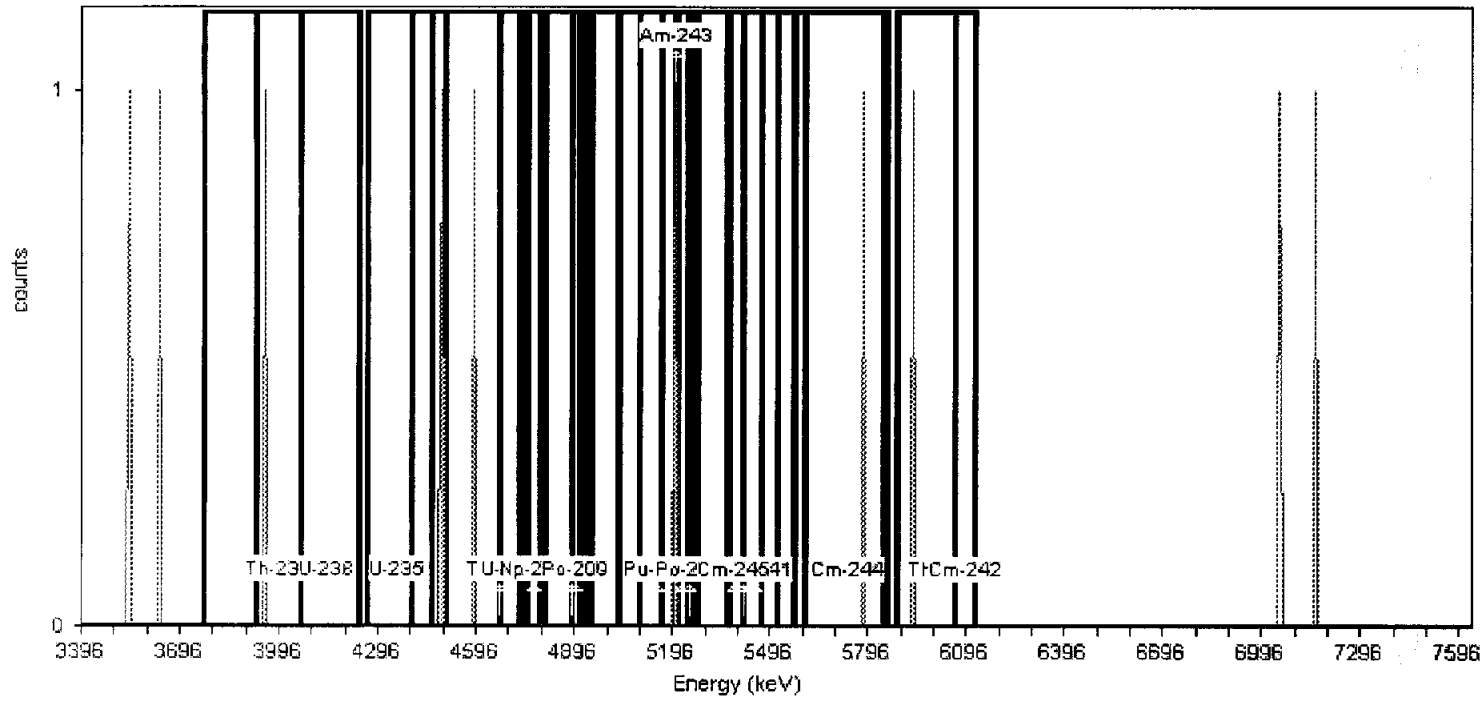
Acquisition

Detector: AV84 , SN: 46-033FF3
Acquisition Start Date: 6/24/2007 8:48:39PM
Live Time: 960.00 min.
Real Time: 960.02 min.
Calibration Name: May2007_AV84
Calibration Date: 5/29/2007 4:48:49PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 26.83% +/- 0.28% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI Nuclide Library: Background ROI Library

Total Background Counts: 10.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	1.00	1.042E-003	1.473E-003
U-238	4.14	3.93	4.24	1.00	1.042E-003	1.473E-003
U-235	4.35	4.26	4.46	0.00	0.000E+000	1.473E-003
Th-230	4.67	4.40	4.73	2.00	2.083E-003	1.804E-003
U-234	4.70	4.50	4.80	1.00	1.042E-003	1.473E-003
Pu-242	4.88	4.67	4.93	0.00	0.000E+000	1.473E-003
Th-229	4.84	4.72	5.10	0.00	0.000E+000	1.473E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	1.00	1.042E-003	1.473E-003
Am-243	5.20	5.03	5.28	1.00	1.042E-003	1.473E-003
U-232	5.23	5.04	5.37	1.00	1.042E-003	1.473E-003
Th-228	5.41	5.16	5.47	1.00	1.042E-003	1.473E-003
Po-210	5.25	5.20	5.26	1.00	1.042E-003	1.473E-003
Pu-238	5.44	5.24	5.52	0.00	0.000E+000	1.473E-003
Am-241	5.45	5.27	5.57	0.00	0.000E+000	1.473E-003
Cm-245	5.39	5.36	5.41	0.00	0.000E+000	1.473E-003
Pu-236	5.72	5.57	5.84	1.00	1.042E-003	1.473E-003
Cm-244	5.73	5.60	5.86	1.00	1.042E-003	1.473E-003
Th-227	6.02	5.89	6.13	1.00	1.042E-003	1.473E-003
Cm-242	6.10	6.07	6.13	0.00	0.000E+000	1.473E-003

SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 12:59:14PM 6/25/2007

Sample

Sample Name: AV85 Spectrum #1 Analysis #1

Comment:

Batch

Batch Name: June2007

Description:

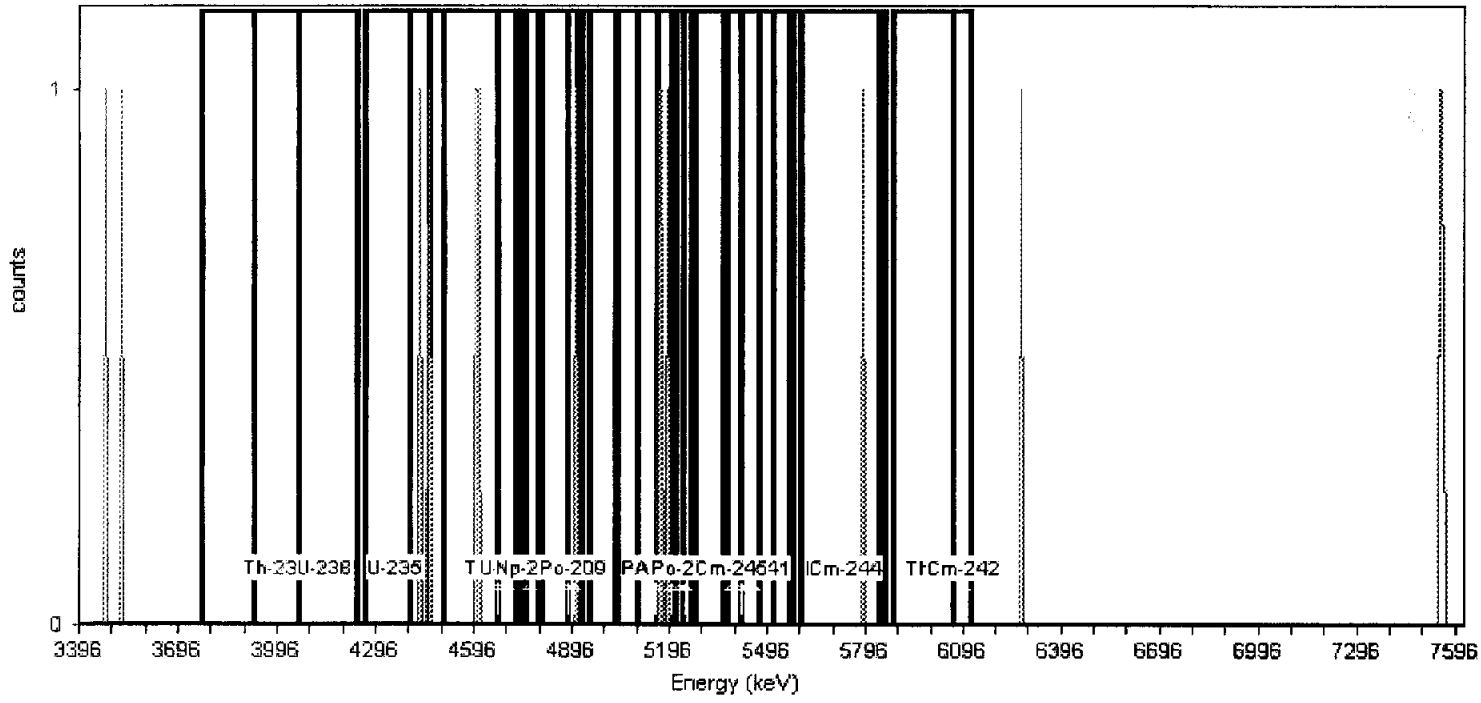
Acquisition

Detector: AV85 , SN: 46-032EE7
Acquisition Start Date: 6/24/2007 8:48:41PM
Live Time: 960.00 min.
Real Time: 960.02 min.
Calibration Name: May2007_AV85
Calibration Date: 5/29/2007 4:49:01PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.64% +/- 0.30% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI Nuclide Library: Background ROI Library

Total Background Counts: 13.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	0.00	0.000E+000	1.473E-003
U-238	4.14	3.93	4.24	0.00	0.000E+000	1.473E-003
U-235	4.35	4.26	4.46	2.00	2.083E-003	1.804E-003
Th-230	4.67	4.40	4.73	4.00	4.167E-003	2.329E-003
U-234	4.70	4.50	4.80	2.00	2.083E-003	1.804E-003
Pu-242	4.88	4.67	4.93	1.00	1.042E-003	1.473E-003
Th-229	4.84	4.72	5.10	1.00	1.042E-003	1.473E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	1.00	1.042E-003	1.473E-003
Pu-239	5.15	4.95	5.21	2.00	2.083E-003	1.804E-003
Am-243	5.20	5.03	5.28	2.00	2.083E-003	1.804E-003
U-232	5.23	5.04	5.37	2.00	2.083E-003	1.804E-003
Th-228	5.41	5.16	5.47	2.00	2.083E-003	1.804E-003
Po-210	5.25	5.20	5.26	0.00	0.000E+000	1.473E-003
Pu-238	5.44	5.24	5.52	0.00	0.000E+000	1.473E-003
Am-241	5.45	5.27	5.57	0.00	0.000E+000	1.473E-003
Cm-245	5.39	5.36	5.41	0.00	0.000E+000	1.473E-003
Pu-236	5.72	5.57	5.84	1.00	1.042E-003	1.473E-003
Cm-244	5.73	5.60	5.86	1.00	1.042E-003	1.473E-003
Th-227	6.02	5.89	6.13	0.00	0.000E+000	1.473E-003
Cm-242	6.10	6.07	6.13	0.00	0.000E+000	1.473E-003

ST SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:59:21PM 6/25/2007

Analyst: 60040

Sample

Sample Name: AV86
Comment:

Spectrum #1 Analysis #1

Batch

Batch Name: June2007
Description:

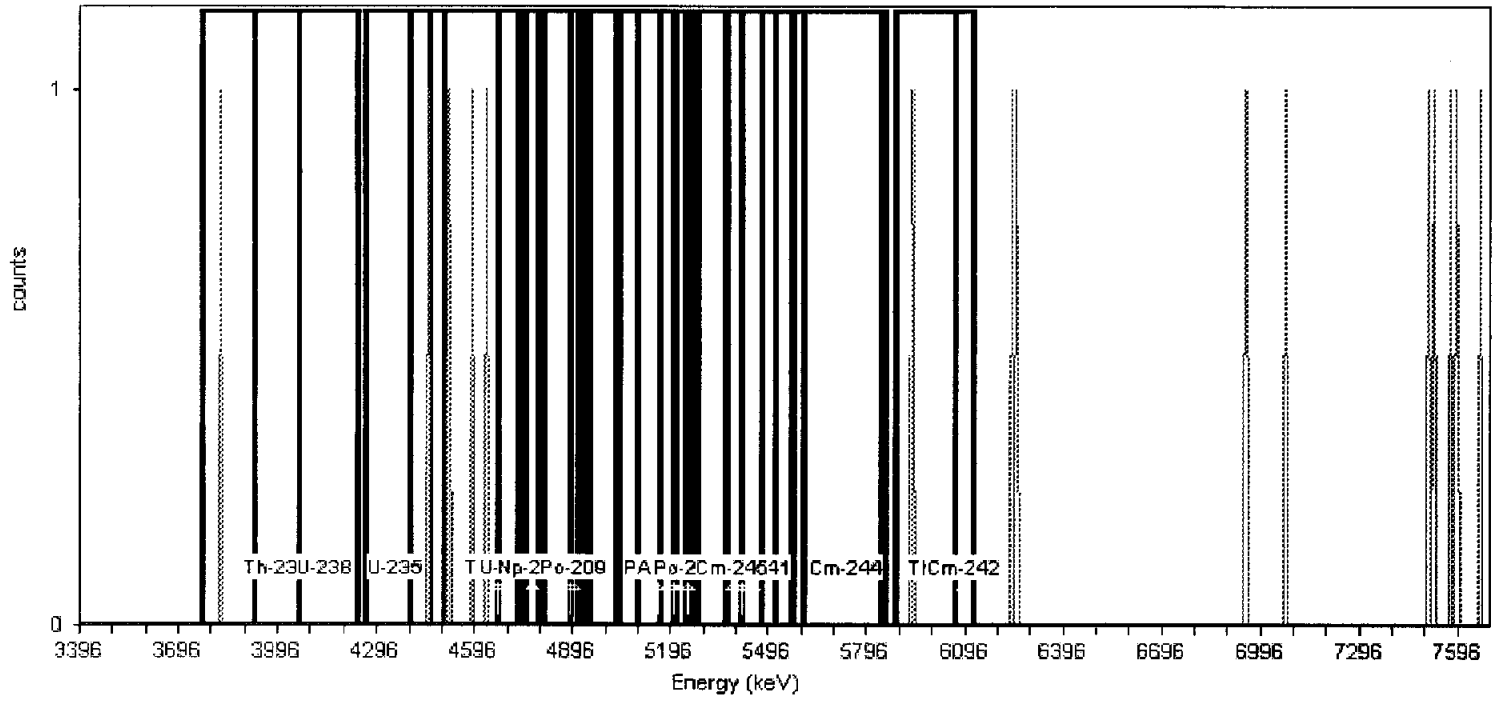
Acquisition

Detector: AV86 , SN: 46-033Q6
Acquisition Start Date: 6/24/2007 8:48:42PM
Live Time: 960.00 min.
Real Time: 960.02 min.
Calibration Name: May2007_AV86
Calibration Date: 5/29/2007 4:49:12PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 26.97% +/- 0.27% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 16.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	1.00	1.042E-003	1.473E-003
U-238	4.14	3.93	4.24	0.00	0.000E+000	1.473E-003
U-235	4.35	4.26	4.46	1.00	1.042E-003	1.473E-003
Th-230	4.67	4.40	4.73	4.00	4.167E-003	2.329E-003
U-234	4.70	4.50	4.80	3.00	3.125E-003	2.083E-003
Pu-242	4.88	4.67	4.93	0.00	0.000E+000	1.473E-003
Th-229	4.84	4.72	5.10	0.00	0.000E+000	1.473E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	0.00	0.000E+000	1.473E-003
Am-243	5.20	5.03	5.28	0.00	0.000E+000	1.473E-003
U-232	5.23	5.04	5.37	0.00	0.000E+000	1.473E-003
Th-228	5.41	5.16	5.47	0.00	0.000E+000	1.473E-003
Po-210	5.25	5.20	5.26	0.00	0.000E+000	1.473E-003
Pu-238	5.44	5.24	5.52	0.00	0.000E+000	1.473E-003
Am-241	5.45	5.27	5.57	0.00	0.000E+000	1.473E-003
Cm-245	5.39	5.36	5.41	0.00	0.000E+000	1.473E-003
Pu-236	5.72	5.57	5.84	0.00	0.000E+000	1.473E-003
Cm-244	5.73	5.60	5.86	0.00	0.000E+000	1.473E-003
Th-227	6.02	5.89	6.13	1.00	1.042E-003	1.473E-003
Cm-242	6.10	6.07	6.13	0.00	0.000E+000	1.473E-003

ST SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:48:03PM 6/25/2007

Analyst: 60040

Sample

Sample Name: AV87 Spectrum #1 Analysis #1

Comment:

Batch

Batch Name: June2007

Description:

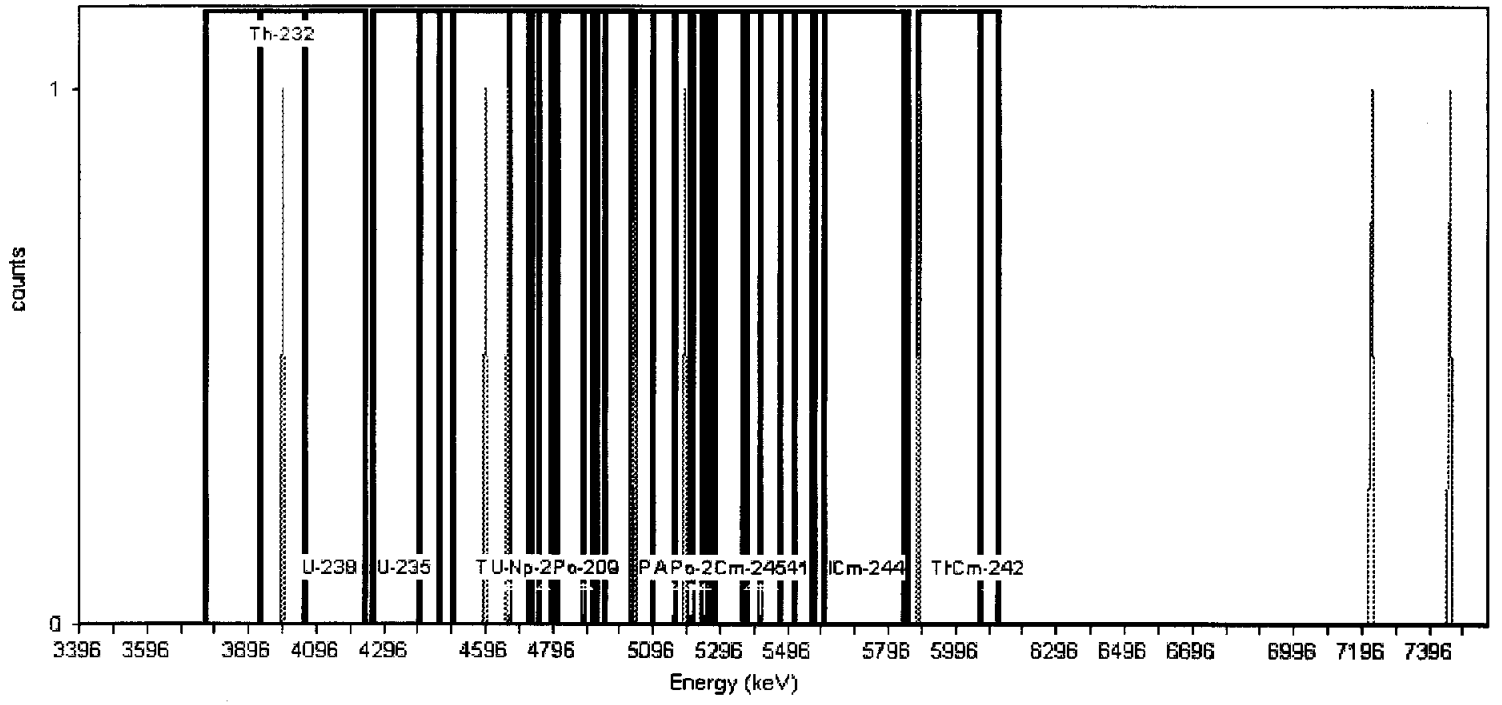
Acquisition

Detector: AV87 , SN: 46-033FF5
Acquisition Start Date: 6/24/2007 8:48:44PM
Live Time: 960.00 min.
Real Time: 960.02 min.
Calibration Name: May2007_AV87
Calibration Date: 5/29/2007 7:36:56PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.08% +/- 0.27% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI Nuclide Library: Background ROI Library

Total Background Counts: 8.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	1.00	1.042E-003	1.473E-003
U-238	4.14	3.93	4.24	1.00	1.042E-003	1.473E-003
U-235	4.35	4.26	4.46	0.00	0.000E+000	1.473E-003
Th-230	4.67	4.40	4.73	2.00	2.083E-003	1.804E-003
U-234	4.70	4.50	4.80	2.00	2.083E-003	1.804E-003
Pu-242	4.88	4.67	4.93	0.00	0.000E+000	1.473E-003
Th-229	4.84	4.72	5.10	1.00	1.042E-003	1.473E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	2.00	2.083E-003	1.804E-003
Am-243	5.20	5.03	5.28	2.00	2.083E-003	1.804E-003
U-232	5.23	5.04	5.37	2.00	2.083E-003	1.804E-003
Th-228	5.41	5.16	5.47	1.00	1.042E-003	1.473E-003
Po-210	5.25	5.20	5.26	0.00	0.000E+000	1.473E-003
Pu-238	5.44	5.24	5.52	0.00	0.000E+000	1.473E-003
Am-241	5.45	5.27	5.57	0.00	0.000E+000	1.473E-003
Cm-245	5.39	5.36	5.41	0.00	0.000E+000	1.473E-003
Pu-236	5.72	5.57	5.84	0.00	0.000E+000	1.473E-003
Cm-244	5.73	5.60	5.86	0.00	0.000E+000	1.473E-003
Th-227	6.02	5.89	6.13	1.00	1.042E-003	1.473E-003
Cm-242	6.10	6.07	6.13	0.00	0.000E+000	1.473E-003

ST SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:58:22PM 6/25/2007

Analyst: 60040

Sample

Sample Name: AV88 Spectrum #1 Analysis #1

Comment:

Batch

Batch Name: June2007

Description:

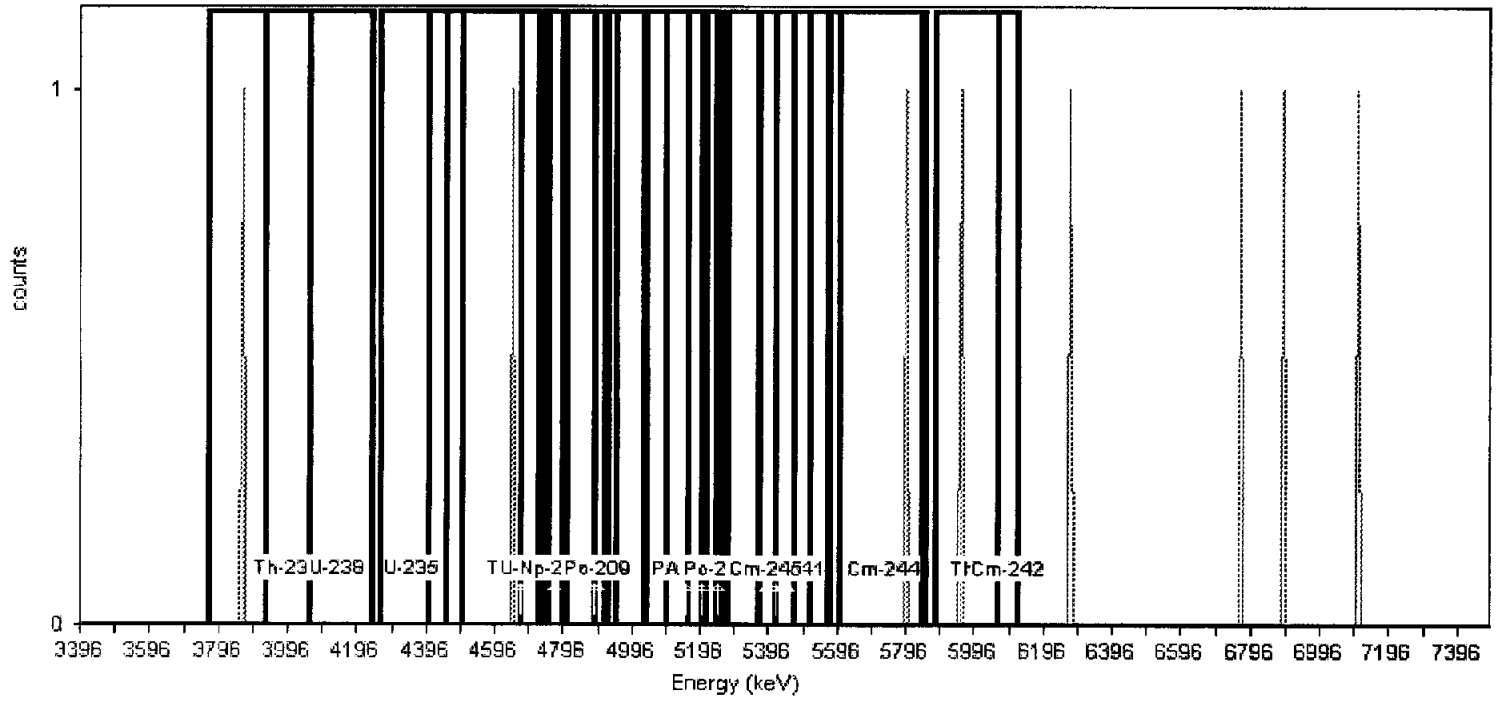
Acquisition

Detector: AV88 , SN: 76-033FF1
Acquisition Start Date: 6/24/2007 8:48:46PM
Live Time: 960.00 min.
Real Time: 960.02 min.
Calibration Name: May2007_AV88
Calibration Date: 5/29/2007 7:37:08PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 26.42% +/- 0.28% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI Nuclide Library: Background ROI Library

Total Background Counts: 8.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	1.00	1.042E-003	1.473E-003
U-238	4.14	3.93	4.24	0.00	0.000E+000	1.473E-003
U-235	4.35	4.26	4.46	0.00	0.000E+000	1.473E-003
Th-230	4.67	4.40	4.73	1.00	1.042E-003	1.473E-003
U-234	4.70	4.50	4.80	1.00	1.042E-003	1.473E-003
Pu-242	4.88	4.67	4.93	0.00	0.000E+000	1.473E-003
Th-229	4.84	4.72	5.10	0.00	0.000E+000	1.473E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	0.00	0.000E+000	1.473E-003
Am-243	5.20	5.03	5.28	0.00	0.000E+000	1.473E-003
U-232	5.23	5.04	5.37	0.00	0.000E+000	1.473E-003
Th-228	5.41	5.16	5.47	0.00	0.000E+000	1.473E-003
Po-210	5.25	5.20	5.26	0.00	0.000E+000	1.473E-003
Pu-238	5.44	5.24	5.52	0.00	0.000E+000	1.473E-003
Am-241	5.45	5.27	5.57	0.00	0.000E+000	1.473E-003
Cm-245	5.39	5.36	5.41	0.00	0.000E+000	1.473E-003
Pu-236	5.72	5.57	5.84	1.00	1.042E-003	1.473E-003
Cm-244	5.73	5.60	5.86	1.00	1.042E-003	1.473E-003
Th-227	6.02	5.89	6.13	1.00	1.042E-003	1.473E-003
Cm-242	6.10	6.07	6.13	0.00	0.000E+000	1.473E-003

ST SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:58:36PM 6/25/2007

Analyst: 60040

Sample

Sample Name: AV89
Comment:

Spectrum #1 Analysis #1

Batch

Batch Name: June2007
Description:

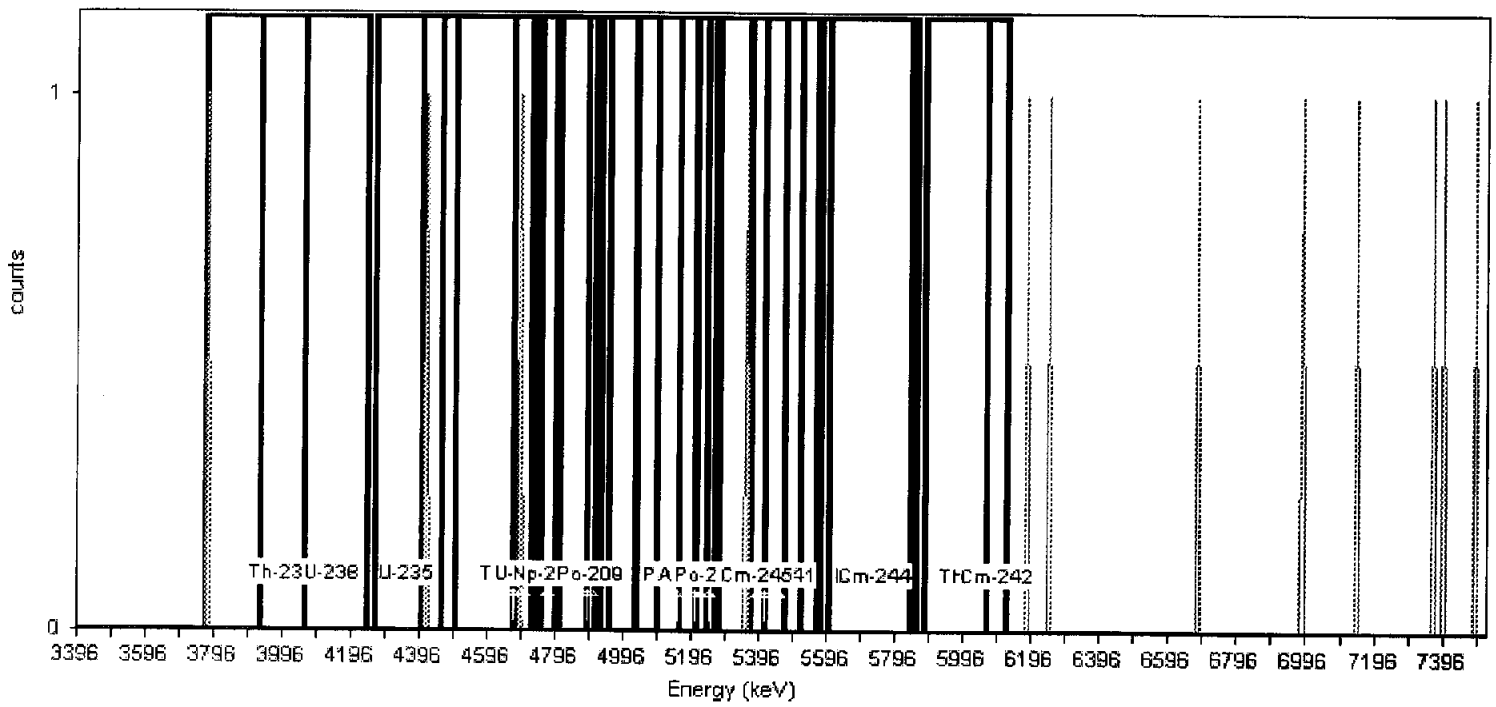
Acquisition

Detector: AV89 , SN: 46-033P5
Acquisition Start Date: 6/24/2007 8:48:47PM
Live Time: 960.00 min.
Real Time: 960.02 min.
Calibration Name: May2007_AV89
Calibration Date: 5/29/2007 7:37:20PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.28% +/- 0.29% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_Background
Nuclide Library: Background ROI Library
Total Background Counts: 12.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	1.00	1.042E-003	1.473E-003
U-238	4.14	3.93	4.24	0.00	0.000E+000	1.473E-003
U-235	4.35	4.26	4.46	1.00	1.042E-003	1.473E-003
Th-230	4.67	4.40	4.73	2.00	2.083E-003	1.804E-003
U-234	4.70	4.50	4.80	1.00	1.042E-003	1.473E-003
Pu-242	4.88	4.67	4.93	1.00	1.042E-003	1.473E-003
Th-229	4.84	4.72	5.10	0.00	0.000E+000	1.473E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	0.00	0.000E+000	1.473E-003
Am-243	5.20	5.03	5.28	0.00	0.000E+000	1.473E-003
U-232	5.23	5.04	5.37	1.00	1.042E-003	1.473E-003
Th-228	5.41	5.16	5.47	1.00	1.042E-003	1.473E-003
Po-210	5.25	5.20	5.26	0.00	0.000E+000	1.473E-003
Pu-238	5.44	5.24	5.52	1.00	1.042E-003	1.473E-003
Am-241	5.45	5.27	5.57	1.00	1.042E-003	1.473E-003
Cm-245	5.39	5.36	5.41	0.00	0.000E+000	1.473E-003
Pu-236	5.72	5.57	5.84	0.00	0.000E+000	1.473E-003
Cm-244	5.73	5.60	5.86	0.00	0.000E+000	1.473E-003
Th-227	6.02	5.89	6.13	0.00	0.000E+000	1.473E-003
Cm-242	6.10	6.07	6.13	0.00	0.000E+000	1.473E-003

ST SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:58:32PM 6/25/2007

Analyst: 60040

Sample

Sample Name: AV90
Comment:

Spectrum #1 Analysis #1

Batch

Batch Name: June2007
Description:

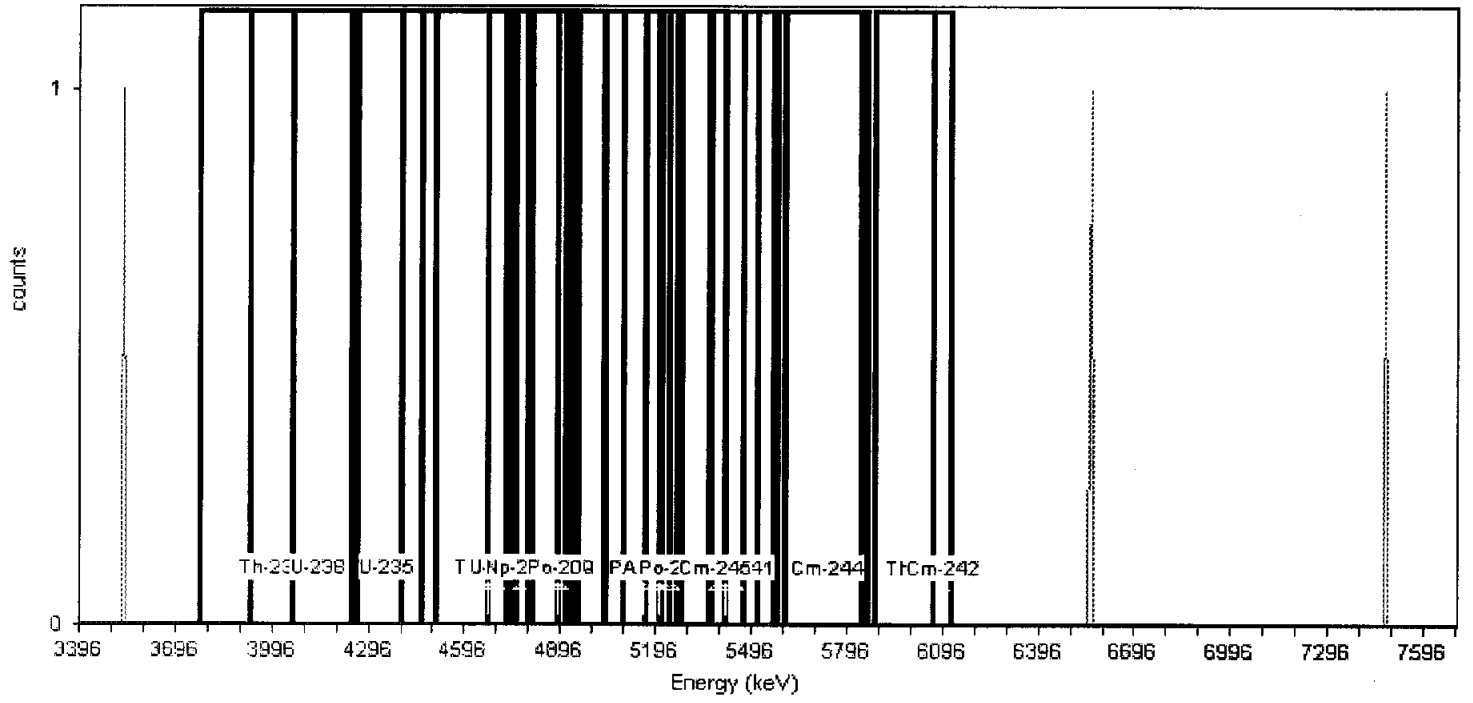
Acquisition

Detector: AV90 , SN: 46-033Q1
Acquisition Start Date: 6/24/2007 8:48:49PM
Live Time: 960.00 min.
Real Time: 960.02 min.
Calibration Name: May2007_AV90
Calibration Date: 5/29/2007 7:37:35PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.61% +/- 0.28% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 3.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	0.00	0.000E+000	1.473E-003
U-238	4.14	3.93	4.24	0.00	0.000E+000	1.473E-003
U-235	4.35	4.26	4.46	0.00	0.000E+000	1.473E-003
Th-230	4.67	4.40	4.73	0.00	0.000E+000	1.473E-003
U-234	4.70	4.50	4.80	0.00	0.000E+000	1.473E-003
Pu-242	4.88	4.67	4.93	0.00	0.000E+000	1.473E-003
Th-229	4.84	4.72	5.10	0.00	0.000E+000	1.473E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	0.00	0.000E+000	1.473E-003
Am-243	5.20	5.03	5.28	0.00	0.000E+000	1.473E-003
U-232	5.23	5.04	5.37	0.00	0.000E+000	1.473E-003
Th-228	5.41	5.16	5.47	0.00	0.000E+000	1.473E-003
Po-210	5.25	5.20	5.26	0.00	0.000E+000	1.473E-003
Pu-238	5.44	5.24	5.52	0.00	0.000E+000	1.473E-003
Am-241	5.45	5.27	5.57	0.00	0.000E+000	1.473E-003
Cm-245	5.39	5.36	5.41	0.00	0.000E+000	1.473E-003
Pu-236	5.72	5.57	5.84	0.00	0.000E+000	1.473E-003
Cm-244	5.73	5.60	5.86	0.00	0.000E+000	1.473E-003
Th-227	6.02	5.89	6.13	0.00	0.000E+000	1.473E-003
Cm-242	6.10	6.07	6.13	0.00	0.000E+000	1.473E-003

ST SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:58:46PM 6/25/2007

Analyst: 60040

Sample

Sample Name: AV92
Comment:

Spectrum #1 Analysis #1

Batch

Batch Name: June2007
Description:

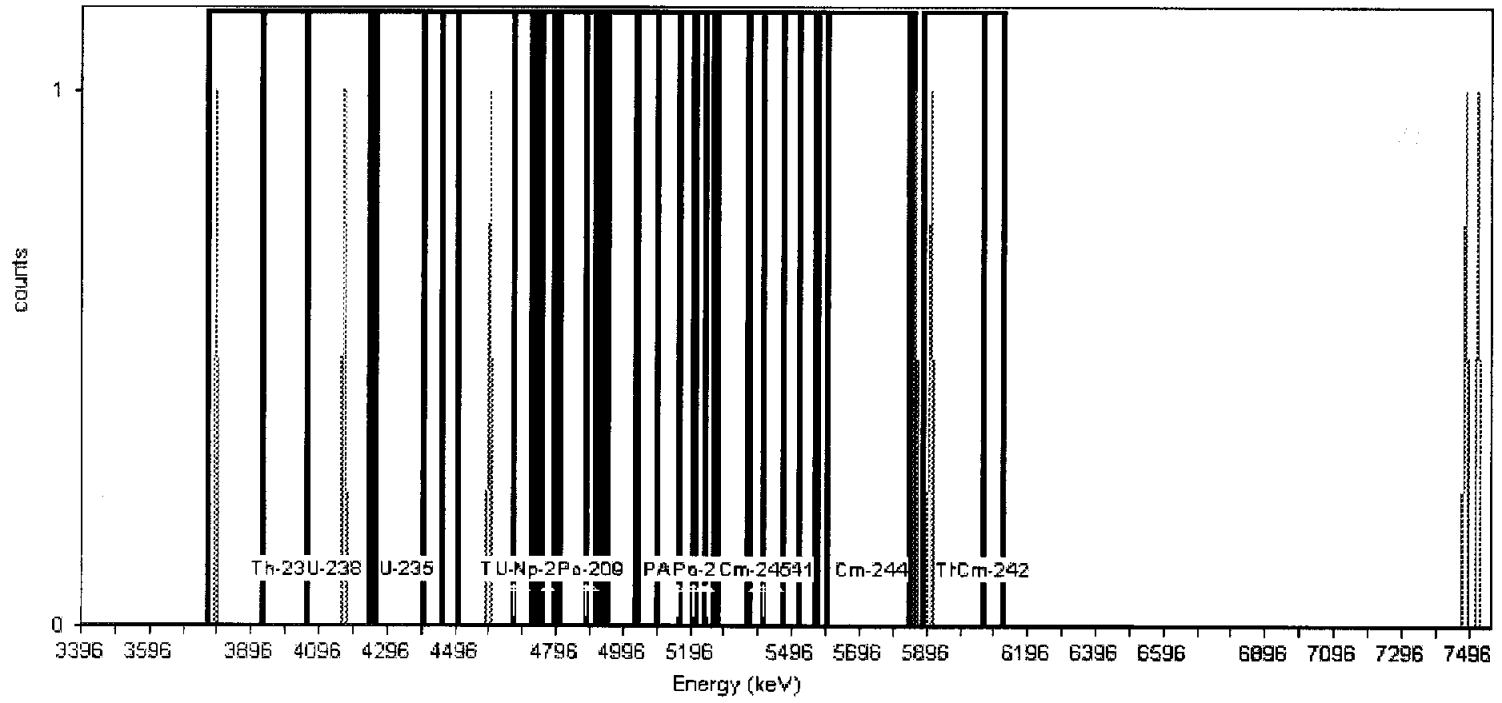
Acquisition

Detector: AV92 , SN: 46-033FF2
Acquisition Start Date: 6/24/2007 8:48:52PM
Live Time: 960.00 min.
Real Time: 960.01 min.
Calibration Name: May2007_AV92
Calibration Date: 5/29/2007 10:13:53PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 26.35% +/- 0.28% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 7.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	1.00	1.042E-003	1.473E-003
U-238	4.14	3.93	4.24	1.00	1.042E-003	1.473E-003
U-235	4.35	4.26	4.46	0.00	0.000E+000	1.473E-003
Th-230	4.67	4.40	4.73	1.00	1.042E-003	1.473E-003
U-234	4.70	4.50	4.80	1.00	1.042E-003	1.473E-003
Pu-242	4.88	4.67	4.93	0.00	0.000E+000	1.473E-003
Th-229	4.84	4.72	5.10	0.00	0.000E+000	1.473E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	0.00	0.000E+000	1.473E-003
Am-243	5.20	5.03	5.28	0.00	0.000E+000	1.473E-003
U-232	5.23	5.04	5.37	0.00	0.000E+000	1.473E-003
Th-228	5.41	5.16	5.47	0.00	0.000E+000	1.473E-003
Po-210	5.25	5.20	5.26	0.00	0.000E+000	1.473E-003
Pu-238	5.44	5.24	5.52	0.00	0.000E+000	1.473E-003
Am-241	5.45	5.27	5.57	0.00	0.000E+000	1.473E-003
Cm-245	5.39	5.36	5.41	0.00	0.000E+000	1.473E-003
Pu-236	5.72	5.57	5.84	0.00	0.000E+000	1.473E-003
Cm-244	5.73	5.60	5.86	0.00	0.000E+000	1.473E-003
Th-227	6.02	5.89	6.13	1.00	1.042E-003	1.473E-003
Cm-242	6.10	6.07	6.13	0.00	0.000E+000	1.473E-003

ST SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:58:52PM 6/25/2007

Analyst: 60040

Sample

Sample Name: AV93
Comment:

Spectrum #1 Analysis #1

Batch

Batch Name: June2007
Description:

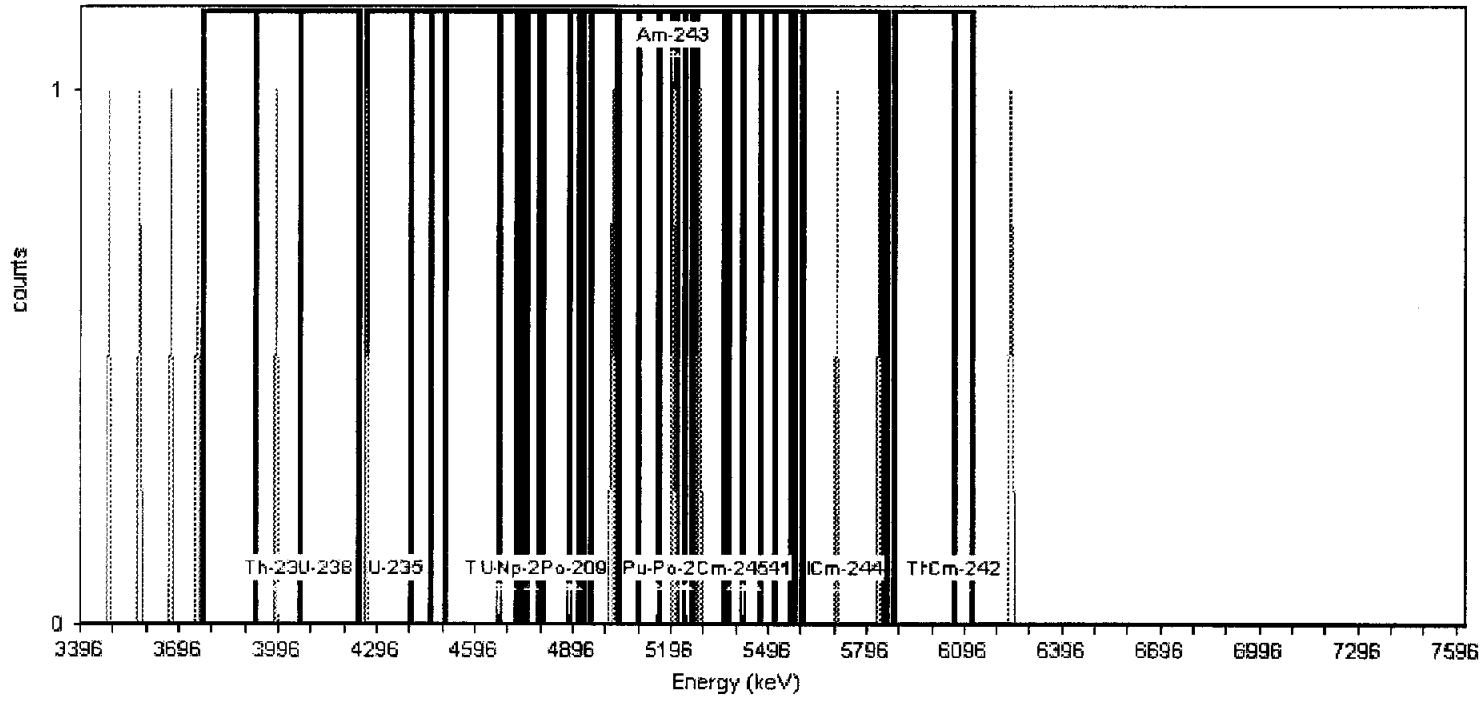
Acquisition

Detector: AV93 , SN: 46-033Q2
Acquisition Start Date: 6/24/2007 8:48:54PM
Live Time: 960.00 min.
Real Time: 960.01 min.
Calibration Name: May2007_AV93
Calibration Date: 5/29/2007 10:14:03PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 26.51% +/- 0.29% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 12.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	1.00	1.042E-003	1.473E-003
U-238	4.14	3.93	4.24	1.00	1.042E-003	1.473E-003
U-235	4.35	4.26	4.46	1.00	1.042E-003	1.473E-003
Th-230	4.67	4.40	4.73	0.00	0.000E+000	1.473E-003
U-234	4.70	4.50	4.80	0.00	0.000E+000	1.473E-003
Pu-242	4.88	4.67	4.93	0.00	0.000E+000	1.473E-003
Th-229	4.84	4.72	5.10	1.00	1.042E-003	1.473E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	2.00	2.083E-003	1.804E-003
Am-243	5.20	5.03	5.28	1.00	1.042E-003	1.473E-003
U-232	5.23	5.04	5.37	2.00	2.083E-003	1.804E-003
Th-228	5.41	5.16	5.47	2.00	2.083E-003	1.804E-003
Po-210	5.25	5.20	5.26	1.00	1.042E-003	1.473E-003
Pu-238	5.44	5.24	5.52	1.00	1.042E-003	1.473E-003
Am-241	5.45	5.27	5.57	1.00	1.042E-003	1.473E-003
Cm-245	5.39	5.36	5.41	0.00	0.000E+000	1.473E-003
Pu-236	5.72	5.57	5.84	2.00	2.083E-003	1.804E-003
Cm-244	5.73	5.60	5.86	2.00	2.083E-003	1.804E-003
Th-227	6.02	5.89	6.13	0.00	0.000E+000	1.473E-003
Cm-242	6.10	6.07	6.13	0.00	0.000E+000	1.473E-003

SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:58:58PM 6/25/2007

Analyst: 60040

Sample

Sample Name: AV94
Comment:

Spectrum #1 Analysis #1

Batch

Batch Name: June2007
Description:

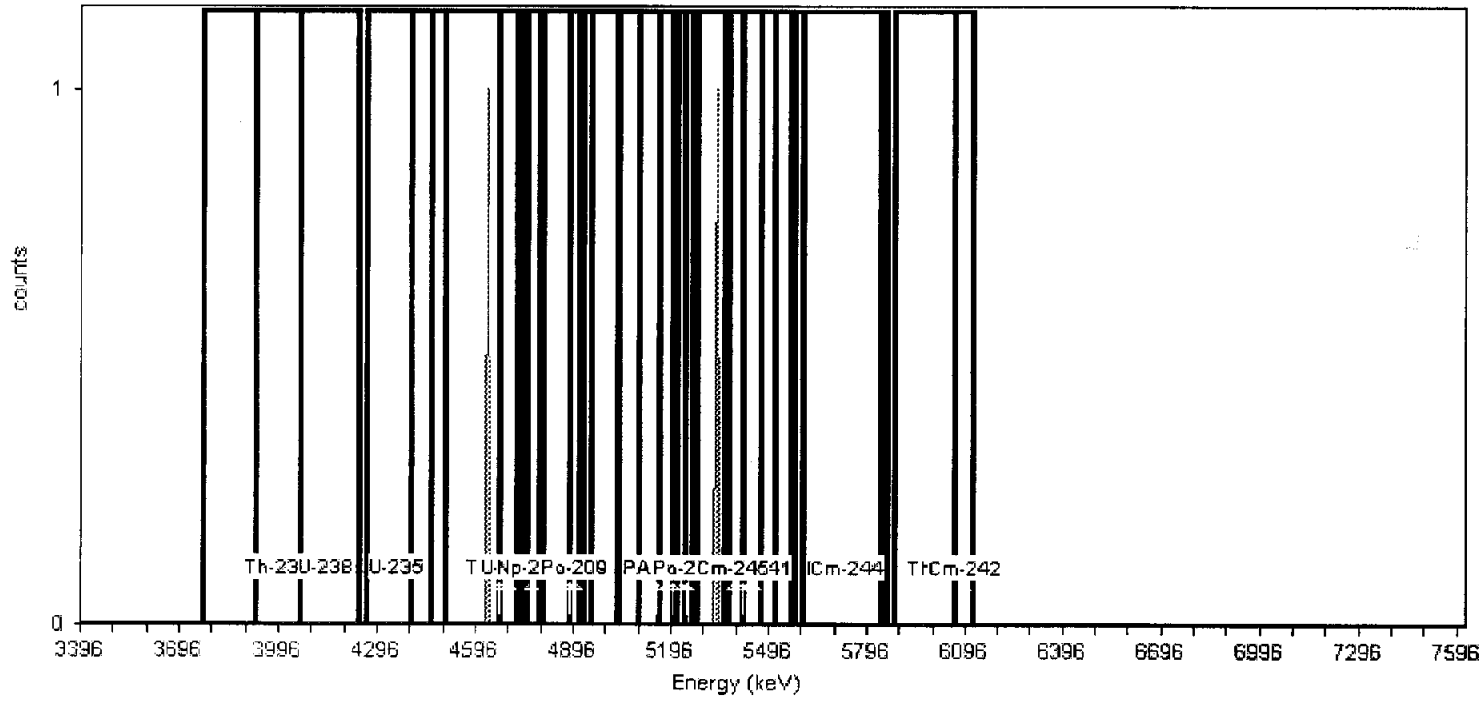
Acquisition

Detector: AV94 , SN: 46-032EE6
Acquisition Start Date: 6/24/2007 8:48:56PM
Live Time: 960.00 min.
Real Time: 960.01 min.
Calibration Name: May2007_AV94
Calibration Date: 5/29/2007 10:14:14PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 28.06% +/- 0.28% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 2.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	0.00	0.000E+000	1.473E-003
U-238	4.14	3.93	4.24	0.00	0.000E+000	1.473E-003
U-235	4.35	4.26	4.46	0.00	0.000E+000	1.473E-003
Th-230	4.67	4.40	4.73	1.00	1.042E-003	1.473E-003
U-234	4.70	4.50	4.80	1.00	1.042E-003	1.473E-003
Pu-242	4.88	4.67	4.93	0.00	0.000E+000	1.473E-003
Th-229	4.84	4.72	5.10	0.00	0.000E+000	1.473E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	0.00	0.000E+000	1.473E-003
Am-243	5.20	5.03	5.28	0.00	0.000E+000	1.473E-003
U-232	5.23	5.04	5.37	1.00	1.042E-003	1.473E-003
Th-228	5.41	5.16	5.47	1.00	1.042E-003	1.473E-003
Po-210	5.25	5.20	5.26	0.00	0.000E+000	1.473E-003
Pu-238	5.44	5.24	5.52	1.00	1.042E-003	1.473E-003
Am-241	5.45	5.27	5.57	1.00	1.042E-003	1.473E-003
Cm-245	5.39	5.36	5.41	0.00	0.000E+000	1.473E-003
Pu-236	5.72	5.57	5.84	0.00	0.000E+000	1.473E-003
Cm-244	5.73	5.60	5.86	0.00	0.000E+000	1.473E-003
Th-227	6.02	5.89	6.13	0.00	0.000E+000	1.473E-003
Cm-242	6.10	6.07	6.13	0.00	0.000E+000	1.473E-003

STL SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:59:05PM 6/25/2007

Analyst: 60040

Sample

Sample Name: AV95
Comment:

Spectrum #1 Analysis #1

Batch

Batch Name: June2007
Description:

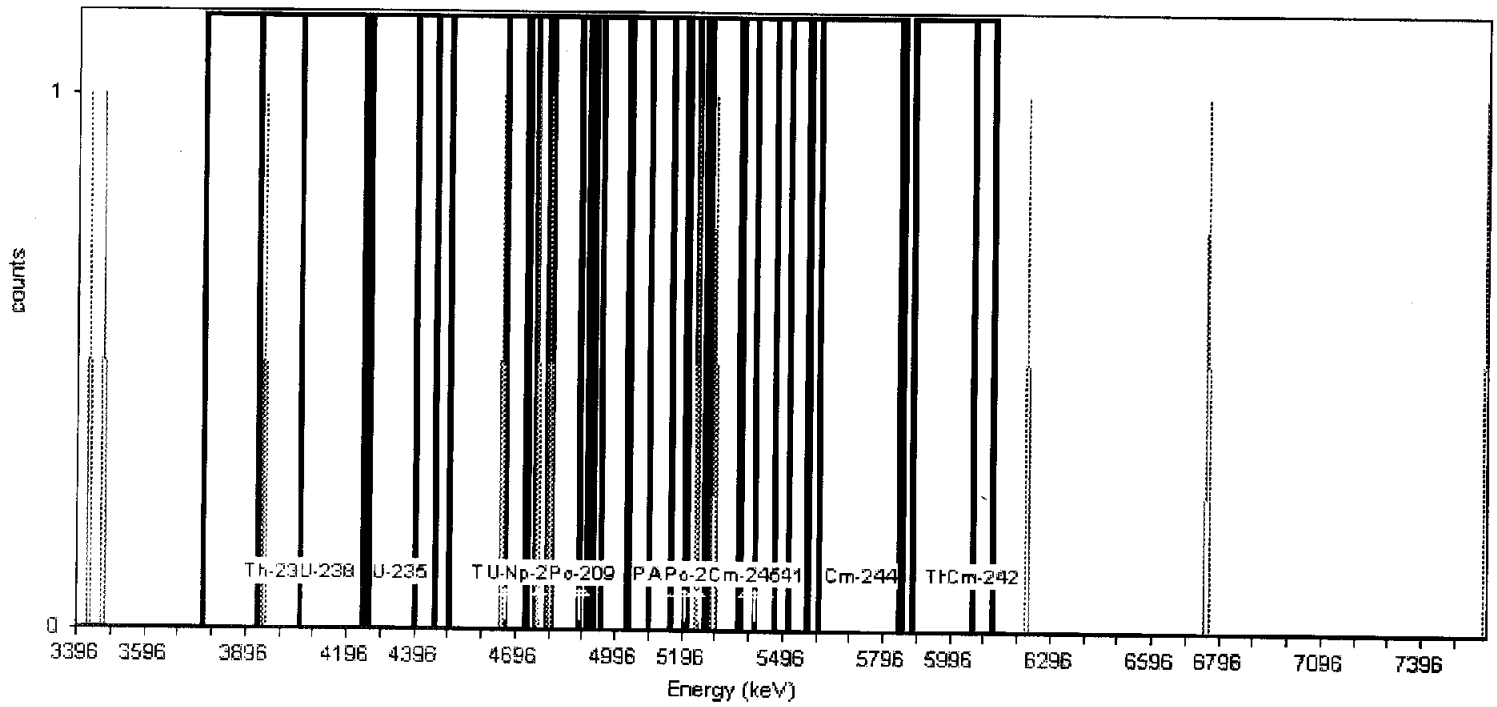
Acquisition

Detector: AV95 , SN: 46-033P4
Acquisition Start Date: 6/24/2007 8:48:57PM
Live Time: 960.00 min.
Real Time: 960.01 min.
Calibration Name: May2007_AV95
Calibration Date: 5/29/2007 10:13:42PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.90% +/- 0.27% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundRoi
Nuclide Library: Background ROI Library
Total Background Counts: 11.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	1.00	1.042E-003	1.473E-003
U-238	4.14	3.93	4.24	1.00	1.042E-003	1.473E-003
U-235	4.35	4.26	4.46	0.00	0.000E+000	1.473E-003
Th-230	4.67	4.40	4.73	1.00	1.042E-003	1.473E-003
U-234	4.70	4.50	4.80	3.00	3.125E-003	2.083E-003
Pu-242	4.88	4.67	4.93	2.00	2.083E-003	1.804E-003
Th-229	4.84	4.72	5.10	2.00	2.083E-003	1.804E-003
Np-237	4.77	4.75	4.79	1.00	1.042E-003	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	0.00	0.000E+000	1.473E-003
Am-243	5.20	5.03	5.28	1.00	1.042E-003	1.473E-003
U-232	5.23	5.04	5.37	2.00	2.083E-003	1.804E-003
Th-228	5.41	5.16	5.47	2.00	2.083E-003	1.804E-003
Po-210	5.25	5.20	5.26	1.00	1.042E-003	1.473E-003
Pu-238	5.44	5.24	5.52	2.00	2.083E-003	1.804E-003
Am-241	5.45	5.27	5.57	1.00	1.042E-003	1.473E-003
Cm-245	5.39	5.36	5.41	0.00	0.000E+000	1.473E-003
Pu-236	5.72	5.57	5.84	0.00	0.000E+000	1.473E-003
Cm-244	5.73	5.60	5.86	0.00	0.000E+000	1.473E-003
Th-227	6.02	5.89	6.13	0.00	0.000E+000	1.473E-003
Cm-242	6.10	6.07	6.13	0.00	0.000E+000	1.473E-003

SEVERN TRENT **STL**

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:59:11PM 6/25/2007

Analyst: 60040

Sample

Sample Name: AV96
Comment:

Spectrum #1 Analysis #1

Batch

Batch Name: June2007
Description:

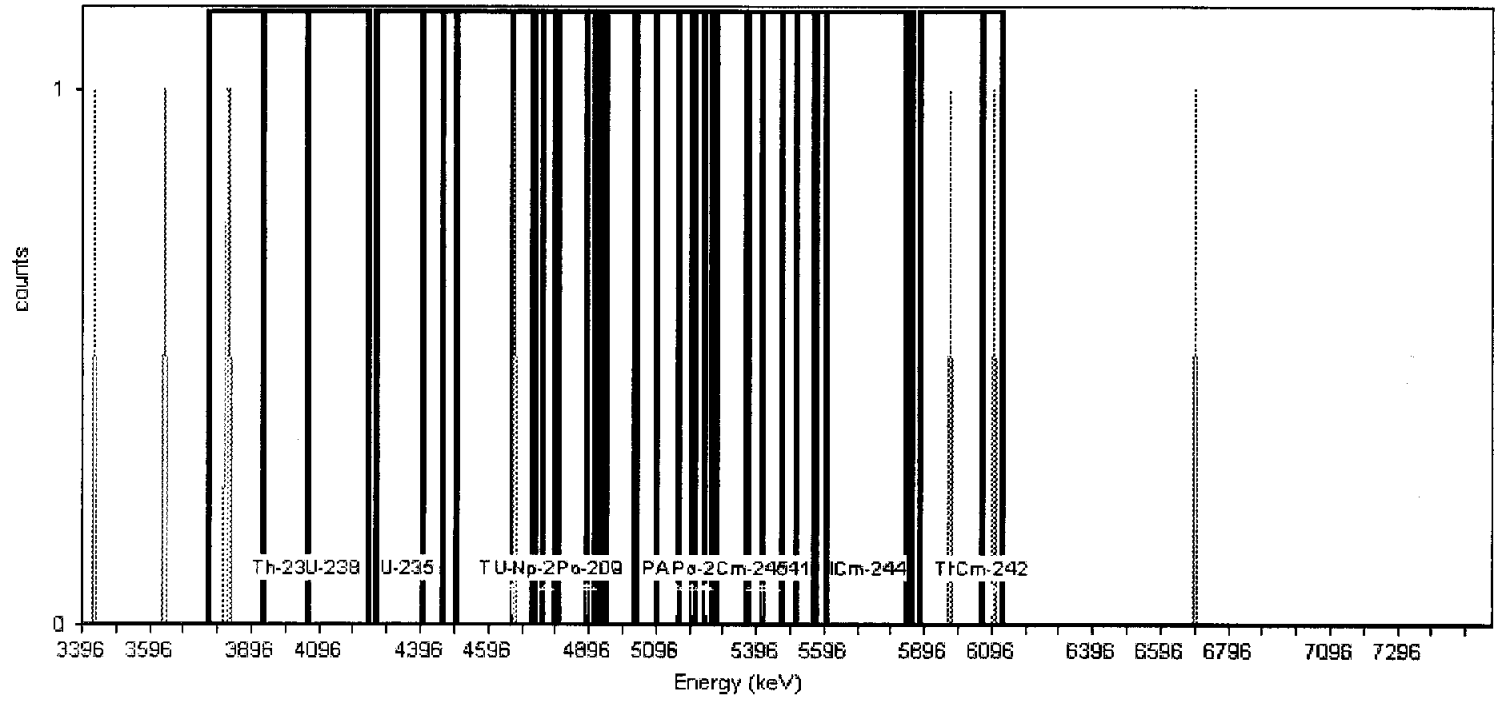
Acquisition

Detector: AV96 , SN: 46-033P1
Acquisition Start Date: 6/24/2007 8:48:59PM
Live Time: 960.00 min.
Real Time: 960.01 min.
Calibration Name: May2007_AV96
Calibration Date: 5/30/2007 6:46:33AM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 26.37% +/- 0.28% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 8.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	2.00	2.083E-003	1.804E-003
U-238	4.14	3.93	4.24	0.00	0.000E+000	1.473E-003
U-235	4.35	4.26	4.46	0.00	0.000E+000	1.473E-003
Th-230	4.67	4.40	4.73	1.00	1.042E-003	1.473E-003
U-234	4.70	4.50	4.80	1.00	1.042E-003	1.473E-003
Pu-242	4.88	4.67	4.93	1.00	1.042E-003	1.473E-003
Th-229	4.84	4.72	5.10	0.00	0.000E+000	1.473E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	0.00	0.000E+000	1.473E-003
Am-243	5.20	5.03	5.28	0.00	0.000E+000	1.473E-003
U-232	5.23	5.04	5.37	0.00	0.000E+000	1.473E-003
Th-228	5.41	5.16	5.47	0.00	0.000E+000	1.473E-003
Po-210	5.25	5.20	5.26	0.00	0.000E+000	1.473E-003
Pu-238	5.44	5.24	5.52	0.00	0.000E+000	1.473E-003
Am-241	5.45	5.27	5.57	0.00	0.000E+000	1.473E-003
Cm-245	5.39	5.36	5.41	0.00	0.000E+000	1.473E-003
Pu-236	5.72	5.57	5.84	0.00	0.000E+000	1.473E-003
Cm-244	5.73	5.60	5.86	0.00	0.000E+000	1.473E-003
Th-227	6.02	5.89	6.13	2.00	2.083E-003	1.804E-003
Cm-242	6.10	6.07	6.13	1.00	1.042E-003	1.473E-003

SEVERN TRENT **STL**

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:59:18PM 6/25/2007

Analyst: 60040

Sample

Sample Name: AV97
Comment:

Spectrum #1 Analysis #1

Batch

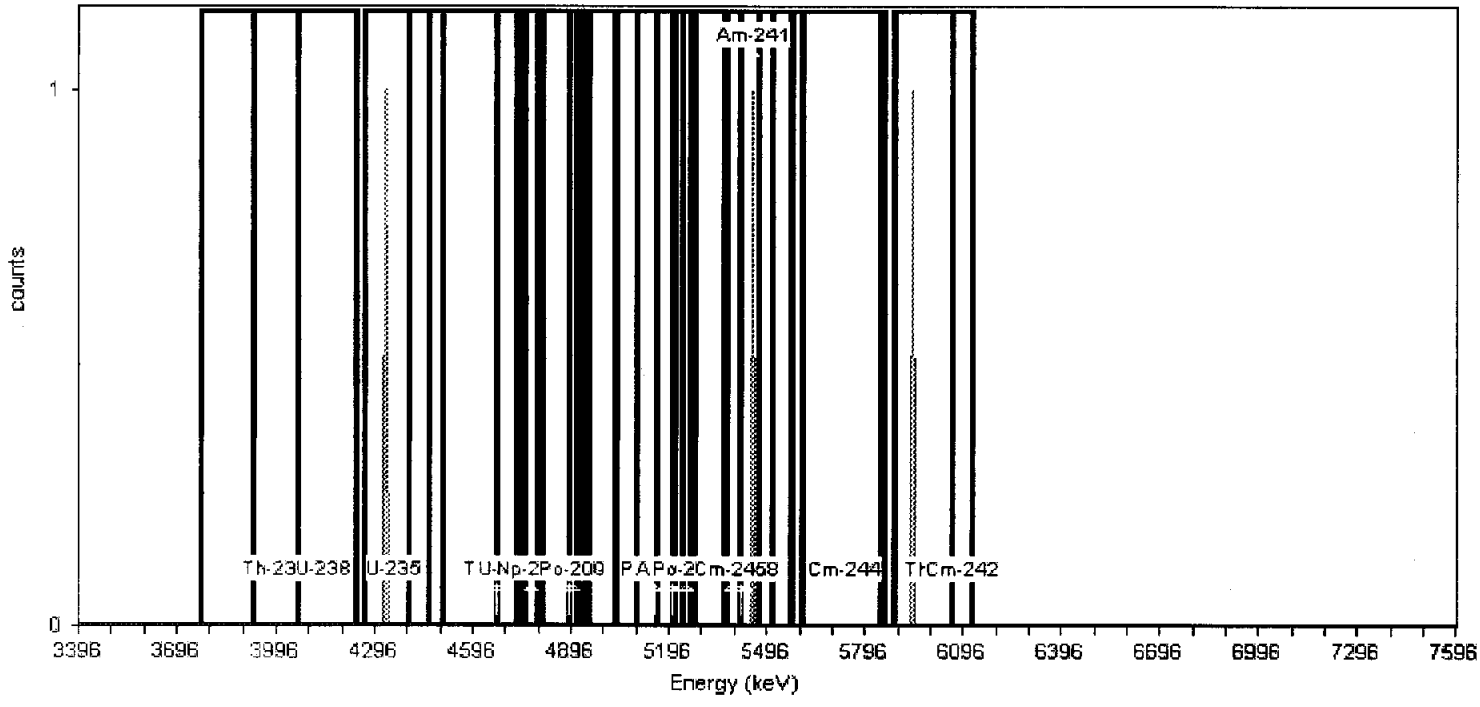
Batch Name: June2007
Description:

Acquisition

Detector: AV97 , SN: 76-03393
Acquisition Start Date: 6/24/2007 8:49:01PM
Live Time: 960.00 min.
Real Time: 960.01 min.
Calibration Name: May2007_AV97
Calibration Date: 5/30/2007 6:46:38AM

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 26.98% +/- 0.29% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 3.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	0.00	0.000E+000	1.473E-003
U-238	4.14	3.93	4.24	0.00	0.000E+000	1.473E-003
U-235	4.35	4.26	4.46	1.00	1.042E-003	1.473E-003
Th-230	4.67	4.40	4.73	0.00	0.000E+000	1.473E-003
U-234	4.70	4.50	4.80	0.00	0.000E+000	1.473E-003
Pu-242	4.88	4.67	4.93	0.00	0.000E+000	1.473E-003
Th-229	4.84	4.72	5.10	0.00	0.000E+000	1.473E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	0.00	0.000E+000	1.473E-003
Am-243	5.20	5.03	5.28	0.00	0.000E+000	1.473E-003
U-232	5.23	5.04	5.37	0.00	0.000E+000	1.473E-003
Th-228	5.41	5.16	5.47	1.00	1.042E-003	1.473E-003
Po-210	5.25	5.20	5.26	0.00	0.000E+000	1.473E-003
Pu-238	5.44	5.24	5.52	1.00	1.042E-003	1.473E-003
Am-241	5.45	5.27	5.57	1.00	1.042E-003	1.473E-003
Cm-245	5.39	5.36	5.41	0.00	0.000E+000	1.473E-003
Pu-236	5.72	5.57	5.84	0.00	0.000E+000	1.473E-003
Cm-244	5.73	5.60	5.86	0.00	0.000E+000	1.473E-003
Th-227	6.02	5.89	6.13	1.00	1.042E-003	1.473E-003
Cm-242	6.10	6.07	6.13	0.00	0.000E+000	1.473E-003

ST SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:59:25PM 6/25/2007

Analyst: 60040

Sample

Sample Name: AV98

Spectrum #1 Analysis #1

Comment:

Batch

Batch Name: June2007

Description:

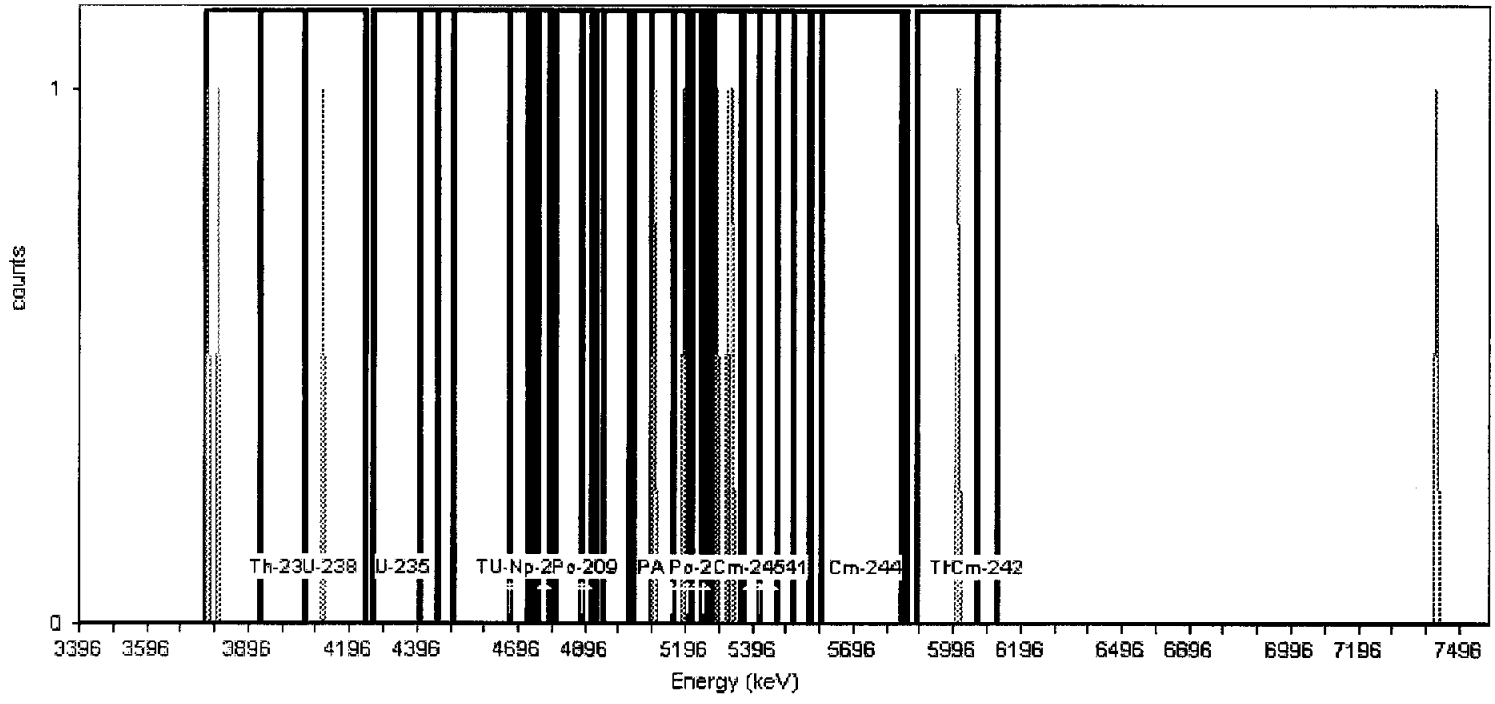
Acquisition

Detector: AV98 , SN: 46-033Q3
Acquisition Start Date: 6/24/2007 8:49:02PM
Live Time: 960.00 min.
Real Time: 960.01 min.
Calibration Name: May2007_AV98
Calibration Date: 5/30/2007 6:46:43AM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.86% +/- 0.28% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI

Nuclide Library: Background ROI Library

Total Background Counts: 10.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	2.00	2.083E-003	1.804E-003
U-238	4.14	3.93	4.24	1.00	1.042E-003	1.473E-003
U-235	4.35	4.26	4.46	0.00	0.000E+000	1.473E-003
Th-230	4.67	4.40	4.73	0.00	0.000E+000	1.473E-003
U-234	4.70	4.50	4.80	0.00	0.000E+000	1.473E-003
Pu-242	4.88	4.67	4.93	0.00	0.000E+000	1.473E-003
Th-229	4.84	4.72	5.10	0.00	0.000E+000	1.473E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	2.00	2.083E-003	1.804E-003
Am-243	5.20	5.03	5.28	2.00	2.083E-003	1.804E-003
U-232	5.23	5.04	5.37	5.00	5.208E-003	2.552E-003
Th-228	5.41	5.16	5.47	4.00	4.167E-003	2.329E-003
Po-210	5.25	5.20	5.26	0.00	0.000E+000	1.473E-003
Pu-238	5.44	5.24	5.52	3.00	3.125E-003	2.083E-003
Am-241	5.45	5.27	5.57	3.00	3.125E-003	2.083E-003
Cm-245	5.39	5.36	5.41	0.00	0.000E+000	1.473E-003
Pu-236	5.72	5.57	5.84	0.00	0.000E+000	1.473E-003
Cm-244	5.73	5.60	5.86	0.00	0.000E+000	1.473E-003
Th-227	6.02	5.89	6.13	1.00	1.042E-003	1.473E-003
Cm-242	6.10	6.07	6.13	0.00	0.000E+000	1.473E-003

TestAmerica STL

Monthly Calibrations
Alpha vision
June 2007

ST SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:01:26PM 6/26/2007

Analyst: 60040
Detector: AV1

Calibration

Name: June2007_AV1
Description:

Calibration Date: 6/26/2007 12:01:23PM

Source Info

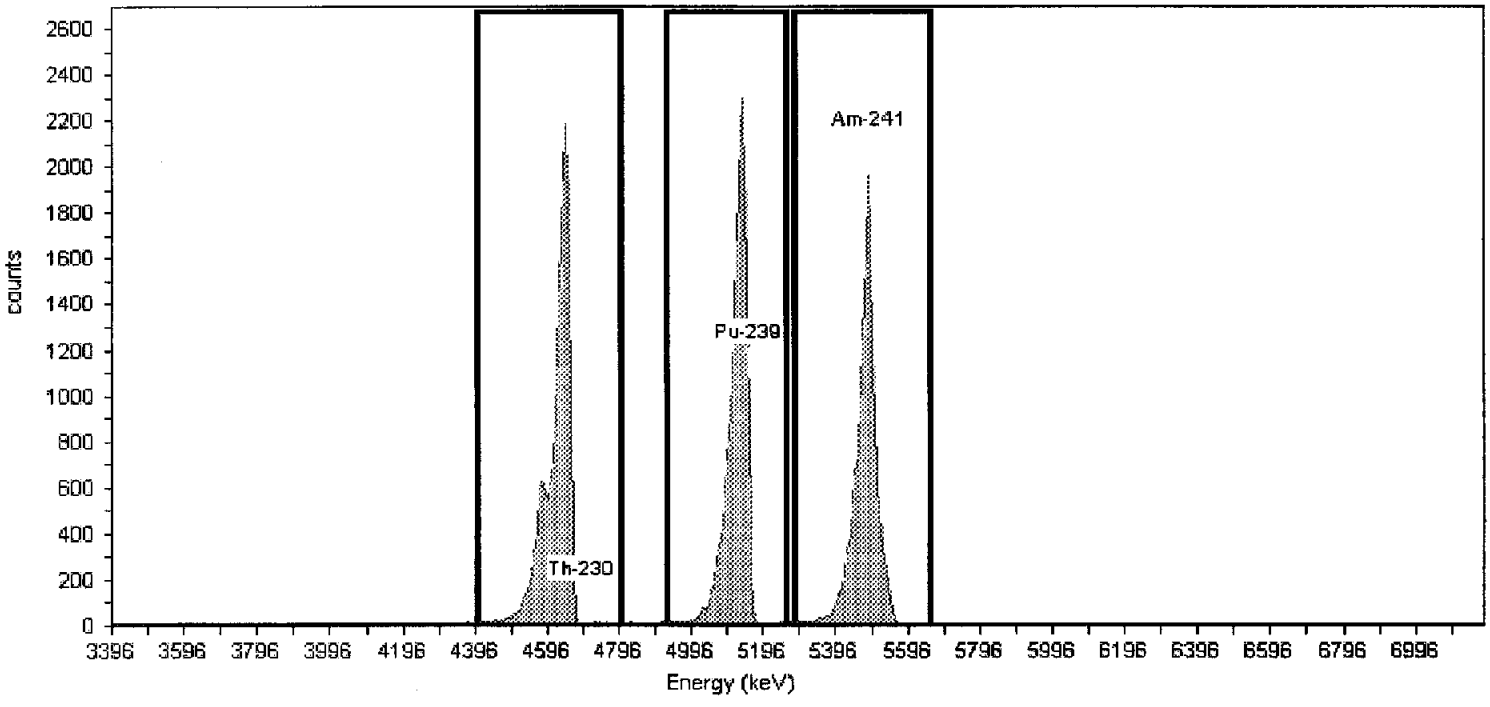
Certificate ID: 63506-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:07PM

Acquisition

Detector: AV1 , SN: 41-158W6
Acquisition Start Date: 6/26/2007 9:40:05AM
Live Time: 140.00 min.
Real Time: 140.06 min.
Efficiency: 26.72% +/- 0.26% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	16,193.00	115.66
Pu-239	243	5.16	212	258	15,667.00	111.91
Am-241	289	5.49	261	313	14,551.00	103.94

ST SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:01:35PM 6/26/2007

Analyst: 60040
Detector: AV2

Calibration

Name: June2007_AV2
Description:

Calibration Date: 6/26/2007 12:01:31PM

Source Info

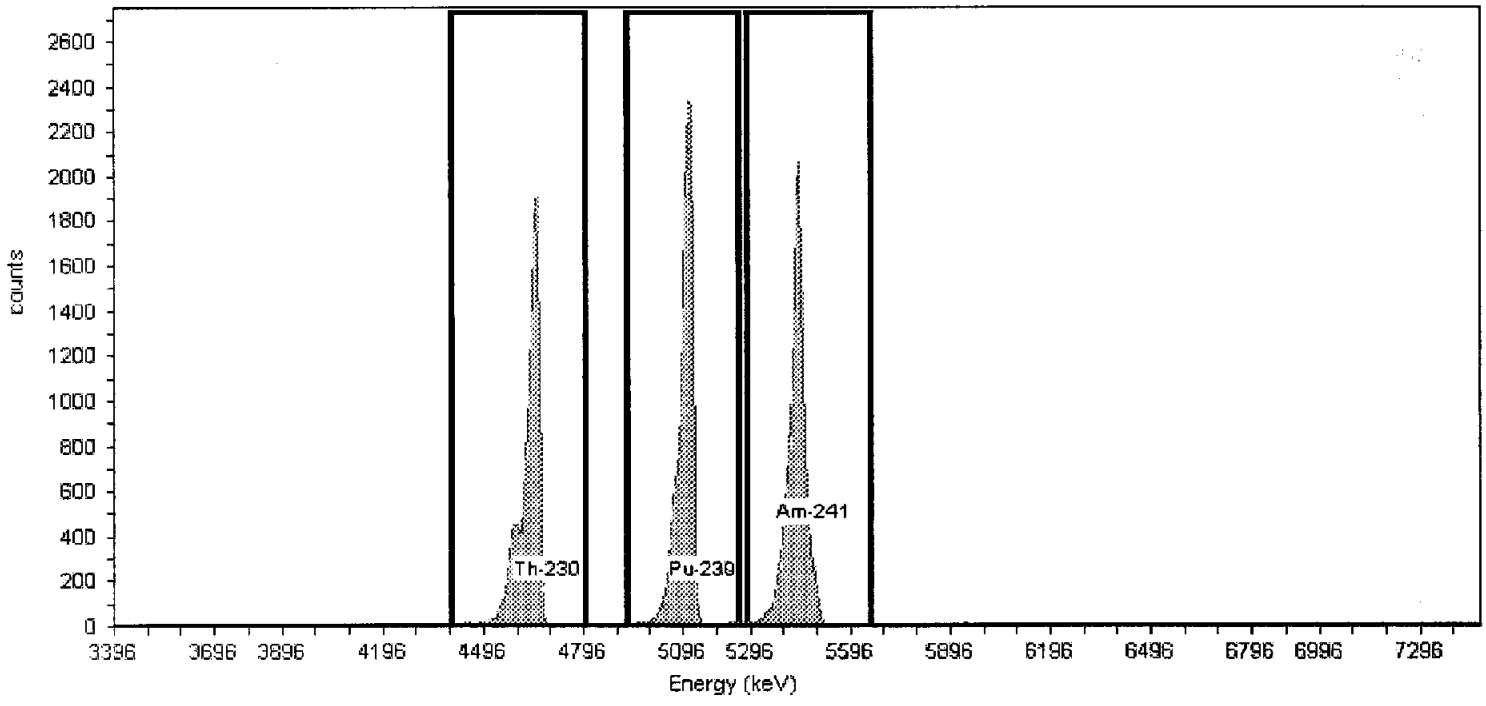
Certificate ID: 63507-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV2 , SN: 41-158W7
Acquisition Start Date: 6/26/2007 9:40:23AM
Live Time: 140.00 min.
Real Time: 140.06 min.
Efficiency: 26.04% +/- 0.28% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	12,244.00	87.46
Pu-239	243	5.16	212	258	14,255.00	101.82
Am-241	289	5.49	261	313	13,853.00	98.95

ST SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:01:41PM 6/26/2007

Analyst: 60040
Detector: AV3

Calibration

Name: June2007_AV3
Description:

Calibration Date: 6/26/2007 12:01:38PM

Source Info

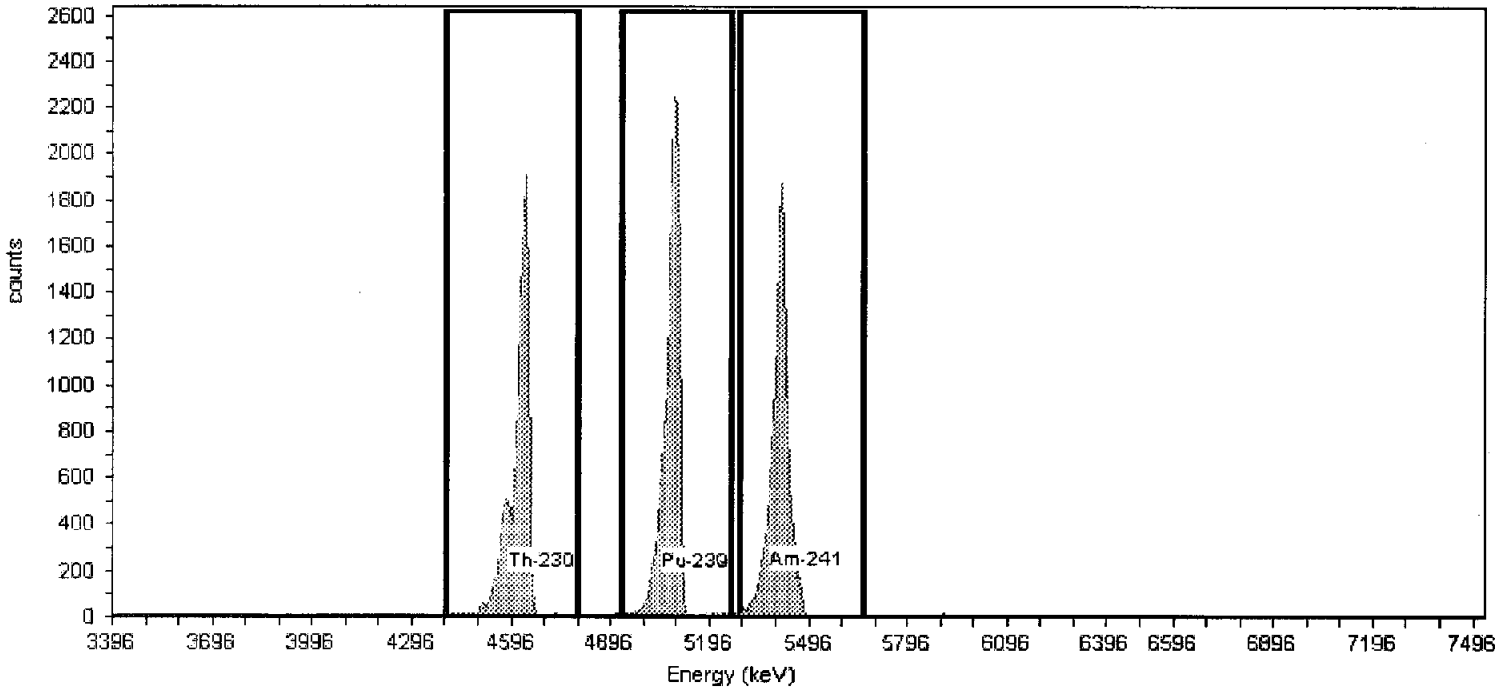
Certificate ID: 63508A-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV3 , SN: 41-158X5
Acquisition Start Date: 6/26/2007 9:40:37AM
Live Time: 140.00 min.
Real Time: 140.06 min.
Efficiency: 26.94% +/- 0.29% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	12,402.00	88.59
Pu-239	243	5.16	212	258	14,214.00	101.53
Am-241	289	5.49	261	313	13,170.00	94.07

STL SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:01:49PM 6/26/2007

Analyst: 60040
Detector: AV4

Calibration

Name: June2007_AV4
Description:

Calibration Date: 6/26/2007 12:01:46PM

Source Info

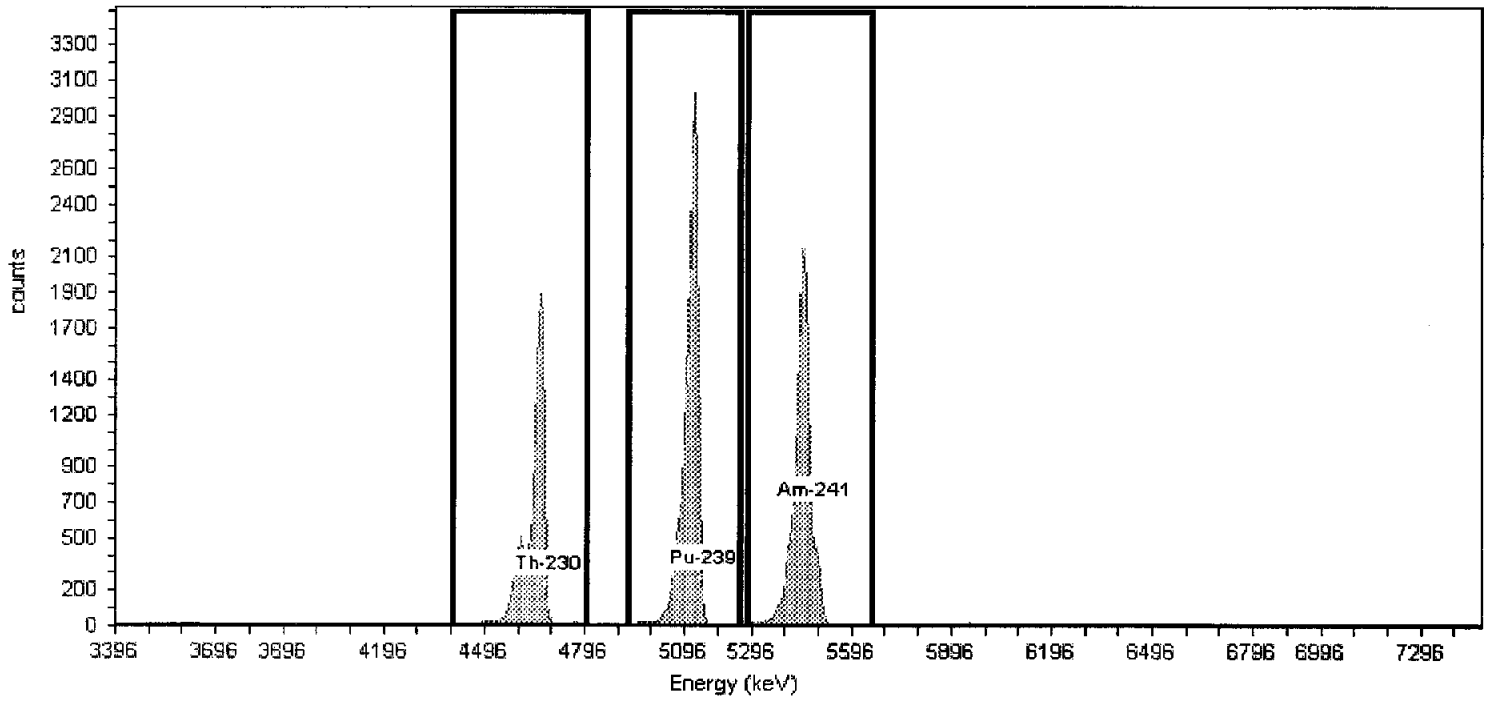
Certificate ID: 63509A-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV4 , SN: 41-172B5
Acquisition Start Date: 6/26/2007 9:40:53AM
Live Time: 140.00 min.
Real Time: 140.06 min.
Efficiency: 26.58% +/- 0.27% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	11,536.00	82.40
Pu-239	243	5.16	212	258	17,450.00	124.64
Am-241	289	5.49	261	313	14,709.00	105.06

ST SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
2:25:12PM 6/26/2007

Analyst: 60040
Detector: AV6

Calibration

Name: June2007_AV6
Description:

Calibration Date: 6/26/2007 2:25:09PM

Source Info

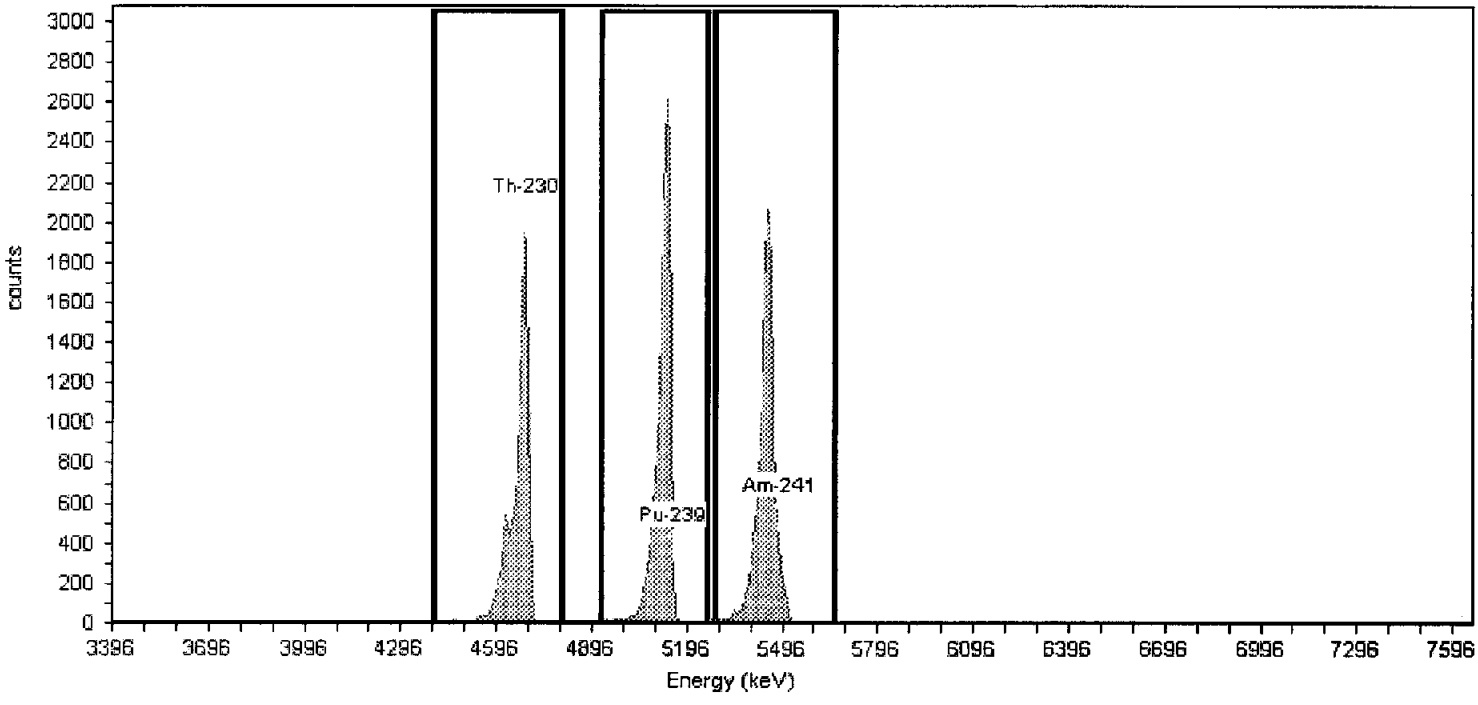
Certificate ID: 63507-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV6 , SN:
Acquisition Start Date: 6/26/2007 12:05:02PM
Live Time: 140.00 min.
Real Time: 140.04 min.
Efficiency: 26.54% +/- 0.28% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	12,465.00	89.04
Pu-239	243	5.16	212	258	14,810.00	105.79
Am-241	289	5.49	261	313	13,862.00	99.01

STL SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
2:25:35PM 6/26/2007

Analyst: 60040
Detector: AV7

Calibration

Name: June2007_AV7
Description:

Calibration Date: 6/26/2007 2:25:32PM

Source Info

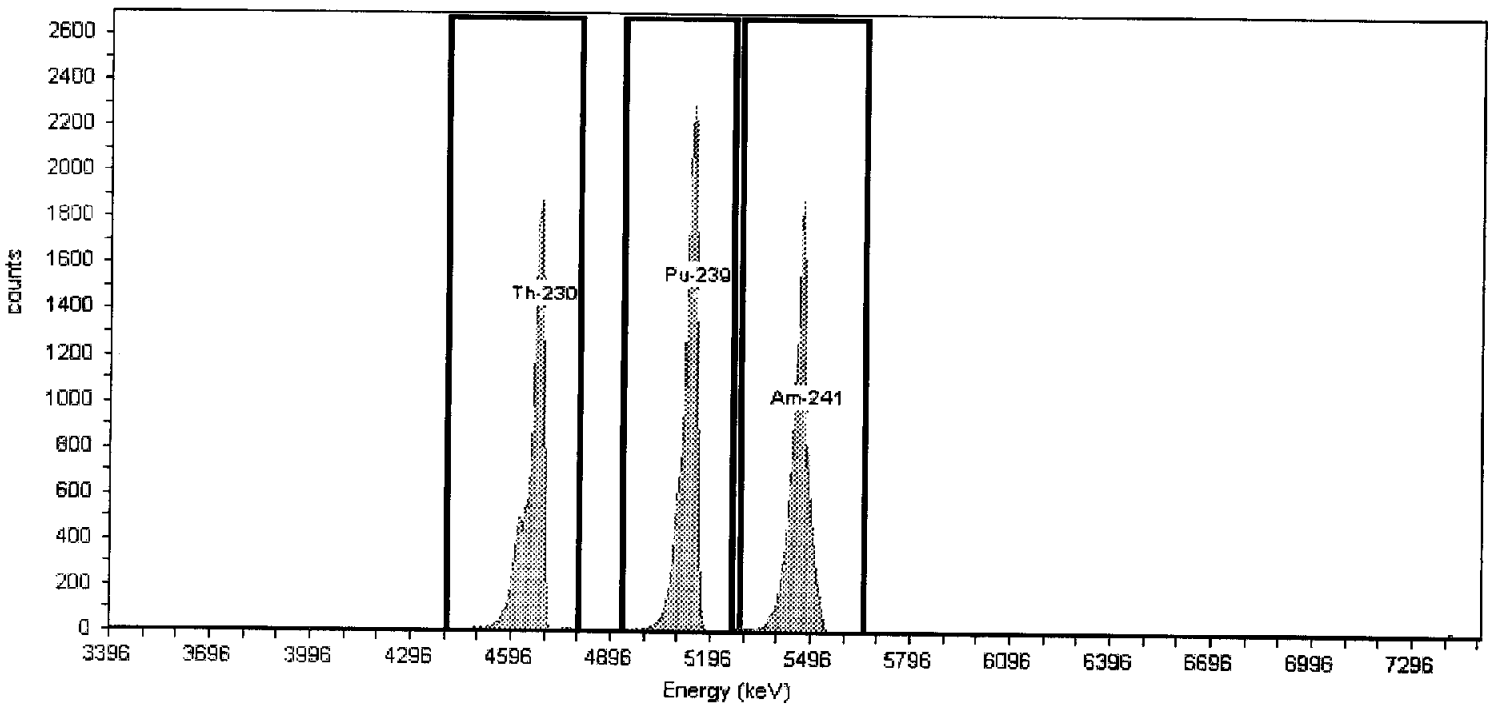
Certificate ID: 63508A-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV7 , SN: 41-158X6
Acquisition Start Date: 6/26/2007 12:05:03PM
Live Time: 140.00 min.
Real Time: 140.04 min.
Efficiency: 27.13% +/- 0.29% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch²



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	12,342.00	88.16
Pu-239	243	5.16	212	258	14,473.00	103.38
Am-241	289	5.49	261	313	13,254.00	94.67

STL SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
2:25:42PM 6/26/2007

Analyst: 60040
Detector: AV8

Calibration

Name: June2007_AV8
Description:

Calibration Date: 6/26/2007 2:25:39PM

Source Info

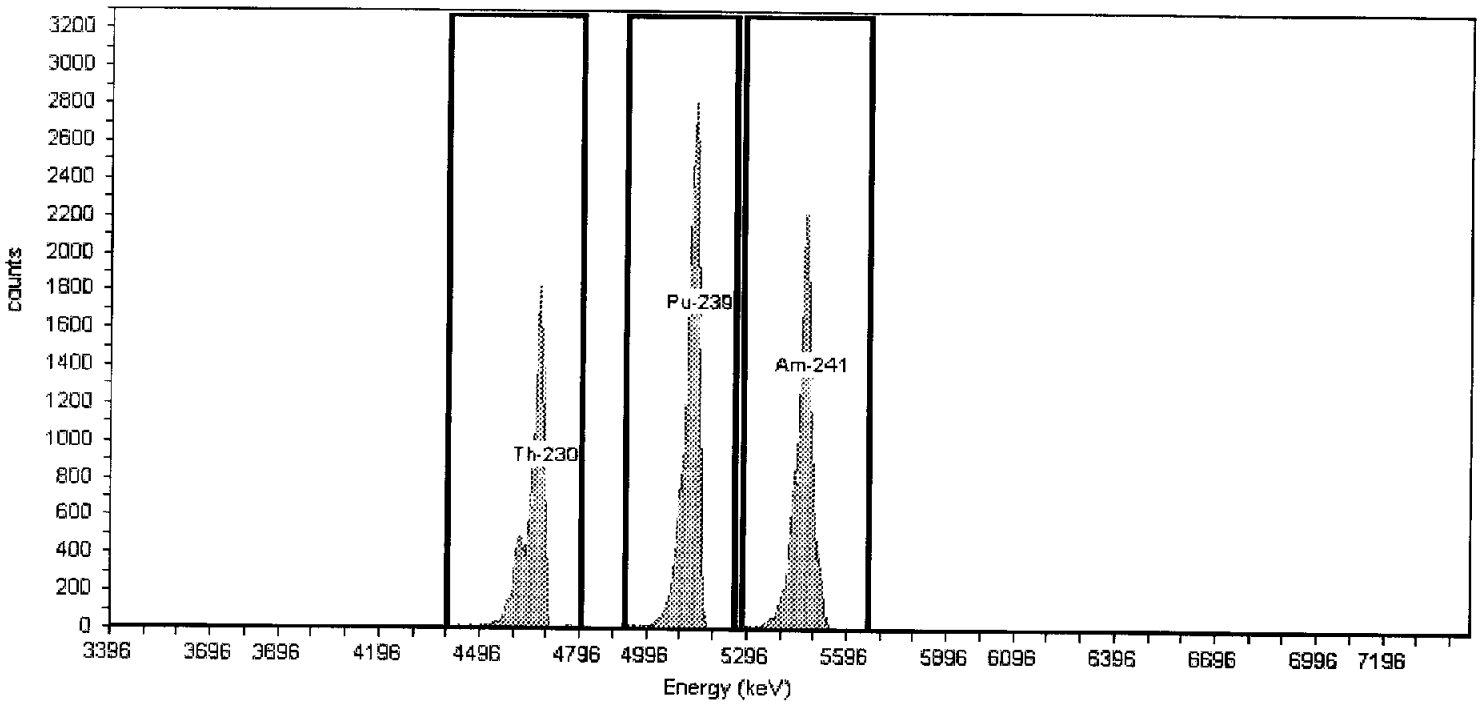
Certificate ID: 63509A-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV8 , SN: 41-158X1
Acquisition Start Date: 6/26/2007 12:05:47PM
Live Time: 140.00 min.
Real Time: 140.04 min.
Efficiency: 27.08% +/- 0.27% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	11,799.00	84.28
Pu-239	243	5.16	212	258	17,456.00	124.69
Am-241	289	5.49	261	313	15,259.00	108.99

ST SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
2:25:03PM 6/26/2007

Analyst: 60040
Detector: AV9

Calibration

Name: June2007_AV9
Description:

Calibration Date: 6/26/2007 2:25:00PM

Source Info

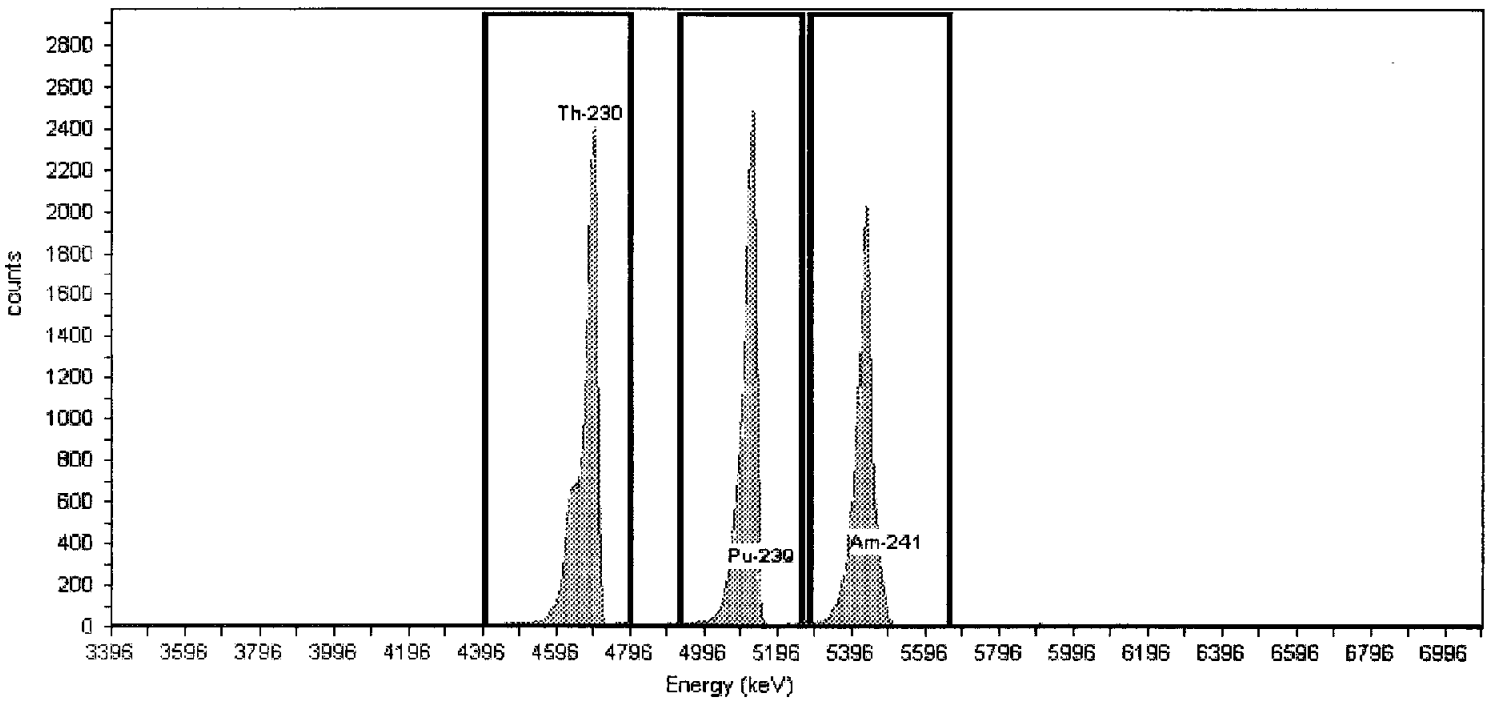
Certificate ID: 63506-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:07PM

Acquisition

Detector: AV9 , SN: 41-172R1
Acquisition Start Date: 6/26/2007 12:05:04PM
Live Time: 140.00 min.
Real Time: 140.02 min.
Efficiency: 26.37% +/- 0.26% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	16,101.00	115.01
Pu-239	243	5.16	212	258	15,653.00	111.81
Am-241	289	5.49	261	313	14,129.00	100.92

STL SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040
Detector: AV11

4:49:16PM 6/26/2007

Calibration

Name: June2007_AV11
Description:

Calibration Date: 6/26/2007 4:49:13PM

Source Info

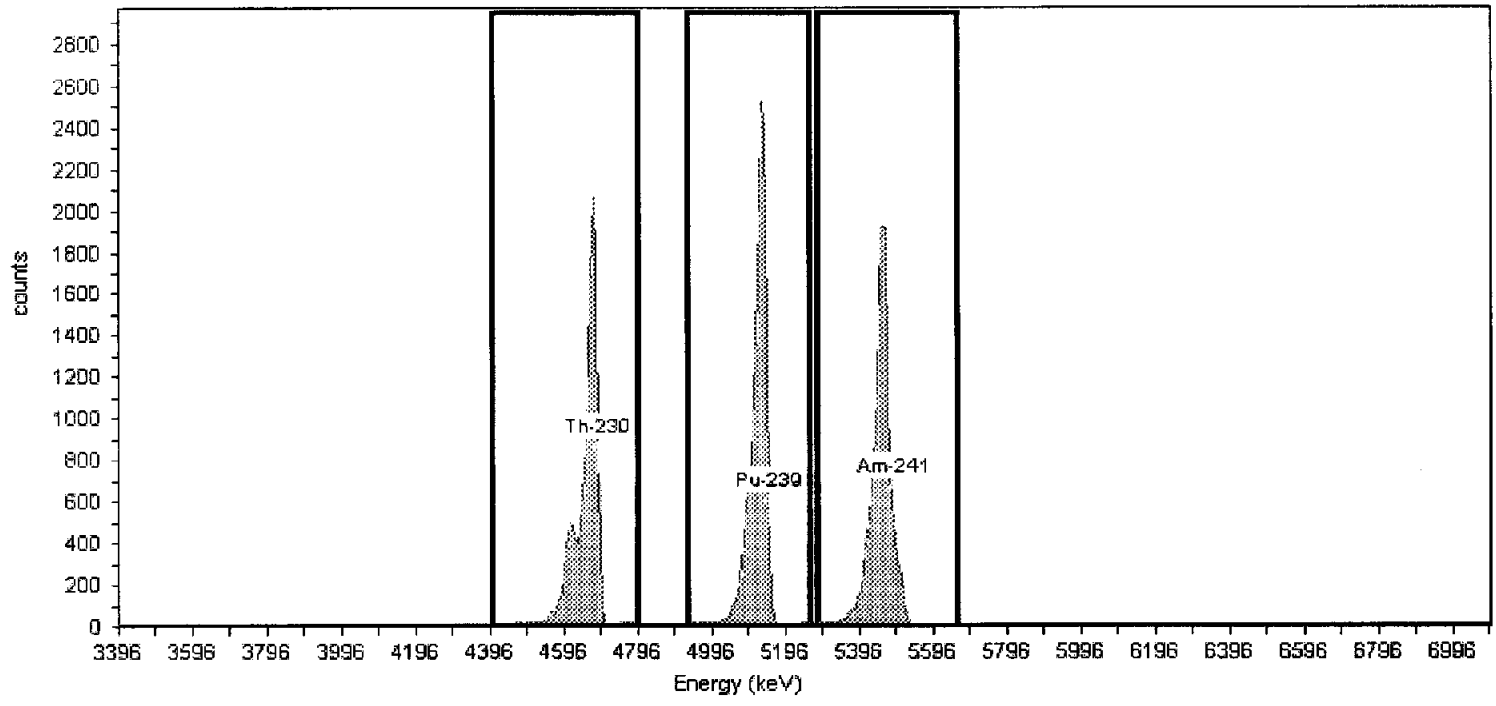
Certificate ID: 63508A-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV11 , SN: 41-172Q3
Acquisition Start Date: 6/26/2007 2:28:16PM
Live Time: 140.00 min.
Real Time: 140.06 min.
Efficiency: 27.17% +/- 0.29% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	12,446.00	88.90
Pu-239	243	5.16	212	258	14,396.00	102.83
Am-241	289	5.49	261	313	13,278.00	94.84

ST SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
4:49:24PM 6/26/2007

Analyst: 60040
Detector: AV12

Calibration

Name: June2007_AV12
Calibration Date: 6/26/2007 4:49:20PM
Description:

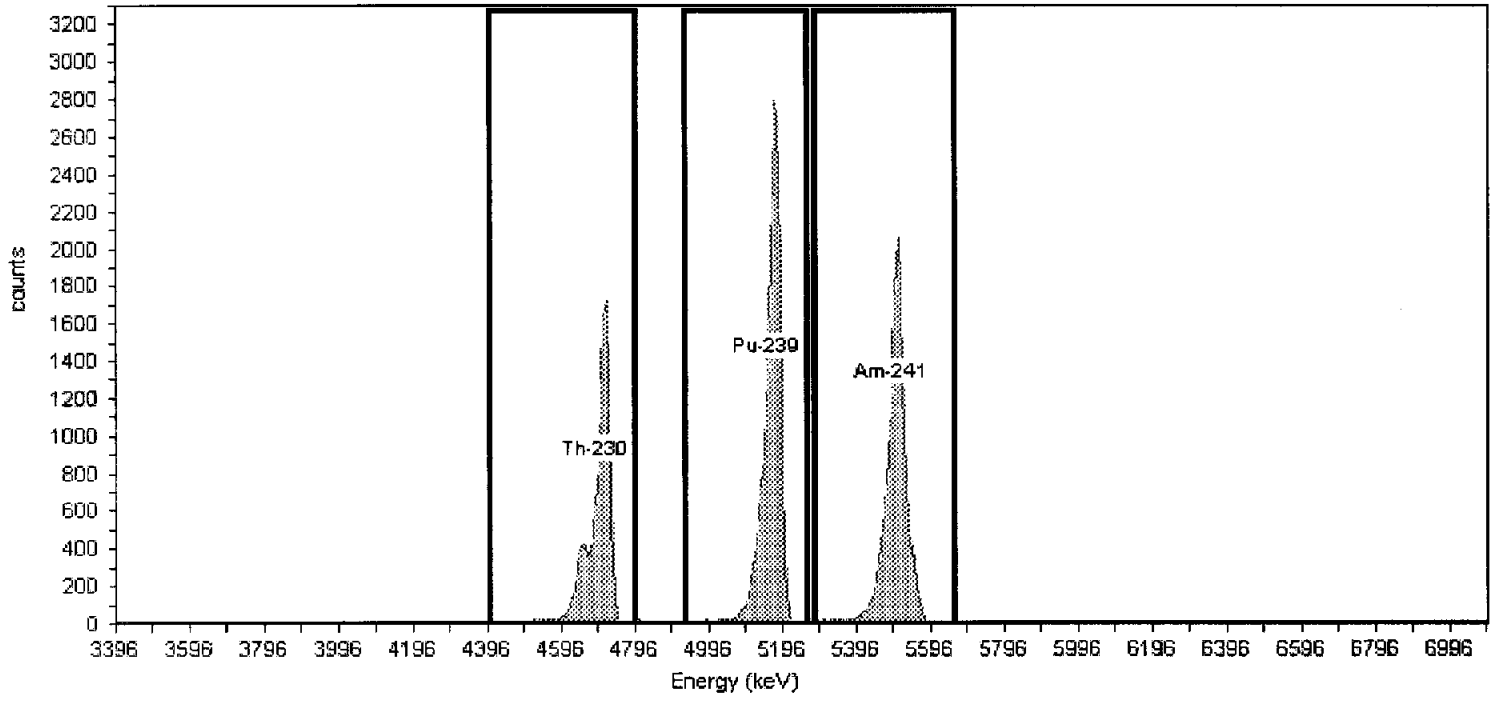
Source Info

Certificate ID: 63509A-334
Certification Date: 5/30/2002 12:00:00PM
Prepared by: Analytics
Description:

Acquisition

Detector: AV12 , SN: 41-172Q2
Acquisition Start Date: 6/26/2007 2:28:41PM
Live Time: 140.00 min.
Real Time: 140.06 min.
Efficiency: 26.45% +/- 0.27% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Initial Calibration: No
Algorithm: Linear
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	11,361.00	81.15
Pu-239	243	5.16	212	258	17,328.00	123.77
Am-241	289	5.49	261	313	14,771.00	105.51

ST SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
4:49:03PM 6/26/2007

Analyst: 60040
Detector: AV13

Calibration

Name: June2007_AV13
Description:

Calibration Date: 6/26/2007 4:49:00PM

Source Info

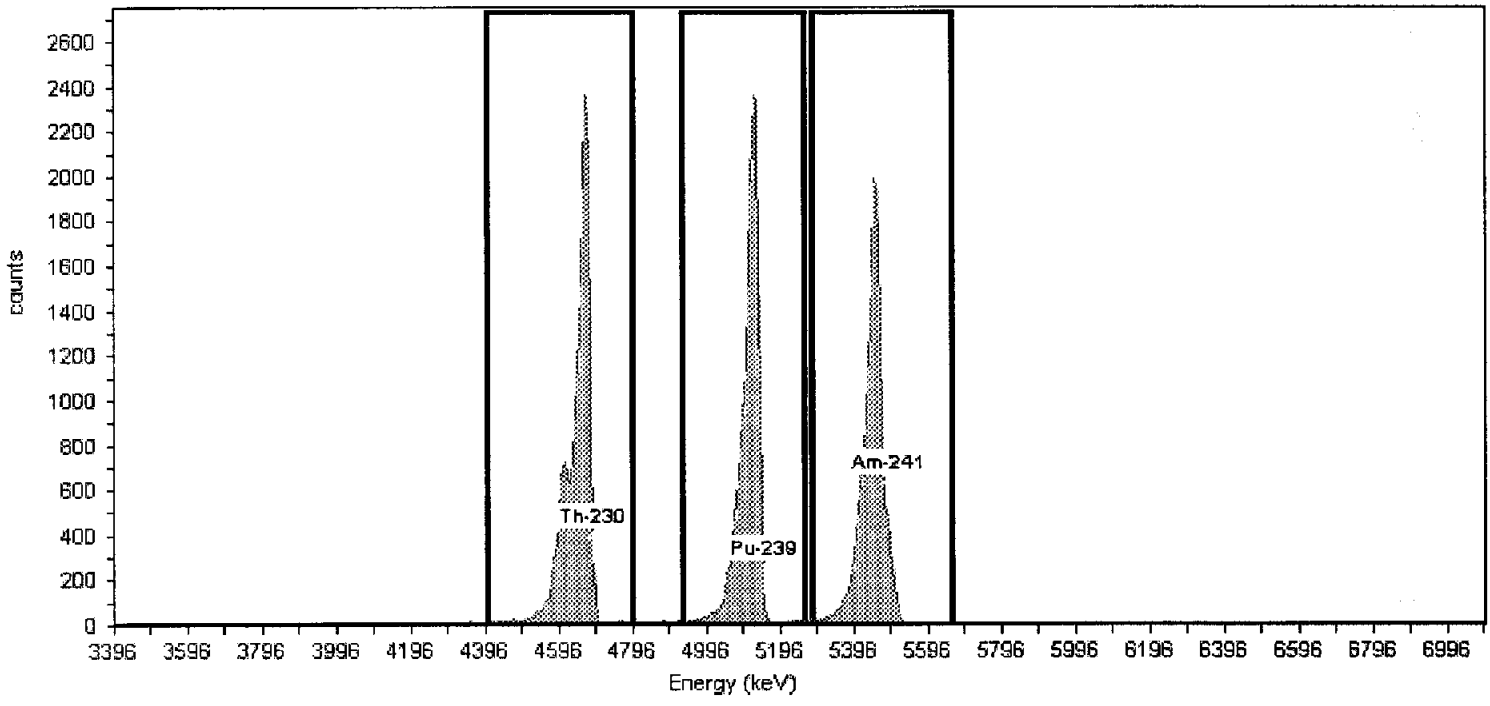
Certificate ID: 63506-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:07PM

Acquisition

Detector: AV13 , SN: 41-172Q1
Acquisition Start Date: 6/26/2007 2:27:50PM
Live Time: 140.00 min.
Real Time: 140.06 min.
Efficiency: 27.09% +/- 0.27% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	16,509.00	117.92
Pu-239	243	5.16	212	258	15,720.00	112.29
Am-241	289	5.49	261	313	14,852.00	106.09

ST SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
4:49:09PM 6/26/2007

Analyst: 60040
Detector: AV14

Calibration

Name: June2007_AV14
Description:

Calibration Date: 6/26/2007 4:49:06PM

Source Info

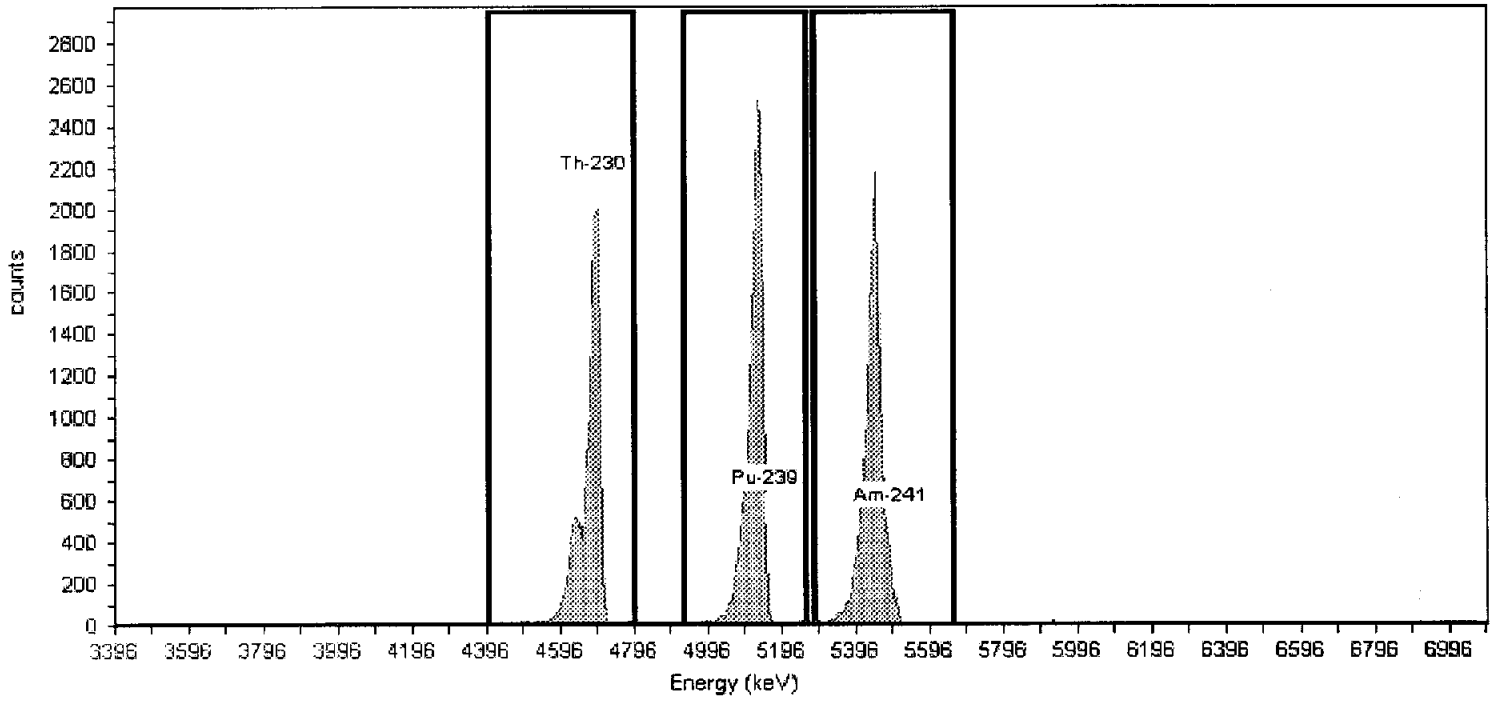
Certificate ID: 63507-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV14 , SN: 41-172C4
Acquisition Start Date: 6/26/2007 2:28:17PM
Live Time: 140.00 min.
Real Time: 140.06 min.
Efficiency: 26.51% +/- 0.28% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	12,432.00	88.80
Pu-239	243	5.16	212	258	14,673.00	104.81
Am-241	289	5.49	261	313	13,999.00	99.99

ST SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
10:35:54PM 6/26/2007

Analyst: 60040
Detector: AV15

Calibration

Name: June2007_AV15
Description:

Calibration Date: 6/26/2007 10:35:50PM

Source Info

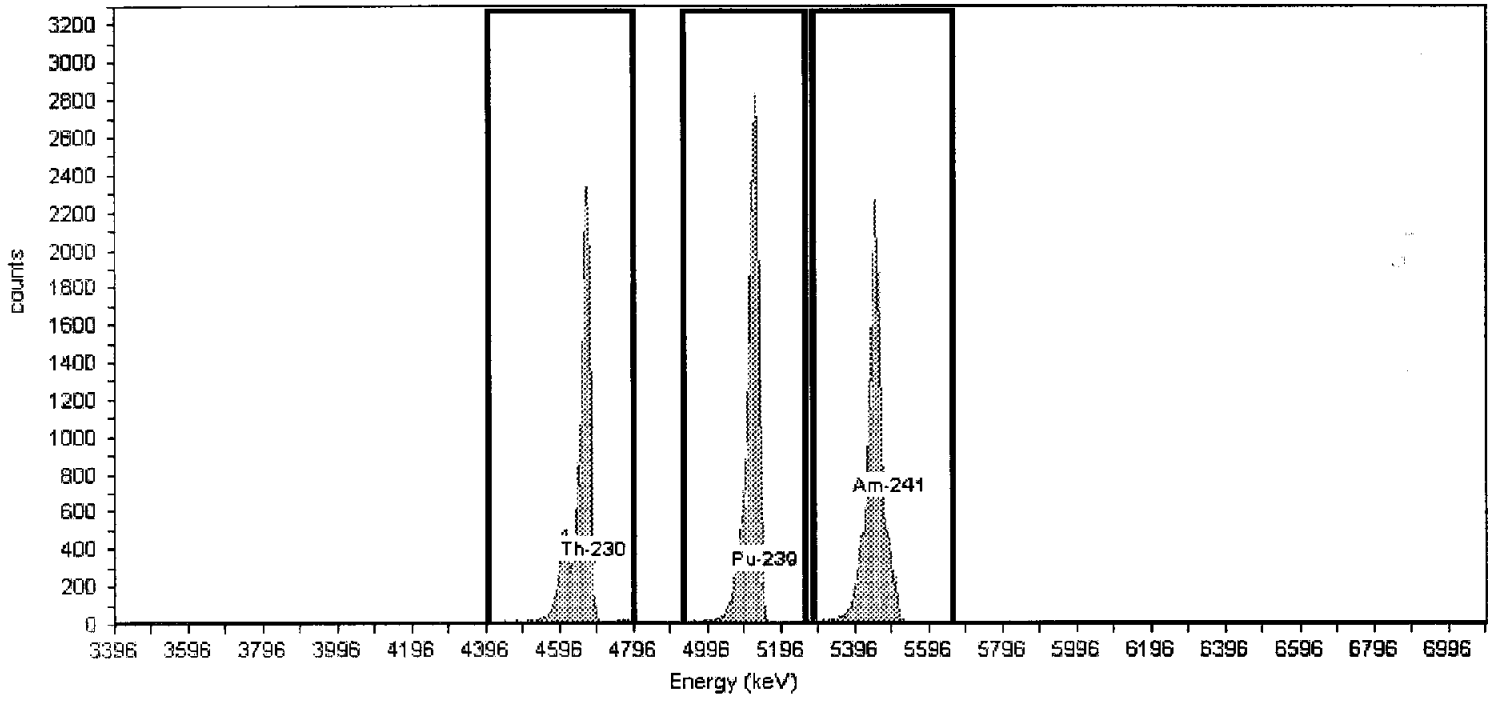
Certificate ID: 63508A-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV15 , SN: 41-172C5
Acquisition Start Date: 6/26/2007 7:54:29PM
Live Time: 140.00 min.
Real Time: 140.01 min.
Efficiency: 26.82% +/- 0.29% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	12,276.00	87.69
Pu-239	243	5.16	212	258	14,255.00	101.82
Am-241	289	5.49	261	313	13,082.00	93.44

STL SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
7:41:45PM 6/26/2007

Analyst: 60040
Detector: AV18

Calibration

Name: June2007_AV18
Description:

Calibration Date: 6/26/2007 7:41:40PM

Source Info

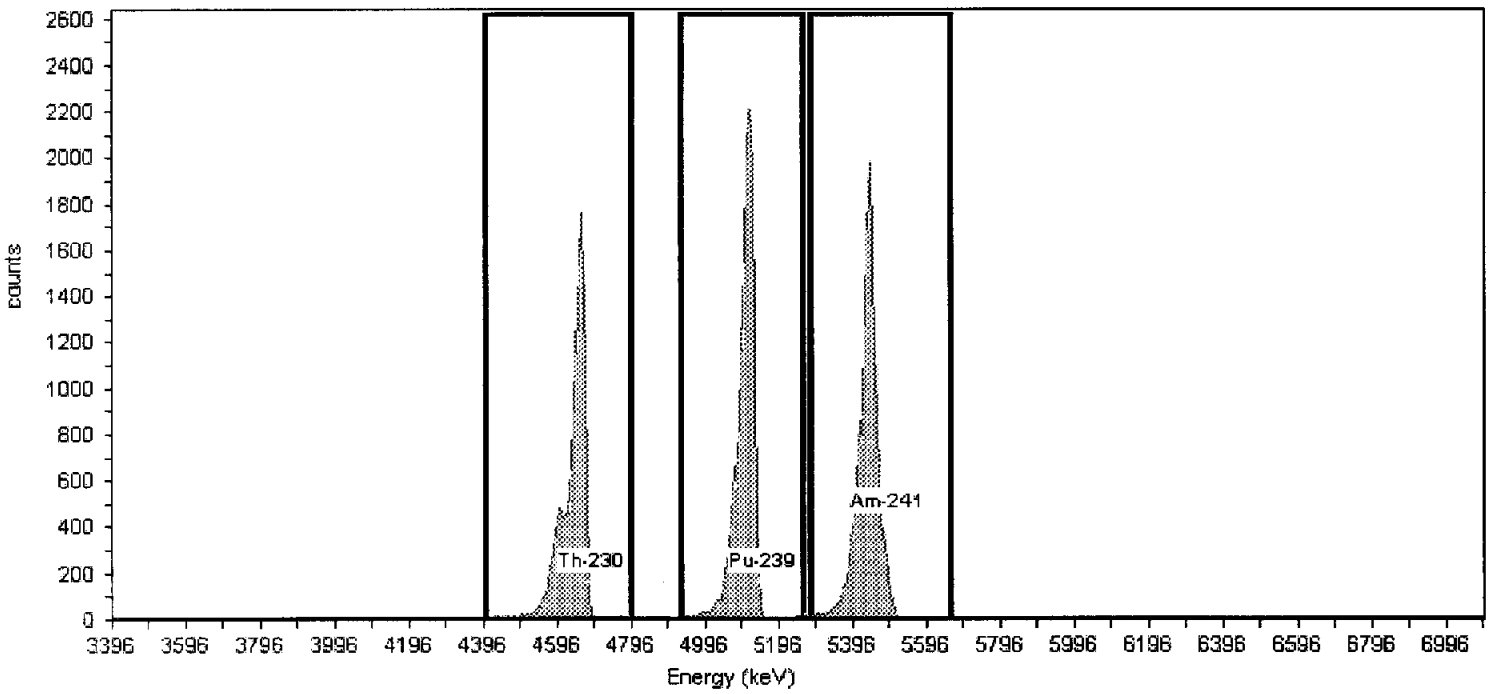
Certificate ID: 63507-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV18 , SN: 41-172C6
Acquisition Start Date: 6/26/2007 4:54:22PM
Live Time: 140.00 min.
Real Time: 140.04 min.
Efficiency: 25.30% +/- 0.27% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	11,761.00	84.01
Pu-239	243	5.16	212	258	14,015.00	100.11
Am-241	289	5.49	261	313	13,527.00	96.62

ST SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
7:41:55PM 6/26/2007

Analyst: 60040
Detector: AV19

Calibration

Name: June2007_AV19
Description:

Calibration Date: 6/26/2007 7:41:51PM

Source Info

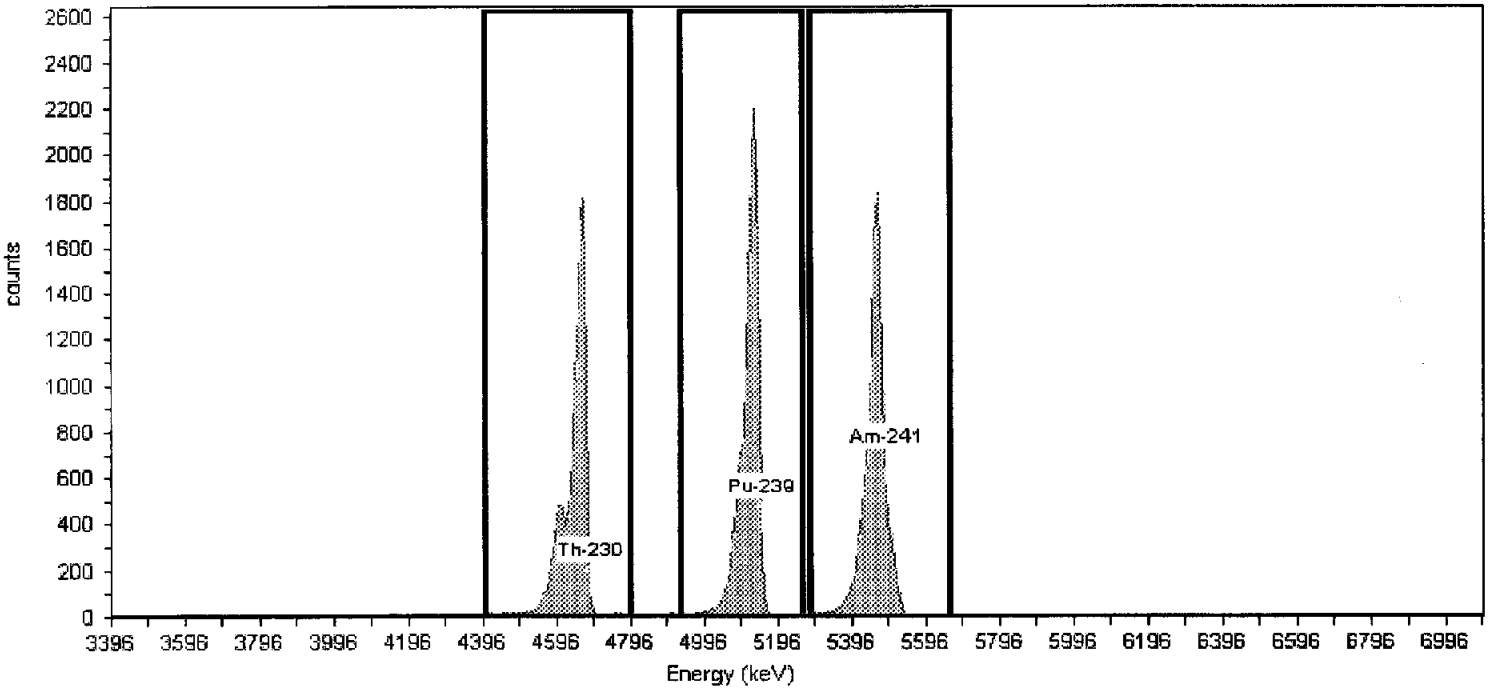
Certificate ID: 63508A-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV19 , SN: 41-172Q6
Acquisition Start Date: 6/26/2007 4:54:53PM
Live Time: 140.00 min.
Real Time: 140.04 min.
Efficiency: 26.02% +/- 0.29% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	11,987.00	85.62
Pu-239	243	5.16	212	258	13,737.00	98.12
Am-241	289	5.49	261	313	12,698.00	90.70

ST SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
7:42:16PM 6/26/2007

Analyst: 60040
Detector: AV20

Calibration

Name: June2007_AV20
Description:

Calibration Date: 6/26/2007 7:42:04PM

Source Info

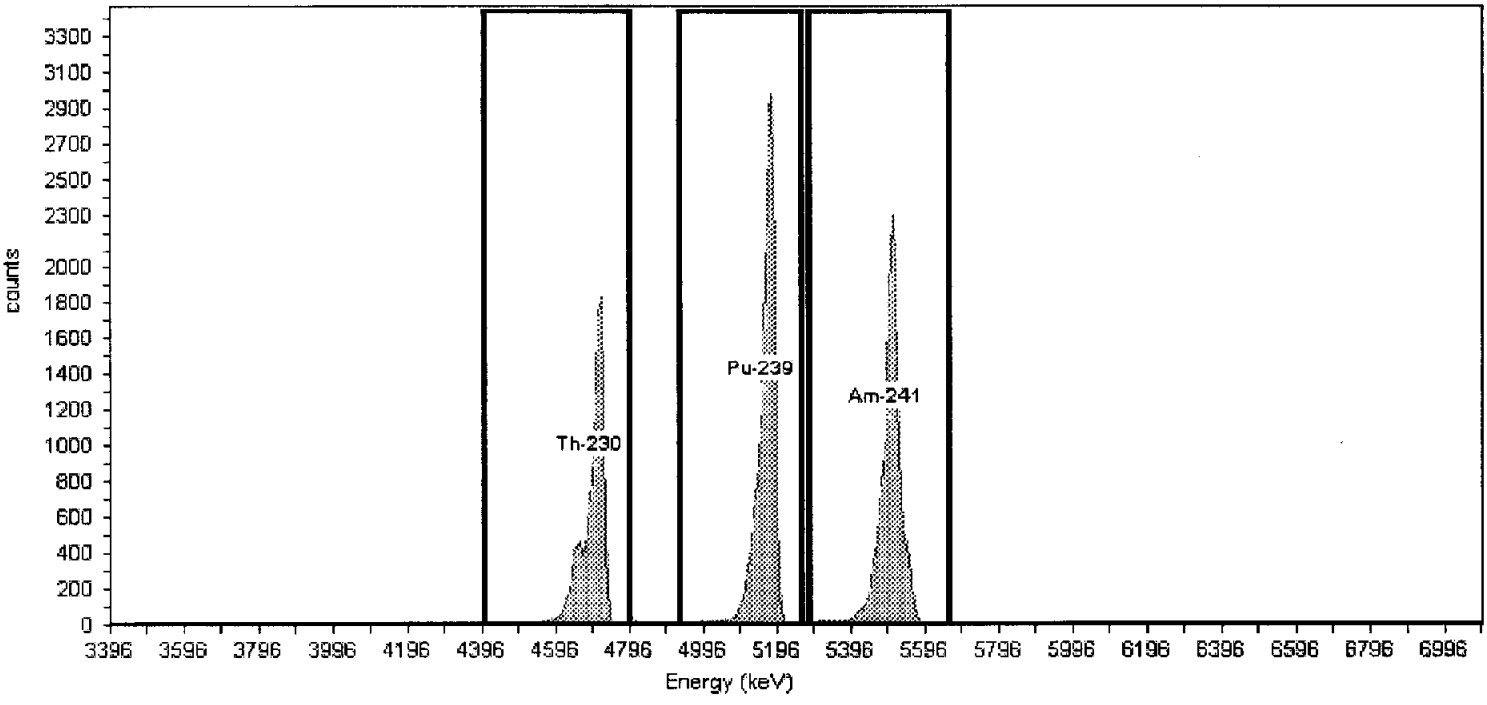
Certificate ID: 63509A-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV20 , SN: 41-172R2
Acquisition Start Date: 6/26/2007 4:54:55PM
Live Time: 140.00 min.
Real Time: 140.04 min.
Efficiency: 27.02% +/- 0.27% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	11,662.00	83.30
Pu-239	243	5.16	212	258	17,468.00	124.77
Am-241	289	5.49	261	313	15,280.00	109.14

STL SEVERN TRENT **STL**

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
10:35:31PM 6/26/2007

Analyst: 60040
Detector: AV21

Calibration

Name: June2007_AV21
Description:

Calibration Date: 6/26/2007 10:35:28PM

Source Info

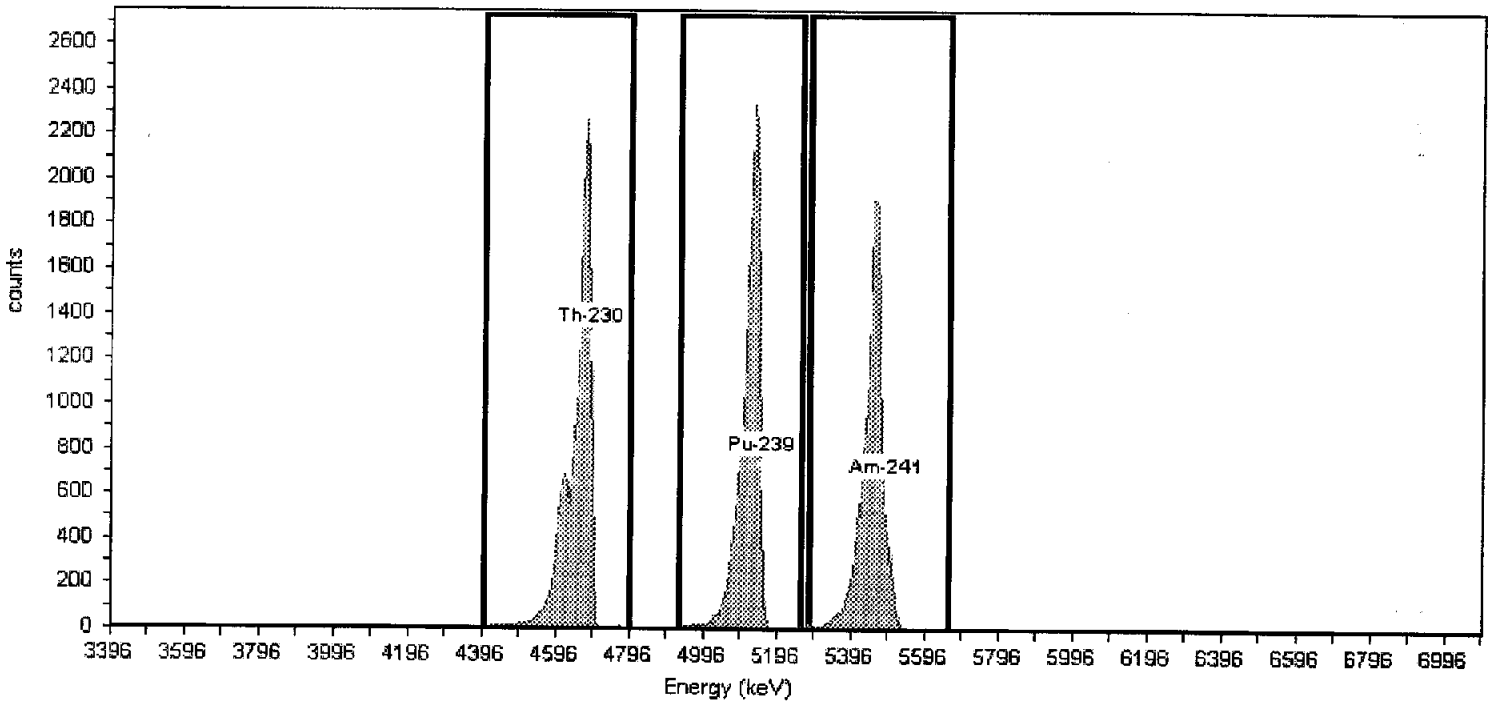
Certificate ID: 63506-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:07PM

Acquisition

Detector: AV21 , SN: 41-172C7
Acquisition Start Date: 6/26/2007 7:53:37PM
Live Time: 140.00 min.
Real Time: 140.04 min.
Efficiency: 26.41% +/- 0.26% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch²



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	16,112.00	115.09
Pu-239	243	5.16	212	258	15,607.00	111.48
Am-241	289	5.49	261	313	14,217.00	101.55

ST SEVERN TRENT **STL**

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
10:35:43PM 6/26/2007

Analyst: 60040
Detector: AV22

Calibration

Name: June2007_AV22
Description:

Calibration Date: 6/26/2007 10:35:39PM

Source Info

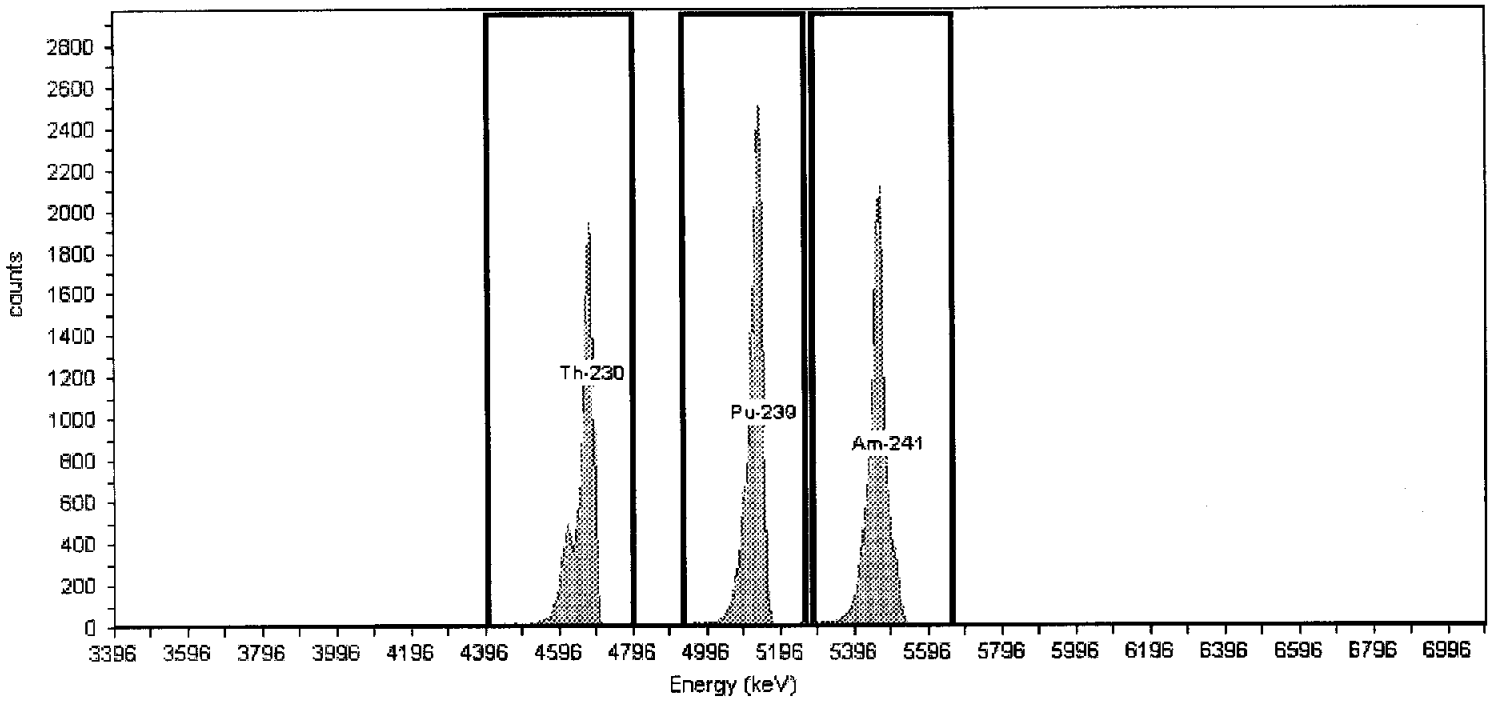
Certificate ID: 63507-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV22 , SN: 41-172Q5
Acquisition Start Date: 6/26/2007 7:53:58PM
Live Time: 140.00 min.
Real Time: 140.04 min.
Efficiency: 25.58% +/- 0.27% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	11,775.00	84.11
Pu-239	243	5.16	212	258	14,251.00	101.79
Am-241	289	5.49	261	313	13,797.00	98.55

ST SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
10:36:05PM 6/26/2007

Analyst: 60040
Detector: AV24

Calibration

Name: June2007_AV24
Description:

Calibration Date: 6/26/2007 10:36:01PM

Source Info

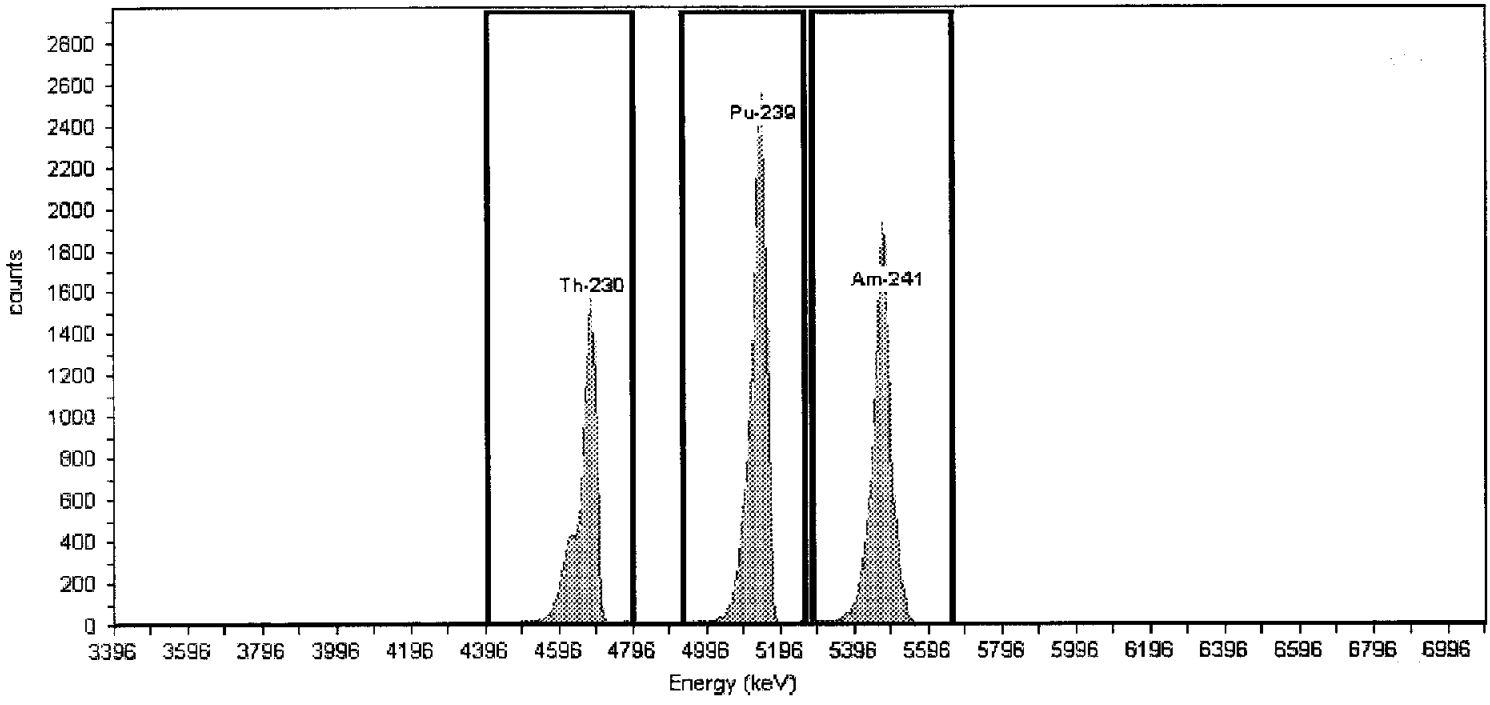
Certificate ID: 63509A-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV24 , SN: 41-172R5
Acquisition Start Date: 6/26/2007 7:54:56PM
Live Time: 140.00 min.
Real Time: 140.04 min.
Efficiency: 26.40% +/- 0.27% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	11,411.00	81.51
Pu-239	243	5.16	212	258	17,234.00	123.10
Am-241	289	5.49	261	313	14,745.00	105.32

ST SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
11:52:09AM 6/27/2007

Analyst: 60040
Detector: AV45

Calibration

Name: June2007_AV45
Description:

Calibration Date: 6/27/2007 11:52:06AM

Source Info

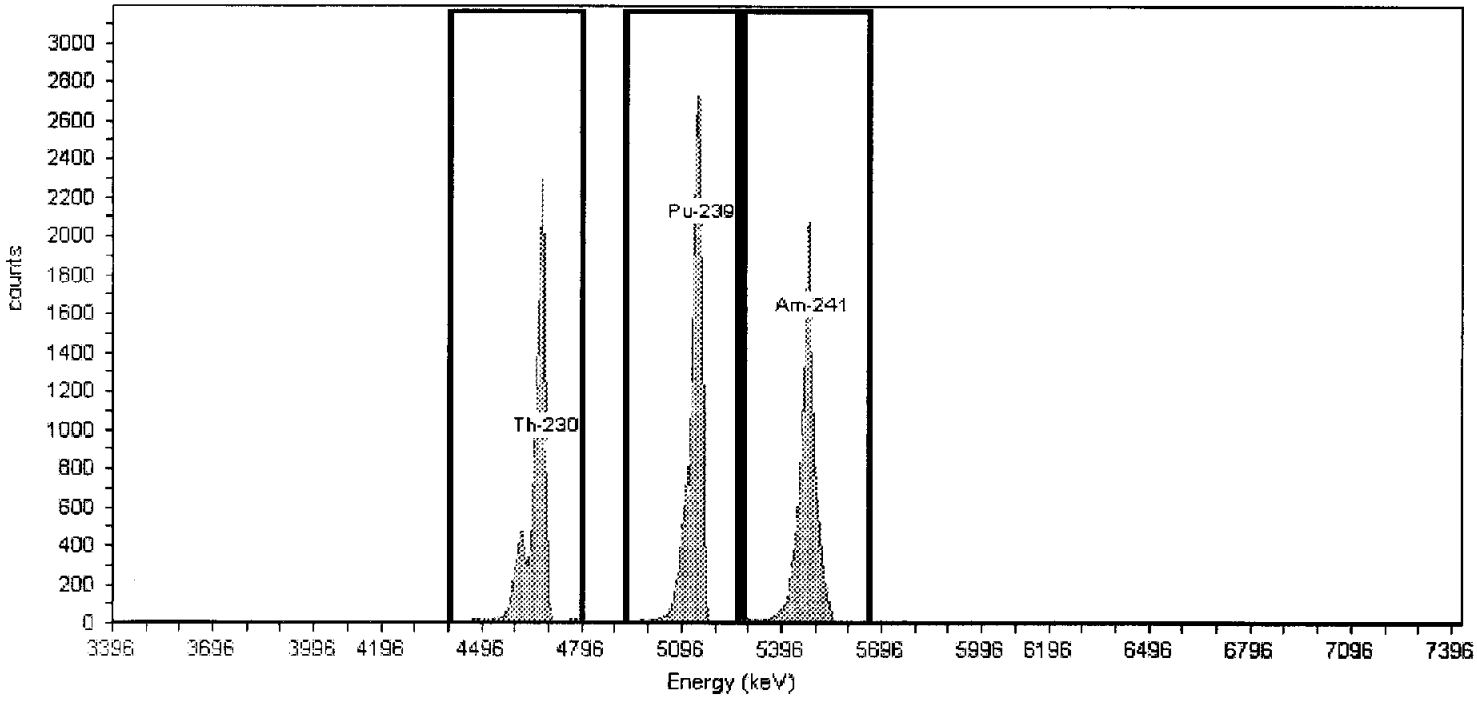
Certificate ID: 63508A-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV45 , SN: AV45
Acquisition Start Date: 6/27/2007 9:20:38AM
Live Time: 140.00 min.
Real Time: 140.04 min.
Efficiency: 27.24% +/- 0.29% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	12,459.00	88.99
Pu-239	243	5.16	212	258	14,525.00	103.75
Am-241	289	5.49	261	313	13,248.00	94.63

SEVERN TRENT **STL**

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040
Detector: AV46
5:43:37AM 6/27/2007

Calibration

Name: June2007_AV46
Calibration Date: 6/27/2007 5:43:34AM
Description:

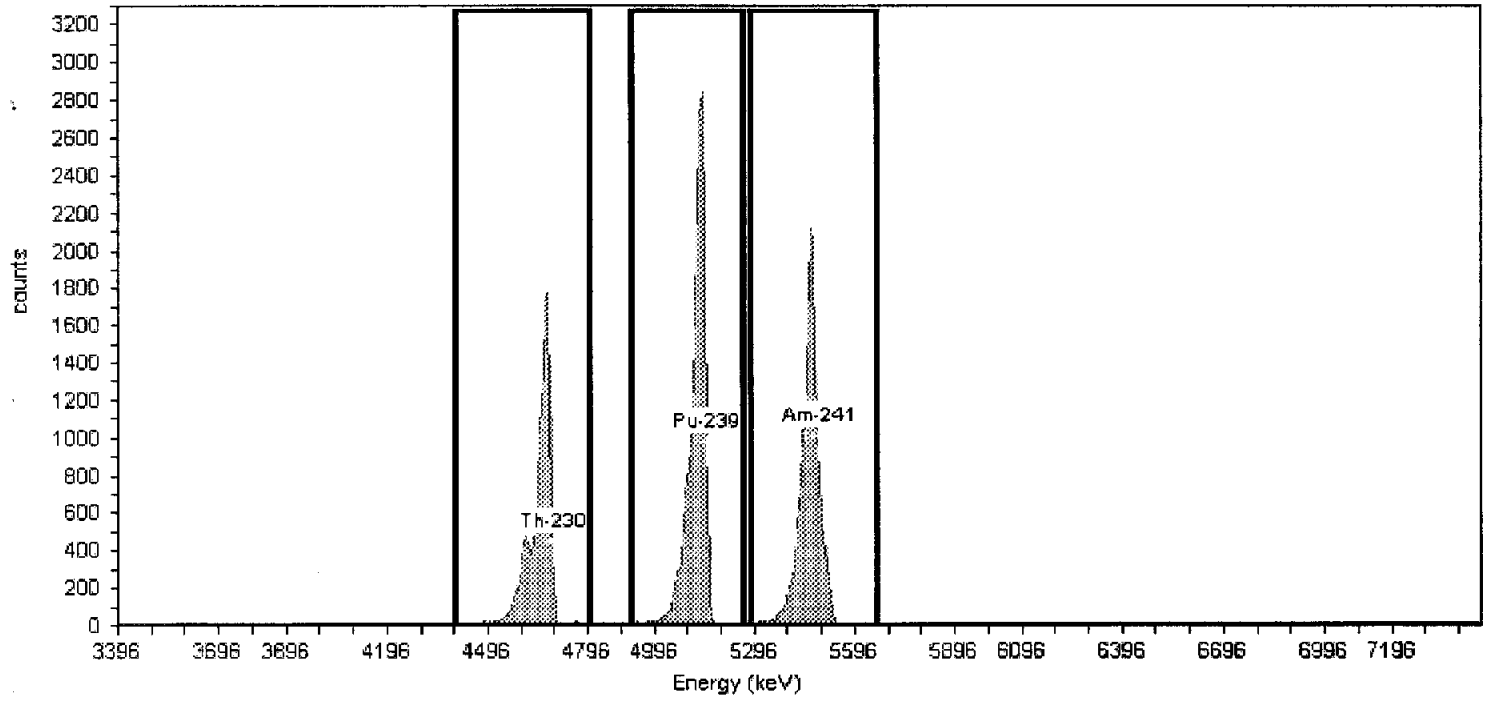
Source Info

Certificate ID: 63509A-334
Certification Date: 5/30/2002 12:00:00PM
Prepared by: Analytics
Description:

Acquisition

Detector: AV46 , SN: AV46
Acquisition Start Date: 6/26/2007 10:45:53PM
Live Time: 140.00 min.
Real Time: 140.03 min.
Efficiency: 27.20% +/- 0.28% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear
Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	11,770.00	84.07
Pu-239	243	5.16	212	258	17,689.00	126.35
Am-241	289	5.49	261	313	15,243.00	108.88

SEVERN TRENT **STL**

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
5:43:21AM 6/27/2007

Analyst: 60040
Detector: AV47

Calibration

Name: June2007_AV47
Description:

Calibration Date: 6/27/2007 5:43:18AM

Source Info

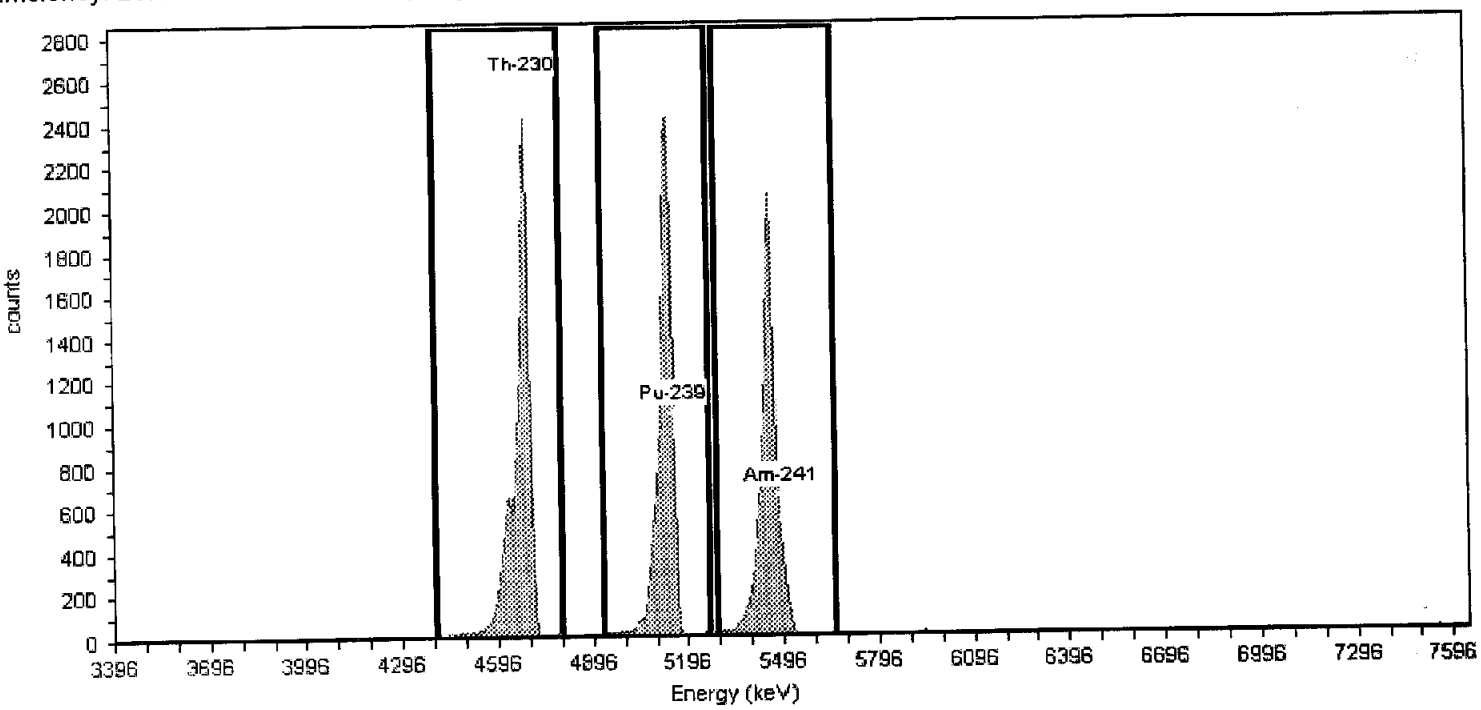
Certificate ID: 63506-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:07PM

Acquisition

Detector: AV47 , SN: AV47
Acquisition Start Date: 6/26/2007 10:44:15PM
Live Time: 140.00 min.
Real Time: 140.03 min.
Efficiency: 26.42% +/- 0.26% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	16,156.00	115.40
Pu-239	243	5.16	212	258	15,312.00	109.37
Am-241	289	5.49	261	313	14,465.00	103.32

ST SEVERN TRENT **STL**

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
11:52:03AM 6/27/2007

Analyst: 60040
Detector: AV48

Calibration

Name: June2007_AV48
Description:

Calibration Date: 6/27/2007 11:52:00AM

Source Info

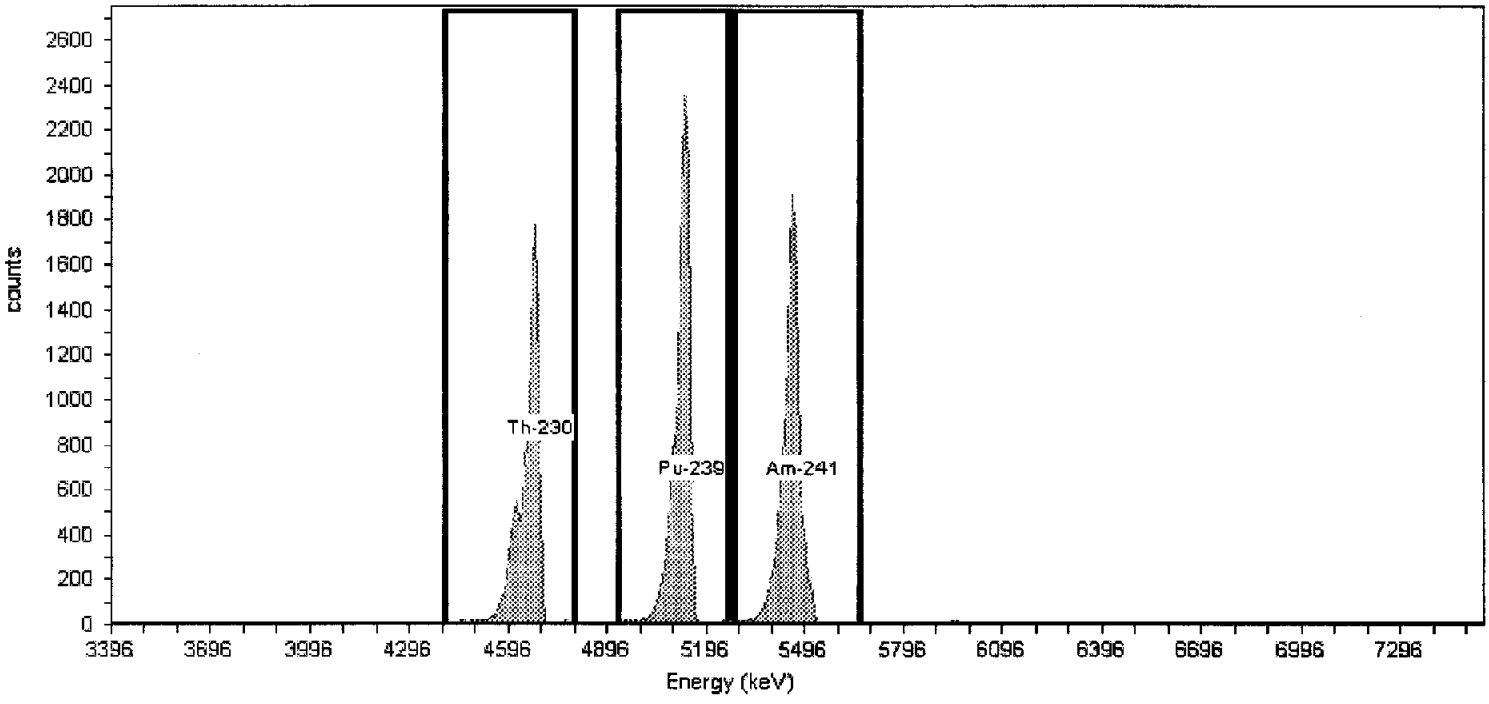
Certificate ID: 63507-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV48 , SN: AV48
Acquisition Start Date: 6/27/2007 9:20:23AM
Live Time: 140.00 min.
Real Time: 140.04 min.
Efficiency: 26.23% +/- 0.28% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	12,293.00	87.81
Pu-239	243	5.16	212	258	14,467.00	103.34
Am-241	289	5.49	261	313	13,913.00	99.38

ST SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
2:24:55PM 6/27/2007

Analyst: 60040
Detector: AV49

Calibration

Name: June2007_AV49
Description:

Calibration Date: 6/27/2007 2:24:52PM

Source Info

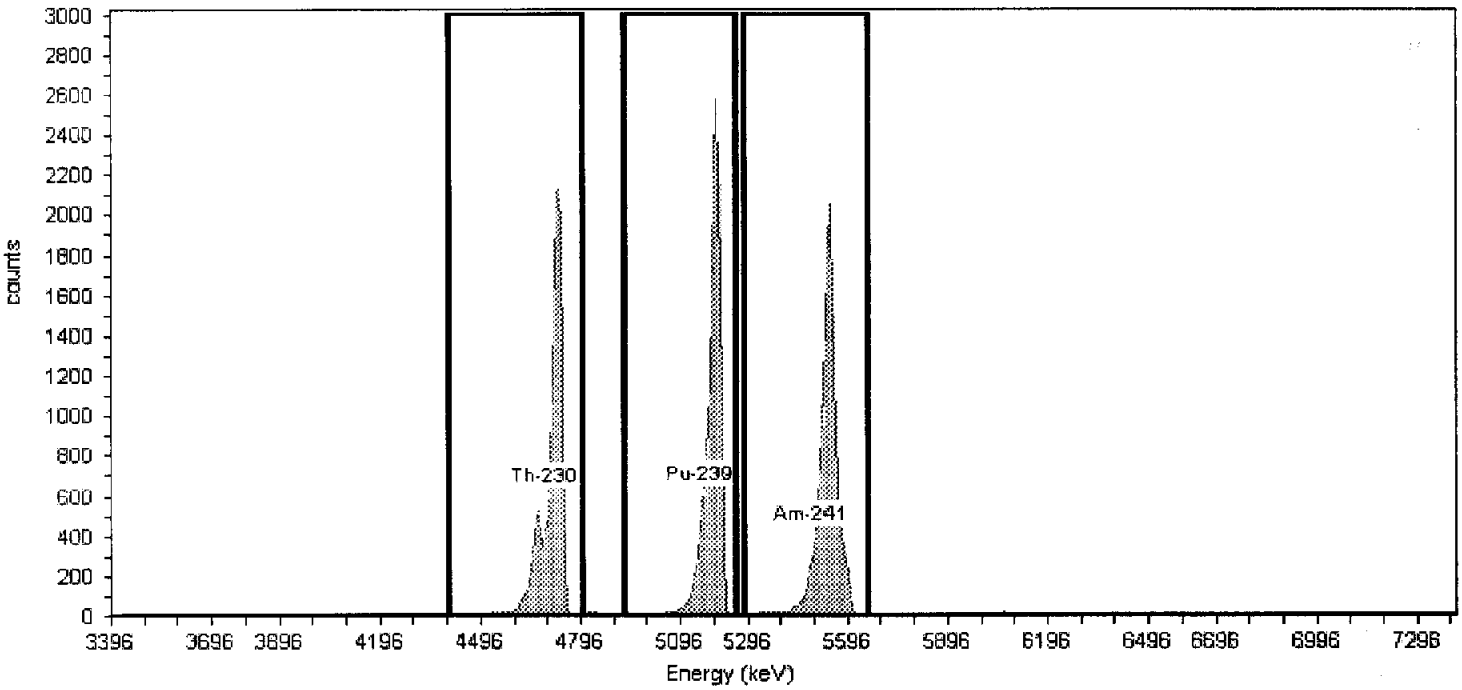
Certificate ID: 63508A-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV49 , SN: AV49
Acquisition Start Date: 6/27/2007 11:56:07AM
Live Time: 140.00 min.
Real Time: 140.02 min.
Efficiency: 27.73% +/- 0.30% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	12,676.00	90.54
Pu-239	243	5.16	212	258	14,558.00	103.99
Am-241	289	5.49	261	313	13,706.00	97.90

SEVERN TRENT **STL**

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
11:52:15AM 6/27/2007

Analyst: 60040
Detector: AV50

Calibration

Name: June2007_AV50
Description:

Calibration Date: 6/27/2007 11:52:12AM

Source Info

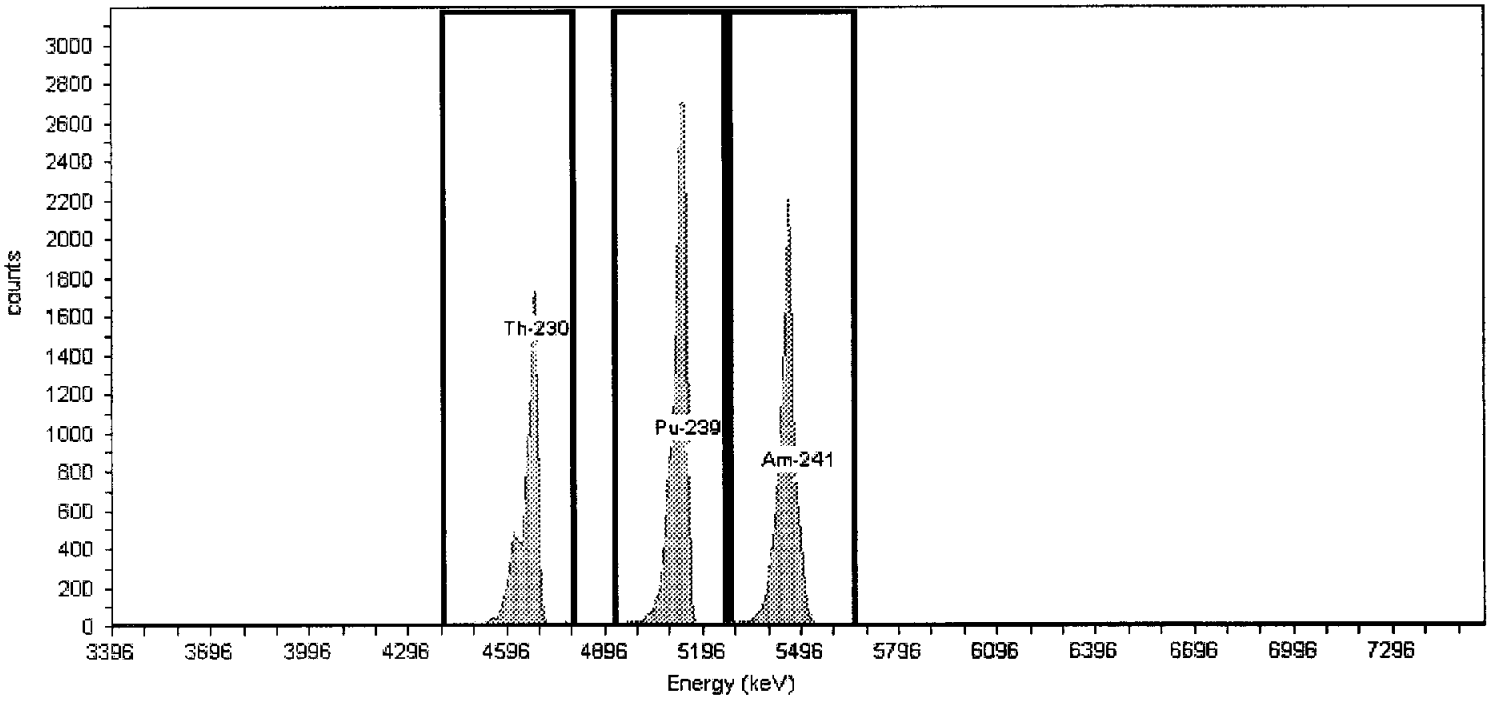
Certificate ID: 63509A-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV50 , SN: AV50
Acquisition Start Date: 6/27/2007 9:20:53AM
Live Time: 140.00 min.
Real Time: 140.04 min.
Efficiency: 26.87% +/- 0.27% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	11,590.00	82.79
Pu-239	243	5.16	212	258	17,433.00	124.52
Am-241	289	5.49	261	313	15,128.00	108.06

ST SEVERN TRENT **STL**

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:06:11PM 6/27/2007

Analyst: 60040
Detector: AV51

Calibration

Name: June2007_AV51
Description:

Calibration Date: 6/27/2007 12:06:05PM

Source Info

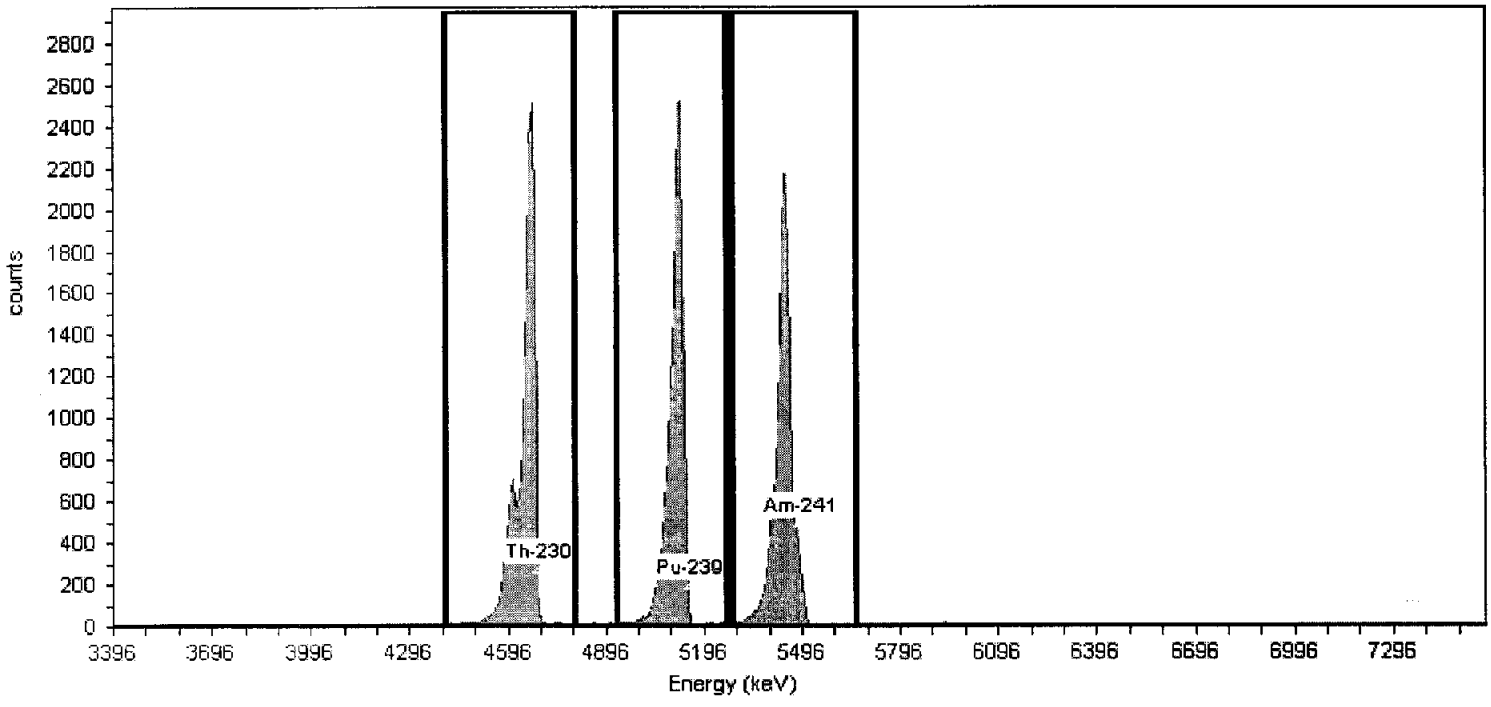
Certificate ID: 63506-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:07PM

Acquisition

Detector: AV51 , SN:
Acquisition Start Date: 6/26/2007 4:54:02PM
Live Time: 140.00 min.
Real Time: 140.02 min.
Efficiency: 26.86% +/- 0.26% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	16,336.00	116.69
Pu-239	243	5.16	212	258	15,662.00	111.87
Am-241	289	5.49	261	313	14,672.00	104.80

ST SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
2:24:49PM 6/27/2007

Analyst: 60040
Detector: AV52

Calibration

Name: June2007_AV52
Description:

Calibration Date: 6/27/2007 2:24:45PM

Source Info

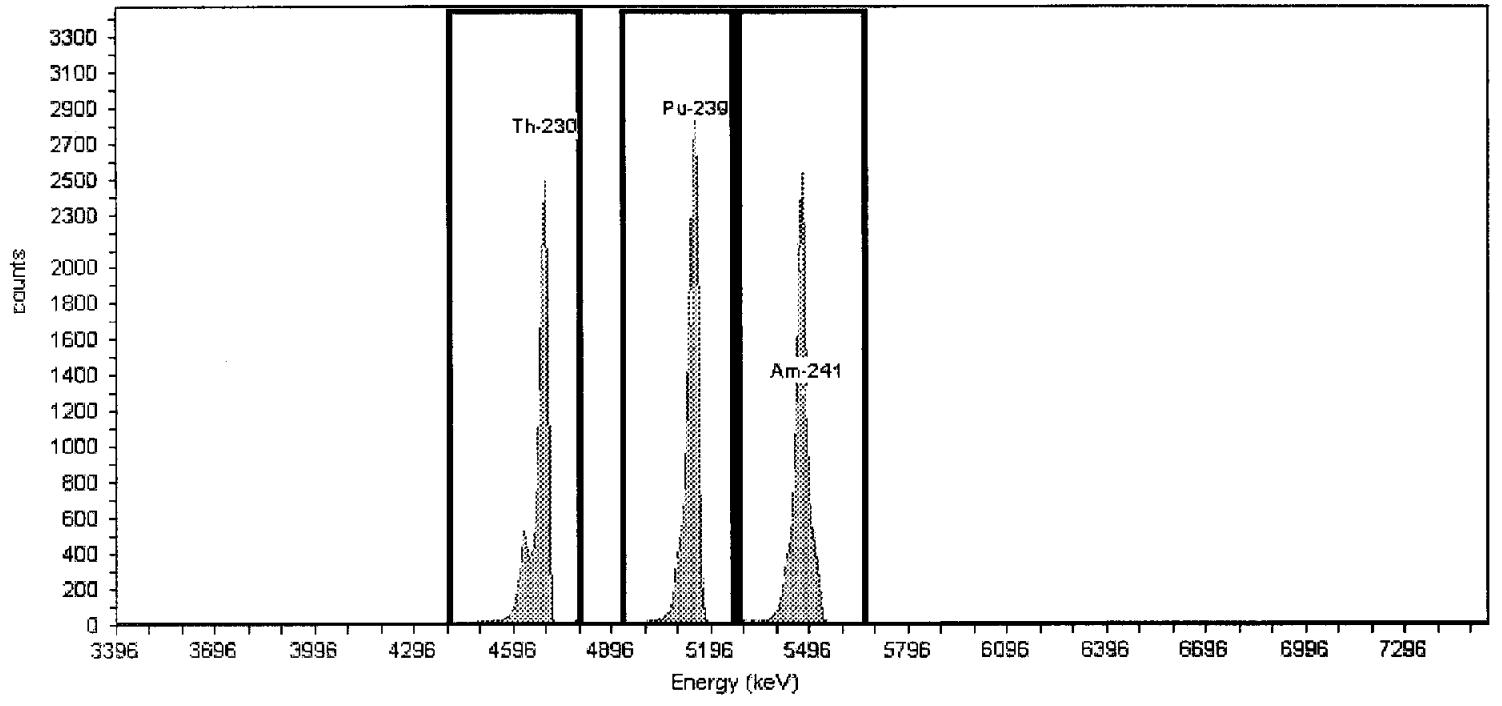
Certificate ID: 63507-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV52 , SN:
Acquisition Start Date: 6/27/2007 11:55:50AM
Live Time: 140.00 min.
Real Time: 140.03 min.
Efficiency: 27.53% +/- 0.28% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	12,768.00	91.20
Pu-239	243	5.16	212	258	15,295.00	109.25
Am-241	289	5.49	261	313	14,731.00	105.22

STL SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
4:52:44PM 6/27/2007

Analyst: 60040
Detector: AV53

Calibration

Name: June2007_AV53
Description:

Calibration Date: 6/27/2007 4:52:41PM

Source Info

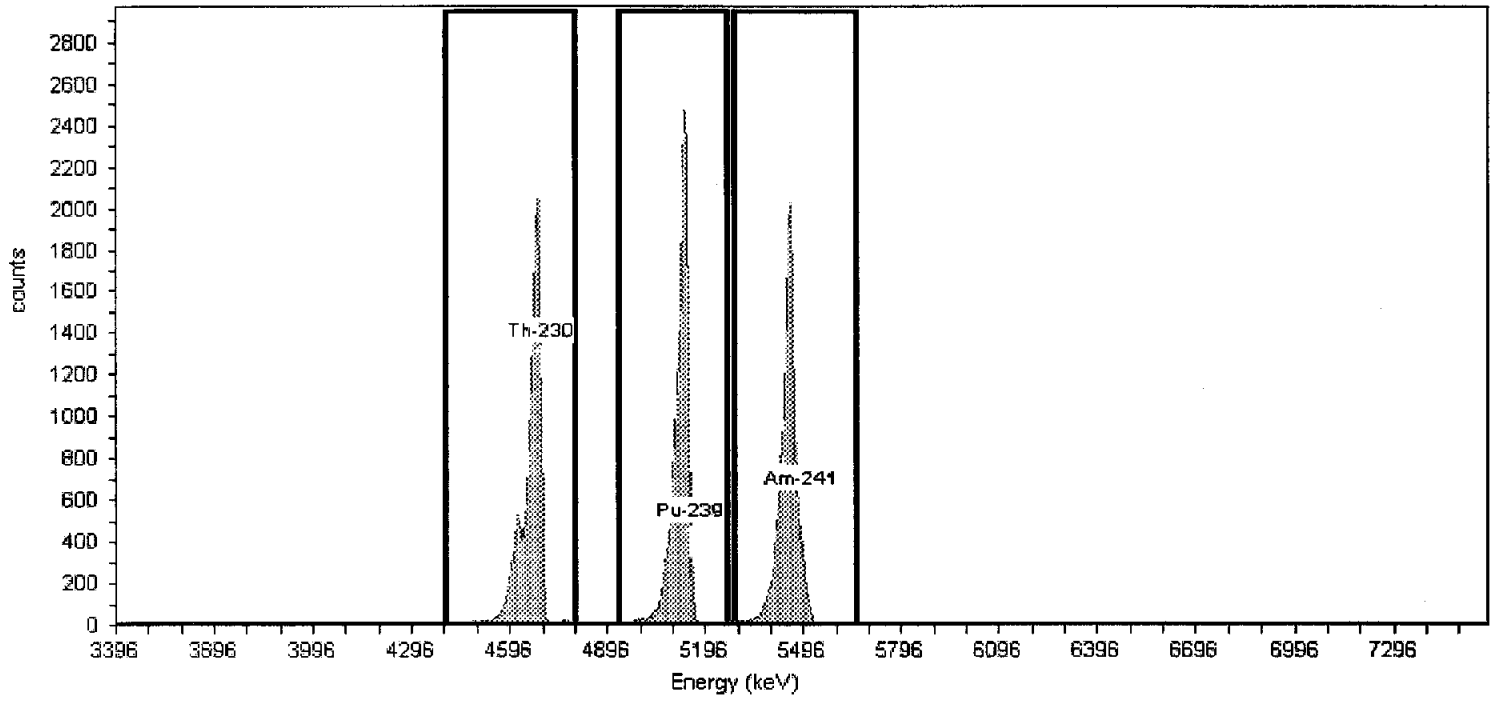
Certificate ID: 63508A-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV53 , SN:
Acquisition Start Date: 6/27/2007 2:28:05PM
Live Time: 140.00 min.
Real Time: 140.04 min.
Efficiency: 27.56% +/- 0.30% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	12,682.00	90.59
Pu-239	243	5.16	212	258	14,477.00	103.41
Am-241	289	5.49	261	313	13,530.00	96.64

ST SEVERN TRENT **STL**

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
2:25:01PM 6/27/2007

Analyst: 60040
Detector: AV54

Calibration

Name: June2007_AV54
Description:

Calibration Date: 6/27/2007 2:24:58PM

Source Info

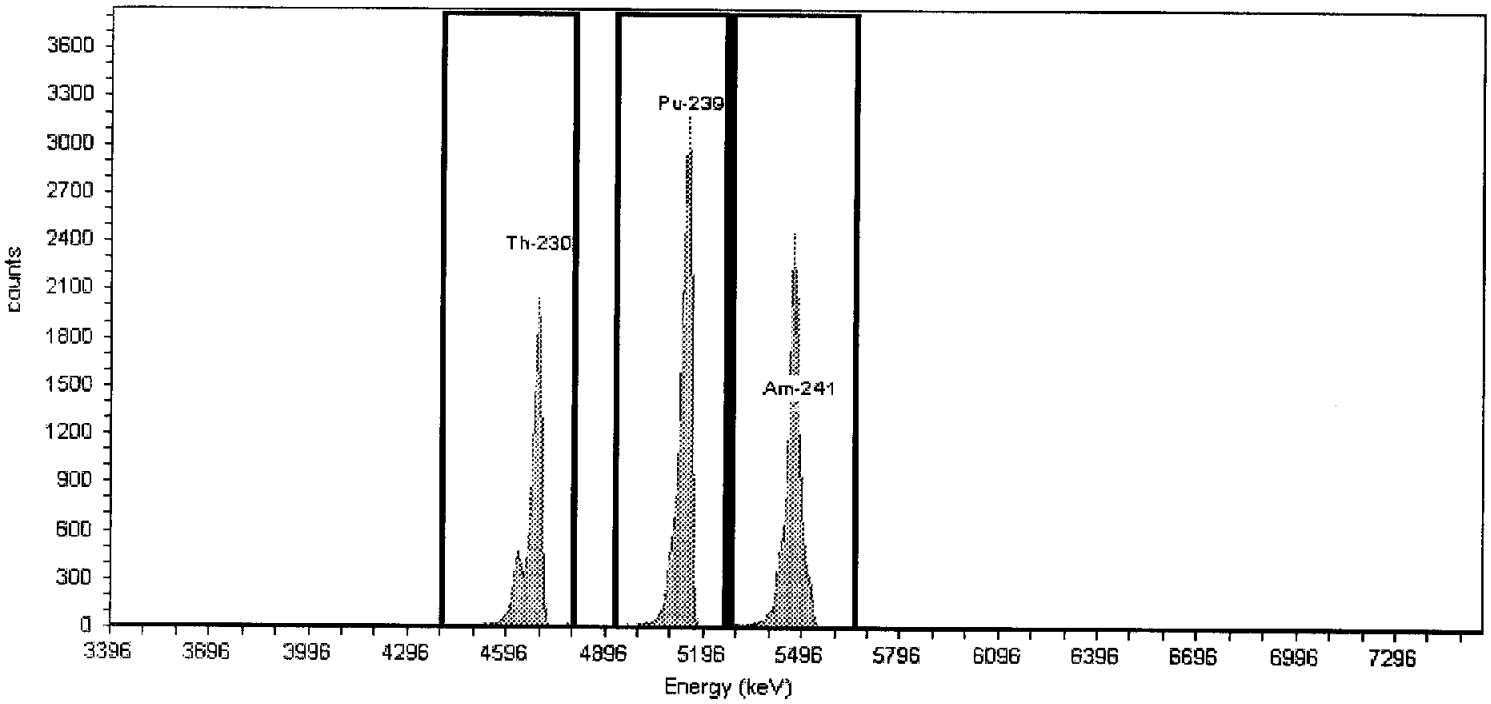
Certificate ID: 63509A-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV54 , SN:
Acquisition Start Date: 6/27/2007 11:56:28AM
Live Time: 140.00 min.
Real Time: 140.03 min.
Efficiency: 26.79% +/- 0.27% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	11,392.00	81.37
Pu-239	243	5.16	212	258	17,550.00	125.36
Am-241	289	5.49	261	313	15,088.00	107.77

STL SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
11:51:56AM 6/27/2007

Analyst: 60040
Detector: AV55

Calibration

Name: June2007_AV55
Description:

Calibration Date: 6/27/2007 11:51:53AM

Source Info

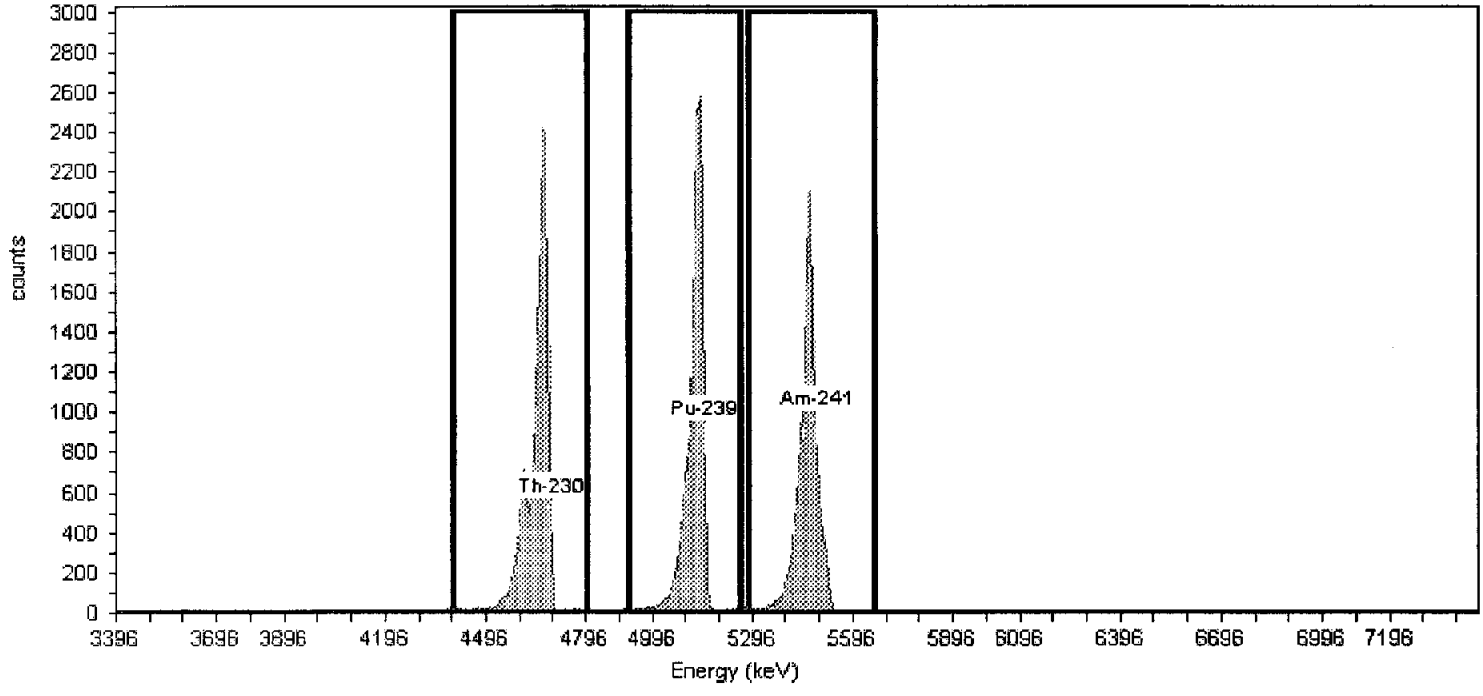
Certificate ID: 63506-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:07PM

Acquisition

Detector: AV55 , SN:
Acquisition Start Date: 6/27/2007 9:20:06AM
Live Time: 140.00 min.
Real Time: 140.02 min.
Efficiency: 26.97% +/- 0.27% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	16,264.00	116.17
Pu-239	243	5.16	212	258	15,646.00	111.76
Am-241	289	5.49	261	313	14,894.00	106.39

ST SEVERN TRENT **STL**

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
5:43:27AM 6/27/2007

Analyst: 60040
Detector: AV56

Calibration

Name: June2007_AV56
Description:

Calibration Date: 6/27/2007 5:43:24AM

Source Info

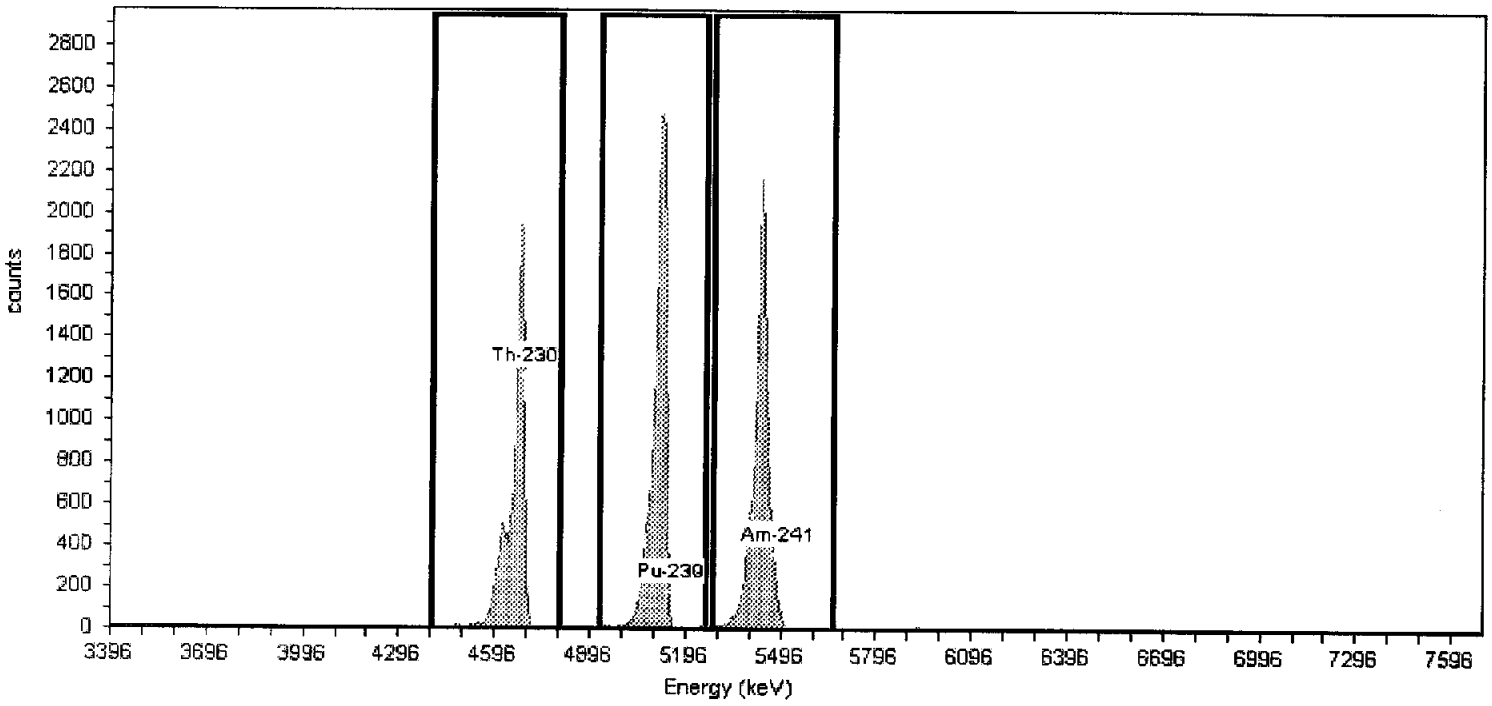
Certificate ID: 63507-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV56 , SN:
Acquisition Start Date: 6/26/2007 10:44:39PM
Live Time: 140.00 min.
Real Time: 140.03 min.
Efficiency: 25.86% +/- 0.27% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	11,961.00	85.44
Pu-239	243	5.16	212	258	14,397.00	102.84
Am-241	289	5.49	261	313	13,867.00	99.05

ST SEVERN TRENT **STL**

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
5:43:32AM 6/27/2007

Analyst: 60040
Detector: AV57

Calibration

Name: June2007_AV57
Description:

Calibration Date: 6/27/2007 5:43:29AM

Source Info

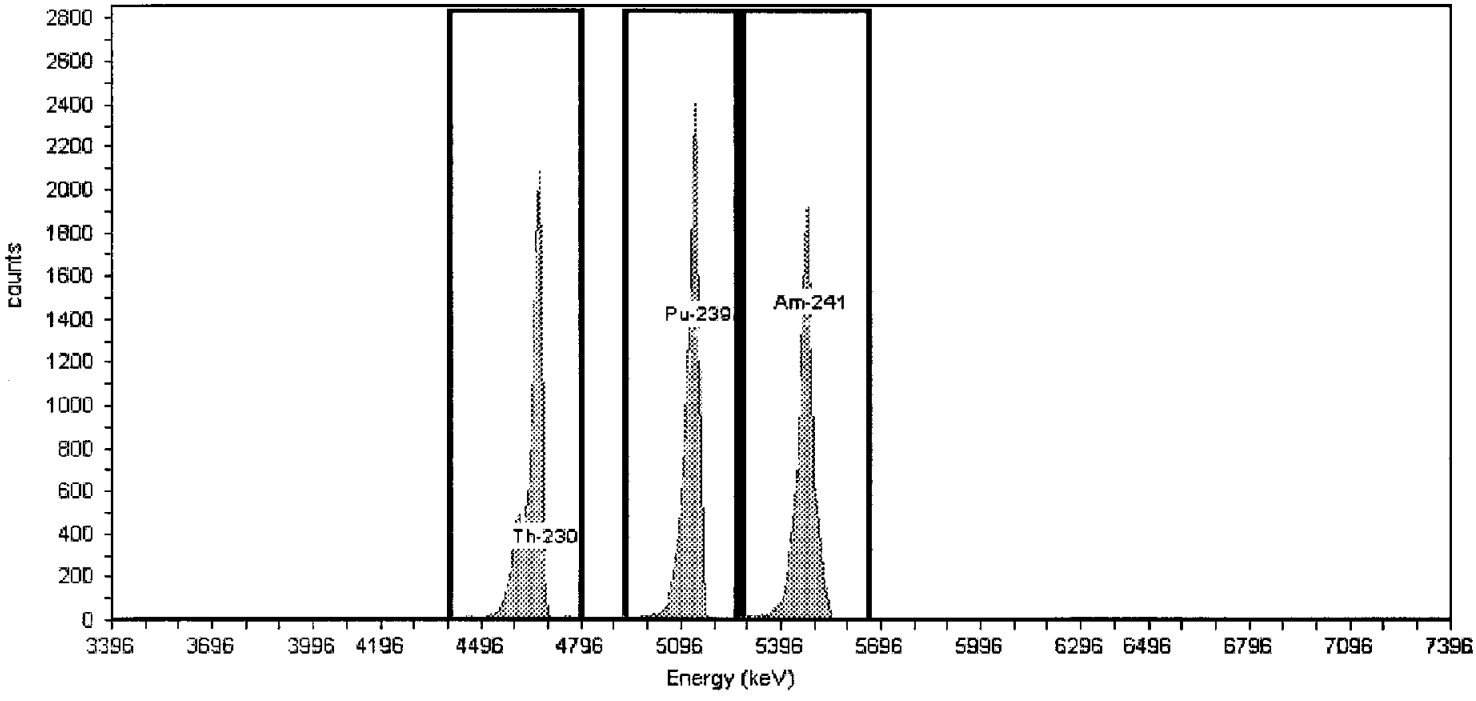
Certificate ID: 63508A-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV57 , SN:
Acquisition Start Date: 6/26/2007 10:45:13PM
Live Time: 140.00 min.
Real Time: 140.03 min.
Efficiency: 27.13% +/- 0.29% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	12,503.00	89.31
Pu-239	243	5.16	212	258	14,170.00	101.21
Am-241	289	5.49	261	313	13,383.00	95.59

ST SEVERN TRENT **STL**

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
4:52:51PM 6/27/2007

Analyst: 60040
Detector: AV58

Calibration

Name: June2007_AV58
Description:

Calibration Date: 6/27/2007 4:52:47PM

Source Info

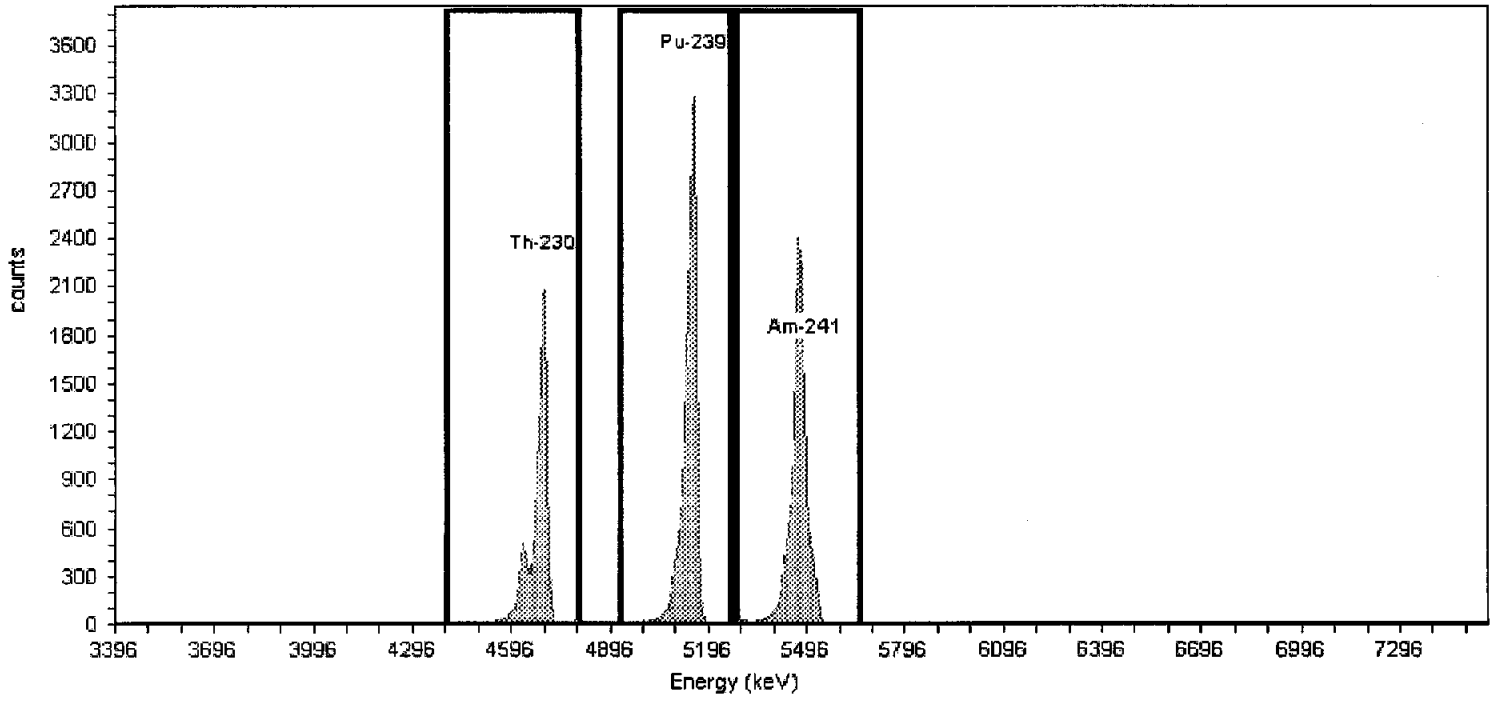
Certificate ID: 63509A-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV58 , SN:
Acquisition Start Date: 6/27/2007 2:28:14PM
Live Time: 140.00 min.
Real Time: 140.04 min.
Efficiency: 27.03% +/- 0.27% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	11,696.00	83.54
Pu-239	243	5.16	212	258	17,587.00	125.62
Am-241	289	5.49	261	313	15,136.00	108.11

STL SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
2:25:11PM 6/27/2007

Analyst: 60040
Detector: AV59

Calibration

Name: June2007_AV59
Description:

Calibration Date: 6/27/2007 2:25:08PM

Source Info

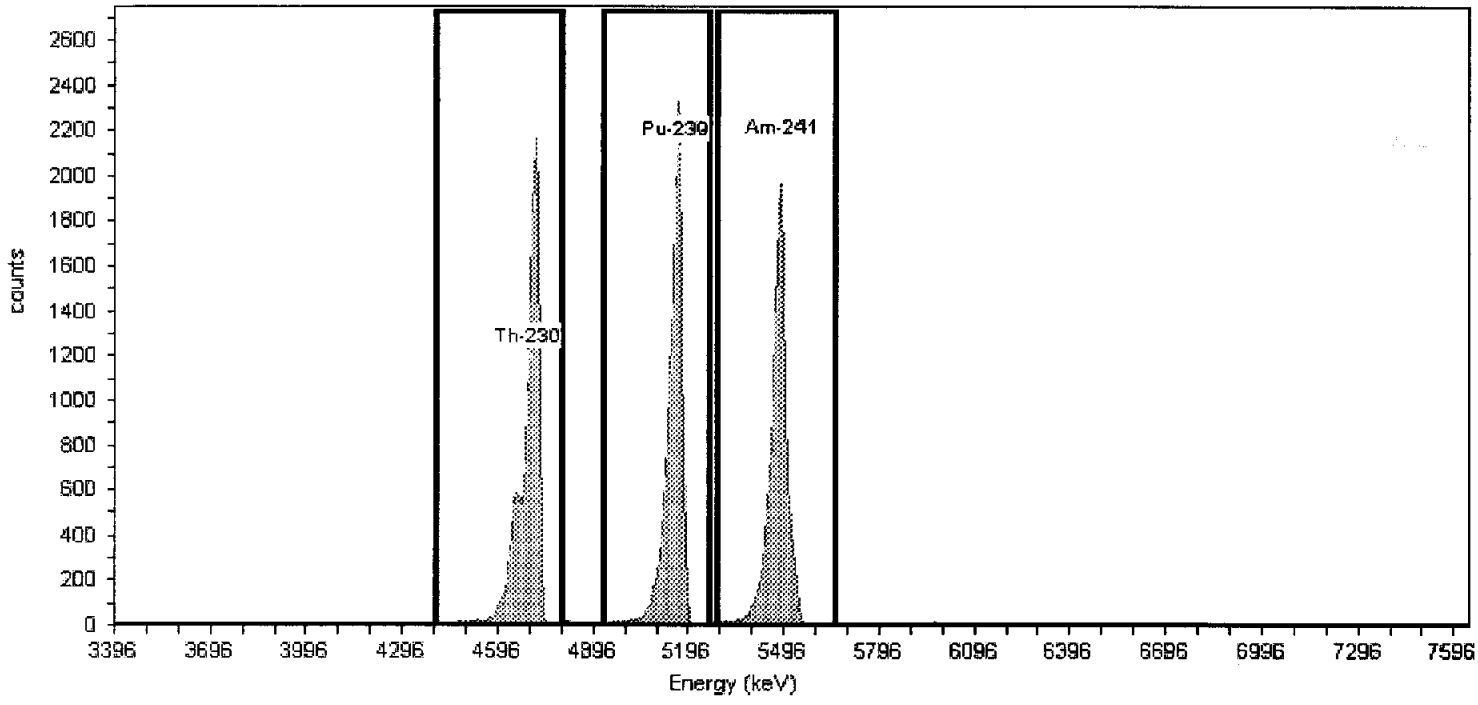
Certificate ID: 63506-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:07PM

Acquisition

Detector: AV59 , SN:
Acquisition Start Date: 6/27/2007 11:55:30AM
Live Time: 140.00 min.
Real Time: 142.46 min.
Efficiency: 25.33% +/- 0.26% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	14,817.00	105.84
Pu-239	243	5.16	212	258	14,852.00	106.09
Am-241	289	5.49	261	313	14,117.00	100.84

ST SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
4:57:24PM 6/27/2007

Analyst: 60040
Detector: AV60

Calibration

Name: June2007_AV60
Description:

Calibration Date: 6/27/2007 4:57:21PM

Source Info

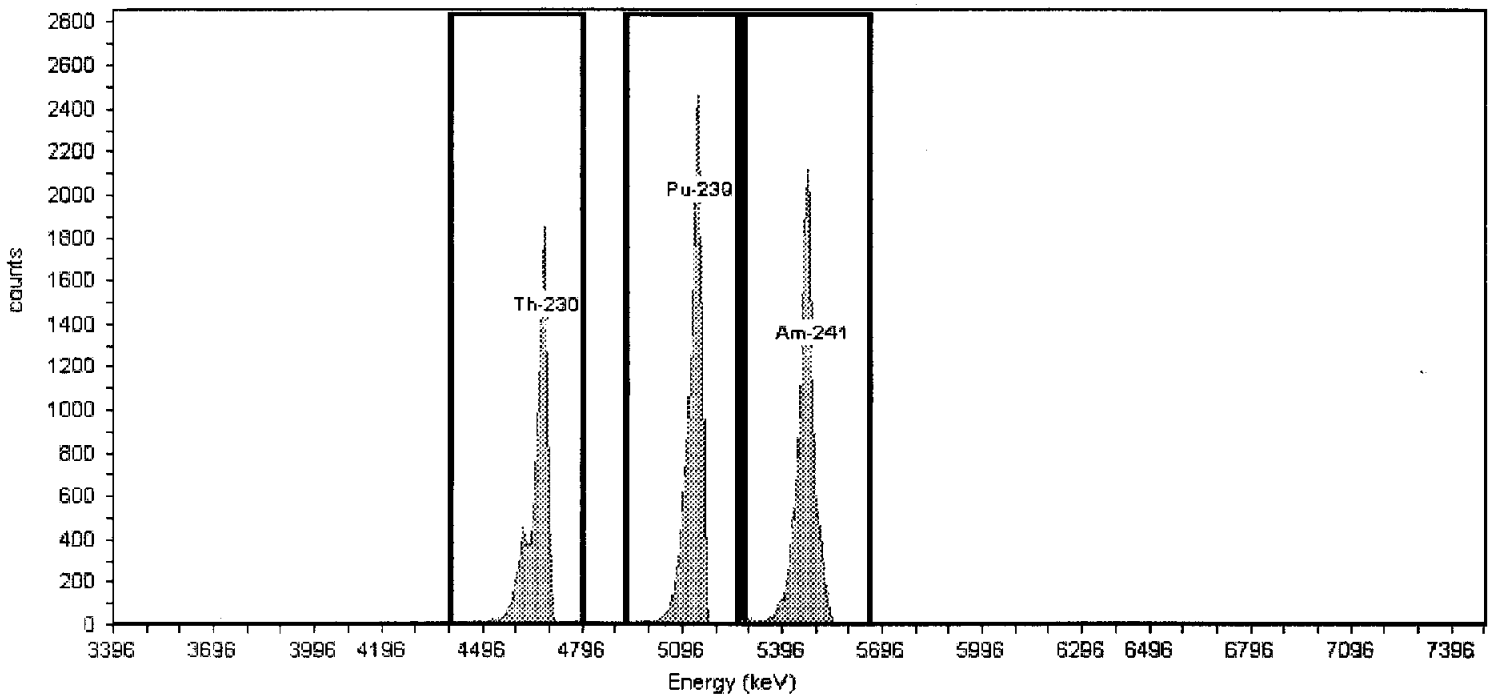
Certificate ID: 63507-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV60 , SN:
Acquisition Start Date: 6/27/2007 2:28:10PM
Live Time: 140.00 min.
Real Time: 149.05 min.
Efficiency: 25.73% +/- 0.27% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	11,337.00	80.98
Pu-239	243	5.16	212	258	14,654.00	104.67
Am-241	289	5.49	261	313	14,615.00	104.39

ST SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
4:56:54PM 6/27/2007

Analyst: 60040
Detector: AV63

Calibration

Name: June2007_AV63
Description:

Calibration Date: 6/27/2007 4:56:51PM

Source Info

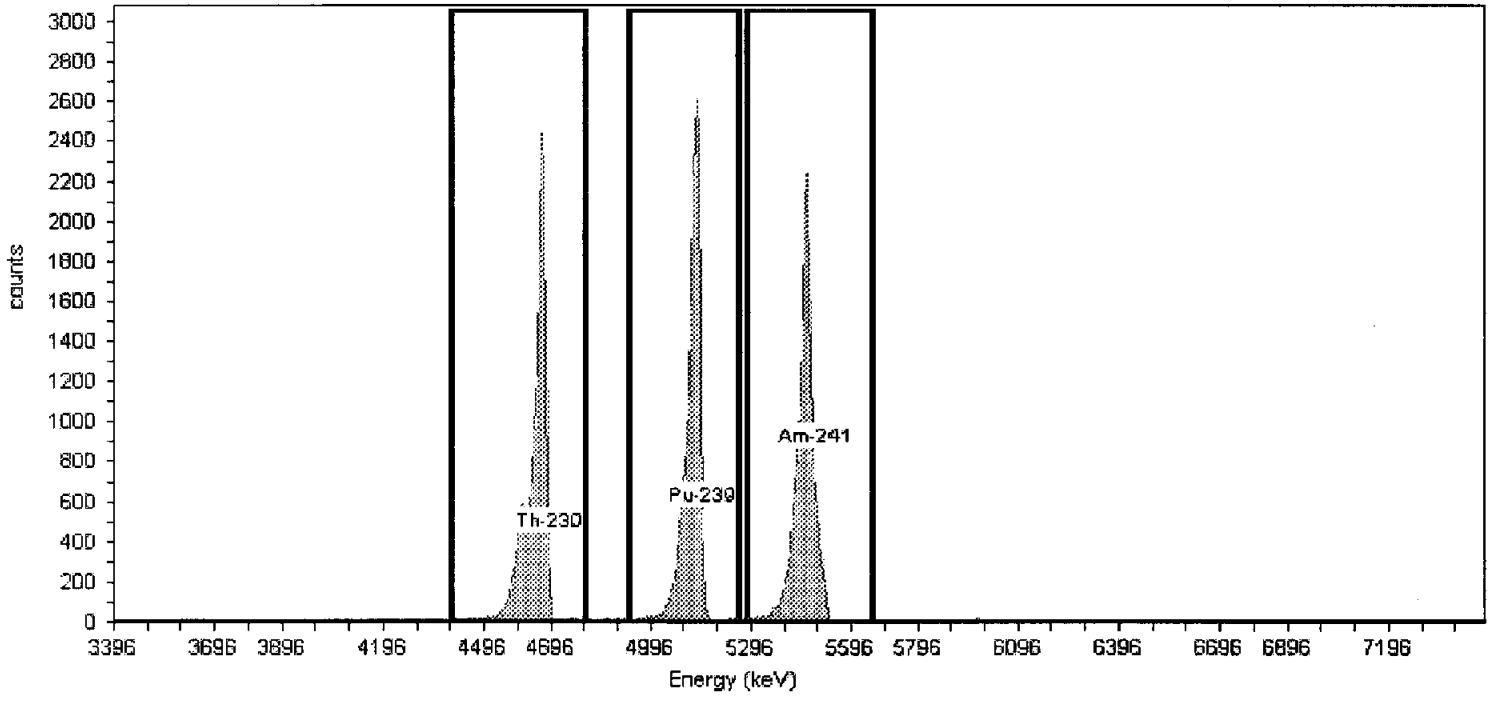
Certificate ID: 63506-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:07PM

Acquisition

Detector: AV63 , SN:
Acquisition Start Date: 6/27/2007 2:27:34PM
Live Time: 140.00 min.
Real Time: 149.05 min.
Efficiency: 26.37% +/- 0.26% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	15,011.00	107.22
Pu-239	243	5.16	212	258	15,424.00	110.17
Am-241	289	5.49	261	313	15,031.00	107.36

ST SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
7:45:42PM 6/27/2007

Analyst: 60040
Detector: AV64

Calibration

Name: June2007_AV64
Description:

Calibration Date: 6/27/2007 7:45:39PM

Source Info

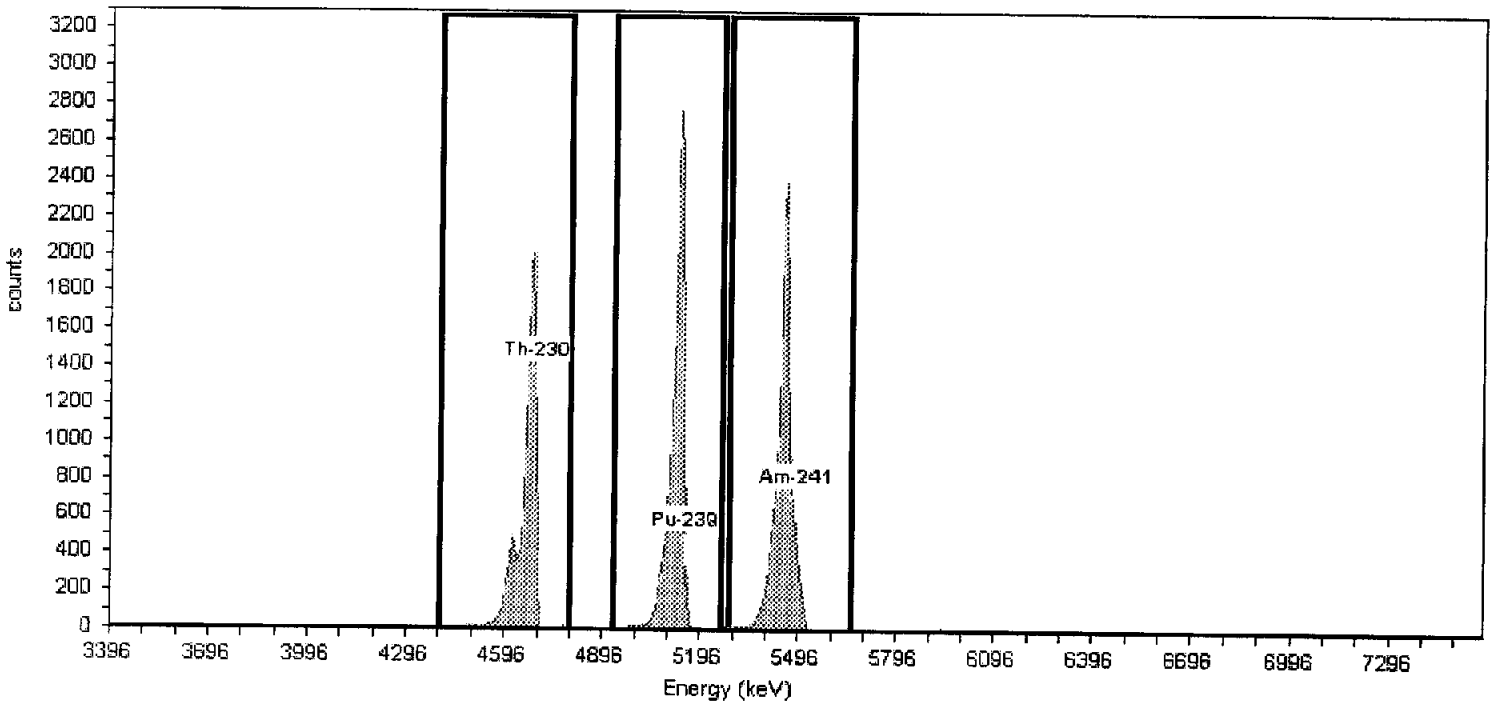
Certificate ID: 63507-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV64 , SN:
Acquisition Start Date: 6/27/2007 4:59:42PM
Live Time: 140.00 min.
Real Time: 149.21 min.
Efficiency: 26.35% +/- 0.28% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch²



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	11,627.00	83.05
Pu-239	243	5.16	212	258	15,085.00	107.75
Am-241	289	5.49	261	313	14,840.00	106.00

ST SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
7:45:54PM 6/27/2007

Analyst: 60040
Detector: AV66

Calibration

Name: June2007_AV66
Description:

Calibration Date: 6/27/2007 7:45:49PM

Source Info

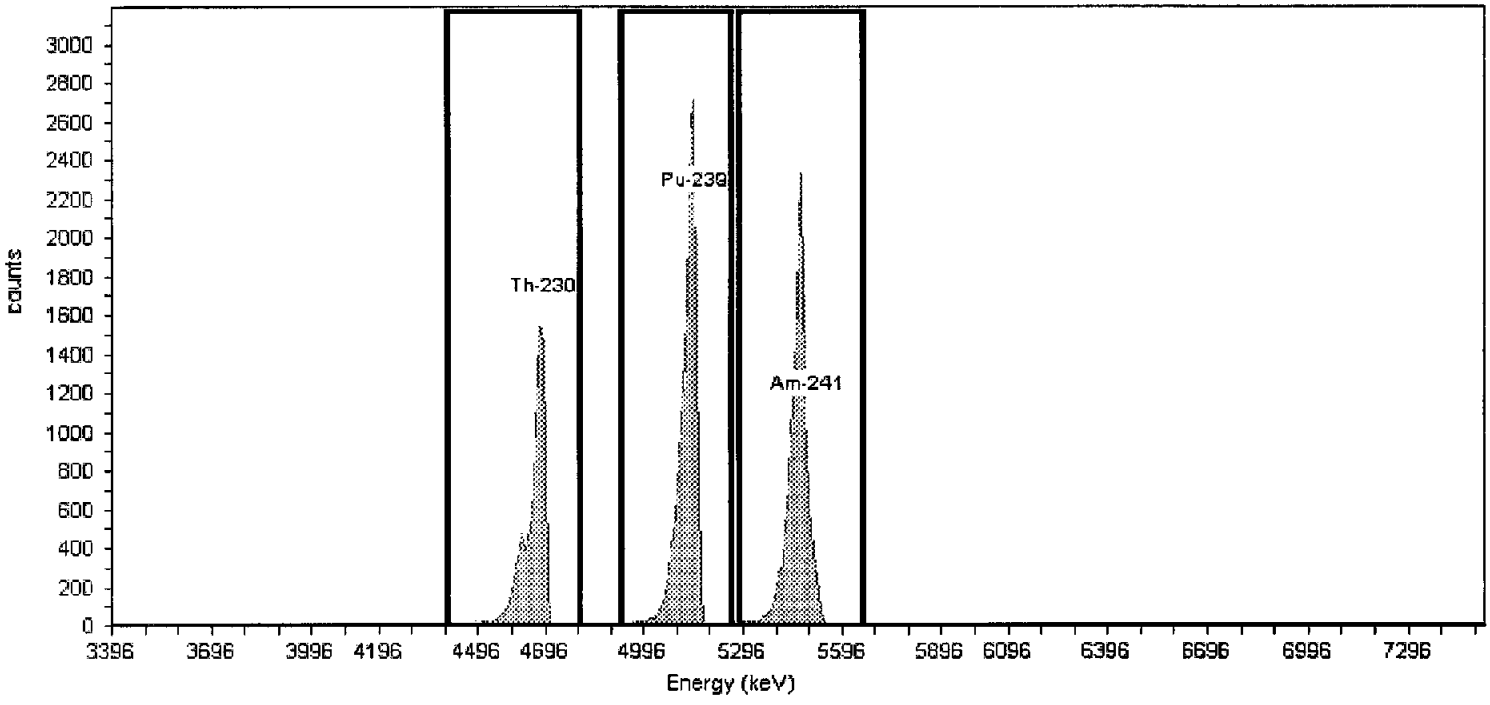
Certificate ID: 63509A-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV66 , SN:
Acquisition Start Date: 6/27/2007 5:00:37PM
Live Time: 140.00 min.
Real Time: 149.21 min.
Efficiency: 27.06% +/- 0.27% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	10,766.00	76.90
Pu-239	243	5.16	212	258	17,821.00	127.29
Am-241	289	5.49	261	313	15,977.00	114.12

ST SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
7:45:24PM 6/27/2007

Analyst: 60040
Detector: AV67

Calibration

Name: June2007_AV67
Description:

Calibration Date: 6/27/2007 7:45:21PM

Source Info

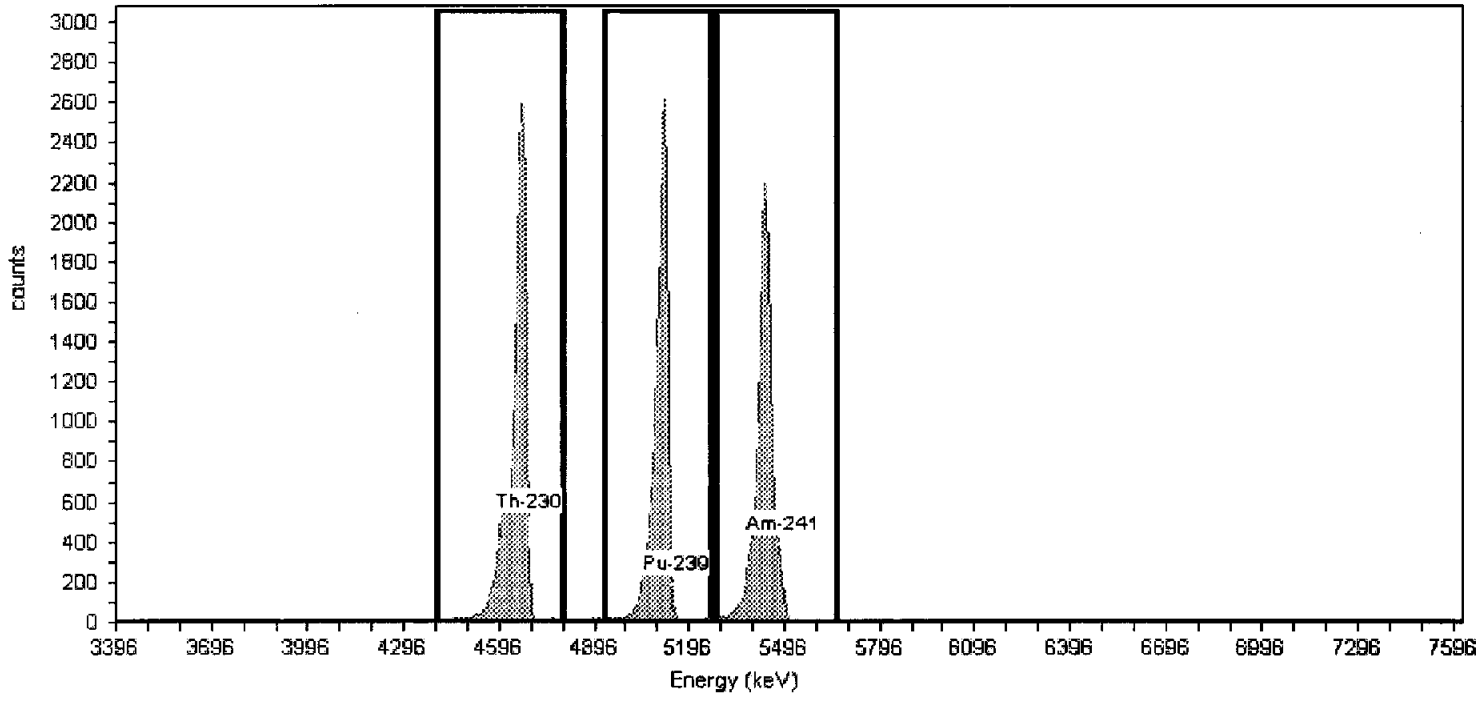
Certificate ID: 63506-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:07PM

Acquisition

Detector: AV67 , SN:
Acquisition Start Date: 6/27/2007 4:59:07PM
Live Time: 140.00 min.
Real Time: 140.03 min.
Efficiency: 27.83% +/- 0.27% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	17,085.00	122.04
Pu-239	243	5.16	212	258	16,129.00	115.21
Am-241	289	5.49	261	313	15,202.00	108.59

ST SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
10:13:59PM 6/27/2007

Analyst: 60040
Detector: AV68

Calibration

Name: June2007_AV68
Description:

Calibration Date: 6/27/2007 10:13:55PM

Source Info

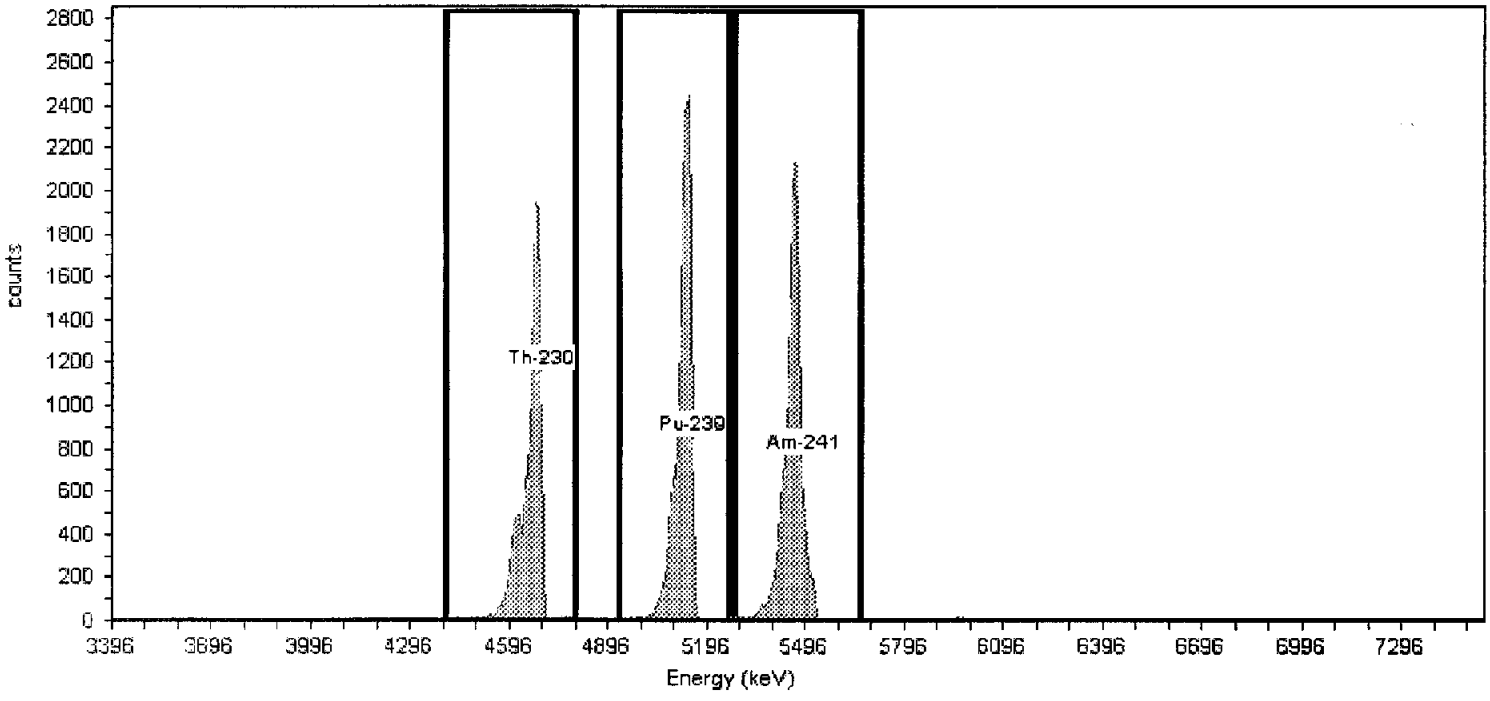
Certificate ID: 63507-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV68 , SN:
Acquisition Start Date: 6/27/2007 7:51:40PM
Live Time: 140.00 min.
Real Time: 140.05 min.
Efficiency: 26.94% +/- 0.28% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	12,557.00	89.69
Pu-239	243	5.16	212	258	14,842.00	106.01
Am-241	289	5.49	261	313	14,436.00	103.11

STL SEVERN TRENT **STL**

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040
Detector: AV69
7:45:33PM 6/27/2007

Calibration

Name: June2007_AV69
Calibration Date: 6/27/2007 7:45:29PM
Description:

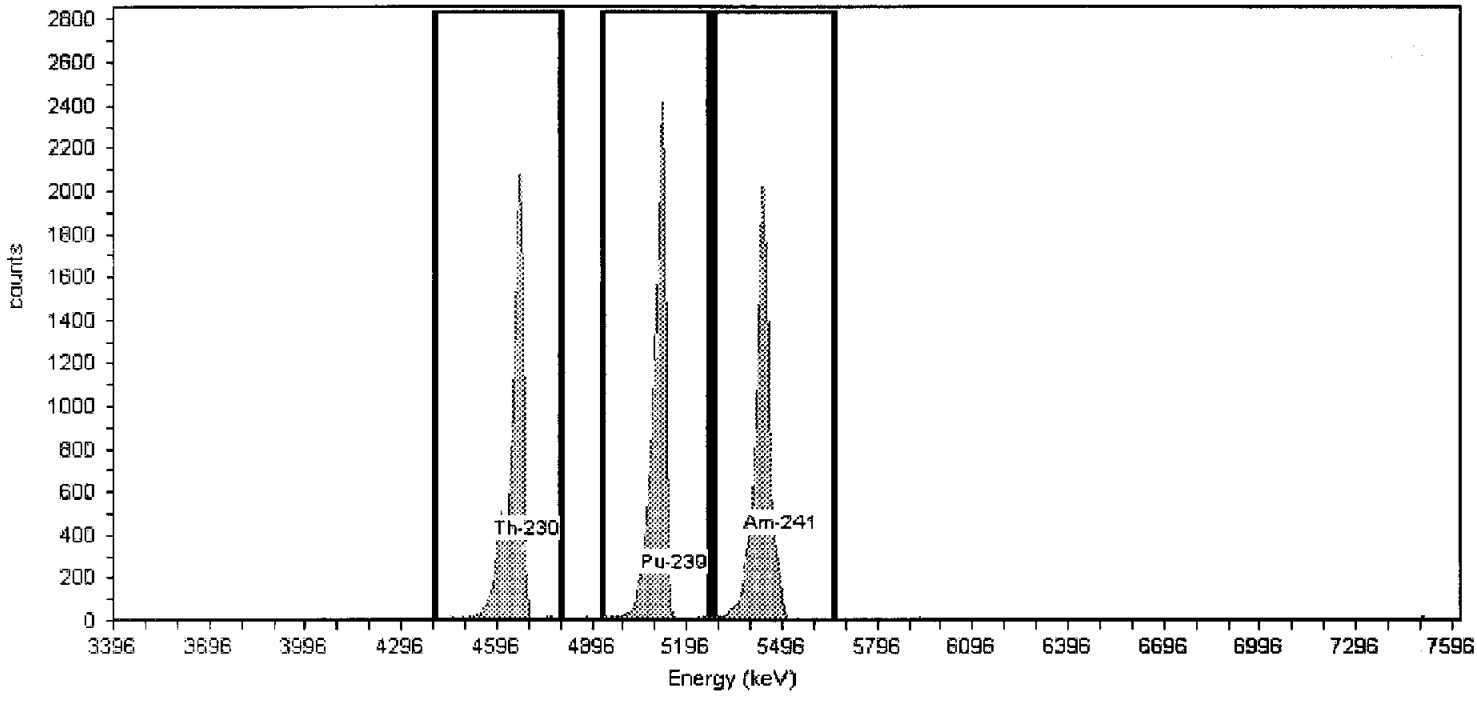
Source Info

Certificate ID: 63508A-334
Certification Date: 5/30/2002 12:00:00PM
Prepared by: Analytics
Description:

Acquisition

Detector: AV69 , SN:
Acquisition Start Date: 6/27/2007 4:59:51PM
Live Time: 140.00 min.
Real Time: 140.03 min.
Efficiency: 27.84% +/- 0.30% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Initial Calibration: No
Algorithm: Linear
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	12,724.00	90.89
Pu-239	243	5.16	212	258	14,757.00	105.41
Am-241	289	5.49	261	313	13,631.00	97.36

ST SEVERN TRENT **STL**

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
10:14:21PM 6/27/2007

Analyst: 60040
Detector: AV70

Calibration

Name: June2007_AV70
Description:

Calibration Date: 6/27/2007 10:14:18PM

Source Info

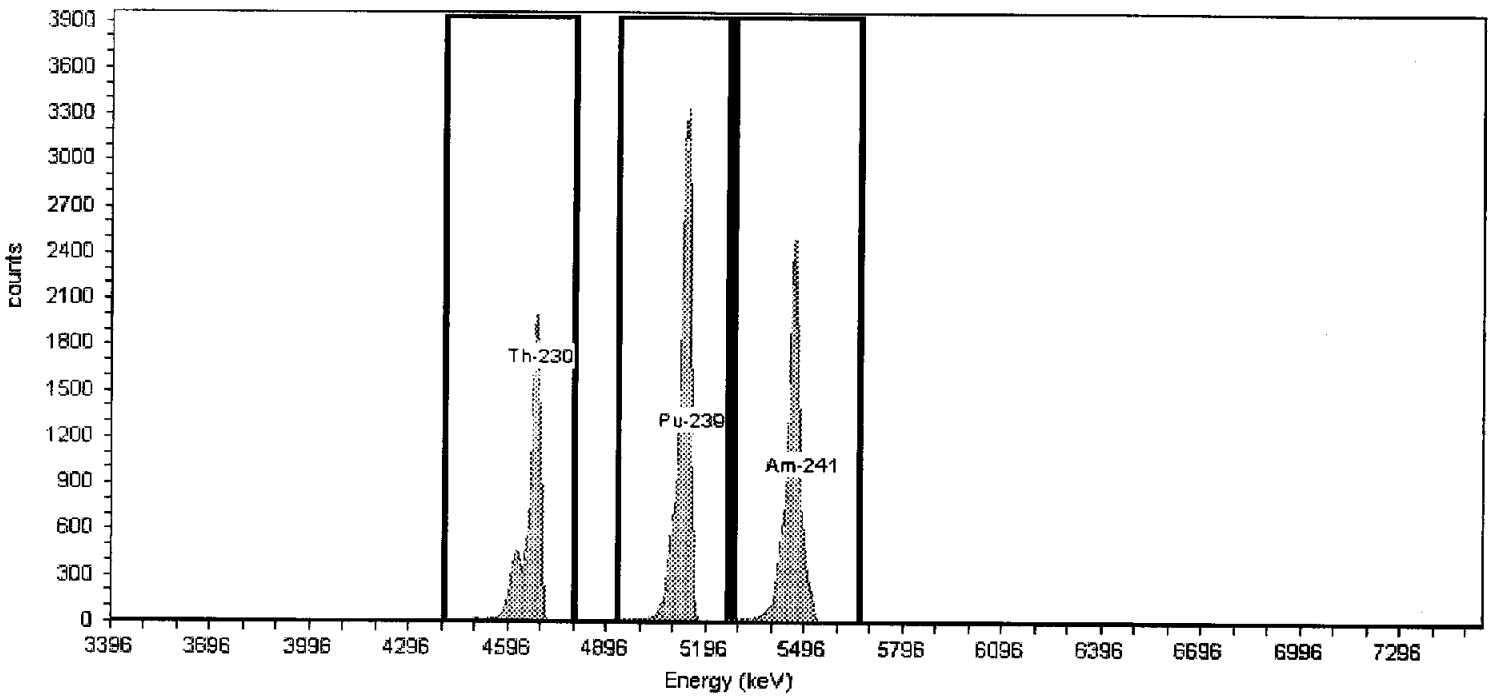
Certificate ID: 63509A-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV70 , SN:
Acquisition Start Date: 6/27/2007 7:52:14PM
Live Time: 140.00 min.
Real Time: 140.05 min.
Efficiency: 27.15% +/- 0.28% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch²



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	11,676.00	83.40
Pu-239	243	5.16	212	258	17,724.00	126.60
Am-241	289	5.49	261	313	15,220.00	108.71

ST SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
10:13:48PM 6/27/2007

Analyst: 60040
Detector: AV71

Calibration

Name: June2007_AV71
Description:

Calibration Date: 6/27/2007 10:13:44PM

Source Info

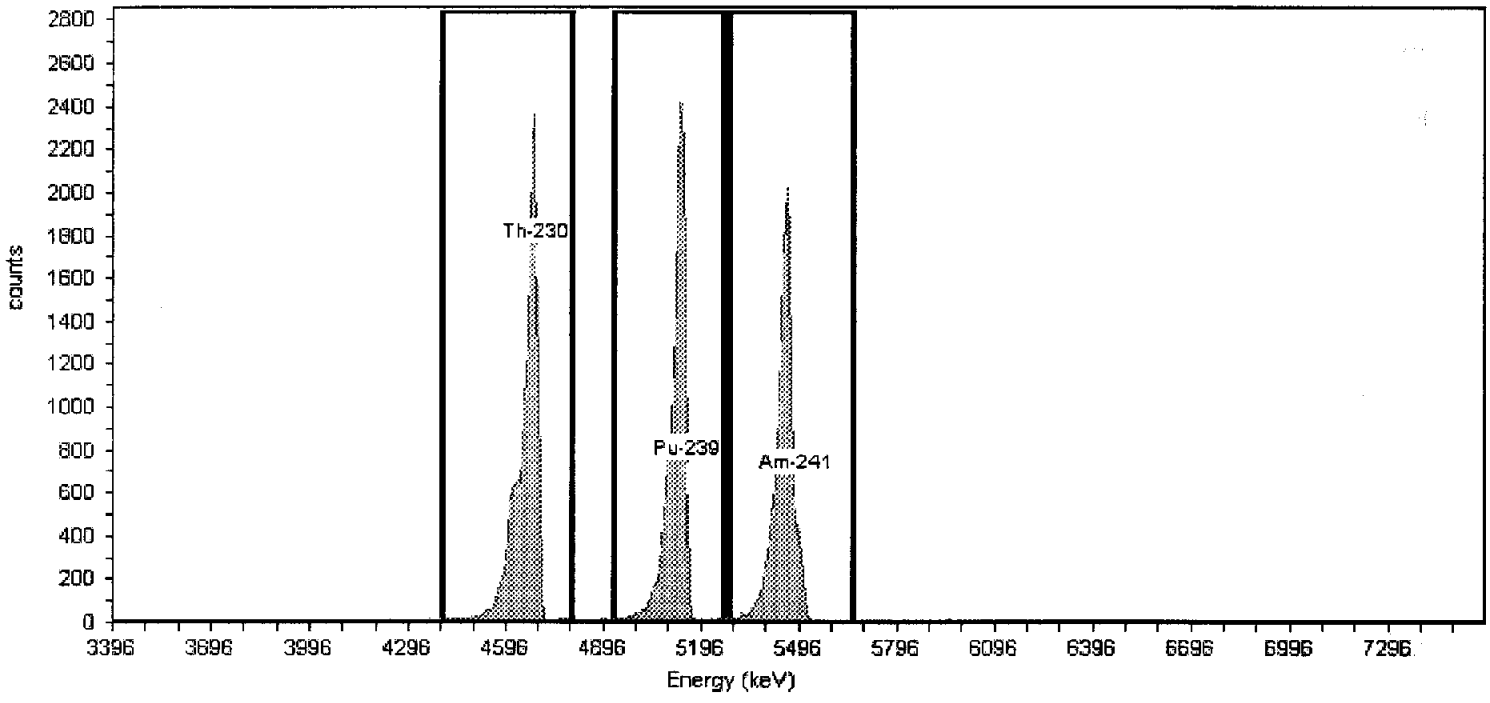
Certificate ID: 63506-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:07PM

Acquisition

Detector: AV71 , SN:
Acquisition Start Date: 6/27/2007 7:50:43PM
Live Time: 140.00 min.
Real Time: 140.05 min.
Efficiency: 27.16% +/- 0.27% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	16,664.00	119.03
Pu-239	243	5.16	212	258	15,761.00	112.58
Am-241	289	5.49	261	313	14,819.00	105.85

ST SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
11:44:23AM 6/28/2007

Analyst: 60040
Detector: AV72

Calibration

Name: June2007_AV72
Description:

Calibration Date: 6/28/2007 11:44:20AM

Source Info

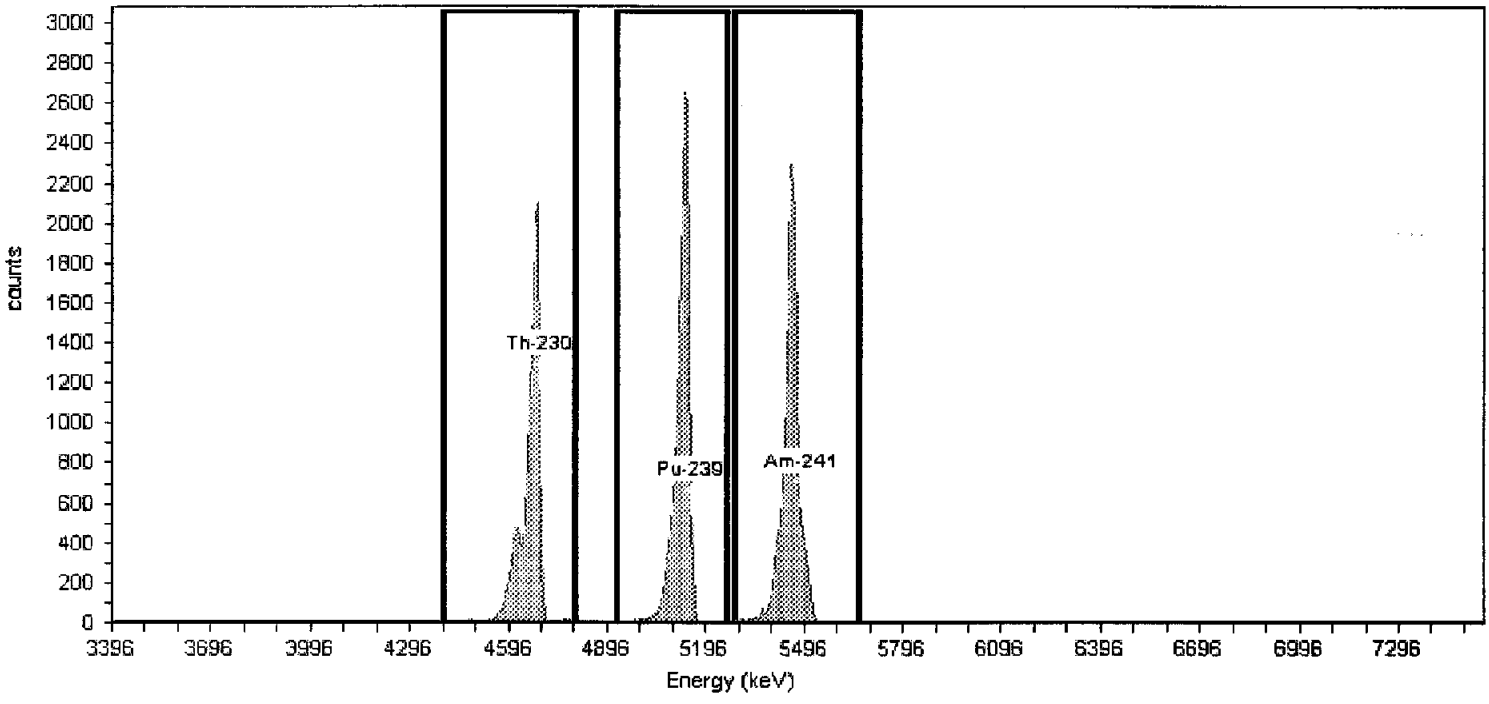
Certificate ID: 63507-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV72 , SN:
Acquisition Start Date: 6/28/2007 9:22:07AM
Live Time: 140.00 min.
Real Time: 140.00 min.
Efficiency: 26.86% +/- 0.28% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	12,554.00	89.67
Pu-239	243	5.16	212	258	14,824.00	105.89
Am-241	289	5.49	261	313	14,297.00	102.12

ST SEVERN TRENT **STL**

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
10:14:12PM 6/27/2007

Analyst: 60040
Detector: AV73

Calibration

Name: June2007_AV73
Description:

Calibration Date: 6/27/2007 10:14:07PM

Source Info

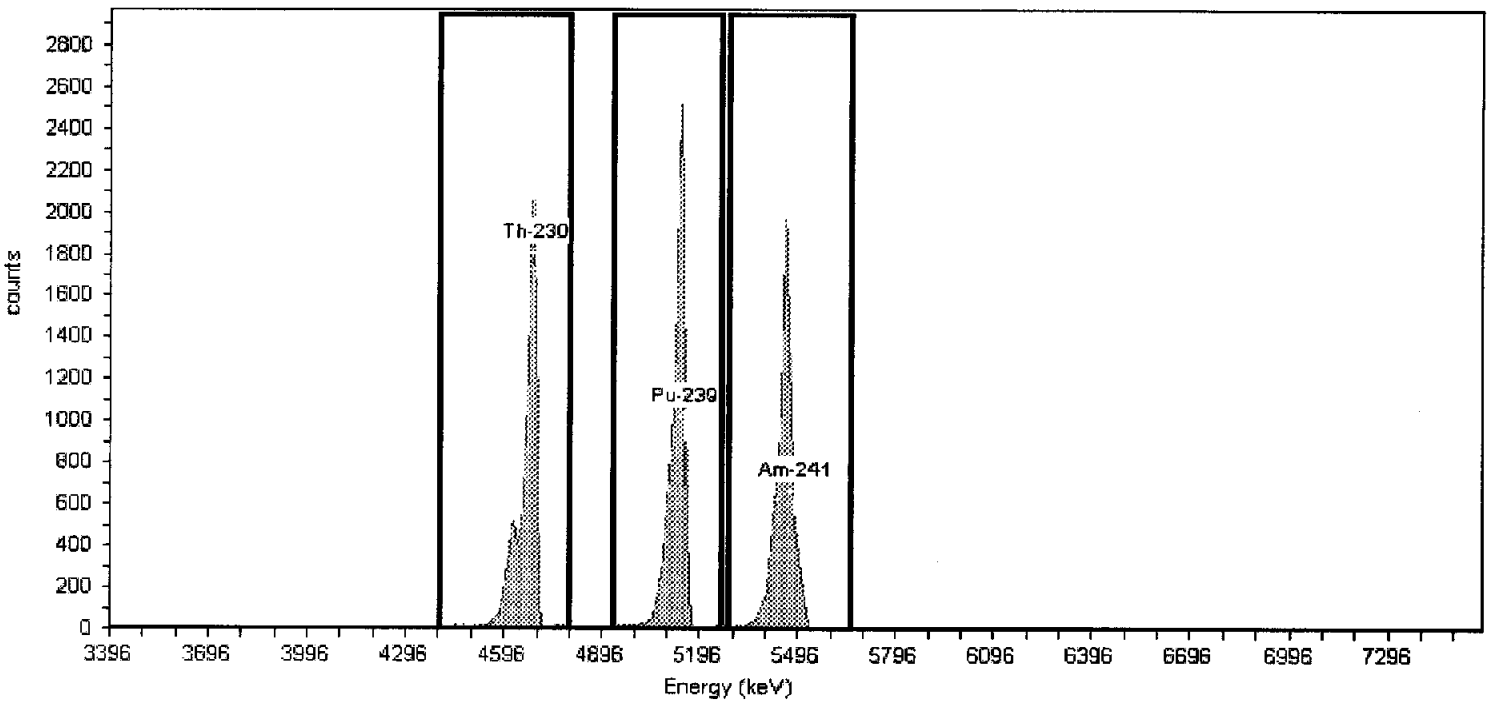
Certificate ID: 63508A-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV73 , SN:
Acquisition Start Date: 6/27/2007 7:51:45PM
Live Time: 140.00 min.
Real Time: 140.05 min.
Efficiency: 27.28% +/- 0.29% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	12,452.00	88.94
Pu-239	243	5.16	212	258	14,486.00	103.47
Am-241	289	5.49	261	313	13,348.00	95.34

ST SEVERN TRENT **STL**

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
6:00:53AM 6/28/2007

Analyst: 60040
Detector: AV75

Calibration

Name: June2007_AV75
Description:

Calibration Date: 6/28/2007 6:00:50AM

Source Info

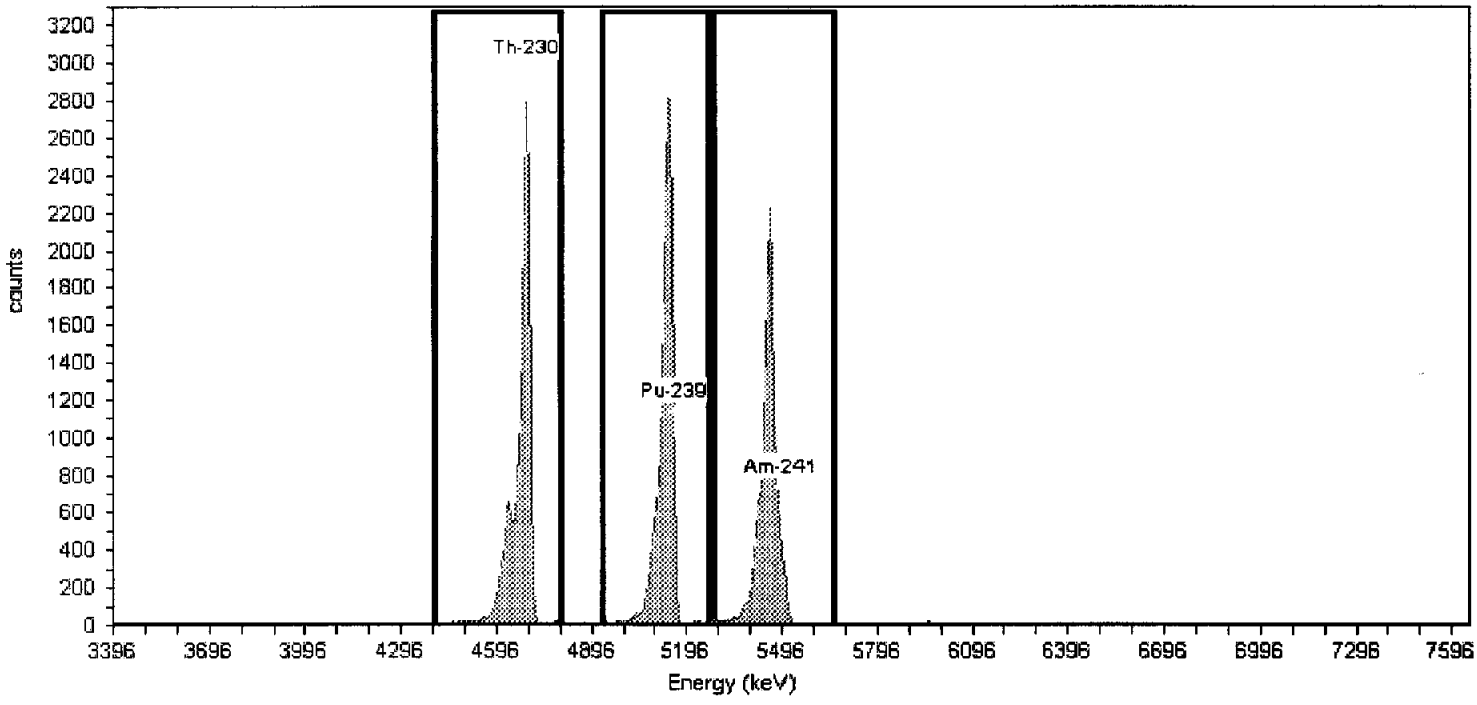
Certificate ID: 63506-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:07PM

Acquisition

Detector: AV75 , SN: 46-033P6
Acquisition Start Date: 6/27/2007 10:20:19PM
Live Time: 140.00 min.
Real Time: 140.06 min.
Efficiency: 26.69% +/- 0.26% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	16,273.00	116.24
Pu-239	243	5.16	212	258	15,488.00	110.63
Am-241	289	5.49	261	313	14,632.00	104.51

ST SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
6:00:57AM 6/28/2007

Analyst: 60040
Detector: AV76

Calibration

Name: June2007_AV76
Description:

Calibration Date: 6/28/2007 6:00:54AM

Source Info

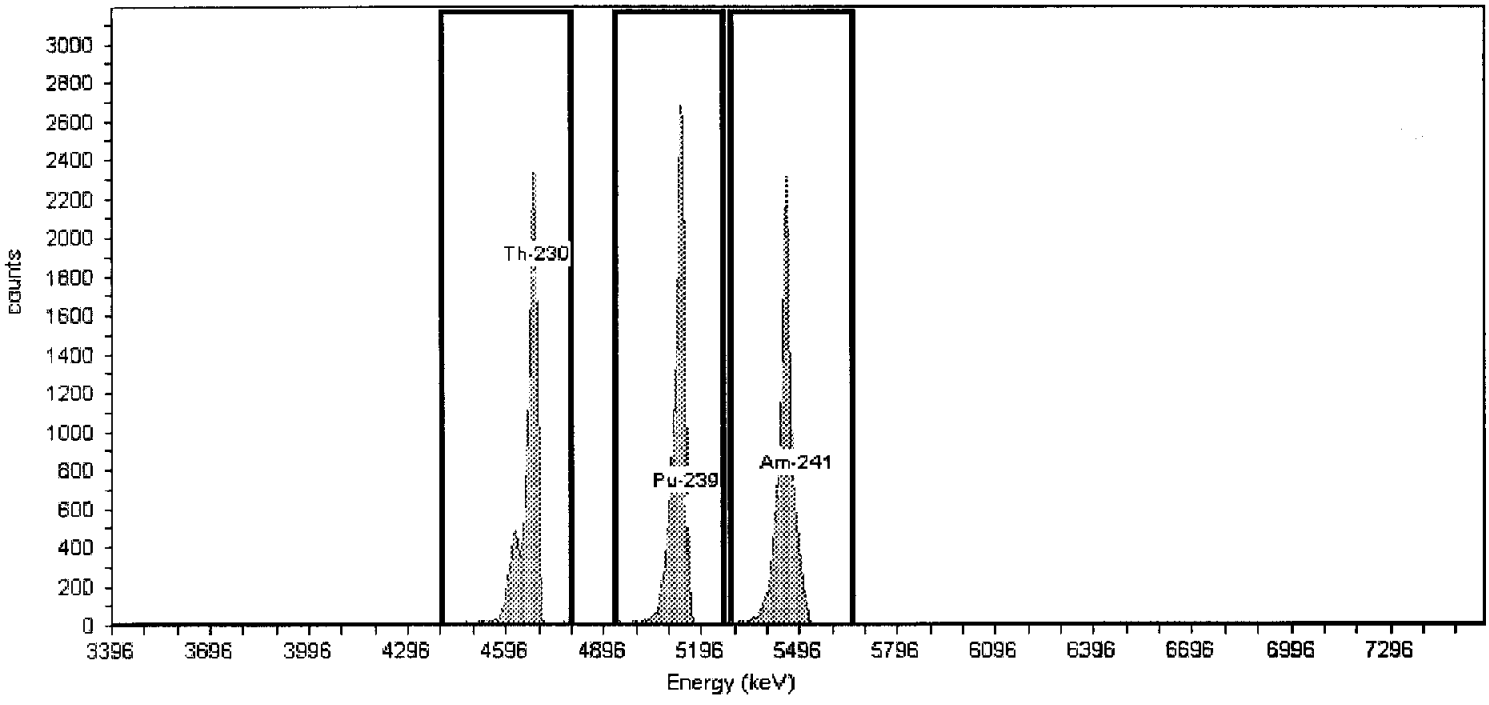
Certificate ID: 63507-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV76 , SN: 46-033Q4
Acquisition Start Date: 6/27/2007 10:20:54PM
Live Time: 140.00 min.
Real Time: 140.06 min.
Efficiency: 26.45% +/- 0.28% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	12,373.00	88.38
Pu-239	243	5.16	212	258	14,609.00	104.35
Am-241	289	5.49	261	313	14,046.00	100.33

SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
6:01:02AM 6/28/2007

Analyst: 60040
Detector: AV77

Calibration

Name: June2007_AV77
Description:

Calibration Date: 6/28/2007 6:00:59AM

Source Info

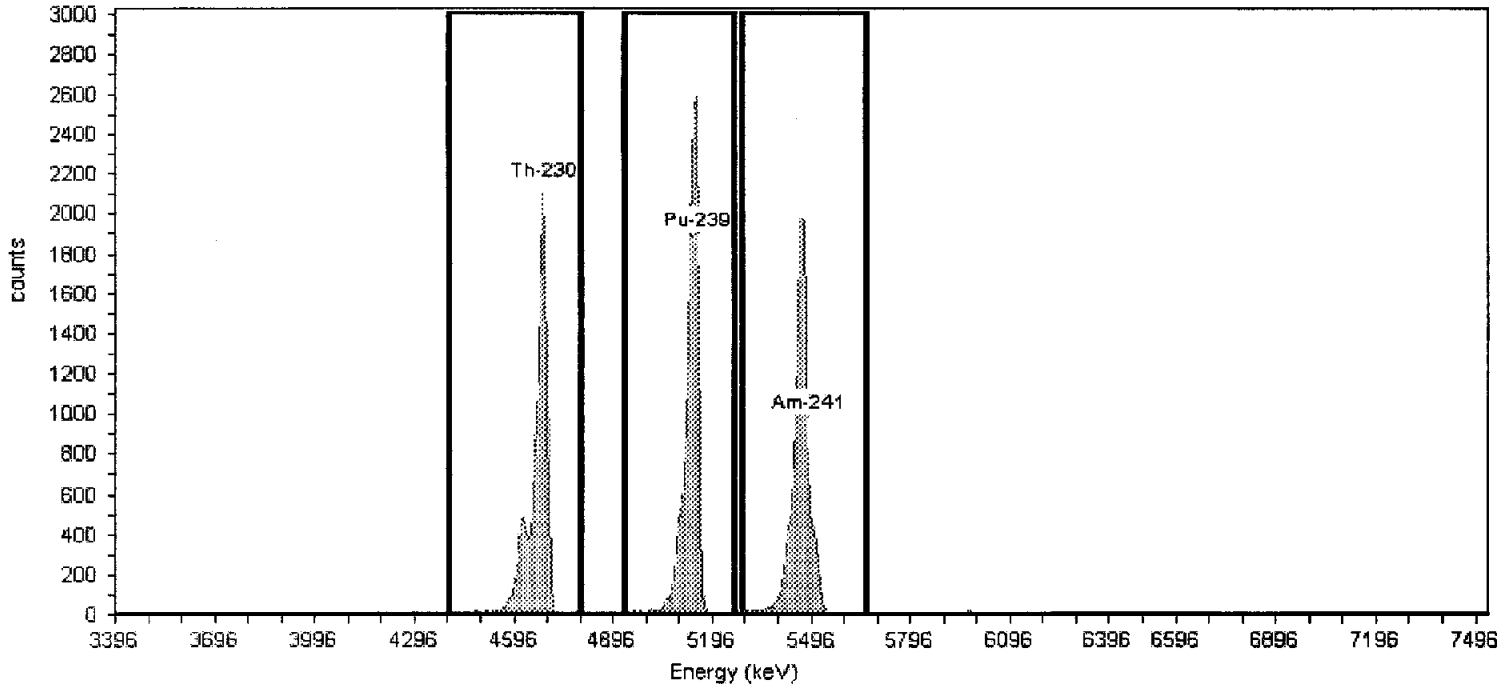
Certificate ID: 63508A-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV77 , SN: 46-033Q7
Acquisition Start Date: 6/27/2007 10:20:56PM
Live Time: 140.00 min.
Real Time: 140.06 min.
Efficiency: 26.78% +/- 0.29% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	12,491.00	89.22
Pu-239	243	5.16	212	258	14,055.00	100.39
Am-241	289	5.49	261	313	12,999.00	92.85

STL SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040
Detector: AV78

6:01:12AM 6/28/2007

Calibration

Name: June2007_AV78
Description:

Calibration Date: 6/28/2007 6:01:03AM

Source Info

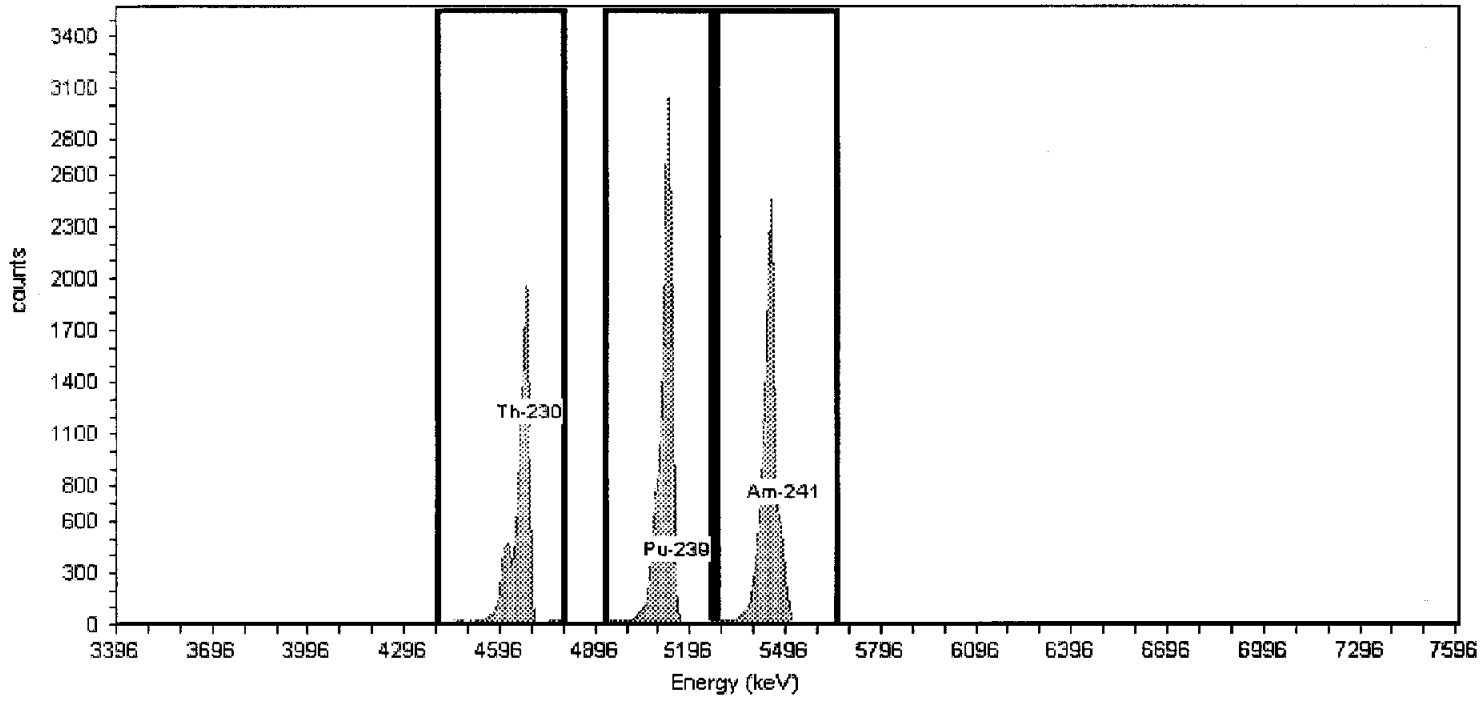
Certificate ID: 63509A-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV78 , SN: 46-033FF4
Acquisition Start Date: 6/27/2007 10:21:39PM
Live Time: 140.00 min.
Real Time: 140.06 min.
Efficiency: 26.66% +/- 0.27% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	11,705.00	83.61
Pu-239	243	5.16	212	258	17,255.00	123.25
Am-241	289	5.49	261	313	14,872.00	106.23

ST SEVERN TRENT **STL**

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
11:44:30AM 6/28/2007

Analyst: 60040
Detector: AV79

Calibration

Name: June2007_AV79
Description:

Calibration Date: 6/28/2007 11:44:27AM

Source Info

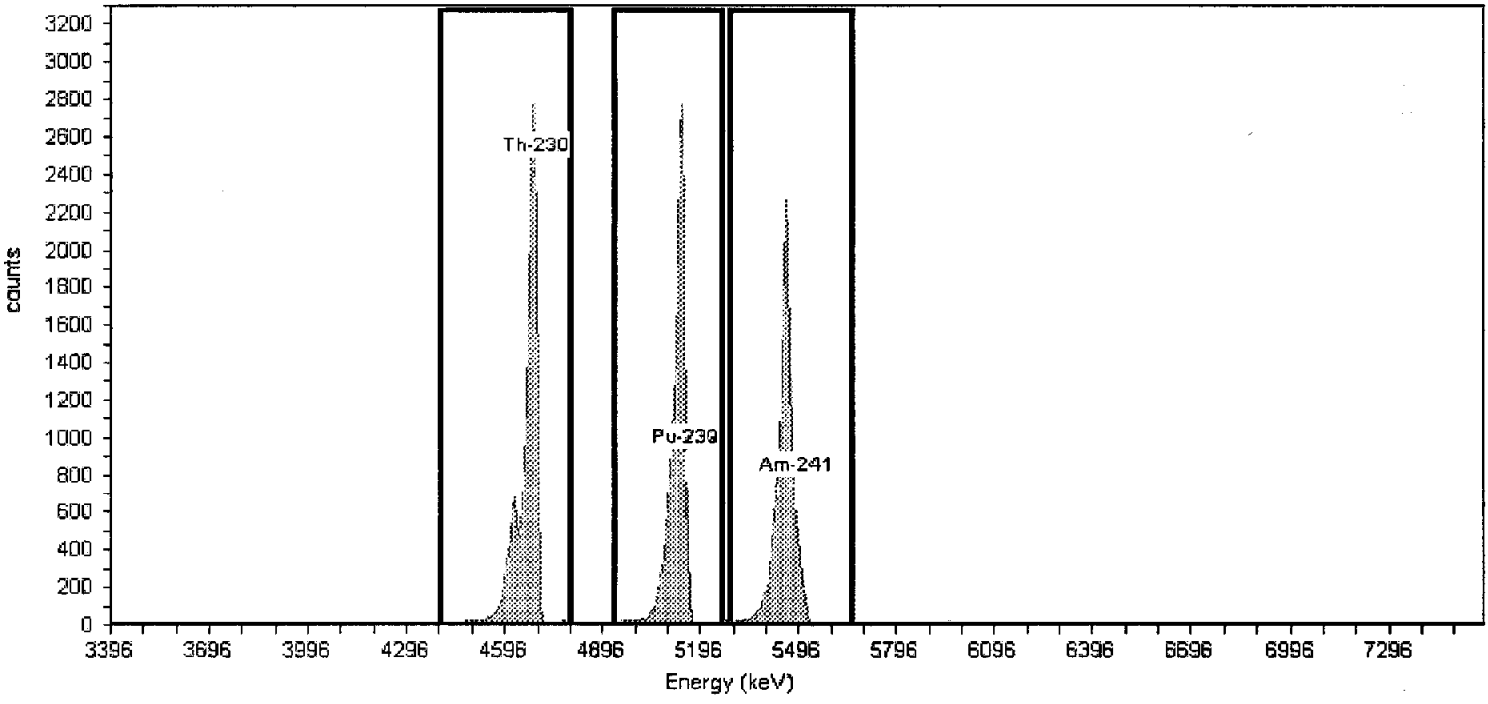
Certificate ID: 63506-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:07PM

Acquisition

Detector: AV79 , SN: 46-033Q5
Acquisition Start Date: 6/28/2007 9:21:35AM
Live Time: 140.00 min.
Real Time: 140.04 min.
Efficiency: 26.98% +/- 0.27% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	16,431.00	117.36
Pu-239	243	5.16	212	258	15,625.00	111.61
Am-241	289	5.49	261	313	14,829.00	105.92

ST SEVERN TRENT **STL**

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
2:09:59PM 6/28/2007

Analyst: 60040
Detector: AV80

Calibration

Name: June2007_AV80
Description:

Calibration Date: 6/28/2007 2:09:56PM

Source Info

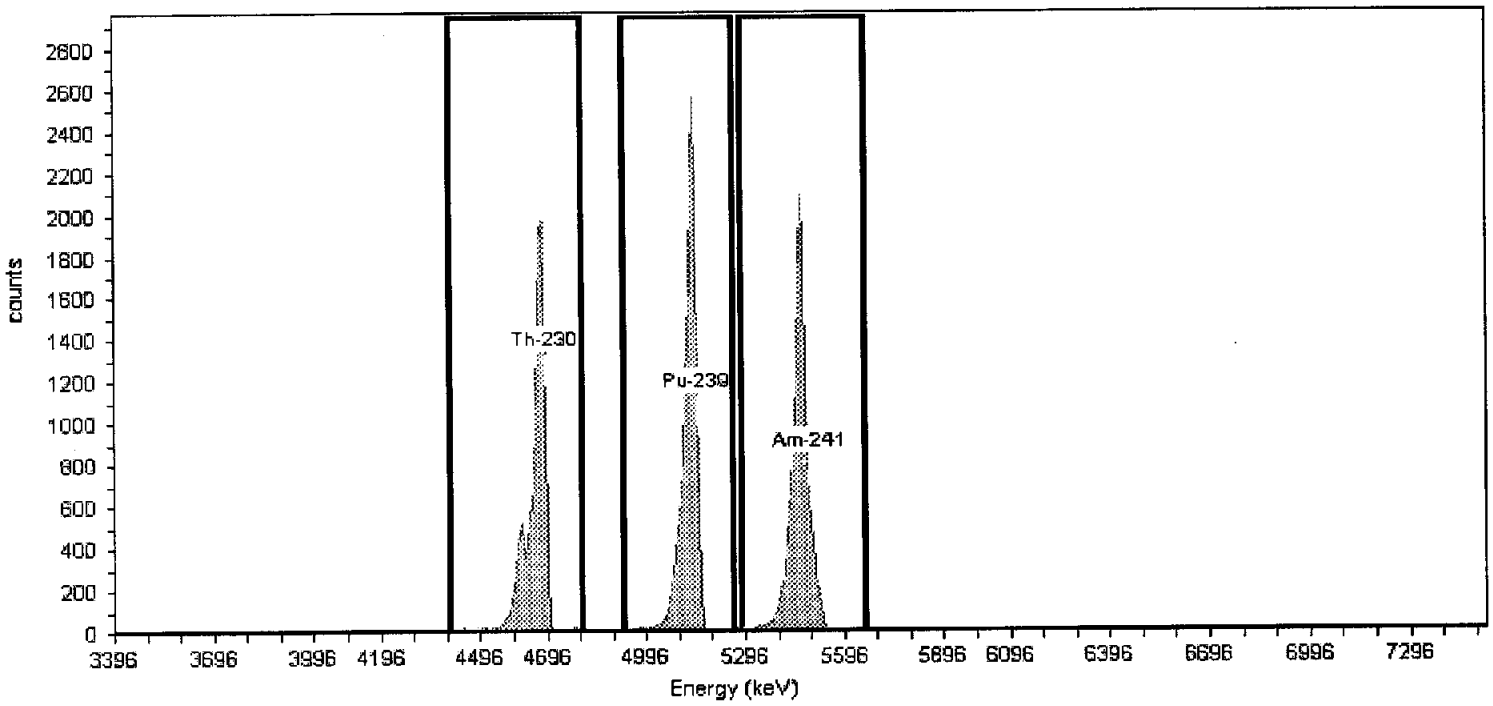
Certificate ID: 63507-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV80 , SN: 46-03305
Acquisition Start Date: 6/28/2007 11:46:59AM
Live Time: 140.00 min.
Real Time: 140.01 min.
Efficiency: 25.72% +/- 0.27% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	12,040.00	86.00
Pu-239	243	5.16	212	258	14,149.00	101.06
Am-241	289	5.49	261	313	13,705.00	97.89

SEVERN TRENT **STL**

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
11:44:40AM 6/28/2007

Analyst: 60040
Detector: AV81

Calibration

Name: June2007_AV81
Description:

Calibration Date: 6/28/2007 11:44:36AM

Source Info

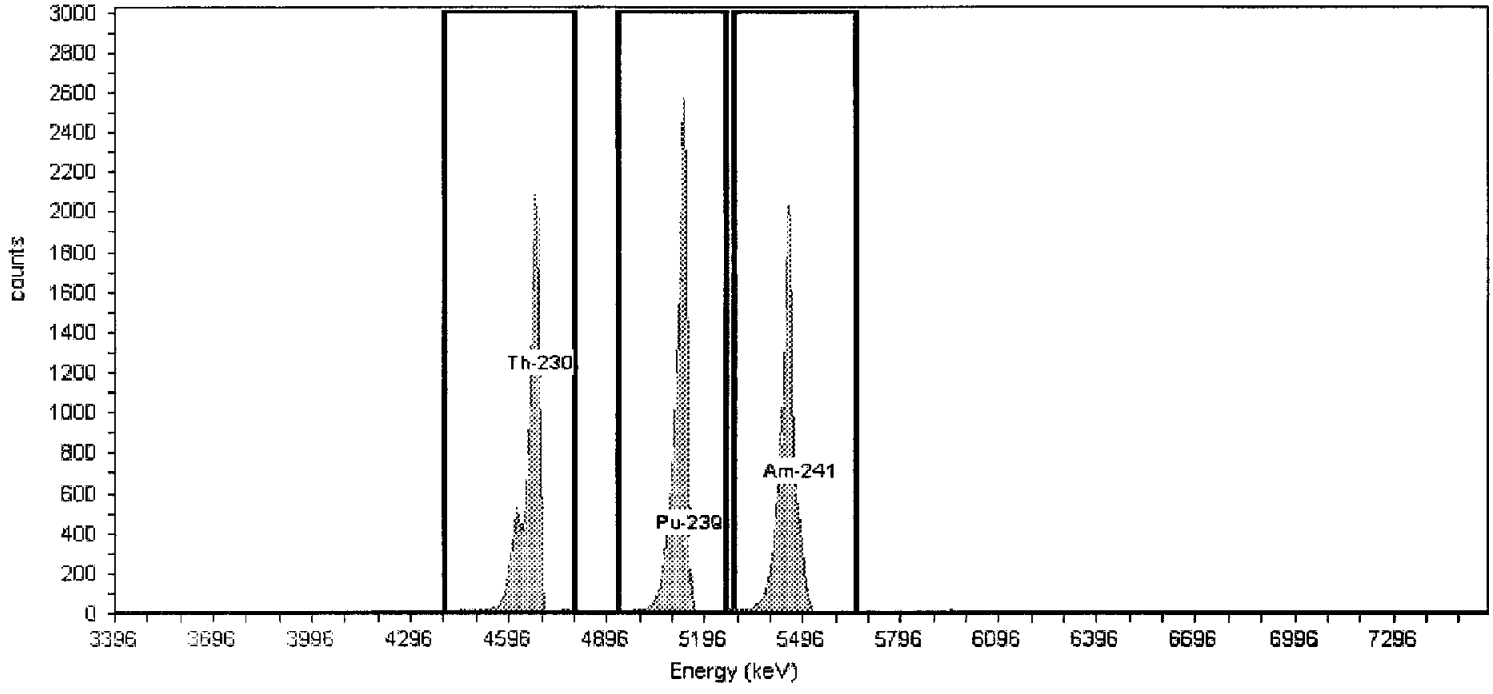
Certificate ID: 63508A-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV81 , SN: 46-03307
Acquisition Start Date: 6/28/2007 9:24:18AM
Live Time: 140.00 min.
Real Time: 140.05 min.
Efficiency: 27.11% +/- 0.29% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	12,367.00	88.34
Pu-239	243	5.16	212	258	14,294.00	102.10
Am-241	289	5.49	261	313	13,363.00	95.45

ST SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
11:44:51AM 6/28/2007

Analyst: 60040
Detector: AV82

Calibration

Name: June2007_AV82
Description:

Calibration Date: 6/28/2007 11:44:48AM

Source Info

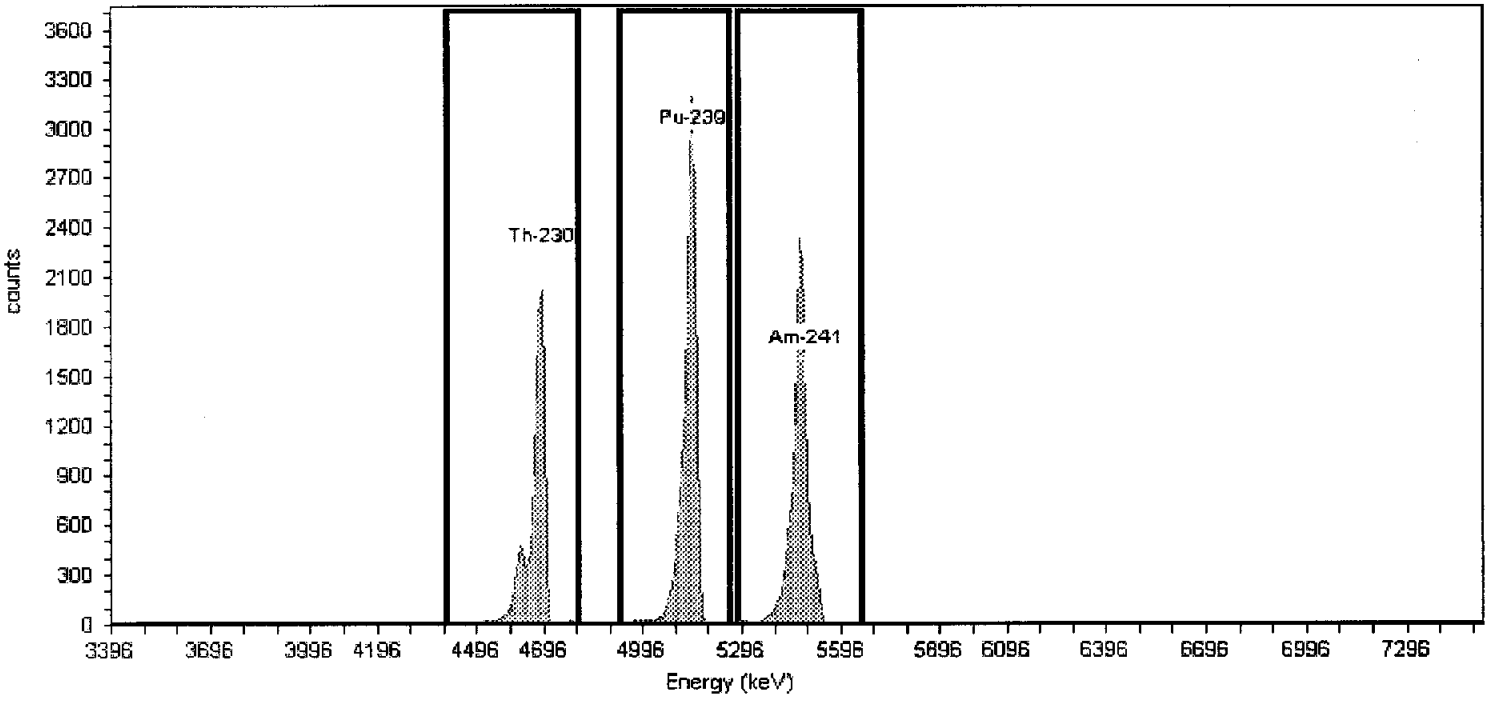
Certificate ID: 63509A-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV82 , SN: 46-032EE5
Acquisition Start Date: 6/28/2007 9:24:33AM
Live Time: 140.00 min.
Real Time: 140.05 min.
Efficiency: 26.91% +/- 0.27% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	11,810.00	84.36
Pu-239	243	5.16	212	258	17,426.00	124.47
Am-241	289	5.49	261	313	14,999.00	107.14

ST SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
2:10:09PM 6/28/2007

Analyst: 60040
Detector: AV83

Calibration

Name: June2007_AV83
Description:

Calibration Date: 6/28/2007 2:10:06PM

Source Info

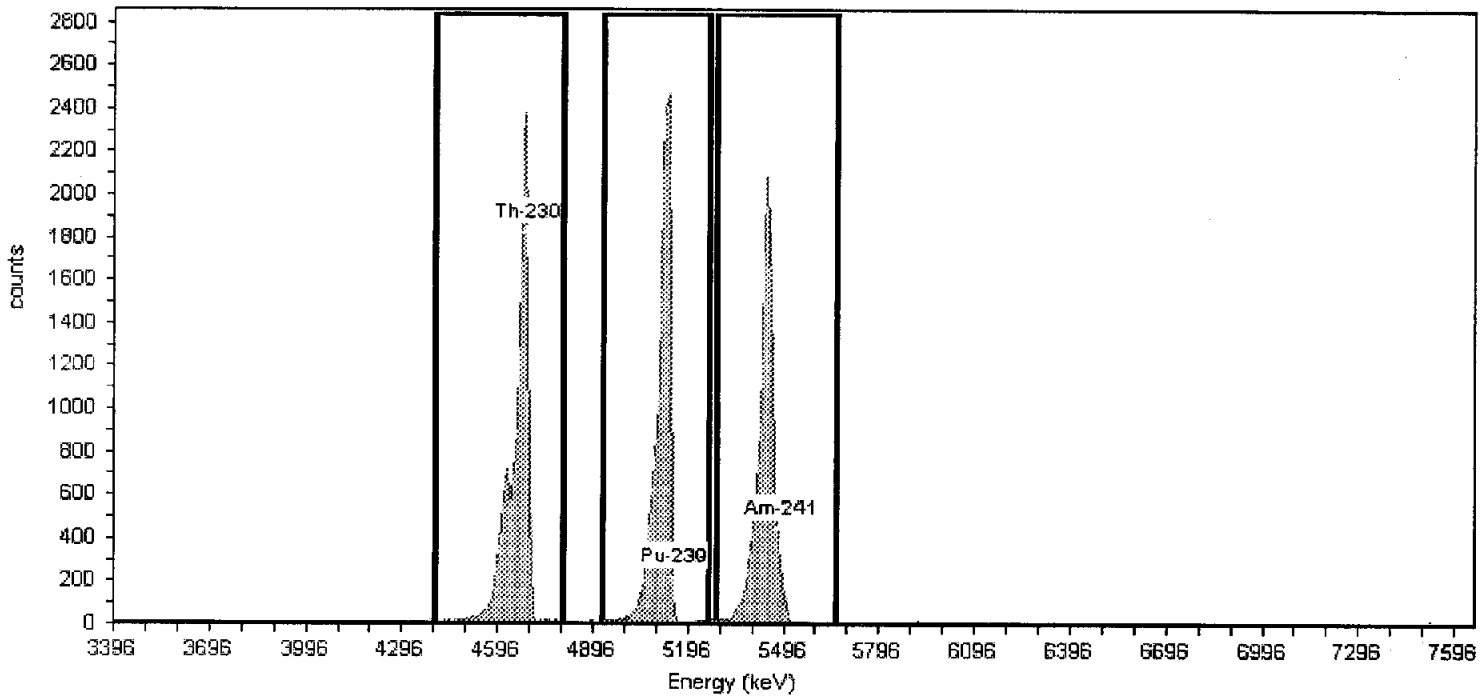
Certificate ID: 63506-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:07PM

Acquisition

Detector: AV83 , SN: 46-03306
Acquisition Start Date: 6/28/2007 11:46:59AM
Live Time: 140.00 min.
Real Time: 140.05 min.
Efficiency: 26.34% +/- 0.26% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	16,022.00	114.44
Pu-239	243	5.16	212	258	15,435.00	110.25
Am-241	289	5.49	261	313	14,322.00	102.30

STL SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
4:34:29PM 6/28/2007

Analyst: 60040
Detector: AV84

Calibration

Name: June2007_AV84
Description:

Calibration Date: 6/28/2007 4:34:26PM

Source Info

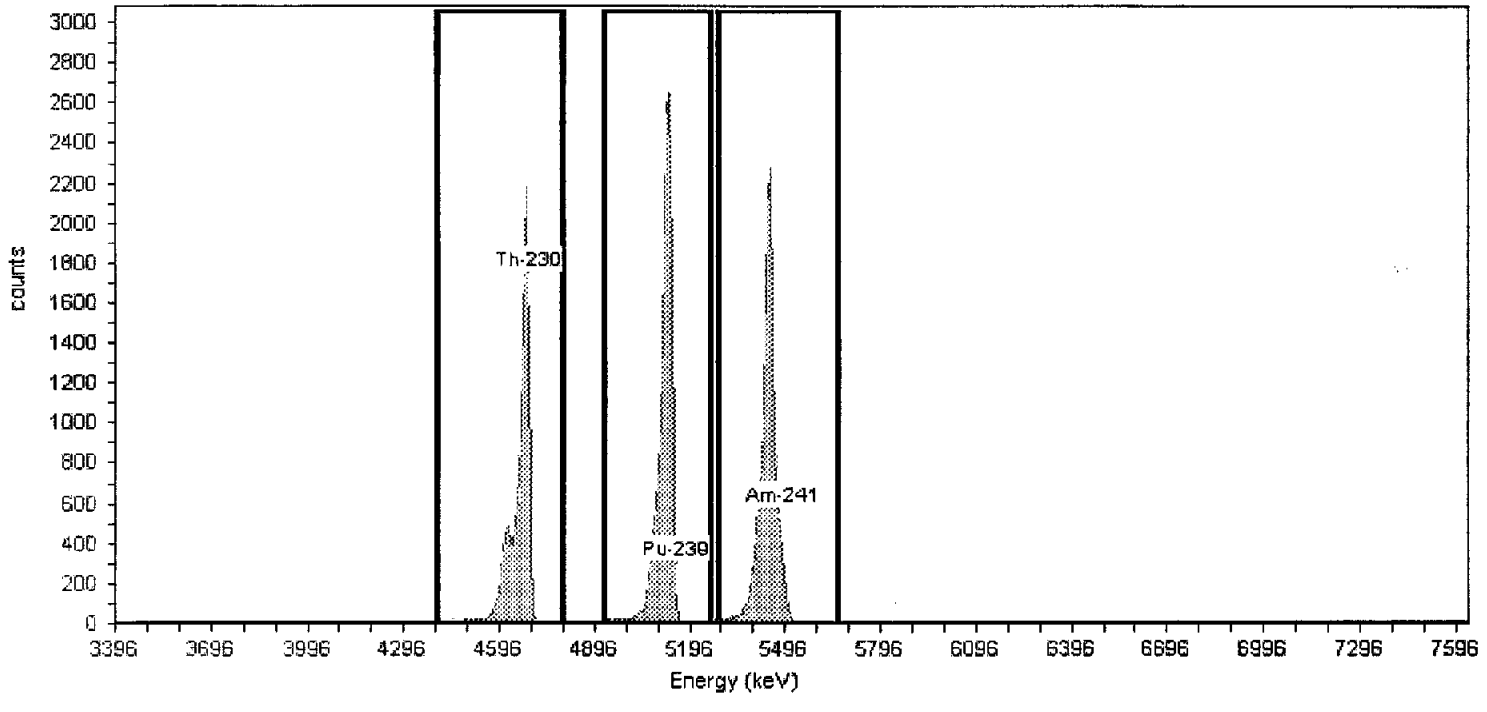
Certificate ID: 63507-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV84 , SN: 46-033FF3
Acquisition Start Date: 6/28/2007 2:12:50PM
Live Time: 140.00 min.
Real Time: 140.06 min.
Efficiency: 26.50% +/- 0.28% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	12,348.00	88.20
Pu-239	243	5.16	212	258	14,668.00	104.77
Am-241	289	5.49	261	313	14,131.00	100.94

ST SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
2:10:15PM 6/28/2007

Analyst: 60040
Detector: AV85

Calibration

Name: June2007_AV85
Description:

Calibration Date: 6/28/2007 2:10:13PM

Source Info

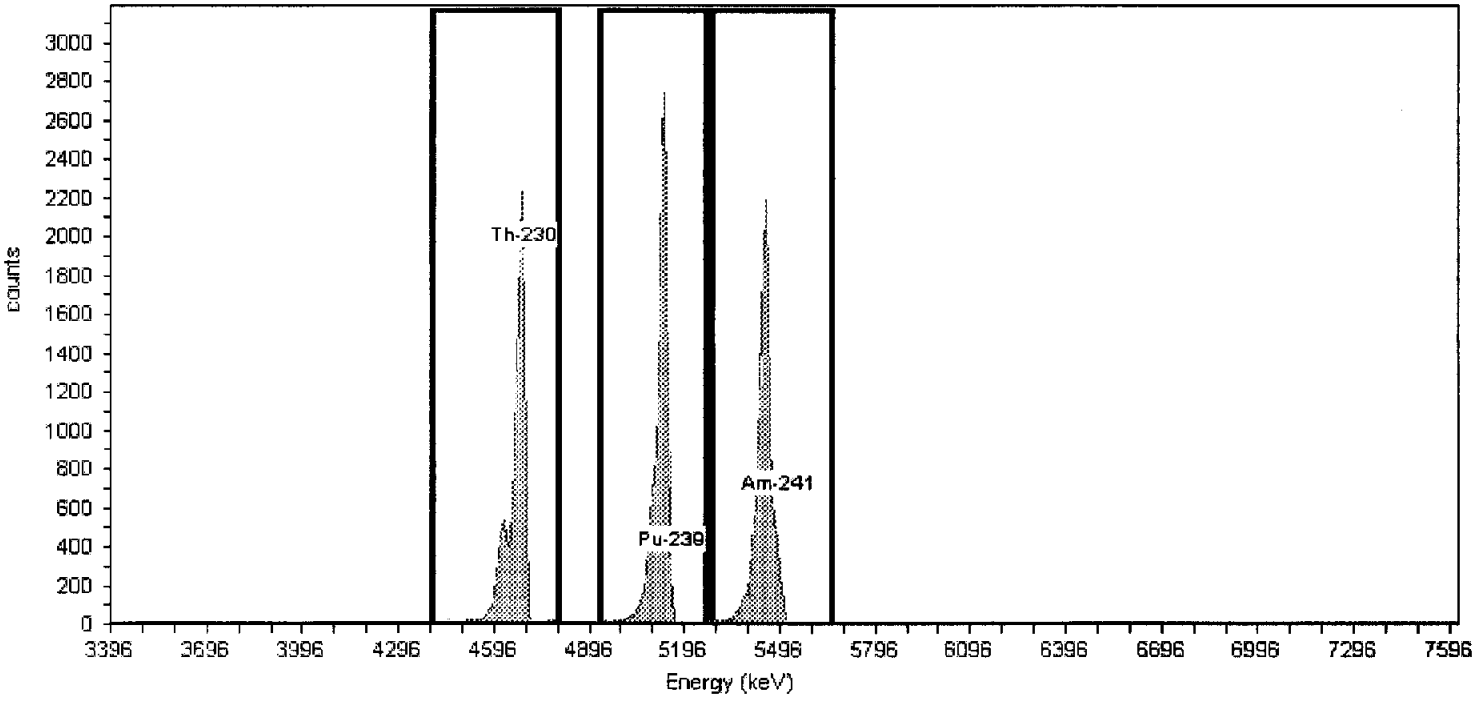
Certificate ID: 63508A-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV85 , SN: 46-032EE7
Acquisition Start Date: 6/28/2007 11:47:31AM
Live Time: 140.00 min.
Real Time: 140.05 min.
Efficiency: 27.68% +/- 0.30% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	12,691.00	90.65
Pu-239	243	5.16	212	258	14,691.00	104.94
Am-241	289	5.49	261	313	13,504.00	96.46

ST SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
2:10:23PM 6/28/2007

Analyst: 60040
Detector: AV86

Calibration

Name: June2007_AV86
Description:

Calibration Date: 6/28/2007 2:10:20PM

Source Info

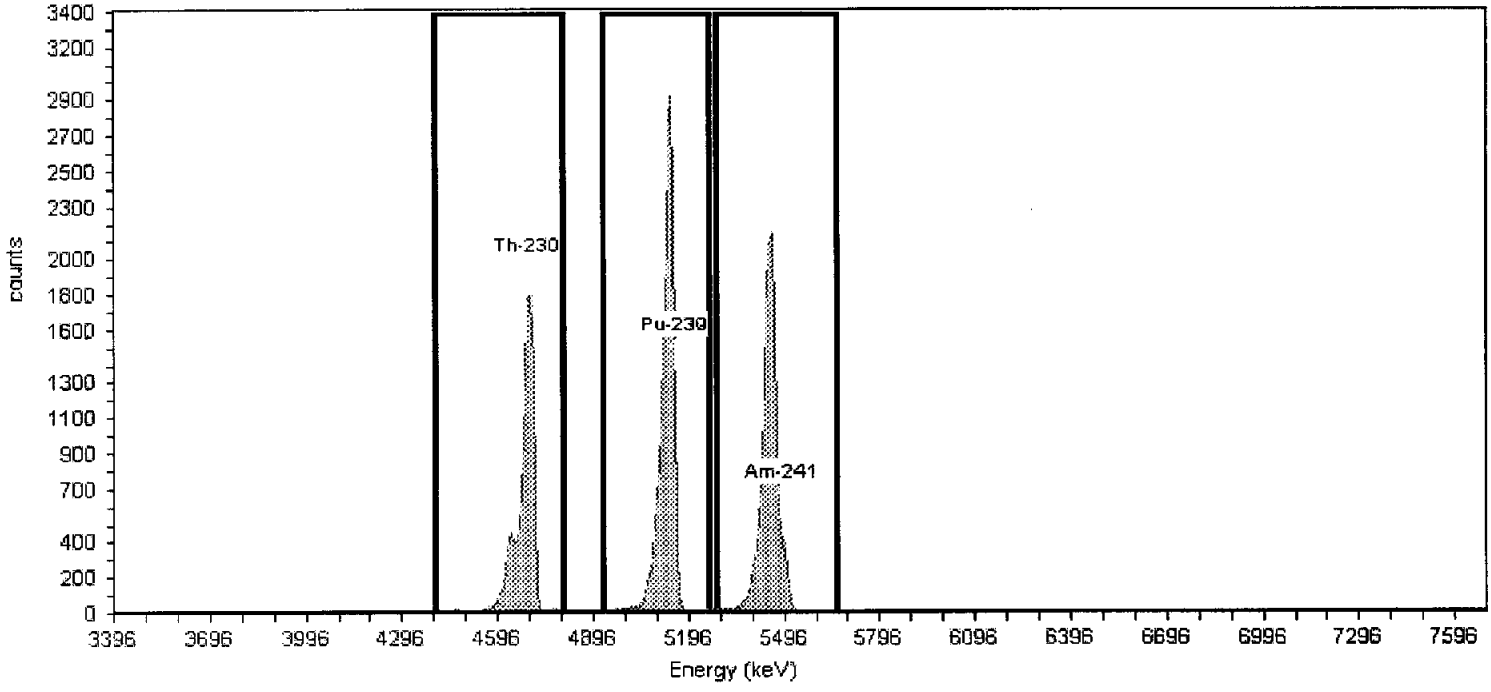
Certificate ID: 63509A-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV86 , SN: 46-033Q6
Acquisition Start Date: 6/28/2007 11:47:33AM
Live Time: 140.00 min.
Real Time: 140.05 min.
Efficiency: 26.82% +/- 0.27% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	11,637.00	83.12
Pu-239	243	5.16	212	258	17,430.00	124.50
Am-241	289	5.49	261	313	15,011.00	107.22

ST SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
4:34:21PM 6/28/2007

Analyst: 60040
Detector: AV87

Calibration

Name: June2007_AV87
Description:

Calibration Date: 6/28/2007 4:34:17PM

Source Info

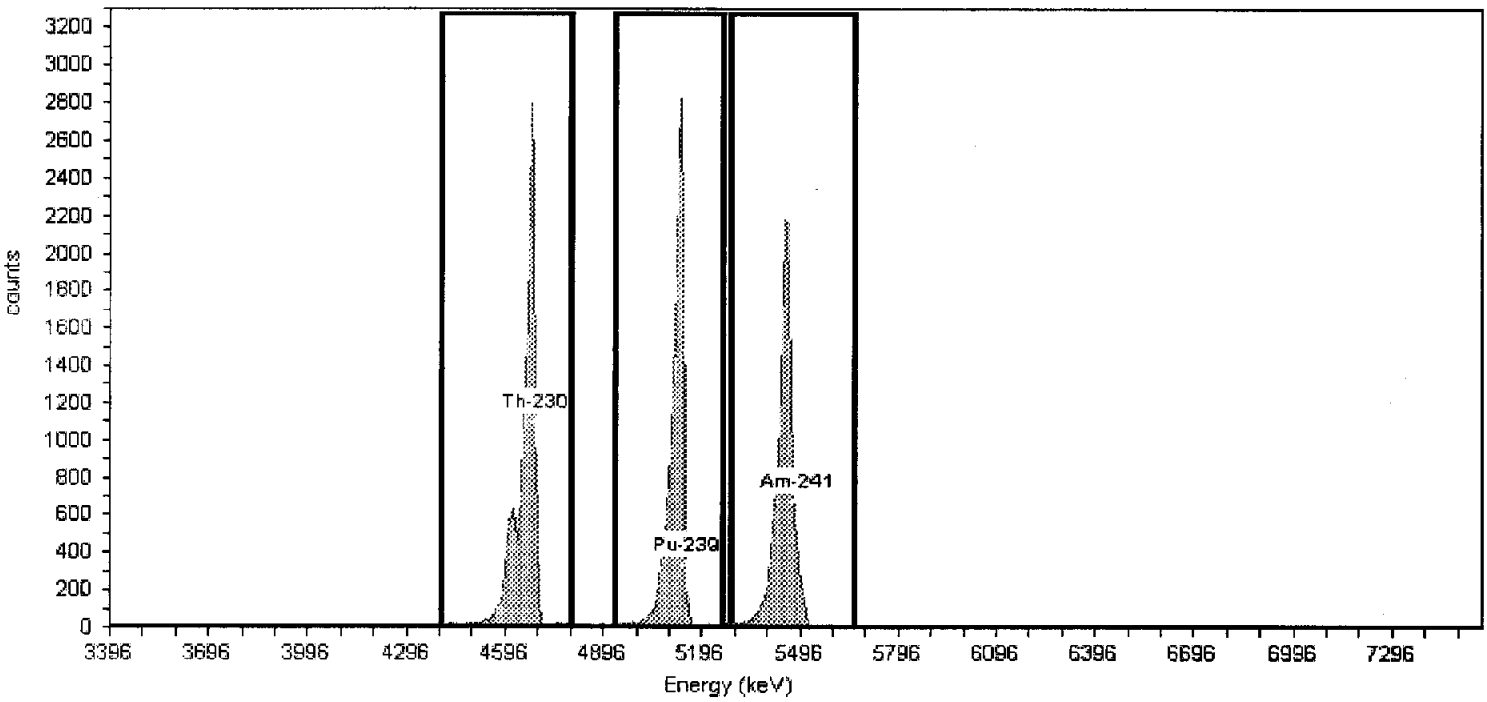
Certificate ID: 63506-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:07PM

Acquisition

Detector: AV87 , SN: 46-033FF5
Acquisition Start Date: 6/28/2007 2:12:25PM
Live Time: 140.00 min.
Real Time: 140.06 min.
Efficiency: 26.49% +/- 0.26% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	16,046.00	114.61
Pu-239	243	5.16	212	258	15,466.00	110.47
Am-241	289	5.49	261	313	14,488.00	103.49

ST SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
11:16:50AM 6/29/2007

Analyst: 60040
Detector: AV88

Calibration

Name: June2007_AV88
Description:

Calibration Date: 6/29/2007 11:16:47AM

Source Info

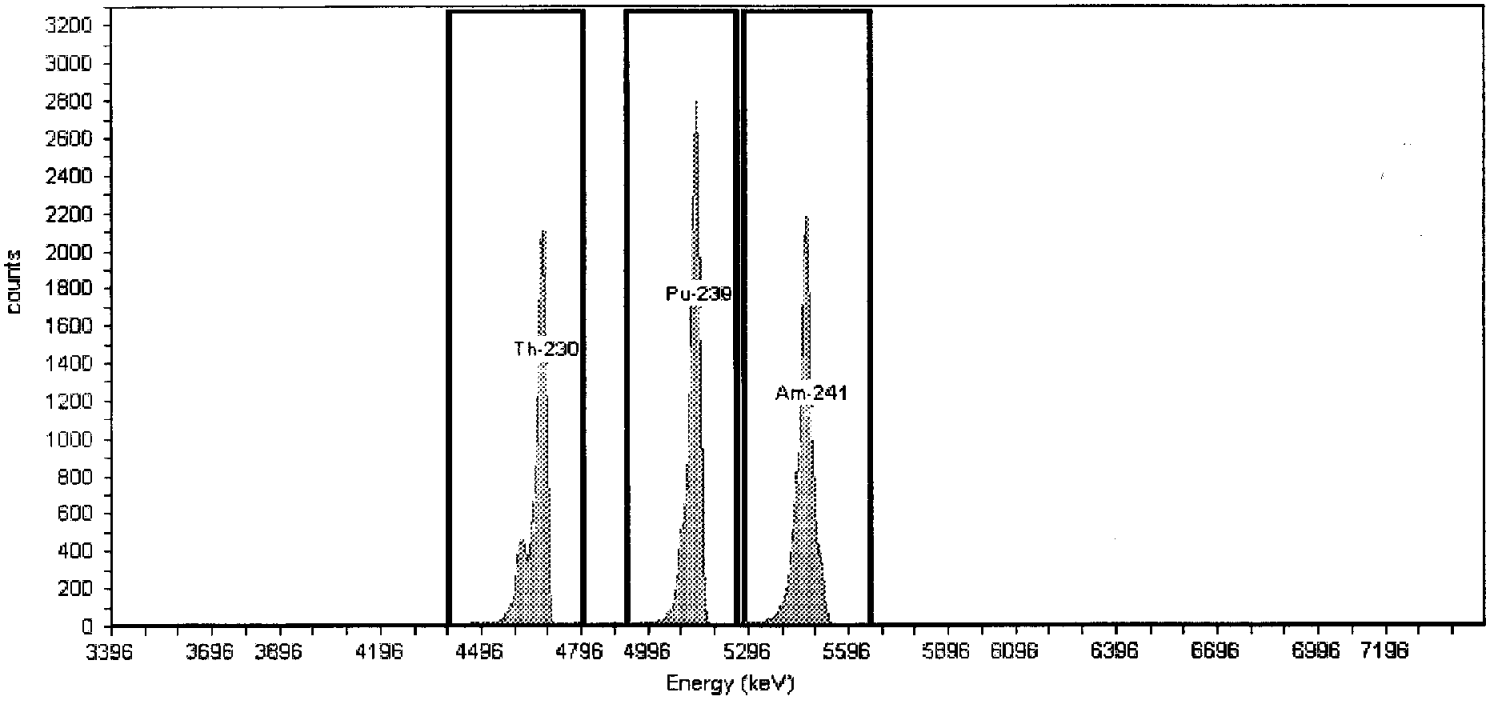
Certificate ID: 63507-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV88 , SN: 76-033FF1
Acquisition Start Date: 6/29/2007 8:56:37AM
Live Time: 140.00 min.
Real Time: 140.01 min.
Efficiency: 26.48% +/- 0.28% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	12,294.00	87.81
Pu-239	243	5.16	212	258	14,664.00	104.74
Am-241	289	5.49	261	313	14,201.00	101.44

ST SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
4:34:33PM 6/28/2007

Analyst: 60040
Detector: AV89

Calibration

Name: June2007_AV89
Description:

Calibration Date: 6/28/2007 4:34:30PM

Source Info

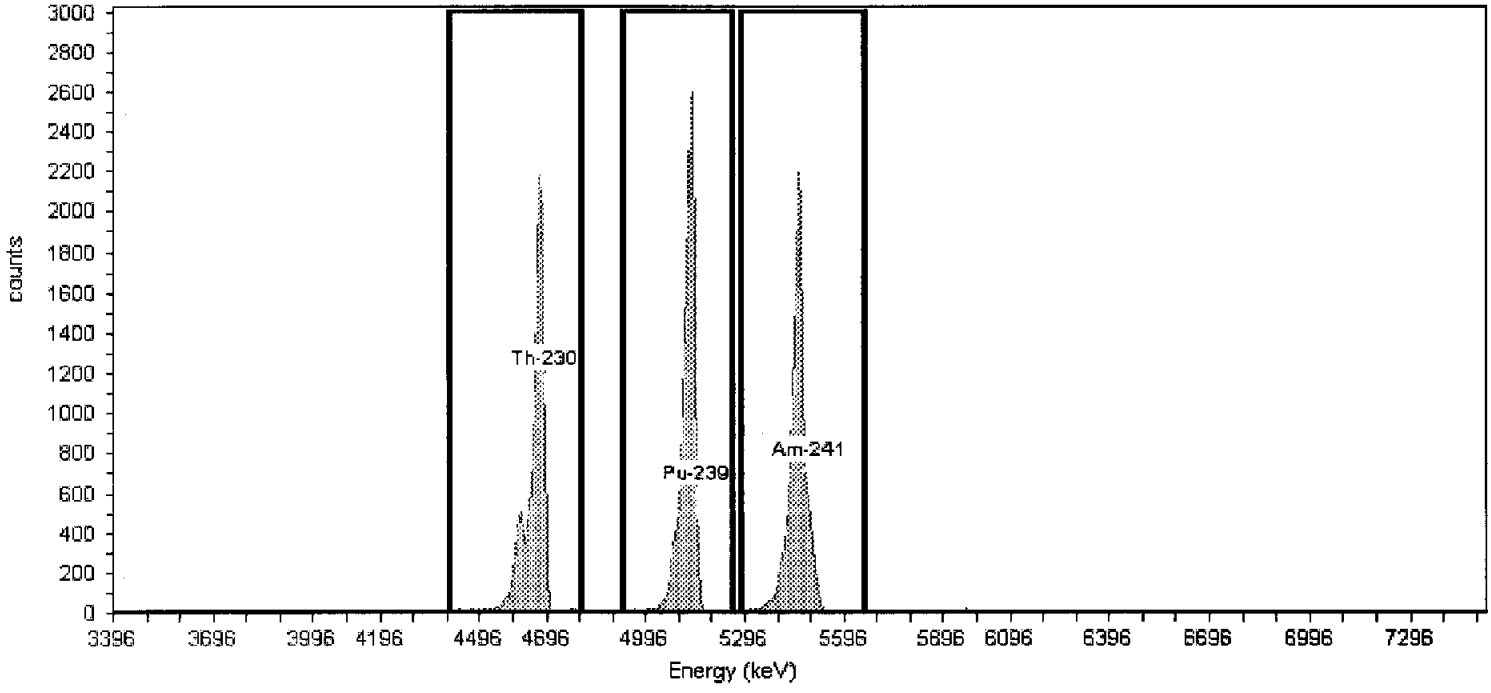
Certificate ID: 63508A-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV89 , SN: 46-033P5
Acquisition Start Date: 6/28/2007 2:13:09PM
Live Time: 140.00 min.
Real Time: 140.06 min.
Efficiency: 27.17% +/- 0.29% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	12,532.00	89.51
Pu-239	243	5.16	212	258	14,160.00	101.14
Am-241	289	5.49	261	313	13,423.00	95.88

ST SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
4:34:39PM 6/28/2007

Analyst: 60040
Detector: AV90

Calibration

Name: June2007_AV90
Description:

Calibration Date: 6/28/2007 4:34:36PM

Source Info

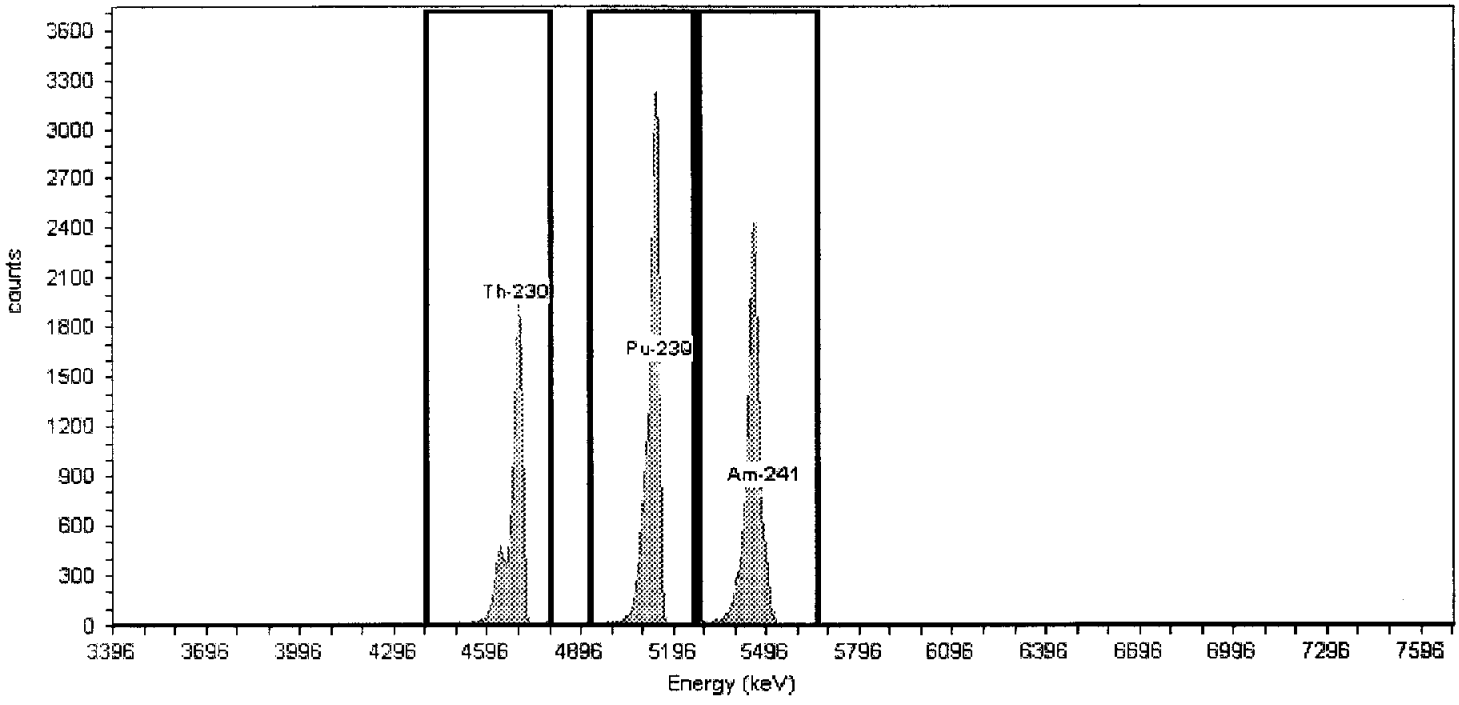
Certificate ID: 63509A-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV90 , SN: 46-033Q1
Acquisition Start Date: 6/28/2007 2:13:40PM
Live Time: 140.00 min.
Real Time: 140.06 min.
Efficiency: 27.45% +/- 0.28% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	11,709.00	83.64
Pu-239	243	5.16	212	258	17,873.00	127.66
Am-241	289	5.49	261	313	15,526.00	110.90

ST SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
2:13:05PM 6/29/2007

Analyst: 60040
Detector: AV92

Calibration

Name: June2007_AV92
Description:

Calibration Date: 6/29/2007 2:13:01PM

Source Info

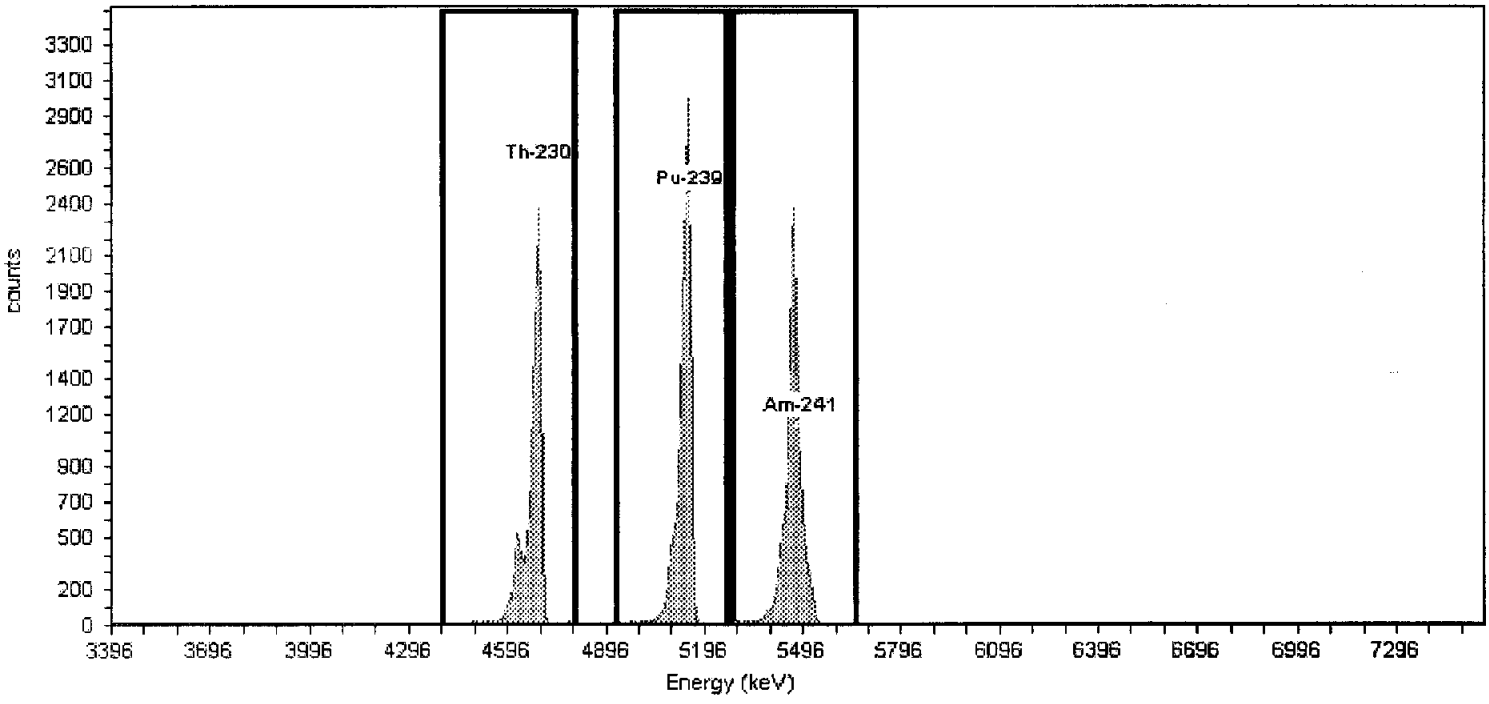
Certificate ID: 63507-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV92 , SN: 46-033FF2
Acquisition Start Date: 6/29/2007 11:33:29AM
Live Time: 140.00 min.
Real Time: 140.04 min.
Efficiency: 26.70% +/- 0.28% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	12,512.00	89.37
Pu-239	243	5.16	212	258	14,806.00	105.76
Am-241	289	5.49	261	313	14,076.00	100.54

ST SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
11:16:57AM 6/29/2007

Analyst: 60040
Detector: AV93

Calibration

Name: June2007_AV93
Description:

Calibration Date: 6/29/2007 11:16:54AM

Source Info

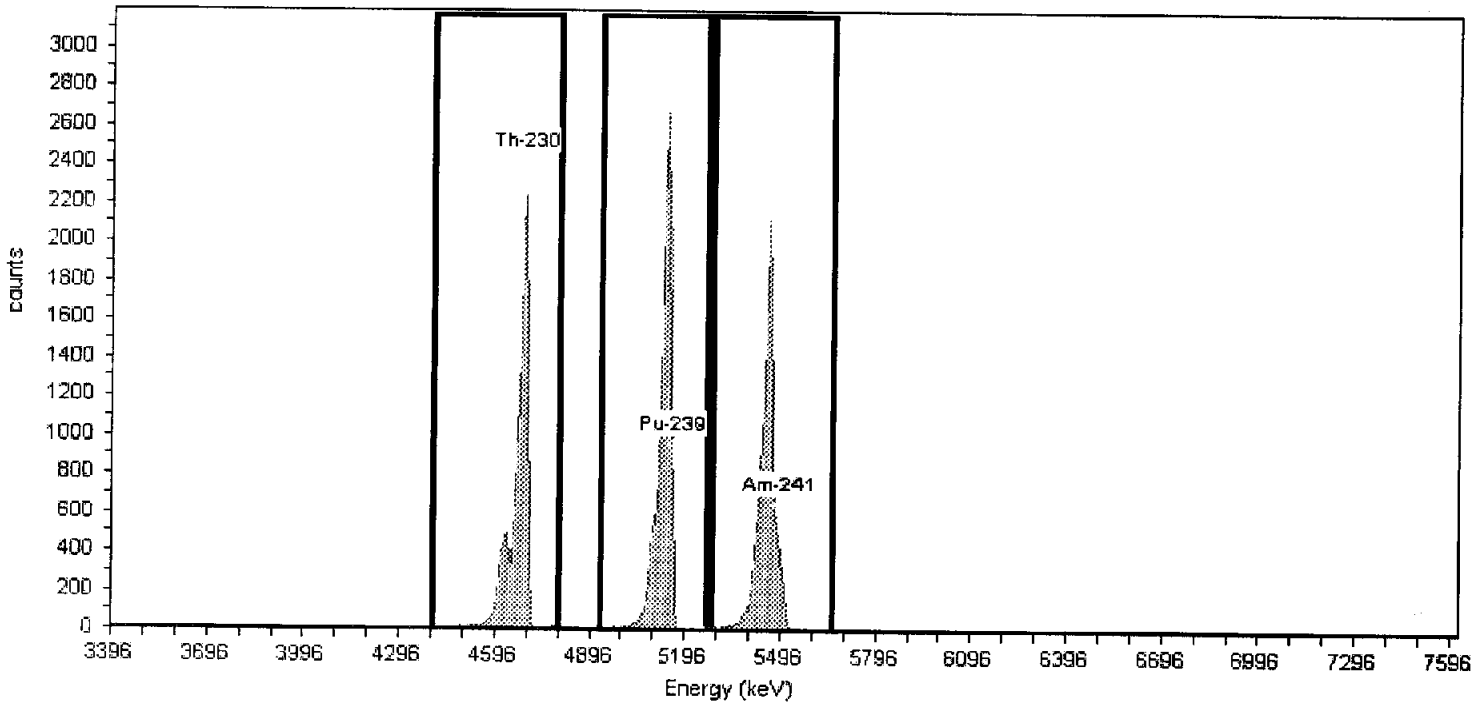
Certificate ID: 63508A-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV93 , SN: 46-033Q2
Acquisition Start Date: 6/29/2007 8:56:38AM
Live Time: 140.00 min.
Real Time: 140.05 min.
Efficiency: 26.45% +/- 0.29% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	12,309.00	87.92
Pu-239	243	5.16	212	258	13,877.00	99.12
Am-241	289	5.49	261	313	12,863.00	91.88

ST SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
11:17:07AM 6/29/2007

Analyst: 60040
Detector: AV94

Calibration

Name: June2007_AV94
Description:

Calibration Date: 6/29/2007 11:17:04AM

Source Info

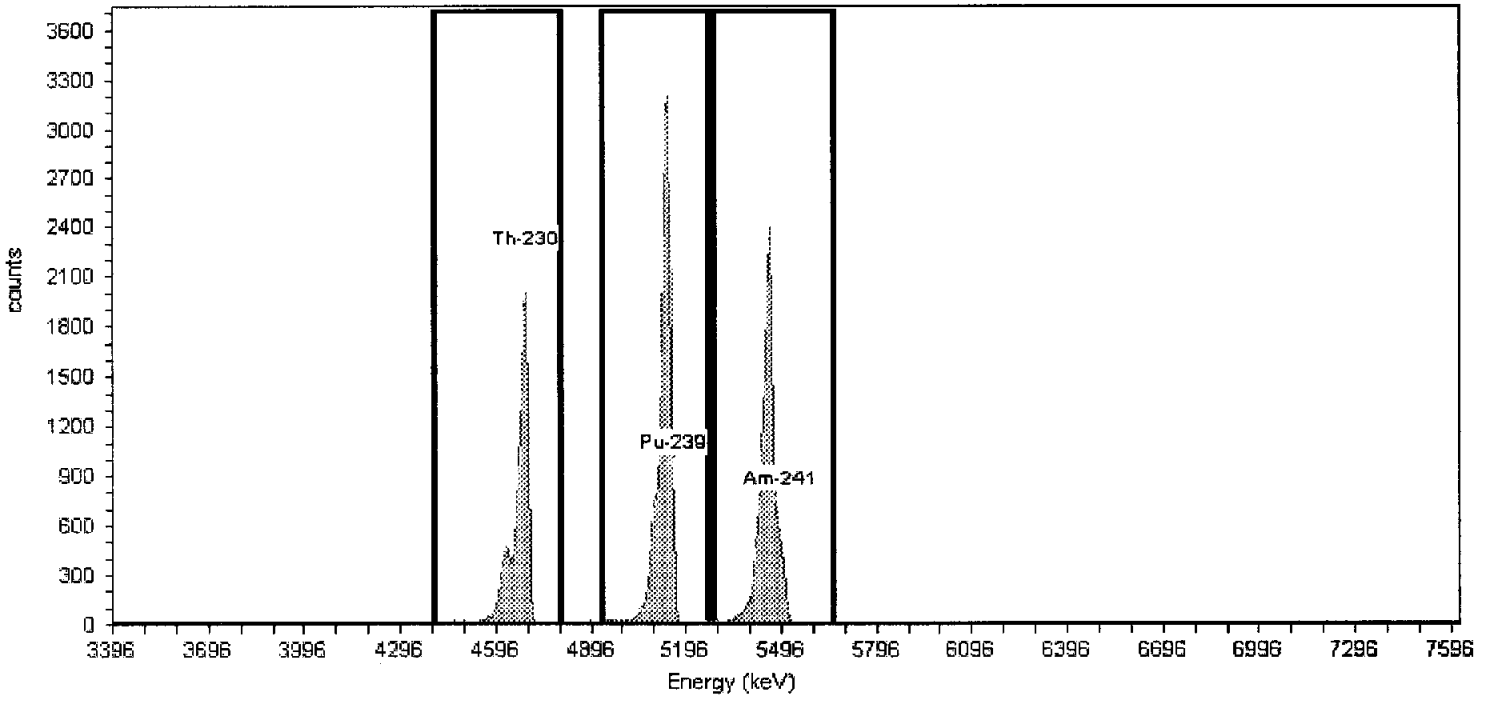
Certificate ID: 63509A-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV94 , SN: 46-032EE6
Acquisition Start Date: 6/29/2007 8:57:26AM
Live Time: 140.00 min.
Real Time: 140.05 min.
Efficiency: 27.04% +/- 0.27% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	11,641.00	83.15
Pu-239	243	5.16	212	258	17,684.00	126.31
Am-241	289	5.49	261	313	15,113.00	107.95

ST SEVERN TRENT **STL**

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
11:16:45AM 6/29/2007

Analyst: 60040
Detector: AV95

Calibration

Name: June2007_AV95
Description:

Calibration Date: 6/29/2007 11:16:42AM

Source Info

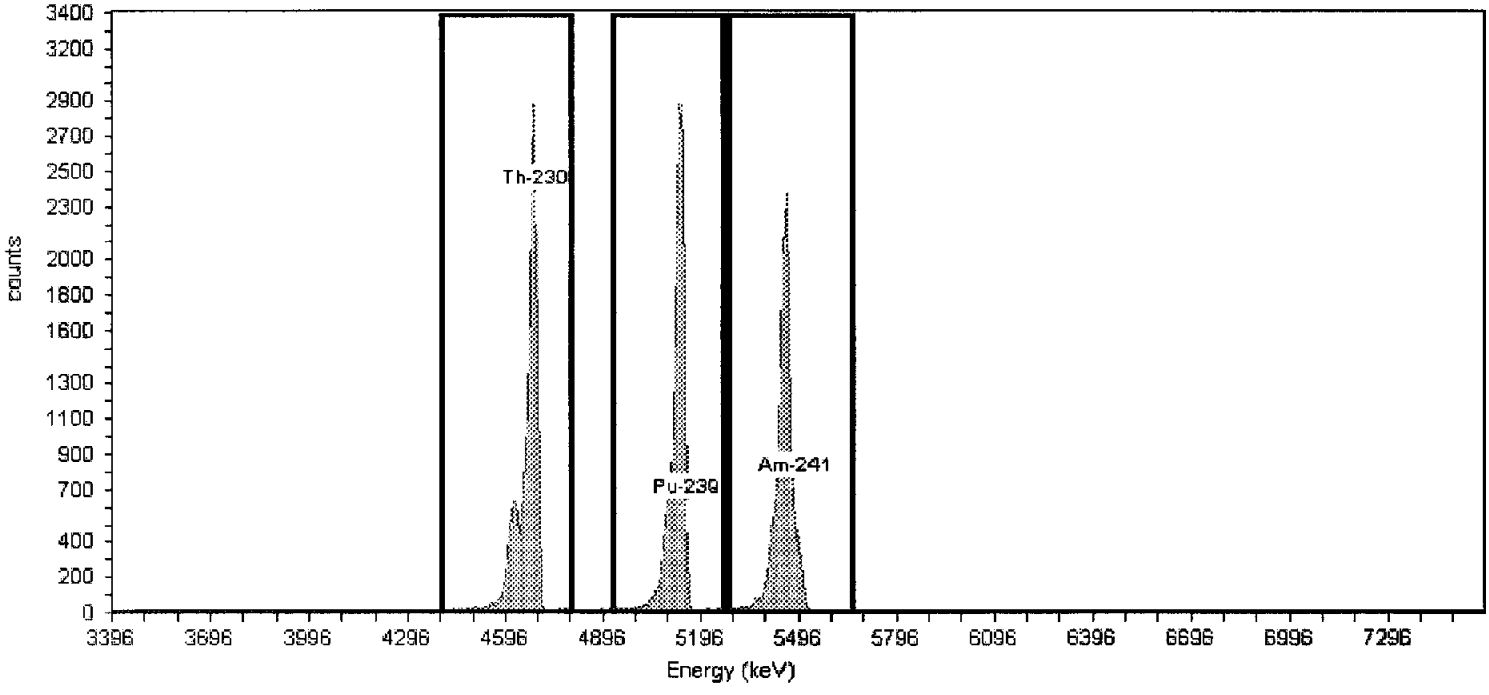
Certificate ID: 63506-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:07PM

Acquisition

Detector: AV95 , SN: 46-033P4
Acquisition Start Date: 6/29/2007 8:56:40AM
Live Time: 140.00 min.
Real Time: 140.04 min.
Efficiency: 26.34% +/- 0.26% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	15,961.00	114.01
Pu-239	243	5.16	212	258	15,359.00	109.71
Am-241	289	5.49	261	313	14,417.00	102.98

ST SEVERN TRENT **STL**

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
4:38:31PM 6/29/2007

Analyst: 60040
Detector: AV96

Calibration

Name: June2007_AV96
Description:

Calibration Date: 6/29/2007 4:38:28PM

Source Info

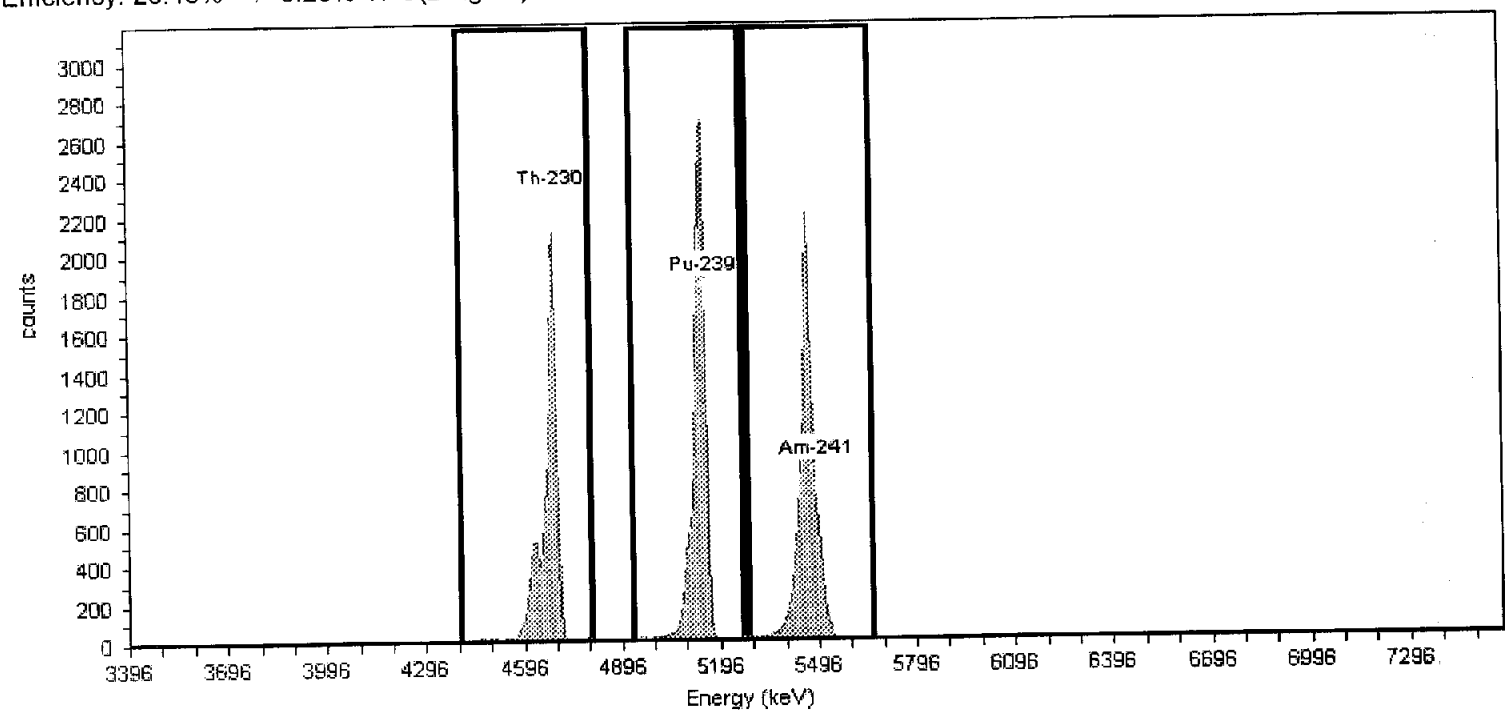
Certificate ID: 63507-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV96 , SN: 46-033P1
Acquisition Start Date: 6/29/2007 2:17:42PM
Live Time: 140.00 min.
Real Time: 140.01 min.
Efficiency: 26.45% +/- 0.28% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	12,343.00	88.16
Pu-239	243	5.16	212	258	14,644.00	104.60
Am-241	289	5.49	261	313	14,057.00	100.41

ST SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
2:13:12PM 6/29/2007

Analyst: 60040
Detector: AV97

Calibration

Name: June2007_AV97
Calibration Date: 6/29/2007 2:13:09PM
Description:

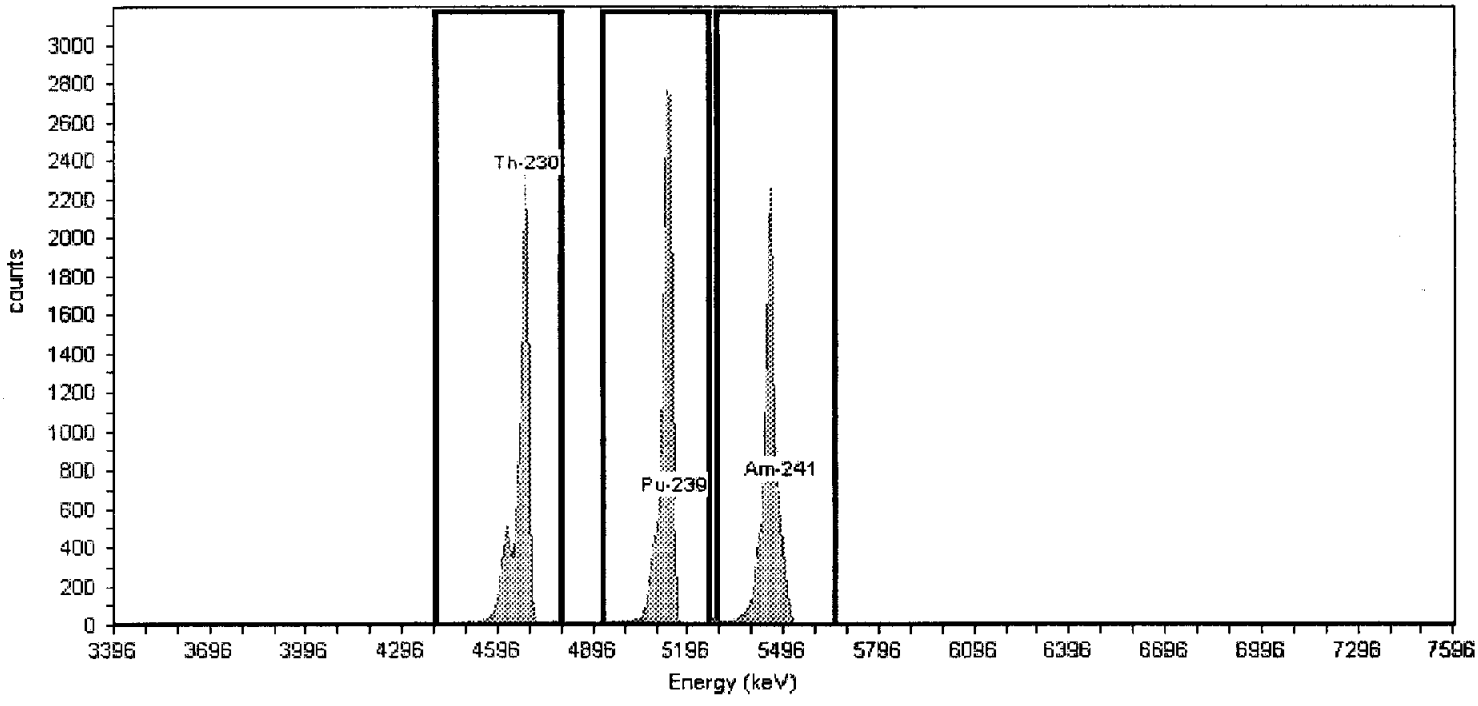
Source Info

Certificate ID: 63508A-334
Certification Date: 5/30/2002 12:00:00PM
Prepared by: Analytics
Description:

Acquisition

Detector: AV97 , SN: 76-03393
Acquisition Start Date: 6/29/2007 11:33:30AM
Live Time: 140.00 min.
Real Time: 140.04 min.
Efficiency: 27.06% +/- 0.29% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Initial Calibration: No
Algorithm: Linear
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	12,460.00	89.00
Pu-239	243	5.16	212	258	14,272.00	101.94
Am-241	289	5.49	261	313	13,226.00	94.47

ST SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
2:13:17PM 6/29/2007

Analyst: 60040
Detector: AV98

Calibration

Name: June2007_AV98
Description:

Calibration Date: 6/29/2007 2:13:15PM

Source Info

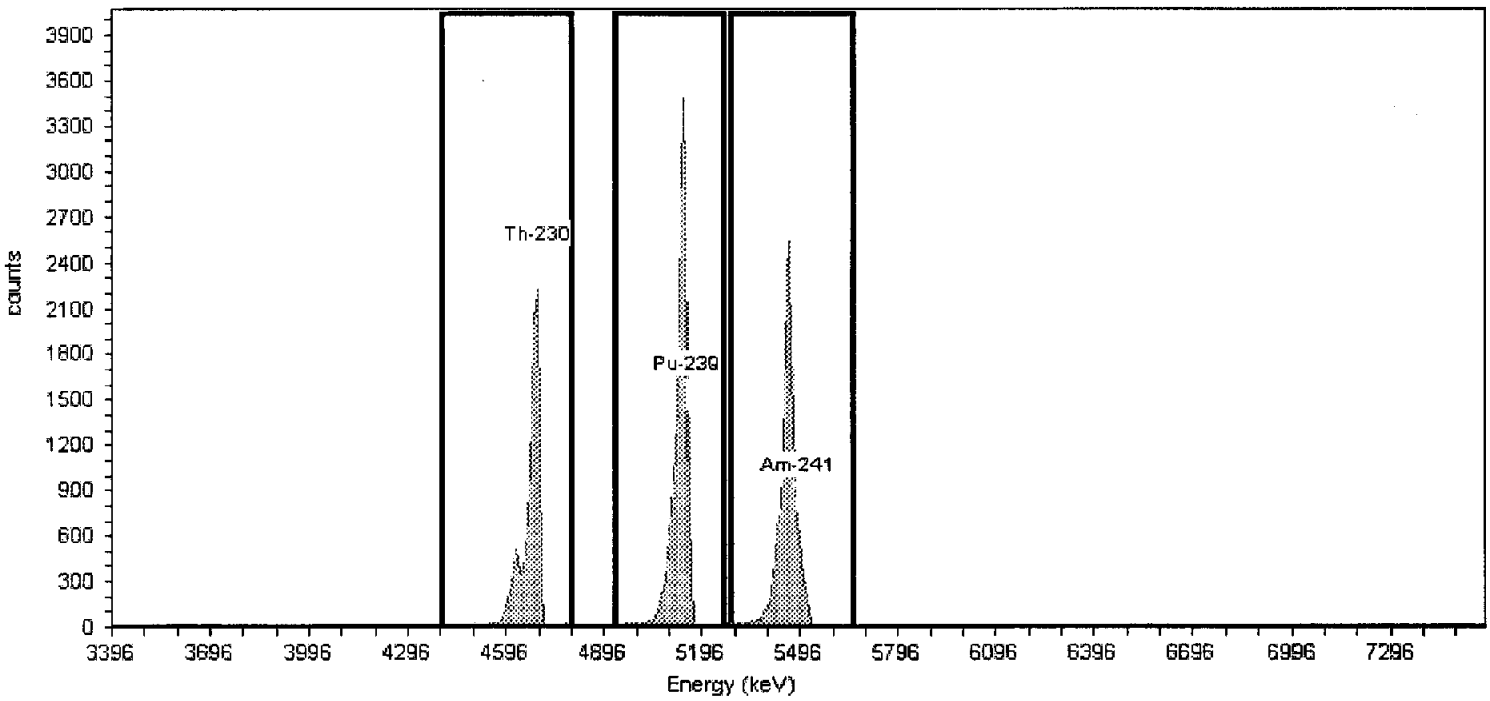
Certificate ID: 63509A-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV98 , SN: 46-033Q3
Acquisition Start Date: 6/29/2007 11:34:15AM
Live Time: 140.00 min.
Real Time: 140.04 min.
Efficiency: 27.85% +/- 0.28% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	12,149.00	86.78
Pu-239	243	5.16	212	258	18,009.00	128.64
Am-241	289	5.49	261	313	15,610.00	111.50

GAS FLOW PROPORTIONAL COUNTING

Gas Flow Proportional Counting Radium

SEVERN TRENT STL

Analysis Report for Radium 226

Batch: 7186382 **Operator:** 403058

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

SampID / WRKNO	Aliquot / Sigma	Truncate Yields / Dilution	Ba Mass / BaYield	Ingrowth / Eff	Cnt Date Time / InstrID	Ba Precip Time / Cal Type	SampCntDur / BkgCntDur	SampCnt / BkgCnt	Activity	UncTotal / UncCount	MDA / DLC
F7G050000-382B	1.0000g	False	0.0303	1.1405	7/24/07 14:16	7/24/07 9:35	200	19	**1.269E-001**	1.155E-001	1.729E-001
J2DC11AA	2.00	1.00	89.38%	0.1985	RedA4	2	1000	38	pCi/g	1.148E-001	7.139E-002
F7G050000-382C	1.0000g	False	0.0323	1.1406	7/24/07 14:16	7/24/07 9:35	200	1080	**1.162E+001**	1.364E+000	1.664E-001
J2DC11AC	2.00	1.00	95.28%	0.1913	RedB1	2	1000	37	pCi/g	7.147E-001	6.858E-002
F7G050168-001	1.0092g	False	0.0314	1.1406	7/24/07 14:16	7/24/07 9:35	200	109	**1.115E+000**	2.600E-001	1.619E-001
J2C1G1AA	2.00	1.00	92.63%	0.1936	RedB2	2	1000	34	pCi/g	2.348E-001	6.619E-002
F7G050168-001X	1.0029g	False	0.0334	1.1406	7/24/07 14:16	7/24/07 9:35	200	88	**8.751E-001**	2.260E-001	1.552E-001
J2C1G1AF	2.00	1.00	98.53%	0.1863	RedB3	2	1000	32	pCi/g	2.084E-001	6.312E-002
F7G050168-002	1.0130g	False	0.0313	1.1406	7/24/07 14:16	7/24/07 9:35	200	103	**9.356E-001**	2.346E-001	1.789E-001
J2C1V1AA	2.00	1.00	92.33%	0.2090	RedB4	2	1000	52	pCi/g	2.152E-001	7.580E-002
F7G050168-003	1.0067g	False	0.0272	1.1405	7/24/07 14:16	7/24/07 9:35	200	81	**9.363E-001**	2.510E-001	1.760E-001
J2C1W1AA	2.00	1.00	80.24%	0.1958	RedC3	2	1000	30	pCi/g	2.329E-001	7.114E-002
F7G050168-004	1.0078g	False	0.0308	1.1405	7/24/07 14:16	7/24/07 9:35	200	83	**8.240E-001**	2.282E-001	1.833E-001
J2C1X1AA	2.00	1.00	90.86%	0.1942	RedC4	2	1000	44	pCi/g	2.128E-001	7.664E-002
F7G050168-005	1.0058g	False	0.0288	1.1405	7/24/07 14:16	7/24/07 9:35	200	87	**9.449E-001**	2.455E-001	1.697E-001
J2C101AA	2.00	1.00	84.96%	0.1971	RedD2	2	1000	32	pCi/g	2.266E-001	6.899E-002
F7G050168-006	1.0088g	False	0.0295	1.1405	7/24/07 14:16	7/24/07 9:35	200	108	**1.172E+000**	2.699E-001	1.543E-001
J2C111AA	2.00	1.00	87.02%	0.1970	RedD3	2	1000	27	pCi/g	2.432E-001	6.173E-002
F7G050168-007	1.0027g	False	0.0261	1.1408	7/24/07 14:16	7/24/07 9:35	200	101	**1.188E+000**	2.890E-001	1.924E-001
J2C131AA	2.00	1.00	76.99%	0.2019	BlueA1	2	1000	36	pCi/g	2.635E-001	7.907E-002
F7G050168-008	1.0061g	False	0.0319	1.1408	7/24/07 14:16	7/24/07 9:35	200	78	**7.373E-001**	2.164E-001	1.888E-001
J2C151AA	2.00	1.00	94.10%	0.1923	BlueA2	2	1000	50	pCi/g	2.034E-001	7.977E-002
F7G050168-009	1.0010g	False	0.0320	1.1408	7/24/07 14:16	7/24/07 9:35	200	85	**8.375E-001**	2.231E-001	1.635E-001
J2C191AA	2.00	1.00	94.40%	0.1941	BlueA4	2	1000	36	pCi/g	2.067E-001	6.720E-002
F7G050168-010	1.0029g	False	0.0298	1.1408	7/24/07 14:16	7/24/07 9:35	200	94	**9.909E-001**	2.565E-001	1.942E-001
J2C2D1AA	2.00	1.00	87.91%	0.1921	BlueB1	2	1000	45	pCi/g	2.366E-001	8.136E-002

Laboratory Control Sample Information

SampID	WRKNO	Analyte	Activity	StdAdded	Recovery	LCL	UCL
F7G050000-382C	J2DC11AC	RA-226	1.162E+001 pCi/g	1.119E+001	103.85 %	55.00	135.00

SampID / WRKNO	Aliquot / Sigma	Truncate Yields / Dilution	Ba Mass / BaYield	Ingrowth / Eff	Cnt Date Time / InstrID	Ba Precip Time / Cal Type	SampCntDur / BkgCntDur	SampCnt / BkgCnt	Activity	UncTotal / UncCount	MDA / DLC

Sample Duplicate Information

SampID	SampDupID	Activity	DupActivity	RPD	RER	DER
F7G050168-001	F7G050168-001X	1.115E+000	8.751E-001	24.12%	4.939E-001	6.967E-001

Matrix Spike Information

SampID	SampMSID	WRKNO	Analyte	Activity	MSActivity	StdAdded	Recovery

SEVERN TRENT **STL**

Analysis Report for Radium 228

Batch: 7186384 **Operator:** 402630

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

SampID / WRKNO	Aliquot Mass	Eff	BaYield / YYield	Truncate Yields	CountDateTime / InstrID	Y Ingrowth Time / Y Precip Time	SampCntD / BkgCntDur	SampCnt / BkgCnt	Cal Type / Sigma	Activity	UncTotal / UncCount	MDA / DLC
F7G050000-384B	1.0000 g	0.4283	89.38	False	7/24/07 10:37	7/10/07 10:45	200	245	1	3.494E-001	3.646E-001	5.922E-001
J2DC31AA	0.0303 g		107.69		RedA4	7/24/07 8:15	1000	1021	2.00	pCi/g	3.630E-001	2.846E-001
F7G050000-384C	1.0000 g	0.4267	95.28	False	7/24/07 10:37	7/10/07 10:45	200	1088	1	8.126E+000	1.054E+000	6.572E-001
J2DC31AC	0.0323 g		93.41		RedB1	7/24/07 8:15	1000	1069	2.00	pCi/g	6.708E-001	3.162E-001
F7G050168-001	1.0092 g	0.4252	92.63	False	7/24/07 10:37	7/10/07 10:45	200	328	1	9.472E-001	4.198E-001	6.258E-001
J2C1G1AC	0.0314 g		101.65		RedB2	7/24/07 8:15	1000	1098	2.00	pCi/g	4.089E-001	3.012E-001
F7G050168-001X	1.0029 g	0.4293	98.53	False	7/24/07 10:37	7/10/07 10:45	200	304	1	6.195E-001	3.548E-001	5.486E-001
J2C1G1AG	0.0334 g		109.34		RedB3	7/24/07 8:15	1000	1113	2.00	pCi/g	3.493E-001	2.642E-001
F7G050168-002	1.0130 g	0.4361	92.33	False	7/24/07 10:37	7/10/07 10:45	200	363	1	1.242E+000	4.566E-001	6.571E-001
J2C1V1AC	0.0313 g		95.60		RedB4	7/24/07 8:15	1000	1129	2.00	pCi/g	4.393E-001	3.165E-001
F7G050168-003	1.0067 g	0.4258	80.24	False	7/24/07 10:37	7/10/07 10:45	200	354	1	1.358E+000	5.384E-001	7.876E-001
J2C1W1AC	0.0272 g		95.05		RedC3	7/24/07 8:15	1000	1141	2.00	pCi/g	5.210E-001	3.794E-001
F7G050168-004	1.0078 g	0.4287	90.86	False	7/24/07 10:37	7/10/07 10:45	200	380	1	1.252E+000	4.760E-001	6.925E-001
J2C1X1AC	0.0308 g		97.80		RedC4	7/24/07 8:15	1000	1219	2.00	pCi/g	4.593E-001	3.340E-001
F7G050168-005	1.0058 g	0.4331	84.96	False	7/24/07 10:38	7/10/07 10:45	200	298	1	7.401E-001	4.065E-001	6.250E-001
J2C101AC	0.0288 g		108.24		BlueA1	7/24/07 8:15	1000	1071	2.00	pCi/g	3.997E-001	3.007E-001
F7G050168-006	1.0088 g	0.4259	87.02	False	7/24/07 10:38	7/10/07 10:45	200	321	1	1.013E+000	4.248E-001	6.258E-001
J2C111AC	0.0295 g		105.49		BlueA2	7/24/07 8:15	1000	1040	2.00	pCi/g	4.126E-001	3.009E-001
F7G050168-007	1.0027 g	0.4280	76.99	False	7/24/07 10:38	7/10/07 10:45	200	283	1	1.044E+000	4.395E-001	6.438E-001
J2C131AC	0.0261 g		107.69		BlueA4	7/24/07 8:15	1000	890	2.00	pCi/g	4.269E-001	3.086E-001
F7G050168-008	1.0061 g	0.4276	94.10	False	7/24/07 10:38	7/10/07 10:45	200	329	1	1.165E+000	3.986E-001	5.587E-001
J2C151AC	0.0319 g		104.40		BlueB1	7/24/07 8:15	1000	949	2.00	pCi/g	3.812E-001	2.682E-001
F7G050168-009	1.0010 g	0.4376	94.40	False	7/24/07 10:38	7/10/07 10:45	200	307	1	7.511E-001	3.696E-001	5.596E-001
J2C191AC	0.0320 g		107.69		BlueB2	7/24/07 8:15	1000	1062	2.00	pCi/g	3.619E-001	2.692E-001
F7G050168-010	1.0029 g	0.4250	87.91	False	7/24/07 10:38	7/10/07 10:45	200	310	1	1.219E+000	4.097E-001	5.684E-001
J2C2D1AC	0.0298 g		106.04		BlueB4	7/24/07 8:15	1000	865	2.00	pCi/g	3.912E-001	2.723E-001

Laboratory Control Sample Information

SampID	WRKNO	ComponentName	Activity	StdAdded	Recovery	LCL	UCL
F7G050000-384C	J2DC31AC	RA-228	8.126E+000 pCi/g	8.768E+000 pCi/g	92.68 %	53.00	131.00

SampID / WRKNO	Aliquot / Mass	Eff	BaYield / YYield	Truncate Count / Yields	DateTime / InstrID	Y Ingrowth Time / Y Precip Time	SampCntD / BkgCntDur	SampCnt / BkgCnt	Cal Type / Sigma	Activity	UncTotal / UncCount	MDA / DLC

Sample Duplicate Information

SampID	SampDupID	Activity	DupActivity	RPD	RER	DER
F7G050168-001	F7G050168-001X	9.472E-001	6.195E-001	41.83%	4.230E-001	5.962E-001

Matrix Spike Information

SampID	SampMSID	Sample Activity	MS Activity	StdAdded	MSRecovery
					%

TestAmerica STL

Instrument Checks

SEVERN TRENT **STL**

Gas Proportional Counter Daily Quality Control Checks

Tuesday, July 24, 2007

Instrument: ***Red***

Detector ID	Check Type	Alpha CPM	Alpha Mean	Alpha Std. Dev.	Alpha Deviation	Alpha Flag	Beta CPM	Beta Mean	Beta Std. Dev.	Beta Deviation	Beta Flag
A1	Efficiency	13307.50	13329.55	85.91	-22.05	Pass	42691.37	42313.25	116.45	378.12	FAIL
	Background	0.045	0.032	0.025	0.013	Pass	1.175	1.107	0.223	0.068	Pass
A2	Efficiency	11737.50	11853.45	82.05	-115.95	Pass	41820.14	43395.25	143.67	-1575.11	FAIL
	Background	0.025	0.038	0.029	-0.013	Pass	1.130	1.153	0.223	-0.023	Pass
A3	Efficiency										
	Background										
A4	Efficiency	12408.00	12623.33	78.88	-215.33	WARNING	38283.75	38445.45	116.80	-161.70	Pass
	Background	0.065	0.038	0.036	0.027	Pass	0.915	0.998	0.157	-0.083	Pass
B1	Efficiency	12856.00	12857.63	84.18	-1.63	Pass	32613.94	32531.30	107.12	82.64	Pass
	Background	0.050	0.055	0.058	-0.005	Pass	1.015	1.047	0.208	-0.032	Pass
B2	Efficiency	12743.50	12719.13	67.48	24.38	Pass	28460.07	28336.95	86.53	123.12	Pass
	Background	0.060	0.042	0.030	0.018	Pass	1.045	1.108	0.254	-0.063	Pass
B3	Efficiency	12683.00	12578.45	116.33	104.55	Pass	36223.97	36441.40	132.39	-217.43	Pass
	Background	0.040	0.030	0.034	0.010	Pass	1.060	1.153	0.205	-0.093	Pass
B4	Efficiency	13858.50	14021.75	77.64	-163.25	WARNING	35979.81	35821.15	149.33	158.66	Pass
	Background	0.065	0.077	0.045	-0.012	Pass	1.215	1.152	0.194	0.063	Pass
C1	Efficiency	12814.50	13191.25	97.58	-376.75	FAIL	42229.27	41823.15	119.67	406.12	FAIL
	Background	0.090	0.040	0.055	0.050	Pass	1.150	1.093	0.244	0.057	Pass
C2	Efficiency	11906.00	12161.95	77.56	-255.95	FAIL	43698.30	43965.10	126.72	-266.80	WARNING
	Background	0.055	0.040	0.043	0.015	Pass	2.435	1.223	0.210	1.212	FAIL
C3	Efficiency	12554.50	12486.35	103.66	68.15	Pass	28645.72	28775.85	121.78	-130.13	Pass
	Background	0.060	0.042	0.026	0.018	Pass	1.225	1.142	0.145	0.083	Pass
C4	Efficiency	12777.00	12595.53	78.88	181.48	WARNING	38453.26	38190.35	142.11	262.91	Pass
	Background	0.060	0.062	0.049	-0.002	Pass	1.090	1.173	0.204	-0.083	Pass
D1	Efficiency	13105.50	13252.15	74.78	-146.65	Pass	33520.48	33075.80	127.27	444.68	FAIL
	Background	0.055	0.048	0.045	0.007	Pass	1.180	1.107	0.122	0.073	Pass
D2	Efficiency	12824.00	12837.17	75.18	-13.17	Pass	28648.75	28629.80	124.53	18.95	Pass
	Background	0.060	0.043	0.042	0.017	Pass	1.250	1.015	0.243	0.235	Pass
D3	Efficiency	12793.00	12785.88	90.30	7.13	Pass	36521.11	36599.43	146.33	-78.32	Pass
	Background	0.055	0.030	0.036	0.025	Pass	1.095	1.080	0.315	0.015	Pass
D4	Efficiency	13735.00	13762.60	85.17	-27.60	Pass	35182.23	35883.50	157.75	-701.27	FAIL
	Background	0.035	0.032	0.041	0.003	Pass	1.170	1.028	0.204	0.142	Pass

7/24/2007 8:34:40 AM

IQC version 2.3, updated 4/5/2006

SEVERN TRENT STL

Gas Proportional Counter Daily Quality Control Checks

Tuesday, July 24, 2007

Instrument: BLUE

Detector ID	Check Type	Alpha CPM	Alpha Mean	Alpha Std. Dev.	Alpha Deviation	Alpha Flag	Beta CPM	Beta Mean	Beta Std. Dev.	Beta Deviation	Beta Flag
A1	Efficiency	13198.50	13340.00	128.40	-141.50	Pass	41961.68	42381.00	252.32	-419.32	Pass
	Background	0.055	0.067	0.048	-0.012	Pass	1.100	1.227	0.201	-0.127	Pass
A2	Efficiency	11501.00	11715.23	105.06	-214.23	WARNING	42529.09	42635.45	236.96	-106.36	Pass
	Background	0.045	0.063	0.071	-0.018	Pass	1.015	1.130	0.240	-0.115	Pass
A3	Efficiency										
	Background										
A4	Efficiency	12643.00	12530.13	71.67	112.88	Pass	38882.28	38278.57	272.28	603.71	WARNING
	Background	0.045	0.063	0.048	-0.018	Pass	0.925	1.282	0.239	-0.357	Pass
B1	Efficiency	12681.00	12722.60	82.61	-41.60	Pass	32627.23	32409.22	937.69	218.01	Pass
	Background	0.065	0.055	0.044	0.010	Pass	1.030	1.285	0.218	-0.255	Pass
B2	Efficiency	12998.50	13046.48	82.59	-47.98	Pass	29125.05	29587.95	859.71	-462.90	Pass
	Background	0.070	0.058	0.059	0.012	Pass	0.995	1.345	0.462	-0.350	Pass
B3	Efficiency										
	Background										
B4	Efficiency	13155.00	13113.90	89.23	41.10	Pass	35269.74	34855.82	143.86	413.92	WARNING
	Background	0.075	0.063	0.056	0.012	Pass	1.015	1.287	0.396	-0.272	Pass
C1	Efficiency										
	Background										
C2	Efficiency	12188.00	11877.95	118.79	310.05	WARNING	44340.65	43087.00	328.67	1253.65	FAIL
	Background	0.040	0.053	0.045	-0.013	Pass	0.940	1.058	0.207	-0.118	Pass
C3	Efficiency										
	Background										
C4	Efficiency	12390.50	12598.48	108.63	-207.98	Pass	38271.54	38461.55	176.79	-190.01	Pass
	Background	0.020	0.047	0.051	-0.027	Pass	0.910	1.108	0.213	-0.198	Pass

TestAmerica STL

Long Backgrounds – Red
June 2007

Detector ID	Sample ID	Alpha	Beta	Guard	Count Count Time	Event	Voltage	TOD
A1	A1-01	37	1103	683176	1000	0	1380	39261.17
A2	A2-01	34	1100	683175	1000	0	1380	39261.17
~~A3~~	~~A3-01~~	~~25~~	~~2545~~	~~683174~~	~~1000~~	~~0~~	~~1380~~	~~39261.17~~
A4	A4-01	38	1021	683171	1000	0	1380	39261.17
B1	B1-01	37	1069	524578	1000	0	1380	39261.17
B2	B2-01	34	1098	524542	1000	0	1380	39261.17
B3	B3-01	32	1113	524538	1000	0	1380	39261.17
B4	B4-01	52	1129	524537	1000	0	1380	39261.17
C1	C1-01	34	1198	567021	1000	0	1380	39261.17
C2	C2-01	34	1377	567017	1000	0	1380	39261.17
C3	C3-01	30	1141	567015	1000	0	1380	39261.17
C4	C4-01	44	1219	567013	1000	0	1380	39261.17
D1	D1-01	31	1034	528039	1000	0	1380	39261.17
D2	D2-01	32	1126	528041	1000	0	1380	39261.17
D3	D3-01	27	1020	528038	1000	0	1380	39261.17
D4	D4-01	32	1036	528041	1000	0	1380	39261.17

SE 6/28/7

TestAmerica STL

Long Backgrounds – Blue
June 2007

Detector ID	Sample ID	Alpha	Beta	Guard	Count Count Time	Event	Voltage	TOD
A1	A1-01	36	1071	522397	1000	0	1410	39261.17
A2	A2-01	50	1040	522396	1000	0	1410	39261.17
A4	A4-01	36	890	522393	1000	0	1410	39261.17
B1	B1-01	45	949	519602	1000	0	1440	39261.17
B2	B2-01	29	1062	519602	1000	0	1440	39261.17
B4	B4-01	27	865	519603	1000	0	1440	39261.17
C2	C2-01	27	928	575886	1000	0	1410	39261.17
~~C3~~	~~C3-01~~	~~29~~	~~6942~~	~~575888~~	~~1000~~	~~0~~	~~1410~~	~~39261.17~~
C4	C4-01	30	886	575886	1000	0	1410	39261.17

SE
6/28/7

TestAmerica STL

Run Log

Logbook No.: 2965

STL
St. Louis Laboratory

Gas Proportional Counter Runlog

Date	Batch #	Sample #	Detector	Count Time	Analysis	Initials
7/03/7	7186488	F7G050214-006	Red A3	200 min	Ra226	SE
	M070693	162107-P1	C3		ABT	
		361907-P2	C4			
	7193232	F7G120127-001	Blue A1		SR90	
		-001X	A2			
		-002	A4			
		-003	B1			
		-004	B2			
		-010	B4			
7-23-07	7200426	F7G190000-426B	Red A1	200 min	TSR	GS
		-426C	A4			
		F7G190285-001	B1			
		-001X	B2			
		-002	B3			
		-003	B4			
		-004	C3			
		-005	C4			
		-006	D1			
		-007	D2			
		-008	D3			
		-009	Blue A1			
		-010	A2			
		-011	A4			
		-012	B1			
		-013	B2			
		-014	B4			
7/24/7	Daily	Bkg + Source	Red/Blue	200+2min	QA	SE

Reviewed By: SE Date: 7/24/7

SOP References: STL-RD-0403 Rev 8 05/30/07
Form: SL-RAD-0025, Revised 8/14/06
QC Type Suffixes: B=Blank; C=Laboratory Control Sample; L=Laboratory Control Sample Duplicate; S=Matrix Spike; D=Matrix Spike Duplicate; X=Sample Duplicate.

Logbook No.: 2965

STL
St. Louis Laboratory

Gas Proportional Counter Runlog

Date	Batch #	Sample #	Detector	Count Time	Analysis	Initials
7/24/7	M070695	2G1107-3	Red D2	200min	ABT	SE
	↓	↓ -4	↓ D3		↓	
	7186384	F7G050000-384B	A4		Ra228	
		↓ -384C	B1			
		F7G050168-001	B2			
		-001K	B3			
		-002	B4			
		-003	C3			
		-004	C4			
		-005	Blue A1			
		-006	A2			
		-007	A4			
		-008	B1			
		-009	B2			
		-010	B4			
	7186382	F7G050000-382B	Red A4		Radio	RR
		-382C	B1			
		F7G050168-001	B2			
		-001K	B3			
		-002	B4			
		-003	C3			
		-004	C4			
		-005	D2			
		-006	D3			
		-007	Blu A1			
		-008	A2			
		-009	A4			

Reviewed By: RR Date: 7-24-07

SOP References: STL-RD-0403 Rev 8 05/30/07
Form: SL-RAD-0025, Revised 8/14/06
QC Type Suffixes: B=Blank; C=Laboratory Control Sample; L=Laboratory Control Sample Duplicate; S=Matrix Spike; D=Matrix Spike Duplicate; X=Sample Duplicate.

Logbook No.: 2965

STL
St. Louis Laboratory

Gas Proportional Counter Runlog

Date	Batch #	Sample #	Detector	Count Time	Analysis	Initials
7-24	7186387	F7G050168-010	Blue B1	200 min	Radde	RK
	M070696	261107-3	B2		ABT	
		-4	B4			
7-24-07	M070698	162407-1	Red A4	200 min.	ABT	GS
		-2	B1			
		-3	B2			
		-4	B3			
		261107-1	B4			
		-2	C3			
		-5	C4			
		-7	D2			
7-24-07	7200558	F76190000-558B	Blue A1	200 min.	TSR	GS
		-558C	A2			
		F76190307-039	A4			
		-039X	B1			
		-040	B2			
		-041	B4			
		-042	C4			
		-043	Red A1			
		-044	B1			
		F76190378-001	B2			
		-002	B3			
		-003	B4			
		-004	C3			
		-005	C4			
		-006	D2			
		-007	D3			

Reviewed By: GS Date: 7-24-07

SOP References: STL-RD-0403 Rev 8 05/30/07
Form: SL-RAD-0025, Revised 8/14/06
QC Type Suffixes: B=Blank; C=Laboratory Control Sample; L=Laboratory Control Sample Duplicate; S=Matrix Spike; D=Matrix Spike Duplicate; X=Sample Duplicate.

Logbook No.: 2965

STL
St. Louis Laboratory

Gas Proportional Counter Runlog

Date	Batch #	Sample #	Detector	Count Time	Analysis	Initials
7-24-07	7201219	F7G200113-011	Blue A1	200 min	TAK	GS
		-012	A2			
		-013	A4			
		-014	B1			
		-015	B2			
		-016	B4			
		-017	C4			
7/26/7	Daily	Bkg & Source	Red/Blue	200+2min	QA	SE
	7202148	F7G200370-001	Red A1	200min	TAK	
		-001X	A4			
		-002	B1			
		-003	B2			
		-004	B3			
		-005	B4			
		-006	C1			
		-007	C3			
		-008	C4			
		-009	D1			
		-010	D2			
		-011	D3			
		-012	Blue A1			
		-013	A2			
		-014	A4			
		F7G210000-148B	B1			
		-148C	B2			

Reviewed By:_____ Date:_____

SOP References: STL-RD-0403 Rev 8 05/30/07
Form: SL-RAD-0025, Revised 8/14/06
QC Type Suffixes: B=Blank; C=Laboratory Control Sample; L=Laboratory Control Sample Duplicate; S=Matrix Spike; D=Matrix Spike Duplicate; X=Sample Duplicate.

7/24

SEVERN TRENT **STL**

Prep Report for Radium 226

Batch: 7186382 **Prep Analyst:** 403301

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

SampID	WRKNO	Aliquot	Gross / Tare	Mass / Ba Yield	Dilution	Ba Precipitation Time / BaYieldAdjusted	Carrier ID / Carrier Added
F7G050000-382B	J2DC11AA	1.0000g	9.0207g / 8.9904g	0.0303g / 89.38%	1.00	7/24/07 9:35 / 89.38%	Ba 36 / 0.0339
		Red A4					
F7G050000-382C	J2DC11AC	1.0000g	8.9763g / 8.9440g	0.0323g / 95.28%	1.00	7/24/07 9:35 / 95.28%	Ba 36 / 0.0339
		B1					
F7G050168-001	J2C1G1AA	1.0092g	8.9879g / 8.9565g	0.0314g / 92.63%	1.00	7/24/07 9:35 / 92.63%	Ba 36 / 0.0339
		B2					
F7G050168-001X	J2C1G1AF	1.0029g	8.9818g / 8.9484g	0.0334g / 98.53%	1.00	7/24/07 9:35 / 98.53%	Ba 36 / 0.0339
		B3					
F7G050168-002	J2C1V1AA	1.0130g	8.9880g / 8.9567g	0.0313g / 92.33%	1.00	7/24/07 9:35 / 92.33%	Ba 36 / 0.0339
		B4					
F7G050168-003	J2C1W1AA	1.0067g	8.9759g / 8.9487g	0.0272g / 80.24%	1.00	7/24/07 9:35 / 80.24%	Ba 36 / 0.0339
		C3					
F7G050168-004	J2C1X1AA	1.0078g	8.9896g / 8.9588g	0.0308g / 90.86%	1.00	7/24/07 9:35 / 90.86%	Ba 36 / 0.0339
		C4					
F7G050168-005	J2C101AA	1.0058g	9.0090g / 8.9802g	0.0288g / 84.96%	1.00	7/24/07 9:35 / 84.96%	Ba 36 / 0.0339
		D2					
F7G050168-006	J2C111AA	1.0088g	8.9618g / 8.9323g	0.0295g / 87.02%	1.00	7/24/07 9:35 / 87.02%	Ba 36 / 0.0339
		D3					
F7G050168-007	J2C131AA	1.0027g	8.9948g / 8.9687g	0.0261g / 76.99%	1.00	7/24/07 9:35 / 76.99%	Ba 36 / 0.0339
		Blue A1					
F7G050168-008	J2C151AA	1.0061g	8.9818g / 8.9499g	0.0319g / 94.10%	1.00	7/24/07 9:35 / 94.10%	Ba 36 / 0.0339
		A2					
F7G050168-009	J2C191AA	1.0010g	8.9665g / 8.9345g	0.0320g / 94.40%	1.00	7/24/07 9:35 / 94.40%	Ba 36 / 0.0339
		A4					
F7G050168-010	J2C2D1AA	1.0029g	8.9961g / 8.9663g	0.0298g / 87.91%	1.00	7/24/07 9:35 / 87.91%	Ba 36 / 0.0339
		B1					

Spike Information

Sample ID	Standard ID	Analyte	Std Conc	Aliquot	Ref Date	StdAdded
F7G050000-382C	rad06-0058	RA-226	2.502E+001 dpm/mL	1.00 mL	9/9/1991 12:00:00AM	1.119E+001 pCi/g

GWM	Flip	07-07-07
Spiked By	Spike Verified By	Spike Date

SampID	WRKNO	Aliquot	Gross / Tare	Mass / Ba Yield	Dilution	Ba Precipitation Time / BaYieldAdjusted	Carrier ID / Carrier Added

Standard Operating Procedures

	SOPNumber	Title	Revision
[x]	STL-RC-0002	Planchet Preparation For Radiochemistry And Radiological Screening Analysis	4.00
[x]	STL-RC-0003	Drying And Grinding Of Soil And Solid Samples	6.00
[x]	STL-RC-0004	Preparation Of Soil, Sludge, And Filter Paper Samples For Radiochemical Analysis	10.00
[x]	STL-RC-0040	Total Alpha Emitting Isotopes Of Radium	3.00
[ ]	STL-RD-0403	Daily Calibration Verification And Maintenance Of The Low Background Gas Flow Proportional Counting System	3.00

Reviewed By	Review Date		
GS	7-24-07		
Analyst/Relenquished By	**Release Date**	**Received By**	**Receipt Date**
STD	07-24-07	8	7/24/7

SEVERN TRENT **STL**

Prep Report for Radium 228

Batch: 7186384 **Prep Analyst:** 403301

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

SampID	WRKNO	Aliquot		Carrier ID	Carrier Added	Gross	Tare	Mass	Yield	Adj Yield	Precip Time
F7G050000-384B	J2DC31AA	1.0000g	Ba:	Ba 36	0.0339 g	9.0207 g	8.9904 g	0.0303 g	89.38%	89.38%	7/10/07 10:45
		Red A4	Y:	Y 42A	0.0182	8.9809	8.9613	0.0196	107.69%	100%	7/24/07 8:15
F7G050000-384C	J2DC31AC	1.0000g	Ba:	Ba 36	0.0339 g	8.9763 g	8.9440 g	0.0323 g	95.28%	95.28%	7/10/07 10:45
		B1	Y:	Y 42A	0.0182	9.0108	8.9938	0.0170	93.41%	93.41%	7/24/07 8:15
F7G050168-001	J2C1G1AC	1.0092g	Ba:	Ba 36	0.0339 g	8.9879 g	8.9565 g	0.0314 g	92.63%	92.63%	7/10/07 10:45
		B2	Y:	Y 42A	0.0182	8.9828	8.9643	0.0185	101.65%	100%	7/24/07 8:15
F7G050168-001X	J2C1G1AG	1.0029g	Ba:	Ba 36	0.0339 g	8.9818 g	8.9484 g	0.0334 g	98.53%	98.53%	7/10/07 10:45
		B3	Y:	Y 42A	0.0182	8.9875	8.9676	0.0199	109.34%	100%	7/24/07 8:15
F7G050168-002	J2C1V1AC	1.0130g	Ba:	Ba 36	0.0339 g	8.9880 g	8.9567 g	0.0313 g	92.33%	92.33%	7/10/07 10:45
		B4	Y:	Y 42A	0.0182	8.9921	8.9747	0.0174	95.60%	95.60%	7/24/07 8:15
F7G050168-003	J2C1W1AC	1.0067g	Ba:	Ba 36	0.0339 g	8.9759 g	8.9487 g	0.0272 g	80.24%	80.24%	7/10/07 10:45
		C3	Y:	Y 42A	0.0182	8.9959	8.9786	0.0173	95.05%	95.05%	7/24/07 8:15
F7G050168-004	J2C1X1AC	1.0078g	Ba:	Ba 36	0.0339 g	8.9896 g	8.9588 g	0.0308 g	90.86%	90.86%	7/10/07 10:45
		C4	Y:	Y 42A	0.0182	8.9731	8.9553	0.0178	97.80%	97.80%	7/24/07 8:15
F7G050168-005	J2C101AC	1.0058g	Ba:	Ba 36	0.0339 g	9.0090 g	8.9802 g	0.0288 g	84.96%	84.96%	7/10/07 10:45
		Blue A1	Y:	Y 42A	0.0182	8.9622	8.9425	0.0197	108.24%	100%	7/24/07 8:15
F7G050168-006	J2C111AC	1.0088g	Ba:	Ba 36	0.0339 g	8.9618 g	8.9323 g	0.0295 g	87.02%	87.02%	7/10/07 10:45
		A2	Y:	Y 42A	0.0182	8.9863	8.9671	0.0192	105.49%	100%	7/24/07 8:15
F7G050168-007	J2C131AC	1.0027g	Ba:	Ba 36	0.0339 g	8.9948 g	8.9687 g	0.0261 g	76.99%	76.99%	7/10/07 10:45
		A4	Y:	Y 42A	0.0182	9.0026	8.9830	0.0196	107.69%	100%	7/24/07 8:15
F7G050168-008	J2C151AC	1.0061g	Ba:	Ba 36	0.0339 g	8.9818 g	8.9499 g	0.0319 g	94.10%	94.10%	7/10/07 10:45
		B1	Y:	Y 42A	0.0182	8.9777	8.9587	0.0190	104.40%	100%	7/24/07 8:15

SampID	WRKNO	Aliquot		Carrier ID	Carrier Added	Gross	Tare	Mass	Yield	Adj Yield	Precip Time
F7G050168-009	J2C191AC	1.0010g	*Ba:*	Ba 36	0.0339 g	8.9665 g	8.9345 g	0.0320 g	94.40%	94.40%	7 / 10 / 07 10:45
		B2	*Y:*	Y 42A	0.0182	9.0017	8.9821	0.0196	107.69%	100%	7 / 24 / 07 8:15
F7G050168-010	J2C2D1AC	1.0029g	*Ba:*	Ba 36	0.0339 g	8.9961 g	8.9663 g	0.0298 g	87.91%	87.91%	7 / 10 / 07 10:45
		B4	*Y:*	Y 42A	0.0182	8.9362	8.9169	0.0193	106.04%	100%	7 / 24 / 07 8:15

Spike Information

Sample ID	Standard ID	Analyte	Std Conc	Aliquot	Ref Date	StdAdded
F7G050000-384C	Rad07-0002	RA-228	2.324E+001 dpm/mL	1.00 mL	2/2/2006 12:00:00AM	9.075E+000 pCi/g

GWM — Spiked By

Flip — Spike Verified By

Spike Date

Standard Operating Procedures

SOPNumber	Title	Revision
☑ STL-RC-0002	Planchet Preparation For Radiochemistry And Radiological Screening Analysis	4.00
☑ STL-RC-0003	Drying And Grinding Of Soil And Solid Samples	6.00
☑ STL-RC-0004	Preparation Of Soil, Sludge, And Filter Paper Samples For Radiochemical Analysis	10.00
☑ STL-RC-0041	Radium 228 In Water	3.00
☐ STL-RD-0403	Daily Calibration Verification And Maintenance Of The Low Background Gas Flow Proportional Counting System	3.00

SE — Reviewed By

7/24/7 — Review Date

Analyst/Relenquished By

07-24-07 — Release Date

SE — Received By

7/24/7 — Receipt Date

reprint per missing weight data
SE 7/24/7

SEVERN TRENT SERVICES

LB4100/W General Counting Application

Unit Type: LB4100/W
Counting Unit ID: Red
Data file name: 7186382

Reviewed By: GJ

Batch ID: Ra226 7/24/07 RR

Date: 7-24-07

Sample ID		Det. ID	Count Date/Time	Count Duration	Sample Alpha	Sample Beta	Bkgd Time	Background Alpha	Background Beta	CalType	Net CPM Alpha	Net CPM Beta
F7G050000-382B	Red	A4	7/24/2007 14:16	200	19	195	1000	38	1021	1	0.06	-0.05
F7G050000-382C	Red	B1	7/24/2007 14:16	200	1080	1382	1000	37	1069	1	5.36	5.84
F7G050168-001	Red	B2	7/24/2007 14:16	200	109	302	1000	34	1098	1	0.51	0.41
001X	Red	B3	7/24/2007 14:16	200	88	356	1000	32	1113	1	0.41	0.67
F7G050168-002	Red	B4	7/24/2007 14:16	200	103	339	1000	52	1129	1	0.46	0.57
F7G050168-003	Red	C3	7/24/2007 14:16	200	81	325	1000	30	1141	1	0.38	0.48
F7G050168-004	Red	C4	7/24/2007 14:16	200	83	362	1000	44	1219	1	0.37	0.59
F7G050168-005	Red	D2	7/24/2007 14:16	200	87	328	1000	32	1126	1	0.40	0.51
F7G050168-006	Red	D3	7/24/2007 14:16	200	108	322	1000	27	1020	1	0.51	0.59

SEVERN TRENT SERVICES

LB4100/W General Counting Application

Unit Type: LB4100/W
Counting Unit ID: Blue
Data file name: 7186382

Reviewed By: GS

Batch ID: Ra226 7/24/07 RR

Date: 7-24-07

Sample ID		Det. ID	Count Date/Time	Count Duration	Sample Alpha	Sample Beta	Bkgd Time	Background Alpha	Background Beta		Net CPM Alpha	Net CPM Beta
F7G050168-007	Blue	A1	7/24/2007 14:16	200	101	348	1000	36	1071	1	0.47	0.67
F7G050168-008	Blue	A2	7/24/2007 14:16	200	78	336	1000	50	1040	1	0.34	0.64
F7G050168-009	Blue	A4	7/24/2007 14:16	200	85	287	1000	36	890	1	0.39	0.55
F7G050168-010	Blue	B1	7/24/2007 14:16	200	94	313	1000	45	949	1	0.43	0.62

SEVERN TRENT SERVICES

LB4100/W General Counting Application

Unit Type: LB4100/W
Counting Unit ID: Red
Data file name: 7186384

Reviewed By: SE

Batch ID: RA228 07/24/07 SE

Date: 7/24/7

Sample ID		Det. ID	Count Date/Time	Count Duration	Sample Alpha	Sample Beta	Bkgd Time	Background Alpha	Background Beta	CalType	Net CPM Alpha	Net CPM Beta
F7G050000-384B	Red	A4	7/24/2007 10:37	200	30	245	1000	38	1021	1	0.11	0.20
F7G050000-384C	Red	B1	7/24/2007 10:37	200	34	1088	1000	37	1069	1	0.13	4.37
F7G050168-001	Red	B2	7/24/2007 10:37	200	29	328	1000	34	1098	1	0.11	0.54
001X	Red	B3	7/24/2007 10:37	200	18	304	1000	32	1113	1	0.06	0.41
F7G050168-002	Red	B4	7/24/2007 10:37	200	34	363	1000	52	1129	1	0.12	0.69
F7G050168-003	Red	C3	7/24/2007 10:37	200	19	354	1000	30	1141	1	0.07	0.63
F7G050168-004	Red	C4	7/24/2007 10:37	200	32	380	1000	44	1219	1	0.12	0.68

SEVERN TRENT SERVICES

LB4100/W General Counting Application

Unit Type: LB4100/W
Counting Unit ID: Blue
Data file name: 7186384

Batch ID: RA228 07/24/07 SE

Reviewed By: SE

Date: 7/24/7

Sample ID		Det. ID	Count Date/Time	Count Duration	Sample Alpha	Sample Beta	Bkgd Time	Background Alpha	Background Beta		Net CPM Alpha	Net CPM Beta
F7G050168-005	Blue	A1	7/24/2007 10:38	200	22	298	1000	36	1071	1	0.07	0.42
F7G050168-006	Blue	A2	7/24/2007 10:38	200	19	321	1000	50	1040	1	0.05	0.57
F7G050168-007	Blue	A4	7/24/2007 10:38	200	9	283	1000	36	890	1	0.01	0.53
F7G050168-008	Blue	B1	7/24/2007 10:38	200	26	329	1000	45	949	1	0.09	0.70
F7G050168-009	Blue	B2	7/24/2007 10:38	200	25	307	1000	29	1062	1	0.10	0.47
F7G050168-010	Blue	B4	7/24/2007 10:38	200	26	310	1000	27	865	1	0.10	0.69

TestAmerica STL

Red 2007

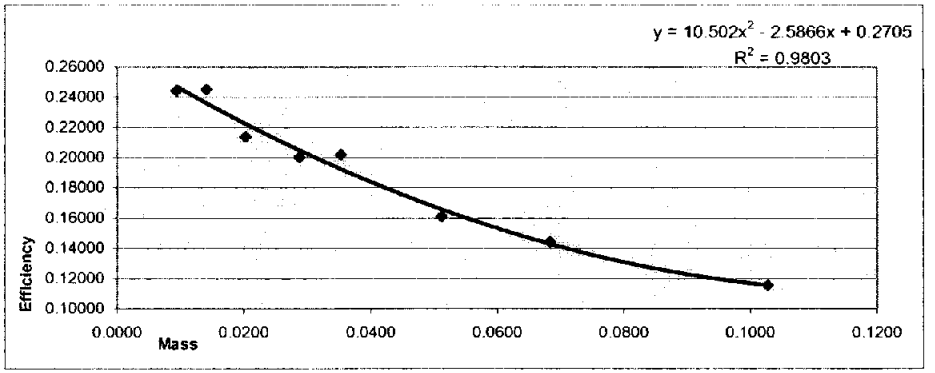
Th-230 $BaSO_4$ Calibration for Ra-226

TestAmerica STL

Detector Efficiency Curves

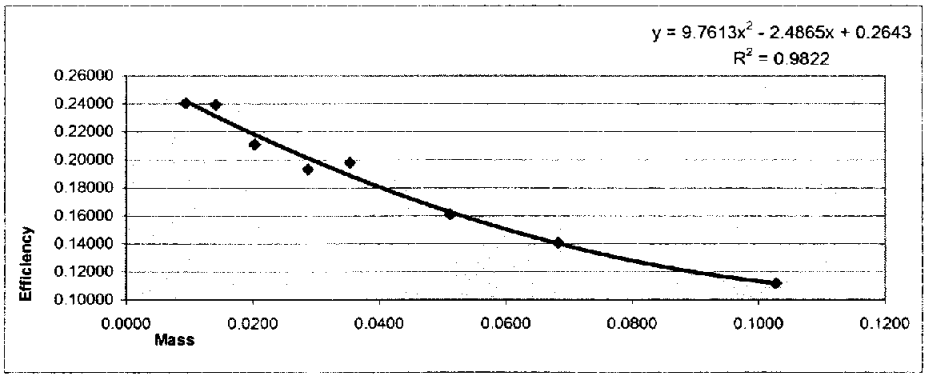
Alpha Th-230 Attenuation Red A1 2/26,27/2007

Detector ID	Sample Wt	Count Time	Alpha	DPM 4567.9 CPM	Th230 Eff
A1	0.0094	40.00	44649	1116.225	0.24436
A1	0.0142	40.00	44771	1119.275	0.24503
A1	0.0203	40.00	39092	977.300	0.21395
A1	0.0287	40.00	36612	915.300	0.20038
A1	0.0353	40.00	36922	923.050	0.20207
A1	0.0512	40.00	29414	735.350	0.16098
A1	0.0683	40.00	26362	659.050	0.14428
A1	0.1028	40.00	21096	527.400	0.11546



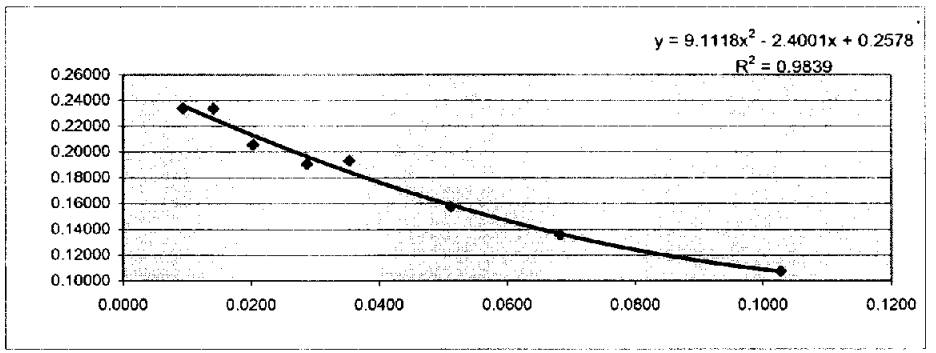
Alpha Th-230 Attenuation Red A2 2/26,27/2007

Detector ID	Sample Wt	Count Time	Alpha	DPM 4567.9 CPM	Th230 Eff
A2	0.0094	40.00	43925	1098.125	0.24040
A2	0.0142	40.00	43691	1092.275	0.23912
A2	0.0203	40.00	38547	963.675	0.21097
A2	0.0287	40.00	35303	882.575	0.19321
A2	0.0353	40.00	36155	903.875	0.19788
A2	0.0512	40.00	29422	735.550	0.16103
A2	0.0683	40.00	25703	642.575	0.14067
A2	0.1028	40.00	20398	509.950	0.11164



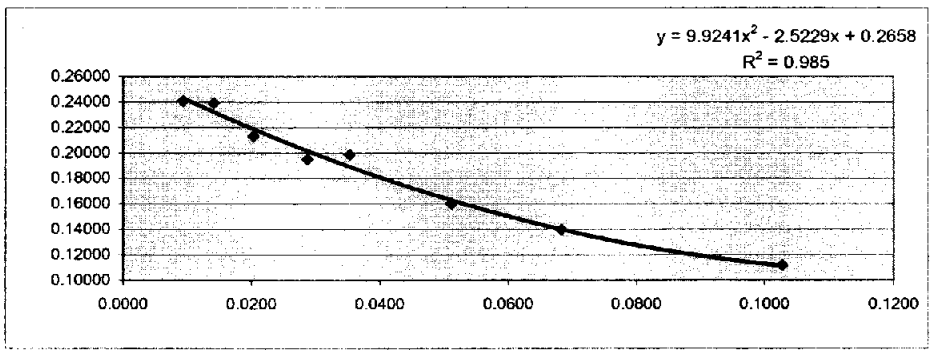
Alpha Th-230 Attenuation Red A3 2/26,27/2007

Detector ID	Sample Wt	Count Time	Alpha	DPM 4567.9 CPM	Th230 Eff
A3	0.0094	40.00	42746	1068.650	0.23395
A3	0.0142	40.00	42674	1066.850	0.23355
A3	0.0203	40.00	37561	939.025	0.20557
A3	0.0287	40.00	34825	870.625	0.19060
A3	0.0353	40.00	35285	882.125	0.19311
A3	0.0512	40.00	28774	719.350	0.15748
A3	0.0683	40.00	24806	620.150	0.13576
A3	0.1028	40.00	19633	490.825	0.10745



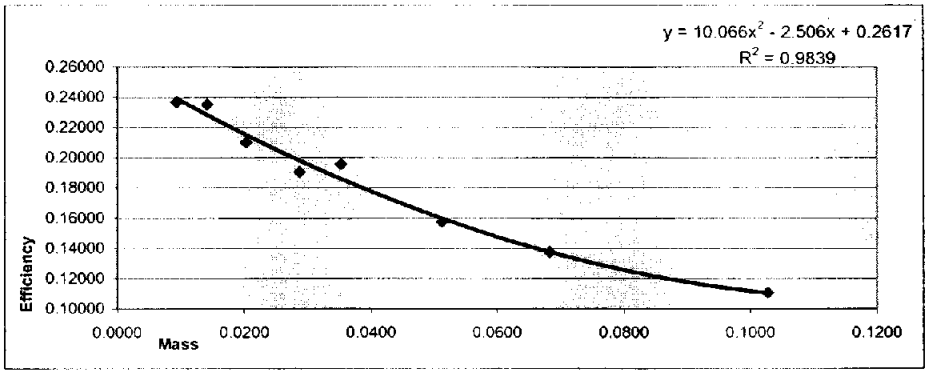
Alpha Th-230 Attenuation Red A4 2/26,27/2007

Detector ID	Sample Wt	Count Time	Alpha	DPM 4567.9 CPM	Th230 Eff
A4	0.0094	40.00	43962	1099.050	0.24060
A4	0.0142	40.00	43676	1091.900	0.23904
A4	0.0203	40.00	38941	973.525	0.21312
A4	0.0287	40.00	35654	891.350	0.19513
A4	0.0353	40.00	36320	908.000	0.19878
A4	0.0512	40.00	29254	731.350	0.16011
A4	0.0683	40.00	25491	637.275	0.13951
A4	0.1028	40.00	20366	509.150	0.11146



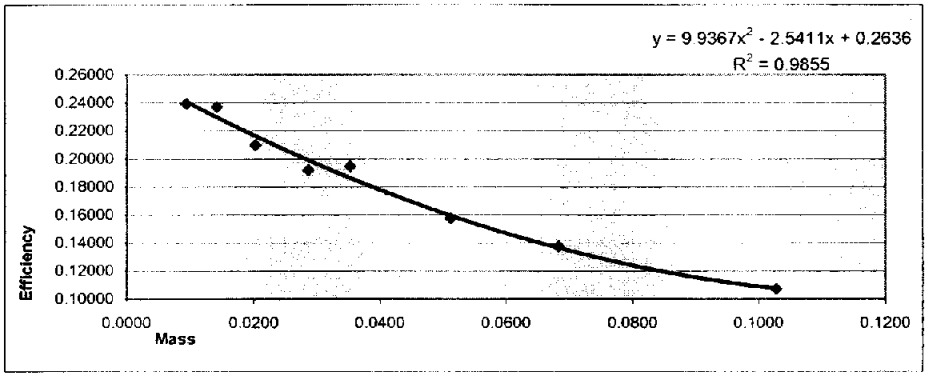
Alpha Th-230 Attenuation Red B1 2/26,27/2007

Detector ID	Sample Wt	Count Time	Alpha	DPM 4567.9 CPM	Th230 Eff
A1	0.0094	40.00	43268	1081.700	0.23680
A1	0.0142	40.00	42945	1073.625	0.23504
A1	0.0203	40.00	38398	959.950	0.21015
A1	0.0287	40.00	34825	870.625	0.19060
A1	0.0353	40.00	35747	893.675	0.19564
A1	0.0512	40.00	28757	718.925	0.15739
A1	0.0683	40.00	25109	627.725	0.13742
A1	0.1028	40.00	20198	504.950	0.11054



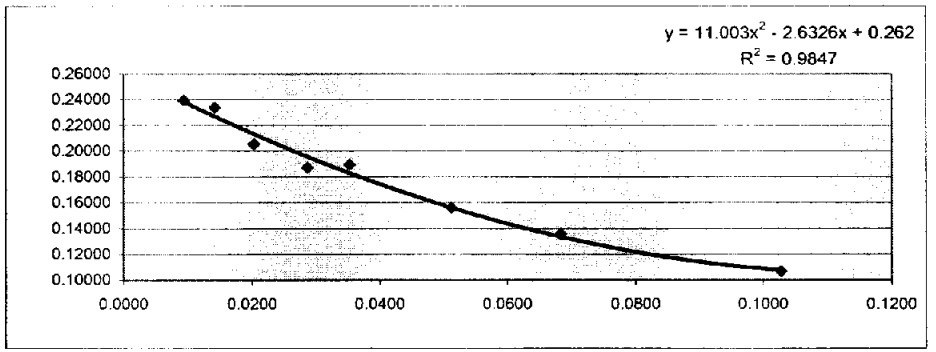
Alpha Th-230 Attenuation Red B2 2/26,27/2007

Detector ID	Sample Wt	Count Time	Alpha	DPM 4567.9 CPM	Th230 Eff
A2	0.0094	40.00	43718	1092.950	0.23927
A2	0.0142	40.00	43313	1082.825	0.23705
A2	0.0203	40.00	38333	958.325	0.20980
A2	0.0287	40.00	35058	876.450	0.19187
A2	0.0353	40.00	35594	889.850	0.19481
A2	0.0512	40.00	28807	720.175	0.15766
A2	0.0683	40.00	25093	627.325	0.13733
A2	0.1028	40.00	19579	489.475	0.10716



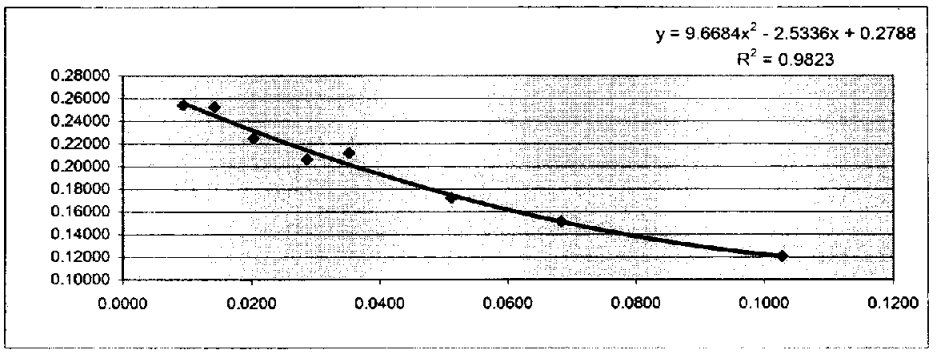
Alpha Th-230 Attenuation Red B3 2/26,27/2007

Detector ID	Sample Wt	Count Time	Alpha	DPM 4567.9 CPM	Th230 Eff
A3	0.0094	40.00	43772	1094.300	0.23956
A3	0.0142	40.00	42748	1068.700	0.23396
A3	0.0203	40.00	37520	938.000	0.20535
A3	0.0287	40.00	34195	854.875	0.18715
A3	0.0353	40.00	34593	864.825	0.18933
A3	0.0512	40.00	28518	712.950	0.15608
A3	0.0683	40.00	24827	620.675	0.13588
A3	0.1028	40.00	19501	487.525	0.10673



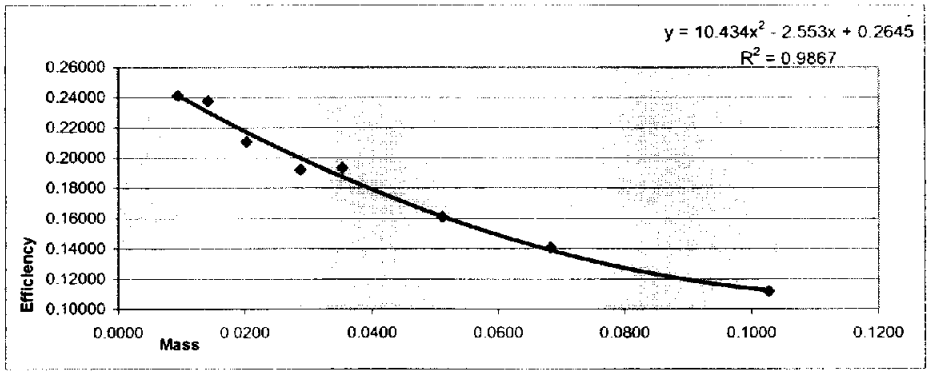
Alpha Th-230 Attenuation Red B4 2/26,27/2007

Detector ID	Sample Wt	Count Time	Alpha	DPM 4567.9 CPM	Th230 Eff
A4	0.0094	40.00	46439	1160.975	0.25416
A4	0.0142	40.00	46134	1153.350	0.25249
A4	0.0203	40.00	41056	1026.400	0.22470
A4	0.0287	40.00	37688	942.200	0.20627
A4	0.0353	40.00	38712	967.800	0.21187
A4	0.0512	40.00	31430	785.750	0.17202
A4	0.0683	40.00	27621	690.525	0.15117
A4	0.1028	40.00	22009	550.225	0.12045



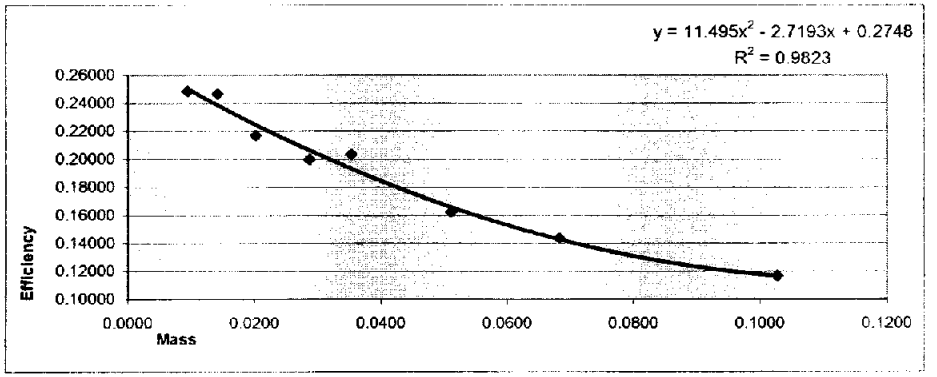
Alpha Th-230 Attenuation Red C1 2/26,27/2007

Detector ID	Sample Wt	Count Time	Alpha	DPM 4567.9 CPM	Th230 Eff
A1	0.0094	40.00	44086	1102.150	0.24128
A1	0.0142	40.00	43436	1085.900	0.23772
A1	0.0203	40.00	38481	962.025	0.21061
A1	0.0287	40.00	35104	877.600	0.19212
A1	0.0353	40.00	35349	883.725	0.19346
A1	0.0512	40.00	29405	735.125	0.16093
A1	0.0683	40.00	25673	641.825	0.14051
A1	0.1028	40.00	20395	509.875	0.11162



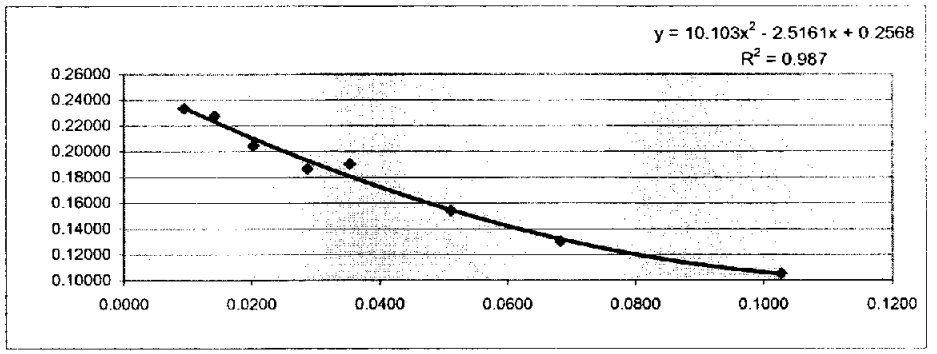
Alpha Th-230 Attenuation Red C2 2/26,27/2007

Detector ID	Sample Wt	Count Time	Alpha	DPM 4567.9 CPM	Th230 Eff
A2	0.0094	40.00	45369	1134.225	0.24830
A2	0.0142	40.00	45039	1125.975	0.24650
A2	0.0203	40.00	39635	990.875	0.21692
A2	0.0287	40.00	36512	912.800	0.19983
A2	0.0353	40.00	37156	928.900	0.20335
A2	0.0512	40.00	29640	741.000	0.16222
A2	0.0683	40.00	26226	655.650	0.14353
A2	0.1028	40.00	21304	532.600	0.11660



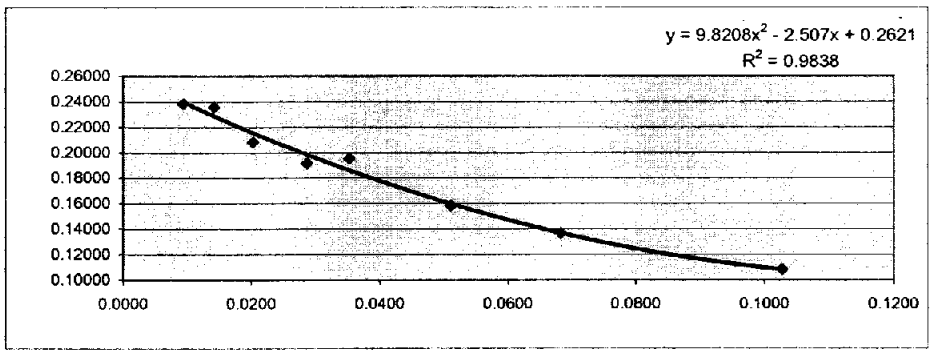
Alpha Th-230 Attenuation Red C3 2/26,27/2007

Detector ID	Sample Wt	Count Time	Alpha	DPM 4567.9 CPM	Th230 Eff
A3	0.0094	40.00	42659	1066.475	0.23347
A3	0.0142	40.00	41616	1040.400	0.22776
A3	0.0203	40.00	37323	933.075	0.20427
A3	0.0287	40.00	34086	852.150	0.18655
A3	0.0353	40.00	34746	868.650	0.19016
A3	0.0512	40.00	28127	703.175	0.15394
A3	0.0683	40.00	23789	594.725	0.13020
A3	0.1028	40.00	19239	480.975	0.10529



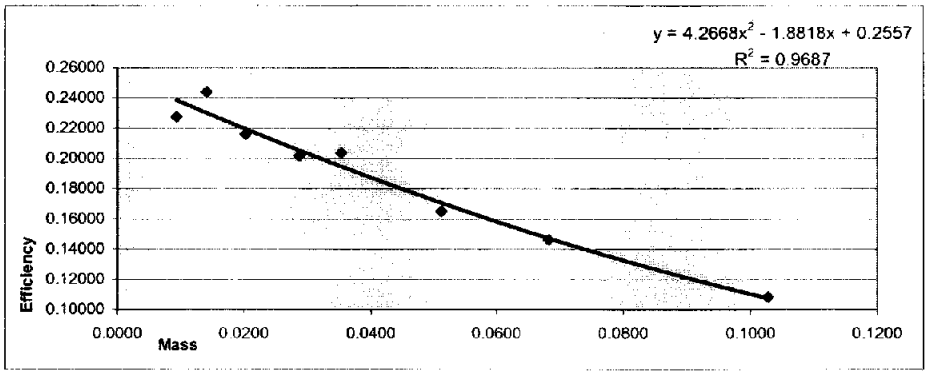
Alpha Th-230 Attenuation Red C4 2/26,27/2007

Detector ID	Sample Wt	Count Time	Alpha	DPM 4567.9 CPM	Th230 Eff
A4	0.0094	40.00	43527	1088.175	0.23822
A4	0.0142	40.00	43089	1077.225	0.23582
A4	0.0203	40.00	38022	950.550	0.20809
A4	0.0287	40.00	35005	875.125	0.19158
A4	0.0353	40.00	35700	892.500	0.19539
A4	0.0512	40.00	28888	722.200	0.15810
A4	0.0683	40.00	24929	623.225	0.13644
A4	0.1028	40.00	19777	494.425	0.10824



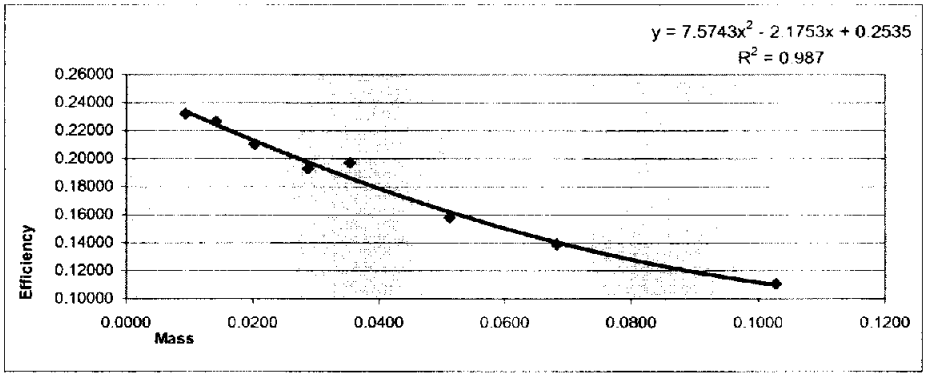
Alpha Th-230 Attenuation Red D1 — 2/26,27/2007

Detector ID	Sample Wt	Count Time	Alpha	DPM 4567.9 CPM	Th230 Eff
A1	0.0094	40.00	41584	1039.600	0.22759
A1	0.0142	40.00	44574	1114.350	0.24395
A1	0.0203	40.00	39465	986.625	0.21599
A1	0.0287	40.00	36873	921.825	0.20180
A1	0.0353	40.00	37226	930.650	0.20374
A1	0.0512	40.00	30143	753.575	0.16497
A1	0.0683	40.00	26706	667.650	0.14616
A1	0.1028	40.00	19794	494.850	0.10833



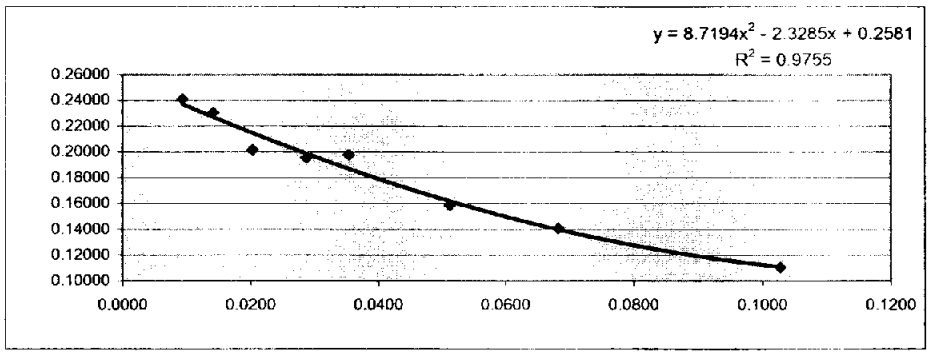
Alpha Th-230 Attenuation Red D2 — 2/26,27/2007

Detector ID	Sample Wt	Count Time	Alpha	DPM 4567.9 CPM	Th230 Eff
A2	0.0094	40.00	42364	1059.100	0.23186
A2	0.0142	40.00	41373	1034.325	0.22643
A2	0.0203	40.00	38425	960.625	0.21030
A2	0.0287	40.00	35233	880.825	0.19283
A2	0.0353	40.00	35995	899.875	0.19700
A2	0.0512	40.00	28846	721.150	0.15787
A2	0.0683	40.00	25365	634.125	0.13882
A2	0.1028	40.00	20219	505.475	0.11066



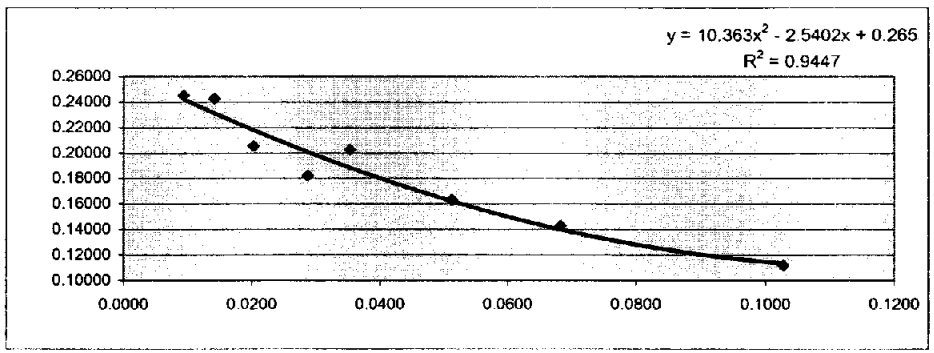
Alpha Th-230 Attenuation Red D3 — 2/26,27/2007

Detector ID	Sample Wt	Count Time	Alpha	DPM 4567.9 CPM	Th230 Eff
A3	0.0094	40.00	44021	1100.525	0.24093
A3	0.0142	40.00	42103	1052.575	0.23043
A3	0.0203	40.00	36792	919.800	0.20136
A3	0.0287	40.00	35701	892.525	0.19539
A3	0.0353	40.00	36134	903.350	0.19776
A3	0.0512	40.00	28971	724.275	0.15856
A3	0.0683	40.00	25736	643.400	0.14085
A3	0.1028	40.00	20196	504.900	0.11053



Alpha Th-230 Attenuation Red D4 — 2/26,27/2007

Detector ID	Sample Wt	Count Time	Alpha	DPM 4567.9 CPM	Th230 Eff
A4	0.0094	40.00	44747	1118.675	0.24490
A4	0.0142	40.00	44291	1107.275	0.24240
A4	0.0203	40.00	37544	938.600	0.20548
A4	0.0287	40.00	33267	831.675	0.18207
A4	0.0353	40.00	36962	924.050	0.20229
A4	0.0512	40.00	29787	744.675	0.16302
A4	0.0683	40.00	26088	652.200	0.14278
A4	0.1028	40.00	20435	510.875	0.11184



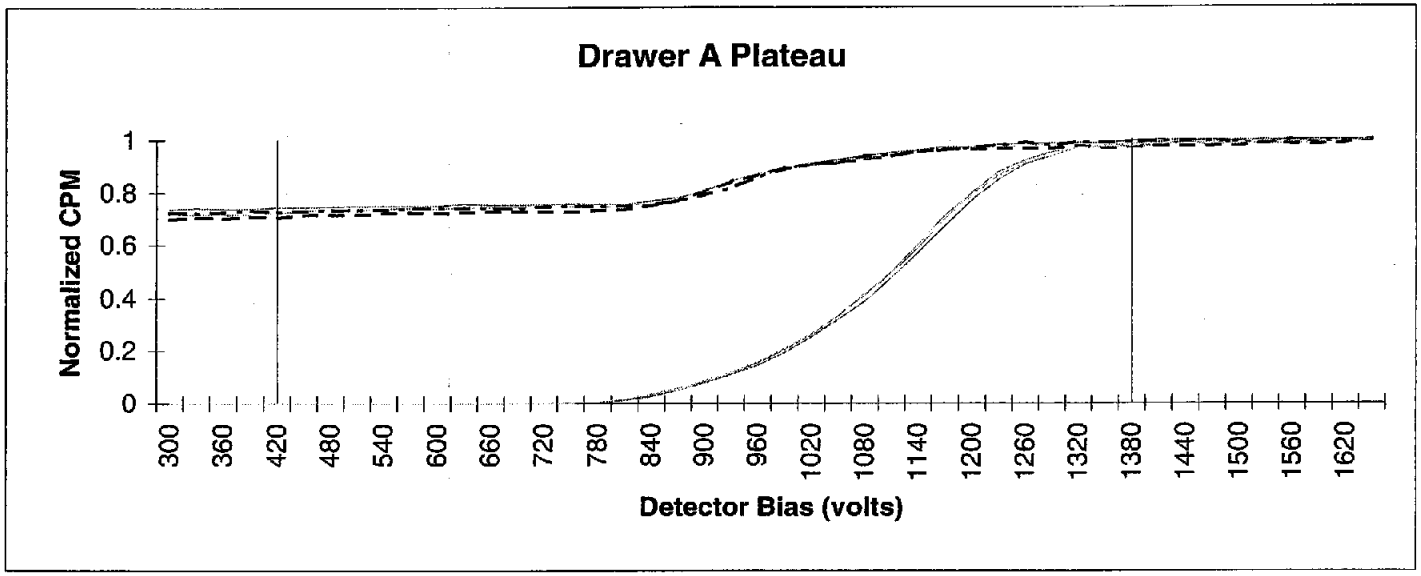
TestAmerica STL

Red 2007

Voltage Plateaus and Discriminator Settings

Unit Type: LB4100/W
Date Performed: 2/19/07 11:58
FileName: PLAT2007
Batch ID:

Unit Id: Red
Application Revision: 2
Application Version: Standard



Optimum alpha beta simultaneous operating voltage: 1380

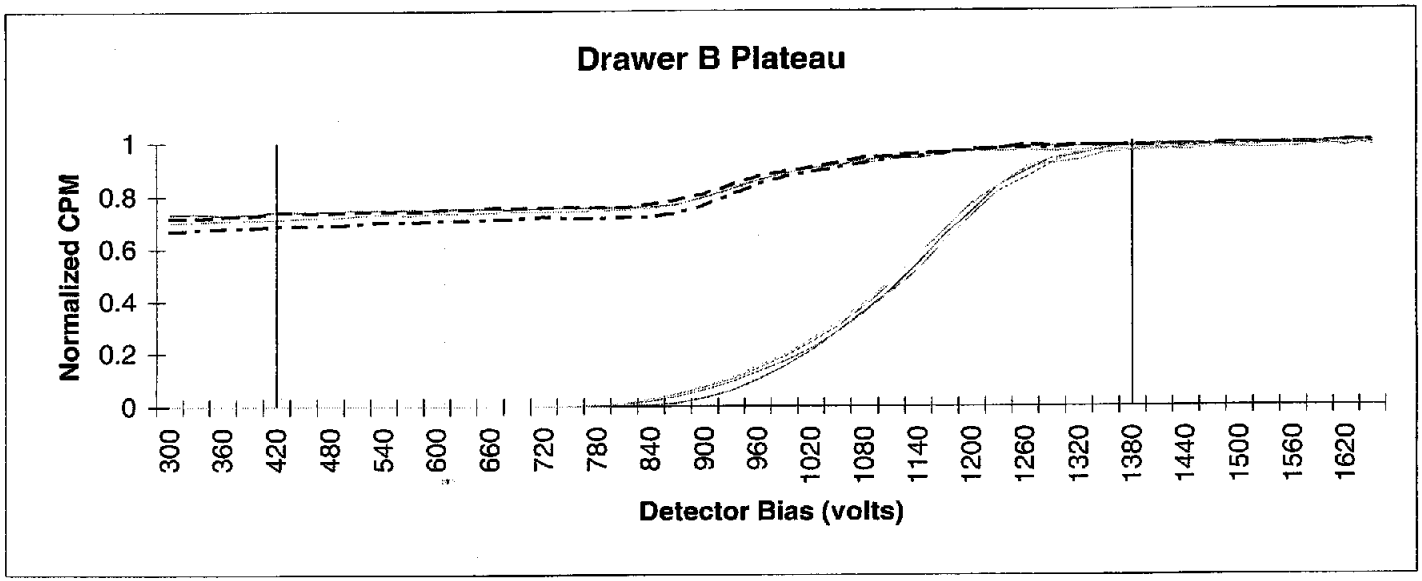
Optimum alpha only operating voltage: 420

	A1	A2	A3	A4
Beta slope at beta voltage	1.90%	2.05%	1.32%	2.19%
Alpha slope at beta voltage	1.02%	0.18%	0.62%	0.32%
Alpha slope at alpha voltage	1.08%	1.54%	2.61%	0.69%

Printed 2/19/2007 4:51 PM

Unit Type: LB4100/W
Date Performed: 2/19/07 11:58
FileName: PLAT2007
Batch ID:

Unit Id: Red
Application Revision: 2
Application Version: Standard



Optimum alpha beta simultaneous operating voltage: 1380

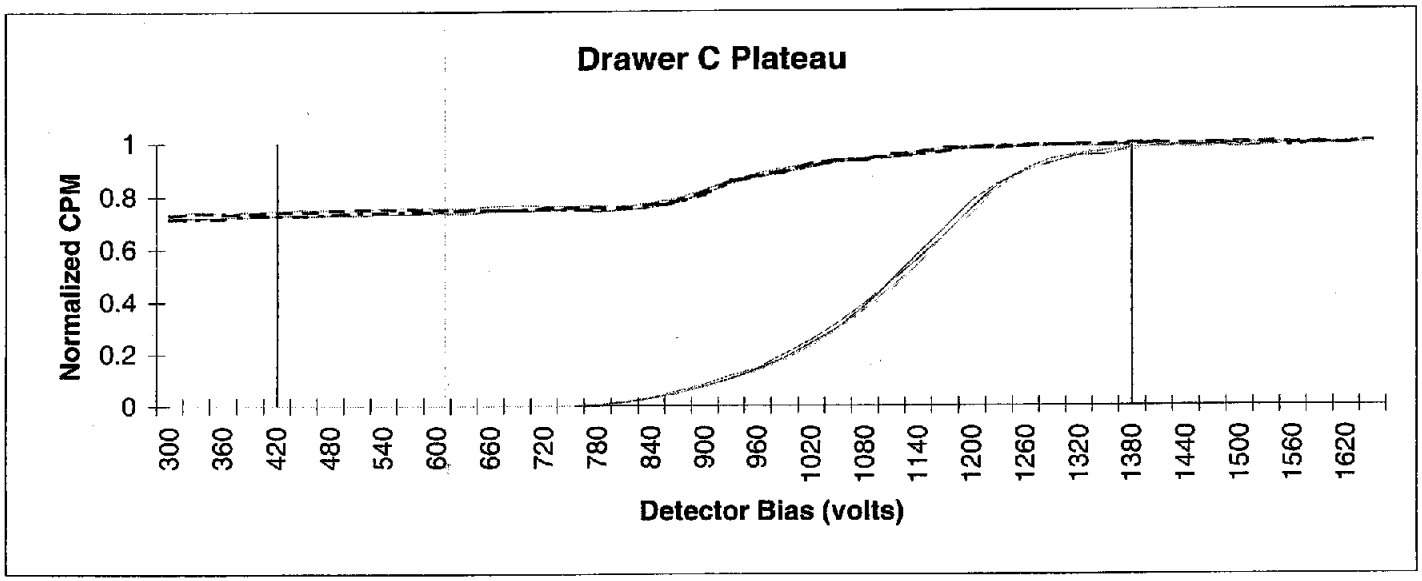
Optimum alpha only operating voltage: 420

	B1	B2	B3	B4
Beta slope at beta voltage	2.29%	3.38%	2.33%	1.55%
Alpha slope at beta voltage	0.81%	0.15%	0.14%	0.26%
Alpha slope at alpha voltage	1.69%	1.63%	1.39%	1.51%

Printed 2/19/2007 4:51 PM

Unit Type: LB4100/W
Date Performed: 2/19/07 11:58
FileName: PLAT2007
Batch ID:

Unit Id: Red
Application Revision: 2
Application Version: Standard



Optimum alpha beta simultaneous operating voltage: 1380

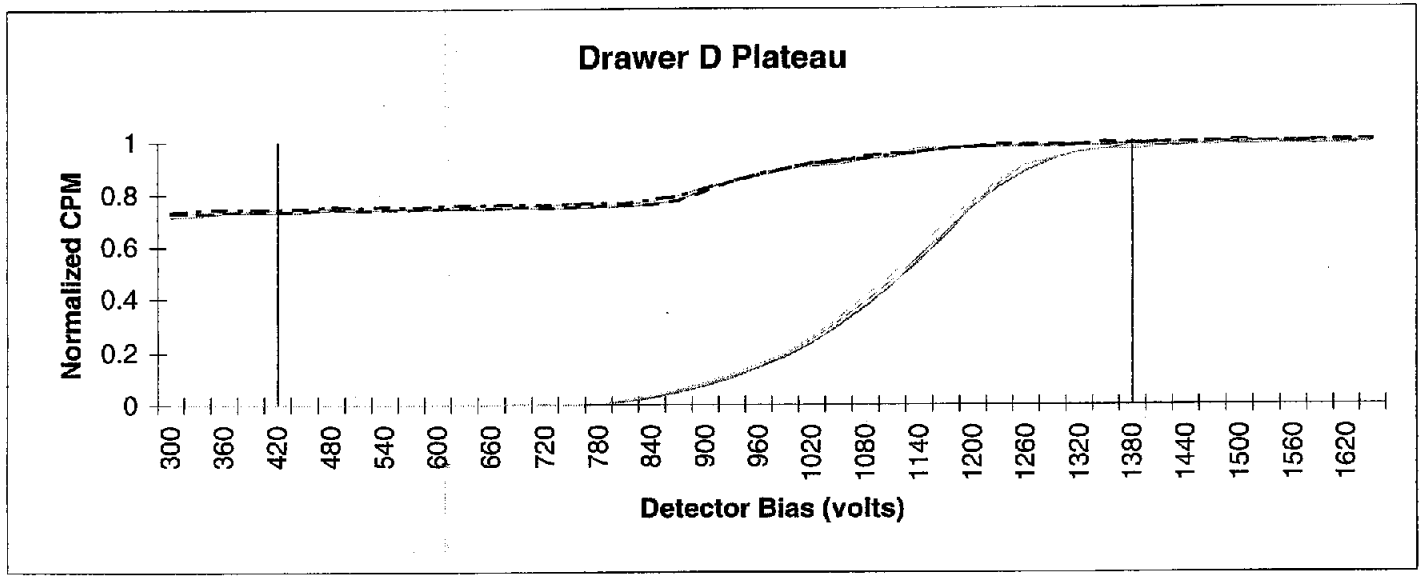
Optimum alpha only operating voltage: 420

	C1	C2	C3	C4
Beta slope at beta voltage	3.13%	2.21%	2.65%	2.67%
Alpha slope at beta voltage	0.40%	-0.09%	0.22%	0.31%
Alpha slope at alpha voltage	0.73%	1.23%	1.51%	1.34%

Printed 2/19/2007 4:51 PM

Unit Type: LB4100/W
Date Performed: 2/19/07 11:58
FileName: PLAT2007
Batch ID:

Unit Id: Red
Application Revision: 2
Application Version: Standard

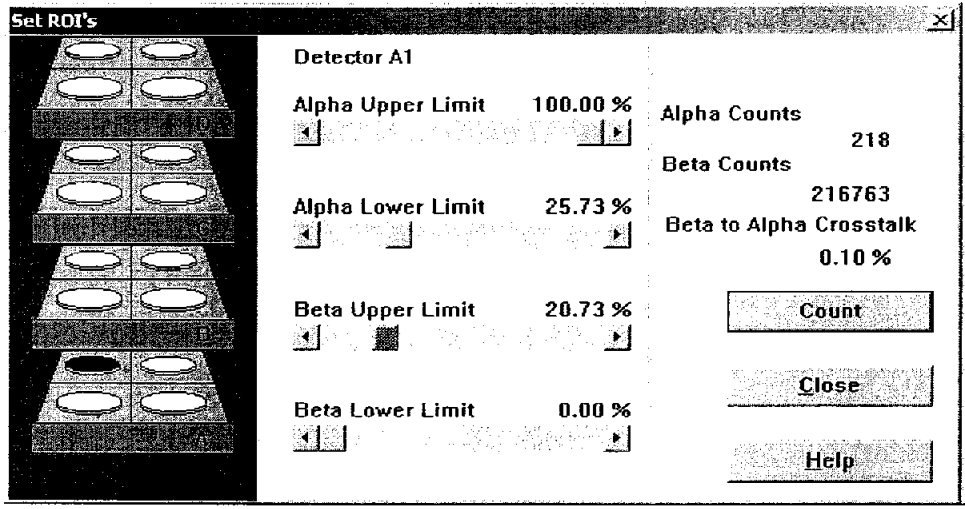


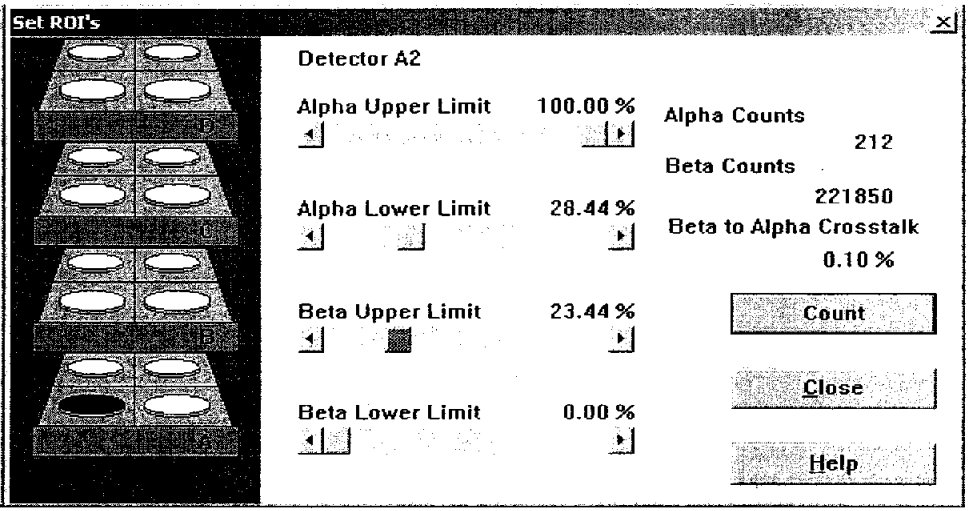
Optimum alpha beta simultaneous operating voltage: 1380

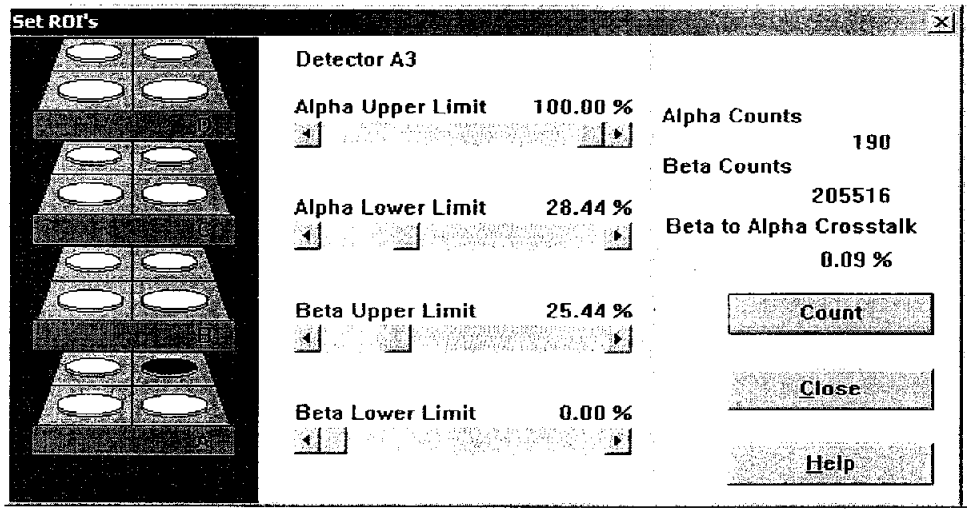
Optimum alpha only operating voltage: 420

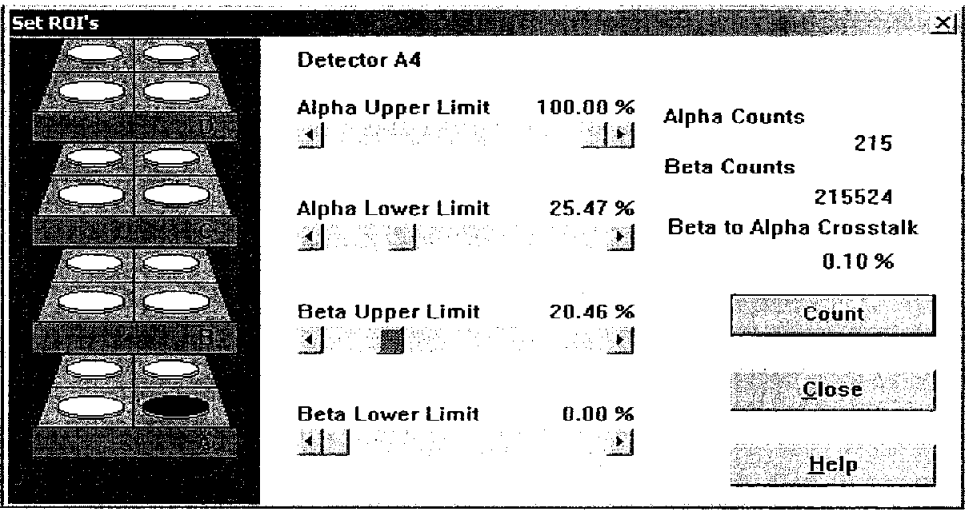
	D1	D2	D3	D4
Beta slope at beta voltage	1.81%	2.24%	2.13%	3.05%
Alpha slope at beta voltage	0.10%	0.43%	0.64%	0.58%
Alpha slope at alpha voltage	1.20%	1.08%	1.08%	1.08%

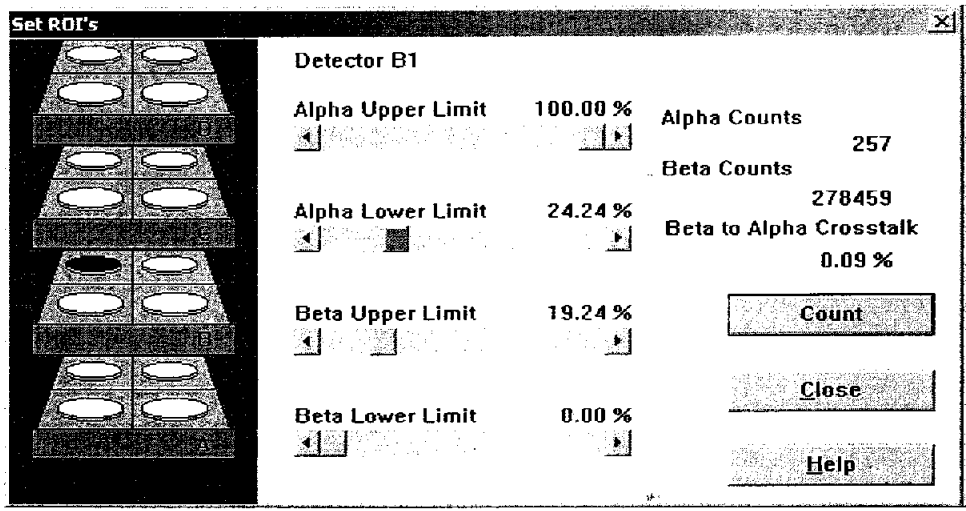
Printed 2/19/2007 4:51 PM

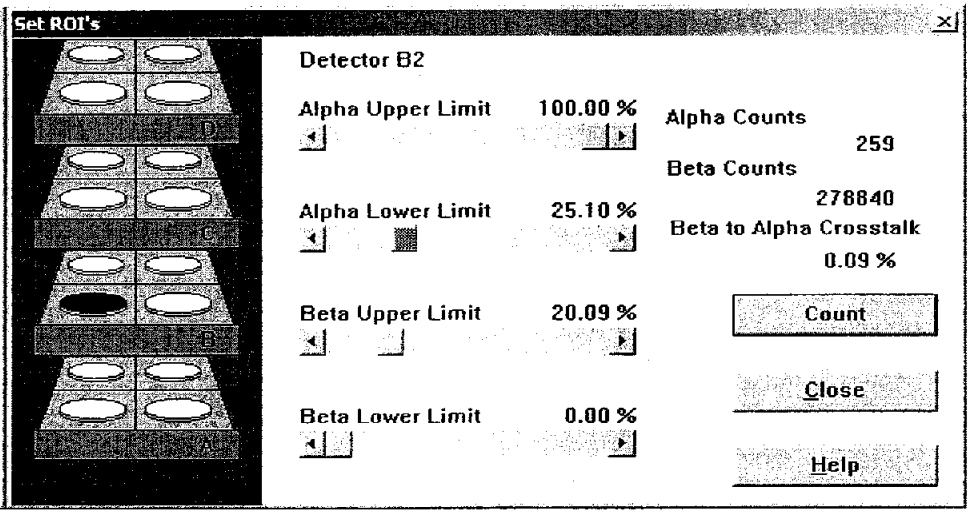

Set ROI's
Detector A1
Alpha Upper Limit 100.00 %
Alpha Lower Limit 25.73 %
Beta Upper Limit 20.73 %
Beta Lower Limit 0.00 %
Alpha Counts
218
Beta Counts
216763
Beta to Alpha Crosstalk
0.10 %
Count
Close
Help

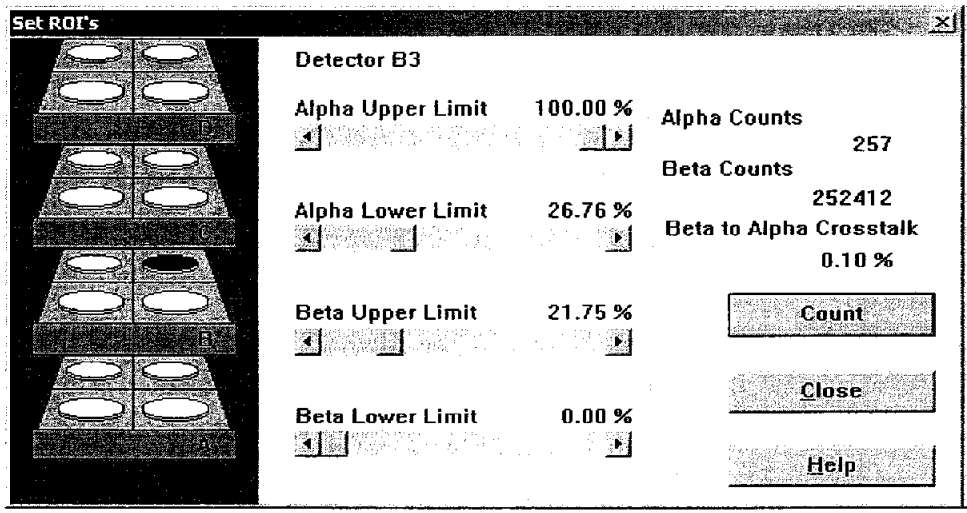

Set ROI's
Detector A2
Alpha Upper Limit 100.00 %
Alpha Lower Limit 28.44 %
Beta Upper Limit 23.44 %
Beta Lower Limit 0.00 %
Alpha Counts
212
Beta Counts
221850
Beta to Alpha Crosstalk
0.10 %
Count
Close
Help

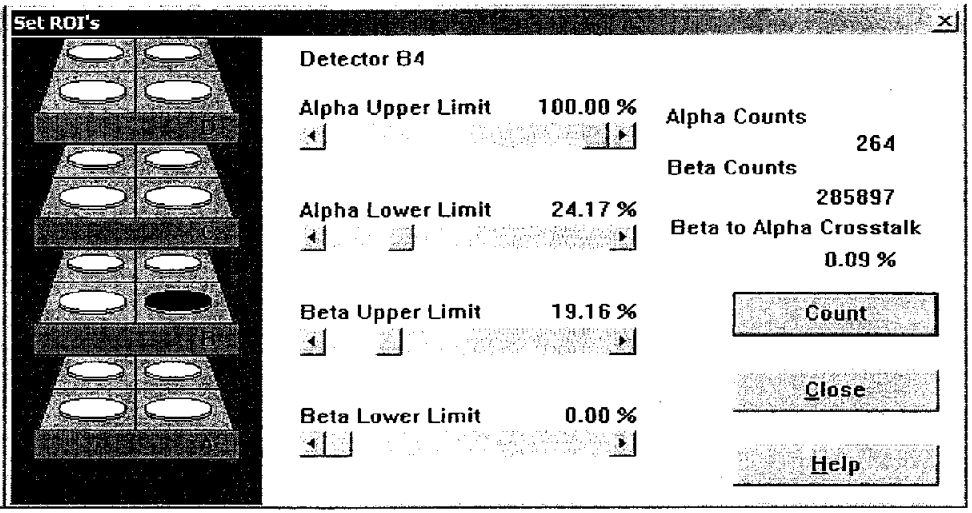

Set ROI's
Detector A3
Alpha Upper Limit 100.00 %
Alpha Lower Limit 28.44 %
Beta Upper Limit 25.44 %
Beta Lower Limit 0.00 %
Alpha Counts
190
Beta Counts
205516
Beta to Alpha Crosstalk
0.09 %
Count
Close
Help

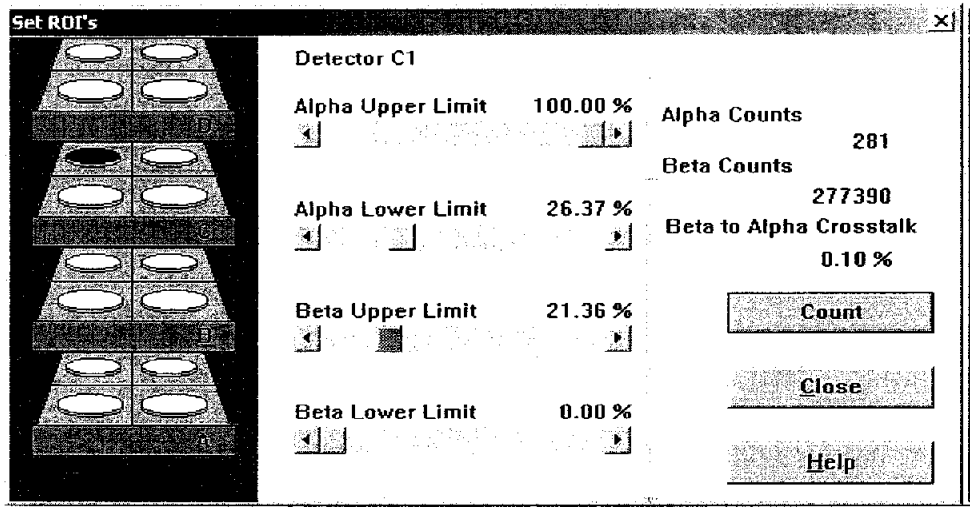

Set ROI's
Detector A4
Alpha Upper Limit 100.00 %
Alpha Lower Limit 25.47 %
Beta Upper Limit 20.46 %
Beta Lower Limit 0.00 %
Alpha Counts
215
Beta Counts
215524
Beta to Alpha Crosstalk
0.10 %
Count
Close
Help

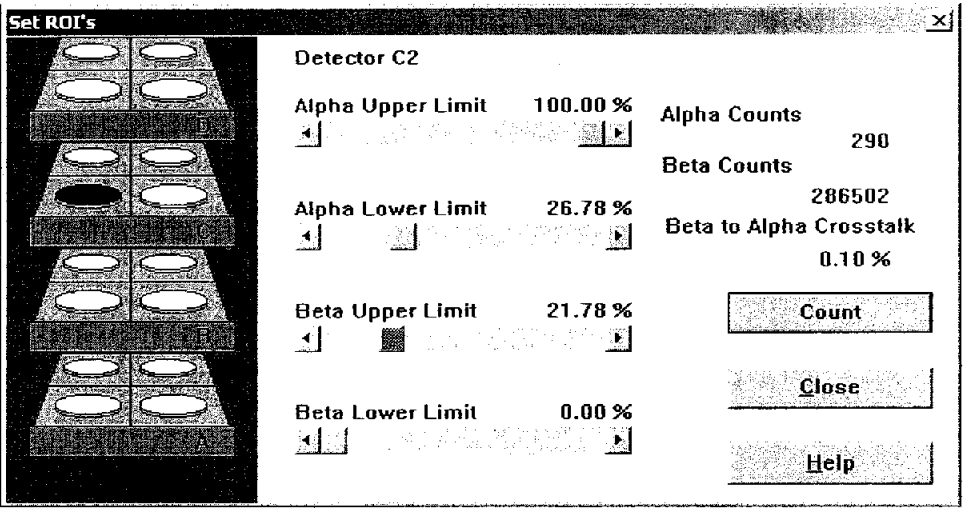

Set ROI's
Detector B1
Alpha Upper Limit 100.00 %
Alpha Lower Limit 24.24 %
Beta Upper Limit 19.24 %
Beta Lower Limit 0.00 %
Alpha Counts 257
Beta Counts 278459
Beta to Alpha Crosstalk 0.09 %
Count
Close
Help

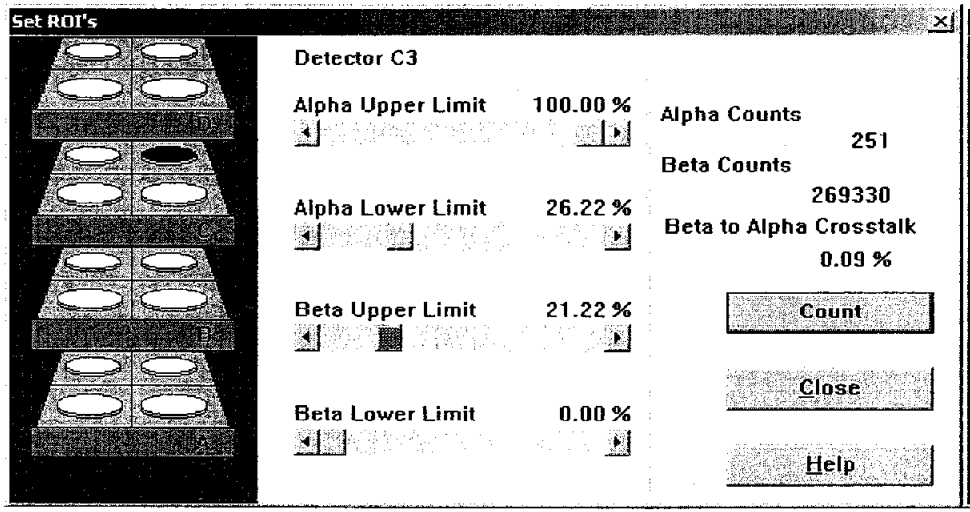

Set ROI's
Detector B2
Alpha Upper Limit 100.00 %
Alpha Lower Limit 25.10 %
Beta Upper Limit 20.09 %
Beta Lower Limit 0.00 %
Alpha Counts 259
Beta Counts 278840
Beta to Alpha Crosstalk 0.09 %
Count
Close
Help

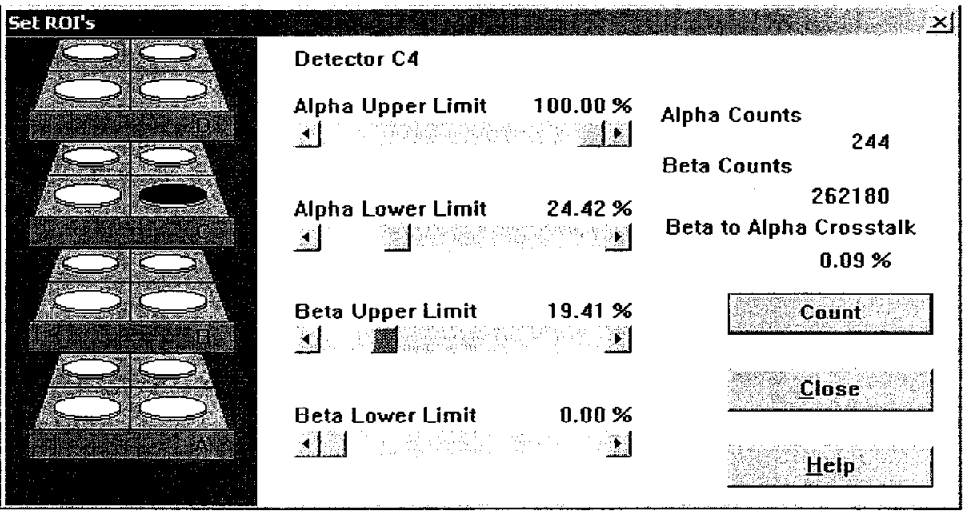

Set ROI's
Detector B3
Alpha Upper Limit 100.00 %
Alpha Lower Limit 26.76 %
Beta Upper Limit 21.75 %
Beta Lower Limit 0.00 %
Alpha Counts 257
Beta Counts 252412
Beta to Alpha Crosstalk 0.10 %
Count
Close
Help

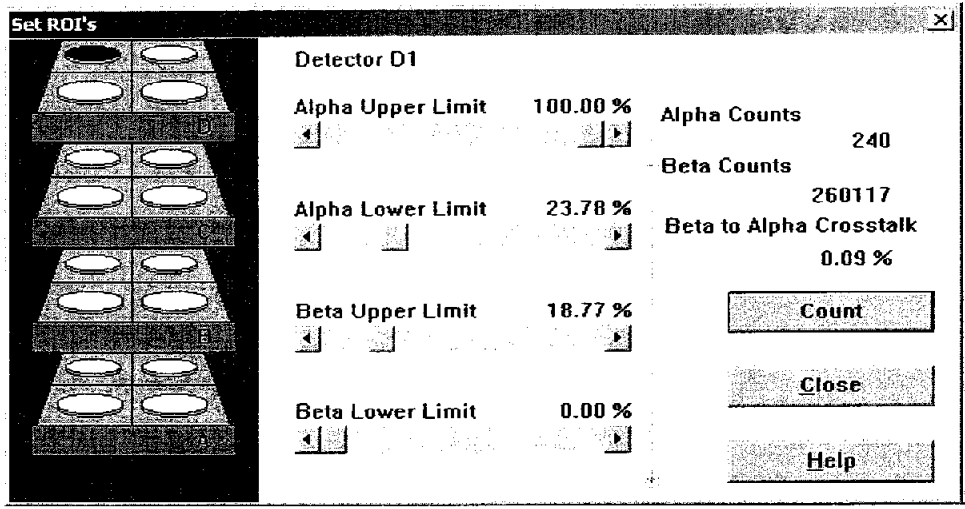

Set ROI's
Detector B4
Alpha Upper Limit 100.00 %
Alpha Lower Limit 24.17 %
Beta Upper Limit 19.16 %
Beta Lower Limit 0.00 %
Alpha Counts 264
Beta Counts 285897
Beta to Alpha Crosstalk 0.09 %
Count
Close
Help

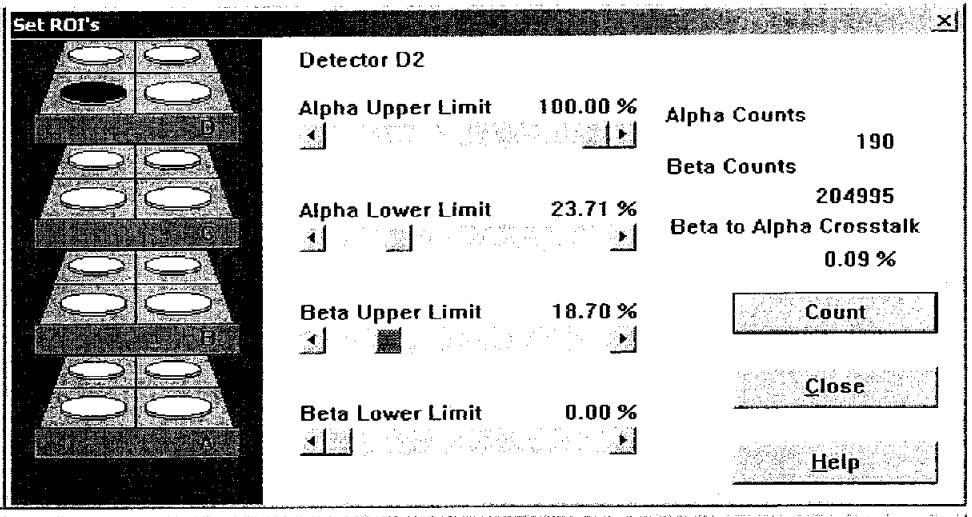

Set ROI's
Detector C1
Alpha Upper Limit 100.00 %
Alpha Lower Limit 26.37 %
Beta Upper Limit 21.36 %
Beta Lower Limit 0.00 %
Alpha Counts
281
Beta Counts
277390
Beta to Alpha Crosstalk
0.10 %
Count
Close
Help

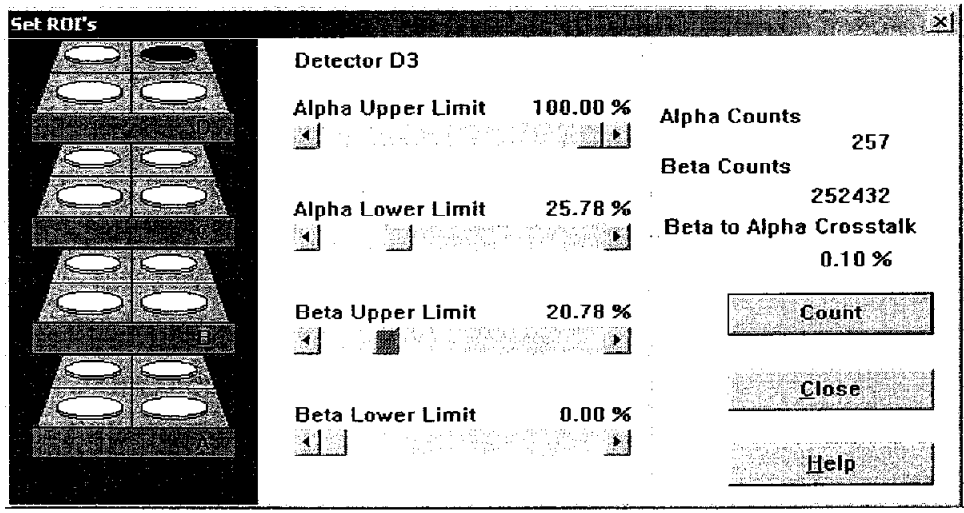

Set ROI's
Detector C2
Alpha Upper Limit 100.00 %
Alpha Lower Limit 26.78 %
Beta Upper Limit 21.78 %
Beta Lower Limit 0.00 %
Alpha Counts
290
Beta Counts
286502
Beta to Alpha Crosstalk
0.10 %
Count
Close
Help

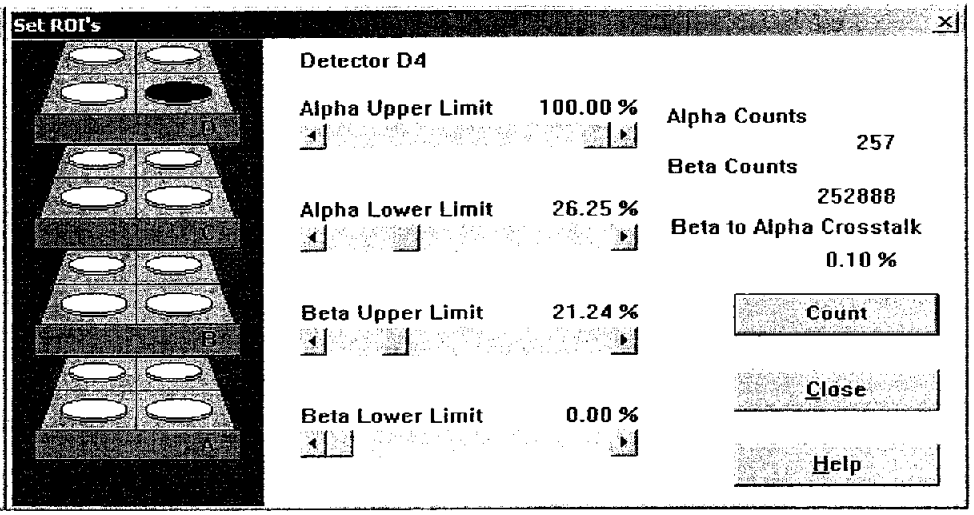

Set ROI's
Detector C3
Alpha Upper Limit 100.00 %
Alpha Lower Limit 26.22 %
Beta Upper Limit 21.22 %
Beta Lower Limit 0.00 %
Alpha Counts
251
Beta Counts
269330
Beta to Alpha Crosstalk
0.09 %
Count
Close
Help


Set ROI's
Detector C4
Alpha Upper Limit 100.00 %
Alpha Lower Limit 24.42 %
Beta Upper Limit 19.41 %
Beta Lower Limit 0.00 %
Alpha Counts
244
Beta Counts
262180
Beta to Alpha Crosstalk
0.09 %
Count
Close
Help


Set ROI's
Detector D1
Alpha Upper Limit 100.00 %
Alpha Lower Limit 23.78 %
Beta Upper Limit 18.77 %
Beta Lower Limit 0.00 %
Alpha Counts
240
Beta Counts
260117
Beta to Alpha Crosstalk
0.09 %
Count
Close
Help


Set ROI's
Detector D2
Alpha Upper Limit 100.00 %
Alpha Lower Limit 23.71 %
Beta Upper Limit 18.70 %
Beta Lower Limit 0.00 %
Alpha Counts
190
Beta Counts
204995
Beta to Alpha Crosstalk
0.09 %
Count
Close
Help


Set ROI's
Detector D3
Alpha Upper Limit 100.00 %
Alpha Lower Limit 25.78 %
Beta Upper Limit 20.78 %
Beta Lower Limit 0.00 %
Alpha Counts
257
Beta Counts
252432
Beta to Alpha Crosstalk
0.10 %
Count
Close
Help


Set ROI's
Detector D4
Alpha Upper Limit 100.00 %
Alpha Lower Limit 26.25 %
Beta Upper Limit 21.24 %
Beta Lower Limit 0.00 %
Alpha Counts
257
Beta Counts
252888
Beta to Alpha Crosstalk
0.10 %
Count
Close
Help

TestAmerica STL

Calibration Standard Data

Alpha Calibration Standards for Ra-226

Standard used: 1mL of Th-230 03-071 4567.9 dpm/mL 12/24/03

Std #	mL Ba Carrier	Gross wt	Tare Wt	Mass BaSO4
1	0.25	8.4779	8.4682	0.0097
2	0.4	8.3925	8.3784	0.0141
3	0.6	8.4768	8.4557	0.0211
4	0.8	8.4605	8.4313	0.0292
5	1	8.4726	8.4372	0.0354
6	1.5	8.4687	8.4173	0.0514
7	2	8.5100	8.4419	0.0681
8	3	8.5684	8.4653	0.1031

ANALYTICS

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

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

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

65090-334

Th-230 5 mL Liquid in Flame Sealed Vial

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

Radionuclide purity and calibration were checked by germanium gamma-ray spectrometry and liquid scintillation counting. The nuclear decay rate and assay date for this source are given below.

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:	Th-230
ACTIVITY (dps):	7.654 E3
HALF-LIFE:	7.538 E4 Years
CALIBRATION DATE:	December 19, 2002 12:00 EST
TOTAL UNCERTAINTY*:	3.5%
SYSTEMATIC:	2.6%
RANDOM:	0.9%

*99% Confidence Level

Impurities: γ-impurities <0.1%, α-impurities <0.05%

5.17738 grams 0.5M HNO_3 solution.

P O NUMBER 1614557-000 OP, Item 3

SOURCE PREPARED BY: M. N. Currie for
M. Taskaeva, Radiochemist

Q A APPROVED: 12-19-02

SEVERN TRENT SERVICES

Logbook: 2060

Radiochemistry
Standards Preparation Logbook

Date Prep'd	Expir. Date	Standard ID Number	Isotope	Parent ID Number	Parent Activity	Parent Ref. Date	Aliquot	Dilution Volume	Change in Time	T½	Final Activity	Solvent/ Lot #	Prep'd Initials	Cal. Ver. Initials	Comments
											66.201	K9-15-03			
~~9-11-03~~	~~9-11-08~~	03-069 ~~03-0069~~ MC 9-22	Pu 238 03	02-026	132.98	2-23-02	95 ml	↓	1.596 dpm/g	32022.4 d 0.75	3310.22 dpm/g ~~66.41~~ dpm/g		MFM		re-certification of 03-031, 02-03-6 and 66.201
↓	↓	–	~~Pu 239~~	~~02-023~~	~~128.05~~	~~2-23-02~~	~~95 ml~~	~~1.50 ml~~	11-18-03 MC	~~24110 y~~	~~32.165 dpm/g~~ ~~69.015 dpm/g~~	~~1/4/62.025 dpm/ml~~	~~MFM~~		↓ 62.025 dpm/ml
9-11-03	9-11-08	03-070 ~~03-0070~~ MC 9-22-03	Am 243	98-011	1161 dpm/g	2-28-98	15 ~~16 gram~~	200 ml		7.37 E+3 y	87.075 ~~9.22~~ dpm/ml		MFM		
10-6-03	10-6-08	03-071	Th 230	65090-334	7,654 dps	12-19-02	5.1498 g	100 mL	N/A	7.538 E4	4,567.9 dpm/mL	0.5M HNO_3	BH	BBF	
10-6-03	10-6-08	03-072	Th 230	03-071	4,567.9 dpm/mL	12-19-02	1 mL	200 mL	N/A	7.538 E4	22.84 dpm/mL	0.5M HNO_3	BH	BBF	
10-11-03	10-11-0	03-073	Clean U-233	047-105	10994 dpm/ml	9-16-97	10 ml	1000 L		70 y	103.85 dpm/mL	DI H_2O 2M H_2SO_4 KOH pH 1.5	MFM BBF		Rad 03-0078 in Rad Capture
10/31/03	10/31/08	03-074	I-129	681-78-4	1.059 uCi	1-1-2000	1 mL	100 mL	N/A	1.57 E+07	10.54 nCi/mL	0.1M NaOH	BH	BBF	
10/31/03	10/31/04	03-075	I-129	03-074	10.54 nCi/mL	1-1-2000	1 mL	100 mL	N/A	1.57E7	105.4 pCi/mL	0.1M NaOH	BH	BBF	
10/31/03	10/31/04	03-076	Ra 228	01012	1,018 dpm/mL	2/16/01	2 mL	100 mL	NA	5.75 y	20.36 dpm/mL	0.5M HNO_3	BH	BBF	
10/31/03	10/31/04	03-081	Pu-242	92-242-5-1	129.63 Bq/g	12/11/89	5.0723	100 mL	NA	3.73 X 10^5 y	78.9027	.5M HNO_3	MFM	MO	
11/3/03	11/3/04	SR19	Std SR carrier	$Sr(NO_3)_2$	N/A	N/A	120.77 g	1 Liter	N/A	N/A		ditto	[illegible]	BBF	Reported in Rad capture
11-5-03	11-5-04	RAD03-0032	Th-229	02-006	2134.75 dpm/mL	1-28-02	17.5 mL	500 mL	N/A	7.3 e+3	74.716 dpm/mL	.5M HNO_3	MFM	JMW	

Additional Comments:

L# F7G050108

TestAmerica STL

Blue 2007

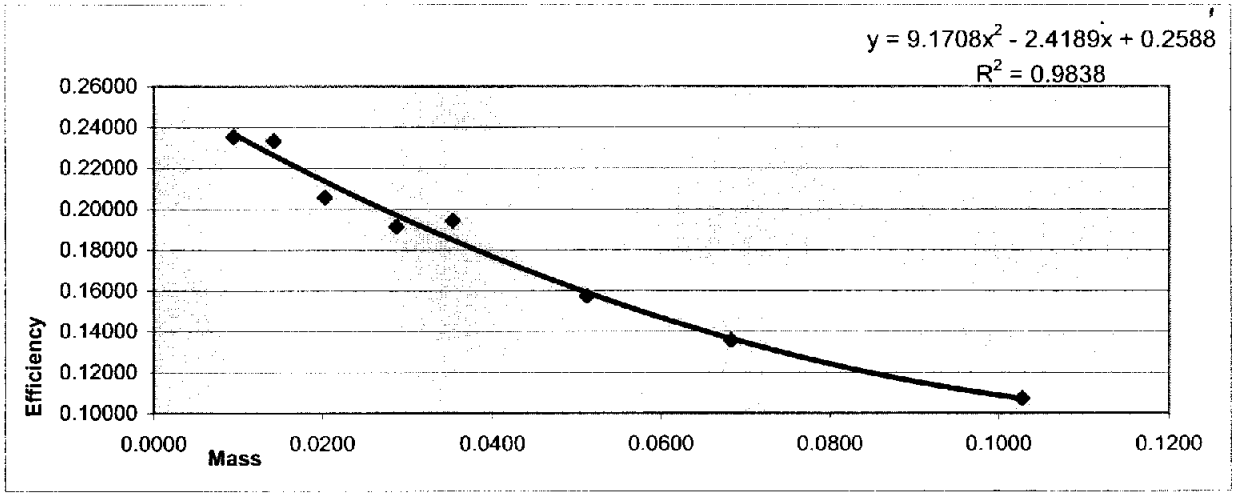
Th-230 $BaSO_4$ Calibration for Ra-226

TestAmerica STL

Detector Efficiency Curves

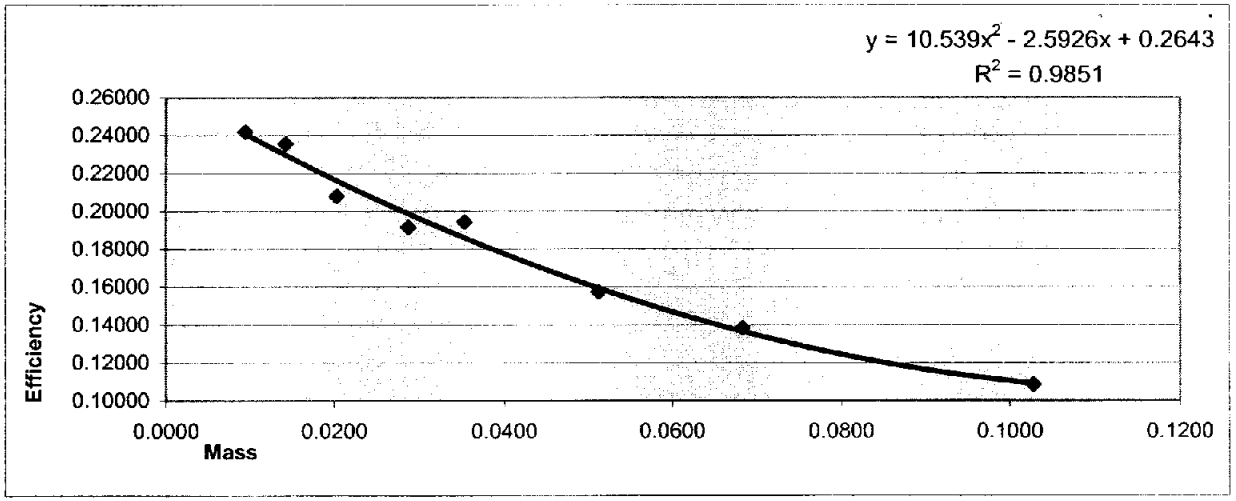
Alpha Th-230 Attenuation Blue A1 3/27/2007

Detector ID	Sample Wt	Count Time	Alpha Counts	DPM 4567.9 CPM	Th230 Eff
A1	0.0094	40.00	43035	1075.875	0.23553
A1	0.0142	40.00	42649	1066.225	0.23342
A1	0.0203	40.00	37607	940.175	0.20582
A1	0.0287	40.00	34973	874.325	0.19141
A1	0.0353	40.00	35530	888.250	0.19445
A1	0.0512	40.00	28745	718.625	0.15732
A1	0.0683	40.00	24793	619.825	0.13569
A1	0.1028	40.00	19597	489.925	0.10725



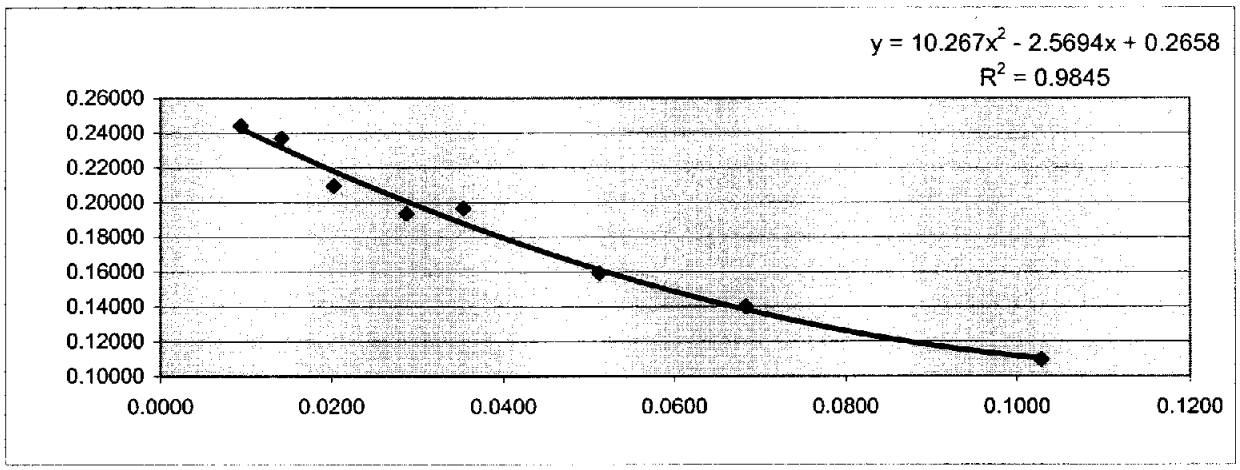
Alpha Th-230 Attenuation Blue A2 3/27/2007

Detector ID	Sample Wt	Count Time	Alpha Counts	DPM 4567.9 CPM	Th230 Eff
A2	0.0094	40.00	44212	1105.300	0.24197
A2	0.0142	40.00	43055	1076.375	0.23564
A2	0.0203	40.00	38022	950.550	0.20809
A2	0.0287	40.00	35015	875.375	0.19164
A2	0.0353	40.00	35512	887.800	0.19436
A2	0.0512	40.00	28751	718.775	0.15735
A2	0.0683	40.00	25269	631.725	0.13830
A2	0.1028	40.00	19833	495.825	0.10855



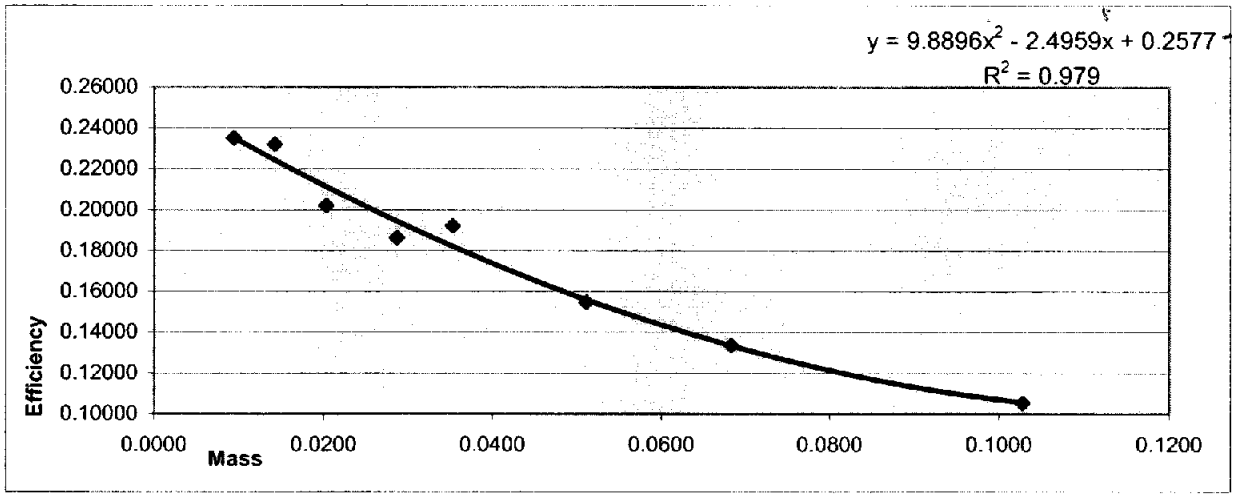
Alpha Th-230 Attenuation Blue A4 3/27/2007

Detector ID	Sample Wt	Count Time	Alpha Counts	DPM 4567.9 CPM	Th230 Eff
A4	0.0094	40.00	44612	1115.300	0.24416
A4	0.0142	40.00	43303	1082.575	0.23700
A4	0.0203	40.00	38269	956.725	0.20945
A4	0.0287	40.00	35351	883.775	0.19348
A4	0.0353	40.00	35927	898.175	0.19663
A4	0.0512	40.00	29122	728.050	0.15938
A4	0.0683	40.00	25580	639.500	0.14000
A4	0.1028	40.00	20008	500.200	0.10950



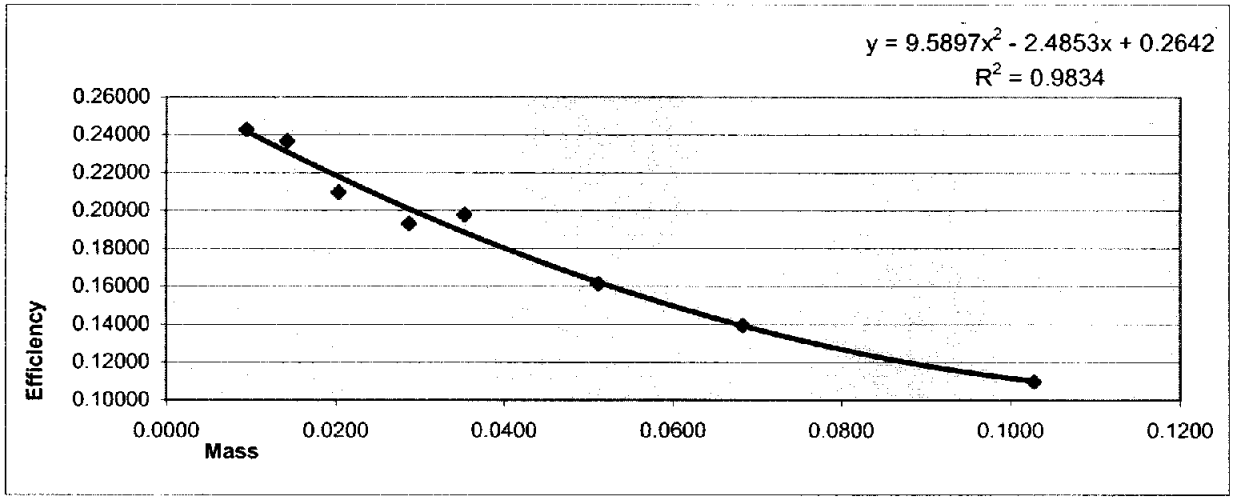
Alpha Th-230 Attenuation Blue B1 3/27/2007

Detector ID	Sample Wt	Count Time	Alpha Counts	DPM 4567.9 CPM	Th230 Eff
A1	0.0094	40.00	42961	1074.025	0.23512
A1	0.0142	40.00	42418	1060.450	0.23215
A1	0.0203	40.00	36930	923.250	0.20212
A1	0.0287	40.00	34040	851.000	0.18630
A1	0.0353	40.00	35092	877.300	0.19206
A1	0.0512	40.00	28307	707.675	0.15492
A1	0.0683	40.00	24427	610.675	0.13369
A1	0.1028	40.00	19262	481.550	0.10542



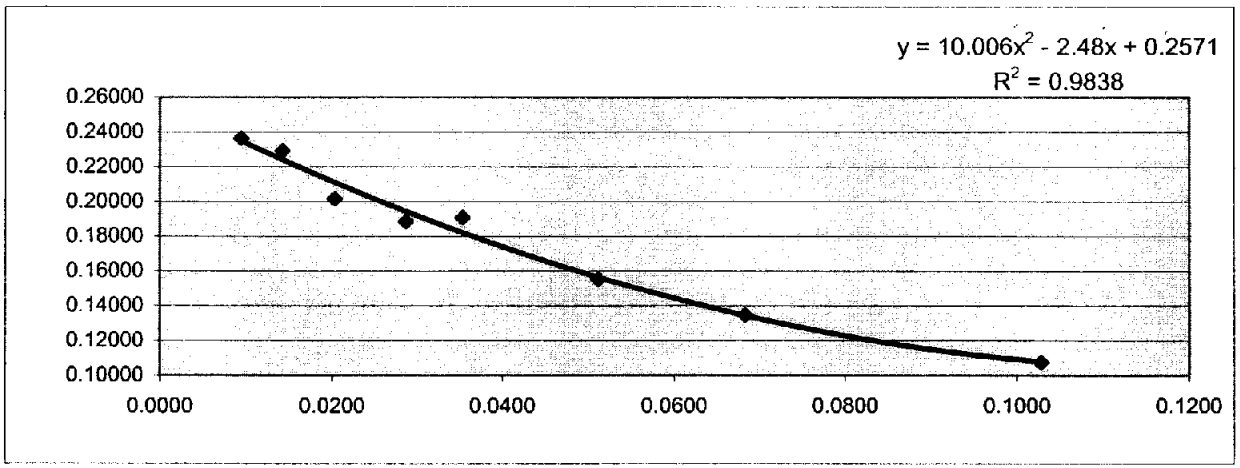
Alpha Th-230 Attenuation Blue B2 3/27/2007

Detector ID	Sample Wt	Count Time	Alpha Counts	DPM 4567.9 CPM	Th230 Eff
A2	0.0094	40.00	44349	1108.725	0.24272
A2	0.0142	40.00	43265	1081.625	0.23679
A2	0.0203	40.00	38302	957.550	0.20963
A2	0.0287	40.00	35289	882.225	0.19314
A2	0.0353	40.00	36162	904.050	0.19791
A2	0.0512	40.00	29512	737.800	0.16152
A2	0.0683	40.00	25476	636.900	0.13943
A2	0.1028	40.00	20063	501.575	0.10980



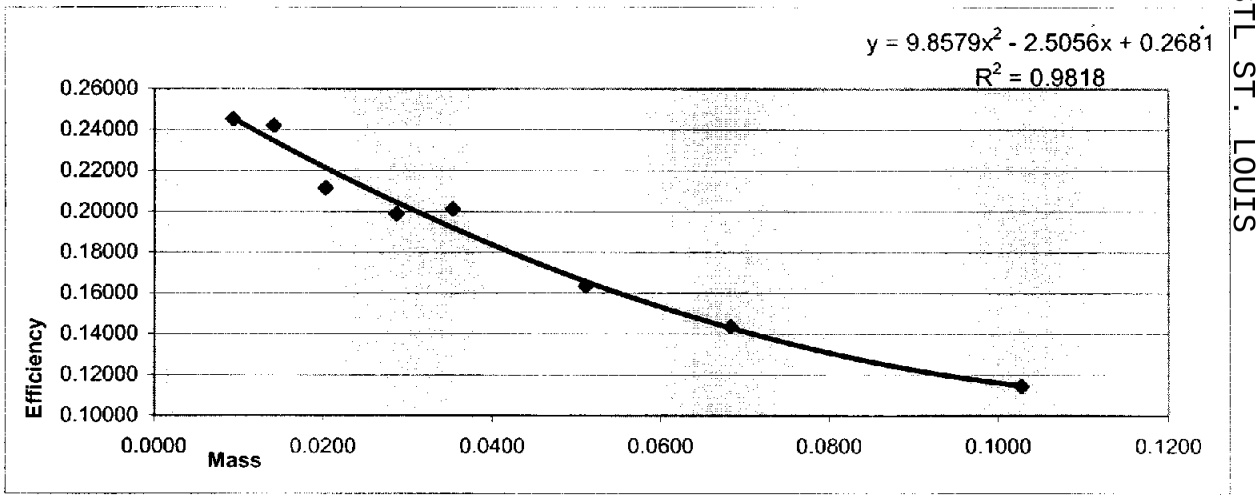
Alpha Th-230 Attenuation Blue B4 3/27/2007

Detector ID	Sample Wt	Count Time	Alpha Counts	DPM 4567.9 CPM	Th230 Eff
A4	0.0094	40.00	43184	1079.600	0.23634
A4	0.0142	40.00	41865	1046.625	0.22913
A4	0.0203	40.00	36826	920.650	0.20155
A4	0.0287	40.00	34436	860.900	0.18847
A4	0.0353	40.00	34868	871.700	0.19083
A4	0.0512	40.00	28384	709.600	0.15534
A4	0.0683	40.00	24627	615.675	0.13478
A4	0.1028	40.00	19653	491.325	0.10756



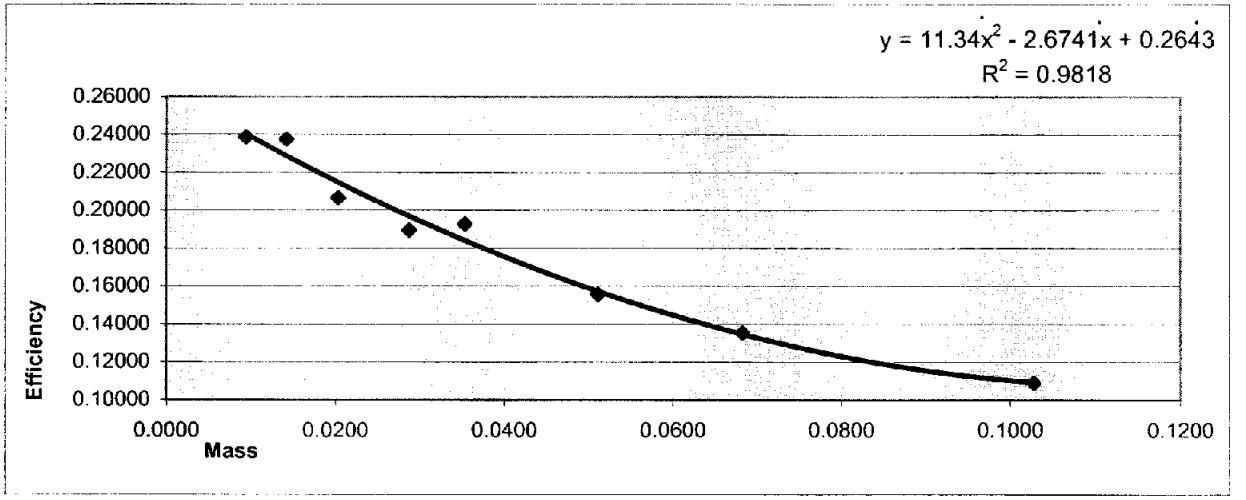
Alpha Th-230 Attenuation Blue C2 3/27/2007

Detector ID	Sample Wt	Count Time	Alpha Counts	DPM 4567.9 CPM	Th230 Eff
A1	0.0094	40.00	44803	1120.075	0.24521
A1	0.0142	40.00	44241	1106.025	0.24213
A1	0.0203	40.00	38671	966.775	0.21165
A1	0.0287	40.00	36343	908.575	0.19890
A1	0.0353	40.00	36775	919.375	0.20127
A1	0.0512	40.00	29871	746.775	0.16348
A1	0.0683	40.00	26263	656.575	0.14374
A1	0.1028	40.00	20913	522.825	0.11446



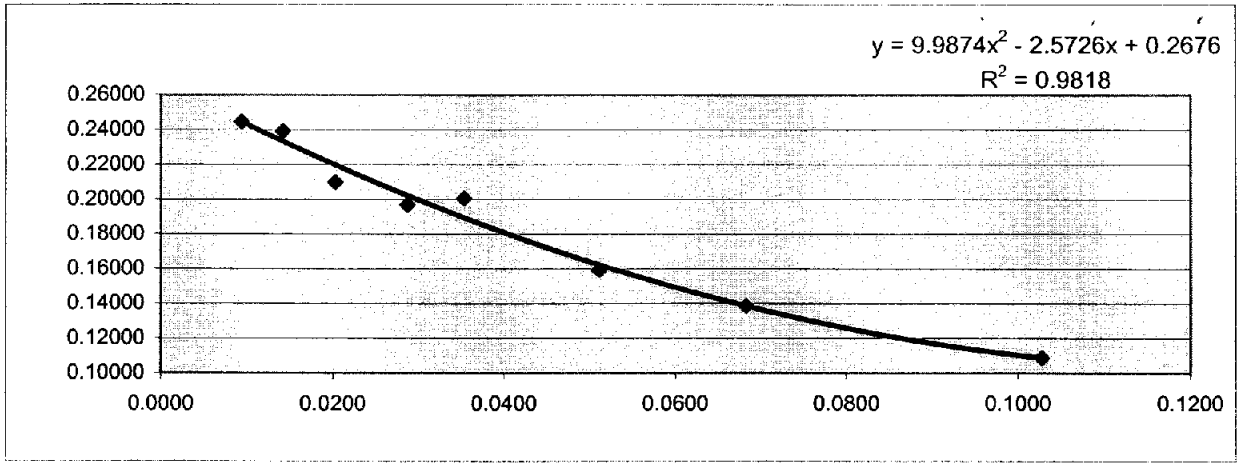
Alpha Th-230 Attenuation Blue C3 3/27/2007

Detector ID	Sample Wt	Count Time	Alpha Counts	DPM 4567.9 CPM	Th230 Eff
A2	0.0094	40.00	43626	1090.650	0.23876
A2	0.0142	40.00	43402	1085.050	0.23754
A2	0.0203	40.00	37766	944.150	0.20669
A2	0.0287	40.00	34635	865.875	0.18956
A2	0.0353	40.00	35220	880.500	0.19276
A2	0.0512	40.00	28443	711.075	0.15567
A2	0.0683	40.00	24744	618.600	0.13542
A2	0.1028	40.00	19900	497.500	0.10891



Alpha Th-230 Attenuation Blue C4 3/27/2007

Detector ID	Sample Wt	Count Time	Alpha Counts	DPM 4567.9 CPM	Th230 Eff
A4	0.0094	40.00	44697	1117.425	0.24463
A4	0.0142	40.00	43730	1093.250	0.23933
A4	0.0203	40.00	38344	958.600	0.20986
A4	0.0287	40.00	35947	898.675	0.19674
A4	0.0353	40.00	36629	915.725	0.20047
A4	0.0512	40.00	29110	727.750	0.15932
A4	0.0683	40.00	25315	632.875	0.13855
A4	0.1028	40.00	19870	496.750	0.10875



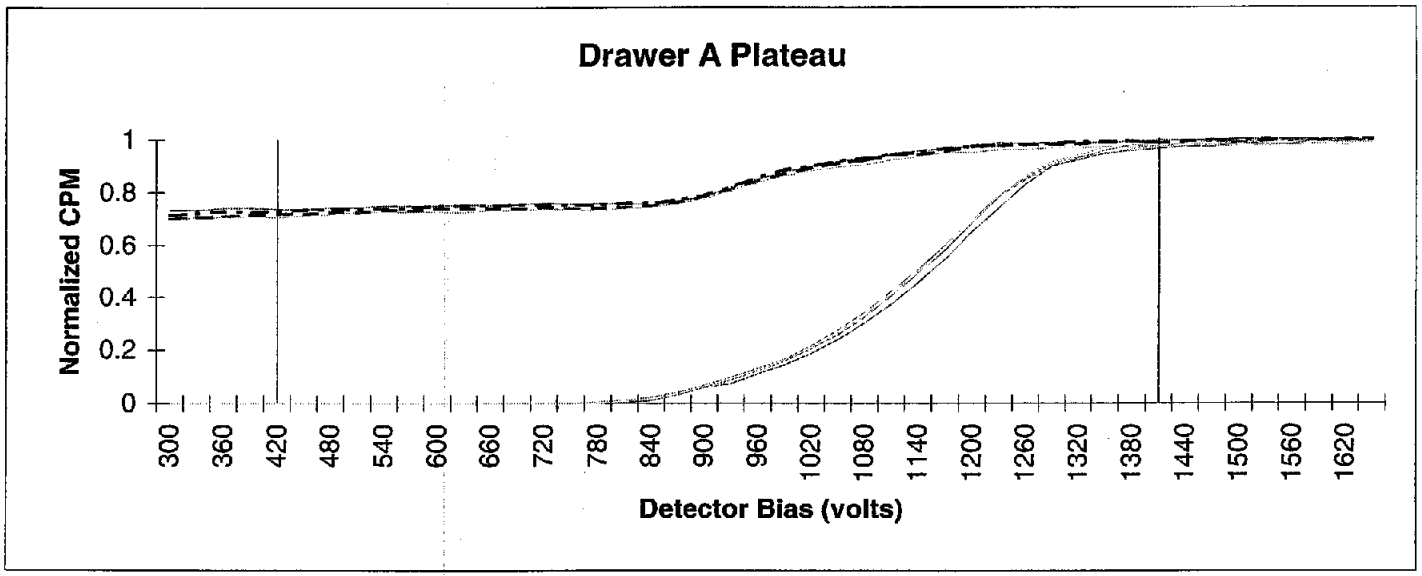
TestAmerica STL

Blue 2007

Voltage Plateaus and Discriminator Settings

Unit Type: LB4100/W
Date Performed: 3/1/07 09:48
FileName: PLAT000
Batch ID:

Unit Id: Blue
Application Revision: 2
Application Version: Standard



Optimum alpha beta simultaneous operating voltage: 1410

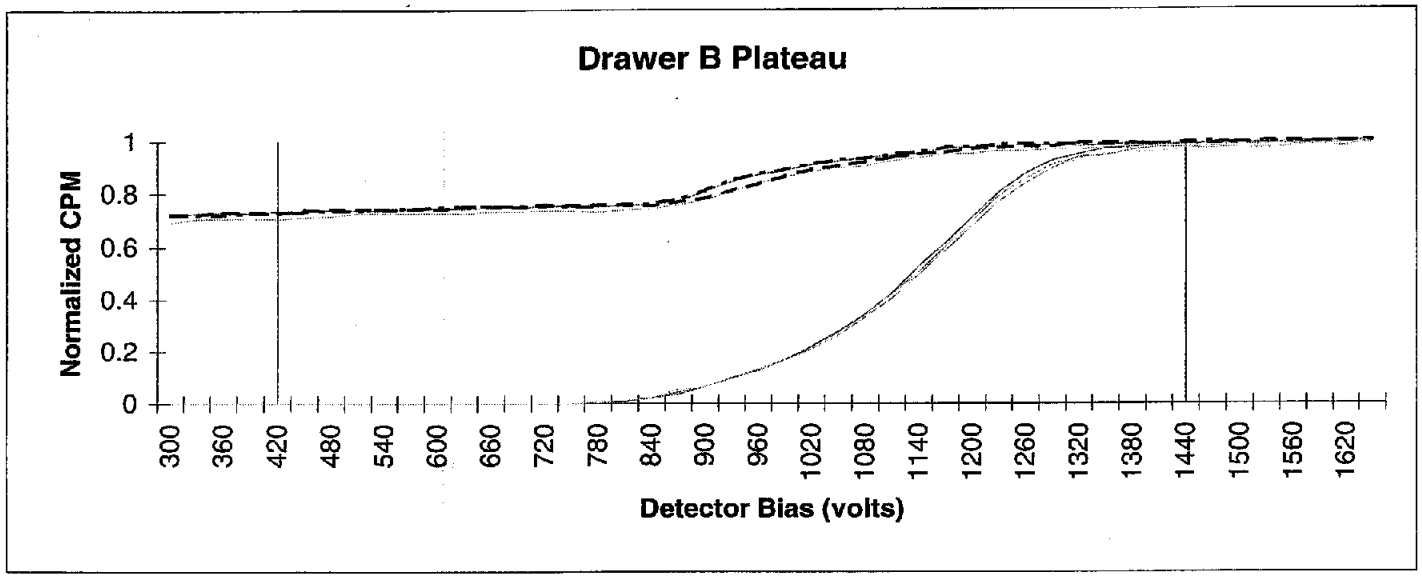
Optimum alpha only operating voltage: 420

	A1	A2	A3	A4
Beta slope at beta voltage	2.23%	1.59%	---	1.80%
Alpha slope at beta voltage	0.85%	0.35%	---	0.02%
Alpha slope at alpha voltage	-0.06%	1.61%	---	1.00%

Printed 3/1/2007 2:39 PM

Unit Type: LB4100/W
Date Performed: 3/1/07 09:48
FileName: PLAT000
Batch ID:

Unit Id: Blue
Application Revision: 2
Application Version: Standard



Optimum alpha beta simultaneous operating voltage: 1440

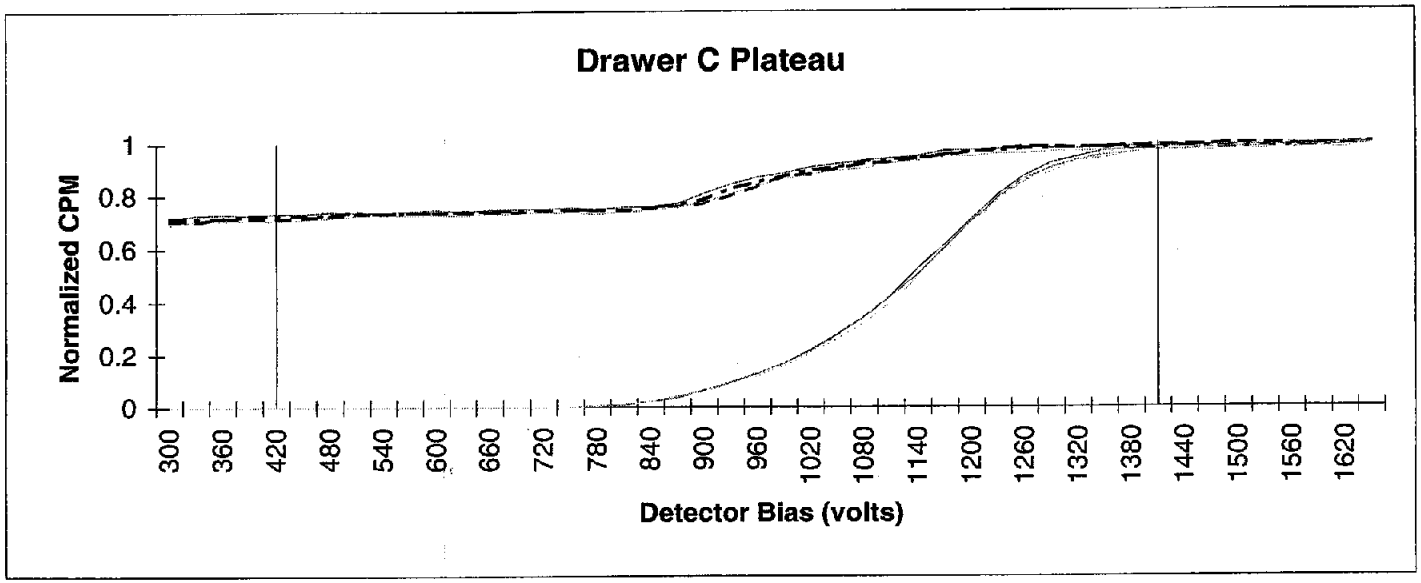
Optimum alpha only operating voltage: 420

	B1	B2	B3	B4
Beta slope at beta voltage	1.12%	2.08%	---	1.74%
Alpha slope at beta voltage	0.47%	0.12%	---	0.37%
Alpha slope at alpha voltage	1.06%	1.37%	---	1.63%

Printed 3/1/2007 2:39 PM

Unit Type: LB4100/W
Date Performed: 3/1/07 09:48
FileName: PLAT000
Batch ID:

Unit Id: Blue
Application Revision: 2
Application Version: Standard

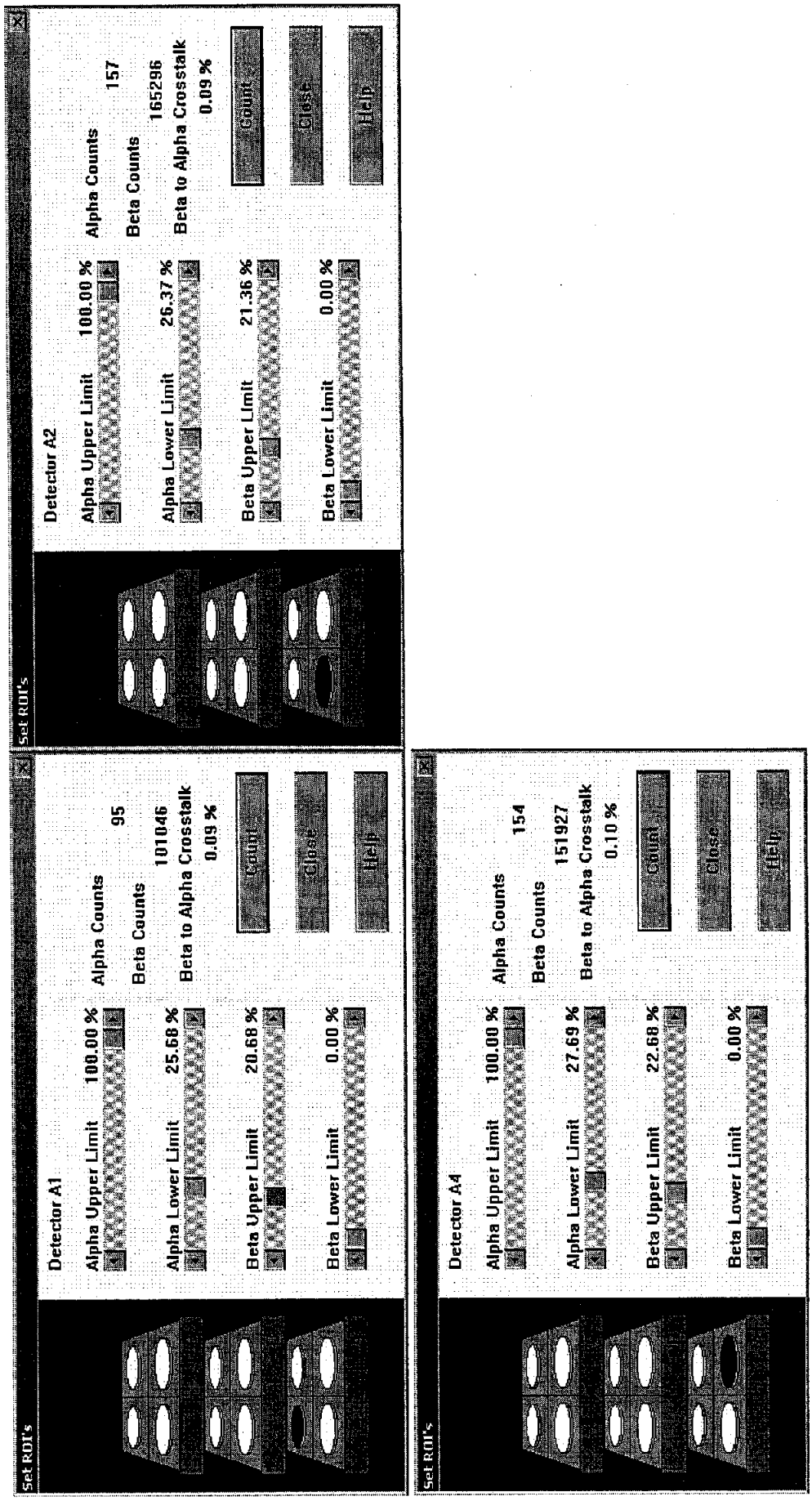


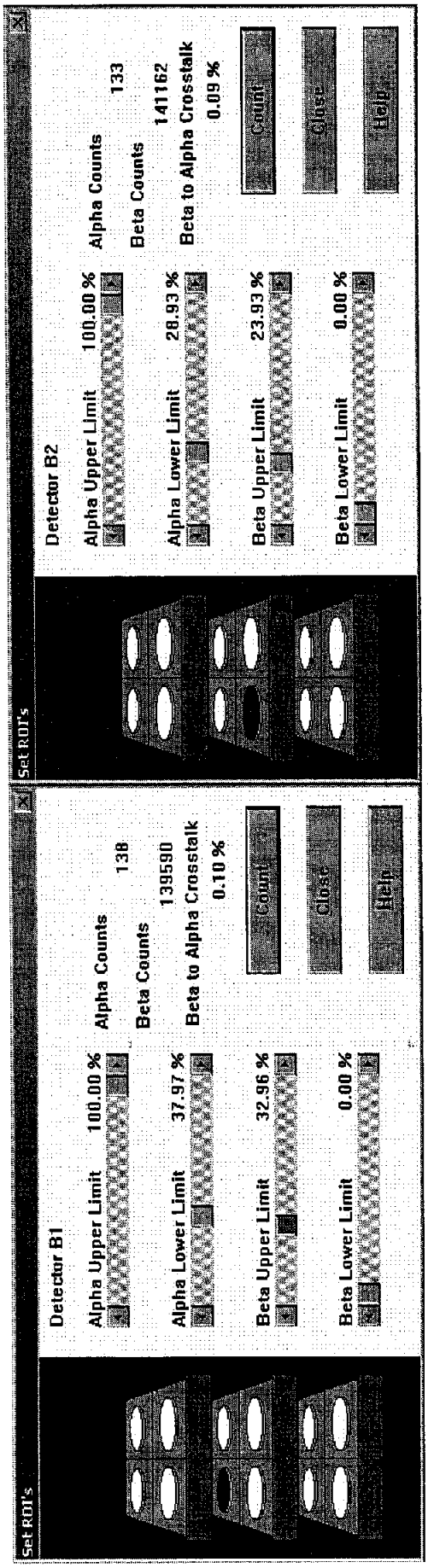
Optimum alpha beta simultaneous operating voltage: 1410

Optimum alpha only operating voltage: 420

	C1	C2	C3	C4
Beta slope at beta voltage	---	2.46%	2.85%	1.60%
Alpha slope at beta voltage	---	0.50%	-0.11%	-0.03%
Alpha slope at alpha voltage	---	0.78%	0.95%	1.26%

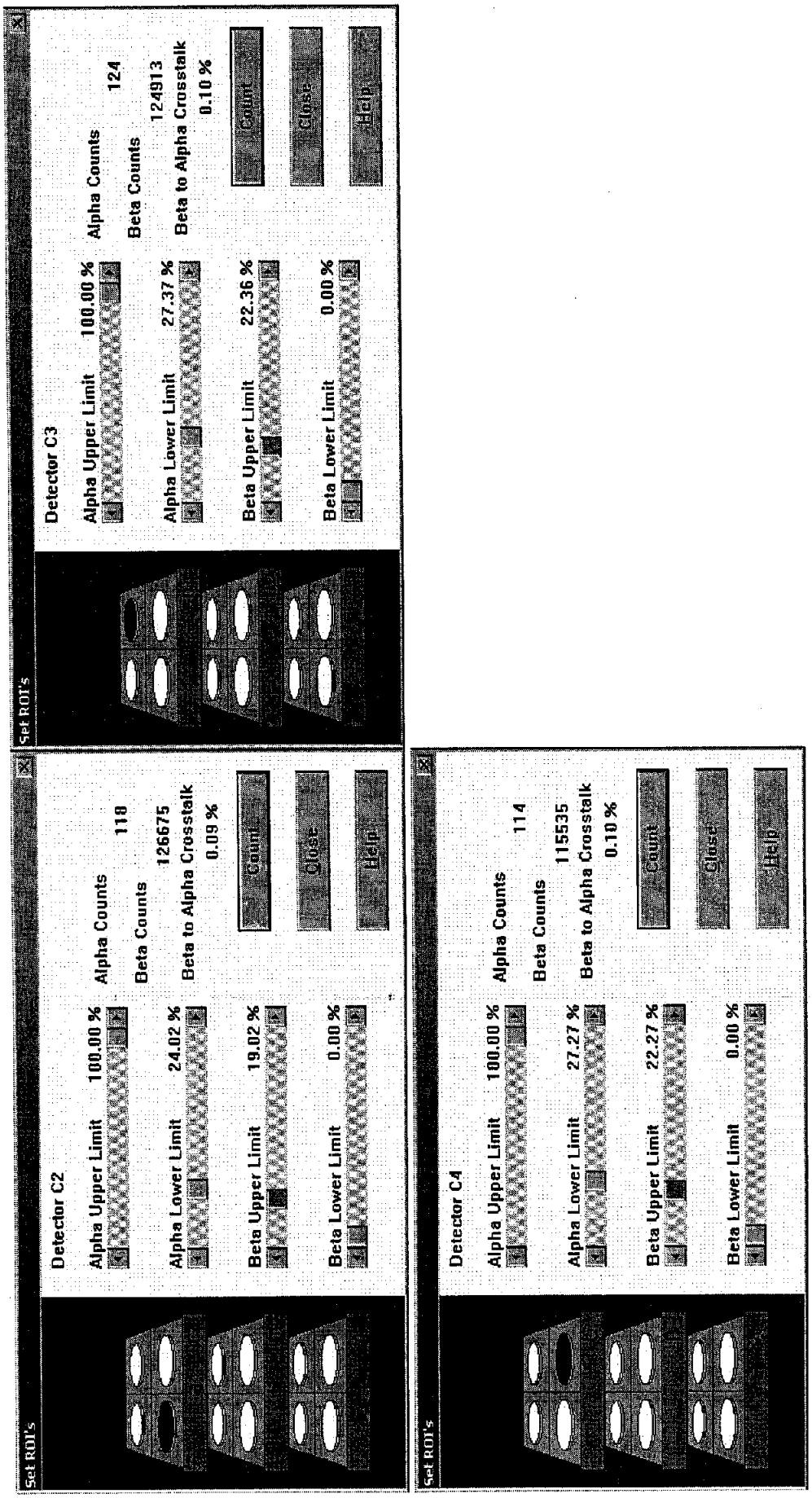
Printed 3/1/2007 2:39 PM


Set ROI's
Detector A1
Alpha Upper Limit 100.00 %
Alpha Counts 95
Alpha Lower Limit 25.68 %
Beta Counts 101046
Beta Upper Limit 20.68 %
Beta to Alpha Crosstalk 0.09 %
Beta Lower Limit 0.00 %
Count
Close
Help
Set ROI's
Detector A2
Alpha Upper Limit 100.00 %
Alpha Counts 157
Alpha Lower Limit 26.37 %
Beta Counts 165296
Beta Upper Limit 21.36 %
Beta to Alpha Crosstalk 0.09 %
Beta Lower Limit 0.00 %
Count
Close
Help
Set ROI's
Detector A4
Alpha Upper Limit 100.00 %
Alpha Counts 154
Alpha Lower Limit 27.69 %
Beta Counts 151927
Beta Upper Limit 22.68 %
Beta to Alpha Crosstalk 0.10 %
Beta Lower Limit 0.00 %
Count
Close
Help


Set ROI's
Detector B1
Alpha Upper Limit 100.00 %
Alpha Counts 138
Beta Counts 139590
Alpha Lower Limit 37.97 %
Beta to Alpha Crosstalk 0.10 %
Beta Upper Limit 32.96 %
Beta Lower Limit 0.00 %
Count
Close
Help

Set ROI's
Detector B2
Alpha Upper Limit 100.00 %
Alpha Counts 133
Beta Counts 141162
Alpha Lower Limit 28.93 %
Beta to Alpha Crosstalk 0.09 %
Beta Upper Limit 23.93 %
Beta Lower Limit 0.00 %
Count
Close
Help

Set ROI's
Detector B4
Alpha Upper Limit 100.00 %
Alpha Counts 140
Beta Counts 138808
Alpha Lower Limit 34.40 %
Beta to Alpha Crosstalk 0.10 %
Beta Upper Limit 29.40 %
Beta Lower Limit 0.00 %
Count
Close
Help


Set ROI's
Detector C2
Alpha Upper Limit 100.00 %
Alpha Counts 118
Alpha Lower Limit 24.02 %
Beta Counts 126675
Beta to Alpha Crosstalk 0.09 %
Beta Upper Limit 19.02 %
Count
Close
Beta Lower Limit 0.00 %
Help
Set ROI's
Detector C3
Alpha Upper Limit 100.00 %
Alpha Counts 124
Alpha Lower Limit 27.37 %
Beta Counts 124913
Beta to Alpha Crosstalk 0.10 %
Beta Upper Limit 22.36 %
Count
Close
Beta Lower Limit 0.00 %
Help
Set ROI's
Detector C4
Alpha Upper Limit 100.00 %
Alpha Counts 114
Alpha Lower Limit 27.27 %
Beta Counts 115535
Beta to Alpha Crosstalk 0.10 %
Beta Upper Limit 22.27 %
Count
Close
Beta Lower Limit 0.00 %
Help

TestAmerica STL

Calibration Standard Data

Alpha Calibration Standards for Ra-226

Standard used: 1mL of Th-230 03-071 4567.9 dpm/mL 12/24/03

Std #	mL Ba Carrier	Gross wt	Tare Wt	Mass BaSO4
1	0.25	8.4779	8.4682	0.0097
2	0.4	8.3925	8.3784	0.0141
3	0.6	8.4768	8.4557	0.0211
4	0.8	8.4605	8.4313	0.0292
5	1	8.4726	8.4372	0.0354
6	1.5	8.4687	8.4173	0.0514
7	2	8.5100	8.4419	0.0681
8	3	8.5684	8.4653	0.1031

ANALYTICS

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

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

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

65090-334

Th-230 5 mL Liquid in Flame Sealed Vial

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

Radionuclide purity and calibration were checked by germanium gamma-ray spectrometry and liquid scintillation counting. The nuclear decay rate and assay date for this source are given below.

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:	Th-230
ACTIVITY (dps):	7.654 E3
HALF-LIFE:	7.538 E4 Years
CALIBRATION DATE:	December 19, 2002 12:00 EST
TOTAL UNCERTAINTY*:	3.5%
SYSTEMATIC:	2.6%
RANDOM:	0.9%

*99% Confidence Level

Impurities: γ-impurities <0.1%, α-impurities <0.05%

5.17738 grams 0.5M HNO_3 solution.

P O NUMBER 1614557-000 OP, Item 3

SOURCE PREPARED BY: M. Taskaeva
M. Taskaeva, Radiochemist

Q A APPROVED: 12-19-02

SEVERN TRENT SERVICES

Logbook: 2060

Radiochemistry
Standards Preparation Logbook

Date Prep'd	Expir. Date	Standard ID Number	Isotope	Parent ID Number	Parent Activity	Parent Ref. Date	Aliquot	Dilution Volume	Change in Time	T ½	Final Activity	Solvent/ Lot #	Prep'd Initials	Cal. Ver. Initials	Comments
~~9-11-03~~	~~9-11-07~~	~~03-069~~ ~~03-069a~~ MC 9-22 03	~~Pa 238~~	02-026	132.98	2-23-02	25ml	↓	1556 hrs	32022.4 d, 75	66.201 MC 9-15-03 ~~33102.2 dpm/ml~~ ~~66.491 dpm/mL~~		MFM		re-certification of 03-031 and 03-069
~~↓~~	~~↓~~	~~↓~~	~~Pa 234~~	~~02-025~~	~~128.05~~	~~2-23-02~~	~~25ml~~	~~150ml~~	11-18-03 MC	24110 y	62.025 dpm/g ~~32766 dpm/g~~ ~~65.525 dpm/ml~~		MFM		62.025 dpm/ml
9-11-03	9-11-08	03-070 ~~03-070~~ MC 9-22-03	Am243	98-011	1161 dpm/g	2-28-98	15 ~~16 gm~~	200ml		7.37 E+3	87.075 ~~92.88 dpm/ml~~		MFM		
10-6-03	10-6-08	03-071	Th230	65090-334	7,654 dps	12-19-02	5.1498g	100mL	N/A	7.538E4	4,567.9 dpm/mL	0.5M HNO3	BH	BBF	
10-6-03	10-6-08	03-072	Th230	03-071	4,567.9 dpm/mL	12-19-02	1mL	200mL	N/A	7.538E4	22.84 dpm/mL	0.5M HNO3	BH	BBF	
10-11-03	10-11-0	03-073	Clean U-232	047-105	10944 dpm/ml	9-16-97	10ml	1000L		70 y	103.85 dpm/mL	DI H2O 2M H2SO4 KOH pH 1.5	MFM BBF		Rad 03-0078 in Rad Capture
10/31/03	10/31/08	03-074	I-129	681-78-4	1.059uCi	1-1-2000	1mL	100mL	N/A	1.57E+07	10.54 nCi/mL	0.1M NaOH	BH	BBF	
10/31/03	10/31/04	03-075	I-129	03-074	10.54 nCi/mL	1-1-2000	1mL	100mL	N/A	1.57E7	105.4 pCi/mL	0.1M NaOH	BH	BBF	
10/31/03	10/31/04	03-076	Ra 228	01012	1,018 dpm/mL	2/16/01	2mL	100mL	NA	5.75y	20.36 dpm/mL	0.5M HNO3	BH	BBF	
10/31/03	10/31/04	03-081	Pu-242	92-242-5-1	129.63 Bq/g	12/18/89	5.0723	500mL	NA	3.73 X 10^5	78.9027	.5M HNO3	MFM	MO	
11/3/03	11/3/04	SR19	Std SR carrier	(Sr(NO3)2)	N/A	N/A	120.77g	1 Liter	N/A	N/A		dilH2O	[illegible]	BBF	Reported in Rad capture
11-5-03	11-5-04	RAD03-0032	Th-229	02-006	2134.75 dpm/mL	1-28-02	17.5mL	500mL	N/A	7.3e+3	74.716 dpm/mL	.5M HNO3	MFM	JMW	

Additional Comments:

LIMS # F7G050168

TestAmerica STL

Red 2007

Alpha and Beta Calibration

with

Crosstalk Correction

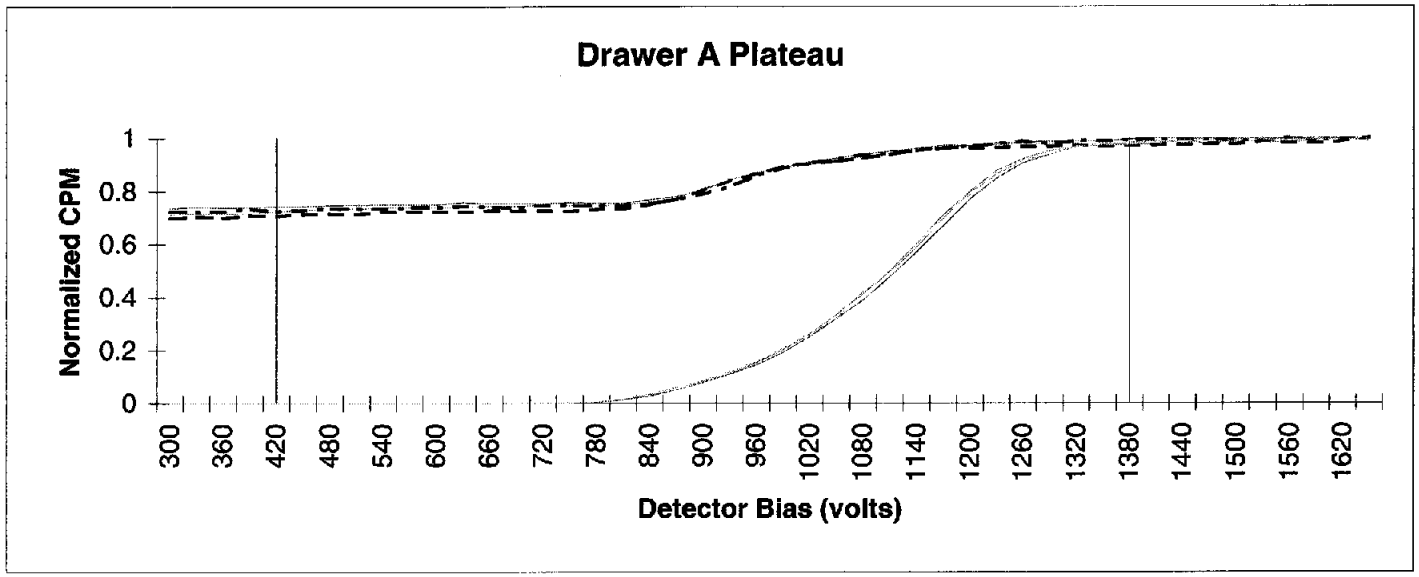
TestAmerica STL

Red 2007

Plateaus and Discriminator Settings

Unit Type: LB4100/W
Date Performed: 2/19/07 11:58
FileName: PLAT2007
Batch ID:

Unit Id: Red
Application Revision: 2
Application Version: Standard



Optimum alpha beta simultaneous operating voltage: 1380

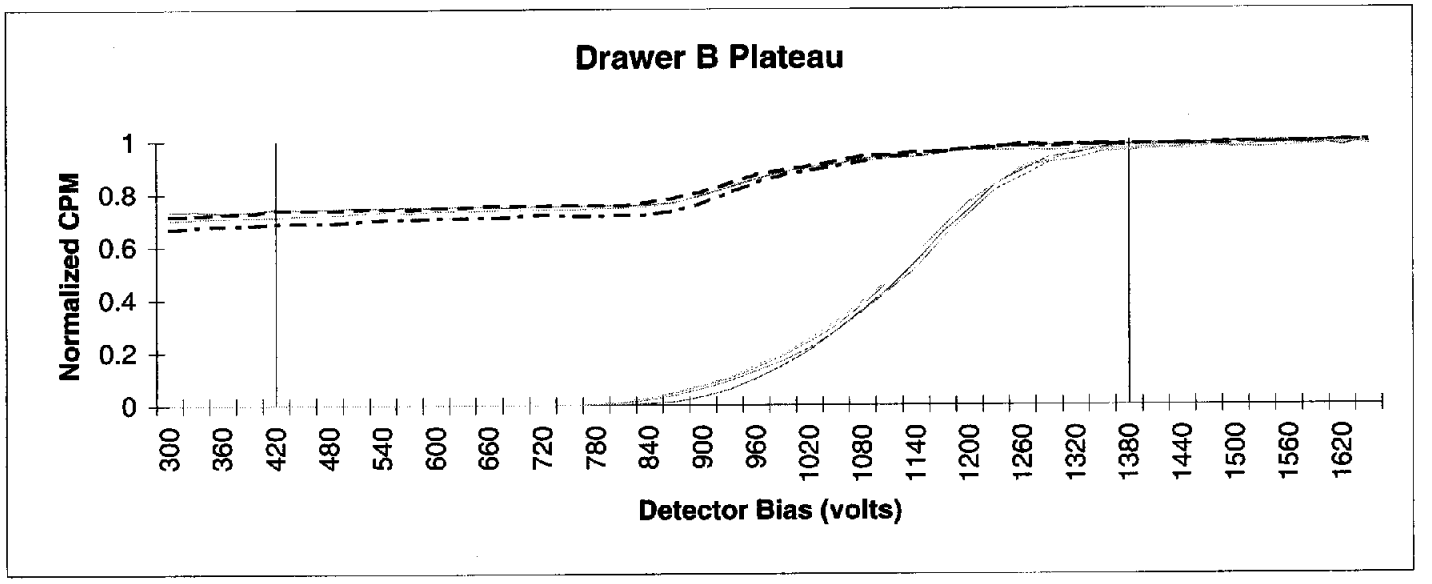
Optimum alpha only operating voltage: 420

	A1	A2	A3	A4
Beta slope at beta voltage	1.90%	2.05%	1.32%	2.19%
Alpha slope at beta voltage	1.02%	0.18%	0.62%	0.32%
Alpha slope at alpha voltage	1.08%	1.54%	2.61%	0.69%

Printed 2/19/2007 4:51 PM

Unit Type: LB4100/W
Date Performed: 2/19/07 11:58
FileName: PLAT2007
Batch ID:

Unit Id: Red
Application Revision: 2
Application Version: Standard



Optimum alpha beta simultaneous operating voltage: 1380

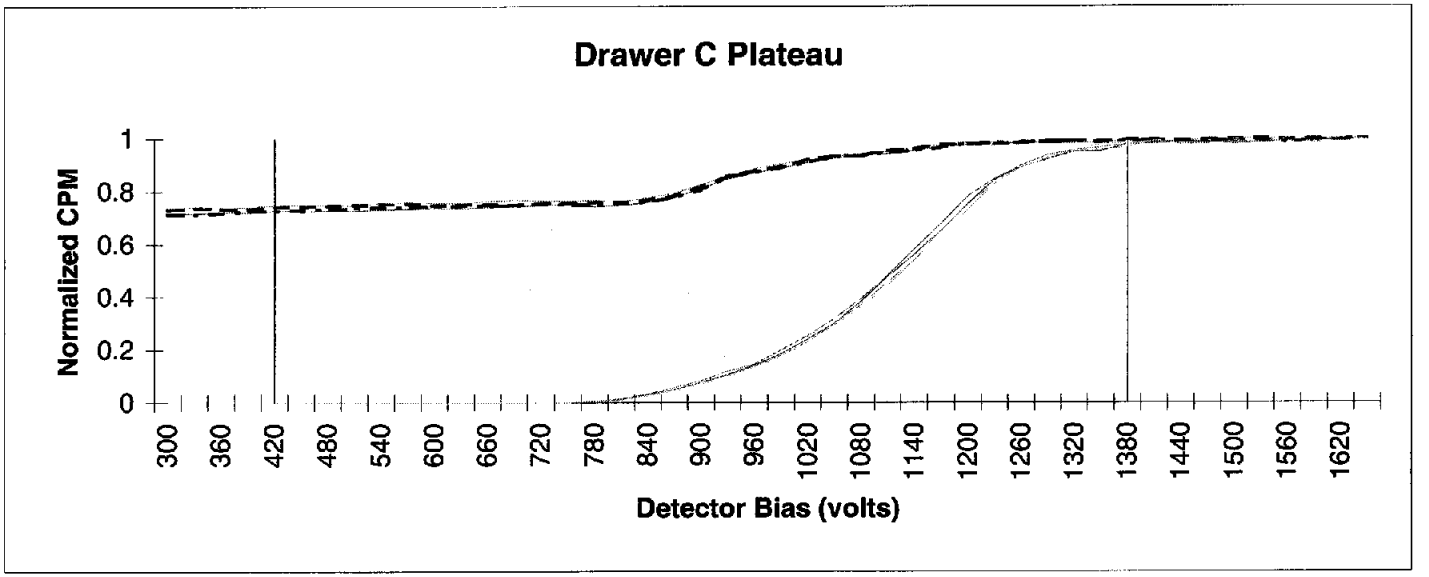
Optimum alpha only operating voltage: 420

	B1	B2	B3	B4
Beta slope at beta voltage	2.29%	3.38%	2.33%	1.55%
Alpha slope at beta voltage	0.81%	0.15%	0.14%	0.26%
Alpha slope at alpha voltage	1.69%	1.63%	1.39%	1.51%

Printed 2/19/2007 4:51 PM

Unit Type: LB4100/W
Date Performed: 2/19/07 11:58
FileName: PLAT2007
Batch ID:

Unit Id: Red
Application Revision: 2
Application Version: Standard



Optimum alpha beta simultaneous operating voltage: 1380

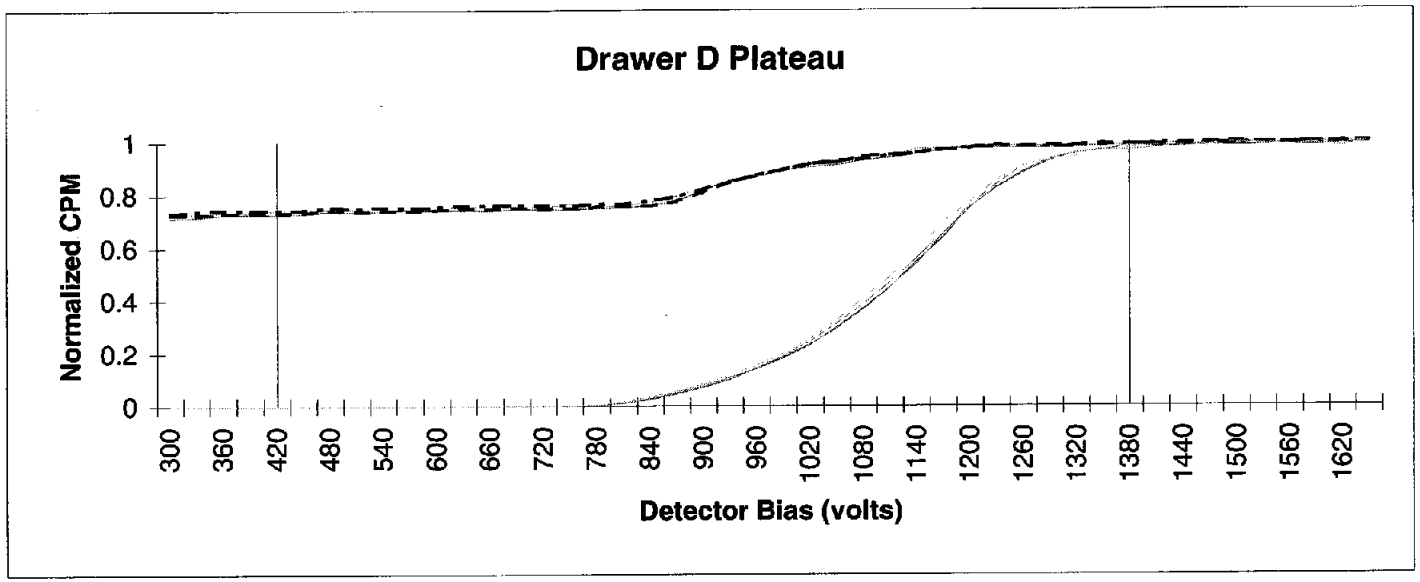
Optimum alpha only operating voltage: 420

	C1	C2	C3	C4
Beta slope at beta voltage	3.13%	2.21%	2.65%	2.67%
Alpha slope at beta voltage	0.40%	-0.09%	0.22%	0.31%
Alpha slope at alpha voltage	0.73%	1.23%	1.51%	1.34%

Printed 2/19/2007 4:51 PM

Unit Type: LB4100/W
Date Performed: 2/19/07 11:58
FileName: PLAT2007
Batch ID:

Unit Id: Red
Application Revision: 2
Application Version: Standard

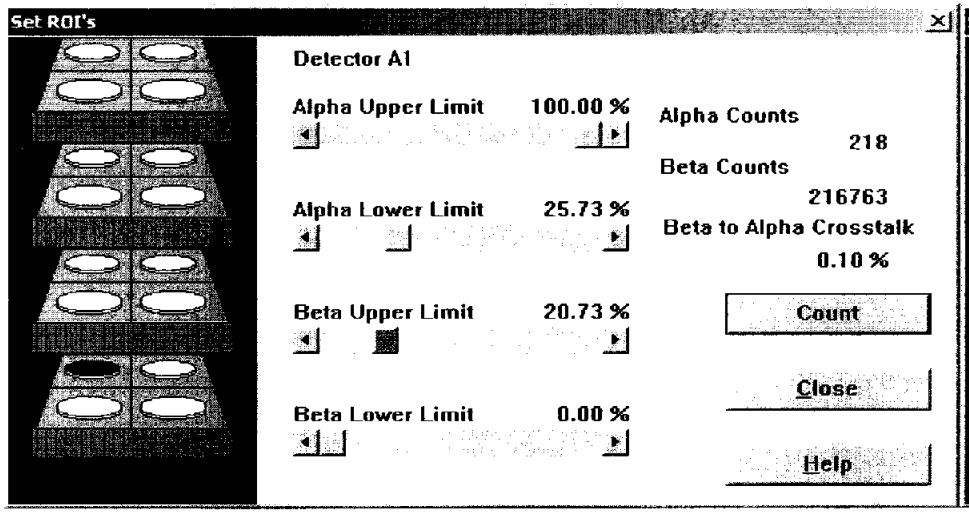


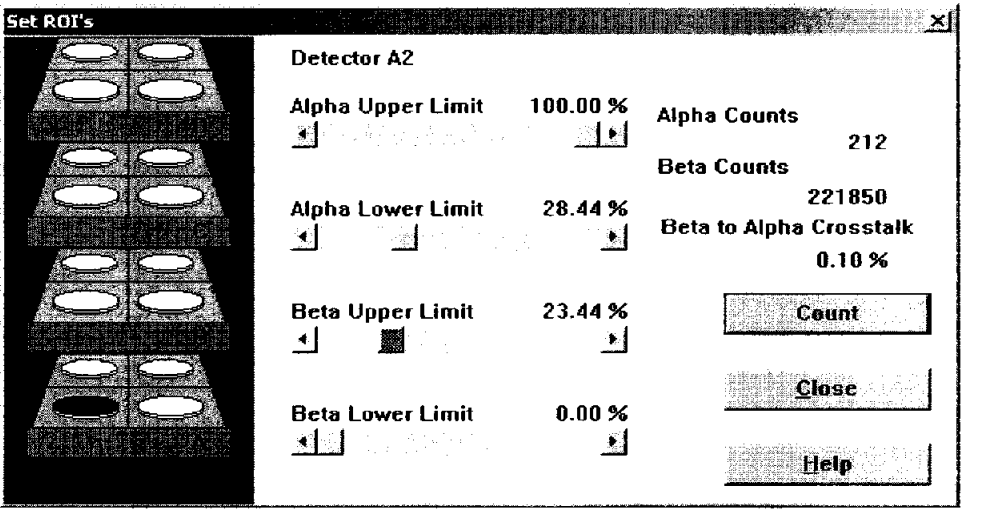
Optimum alpha beta simultaneous operating voltage: 1380

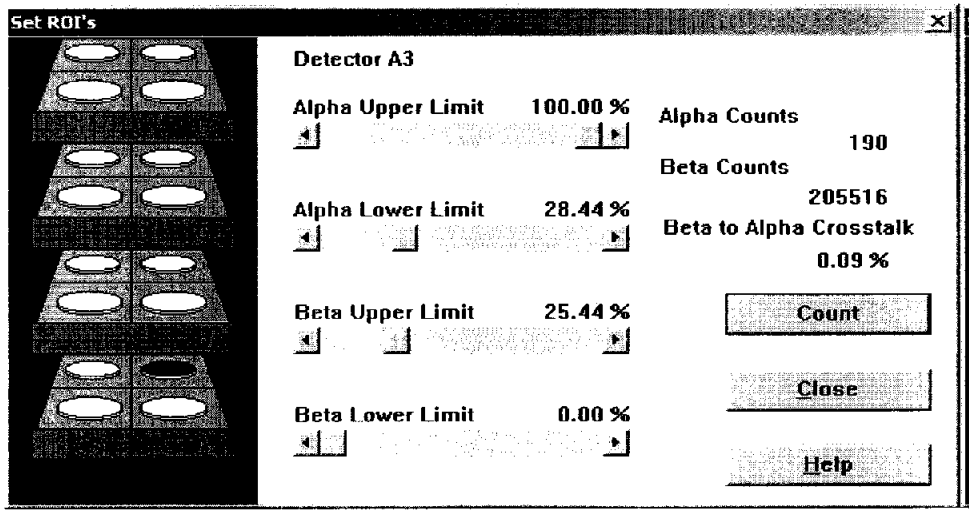
Optimum alpha only operating voltage: 420

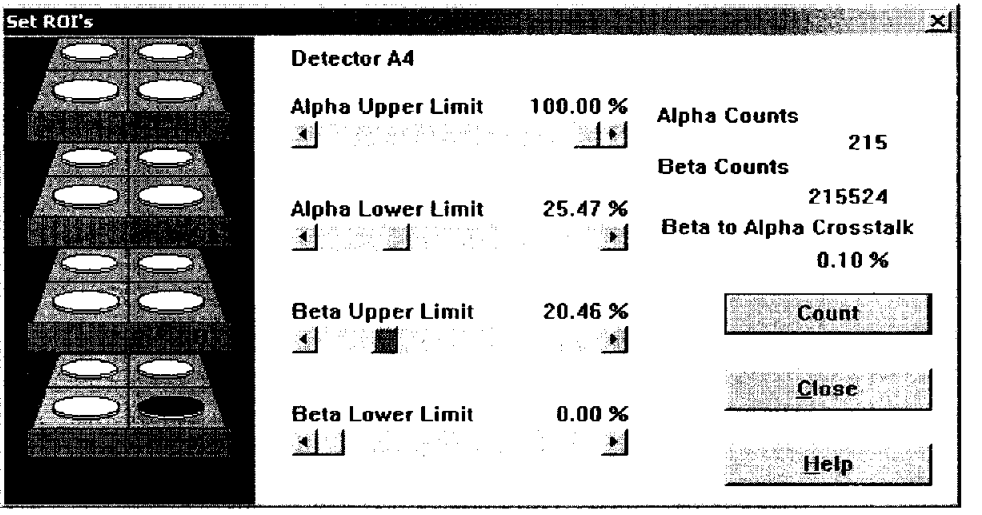
	D1	D2	D3	D4
Beta slope at beta voltage	1.81%	2.24%	2.13%	3.05%
Alpha slope at beta voltage	0.10%	0.43%	0.64%	0.58%
Alpha slope at alpha voltage	1.20%	1.08%	1.08%	1.08%

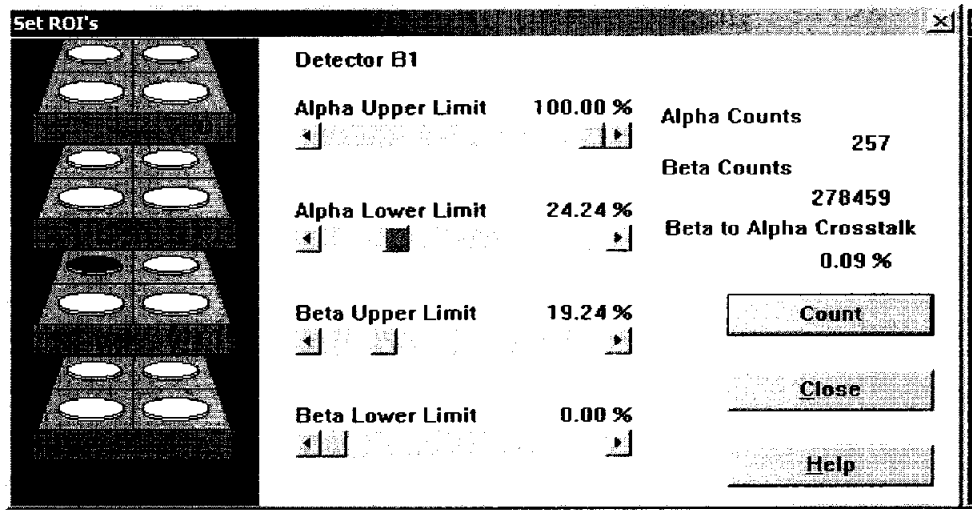
Printed 2/19/2007 4:51 PM

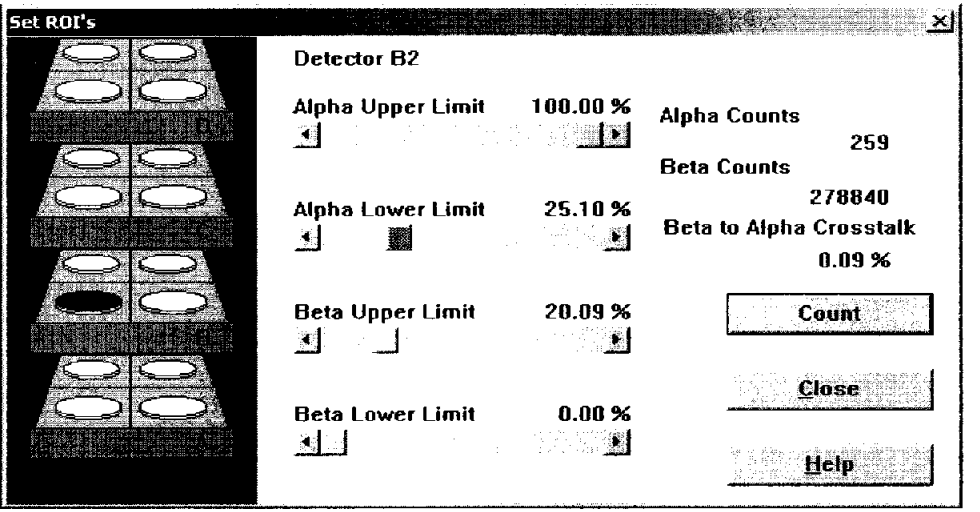

Set ROI's
Detector A1
Alpha Upper Limit 100.00 %
Alpha Lower Limit 25.73 %
Beta Upper Limit 20.73 %
Beta Lower Limit 0.00 %
Alpha Counts
218
Beta Counts
216763
Beta to Alpha Crosstalk
0.10 %
Count
Close
Help

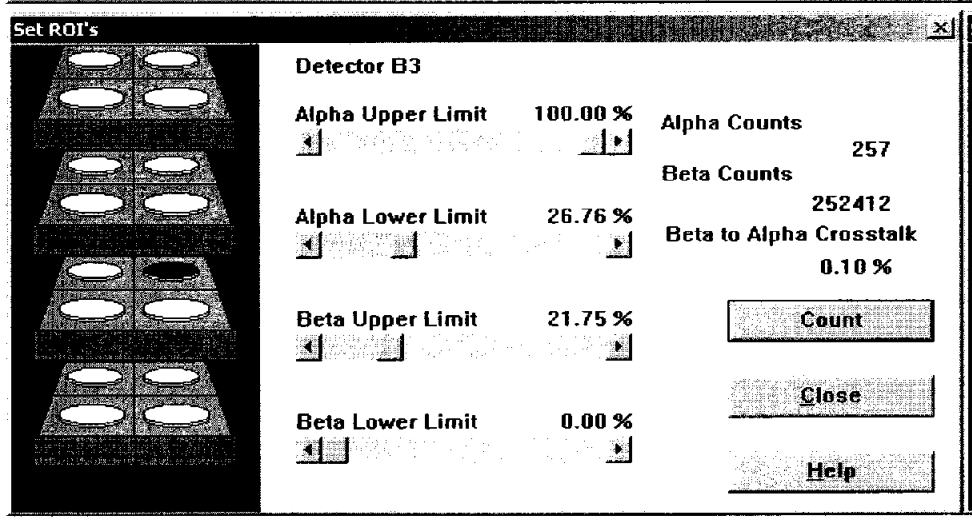

Set ROI's
Detector A2
Alpha Upper Limit 100.00 %
Alpha Lower Limit 28.44 %
Beta Upper Limit 23.44 %
Beta Lower Limit 0.00 %
Alpha Counts
212
Beta Counts
221850
Beta to Alpha Crosstalk
0.10 %
Count
Close
Help

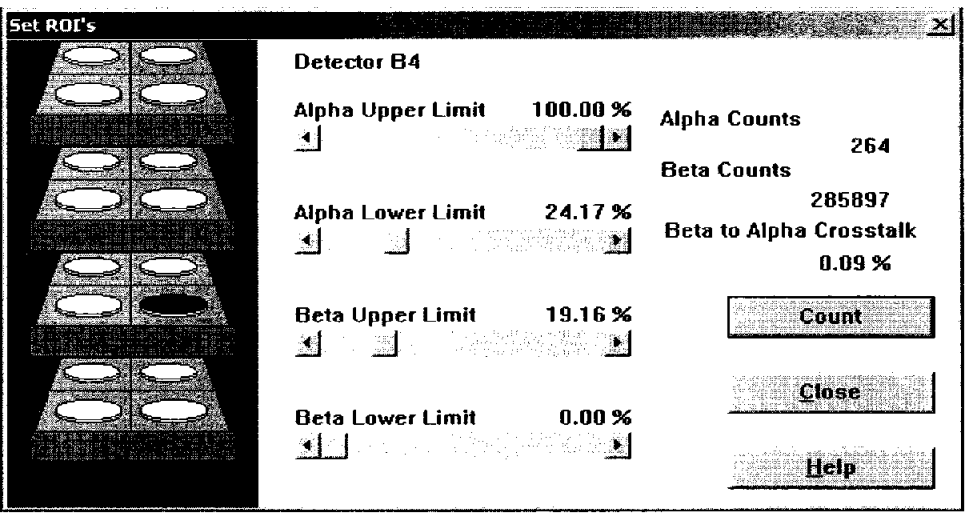

Set ROI's
Detector A3
Alpha Upper Limit 100.00 %
Alpha Lower Limit 28.44 %
Beta Upper Limit 25.44 %
Beta Lower Limit 0.00 %
Alpha Counts
190
Beta Counts
205516
Beta to Alpha Crosstalk
0.09 %
Count
Close
Help

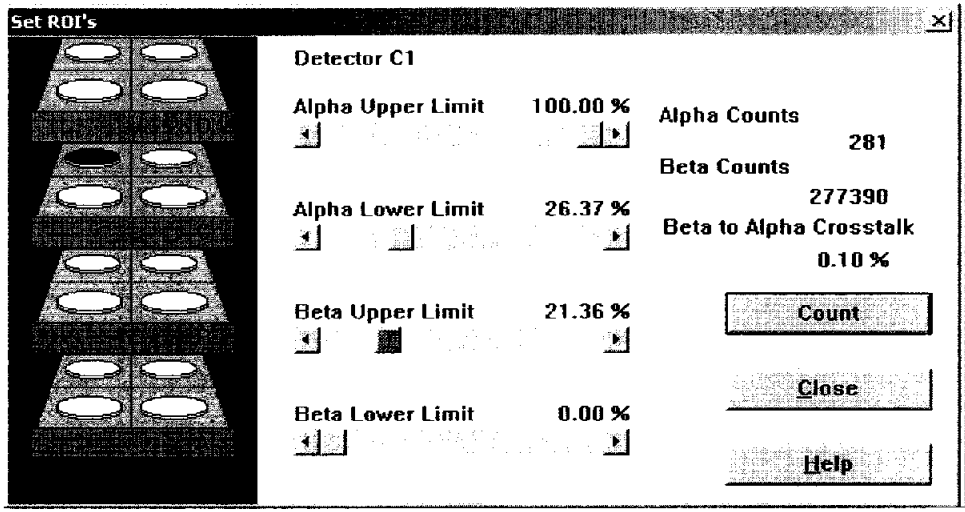

Set ROI's
Detector A4
Alpha Upper Limit 100.00 %
Alpha Lower Limit 25.47 %
Beta Upper Limit 20.46 %
Beta Lower Limit 0.00 %
Alpha Counts
215
Beta Counts
215524
Beta to Alpha Crosstalk
0.10 %
Count
Close
Help

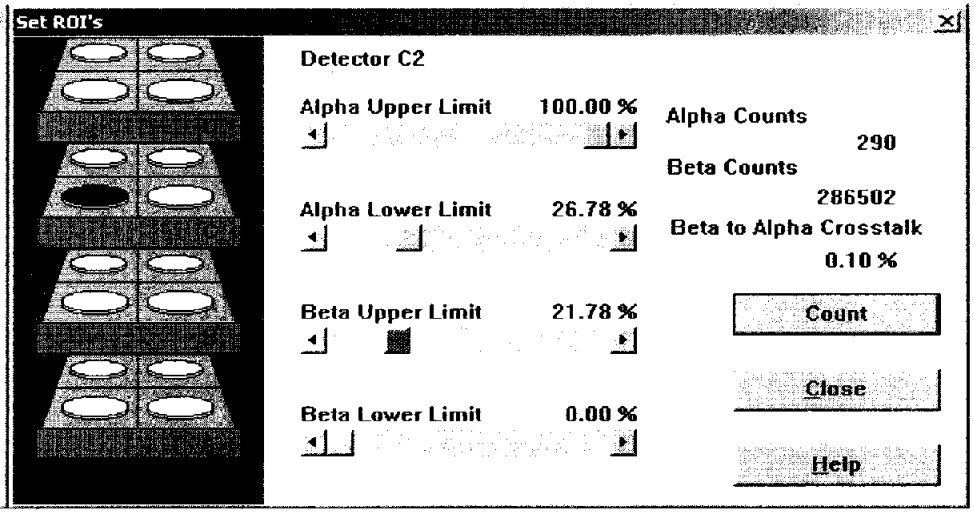

Set ROI's
Detector B1
Alpha Upper Limit 100.00 %
Alpha Lower Limit 24.24 %
Beta Upper Limit 19.24 %
Beta Lower Limit 0.00 %
Alpha Counts
257
Beta Counts
278459
Beta to Alpha Crosstalk
0.09 %
Count
Close
Help

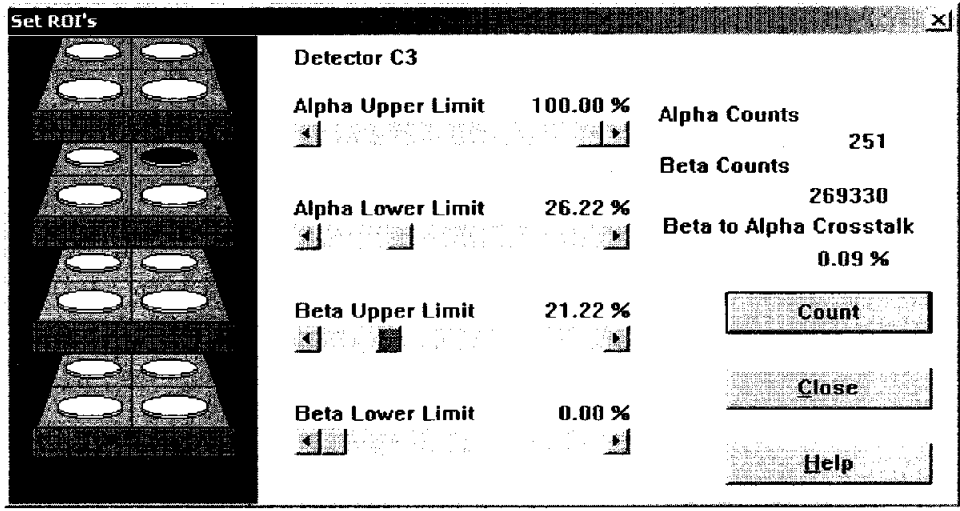

Set ROI's
Detector B2
Alpha Upper Limit 100.00 %
Alpha Lower Limit 25.10 %
Beta Upper Limit 20.09 %
Beta Lower Limit 0.00 %
Alpha Counts
259
Beta Counts
278840
Beta to Alpha Crosstalk
0.09 %
Count
Close
Help

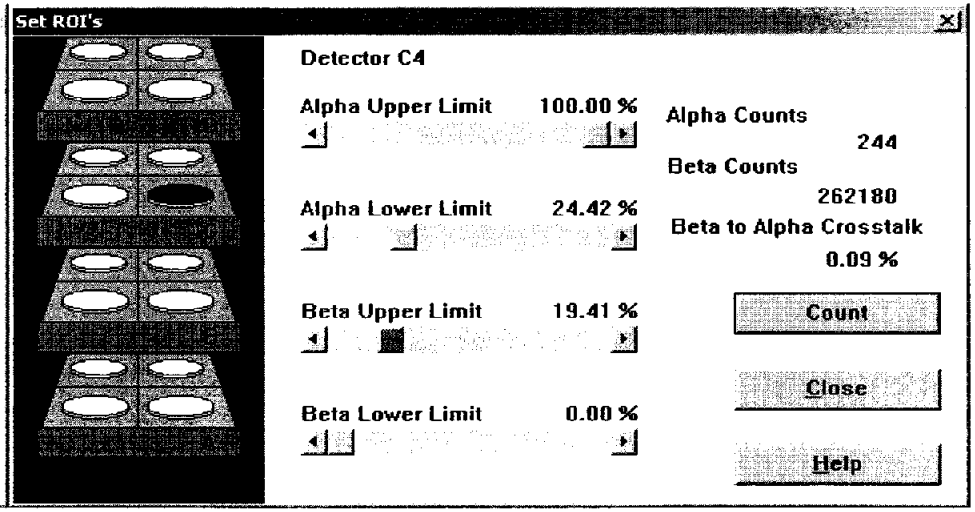

Set ROI's
Detector B3
Alpha Upper Limit 100.00 %
Alpha Lower Limit 26.76 %
Beta Upper Limit 21.75 %
Beta Lower Limit 0.00 %
Alpha Counts
257
Beta Counts
252412
Beta to Alpha Crosstalk
0.10 %
Count
Close
Help

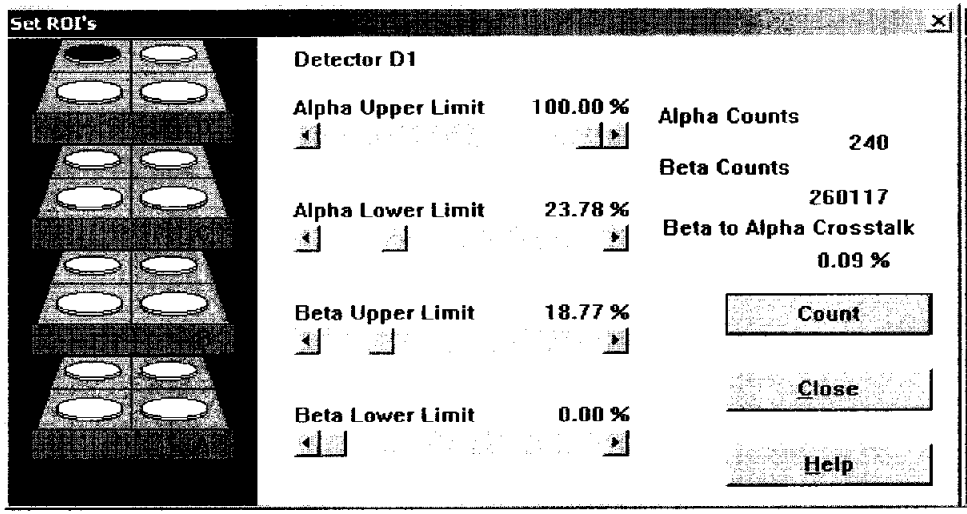

Set ROI's
Detector B4
Alpha Upper Limit 100.00 %
Alpha Lower Limit 24.17 %
Beta Upper Limit 19.16 %
Beta Lower Limit 0.00 %
Alpha Counts
264
Beta Counts
285897
Beta to Alpha Crosstalk
0.09 %
Count
Close
Help

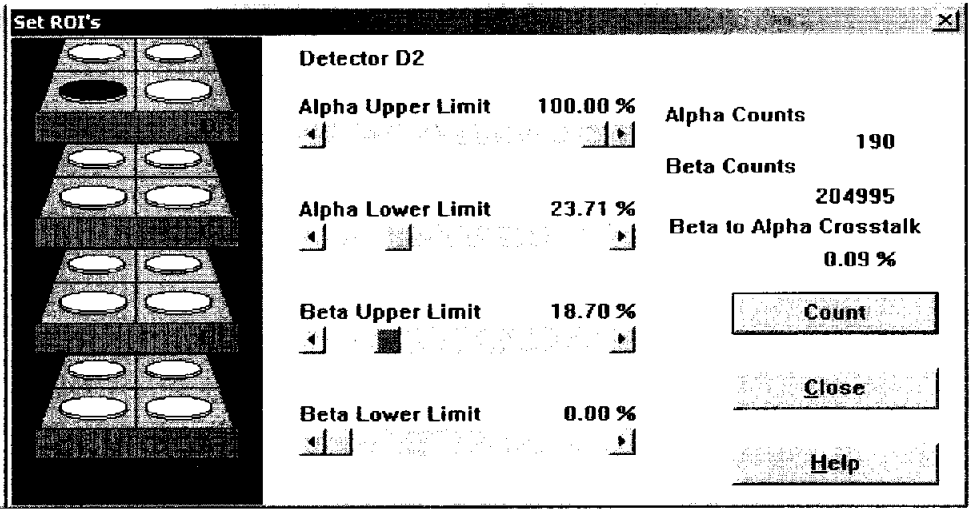

Set ROI's
Detector C1
Alpha Upper Limit 100.00 %
Alpha Lower Limit 26.37 %
Beta Upper Limit 21.36 %
Beta Lower Limit 0.00 %
Alpha Counts
281
Beta Counts
277390
Beta to Alpha Crosstalk
0.10 %
Count
Close
Help

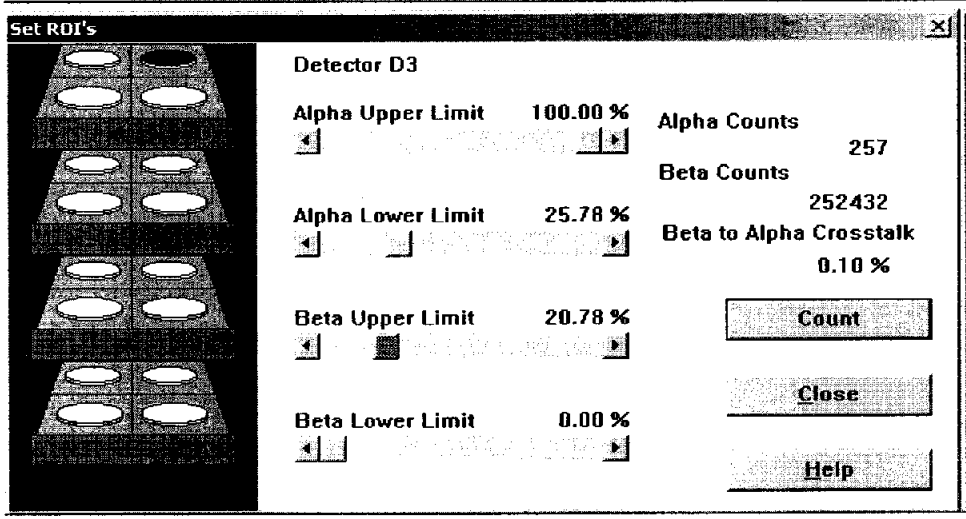

Set ROI's
Detector C2
Alpha Upper Limit 100.00 %
Alpha Lower Limit 26.78 %
Beta Upper Limit 21.78 %
Beta Lower Limit 0.00 %
Alpha Counts
290
Beta Counts
286502
Beta to Alpha Crosstalk
0.10 %
Count
Close
Help

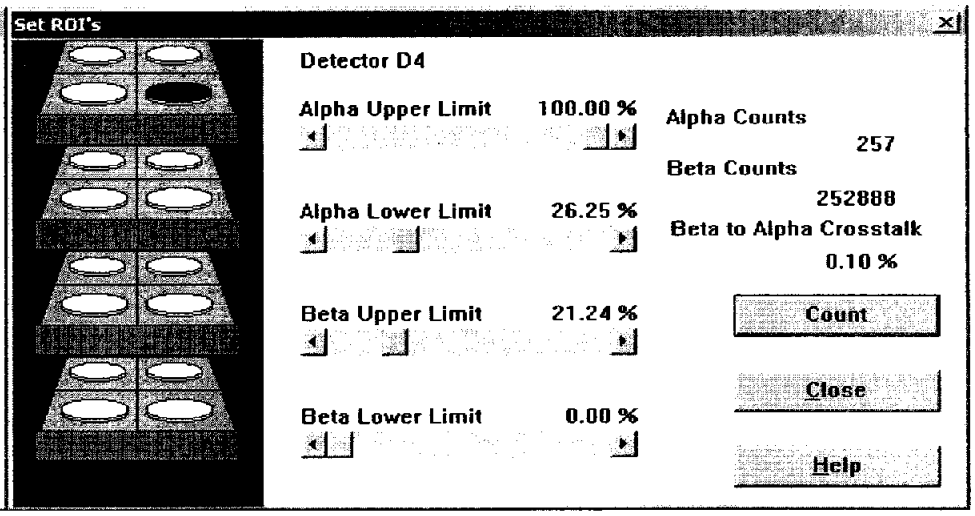

Set ROI's
Detector C3
Alpha Upper Limit 100.00 %
Alpha Lower Limit 26.22 %
Beta Upper Limit 21.22 %
Beta Lower Limit 0.00 %
Alpha Counts
251
Beta Counts
269330
Beta to Alpha Crosstalk
0.09 %
Count
Close
Help


Set ROI's
Detector C4
Alpha Upper Limit 100.00 %
Alpha Lower Limit 24.42 %
Beta Upper Limit 19.41 %
Beta Lower Limit 0.00 %
Alpha Counts
244
Beta Counts
262180
Beta to Alpha Crosstalk
0.09 %
Count
Close
Help


Set ROI's
Detector D1
Alpha Upper Limit 100.00 %
Alpha Lower Limit 23.78 %
Beta Upper Limit 18.77 %
Beta Lower Limit 0.00 %
Alpha Counts
240
Beta Counts
260117
Beta to Alpha Crosstalk
0.09 %
Count
Close
Help


Set ROI's
Detector D2
Alpha Upper Limit 100.00 %
Alpha Lower Limit 23.71 %
Beta Upper Limit 18.70 %
Beta Lower Limit 0.00 %
Alpha Counts
190
Beta Counts
204995
Beta to Alpha Crosstalk
0.09 %
Count
Close
Help


Set ROI's
Detector D3
Alpha Upper Limit 100.00 %
Alpha Lower Limit 25.78 %
Beta Upper Limit 20.78 %
Beta Lower Limit 0.00 %
Alpha Counts
257
Beta Counts
252432
Beta to Alpha Crosstalk
0.10 %
Count
Close
Help


Set ROI's
Detector D4
Alpha Upper Limit 100.00 %
Alpha Lower Limit 26.25 %
Beta Upper Limit 21.24 %
Beta Lower Limit 0.00 %
Alpha Counts
257
Beta Counts
252888
Beta to Alpha Crosstalk
0.10 %
Count
Close
Help

TestAmerica STL

Red 2007

Alpha Efficiency Curves

lpha Attenuation Red A1
2_2007

ata Set 1

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
A1	A11	0.0094	40.00	35745	893.625	4567.9	0.1956
A1	A12	0.0169	40.00	38711	967.775	4567.9	0.2119
A1	A13	0.0257	40.00	27785	694.625	4567.9	0.1521
A1	A14	0.0421	40.00	26048	651.200	4567.9	0.1426
A1	A15	0.0629	40.00	19799	494.975	4567.9	0.1084
A1	A16	0.0817	40.00	37913	947.825	9135.8	0.1037
A1	A17	0.1052	40.00	32238	805.950	9135.8	0.0882
A1	A18	0.1240	40.00	28324	708.100	9135.8	0.0775

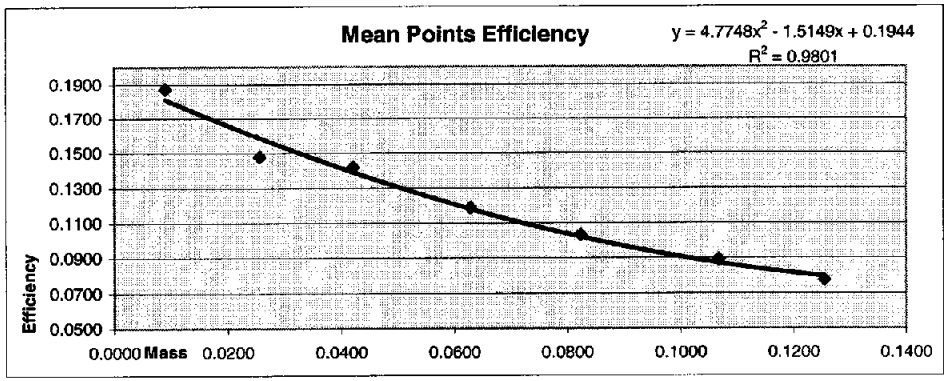
Alpha Attenuation Red A1
02_2007

Data Set 2

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
A1	A21	0.0086	40.00	32650	816.250	4567.9	0.1787
A1	A22	0.0172	40.00	27673	691.825	4567.9	0.1515
A1	A23	0.0256	40.00	26220	655.500	4567.9	0.1435
A1	A24	0.0422	40.00	25802	645.050	4567.9	0.1412
A1	A25	0.0628	40.00	23582	589.550	4567.9	0.1291
A1	A26	0.0830	40.00	37518	937.950	9135.8	0.1027
A1	A27	0.1082	40.00	32891	822.275	9135.8	0.0900
A1	A28	0.1269	40.00	28219	705.475	9135.8	0.0772

Red A1

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0094	0.0086	0.0090	0.1956	0.1787	0.1872	4.53%	-4.53%
0.0257	0.0256	0.0257	0.1521	0.1435	0.1478	2.90%	-2.90%
0.0421	0.0422	0.0421	0.1426	0.1412	0.1419	0.47%	-0.47%
0.0629	0.0628	0.0629	0.1084	0.1291	0.1187	-8.72%	8.72%
0.0817	0.0830	0.0823	0.1037	0.1027	0.1032	0.52%	-0.52%
0.1052	0.1082	0.1067	0.0882	0.0900	0.0891	-1.00%	1.00%
0.1240	0.1269	0.1255	0.0775	0.0772	0.0774	0.19%	-0.19%



lpha Attenuation Red A2
2_2007

ata Set 1

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
A2	A11	0.0094	40.00	34631	865.775	4567.9	0.1895
A2	A12	0.0169	40.00	38079	951.975	4567.9	0.2084
A2	A13	0.0257	40.00	27234	680.850	4567.9	0.1491
A2	A14	0.0421	40.00	25024	625.600	4567.9	0.1370
A2	A15	0.0629	40.00	19303	482.575	4567.9	0.1056
A2	A16	0.0817	40.00	36805	920.125	9135.8	0.1007
A2	A17	0.1052	40.00	30735	768.375	9135.8	0.0841
A2	A18	0.1240	40.00	27563	689.075	9135.8	0.0754

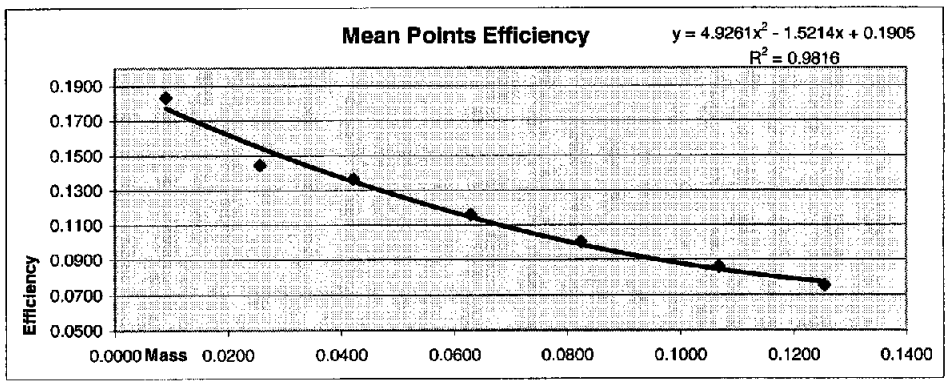
Alpha Attenuation Red A2
02_2007

Data Set 2

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
A2	A21	0.0086	40.00	32366	809.150	4567.9	0.1771
A2	A22	0.0172	40.00	26492	662.300	4567.9	0.1450
A2	A23	0.0256	40.00	25566	639.150	4567.9	0.1399
A2	A24	0.0422	40.00	24882	622.050	4567.9	0.1362
A2	A25	0.0628	40.00	23042	576.050	4567.9	0.1261
A2	A26	0.0830	40.00	36455	911.375	9135.8	0.0998
A2	A27	0.1082	40.00	32037	800.925	9135.8	0.0877
A2	A28	0.1269	40.00	27387	684.675	9135.8	0.0749

ed A2

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0094	0.0086	0.0090	0.1895	0.1771	0.1833	3.38%	-3.38%
0.0257	0.0256	0.0257	0.1491	0.1399	0.1445	3.16%	-3.16%
0.0421	0.0422	0.0421	0.1370	0.1362	0.1366	0.28%	-0.28%
0.0629	0.0628	0.0629	0.1056	0.1261	0.1159	-8.83%	8.83%
0.0817	0.0830	0.0823	0.1007	0.0998	0.1002	0.48%	-0.48%
0.1052	0.1082	0.1067	0.0841	0.0877	0.0859	-2.07%	2.07%
0.1240	0.1269	0.1255	0.0754	0.0749	0.0752	0.32%	-0.32%



lpha Attenuation Red A3
2_2007

ata Set 1

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
A3	A11	0.0094	40.00	34219	855.475	4567.9	0.1873
A3	A12	0.0169	40.00	37272	931.800	4567.9	0.2040
A3	A13	0.0257	40.00	26862	671.550	4567.9	0.1470
A3	A14	0.0421	40.00	24550	613.750	4567.9	0.1344
A3	A15	0.0629	40.00	18535	463.375	4567.9	0.1014
A3	A16	0.0817	40.00	35209	880.225	9135.8	0.0963
A3	A17	0.1052	40.00	29901	747.525	9135.8	0.0818
A3	A18	0.1240	40.00	25821	645.525	9135.8	0.0707

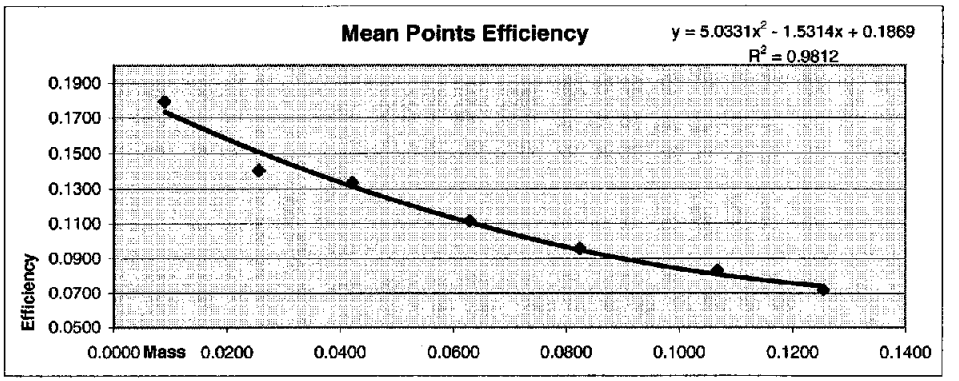
Alpha Attenuation Red A3
02_2007

Data Set 2

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
A3	A21	0.0086	40.00	31329	783.225	4567.9	0.1715
A3	A22	0.0172	40.00	25963	649.075	4567.9	0.1421
A3	A23	0.0256	40.00	24528	613.200	4567.9	0.1342
A3	A24	0.0422	40.00	24295	607.375	4567.9	0.1330
A3	A25	0.0628	40.00	22223	555.575	4567.9	0.1216
A3	A26	0.0830	40.00	34783	869.575	9135.8	0.0952
A3	A27	0.1082	40.00	30886	772.150	9135.8	0.0845
A3	A28	0.1269	40.00	26628	665.700	9135.8	0.0729

ed A3

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0094	0.0086	0.0090	0.1873	0.1715	0.1794	4.41%	-4.41%
0.0257	0.0256	0.0257	0.1470	0.1342	0.1406	4.54%	-4.54%
0.0421	0.0422	0.0421	0.1344	0.1330	0.1337	0.52%	-0.52%
0.0629	0.0628	0.0629	0.1014	0.1216	0.1115	-9.05%	9.05%
0.0817	0.0830	0.0823	0.0963	0.0952	0.0958	0.61%	-0.61%
0.1052	0.1082	0.1067	0.0818	0.0845	0.0832	-1.62%	1.62%
0.1240	0.1269	0.1255	0.0707	0.0729	0.0718	-1.54%	1.54%



lpha Attenuation Red A4
2_2007

ata Set 1

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
A4	A11	0.0094	40.00	34593	864.825	4567.9	0.1893
A4	A12	0.0169	40.00	38096	952.400	4567.9	0.2085
A4	A13	0.0257	40.00	27725	693.125	4567.9	0.1517
A4	A14	0.0421	40.00	25428	635.700	4567.9	0.1392
A4	A15	0.0629	40.00	19354	483.850	4567.9	0.1059
A4	A16	0.0817	40.00	36857	921.425	9135.8	0.1009
A4	A17	0.1052	40.00	31039	775.975	9135.8	0.0849
A4	A18	0.1240	40.00	26757	668.925	9135.8	0.0732

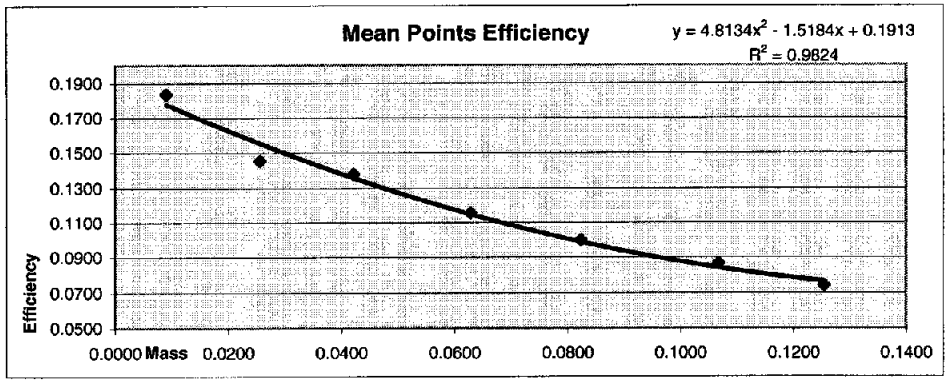
Alpha Attenuation Red A4
02_2007

Data Set 2

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
A4	A21	0.0086	40.00	32565	814.125	4567.9	0.1782
A4	A22	0.0172	40.00	26997	674.925	4567.9	0.1478
A4	A23	0.0256	40.00	25422	635.550	4567.9	0.1391
A4	A24	0.0422	40.00	25015	625.375	4567.9	0.1369
A4	A25	0.0628	40.00	22906	572.650	4567.9	0.1254
A4	A26	0.0830	40.00	36161	904.025	9135.8	0.0990
A4	A27	0.1082	40.00	32177	804.425	9135.8	0.0881
A4	A28	0.1269	40.00	27495	687.375	9135.8	0.0752

ed A4

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0094	0.0086	0.0090	0.1893	0.1782	0.1838	3.02%	-3.02%
0.0257	0.0256	0.0257	0.1517	0.1391	0.1454	4.33%	-4.33%
0.0421	0.0422	0.0421	0.1392	0.1369	0.1380	0.82%	-0.82%
0.0629	0.0628	0.0629	0.1059	0.1254	0.1156	-8.41%	8.41%
0.0817	0.0830	0.0823	0.1009	0.0990	0.0999	0.95%	-0.95%
0.1052	0.1082	0.1067	0.0849	0.0881	0.0865	-1.80%	1.80%
0.1240	0.1269	0.1255	0.0732	0.0752	0.0742	-1.36%	1.36%



lpha Attenuation Red B1
2_2007

ata Set 1

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
B1	A11	0.0094	40.00	34489	862.225	4567.9	0.1888
B1	A12	0.0169	40.00	37707	942.675	4567.9	0.2064
B1	A13	0.0257	40.00	27207	680.175	4567.9	0.1489
B1	A14	0.0421	40.00	24522	613.050	4567.9	0.1342
B1	A15	0.0629	40.00	19517	487.925	4567.9	0.1068
B1	A16	0.0817	40.00	35833	895.825	9135.8	0.0981
B1	A17	0.1052	40.00	30386	759.650	9135.8	0.0832
B1	A18	0.1240	40.00	26365	659.125	9135.8	0.0721

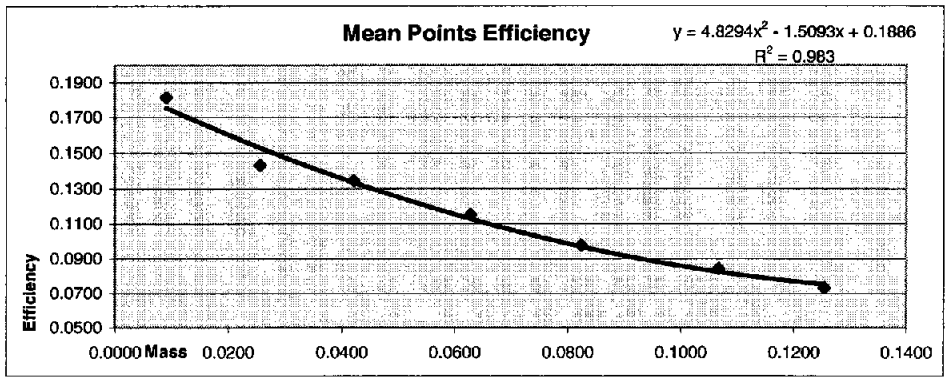
Alpha Attenuation Red B1
02_2007

Data Set 2

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
B1	A21	0.0086	40.00	31749	793.725	4567.9	0.1738
B1	A22	0.0172	40.00	26438	660.950	4567.9	0.1447
B1	A23	0.0256	40.00	25150	628.750	4567.9	0.1376
B1	A24	0.0422	40.00	24622	615.550	4567.9	0.1348
B1	A25	0.0628	40.00	22538	563.450	4567.9	0.1233
B1	A26	0.0830	40.00	35668	891.700	9135.8	0.0976
B1	A27	0.1082	40.00	31291	782.275	9135.8	0.0856
B1	A28	0.1269	40.00	27170	679.250	9135.8	0.0744

ed B1

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0094	0.0086	0.0090	0.1888	0.1738	0.1813	4.14%	-4.14%
0.0257	0.0256	0.0257	0.1489	0.1376	0.1433	3.93%	-3.93%
0.0421	0.0422	0.0421	0.1342	0.1348	0.1345	-0.20%	0.20%
0.0629	0.0628	0.0629	0.1068	0.1233	0.1151	-7.18%	7.18%
0.0817	0.0830	0.0823	0.0981	0.0976	0.0978	0.23%	-0.23%
0.1052	0.1082	0.1067	0.0832	0.0856	0.0844	-1.47%	1.47%
0.1240	0.1269	0.1255	0.0721	0.0744	0.0732	-1.50%	1.50%



Alpha Attenuation Red B2
02_2007

Data Set 1

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
B2	A11	0.0094	40.00	34228	855.700	4567.9	0.1873
B2	A12	0.0169	40.00	37453	936.325	4567.9	0.2050
B2	A13	0.0257	40.00	27139	678.475	4567.9	0.1485
B2	A14	0.0421	40.00	24918	622.950	4567.9	0.1364
B2	A15	0.0629	40.00	18986	474.650	4567.9	0.1039
B2	A16	0.0817	40.00	36258	906.450	9135.8	0.0992
B2	A17	0.1052	40.00	30293	757.325	9135.8	0.0829
B2	A18	0.1240	40.00	26402	660.050	9135.8	0.0722

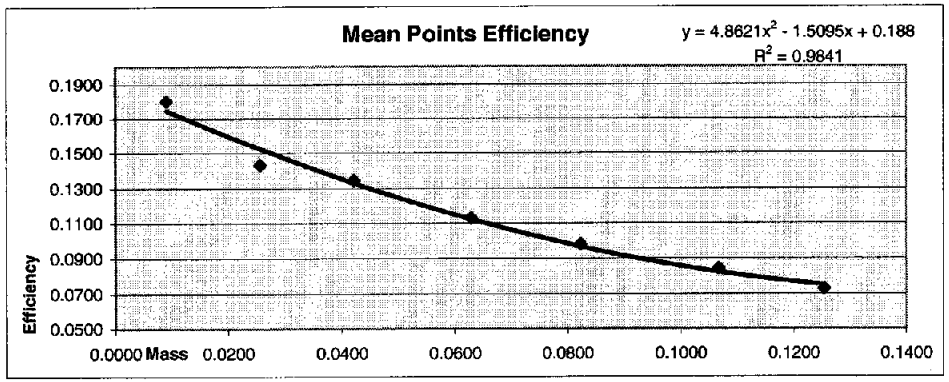
Alpha Attenuation Red B2
02_2007

Data Set 2

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
B2	A21	0.0086	40.00	31687	792.175	4567.9	0.1734
B2	A22	0.0172	40.00	26252	656.300	4567.9	0.1437
B2	A23	0.0256	40.00	25168	629.200	4567.9	0.1377
B2	A24	0.0422	40.00	24246	606.150	4567.9	0.1327
B2	A25	0.0628	40.00	22365	559.125	4567.9	0.1224
B2	A26	0.0830	40.00	35428	885.700	9135.8	0.0969
B2	A27	0.1082	40.00	31419	785.475	9135.8	0.0860
B2	A28	0.1269	40.00	26912	672.800	9135.8	0.0736

Red B2

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0094	0.0086	0.0090	0.1873	0.1734	0.1804	3.85%	-3.85%
0.0257	0.0256	0.0257	0.1485	0.1377	0.1431	3.77%	-3.77%
0.0421	0.0422	0.0421	0.1364	0.1327	0.1345	1.37%	-1.37%
0.0629	0.0628	0.0629	0.1039	0.1224	0.1132	-8.17%	8.17%
0.0817	0.0830	0.0823	0.0992	0.0969	0.0981	1.16%	-1.16%
0.1052	0.1082	0.1067	0.0829	0.0860	0.0844	-1.82%	1.82%
0.1240	0.1269	0.1255	0.0722	0.0736	0.0729	-0.96%	0.96%



lpha Attenuation Red B3
2_2007

ata Set 1

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
B3	A11	0.0094	40.00	33892	847.300	4567.9	0.1855
B3	A12	0.0169	40.00	37656	941.400	4567.9	0.2061
B3	A13	0.0257	40.00	26621	665.525	4567.9	0.1457
B3	A14	0.0421	40.00	24345	608.625	4567.9	0.1332
B3	A15	0.0629	40.00	18733	468.325	4567.9	0.1025
B3	A16	0.0817	40.00	35795	894.875	9135.8	0.0980
B3	A17	0.1052	40.00	29945	748.625	9135.8	0.0819
B3	A18	0.1240	40.00	25815	645.375	9135.8	0.0706

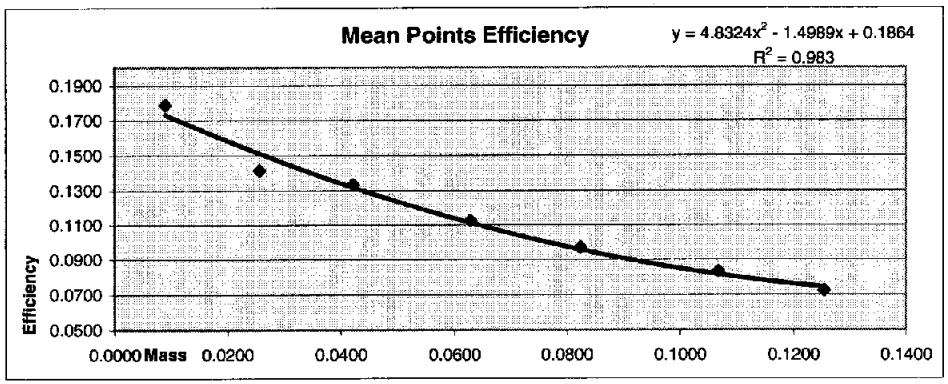
Alpha Attenuation Red B3
02_2007

Data Set 2

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
B3	A21	0.0086	40.00	31517	787.925	4567.9	0.1725
B3	A22	0.0172	40.00	26449	661.225	4567.9	0.1448
B3	A23	0.0256	40.00	25043	626.075	4567.9	0.1371
B3	A24	0.0422	40.00	24395	609.875	4567.9	0.1335
B3	A25	0.0628	40.00	22381	559.525	4567.9	0.1225
B3	A26	0.0830	40.00	35117	877.925	9135.8	0.0961
B3	A27	0.1082	40.00	30900	772.500	9135.8	0.0846
B3	A28	0.1269	40.00	27093	677.325	9135.8	0.0741

ed B3

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0094	0.0086	0.0090	0.1855	0.1725	0.1790	3.63%	-3.63%
0.0257	0.0256	0.0257	0.1457	0.1371	0.1414	3.05%	-3.05%
0.0421	0.0422	0.0421	0.1332	0.1335	0.1334	-0.10%	0.10%
0.0629	0.0628	0.0629	0.1025	0.1225	0.1125	-8.87%	8.87%
0.0817	0.0830	0.0823	0.0980	0.0961	0.0970	0.96%	-0.96%
0.1052	0.1082	0.1067	0.0819	0.0846	0.0833	-1.57%	1.57%
0.1240	0.1269	0.1255	0.0706	0.0741	0.0724	-2.42%	2.42%



lpha Attenuation Red B4
2_2007

ata Set 1

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
B4	A11	0.0094	40.00	36870	921.750	4567.9	0.2018
B4	A12	0.0169	40.00	40325	1008.125	4567.9	0.2207
B4	A13	0.0257	40.00	29207	730.175	4567.9	0.1598
B4	A14	0.0421	40.00	26958	673.950	4567.9	0.1475
B4	A15	0.0629	40.00	20695	517.375	4567.9	0.1133
B4	A16	0.0817	40.00	39988	999.700	9135.8	0.1094
B4	A17	0.1052	40.00	33789	844.725	9135.8	0.0925
B4	A18	0.1240	40.00	29359	733.975	9135.8	0.0803

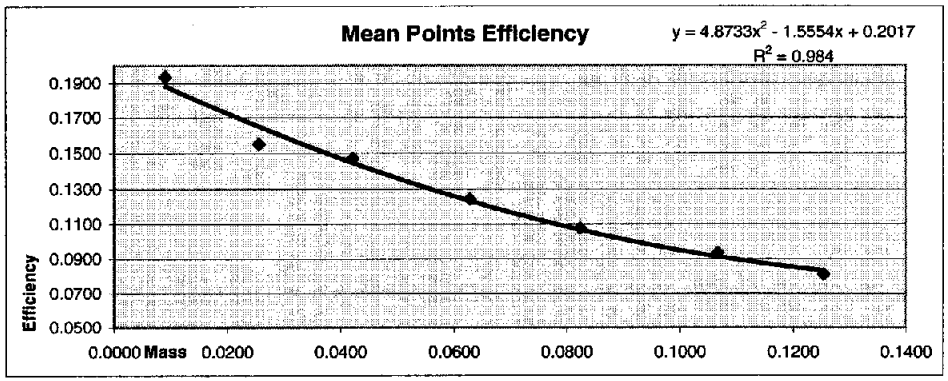
Alpha Attenuation Red B4
02_2007

Data Set 2

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
B4	A21	0.0086	40.00	33963	849.075	4567.9	0.1859
B4	A22	0.0172	40.00	28672	716.800	4567.9	0.1569
B4	A23	0.0256	40.00	27477	686.925	4567.9	0.1504
B4	A24	0.0422	40.00	26784	669.600	4567.9	0.1466
B4	A25	0.0628	40.00	24693	617.325	4567.9	0.1351
B4	A26	0.0830	40.00	38672	966.800	9135.8	0.1058
B4	A27	0.1082	40.00	34584	864.600	9135.8	0.0946
B4	A28	0.1269	40.00	29952	748.800	9135.8	0.0820

ed B4

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0094	0.0086	0.0090	0.2018	0.1859	0.1938	4.10%	-4.10%
0.0257	0.0256	0.0257	0.1598	0.1504	0.1551	3.05%	-3.05%
0.0421	0.0422	0.0421	0.1475	0.1466	0.1471	0.32%	-0.32%
0.0629	0.0628	0.0629	0.1133	0.1351	0.1242	-8.81%	8.81%
0.0817	0.0830	0.0823	0.1094	0.1058	0.1076	1.67%	-1.67%
0.1052	0.1082	0.1067	0.0925	0.0946	0.0936	-1.16%	1.16%
0.1240	0.1269	0.1255	0.0803	0.0820	0.0812	-1.00%	1.00%



lpha Attenuation Red C1
2_2007

ata Set 1

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
C1	A11	0.0094	40.00	34400	860.000	4567.9	0.1883
C1	A12	0.0169	40.00	37862	946.550	4567.9	0.2072
C1	A13	0.0257	40.00	27197	679.925	4567.9	0.1488
C1	A14	0.0421	40.00	24720	618.000	4567.9	0.1353
C1	A15	0.0629	40.00	18852	471.300	4567.9	0.1032
C1	A16	0.0817	40.00	36495	912.375	9135.8	0.0999
C1	A17	0.1052	40.00	30705	767.625	9135.8	0.0840
C1	A18	0.1240	40.00	26877	671.925	9135.8	0.0735

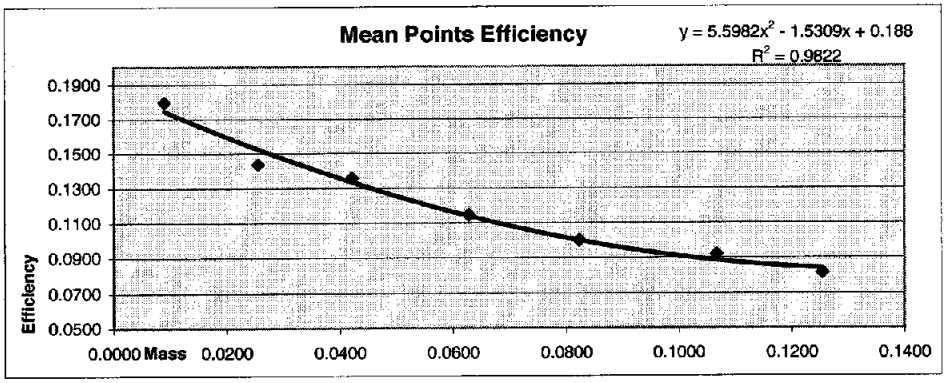
Alpha Attenuation Red C1
02_2007

Data Set 2

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
C1	A21	0.0086	40.00	31275	781.875	4567.9	0.1712
C1	A22	0.0172	40.00	26242	656.050	4567.9	0.1436
C1	A23	0.0256	40.00	25308	632.700	4567.9	0.1385
C1	A24	0.0422	40.00	24805	620.125	4567.9	0.1358
C1	A25	0.0628	40.00	22991	574.775	4567.9	0.1258
C1	A26	0.0830	40.00	36530	913.250	9135.8	0.1000
C1	A27	0.1082	40.00	36483	912.075	9135.8	0.0998
C1	A28	0.1269	40.00	32625	815.625	9135.8	0.0893

ed C1

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0094	0.0086	0.0090	0.1883	0.1712	0.1797	4.76%	-4.76%
0.0257	0.0256	0.0257	0.1488	0.1385	0.1437	3.60%	-3.60%
0.0421	0.0422	0.0421	0.1353	0.1358	0.1355	-0.17%	0.17%
0.0629	0.0628	0.0629	0.1032	0.1258	0.1145	-9.89%	9.89%
0.0817	0.0830	0.0823	0.0999	0.1000	0.0999	-0.05%	0.05%
0.1052	0.1082	0.1067	0.0840	0.0998	0.0919	-8.60%	8.60%
0.1240	0.1269	0.1255	0.0735	0.0893	0.0814	-9.66%	9.66%



lpha Attenuation Red C2
2_2007

ata Set 1

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
C2	A11	0.0094	40.00	35843	896.075	4567.9	0.1962
C2	A12	0.0169	40.00	38834	970.850	4567.9	0.2125
C2	A13	0.0257	40.00	28848	721.200	4567.9	0.1579
C2	A14	0.0421	40.00	25708	642.700	4567.9	0.1407
C2	A15	0.0629	40.00	19870	496.750	4567.9	0.1087
C2	A16	0.0817	40.00	37448	936.200	9135.8	0.1025
C2	A17	0.1052	40.00	32454	811.350	9135.8	0.0888
C2	A18	0.1240	40.00	28289	707.225	9135.8	0.0774

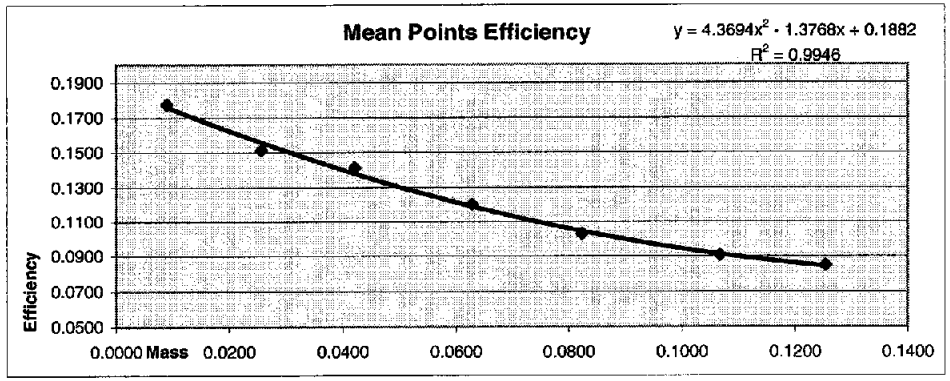
Alpha Attenuation Red C2
02_2007

Data Set 2

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
C2	A21	0.0086	40.00	29065	726.625	4567.9	0.1591
C2	A22	0.0172	40.00	27073	676.825	4567.9	0.1482
C2	A23	0.0256	40.00	26428	660.700	4567.9	0.1446
C2	A24	0.0422	40.00	25899	647.475	4567.9	0.1417
C2	A25	0.0628	40.00	24049	601.225	4567.9	0.1316
C2	A26	0.0830	40.00	37778	944.450	9135.8	0.1034
C2	A27	0.1082	40.00	33625	840.625	9135.8	0.0920
C2	A28	0.1269	40.00	33706	842.650	9135.8	0.0922

ed C2

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0094	0.0086	0.0090	0.1962	0.1591	0.1776	10.44%	-10.44%
0.0257	0.0256	0.0257	0.1579	0.1446	0.1513	4.38%	-4.38%
0.0421	0.0422	0.0421	0.1407	0.1417	0.1412	-0.37%	0.37%
0.0629	0.0628	0.0629	0.1087	0.1316	0.1202	-9.52%	9.52%
0.0817	0.0830	0.0823	0.1025	0.1034	0.1029	-0.44%	0.44%
0.1052	0.1082	0.1067	0.0888	0.0920	0.0904	-1.77%	1.77%
0.1240	0.1269	0.1255	0.0774	0.0922	0.0848	-8.74%	8.74%



lpha Attenuation Red C3
2_2007

ata Set 1

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
C3	A11	0.0094	40.00	33301	832.525	4567.9	0.1823
C3	A12	0.0169	40.00	36527	913.175	4567.9	0.1999
C3	A13	0.0257	40.00	26268	656.700	4567.9	0.1438
C3	A14	0.0421	40.00	24104	602.600	4567.9	0.1319
C3	A15	0.0629	40.00	18012	450.300	4567.9	0.0986
C3	A16	0.0817	40.00	35016	875.400	9135.8	0.0958
C3	A17	0.1052	40.00	28950	723.750	9135.8	0.0792
C3	A18	0.1240	40.00	25436	635.900	9135.8	0.0696

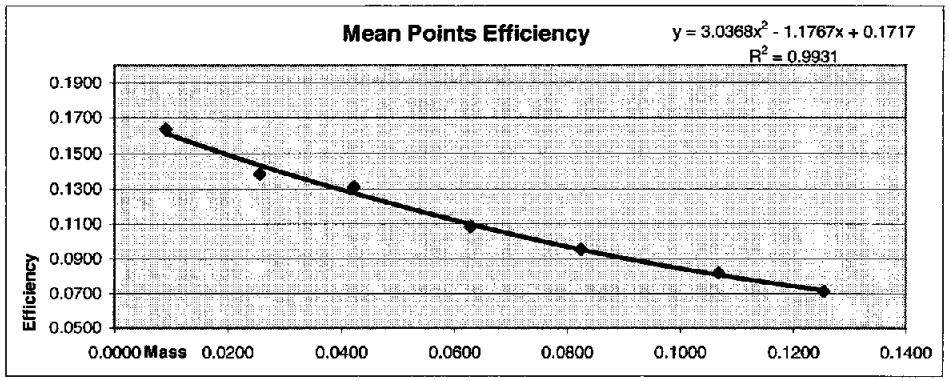
Alpha Attenuation Red C3
02_2007

Data Set 2

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
C3	A21	0.0086	40.00	26441	661.025	4567.9	0.1447
C3	A22	0.0172	40.00	31072	776.800	4567.9	0.1701
C3	A23	0.0256	40.00	24341	608.525	4567.9	0.1332
C3	A24	0.0422	40.00	23799	594.975	4567.9	0.1303
C3	A25	0.0628	40.00	21669	541.725	4567.9	0.1186
C3	A26	0.0830	40.00	34778	869.450	9135.8	0.0952
C3	A27	0.1082	40.00	30807	770.175	9135.8	0.0843
C3	A28	0.1269	40.00	26558	663.950	9135.8	0.0727

ed C3

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0094	0.0086	0.0090	0.1823	0.1447	0.1635	11.48%	-11.48%
0.0257	0.0256	0.0257	0.1438	0.1332	0.1385	3.81%	-3.81%
0.0421	0.0422	0.0421	0.1319	0.1303	0.1311	0.64%	-0.64%
0.0629	0.0628	0.0629	0.0986	0.1186	0.1086	-9.22%	9.22%
0.0817	0.0830	0.0823	0.0958	0.0952	0.0955	0.34%	-0.34%
0.1052	0.1082	0.1067	0.0792	0.0843	0.0818	-3.11%	3.11%
0.1240	0.1269	0.1255	0.0696	0.0727	0.0711	-2.16%	2.16%



lpha Attenuation Red C4
2_2007

ata Set 1

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
C4	A11	0.0094	40.00	34460	861.500	4567.9	0.1886
C4	A12	0.0169	40.00	37771	944.275	4567.9	0.2067
C4	A13	0.0257	40.00	27241	681.025	4567.9	0.1491
C4	A14	0.0421	40.00	24859	621.475	4567.9	0.1361
C4	A15	0.0629	40.00	18747	468.675	4567.9	0.1026
C4	A16	0.0817	40.00	36298	907.450	9135.8	0.0993
C4	A17	0.1052	40.00	30655	766.375	9135.8	0.0839
C4	A18	0.1240	40.00	26777	669.425	9135.8	0.0733

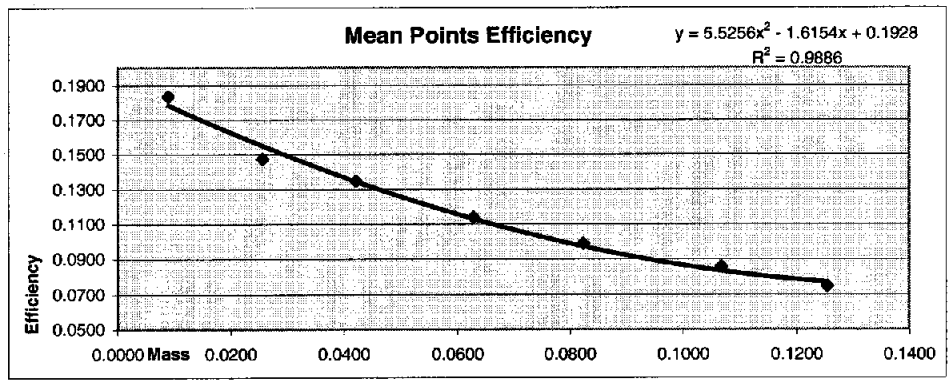
Alpha Attenuation Red C4
02_2007

Data Set 2

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
C4	A21	0.0086	40.00	32665	816.625	4567.9	0.1788
C4	A22	0.0172	40.00	32217	805.425	4567.9	0.1763
C4	A23	0.0256	40.00	26569	664.225	4567.9	0.1454
C4	A24	0.0422	40.00	24373	609.325	4567.9	0.1334
C4	A25	0.0628	40.00	22847	571.175	4567.9	0.1250
C4	A26	0.0830	40.00	35913	897.825	9135.8	0.0983
C4	A27	0.1082	40.00	32001	800.025	9135.8	0.0876
C4	A28	0.1269	40.00	27809	695.225	9135.8	0.0761

ed C4

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0094	0.0086	0.0090	0.1886	0.1788	0.1837	2.67%	-2.67%
0.0257	0.0256	0.0257	0.1491	0.1454	0.1473	1.25%	-1.25%
0.0421	0.0422	0.0421	0.1361	0.1334	0.1347	0.99%	-0.99%
0.0629	0.0628	0.0629	0.1026	0.1250	0.1138	-9.86%	9.86%
0.0817	0.0830	0.0823	0.0993	0.0983	0.0988	0.53%	-0.53%
0.1052	0.1082	0.1067	0.0839	0.0876	0.0857	-2.15%	2.15%
0.1240	0.1269	0.1255	0.0733	0.0761	0.0747	-1.89%	1.89%



lpha Attenuation Red D1
2_2007

ata Set 1

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
D1	A11	0.0094	40.00	33615	840.375	4567.9	0.1840
D1	A12	0.0169	40.00	37627	940.675	4567.9	0.2059
D1	A13	0.0257	40.00	28030	700.750	4567.9	0.1534
D1	A14	0.0421	40.00	25823	645.575	4567.9	0.1413
D1	A15	0.0629	40.00	19905	497.625	4567.9	0.1089
D1	A16	0.0817	40.00	37645	941.125	9135.8	0.1030
D1	A17	0.1052	40.00	31994	799.850	9135.8	0.0876
D1	A18	0.1240	40.00	28013	700.325	9135.8	0.0767

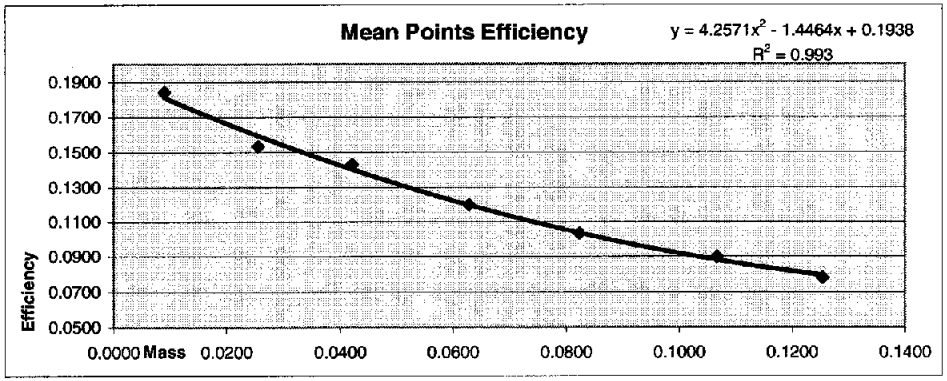
Alpha Attenuation Red D1
02_2007

Data Set 2

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
D1	A21	0.0086	40.00	33714	842.850	4567.9	0.1845
D1	A22	0.0172	40.00	27629	690.725	4567.9	0.1512
D1	A23	0.0256	40.00	27990	699.750	4567.9	0.1532
D1	A24	0.0422	40.00	26457	661.425	4567.9	0.1448
D1	A25	0.0628	40.00	23898	597.450	4567.9	0.1308
D1	A26	0.0830	40.00	37824	945.600	9135.8	0.1035
D1	A27	0.1082	40.00	33579	839.475	9135.8	0.0919
D1	A28	0.1269	40.00	29047	726.175	9135.8	0.0795

ed D1

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0094	0.0086	0.0090	0.1840	0.1845	0.1842	-0.15%	0.15%
0.0257	0.0256	0.0257	0.1534	0.1532	0.1533	0.07%	-0.07%
0.0421	0.0422	0.0421	0.1413	0.1448	0.1431	-1.21%	1.21%
0.0629	0.0628	0.0629	0.1089	0.1308	0.1199	-9.12%	9.12%
0.0817	0.0830	0.0823	0.1030	0.1035	0.1033	-0.24%	0.24%
0.1052	0.1082	0.1067	0.0876	0.0919	0.0897	-2.42%	2.42%
0.1240	0.1269	0.1255	0.0767	0.0795	0.0781	-1.81%	1.81%



lpha Attenuation Red D2
2_2007

ata Set 1

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
D2	A11	0.0094	40.00	34185	854.625	4567.9	0.1871
D2	A12	0.0169	40.00	35278	881.950	4567.9	0.1931
D2	A13	0.0257	40.00	26366	659.150	4567.9	0.1443
D2	A14	0.0421	40.00	25048	626.200	4567.9	0.1371
D2	A15	0.0629	40.00	19363	484.075	4567.9	0.1060
D2	A16	0.0817	40.00	36555	913.875	9135.8	0.1000
D2	A17	0.1052	40.00	30601	765.025	9135.8	0.0837
D2	A18	0.1240	40.00	26880	672.000	9135.8	0.0736

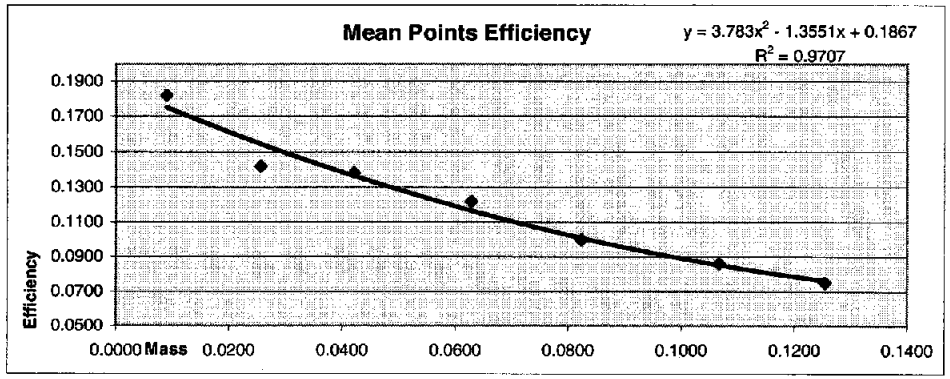
Alpha Attenuation Red D2
02_2007

Data Set 2

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
D2	A21	0.0086	40.00	32233	805.825	4567.9	0.1764
D2	A22	0.0172	40.00	26758	668.950	4567.9	0.1464
D2	A23	0.0256	40.00	25474	636.850	4567.9	0.1394
D2	A24	0.0422	40.00	25455	636.375	4567.9	0.1393
D2	A25	0.0628	40.00	25118	627.950	4567.9	0.1375
D2	A26	0.0830	40.00	36313	907.825	9135.8	0.0994
D2	A27	0.1082	40.00	32312	807.800	9135.8	0.0884
D2	A28	0.1269	40.00	27983	699.575	9135.8	0.0766

ed D2

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0094	0.0086	0.0090	0.1871	0.1764	0.1818	2.94%	-2.94%
0.0257	0.0256	0.0257	0.1443	0.1394	0.1419	1.72%	-1.72%
0.0421	0.0422	0.0421	0.1371	0.1393	0.1382	-0.81%	0.81%
0.0629	0.0628	0.0629	0.1060	0.1375	0.1217	-12.94%	12.94%
0.0817	0.0830	0.0823	0.1000	0.0994	0.0997	0.33%	-0.33%
0.1052	0.1082	0.1067	0.0837	0.0884	0.0861	-2.72%	2.72%
0.1240	0.1269	0.1255	0.0736	0.0766	0.0751	-2.01%	2.01%



lpha Attenuation Red D3
2_2007

ata Set 1

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
D3	A11	0.0094	40.00	35427	885.675	4567.9	0.1939
D3	A12	0.0169	40.00	38747	968.675	4567.9	0.2121
D3	A13	0.0257	40.00	25892	647.300	4567.9	0.1417
D3	A14	0.0421	40.00	24458	611.450	4567.9	0.1339
D3	A15	0.0629	40.00	19326	483.150	4567.9	0.1058
D3	A16	0.0817	40.00	36581	914.525	9135.8	0.1001
D3	A17	0.1052	40.00	31170	779.250	9135.8	0.0853
D3	A18	0.1240	40.00	27160	679.000	9135.8	0.0743

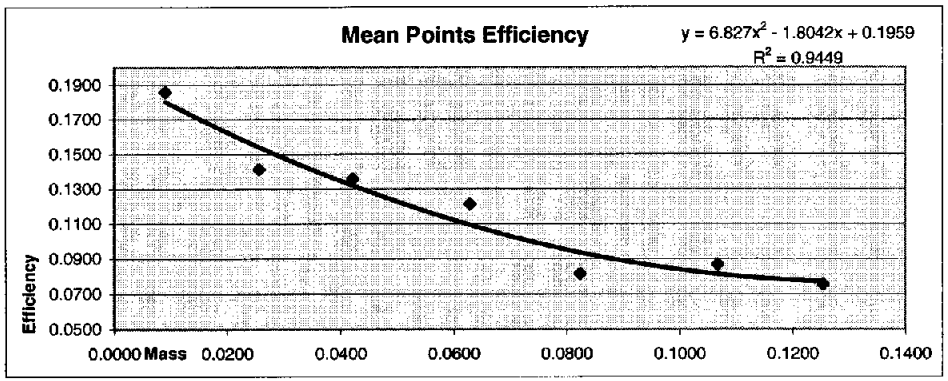
Alpha Attenuation Red D3
02_2007

Data Set 2

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
D3	A21	0.0086	40.00	32488	812.200	4567.9	0.1778
D3	A22	0.0172	40.00	27123	678.075	4567.9	0.1484
D3	A23	0.0256	40.00	25739	643.475	4567.9	0.1409
D3	A24	0.0422	40.00	25094	627.350	4567.9	0.1373
D3	A25	0.0628	40.00	24925	623.125	4567.9	0.1364
D3	A26	0.0830	40.00	22899	572.475	9135.8	0.0627
D3	A27	0.1082	40.00	32238	805.950	9135.8	0.0882
D3	A28	0.1269	40.00	27857	696.425	9135.8	0.0762

ed D3

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0094	0.0086	0.0090	0.1939	0.1778	0.1858	4.33%	-4.33%
0.0257	0.0256	0.0257	0.1417	0.1409	0.1413	0.30%	-0.30%
0.0421	0.0422	0.0421	0.1339	0.1373	0.1356	-1.28%	1.28%
0.0629	0.0628	0.0629	0.1058	0.1364	0.1211	-12.65%	12.65%
0.0817	0.0830	0.0823	0.1001	0.0627	0.0814	23.00%	-23.00%
0.1052	0.1082	0.1067	0.0853	0.0882	0.0868	-1.68%	1.68%
0.1240	0.1269	0.1255	0.0743	0.0762	0.0753	-1.27%	1.27%



lpha Attenuation Red D4
2_2007

ata Set 1

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
D4	A11	0.0094	40.00	35538	888.450	4567.9	0.1945
D4	A12	0.0169	40.00	38571	964.275	4567.9	0.2111
D4	A13	0.0257	40.00	27914	697.850	4567.9	0.1528
D4	A14	0.0421	40.00	23918	597.950	4567.9	0.1309
D4	A15	0.0629	40.00	18894	472.350	4567.9	0.1034
D4	A16	0.0817	40.00	37490	937.250	9135.8	0.1026
D4	A17	0.1052	40.00	31132	778.300	9135.8	0.0852
D4	A18	0.1240	40.00	27415	685.375	9135.8	0.0750

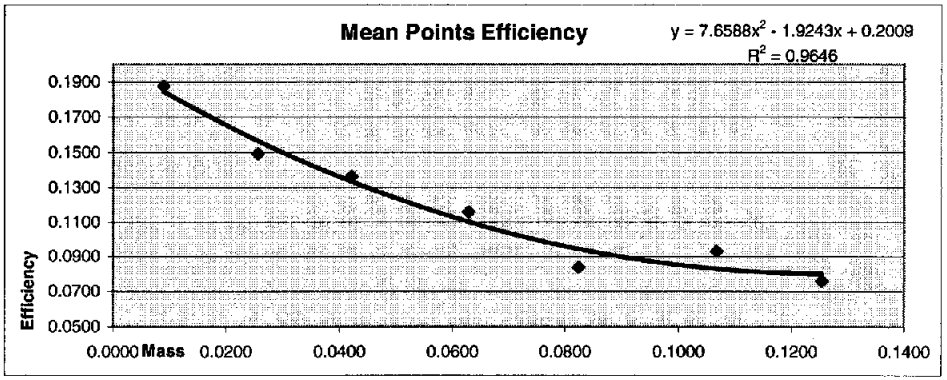
Alpha Attenuation Red D4
02_2007

Data Set 2

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
D4	A21	0.0086	40.00	33000	825.000	4567.9	0.1806
D4	A22	0.0172	40.00	27885	697.125	4567.9	0.1526
D4	A23	0.0256	40.00	26655	666.375	4567.9	0.1459
D4	A24	0.0422	40.00	25937	648.425	4567.9	0.1420
D4	A25	0.0628	40.00	23448	586.200	4567.9	0.1283
D4	A26	0.0830	40.00	23594	589.850	9135.8	0.0646
D4	A27	0.1082	40.00	36840	921.000	9135.8	0.1008
D4	A28	0.1269	40.00	27990	699.750	9135.8	0.0766

ed D4

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0094	0.0086	0.0090	0.1945	0.1806	0.1876	3.70%	-3.70%
0.0257	0.0256	0.0257	0.1528	0.1459	0.1493	2.31%	-2.31%
0.0421	0.0422	0.0421	0.1309	0.1420	0.1364	-4.05%	4.05%
0.0629	0.0628	0.0629	0.1034	0.1283	0.1159	-10.76%	10.76%
0.0817	0.0830	0.0823	0.1026	0.0646	0.0836	22.75%	-22.75%
0.1052	0.1082	0.1067	0.0852	0.1008	0.0930	-8.40%	8.40%
0.1240	0.1269	0.1255	0.0750	0.0766	0.0758	-1.04%	1.04%



TestAmerica STL

Red 2007

Beta Efficiency Curves

eta Attenuation Red A1
et 1 2/20/2007

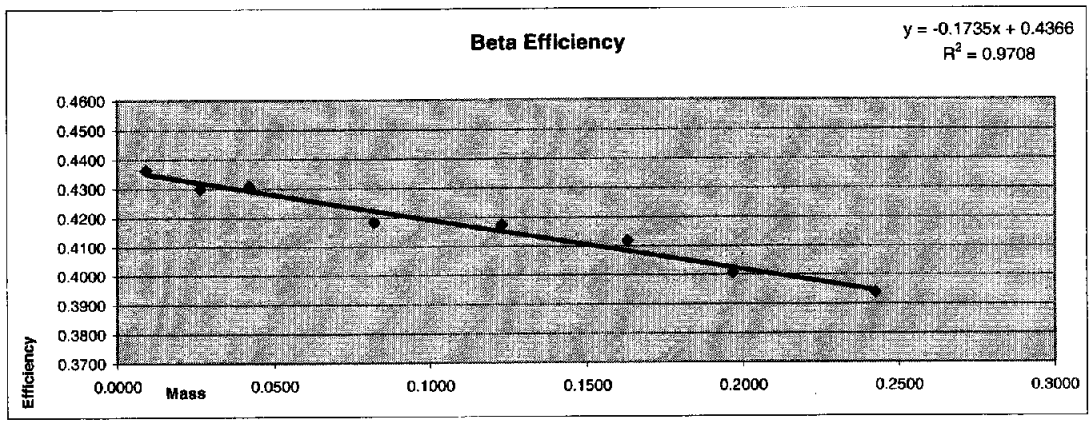
Std ID	Sample Wt	Count Time	Beta Counts	DPM 4049 CPM	Sr-90 Eff
B11	0.0093	20	36641	1832.050	0.4525
B12	0.0264	20	36151	1807.550	0.4464
B13	0.0425	20	35526	1776.300	0.4387
B14	0.0809	20	33781	1689.050	0.4172
B15	0.1227	20	33892	1694.600	0.4185
B16	0.1647	20	32785	1639.250	0.4049
B17	0.2003	20	32086	1604.300	0.3962
B18	0.2429	20	31875	1593.750	0.3936

Beta Attenuation Red A1
Set 2

Std ID	Sample Wt	Count Time	Beta Counts	DPM 4049 CPM	Sr-90 Eff
B21	0.0091	20	34015	1700.750	0.4200
B22	0.0265	20	33483	1674.150	0.4135
B23	0.0415	20	34243	1712.150	0.4229
B24	0.0830	20	33981	1699.050	0.4196
B25	0.1230	20	33733	1686.650	0.4166
B26	0.1611	20	33919	1695.950	0.4189
B27	0.1932	20	32780	1639.000	0.4048
B28	0.2421	20	31896	1594.800	0.3939

ed A1

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0093	0.0091	0.0092	0.4525	0.4200	0.4363	3.72%	-3.72%
0.0264	0.0265	0.0265	0.4464	0.4135	0.4299	3.83%	-3.83%
0.0425	0.0415	0.0420	0.4387	0.4229	0.4308	1.84%	-1.84%
0.0809	0.0830	0.0820	0.4172	0.4196	0.4184	-0.30%	0.30%
0.1227	0.1230	0.1229	0.4185	0.4166	0.4175	0.24%	-0.24%
0.1647	0.1611	0.1629	0.4049	0.4189	0.4119	-1.70%	1.70%
0.2003	0.1932	0.1968	0.3962	0.4048	0.4005	-1.07%	1.07%
0.2429	0.2421	0.2425	0.3936	0.3939	0.3937	-0.03%	0.03%



Beta Attenuation Red A2
Set 1 2/20/2007

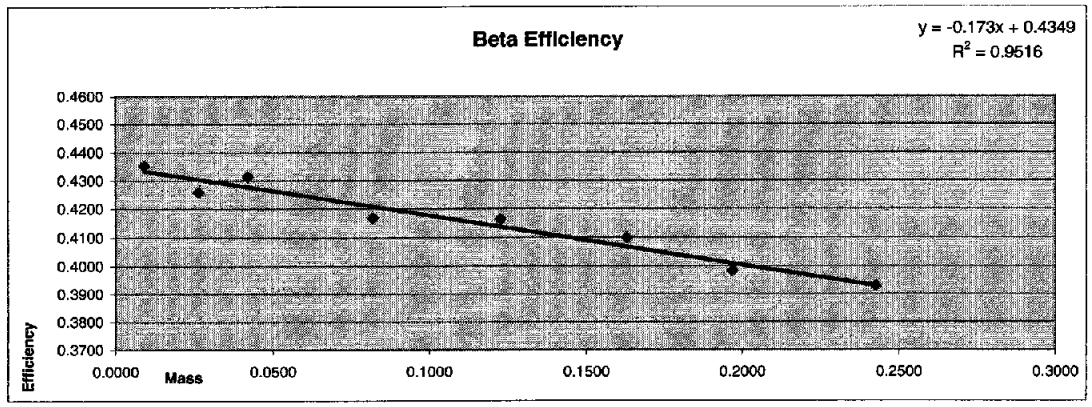
Std ID	Sample Wt	Count Time	Beta Counts	DPM 4049 CPM	Sr-90 Eff
B11	0.0093	20	36483	1824.150	0.45052
B12	0.0264	20	35673	1783.650	0.44052
B13	0.0425	20	35713	1785.650	0.44101
B14	0.0809	20	33707	1685.350	0.41624
B15	0.1227	20	33729	1686.450	0.41651
B16	0.1647	20	32740	1637.000	0.40430
B17	0.2003	20	31770	1588.500	0.39232
B18	0.2429	20	32078	1603.900	0.39612

Beta Attenuation Red A2
Set 2

Std ID	Sample Wt	Count Time	Beta Counts	DPM 4049 CPM	Sr-90 Eff
B21	0.0091	20	34007	1700.350	0.41994
B22	0.0265	20	33294	1664.700	0.41114
B23	0.0415	20	34154	1707.700	0.42176
B24	0.0830	20	33794	1689.700	0.41731
B25	0.1230	20	33697	1684.850	0.41612
B26	0.1611	20	33632	1681.600	0.41531
B27	0.1932	20	32731	1636.550	0.40419
B28	0.2421	20	31553	1577.650	0.38964

Red A2

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0093	0.0091	0.0092	0.4505	0.4199	0.4352	3.51%	-3.51%
0.0264	0.0265	0.0265	0.4405	0.4111	0.4258	3.45%	-3.45%
0.0425	0.0415	0.0420	0.4410	0.4218	0.4314	2.23%	-2.23%
0.0809	0.0830	0.0820	0.4162	0.4173	0.4168	-0.13%	0.13%
0.1227	0.1230	0.1229	0.4165	0.4161	0.4163	0.05%	-0.05%
0.1647	0.1611	0.1629	0.4043	0.4153	0.4098	-1.34%	1.34%
0.2003	0.1932	0.1968	0.3923	0.4042	0.3983	-1.49%	1.49%
0.2429	0.2421	0.2425	0.3961	0.3896	0.3929	0.83%	-0.83%



Beta Attenuation Red A3
Set 1 2/20/2007

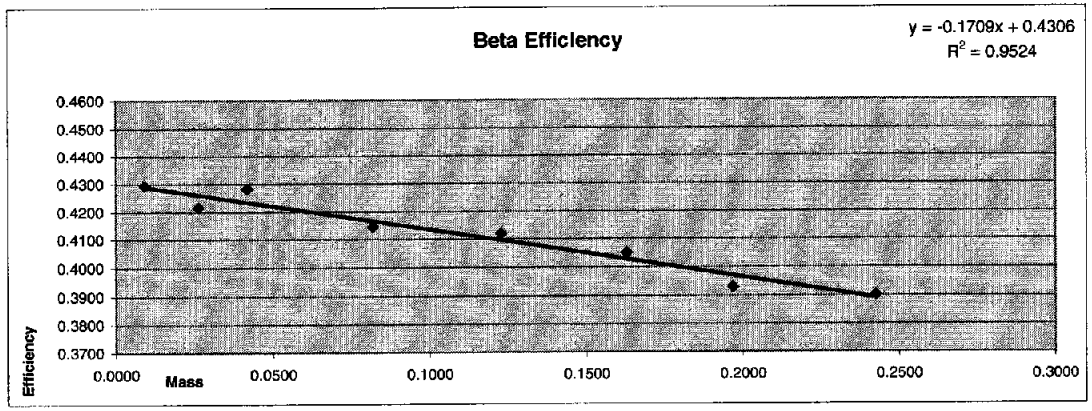
Std ID	Sample Wt	Count Time	Beta Counts	DPM 4049 CPM	Sr-90 Eff
B11	0.0093	20	35970	1798.500	0.44418
B12	0.0264	20	35416	1770.800	0.43734
B13	0.0425	20	35541	1777.050	0.43889
B14	0.0809	20	33676	1683.800	0.41586
B15	0.1227	20	33272	1663.600	0.41087
B16	0.1647	20	32397	1619.850	0.40006
B17	0.2003	20	31279	1563.950	0.38626
B18	0.2429	20	31816	1590.800	0.39289

Beta Attenuation Red A3
Set 2

Std ID	Sample Wt	Count Time	Beta Counts	DPM 4049 CPM	Sr-90 Eff
B21	0.0091	20	33560	1678.000	0.41442
B22	0.0265	20	32878	1643.900	0.40600
B23	0.0415	20	33808	1690.400	0.41749
B24	0.0830	20	33446	1672.300	0.41302
B25	0.1230	20	33432	1671.600	0.41284
B26	0.1611	20	33186	1659.300	0.40980
B27	0.1932	20	32362	1618.100	0.39963
B28	0.2421	20	31370	1568.500	0.38738

Red A3

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0093	0.0091	0.0092	0.4442	0.4144	0.4293	3.47%	-3.47%
0.0264	0.0265	0.0265	0.4373	0.4060	0.4217	3.72%	-3.72%
0.0425	0.0415	0.0420	0.4389	0.4175	0.4282	2.50%	-2.50%
0.0809	0.0830	0.0820	0.4159	0.4130	0.4144	0.34%	-0.34%
0.1227	0.1230	0.1229	0.4109	0.4128	0.4119	-0.24%	0.24%
0.1647	0.1611	0.1629	0.4001	0.4098	0.4049	-1.20%	1.20%
0.2003	0.1932	0.1968	0.3863	0.3996	0.3929	-1.70%	1.70%
0.2429	0.2421	0.2425	0.3929	0.3874	0.3901	0.71%	-0.71%



Beta Attenuation Red A4
Set 1 2/20/2007

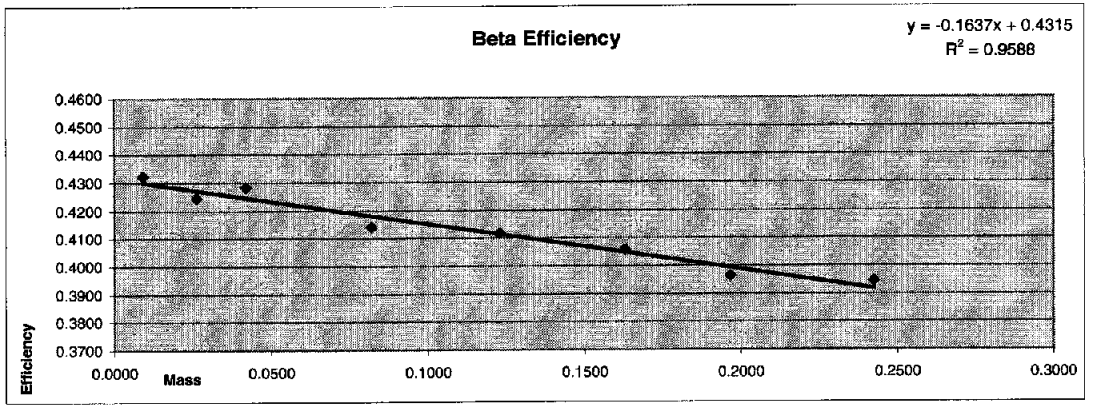
Std ID	Sample Wt	Count Time	Beta Counts	DPM 4049 CPM	Sr-90 Eff
B11	0.0093	20	35901	1795.050	0.44333
B12	0.0264	20	35590	1779.500	0.43949
B13	0.0425	20	35306	1765.300	0.43598
B14	0.0809	20	33738	1686.900	0.41662
B15	0.1227	20	33538	1676.900	0.41415
B16	0.1647	20	32295	1614.750	0.39880
B17	0.2003	20	31822	1591.100	0.39296
B18	0.2429	20	32026	1601.300	0.39548

Beta Attenuation Red A4
Set 2

Std ID	Sample Wt	Count Time	Beta Counts	DPM 4049 CPM	Sr-90 Eff
B21	0.0091	20	34085	1704.250	0.42091
B22	0.0265	20	33172	1658.600	0.40963
B23	0.0415	20	34073	1703.650	0.42076
B24	0.0830	20	33310	1665.500	0.41134
B25	0.1230	20	33153	1657.650	0.40940
B26	0.1611	20	33405	1670.250	0.41251
B27	0.1932	20	32372	1618.600	0.39975
B28	0.2421	20	31848	1592.400	0.39328

Red A4

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0093	0.0091	0.0092	0.4433	0.4209	0.4321	2.59%	-2.59%
0.0264	0.0265	0.0265	0.4395	0.4096	0.4246	3.52%	-3.52%
0.0425	0.0415	0.0420	0.4360	0.4208	0.4284	1.78%	-1.78%
0.0809	0.0830	0.0820	0.4166	0.4113	0.4140	0.64%	-0.64%
0.1227	0.1230	0.1229	0.4142	0.4094	0.4118	0.58%	-0.58%
0.1647	0.1611	0.1629	0.3988	0.4125	0.4057	-1.69%	1.69%
0.2003	0.1932	0.1968	0.3930	0.3998	0.3964	-0.86%	0.86%
0.2429	0.2421	0.2425	0.3955	0.3933	0.3944	0.28%	-0.28%



Beta Attenuation Red B1
Set 1 2/20/2007

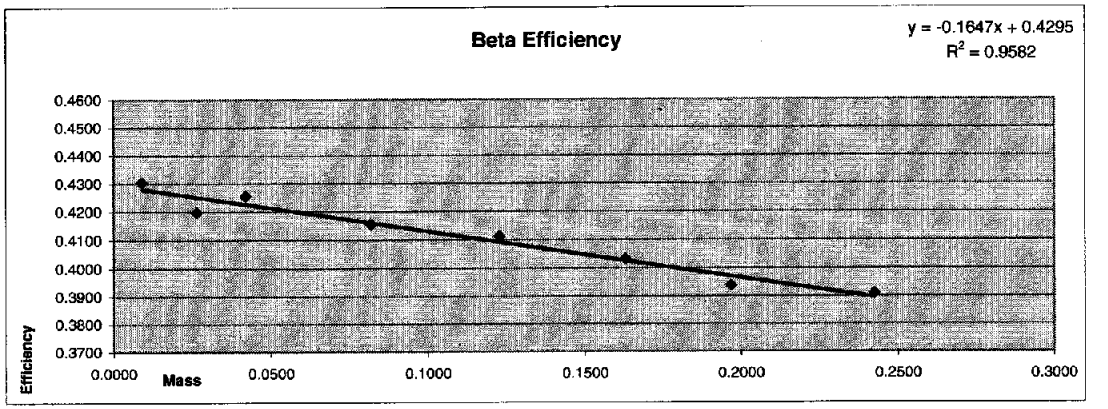
Std ID	Sample Wt	Count Time	Beta Counts	DPM 4049 CPM	Sr-90 Eff
B11	0.0093	20	35948	1797.400	0.44391
B12	0.0264	20	35517	1775.850	0.43859
B13	0.0425	20	35113	1755.650	0.43360
B14	0.0809	20	33515	1675.750	0.41387
B15	0.1227	20	33041	1652.050	0.40801
B16	0.1647	20	32342	1617.100	0.39938
B17	0.2003	20	31314	1565.700	0.38669
B18	0.2429	20	31896	1594.800	0.39388

Beta Attenuation Red B1
Set 2

Std ID	Sample Wt	Count Time	Beta Counts	DPM 4049 CPM	Sr-90 Eff
B21	0.0091	20	33747	1687.350	0.41673
B22	0.0265	20	32471	1623.550	0.40098
B23	0.0415	20	33788	1689.400	0.41724
B24	0.0830	20	33772	1688.600	0.41704
B25	0.1230	20	33560	1678.000	0.41442
B26	0.1611	20	32982	1649.100	0.40729
B27	0.1932	20	32462	1623.100	0.40086
B28	0.2421	20	31432	1571.600	0.38815

Red B1

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0093	0.0091	0.0092	0.4439	0.4167	0.4303	3.16%	-3.16%
0.0264	0.0265	0.0265	0.4386	0.4010	0.4198	4.48%	-4.48%
0.0425	0.0415	0.0420	0.4336	0.4172	0.4254	1.92%	-1.92%
0.0809	0.0830	0.0820	0.4139	0.4170	0.4155	-0.38%	0.38%
0.1227	0.1230	0.1229	0.4080	0.4144	0.4112	-0.78%	0.78%
0.1647	0.1611	0.1629	0.3994	0.4073	0.4033	-0.98%	0.98%
0.2003	0.1932	0.1968	0.3867	0.4009	0.3938	-1.80%	1.80%
0.2429	0.2421	0.2425	0.3939	0.3881	0.3910	0.73%	-0.73%



Beta Attenuation Red B2
Set 1 2/20/2007

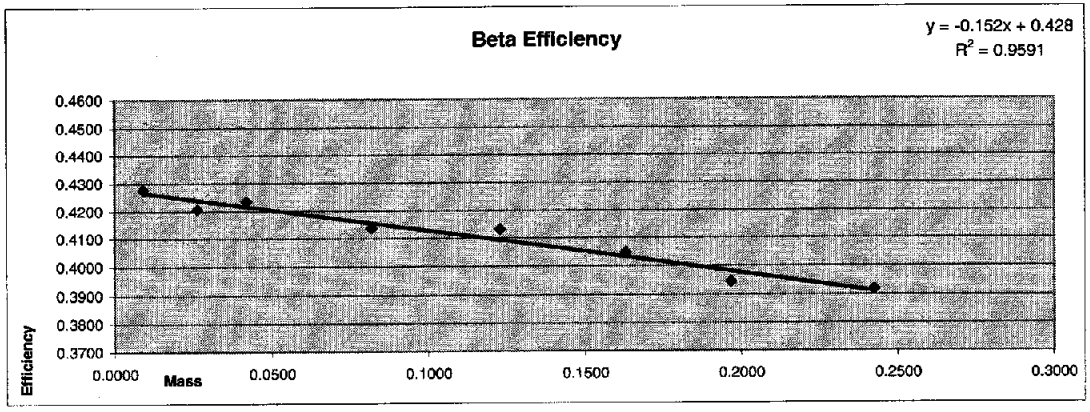
Std ID	Sample Wt	Count Time	Beta Counts	DPM 4049 CPM	Sr-90 Eff
B11	0.0093	20	35896	1794.800	0.44327
B12	0.0264	20	35424	1771.200	0.43744
B13	0.0425	20	34941	1747.050	0.43148
B14	0.0809	20	33501	1675.050	0.41369
B15	0.1227	20	33478	1673.900	0.41341
B16	0.1647	20	32241	1612.050	0.39814
B17	0.2003	20	31771	1588.550	0.39233
B18	0.2429	20	31978	1598.900	0.39489

Beta Attenuation Red B2
Set 2

Std ID	Sample Wt	Count Time	Beta Counts	DPM 4049 CPM	Sr-90 Eff
B21	0.0091	20	33363	1668.150	0.41199
B22	0.0265	20	32697	1634.850	0.40377
B23	0.0415	20	33640	1682.000	0.41541
B24	0.0830	20	33508	1675.400	0.41378
B25	0.1230	20	33425	1671.250	0.41276
B26	0.1611	20	33309	1665.450	0.41132
B27	0.1932	20	32100	1605.000	0.39639
B28	0.2421	20	31483	1574.150	0.38878

Red B2

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0093	0.0091	0.0092	0.4433	0.4120	0.4276	3.66%	-3.66%
0.0264	0.0265	0.0265	0.4374	0.4038	0.4206	4.00%	-4.00%
0.0425	0.0415	0.0420	0.4315	0.4154	0.4234	1.90%	-1.90%
0.0809	0.0830	0.0820	0.4137	0.4138	0.4137	-0.01%	0.01%
0.1227	0.1230	0.1229	0.4134	0.4128	0.4131	0.08%	-0.08%
0.1647	0.1611	0.1629	0.3981	0.4113	0.4047	-1.63%	1.63%
0.2003	0.1932	0.1968	0.3923	0.3964	0.3944	-0.52%	0.52%
0.2429	0.2421	0.2425	0.3949	0.3888	0.3918	0.78%	-0.78%



Beta Attenuation Red B3
Set 1 2/20/2007

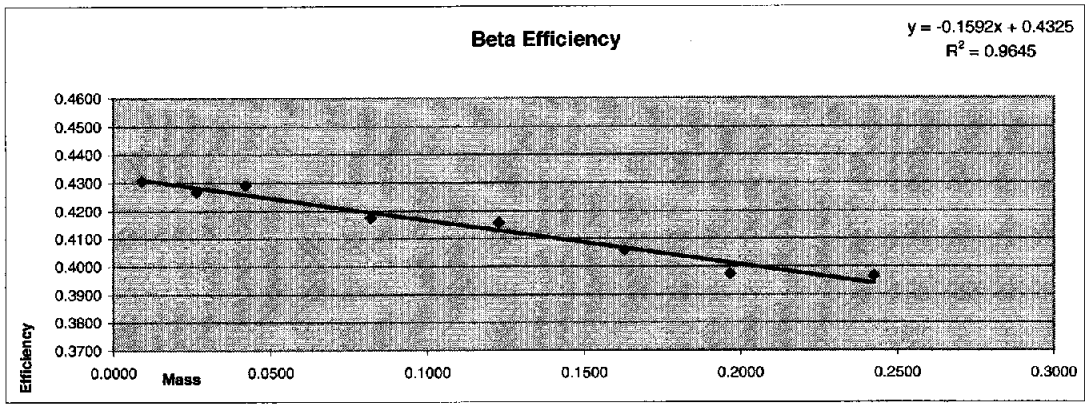
Std ID	Sample Wt	Count Time	Beta Counts	DPM 4049 CPM	Sr-90 Eff
B11	0.0093	20	36165	1808.250	0.44659
B12	0.0264	20	35905	1795.250	0.44338
B13	0.0425	20	35529	1776.450	0.43874
B14	0.0809	20	33494	1674.700	0.41361
B15	0.1227	20	33701	1685.050	0.41616
B16	0.1647	20	32748	1637.400	0.40440
B17	0.2003	20	31786	1589.300	0.39252
B18	0.2429	20	32163	1608.150	0.39717

Beta Attenuation Red B3
Set 2

Std ID	Sample Wt	Count Time	Beta Counts	DPM 4049 CPM	Sr-90 Eff
B21	0.0091	20	33597	1679.850	0.41488
B22	0.0265	20	33215	1660.750	0.41016
B23	0.0415	20	33958	1697.900	0.41934
B24	0.0830	20	34130	1706.500	0.42146
B25	0.1230	20	33627	1681.350	0.41525
B26	0.1611	20	32981	1649.050	0.40727
B27	0.1932	20	32552	1627.600	0.40198
B28	0.2421	20	32065	1603.250	0.39596

Red B3

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0093	0.0091	0.0092	0.4466	0.4149	0.4307	3.68%	-3.68%
0.0264	0.0265	0.0265	0.4434	0.4102	0.4268	3.89%	-3.89%
0.0425	0.0415	0.0420	0.4387	0.4193	0.4290	2.26%	-2.26%
0.0809	0.0830	0.0820	0.4136	0.4215	0.4175	-0.94%	0.94%
0.1227	0.1230	0.1229	0.4162	0.4153	0.4157	0.11%	-0.11%
0.1647	0.1611	0.1629	0.4044	0.4073	0.4058	-0.35%	0.35%
0.2003	0.1932	0.1968	0.3925	0.4020	0.3972	-1.19%	1.19%
0.2429	0.2421	0.2425	0.3972	0.3960	0.3966	0.15%	-0.15%



Beta Attenuation Red B4
Set 1 2/20/2007

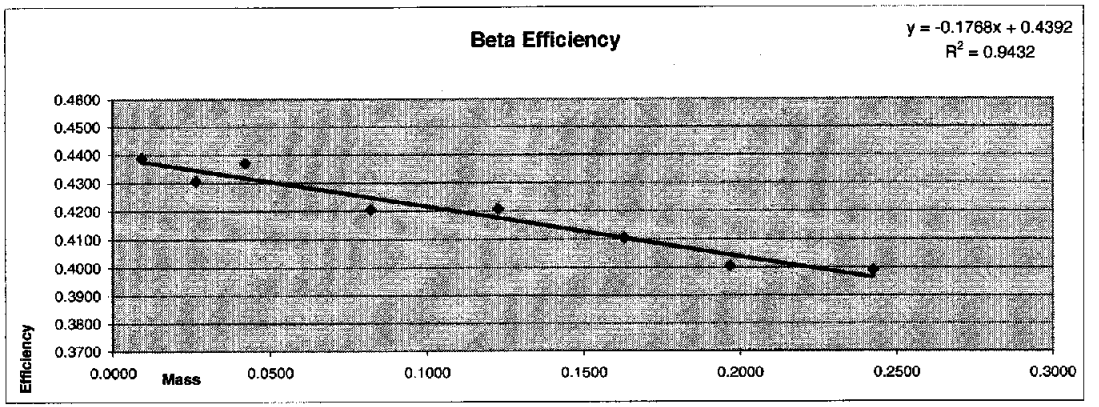
Std ID	Sample Wt	Count Time	Beta Counts	DPM 4049 CPM	Sr-90 Eff
B11	0.0093	20	36737	1836.850	0.45366
B12	0.0264	20	36371	1818.550	0.44914
B13	0.0425	20	36215	1810.750	0.44721
B14	0.0809	20	34203	1710.150	0.42236
B15	0.1227	20	34350	1717.500	0.42418
B16	0.1647	20	32719	1635.950	0.40404
B17	0.2003	20	32068	1603.400	0.39600
B18	0.2429	20	32381	1619.050	0.39986

Beta Attenuation Red B4
Set 2

Std ID	Sample Wt	Count Time	Beta Counts	DPM 4049 CPM	Sr-90 Eff
B21	0.0091	20	34341	1717.050	0.42407
B22	0.0265	20	33379	1668.950	0.41219
B23	0.0415	20	34576	1728.800	0.42697
B24	0.0830	20	33890	1694.500	0.41850
B25	0.1230	20	33773	1688.650	0.41705
B26	0.1611	20	33753	1687.650	0.41681
B27	0.1932	20	32797	1639.850	0.40500
B28	0.2421	20	32234	1611.700	0.39805

Red B4

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0093	0.0091	0.0092	0.4537	0.4241	0.4389	3.37%	-3.37%
0.0264	0.0265	0.0265	0.4491	0.4122	0.4307	4.29%	-4.29%
0.0425	0.0415	0.0420	0.4472	0.4270	0.4371	2.32%	-2.32%
0.0809	0.0830	0.0820	0.4224	0.4185	0.4204	0.46%	-0.46%
0.1227	0.1230	0.1229	0.4242	0.4171	0.4206	0.85%	-0.85%
0.1647	0.1611	0.1629	0.4040	0.4168	0.4104	-1.56%	1.56%
0.2003	0.1932	0.1968	0.3960	0.4050	0.4005	-1.12%	1.12%
0.2429	0.2421	0.2425	0.3999	0.3980	0.3990	0.23%	-0.23%



Beta Attenuation Red C1
Set 1 2/20/2007

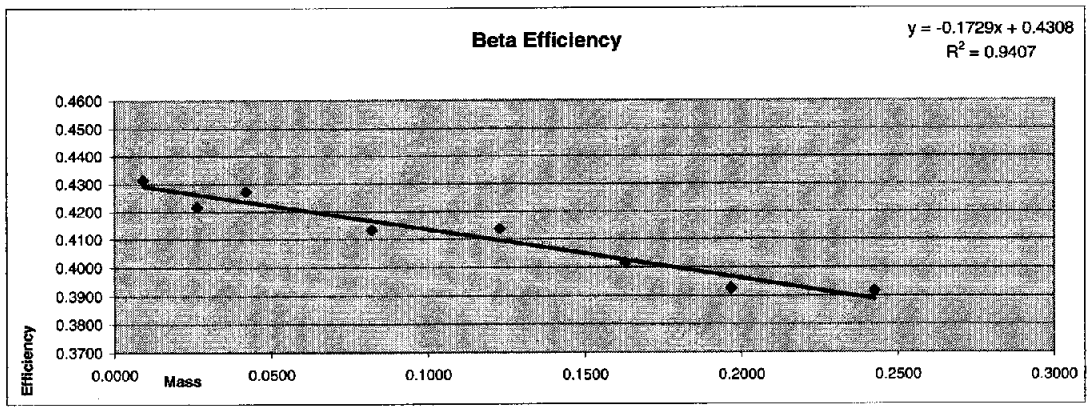
Std ID	Sample Wt	Count Time	Beta Counts	DPM 4049 CPM	Sr-90 Eff
B11	0.0093	20	36130	1806.500	0.44616
B12	0.0264	20	35498	1774.900	0.43836
B13	0.0425	20	35255	1762.750	0.43535
B14	0.0809	20	33516	1675.800	0.41388
B15	0.1227	20	33408	1670.400	0.41255
B16	0.1647	20	32316	1615.800	0.39906
B17	0.2003	20	31331	1566.550	0.38690
B18	0.2429	20	31736	1586.800	0.39190

Beta Attenuation Red C1
Set 2 2/28/2007

Std ID	Sample Wt	Count Time	Beta Counts	DPM 4047 CPM	Sr-90 Eff
B21	0.0091	20	33737	1686.850	0.41681
B22	0.0265	20	32781	1639.050	0.40500
B23	0.0415	20	33927	1696.350	0.41916
B24	0.0830	20	33397	1669.850	0.41261
B25	0.1230	20	33585	1679.250	0.41494
B26	0.1611	20	32710	1635.500	0.40413
B27	0.1932	20	32233	1611.650	0.39823
B28	0.2421	20	31685	1584.250	0.39146

Red C1

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0093	0.0091	0.0092	0.4462	0.4168	0.4315	3.40%	-3.40%
0.0264	0.0265	0.0265	0.4384	0.4050	0.4217	3.95%	-3.95%
0.0425	0.0415	0.0420	0.4354	0.4192	0.4273	1.89%	-1.89%
0.0809	0.0830	0.0820	0.4139	0.4126	0.4132	0.15%	-0.15%
0.1227	0.1230	0.1229	0.4125	0.4149	0.4137	-0.29%	0.29%
0.1647	0.1611	0.1629	0.3991	0.4041	0.4016	-0.63%	0.63%
0.2003	0.1932	0.1968	0.3869	0.3982	0.3926	-1.44%	1.44%
0.2429	0.2421	0.2425	0.3919	0.3915	0.3917	0.06%	-0.06%



Beta Attenuation Red C2
Set 1 2/20/2007

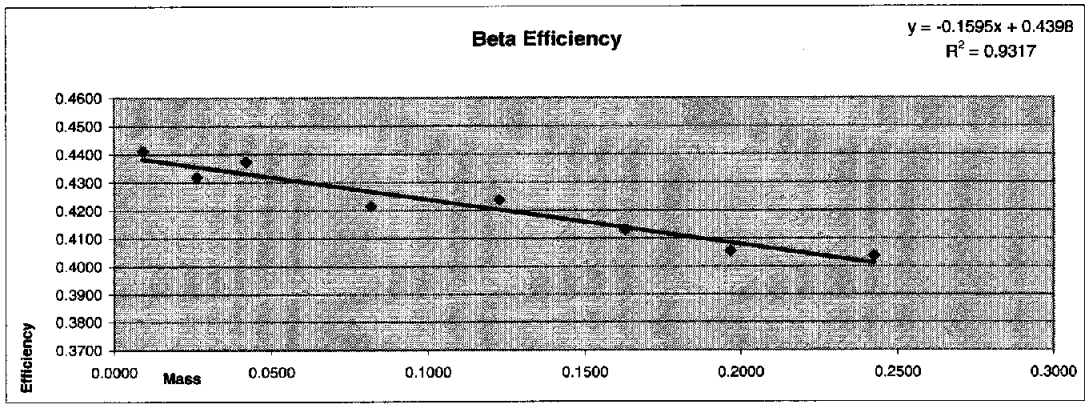
Std ID	Sample Wt	Count Time	Beta Counts	DPM 4049 CPM	Sr-90 Eff
B11	0.0093	20	36818	1840.900	0.45466
B12	0.0264	20	36386	1819.300	0.44932
B13	0.0425	20	36089	1804.450	0.44565
B14	0.0809	20	34199	1709.950	0.42231
B15	0.1227	20	34271	1713.550	0.42320
B16	0.1647	20	32889	1644.450	0.40614
B17	0.2003	20	32319	1615.950	0.39910
B18	0.2429	20	32795	1639.750	0.40498

Beta Attenuation Red C2
Set 2 2/28/2007

Std ID	Sample Wt	Count Time	Beta Counts	DPM 4047 CPM	Sr-90 Eff
B21	0.0091	20	34591	1729.550	0.42737
B22	0.0265	20	33549	1677.450	0.41449
B23	0.0415	20	34714	1735.700	0.42889
B24	0.0830	20	34049	1702.450	0.42067
B25	0.1230	20	34338	1716.900	0.42424
B26	0.1611	20	33987	1699.350	0.41990
B27	0.1932	20	33331	1666.550	0.41180
B28	0.2421	20	32585	1629.250	0.40258

Red C2

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0093	0.0091	0.0092	0.4547	0.4274	0.4410	3.09%	-3.09%
0.0264	0.0265	0.0265	0.4493	0.4145	0.4319	4.03%	-4.03%
0.0425	0.0415	0.0420	0.4457	0.4289	0.4373	1.92%	-1.92%
0.0809	0.0830	0.0820	0.4223	0.4207	0.4215	0.20%	-0.20%
0.1227	0.1230	0.1229	0.4232	0.4242	0.4237	-0.12%	0.12%
0.1647	0.1611	0.1629	0.4061	0.4199	0.4130	-1.67%	1.67%
0.2003	0.1932	0.1968	0.3991	0.4118	0.4054	-1.57%	1.57%
0.2429	0.2421	0.2425	0.4050	0.4026	0.4038	0.30%	-0.30%



Beta Attenuation Red C3
Set 1 2/20/2007

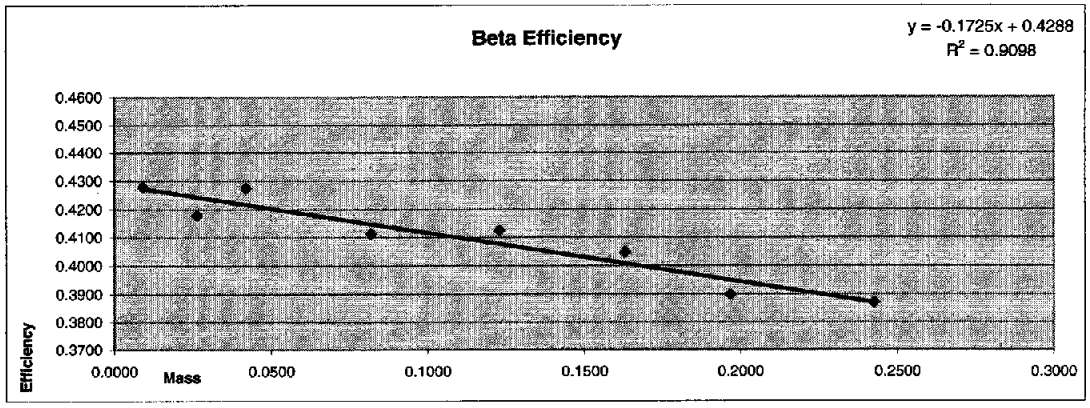
Std ID	Sample Wt	Count Time	Beta Counts	DPM 4049 CPM	Sr-90 Eff
B11	0.0093	20	35516	1775.800	0.43858
B12	0.0264	20	35358	1767.900	0.43663
B13	0.0425	20	35243	1762.150	0.43521
B14	0.0809	20	33214	1660.700	0.41015
B15	0.1227	20	33470	1673.500	0.41331
B16	0.1647	20	32308	1615.400	0.39896
B17	0.2003	20	31172	1558.600	0.38493
B18	0.2429	20	31341	1567.050	0.38702

Beta Attenuation Red C3
Set 2 2/28/2007

Std ID	Sample Wt	Count Time	Beta Counts	DPM 4047 CPM	Sr-90 Eff
B21	0.0091	20	33752	1687.600	0.41700
B22	0.0265	20	32318	1615.900	0.39928
B23	0.0415	20	33953	1697.650	0.41948
B24	0.0830	20	33375	1668.750	0.41234
B25	0.1230	20	33306	1665.300	0.41149
B26	0.1611	20	33210	1660.500	0.41030
B27	0.1932	20	31939	1596.950	0.39460
B28	0.2421	20	31319	1565.950	0.38694

Red C3

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0093	0.0091	0.0092	0.4386	0.4170	0.4278	2.52%	-2.52%
0.0264	0.0265	0.0265	0.4366	0.3993	0.4180	4.47%	-4.47%
0.0425	0.0415	0.0420	0.4352	0.4195	0.4273	1.84%	-1.84%
0.0809	0.0830	0.0820	0.4102	0.4123	0.4112	-0.27%	0.27%
0.1227	0.1230	0.1229	0.4133	0.4115	0.4124	0.22%	-0.22%
0.1647	0.1611	0.1629	0.3990	0.4103	0.4046	-1.40%	1.40%
0.2003	0.1932	0.1968	0.3849	0.3946	0.3898	-1.24%	1.24%
0.2429	0.2421	0.2425	0.3870	0.3869	0.3870	0.01%	-0.01%



Beta Attenuation Red C4
Set 1 2/20/2007

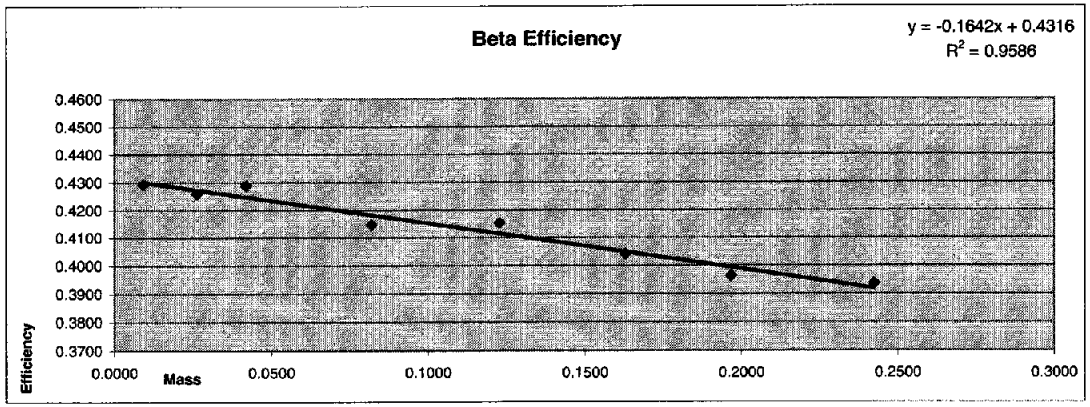
Std ID	Sample Wt	Count Time	Beta Counts	DPM 4049 CPM	Sr-90 Eff
B11	0.0093	20	35706	1785.300	0.44092
B12	0.0264	20	35907	1795.350	0.44341
B13	0.0425	20	35606	1780.300	0.43969
B14	0.0809	20	33692	1684.600	0.41605
B15	0.1227	20	33731	1686.550	0.41653
B16	0.1647	20	32292	1614.600	0.39877
B17	0.2003	20	31840	1592.000	0.39318
B18	0.2429	20	31816	1590.800	0.39289

Beta Attenuation Red C4
Set 2 2/28/2007

Std ID	Sample Wt	Count Time	Beta Counts	DPM 4047 CPM	Sr-90 Eff
B21	0.0091	20	33789	1689.450	0.41746
B22	0.0265	20	33056	1652.800	0.40840
B23	0.0415	20	33832	1691.600	0.41799
B24	0.0830	20	33453	1672.650	0.41331
B25	0.1230	20	33489	1674.450	0.41375
B26	0.1611	20	33134	1656.700	0.40936
B27	0.1932	20	32316	1615.800	0.39926
B28	0.2421	20	31918	1595.900	0.39434

Red C4

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0093	0.0091	0.0092	0.4409	0.4175	0.4292	2.73%	-2.73%
0.0264	0.0265	0.0265	0.4434	0.4084	0.4259	4.11%	-4.11%
0.0425	0.0415	0.0420	0.4397	0.4180	0.4288	2.53%	-2.53%
0.0809	0.0830	0.0820	0.4161	0.4133	0.4147	0.33%	-0.33%
0.1227	0.1230	0.1229	0.4165	0.4138	0.4151	0.34%	-0.34%
0.1647	0.1611	0.1629	0.3988	0.4094	0.4041	-1.31%	1.31%
0.2003	0.1932	0.1968	0.3932	0.3993	0.3962	-0.77%	0.77%
0.2429	0.2421	0.2425	0.3929	0.3943	0.3936	-0.18%	0.18%



Beta Attenuation Red D1
Set 1 2/20/2007

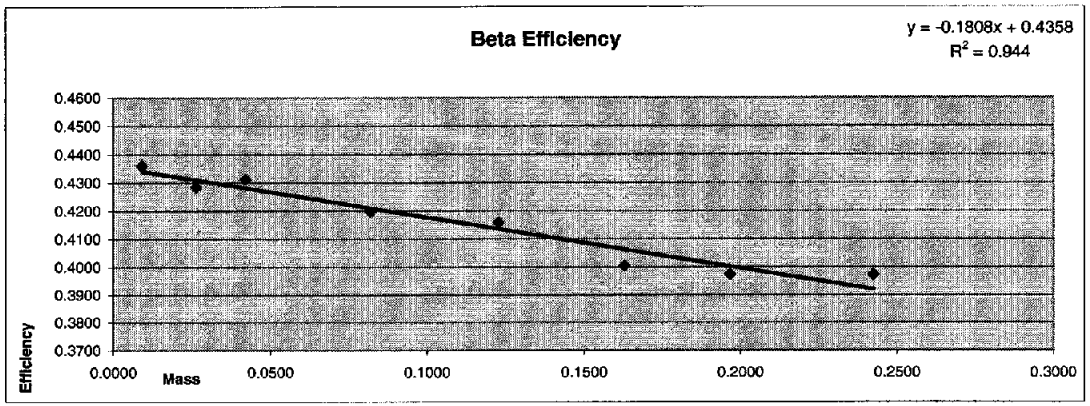
Std ID	Sample Wt	Count Time	Beta Counts	DPM 4049 CPM	Sr-90 Eff
B11	0.0093	20	36492	1824.600	0.45063
B12	0.0264	20	36171	1808.550	0.44667
B13	0.0425	20	35442	1772.100	0.43766
B14	0.0809	20	34013	1700.650	0.42002
B15	0.1227	20	33794	1689.700	0.41731
B16	0.1647	20	32781	1639.050	0.40480
B17	0.2003	20	31870	1593.500	0.39355
B18	0.2429	20	32080	1604.000	0.39615

Beta Attenuation Red D1
Set 2 2/28/2007

Std ID	Sample Wt	Count Time	Beta Counts	DPM 4047 CPM	Sr-90 Eff
B21	0.0091	20	34113	1705.650	0.42146
B22	0.0265	20	33200	1660.000	0.41018
B23	0.0415	20	34391	1719.550	0.42489
B24	0.0830	20	33941	1697.050	0.41934
B25	0.1230	20	33550	1677.500	0.41450
B26	0.1611	20	32037	1601.850	0.39581
B27	0.1932	20	32472	1623.600	0.40119
B28	0.2421	20	32220	1611.000	0.39807

Red D1

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0093	0.0091	0.0092	0.4506	0.4215	0.4360	3.34%	-3.34%
0.0264	0.0265	0.0265	0.4467	0.4102	0.4284	4.26%	-4.26%
0.0425	0.0415	0.0420	0.4377	0.4249	0.4313	1.48%	-1.48%
0.0809	0.0830	0.0820	0.4200	0.4193	0.4197	0.08%	-0.08%
0.1227	0.1230	0.1229	0.4173	0.4145	0.4159	0.34%	-0.34%
0.1647	0.1611	0.1629	0.4048	0.3958	0.4003	1.12%	-1.12%
0.2003	0.1932	0.1968	0.3936	0.4012	0.3974	-0.96%	0.96%
0.2429	0.2421	0.2425	0.3961	0.3981	0.3971	-0.24%	0.24%



Beta Attenuation Red D2
Set 1 2/20/2007

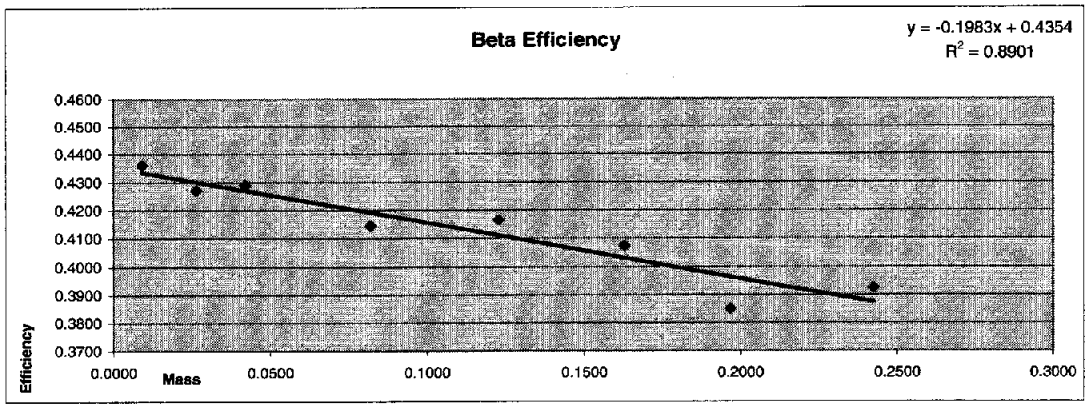
Std ID	Sample Wt	Count Time	Beta Counts	DPM 4049 CPM	Sr-90 Eff
B11	0.0093	20	36492	1824.600	0.45063
B12	0.0264	20	36171	1808.550	0.44667
B13	0.0425	20	35442	1772.100	0.43766
B14	0.0809	20	34013	1700.650	0.42002
B15	0.1227	20	33794	1689.700	0.41731
B16	0.1647	20	32781	1639.050	0.40480
B17	0.2003	20	31870	1593.500	0.39355
B18	0.2429	20	32080	1604.000	0.39615

Beta Attenuation Red D2
Set 2 2/28/2007

Std ID	Sample Wt	Count Time	Beta Counts	DPM 4047 CPM	Sr-90 Eff
B21	0.0091	20	34105	1705.250	0.42136
B22	0.0265	20	32987	1649.350	0.40755
B23	0.0415	20	34014	1700.700	0.42024
B24	0.0830	20	33086	1654.300	0.40877
B25	0.1230	20	33642	1682.100	0.41564
B26	0.1611	20	33174	1658.700	0.40986
B27	0.1932	20	30463	1523.150	0.37637
B28	0.2421	20	31464	1573.200	0.38873

Red D2

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0093	0.0091	0.0092	0.4506	0.4214	0.4360	3.36%	-3.36%
0.0264	0.0265	0.0265	0.4467	0.4075	0.4271	4.58%	-4.58%
0.0425	0.0415	0.0420	0.4377	0.4202	0.4290	2.03%	-2.03%
0.0809	0.0830	0.0820	0.4200	0.4088	0.4144	1.36%	-1.36%
0.1227	0.1230	0.1229	0.4173	0.4156	0.4165	0.20%	-0.20%
0.1647	0.1611	0.1629	0.4048	0.4099	0.4073	-0.62%	0.62%
0.2003	0.1932	0.1968	0.3936	0.3764	0.3850	2.23%	-2.23%
0.2429	0.2421	0.2425	0.3961	0.3887	0.3924	0.94%	-0.94%



Beta Attenuation Red D3
Set 1 2/20/2007

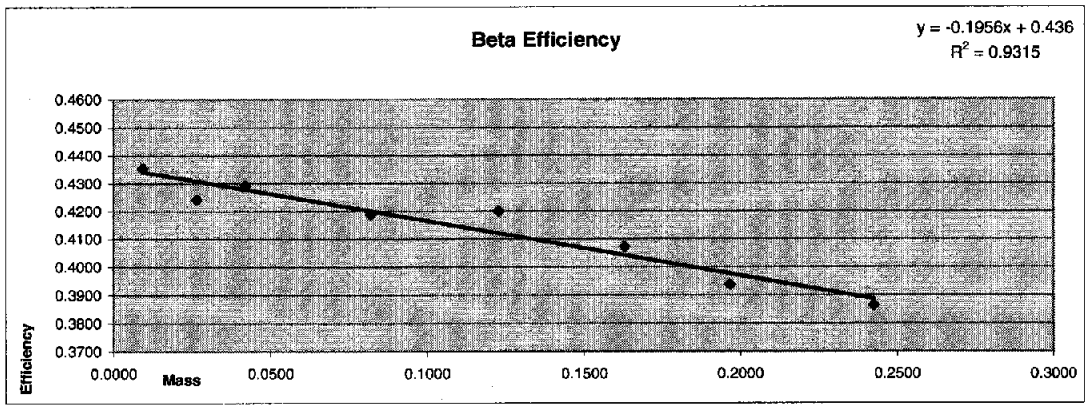
Std ID	Sample Wt	Count Time	Beta Counts	DPM 4049 CPM	Sr-90 Eff
B11	0.0093	20	36168	1808.400	0.44663
B12	0.0264	20	35426	1771.300	0.43747
B13	0.0425	20	35378	1768.900	0.43687
B14	0.0809	20	34054	1702.700	0.42052
B15	0.1227	20	34143	1707.150	0.42162
B16	0.1647	20	32519	1625.950	0.40157
B17	0.2003	20	31724	1586.200	0.39175
B18	0.2429	20	32163	1608.150	0.39717

Beta Attenuation Red D3
Set 2

Std ID	Sample Wt	Count Time	Beta Counts	DPM 4047 CPM	Sr-90 Eff
B21	0.0091	20	34339	1716.950	0.42425
B22	0.0265	20	33265	1663.250	0.41098
B23	0.0415	20	34115	1705.750	0.42149
B24	0.0830	20	33751	1687.550	0.41699
B25	0.1230	20	33861	1693.050	0.41835
B26	0.1611	20	33421	1671.050	0.41291
B27	0.1932	20	32016	1600.800	0.39555
B28	0.2421	20	30391	1519.550	0.37548

Red D3

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0093	0.0091	0.0092	0.4466	0.4243	0.4354	2.57%	-2.57%
0.0264	0.0265	0.0265	0.4375	0.4110	0.4242	3.12%	-3.12%
0.0425	0.0415	0.0420	0.4369	0.4215	0.4292	1.79%	-1.79%
0.0809	0.0830	0.0820	0.4205	0.4170	0.4188	0.42%	-0.42%
0.1227	0.1230	0.1229	0.4216	0.4183	0.4200	0.39%	-0.39%
0.1647	0.1611	0.1629	0.4016	0.4129	0.4072	-1.39%	1.39%
0.2003	0.1932	0.1968	0.3918	0.3956	0.3937	-0.48%	0.48%
0.2429	0.2421	0.2425	0.3972	0.3755	0.3863	2.81%	-2.81%



Beta Attenuation Red D4
Set 1 2/20/2007

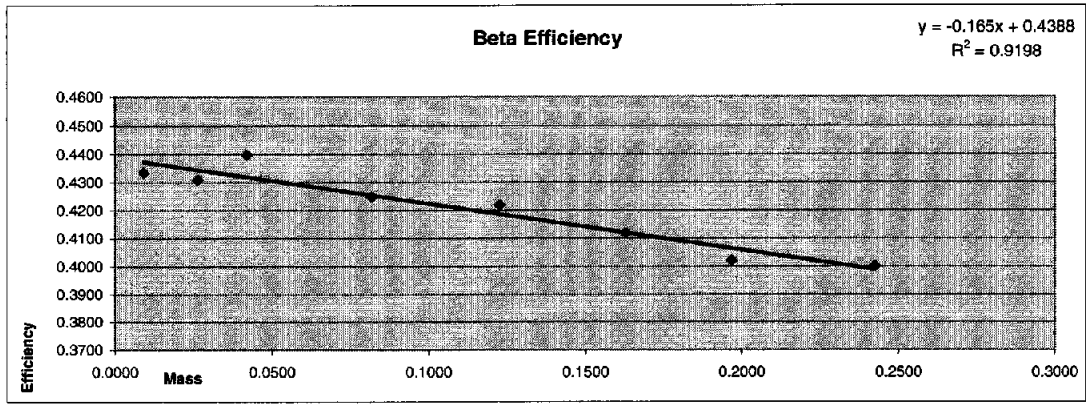
Std ID	Sample Wt	Count Time	Beta Counts	DPM 4049 CPM	Sr-90 Eff
B11	0.0093	20	36834	1841.700	0.45485
B12	0.0264	20	36252	1812.600	0.44767
B13	0.0425	20	36452	1822.600	0.45014
B14	0.0809	20	34339	1716.950	0.42404
B15	0.1227	20	34119	1705.950	0.42133
B16	0.1647	20	32938	1646.900	0.40674
B17	0.2003	20	32132	1606.600	0.39679
B18	0.2429	20	32653	1632.650	0.40322

Beta Attenuation Red D4
Set 2

Std ID	Sample Wt	Count Time	Beta Counts	DPM 4047 CPM	Sr-90 Eff
B21	0.0091	20	33363	1668.150	0.41219
B22	0.0265	20	33515	1675.750	0.41407
B23	0.0415	20	34758	1737.900	0.42943
B24	0.0830	20	34434	1721.700	0.42543
B25	0.1230	20	34169	1708.450	0.42215
B26	0.1611	20	33747	1687.350	0.41694
B27	0.1932	20	32970	1648.500	0.40734
B28	0.2421	20	32139	1606.950	0.39707

Red D4

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0093	0.0091	0.0092	0.4549	0.4122	0.4335	4.92%	-4.92%
0.0264	0.0265	0.0265	0.4477	0.4141	0.4309	3.90%	-3.90%
0.0425	0.0415	0.0420	0.4501	0.4294	0.4398	2.35%	-2.35%
0.0809	0.0830	0.0820	0.4240	0.4254	0.4247	-0.16%	0.16%
0.1227	0.1230	0.1229	0.4213	0.4222	0.4217	-0.10%	0.10%
0.1647	0.1611	0.1629	0.4067	0.4169	0.4118	-1.24%	1.24%
0.2003	0.1932	0.1968	0.3968	0.4073	0.4021	-1.31%	1.31%
0.2429	0.2421	0.2425	0.4032	0.3971	0.4001	0.77%	-0.77%

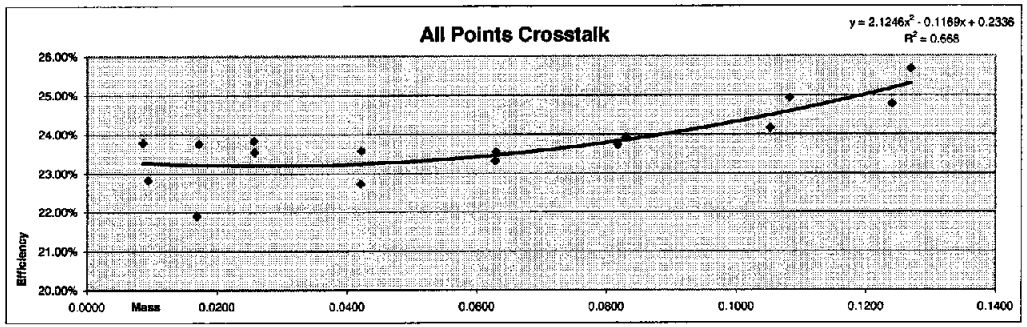


TestAmerica STL

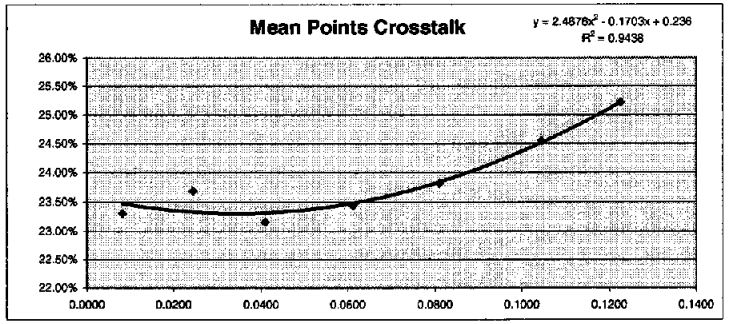
Red 2007

Crosstalk Correction Curves

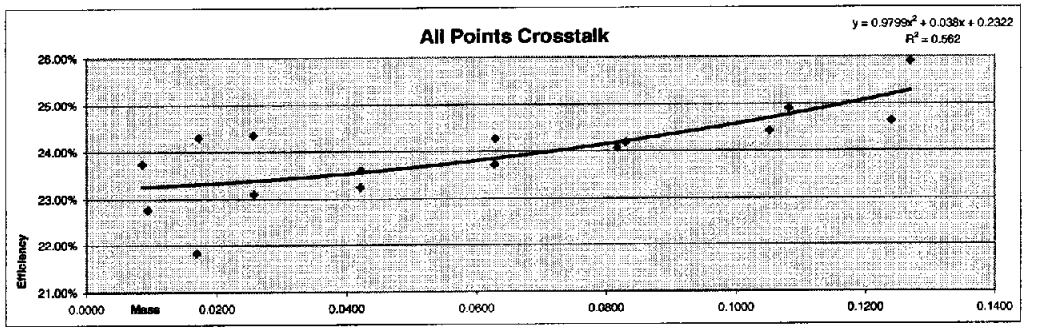
Red A1 Detector ID	Sample ID	Mass	Count Time	Alpha Counts	Beta Counts	Alpha CPM	Beta CPM	% α into β	
0	A11	0.0094	40.00	35745	10574	893.63	264.35	22.83%	Min
0	A12	0.0169	40.00	38711	10857	967.78	271.43	21.90%	21.90%
0	A13	0.0257	40.00	27785	8558	694.63	213.95	23.55%	
0	A14	0.0421	40.00	26048	7663	651.20	191.58	22.73%	Max
0	A15	0.0629	40.00	19799	6101	494.98	152.53	23.56%	25.68%
0	A16	0.0817	40.00	37913	11792	947.83	294.80	23.72%	
0	A17	0.1052	40.00	32239	10270	805.95	256.75	24.16%	Mean
0	A18	0.1240	40.00	28324	9324	708.10	233.10	24.77%	23.75%
0	A21	0.0086	40.00	32650	10189	816.25	254.73	23.76%	
0	A22	0.0172	40.00	27673	8624	691.83	215.60	23.76%	
0	A23	0.0256	40.00	26220	8205	655.50	205.13	23.83%	
0	A24	0.0422	40.00	25802	7961	645.05	199.03	23.58%	
0	A25	0.0628	40.00	23582	7175	589.55	179.38	23.33%	
0	A26	0.0830	40.00	37518	11793	937.95	294.83	23.92%	
0	A27	0.1082	40.00	32891	10924	822.28	273.10	24.93%	
0	A28	0.1269	40.00	28219	9749	705.48	243.73	25.68%	



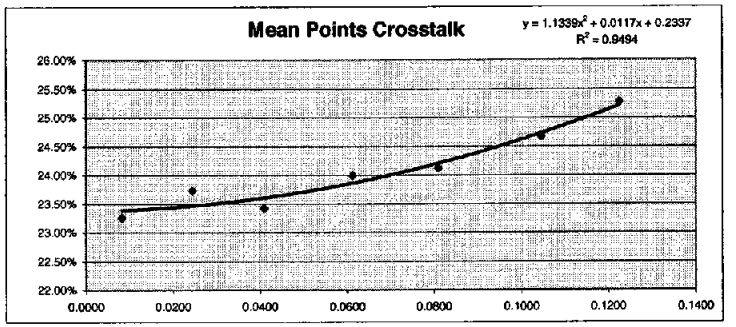
Red A1 Mean Mass	Mean % α into β	
0.0083	23.31%	Min
0.0245	23.69%	22.83%
0.0409	23.16%	Max
0.0612	23.44%	25.22%
0.0811	23.82%	Mean
0.1046	24.55%	23.75%
0.1226	25.22%	



Red A2 Detector ID	Sample ID	Mass	Count Time	Alpha Counts	Beta Counts	Alpha CPM	Beta CPM	% α into β	
0	A11	0.0094	40.00	34631	10207	865.78	255.18	22.76%	Min
0	A12	0.0169	40.00	38079	10632	951.98	265.80	21.83%	21.83%
0	A13	0.0257	40.00	27234	8181	680.85	204.53	23.10%	
0	A14	0.0421	40.00	25024	7578	625.60	189.45	23.24%	Max
0	A15	0.0629	40.00	19303	6186	482.58	154.65	24.27%	25.90%
0	A16	0.0817	40.00	36805	11662	920.13	291.55	24.06%	
0	A17	0.1052	40.00	30735	9933	768.38	248.33	24.42%	Mean
0	A18	0.1240	40.00	27563	9015	689.08	225.38	24.65%	23.94%
0	A21	0.0086	40.00	32366	10079	809.15	251.98	23.75%	
0	A22	0.0172	40.00	26492	8507	662.30	212.68	24.31%	
0	A23	0.0256	40.00	25568	8232	639.15	205.80	24.36%	
0	A24	0.0422	40.00	24862	7685	622.05	192.13	23.60%	
0	A25	0.0628	40.00	23042	7164	576.05	179.10	23.72%	
0	A26	0.0830	40.00	36455	11629	911.38	290.73	24.18%	
0	A27	0.1082	40.00	32037	10624	800.93	265.60	24.90%	
0	A28	0.1269	40.00	27387	9573	684.68	239.33	25.90%	

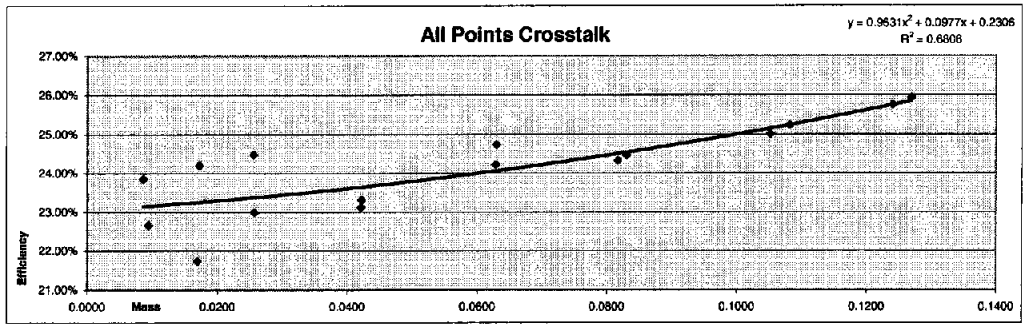


Red A2 Mean Mass	Mean % α into β	
0.0083	23.26%	Min
0.0245	23.73%	23.07%
0.0409	23.42%	Max
0.0612	23.99%	25.27%
0.0811	24.12%	Mean
0.1046	24.66%	23.94%
0.1226	25.27%	

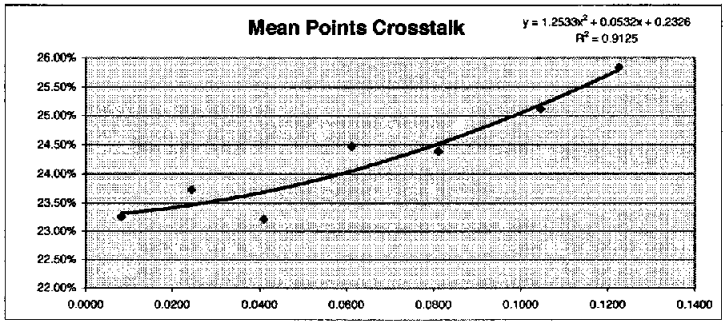


Red A3

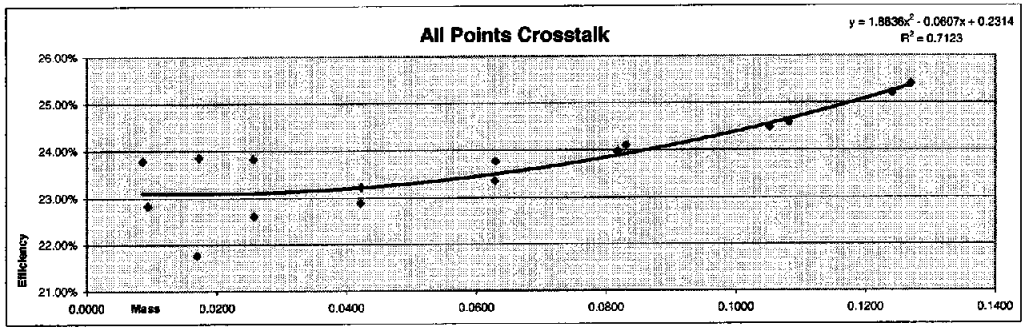
Red A3 Detector ID	Sample ID	Mass	Count Time	Alpha Counts	Beta Counts	Alpha CPM	Beta CPM	% α into β	
0	A11	0.0094	40.00	34219	10029	855.48	250.73	22.67%	Min
0	A12	0.0169	40.00	37272	10346	931.80	258.65	21.73%	21.73%
0	A13	0.0257	40.00	26862	8020	671.55	200.50	22.99%	
0	A14	0.0421	40.00	24550	7382	613.75	184.55	23.12%	Max
0	A15	0.0629	40.00	18535	6086	463.38	152.20	24.72%	25.93%
0	A16	0.0817	40.00	35209	11310	880.23	282.75	24.31%	
0	A17	0.1052	40.00	29901	9968	747.53	249.20	25.00%	Mean
0	A18	0.1240	40.00	25821	8954	645.53	223.85	25.75%	24.12%
0	A21	0.0085	40.00	31329	9811	783.23	245.28	23.85%	
0	A22	0.0172	40.00	25963	8285	649.08	207.13	24.19%	
0	A23	0.0256	40.00	24528	7947	613.20	198.68	24.47%	
0	A24	0.0422	40.00	24295	7384	607.38	184.60	23.31%	
0	A25	0.0628	40.00	22223	7102	555.58	177.55	24.22%	
0	A26	0.0830	40.00	34783	11262	869.58	281.55	24.46%	
0	A27	0.1082	40.00	30886	10423	772.15	260.58	25.23%	
0	A28	0.1269	40.00	26628	9324	665.70	233.10	25.93%	



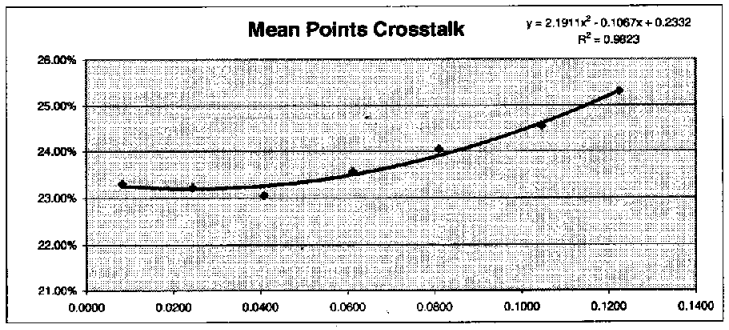
Red A3 Mean Mass	Mean % α into β	
0.0083	23.26%	Min
0.0245	23.73%	22.96%
0.0409	23.21%	Max
0.0612	24.47%	25.84%
0.0811	24.39%	Mean
0.1046	25.12%	24.12%
0.1226	25.84%	



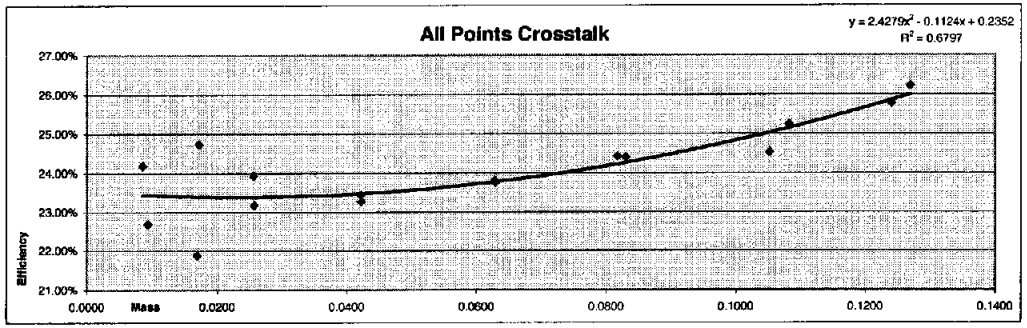
Red A4 Detector ID	Sample ID	Mass	Count Time	Alpha Counts	Beta Counts	Alpha CPM	Beta CPM	% α into β	
0	A11	0.0094	40.00	34593	10233	864.83	255.83	22.83%	Min
0	A12	0.0169	40.00	38096	10593	952.40	264.83	21.76%	21.76%
0	A13	0.0257	40.00	27725	8100	693.13	202.50	22.61%	
0	A14	0.0421	40.00	25428	7546	635.70	188.65	22.88%	Max
0	A15	0.0629	40.00	19354	6033	483.85	150.83	23.76%	25.39%
0	A16	0.0817	40.00	36857	11618	921.43	290.45	23.97%	
0	A17	0.1052	40.00	31039	10061	775.98	251.53	24.48%	Mean
0	A18	0.1240	40.00	26757	9021	668.93	225.53	25.21%	23.73%
0	A21	0.0086	40.00	32565	10158	814.13	253.95	23.78%	
0	A22	0.0172	40.00	26997	8457	674.93	211.43	23.85%	
0	A23	0.0256	40.00	25422	7949	635.55	198.73	23.82%	
0	A24	0.0422	40.00	25015	7566	625.38	189.15	23.22%	
0	A25	0.0628	40.00	22906	6977	572.65	174.43	23.35%	
0	A26	0.0830	40.00	36161	11485	904.03	287.13	24.10%	
0	A27	0.1082	40.00	32177	10490	804.43	262.25	24.59%	
0	A28	0.1269	40.00	27495	9359	687.38	233.98	25.39%	



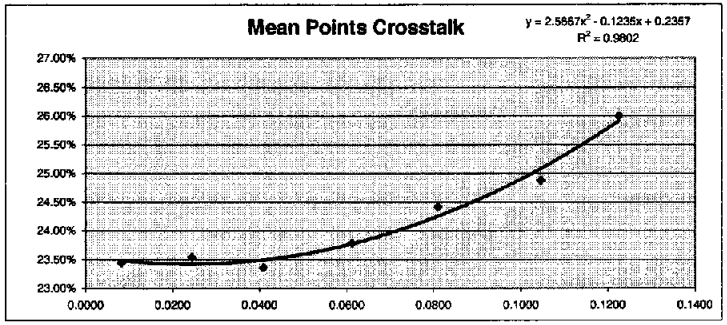
Red A4 Mean Mass	Mean % α into β	
0.0083	23.30%	Min
0.0245	23.21%	22.80%
0.0409	23.05%	Max
0.0612	23.56%	25.30%
0.0811	24.04%	Mean
0.1046	24.53%	23.73%
0.1226	25.30%	



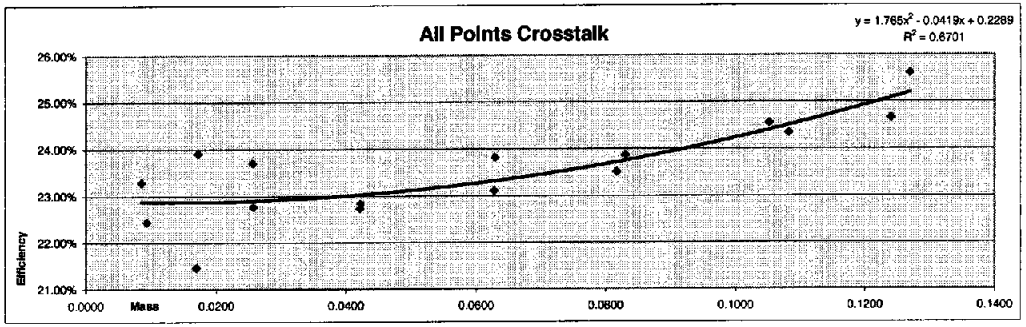
Red B1 Detector ID	Sample ID	Mass	Count Time	Alpha Counts	Beta Counts	Alpha CPM	Beta CPM	% α into β	
0	A11	0.0094	40.00	34489	10125	862.23	253.13	22.69%	Min
0	A12	0.0169	40.00	37707	10562	942.68	264.05	21.88%	21.88%
0	A13	0.0257	40.00	27207	8206	680.18	205.15	23.17%	
0	A14	0.0421	40.00	24522	7510	613.05	187.75	23.45%	Max
0	A15	0.0629	40.00	19517	6083	487.93	152.08	23.76%	26.22%
0	A16	0.0817	40.00	35833	11581	895.83	289.53	24.43%	
0	A17	0.1052	40.00	30386	9872	759.65	246.80	24.52%	Mean
0	A18	0.1240	40.00	26365	9156	659.13	228.90	25.76%	24.09%
0	A21	0.0086	40.00	31749	10129	793.73	253.23	24.19%	
0	A22	0.0172	40.00	26439	8683	660.95	217.08	24.72%	
0	A23	0.0258	40.00	25150	7910	628.75	197.75	23.93%	
0	A24	0.0422	40.00	24622	7469	615.55	186.73	23.27%	
0	A25	0.0628	40.00	22538	7043	563.45	176.08	23.81%	
0	A26	0.0830	40.00	35668	11512	891.70	287.80	24.40%	
0	A27	0.1082	40.00	31291	10564	782.28	264.10	25.24%	
0	A28	0.1269	40.00	27170	9657	679.25	241.43	26.22%	



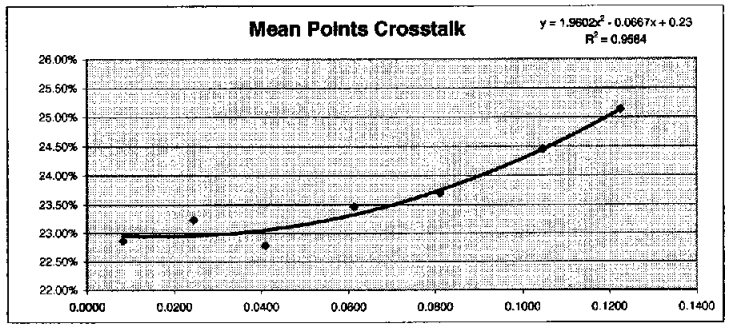
Red B1 Mean Mass	Mean % α into β	
0.0083	23.44%	Min
0.0245	23.55%	23.30%
0.0409	23.36%	Max
0.0612	23.79%	26.00%
0.0811	24.41%	Mean
0.1046	24.88%	24.09%
0.1226	26.00%	



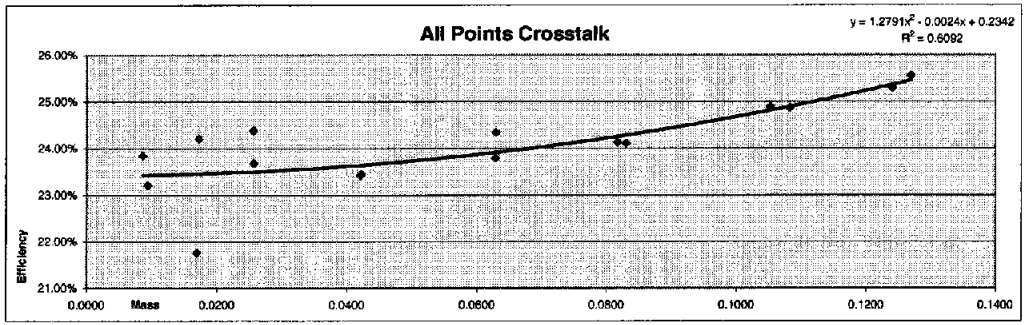
Red B2 Detector ID	Sample ID	Mass	Count Time	Alpha Counts	Beta Counts	Alpha CPM	Beta CPM	% α into β	
0	A11	0.0094	40.00	34228	9897	855.70	247.43	22.43%	Min
0	A12	0.0169	40.00	37453	10238	936.33	255.95	21.47%	21.47%
0	A13	0.0257	40.00	27139	7995	678.48	199.88	22.76%	
0	A14	0.0421	40.00	24918	7328	622.95	183.20	22.73%	Max
0	A15	0.0629	40.00	18986	5937	474.65	148.43	23.82%	25.62%
0	A16	0.0817	40.00	36258	11150	906.45	278.75	23.52%	
0	A17	0.1052	40.00	30293	9857	757.33	246.43	24.56%	Mean
0	A18	0.1240	40.00	26402	8638	660.05	215.95	24.65%	23.54%
0	A21	0.0086	40.00	31667	9622	792.18	240.55	23.29%	
0	A22	0.0172	40.00	26252	8252	656.30	206.30	23.92%	
0	A23	0.0256	40.00	25168	7820	629.20	195.50	23.71%	
0	A24	0.0422	40.00	24246	7173	606.15	179.33	22.83%	
0	A25	0.0628	40.00	22365	6720	559.13	168.00	23.10%	
0	A26	0.0830	40.00	35428	11111	885.70	277.78	23.87%	
0	A27	0.1082	40.00	31419	10108	785.48	252.70	24.34%	
0	A28	0.1269	40.00	26912	9268	672.80	231.70	25.62%	



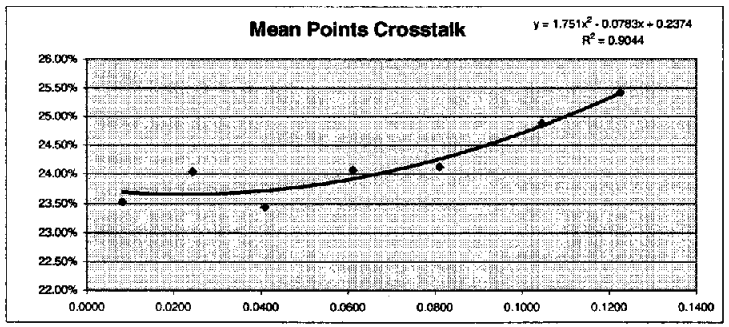
Red B2 Mean Mass	Mean % α into β	
0.0083	22.86%	Min
0.0245	23.23%	22.69%
0.0409	22.78%	Max
0.0612	23.46%	25.13%
0.0811	23.70%	Mean
0.1046	24.45%	23.54%
0.1226	25.13%	



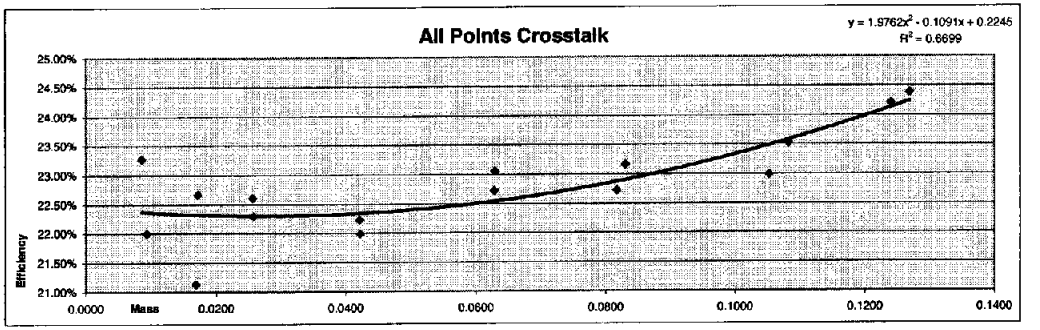
Red B3 Detector ID	Sample ID	Mass	Count Time	Alpha Counts	Beta Counts	Alpha CPM	Beta CPM	% α into β	
0	A11	0.0094	40.00	33892	10243	847.30	256.08	23.21%	Min
0	A12	0.0169	40.00	37656	10474	941.40	261.85	21.76%	21.76%
0	A13	0.0257	40.00	26621	8260	665.53	206.50	23.68%	
0	A14	0.0421	40.00	24345	7445	608.63	186.13	23.42%	Max
0	A15	0.0629	40.00	18733	6029	468.33	150.73	24.35%	25.55%
0	A16	0.0817	40.00	35795	11386	894.88	284.65	24.13%	
0	A17	0.1052	40.00	29945	9923	748.63	248.08	24.89%	Mean
0	A18	0.1240	40.00	25815	8739	645.38	218.48	25.29%	24.06%
0	A21	0.0086	40.00	31517	9868	787.93	246.70	23.84%	
0	A22	0.0172	40.00	26449	8448	661.23	211.20	24.21%	
0	A23	0.0256	40.00	25043	8077	626.08	201.93	24.39%	
0	A24	0.0422	40.00	24395	7473	609.88	186.83	23.45%	
0	A25	0.0628	40.00	22381	6986	559.53	174.65	23.79%	
0	A26	0.0830	40.00	35117	11157	877.93	278.93	24.11%	
0	A27	0.1082	40.00	30900	10225	772.50	255.63	24.86%	
0	A28	0.1269	40.00	27093	9300	677.33	232.50	25.55%	



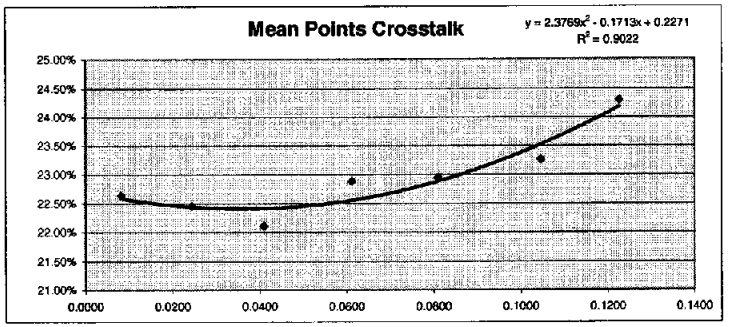
Red B3 Mean Mass	Mean % α into β	
0.0083	23.53%	Min
0.0245	24.03%	22.99%
0.0409	23.43%	Max
0.0612	24.07%	25.42%
0.0811	24.12%	Mean
0.1046	24.88%	24.06%
0.1226	25.42%	



Red B4 Detector ID	Sample ID	Mass	Count Time	Alpha Counts	Beta Counts	Alpha CPM	Beta CPM	% α into β	
0	A11	0.0094	40.00	36870	10396	921.75	259.90	21.99%	Min
0	A12	0.0169	40.00	40325	10804	1008.13	270.10	21.13%	21.13%
0	A13	0.0257	40.00	29207	8379	730.18	209.48	22.29%	
0	A14	0.0421	40.00	26958	7703	673.95	192.58	22.22%	Max
0	A15	0.0629	40.00	20695	6198	517.38	154.95	23.05%	24.39%
0	A16	0.0817	40.00	39988	11757	999.70	293.93	22.72%	
0	A17	0.1052	40.00	33789	10085	844.73	252.13	22.99%	Mean
0	A18	0.1240	40.00	29359	9380	733.98	234.50	24.21%	22.81%
0	A21	0.0086	40.00	33963	10301	849.08	257.53	23.27%	
0	A22	0.0172	40.00	28672	8406	716.80	210.15	22.67%	
0	A23	0.0256	40.00	27477	8027	686.93	200.68	22.61%	
0	A24	0.0422	40.00	26784	7547	669.60	188.68	21.98%	
0	A25	0.0628	40.00	24693	7259	617.33	181.48	22.72%	
0	A26	0.0830	40.00	38672	11658	966.80	291.45	23.16%	
0	A27	0.1082	40.00	34584	10637	864.60	265.93	23.52%	
0	A28	0.1269	40.00	29952	9661	748.80	241.53	24.39%	

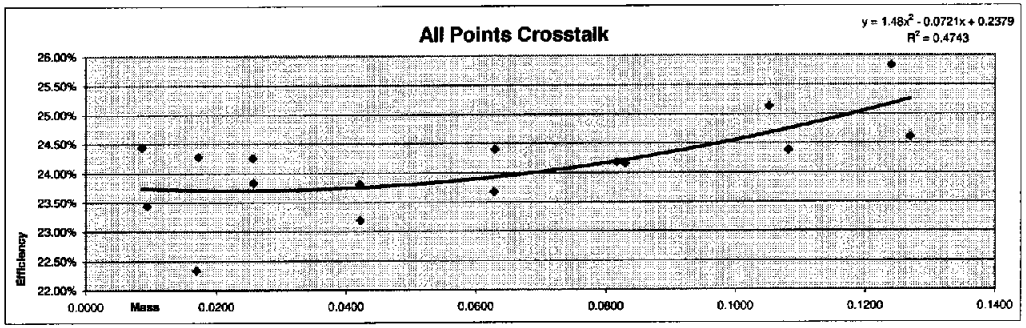


Red B4 Mean Mass	Mean % α into β	
0.0083	22.63%	Min
0.0245	22.45%	21.90%
0.0409	22.10%	Max
0.0612	22.88%	24.30%
0.0811	22.94%	Mean
0.1046	23.25%	22.81%
0.1226	24.30%	

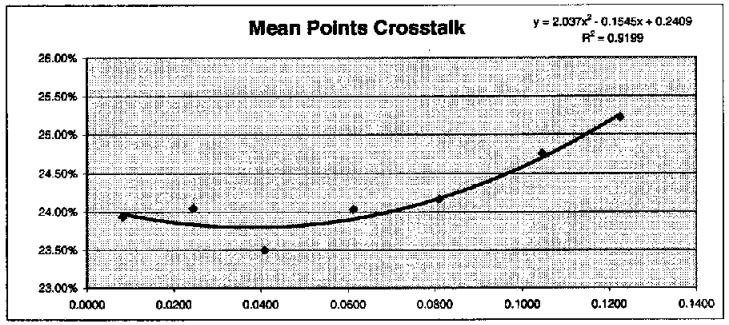


Red C1

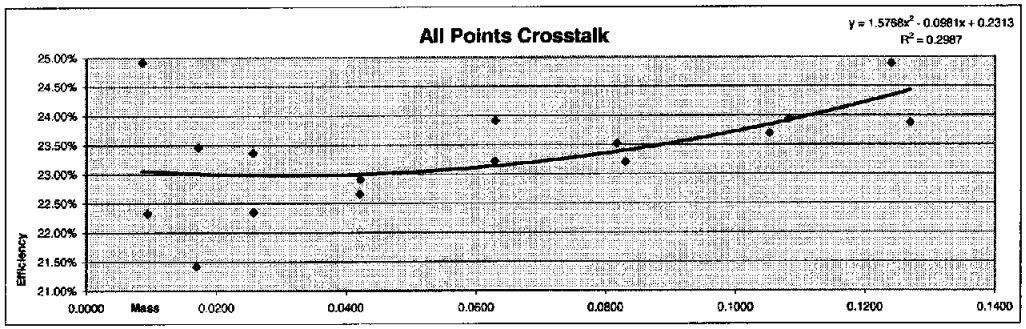
Red C1 Detector ID	Sample ID	Mass	Count Time	Alpha Counts	Beta Counts	Alpha CPM	Beta CPM	% α into β	
0	A11	0.0094	40.00	34400	10531	860.00	263.28	23.44%	Min
0	A12	0.0169	40.00	37862	10892	946.55	272.30	22.34%	22.34%
0	A13	0.0257	40.00	27197	8511	679.93	212.78	23.83%	
0	A14	0.0421	40.00	24720	7726	618.00	193.15	23.81%	Max
0	A15	0.0629	40.00	18852	6083	471.30	152.08	24.40%	25.83%
0	A16	0.0817	40.00	36495	11636	912.38	290.90	24.18%	
0	A17	0.1052	40.00	30705	10306	767.63	257.65	25.13%	Mean
0	A18	0.1240	40.00	26877	9361	671.93	234.03	25.83%	24.12%
0	A21	0.0086	40.00	31275	10115	781.88	252.88	24.44%	
0	A22	0.0172	40.00	26242	8414	656.05	210.35	24.28%	
0	A23	0.0256	40.00	25308	8105	632.70	202.63	24.26%	
0	A24	0.0422	40.00	24805	7489	620.13	187.23	23.19%	
0	A25	0.0628	40.00	22991	7131	574.78	178.28	23.67%	
0	A26	0.0830	40.00	36530	11631	913.25	290.78	24.15%	
0	A27	0.1082	40.00	36483	11764	912.08	294.10	24.38%	
0	A28	0.1269	40.00	32625	10646	815.63	266.15	24.60%	



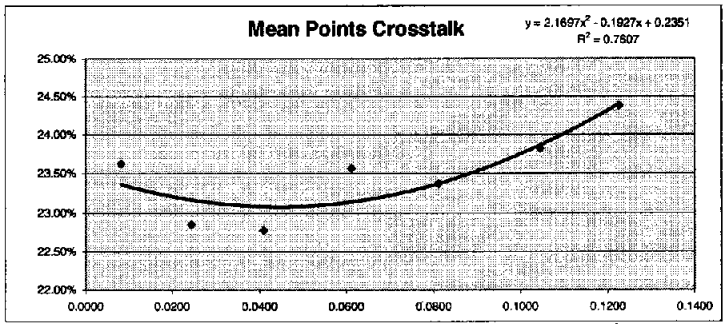
Red C1 Mean Mass	Mean % α into β	
0.0083	23.94%	Min
0.0245	24.05%	23.31%
0.0409	23.50%	Max
0.0612	24.03%	25.22%
0.0811	24.16%	Mean
0.1046	24.76%	24.12%
0.1226	25.22%	



Red C2 Detector ID	Sample ID	Mass	Count Time	Alpha Counts	Beta Counts	Alpha CPM	Beta CPM	% α into β	
0	A11	0.0094	40.00	35843	10301	896.08	257.53	22.32%	Min
0	A12	0.0169	40.00	38834	10582	970.85	264.55	21.41%	21.41%
0	A13	0.0257	40.00	28848	8301	721.20	207.53	22.35%	
0	A14	0.0421	40.00	25708	7531	642.70	188.28	22.66%	Max
0	A15	0.0629	40.00	19870	6245	496.75	156.13	23.91%	24.92%
0	A16	0.0817	40.00	37448	11519	936.20	287.98	23.52%	
0	A17	0.1052	40.00	32454	10075	811.35	251.88	23.69%	Mean
0	A18	0.1240	40.00	28289	9373	707.23	234.33	24.89%	23.35%
0	A21	0.0086	40.00	29065	9647	726.63	241.18	24.92%	
0	A22	0.0172	40.00	27073	8300	676.83	207.50	23.46%	
0	A23	0.0256	40.00	26428	8058	660.70	201.45	23.37%	
0	A24	0.0422	40.00	25899	7694	647.48	192.35	22.90%	
0	A25	0.0628	40.00	24049	7274	601.23	181.85	23.22%	
0	A26	0.0830	40.00	37778	11417	944.45	285.43	23.21%	
0	A27	0.1082	40.00	33625	10582	840.63	264.55	23.94%	
0	A28	0.1269	40.00	33706	10569	842.65	264.23	23.87%	

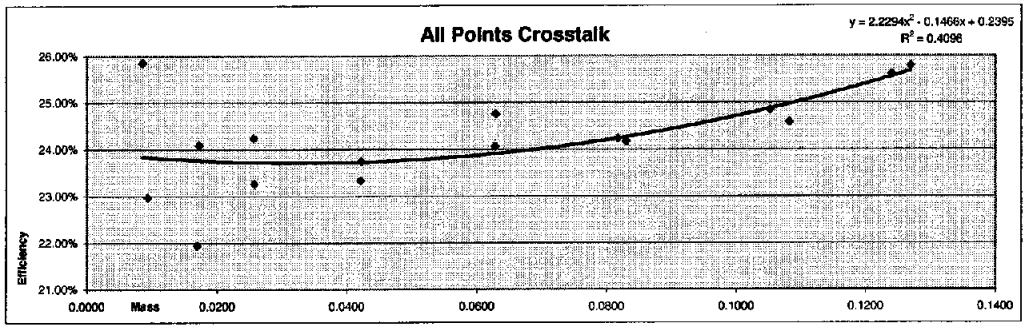


Red C2 Mean Mass	Mean % α into β	
0.0083	23.62%	Min
0.0245	22.86%	22.44%
0.0409	22.78%	Max
0.0612	23.57%	24.38%
0.0811	23.37%	Mean
0.1046	23.81%	23.35%
0.1226	24.38%	

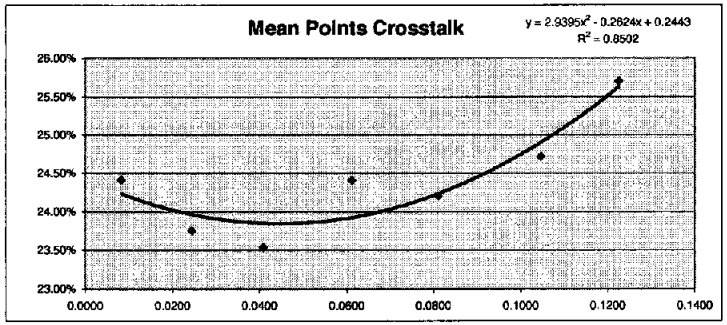


Red C3

Red C3 Detector ID	Sample ID	Mass	Count Time	Alpha Counts	Beta Counts	Alpha CPM	Beta CPM	% α into β	
0	A11	0.0094	40.00	33301	9932	832.53	248.30	22.97%	Min
0	A12	0.0169	40.00	36527	10263	913.18	256.58	21.93%	21.93%
0	A13	0.0257	40.00	26268	7964	656.70	199.10	23.26%	
0	A14	0.0421	40.00	24104	7336	602.60	183.40	23.33%	Max
0	A15	0.0629	40.00	18012	5926	450.30	148.15	24.76%	25.86%
0	A16	0.0817	40.00	35016	11199	875.40	279.98	24.23%	
0	A17	0.1052	40.00	28950	9571	723.75	239.28	24.85%	Mean
0	A18	0.1240	40.00	25436	8758	635.90	218.95	25.61%	24.22%
0	A21	0.0086	40.00	26441	9221	661.03	230.53	25.86%	
0	A22	0.0172	40.00	31072	9862	776.80	246.55	24.09%	
0	A23	0.0256	40.00	24341	7790	608.53	194.75	24.24%	
0	A24	0.0422	40.00	23799	7411	594.98	185.28	23.75%	
0	A25	0.0628	40.00	21669	6866	541.73	171.65	24.06%	
0	A26	0.0830	40.00	34778	11089	869.45	277.23	24.18%	
0	A27	0.1082	40.00	30807	10042	770.18	251.05	24.58%	
0	A28	0.1269	40.00	26558	9228	663.95	230.70	25.79%	

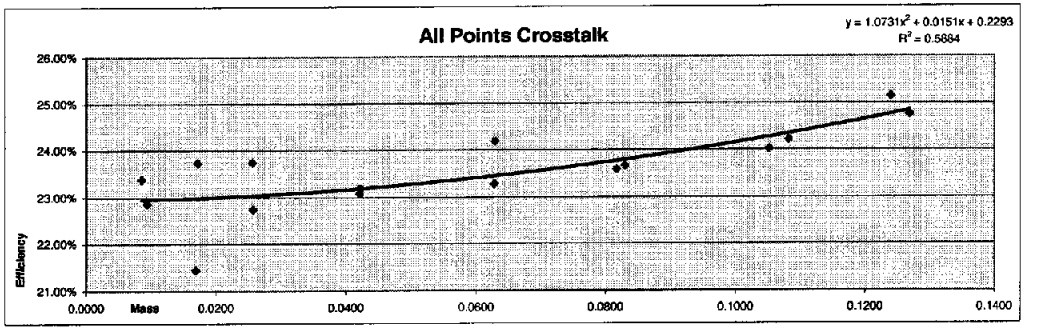


Red C3 Mean Mass	Mean % α into β	
0.0083	24.41%	Min
0.0245	23.75%	23.01%
0.0409	23.54%	Max
0.0612	24.41%	25.70%
0.0811	24.20%	Mean
0.1046	24.71%	24.22%
0.1226	25.70%	

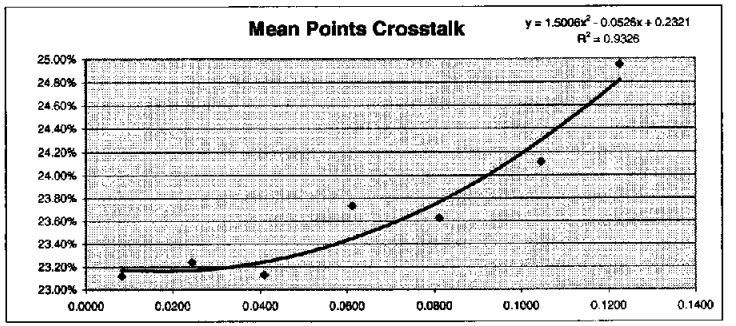


Red C4

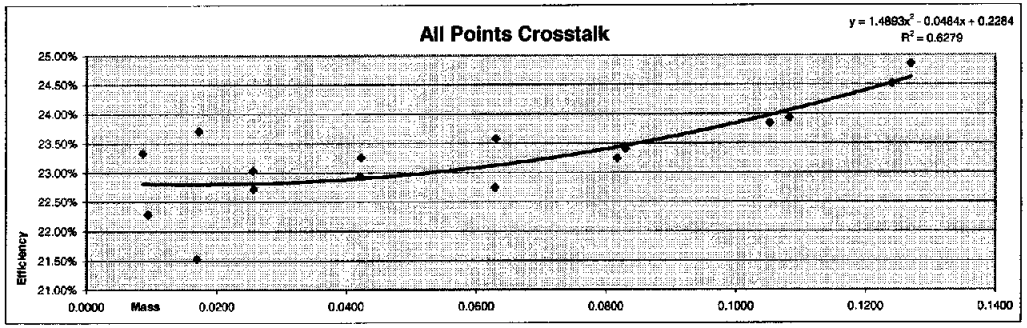
Red C4 Detector ID	Sample ID	Mass	Count Time	Alpha Counts	Beta Counts	Alpha CPM	Beta CPM	% α into β	
0	A11	0.0094	40.00	34460	10211	861.50	255.28	22.86%	Min
0	A12	0.0169	40.00	37771	10305	944.28	257.63	21.43%	21.43%
0	A13	0.0257	40.00	27241	8016	681.03	200.40	22.74%	
0	A14	0.0421	40.00	24859	7455	621.48	186.38	23.07%	Max
0	A15	0.0629	40.00	18747	5982	468.68	149.55	24.19%	25.14%
0	A16	0.0817	40.00	36298	11204	907.45	280.10	23.59%	
0	A17	0.1052	40.00	30655	9689	766.36	242.23	24.02%	Mean
0	A18	0.1240	40.00	26777	8994	669.43	224.85	25.14%	23.56%
0	A21	0.0086	40.00	32665	9967	816.63	249.18	23.38%	
0	A22	0.0172	40.00	32217	10025	805.43	250.63	23.73%	
0	A23	0.0256	40.00	26569	8273	664.23	206.83	23.74%	
0	A24	0.0422	40.00	24373	7359	609.33	183.98	23.19%	
0	A25	0.0628	40.00	22847	6933	571.18	173.33	23.28%	
0	A26	0.0830	40.00	35913	11131	897.83	278.28	23.66%	
0	A27	0.1082	40.00	32001	10224	800.03	255.60	24.21%	
0	A28	0.1269	40.00	27809	9151	695.23	228.78	24.76%	



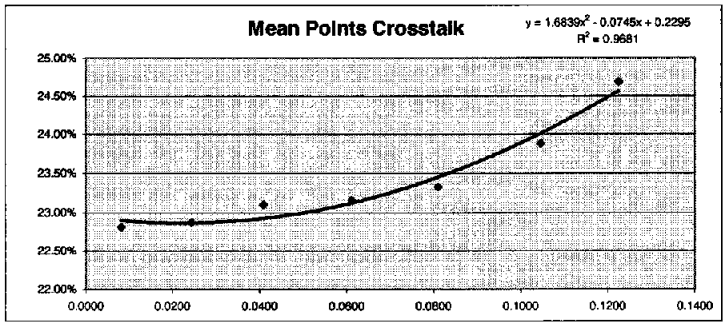
Red C4 Mean Mass	Mean % α into β	
0.0083	23.12%	Min
0.0245	23.24%	22.58%
0.0409	23.13%	Max
0.0612	23.74%	24.95%
0.0811	23.62%	Mean
0.1046	24.11%	23.56%
0.1226	24.95%	



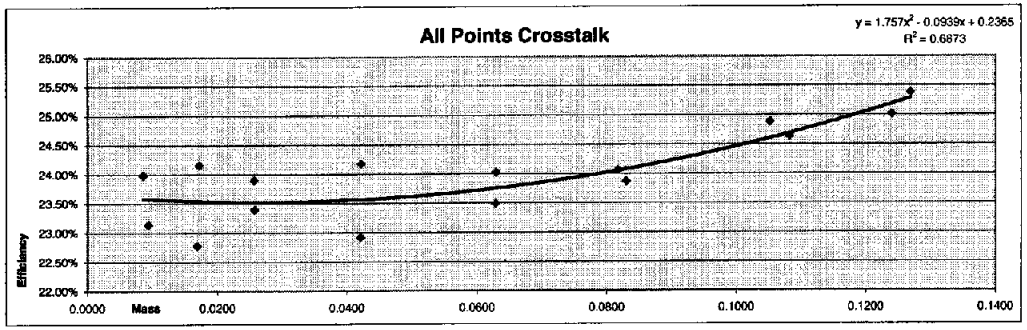
Red D1 Detector ID	Sample ID	Mass	Count Time	Alpha Counts	Beta Counts	Alpha CPM	Beta CPM	% α into β	
0	A11	0.0094	40.00	33615	9640	840.38	241.00	22.29%	Min
0	A12	0.0169	40.00	37627	10324	940.68	258.10	21.53%	21.53%
0	A13	0.0257	40.00	28030	8241	700.75	206.03	22.72%	
0	A14	0.0421	40.00	25823	7685	645.58	192.13	22.93%	Max
0	A15	0.0629	40.00	19905	6142	497.63	153.55	23.58%	24.85%
0	A16	0.0817	40.00	37645	11401	941.13	285.03	23.25%	
0	A17	0.1052	40.00	31994	10015	799.85	250.38	23.84%	Mean
0	A18	0.1240	40.00	28013	9098	700.33	227.45	24.52%	23.31%
0	A21	0.0086	40.00	33714	10264	842.85	256.60	23.34%	
0	A22	0.0172	40.00	27629	8587	690.73	214.68	23.71%	
0	A23	0.0256	40.00	27990	8375	699.75	209.38	23.03%	
0	A24	0.0422	40.00	26457	8020	661.43	200.50	23.26%	
0	A25	0.0628	40.00	23898	7034	597.45	175.85	22.74%	
0	A26	0.0830	40.00	37824	11561	945.60	289.03	23.41%	
0	A27	0.1082	40.00	33579	10561	839.48	264.03	23.93%	
0	A28	0.1269	40.00	29047	9606	726.18	240.15	24.85%	



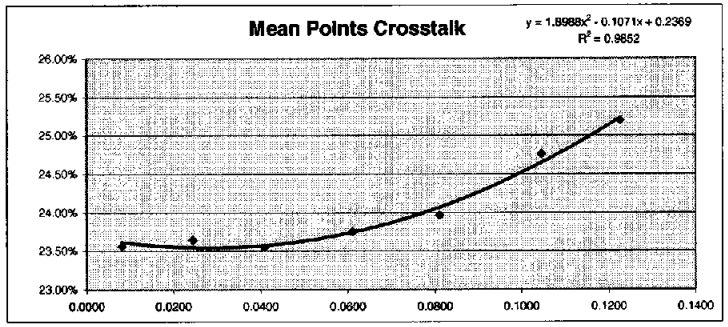
Red D1 Mean Mass	Mean % α into β	
0.0083	22.81%	Min
0.0245	22.88%	22.62%
0.0409	23.10%	Max
0.0612	23.16%	24.68%
0.0811	23.33%	Mean
0.1046	23.88%	23.31%
0.1226	24.68%	



Red D2 Detector ID	Sample ID	Mass	Count Time	Alpha Counts	Beta Counts	Alpha CPM	Beta CPM	% α into β	
0	A11	0.0094	40.00	34185	10291	854.63	257.28	23.14%	Min
0	A12	0.0169	40.00	35278	10405	881.95	260.13	22.78%	22.78%
0	A13	0.0257	40.00	26366	8049	659.15	201.23	23.39%	
0	A14	0.0421	40.00	25048	7448	626.20	186.20	22.92%	Max
0	A15	0.0629	40.00	19363	6122	484.08	153.05	24.02%	25.38%
0	A16	0.0817	40.00	36555	11582	913.88	289.55	24.06%	
0	A17	0.1052	40.00	30601	10133	765.03	253.33	24.88%	Mean
0	A18	0.1240	40.00	26880	8965	672.00	224.13	25.01%	23.99%
0	A21	0.0086	40.00	32233	10169	805.83	254.23	23.98%	
0	A22	0.0172	40.00	26758	8523	668.95	213.08	24.16%	
0	A23	0.0256	40.00	25474	7999	636.85	199.98	23.90%	
0	A24	0.0422	40.00	25455	8117	636.38	202.93	24.18%	
0	A25	0.0628	40.00	25118	7711	627.95	192.78	23.49%	
0	A26	0.0830	40.00	36313	11384	907.83	284.60	23.87%	
0	A27	0.1082	40.00	32312	10562	807.80	264.05	24.63%	
0	A28	0.1269	40.00	27983	9516	699.58	237.90	25.38%	

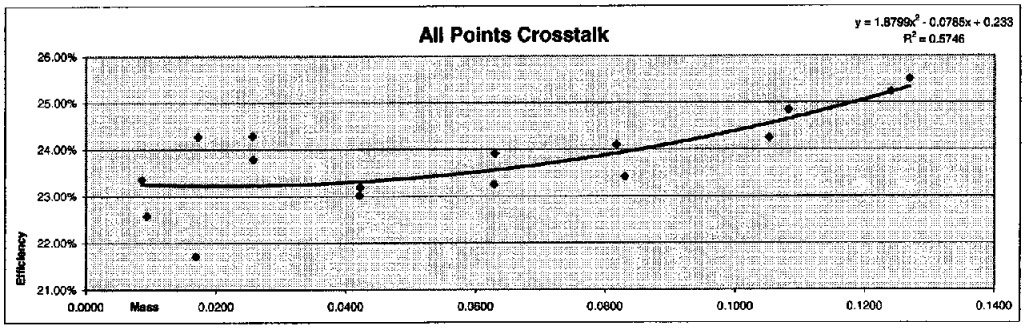


Red D2 Mean Mass	Mean % α into β	
0.0083	23.56%	Min
0.0245	23.64%	23.47%
0.0409	23.55%	Max
0.0612	23.76%	25.19%
0.0811	23.96%	Mean
0.1046	24.76%	23.99%
0.1226	25.19%	

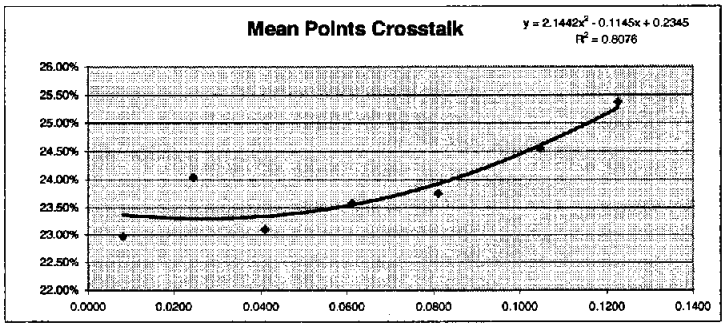


Red D3

Red D3 Detector ID	Sample ID	Mass	Count Time	Alpha Counts	Beta Counts	Alpha CPM	Beta CPM	% α into β	
0	A11	0.0094	40.00	35427	10331	885.68	258.28	22.58%	Min
0	A12	0.0169	40.00	38747	10745	968.68	268.63	21.71%	21.71%
0	A13	0.0257	40.00	25892	8079	647.30	201.98	23.78%	
0	A14	0.0421	40.00	24458	7309	611.45	182.73	23.01%	Max
0	A15	0.0629	40.00	19326	6073	483.15	151.83	23.91%	25.51%
0	A16	0.0817	40.00	36581	11815	914.53	290.38	24.10%	
0	A17	0.1052	40.00	31170	9978	779.25	249.45	24.25%	Mean
0	A18	0.1240	40.00	27160	9167	679.00	229.18	25.23%	23.79%
0	A21	0.0086	40.00	32488	9897	812.20	247.43	23.35%	
0	A22	0.0172	40.00	27123	8694	678.08	217.35	24.27%	
0	A23	0.0256	40.00	25739	8260	643.48	206.50	24.29%	
0	A24	0.0422	40.00	25094	7575	627.35	189.38	23.19%	
0	A25	0.0628	40.00	24925	7549	623.13	188.73	23.25%	
0	A26	0.0830	40.00	22899	6998	572.48	174.95	23.41%	
0	A27	0.1082	40.00	32238	10657	805.95	266.43	24.84%	
0	A28	0.1269	40.00	27857	9540	696.43	238.50	25.51%	

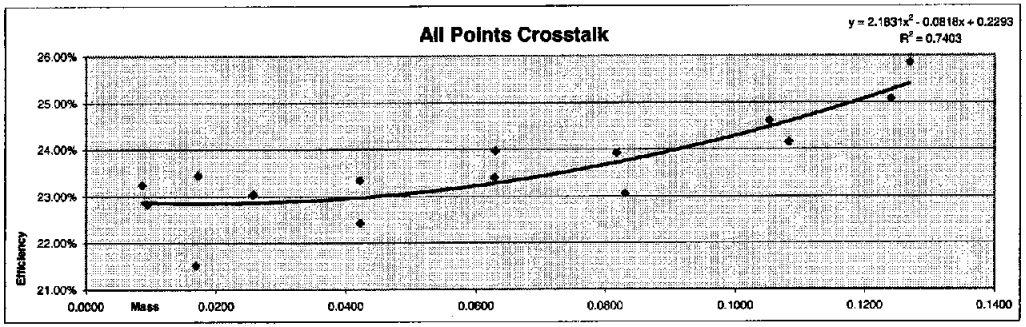


Red D3 Mean Mass	Mean % α into β	
0.0083	22.96%	Min
0.0245	24.04%	22.96%
0.0409	23.10%	Max
0.0612	23.58%	25.37%
0.0811	23.75%	Mean
0.1046	24.55%	23.79%
0.1226	25.37%	

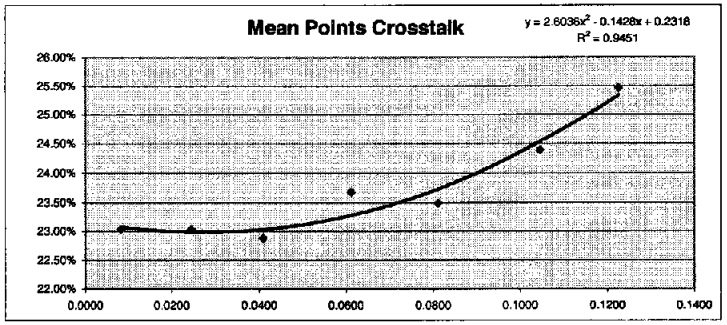


Red D4

Red D4 Detector ID	Sample ID	Mass	Count Time	Alpha Counts	Beta Counts	Alpha CPM	Beta CPM	% α into β	
0	A11	0.0094	40.00	35538	10512	888.45	262.80	22.83%	Min
0	A12	0.0169	40.00	38571	10571	964.28	264.28	21.51%	21.51%
0	A13	0.0257	40.00	27914	8358	697.85	208.95	23.04%	
0	A14	0.0421	40.00	23918	7281	597.95	182.03	23.34%	Max
0	A15	0.0629	40.00	18894	5954	472.35	148.85	23.96%	25.85%
0	A16	0.0817	40.00	37490	11788	937.25	294.70	23.92%	
0	A17	0.1052	40.00	31132	10167	778.30	254.18	24.62%	Mean
0	A18	0.1240	40.00	27415	9178	685.38	229.45	25.08%	23.56%
0	A21	0.0086	40.00	33000	9993	825.00	249.83	23.24%	
0	A22	0.0172	40.00	27885	8537	697.13	213.43	23.44%	
0	A23	0.0256	40.00	26655	7975	666.38	199.38	23.03%	
0	A24	0.0422	40.00	25937	7497	648.43	187.43	22.42%	
0	A25	0.0628	40.00	23448	7162	586.20	179.05	23.40%	
0	A26	0.0830	40.00	23594	7069	589.85	176.73	23.05%	
0	A27	0.1082	40.00	36840	11730	921.00	293.25	24.15%	
0	A28	0.1269	40.00	27990	9758	699.75	243.95	25.85%	



Red D4 Mean Mass	Mean % α into β	
0.0083	23.04%	Min
0.0245	23.04%	22.48%
0.0409	22.88%	Max
0.0612	23.68%	25.47%
0.0811	23.49%	Mean
0.1046	24.38%	23.56%
0.1226	25.47%	



SEVERN TRENT STL

2007
GFPC Red Alpha Efficiency Curves

TestAmerica STL

Calibration Standard Data

Beta calibration stds.	8/31/2005	salt solution SLRB-B			SET 1	
Beta standard, RAD04-0095, 2316.6 dpm/mL Sr/Y90 on 08/07/2001						
Std #	mLs RAD04-0095	mLs salt solution	gross mass	tare mass	reweigh 2/7/6	mass 2/7/6
1	1	0.1000	8.8980	8.8888	8.8981	0.0093
2	1	0.3000	8.9490	8.9230	8.9494	0.0264
3	1	0.5000	9.0149	8.9703	9.0128	0.0425
4	1	1.0000	9.0419	8.9602	9.0411	0.0809
5	1	1.5000	9.0033	8.8764	8.9991	0.1227
6	1	2.0000	9.0833	8.9072	9.0719	0.1647
7	1	2.5000	9.1219	8.9194	9.1197	0.2003
8	1	3.0000	9.1769	8.9241	9.167	0.2429

Alpha calibration standards		salt solution SLRB-B			SET 1	
Alpha standard, 03-071, 4567.9 dpm/mL Th-230 on 10/07/2003						
Std #	mLs 03-071	mLs salt solution	gross mass	tare mass	reweigh 3/7/7	mass 3/7/7
1	1	0.1000	8.9369	8.9273	8.9367	0.0094
2	1	0.2000	8.9958	8.9783	8.9952	0.0169
3	1	0.3000	8.9737	8.9470	8.9727	0.0257
4	1	0.5000	8.9206	8.8766	8.9187	0.0421
5	1	0.7500	8.9565	8.8888	8.9517	0.0629
6	2	1.0000	9.0043	8.9170	8.9987	0.0817
7	2	1.3000	9.0092	8.8992	9.0044	0.1052
8	2	1.5000	9.0413	8.9088	9.0328	0.1240

spiked by:	Joel Kempema	verified by:	Sarah Hurst

Alpha Beta calibration standards 9/02/05

Beta calibration stds.			salt solution SLRB-B		SET 2	
Beta standard, RAD04-0095, 1043.5 dpm/mL on 08/07/01 Sr/Y90.						
Std #	mLs RAD04-0095	mLs salt solution	gross mass	tare mass	reweigh 2/23/7	net mass 2/23/7
1	1	0.1000	8.9140	8.9056	8.9147	0.0091
2	1	0.3000	8.9197	8.8939	8.9204	0.0265
3	1	0.5000	8.8978	8.8559	8.8974	0.0415
4	1	1.0000	8.9580	8.8715	8.9545	0.0830
5	1	1.5000	9.0437	8.9139	9.0369	0.1230
6	1	2.0000	9.0249	8.8592	9.0203	0.1611
7	1	2.5000	9.1269	8.9239	9.1171	0.1932
8	1	3.0000	9.1390	8.8872	9.1293	0.2421

alpha calibration standards			salt solution SLRB-B		SET 2	
Alpha standard, 03-071, 4567.9 dpm/mL Th-230 on 12/19/02						
Std #	mLs	mLs salt solution	gross mass	tare mass	reweigh 3/7/7	mass 3/7/7
1	1	0.1000	8.9143	8.9061	8.9147	0.0086
2	1	0.2000	8.9348	8.9182	8.9354	0.0172
3	1	0.3000	8.9231	8.8980	8.9236	0.0256
4	1	0.5000	8.9518	8.9082	8.9504	0.0422
5	1	0.7500	8.9683	8.9026	8.9654	0.0628
6	2	1.0000	9.0179	8.9303	9.0133	0.0830
7	2	1.3000	8.9901	8.8763	8.9845	0.1082
8	2	1.5000	9.0533	8.9206	9.0475	0.1269
spiked by:	Joel Kempema		verified by:	N/A		

alpha beta standards second set

ANALYTICS

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

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

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

65090-334

Th-230 5 mL Liquid in Flame Sealed Vial

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

Radionuclide purity and calibration were checked by germanium gamma-ray spectrometry and liquid scintillation counting. The nuclear decay rate and assay date for this source are given below.

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:	Th-230
ACTIVITY (dps):	7.654 E3
HALF-LIFE:	7.538 E4 Years
CALIBRATION DATE:	December 19, 2002 12:00 EST
TOTAL UNCERTAINTY*:	3.5%
SYSTEMATIC:	2.6%
RANDOM:	0.9%

*99% Confidence Level

Impurities: γ-impurities <0.1%, α-impurities <0.05%

5.17738 grams 0.5M HNO_3 solution.

P O NUMBER 1614557-000 OP, Item 3

SOURCE PREPARED BY: M. D. Currie for
M. Taskaeva, Radiochemist

Q A APPROVED: 12-19-02

STL St. Louis

Standards Preparation Logbook Record

Jan-05-2006

Logbook: \\Qstlmo01\Stdslog\RAD_STD.std

RAD03-0085, Th 230 03-071 Analyst: hicksb

Vendor: Analytics
Solvent: 0.5M HNO3
Date Prep./Opened: 10-07-2003 Date Received: 12-19-2002
Date Expires(1): 10-07-2008 (5 Years)
Date Expires(2): 10-07-2008 (5 Years)
parent, vial# 65090-334

Component	Initial Conc (dpm/mL)	Final Conc (dpm/mL)
Th230	4,567.9	4,567.9

RAD06-0001, Th-230 Analyst: dillardj

Solvent: 0.5M HNO3 Volume (ml): 200.00
Date Prep./Opened: 01-04-2006
Date Expires(1): 01-04-2007 (1 Year)
Date Expires(2): 01-04-2007 (1 Year)

Parent Std No.: RAD03-0085, Th 230 03-071 Aliquot Amount (ml): 1.0000
Parent Date Expires(1): 10-07-2008 Parent Date Expires(2): 10-07-2008

Component	Initial Conc (dpm/mL)	Final Conc (dpm/mL)
Th230	4,567.9	22.840

Reviewed By: _____

Thorium 230

10/7/03

ANALYTICS

SOURCE ID: 65090-334

Radioactivity: 7,654 dps

Reference time: 12-19-2002 12:00 EST

Useful life: indefinite

Initial mass = 5.17738 grams

Mass transferred = 5.1498 grams

$$\frac{5.1498\,g}{5.17738\,g} \times 7{,}654\ dps \times \frac{60\ dpm}{1\ dps} \div 100\,mL = \boxed{4{,}567.9\ \frac{dpm}{mL}}$$

ANALYTICS

1380 Seaboard Ind Blvd * Atlanta, GA 30318 * USA : 404-352-8677

Th-230

SRS 65090-334 Amount 0.207 µCi QA

Date 12/19/02 12:00 EST Exp. ----------

PO # 1614557-000 OP, Item 3

5.17738 grams 0.5M HNO_3 solution

CAUTION RADIOACTIVE MATERIAL

Logbook: 2060

STERN TRENT SERVICES

Radiochemistry
Standards Preparation Logbook

Date Prep'd	Expir. Date	Standard ID Number	Isotope	Parent ID Number	Parent Activity	Parent Ref. Date	Aliquot	Dilution Volume	Change in Time	T ½	Final Activity	Solvent/ Lot #	Prep'd Initials	Cal. Ver. Initials	Comments
11-12-03	11-12-04	03.082	P32	IPL 7032	1.103 µCi/g ~~11,991.2 dpm~~	15 NOV 03	4.5989 g	100 ml		14.29 dy	119,957 dpm/ml ~~119,912.0~~	1PC 2-4-04	SDB	MFM	From Pg 10 STEVE'S
11-12-03	11-12-04	03-083	P32	03082	119,957 dpm/ml ~~119,912.0~~	15 NOV 03	1 ml	50 ml		14.29 dy	dpm/ml ~~2,398.2~~	2399.15 1PC 2-4-04	SDB	MFM	LAB Book
9-11-03	9-11-04	03-069	Pu238	02-032	68.235 1PC 11-19-03 ~~75.174~~	11-15-99 dpm/ml	95 ml	190 ml	1396 day	87.7 y	decay corr ~~33.5069~~ 16.22	1M HNO_3	MFM	PC	from page 28
9-11-03	9-11-04	03-069	Pu239	02-~~033~~ 031	64.025 11-19-03 ~~128.05~~ dpm/ml	11-15-99	95 ml	190 ml	1396 day	24110 y	32.0125 ~~32.0251~~	1M HNO_3	MFM	PC	from page 28
11-7-03	11-21-04	Rad03-0083 ~~03-070~~	TC-99	02-028	95,341.2 dpm/ml	10-96	1 ml	200 ml		2.1E5	476.7 dpm/ml	KOH	SDB		Rad Gp Use IO Rad03-0083
12-9-03	12-9-04	03-084	Ra228	01012	1,018 dpm/mL	2/16/01	2 mL	100 mL		5.75 y	20.36 dpm/mL	0.5M HNO_3	BH	~~BHF~~	
12-9-03	12-9-04	03-085	Th230	03-071	4,567.9 dpm/mL	12/19/02	1 mL	200 mL		7538 E4	22.84 dpm/mL	0.5M HNO_3	BH	LE	
12/31/03	12/31/08	03-086	Fe-55	681-78-3	.203 µCi/g	1/1/2000	4.9917 g	100 mL		999 days	10,133.2 pCi/mL	0.5M HNO_3	BH		
12/31/03	12/31/04	03-087	Fe-55	03-086	10,133.2 pCi/mL	1/1/2000	5 mL	100 mL		999 days	506.7 pCi/mL	0.5M HNO_3	BH		
1-5-04	1-5-05	Rad04-0001	UNAT	01-018	235.76 dpm/mL	3-2-01	20 mL	80 mL	N/A	4.5 E9 yrs	58.94 dpm/mL	0.5M HNO_3	MFM		
1/12/04	1/12/05	Rad04-0003	Ra228	01012	1,018 dpm/mL	2/16/01	2 mL	100 mL		5.75 y	20.36 dpm/mL	0.5M HNO_3	BH	BBF	
2/12/04	2/12/04	RAD-0015	Sr90	03-038	2,314.57 dpm/mL	9/19/01	5 mL	500 mL		28.5 y	23.16 dpm/mL	0.5M HNO_3	BH	BBF	

Additional Comments:

ANALYTICS

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

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

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

62204-334

Sr-90 5 mL Liquid in Flame Sealed Vial

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

Radionuclide purity and calibration were checked by germanium gamma-ray spectrometry and liquid scintillation counting. The nuclear decay rate and assay date for this source are given below.

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:	Sr-90
ACTIVITY (dps):	3.897 E4
HALF-LIFE:	28.79 years
CALIBRATION DATE:	August 7, 2001 12:00 EST
TOTAL UNCERTAINTY*:	4.0%
SYSTEMATIC:	3.5%
RANDOM:	0.5%

*99% Confidence Level

Impurities: γ-impurities <0.1%

4.99897 grams 0.1M HCl solution with 30 μg/g Sr carrier.

P O NUMBER 1097166, Item 1

SOURCE PREPARED BY: M. D. Currie
M. D. Currie, Radiochemist

Q A APPROVED: 8-8-01

STL St. Louis

Standards Preparation Logbook Record

Feb-14-2006

Logbook: \\Qstlmo01\Stdslog\RAD_STD.std

RAD01-0025, Sr 90 01-093 Analyst: hicksb

Vendor: Analytics Vendor's Expiration Date: 08-07-2006
Solvent: 1M HNO3
Date Prep./Opened: 09-19-2001 Date Received: 08-07-2001
Date Expires(1): 09-19-2006 (5 Years)
Date Expires(2): 09-19-2006 (5 Years)
Current Sr 90, beta spike parent, vial# 62204-334

Component	Initial Conc (dpm/mL)	Final Conc (dpm/mL)
Sr 90	23,166	23,166

RAD04-0095, Sr-90 Analyst: hicksb

Solvent: 0.5M HNO3 Volume (ml): 100.00
Date Prep./Opened: 10-07-2004 Date Consumed: 01-05-2006
Date Expires(1): 10-07-2005 (1 Year)
Date Expires(2): 04-17-2004 (1 Year)

Parent Std No.: RAD01-0025, Sr 90 01-093 Aliquot Amount (ml): 10.000
Parent Date Expires(1): 09-19-2006 Parent Date Expires(2): 09-19-2006

Component	Initial Conc (dpm/mL)	Final Conc (dpm/mL)
Sr 90	23,166	2,316.6

Reviewed By: _____

49

SR-90 Parent Ampoule for 2nd source CPC cal.

9/19/01
BMW

#62204-334

ampoule activity: ~~3,8970~~ dps 38,970 dps.
½ life : 28.79 yrs
Calibration date: August 7, 2001 12:00 EST
Uncertainty 4.0%

STANDARDS LOG PARENT DILUTION # 01-093

$\left(\frac{38970 \text{ decays}}{1 \text{ sec}}\right)\left(\frac{60 \text{ sec}}{1 \text{ min}}\right) = 2,338,200$ dpm in ampoule.

$\left(\frac{2338200}{2.22}\right) = 1053243.2$ pCi/m in ampoule - Actual, 1043553.363 pCi/L
÷100 = 10435.8 pCi/ml

Actual Amount Transferred.... 4.9531 g

093
FD
-094

4.9531 g / 4.99897 actual = 0.9908 0.9908 x 2.3382x10^6 = 2,316,688.56 dpm

$\left(\frac{2,316,688}{100 \text{ mL}}\right) = \boxed{23,166 \text{ dpm/mL}}$ or $\boxed{104.3 \text{ pCi/mL}}$

231.66 dpm/ml
MK 12-13-02

ANALYTICS
1380 Seaboard Ind Blvd * Atlanta, GA 30318 * USA * 404-352-8677
Sr-90
SRS 62204-334 Amount 1.053 µCi QA VMN
Date 08/07/01 12:00 EST Exp. ----------
PO # 1097166, Item 1
4.99897 grams 0.1M HCl solution

CAUTION RADIOACTIVE MATERIAL

SEVERN TRENT SERVICES

R ochemistry
Standards Preparation Logbook

Date Prep'd	Expir. Date	Standard ID Number	Isotope	Parent ID Number	Parent Activity	Parent Ref. Date	Aliquot	Dilution Volume	Change in Time	T ½	Final Activity	Solvent/ Lot #	Prep'd Initials	Cal. Ver. Initials	Comments
9/18/01	12/18/01	01-087	UNAT CAL STD	01085	10 µg/mL	9/18/01	1.5 mL	100 mL	N/A	N/A	150 ng/mL	.8 M HNO3	BMW	MK	nanogram/mL
		01-088					1.0 mL				100 ng/mL			MK	
		01-089					0.5 mL				50 ng/mL			MK	
		01-090		01088	100 ng/mL		10 mL	100 mL			10 ng/mL			MK	
		01-091		01-089	50 ng/mL		10 mL	100.0 mL			5 ng/mL			MK	
		01-092		01-088	100 ng/mL		1.0 mL	100.0 mL			1 ng/mL			MK	
9/19/01	9/19/01	01-093	SR-90	ampule C2204-334	38,287 dps	8/7/01	4.953 g	100.0 mL	N/A	28.79 K	~~10435 pCi/mL~~ 104.3 pCi/mL 23,166 dpm/mL	.8 M HNO3	BMW	MK	
9/19/01	9/19/02	01-094	SR90	01093	10435.8 pCi/mL	9/19/01	1.0 mL	100.0 mL	N/A	28.79 K	104.3 pCi/mL 231.66 dpm/mL	.8 M HNO3	BMW	MK	
9/20/01	9/20/02	Ba-28	STD. Barium Carrier	MO28-KPCM BaCl2	N/A	3/23/93	28.46 g	1000.0 mL	N/A	N/A	27.2 mg/mL	Reagent H2O	BMW	MK	See Ind capture weight sheet.
10/4/01	~~10/4/01~~ 10/4/02 ~~10/4/04~~ 2nd 3rd 4th	01-095	U-232	97-105	10,994 dpm/mL	9-6-97	1 mL	500 mL	—	70 yr	21.99 dpm	1M HNO3	CAM	MK	
10/12/01	10/12/02	01-096	Ra226	98-006	1316 dpm/mL	4/12/98	1.0 mL	100.0 mL	—	1600 yr	13.16 dpm/mL	1M HNO3	AM	MK	
12/13/01	~~12/13/01~~ ~~12/13/02~~ ~~12/13/04~~ 2nd 3rd 4th	01-097	(ABT) SR90/Y90	01032	1765.4 dpm/mL	3/28/03	2.0 mL	100.0 mL	N/A	28.5 yr	~~73.97 dpm/mL~~ (26.31 total) ~~0.995 pCi/mL~~ decay corrected 29.87	1M HNO3	BMW	AW	Decay Correct = 1699.65 dpm/mL

MK 10-29-01

Additional Comments:

TestAmerica STL

Blue 2007

Alpha and Beta Calibration

with

Crosstalk Correction

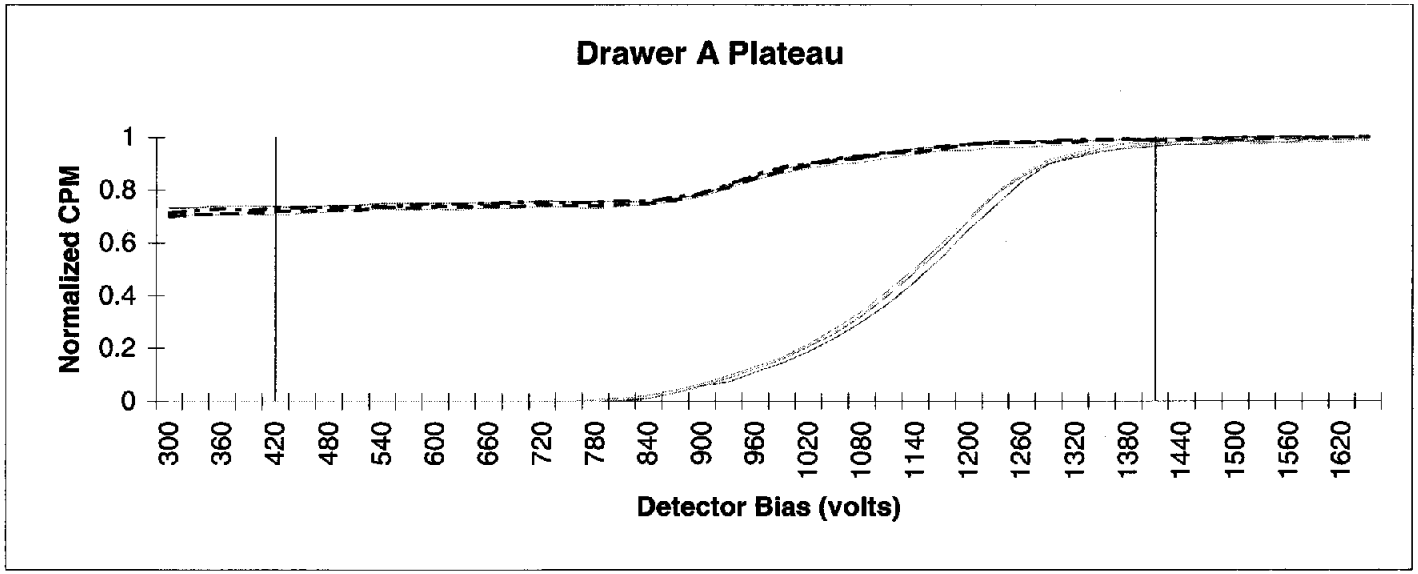
TestAmerica STL

Blue 2007

Plateaus and Discriminator Settings

Unit Type: LB4100/W
Date Performed: 3/1/07 09:48
FileName: PLAT000
Batch ID:

Unit Id: Blue
Application Revision: 2
Application Version: Standard



Optimum alpha beta simultaneous operating voltage: 1410

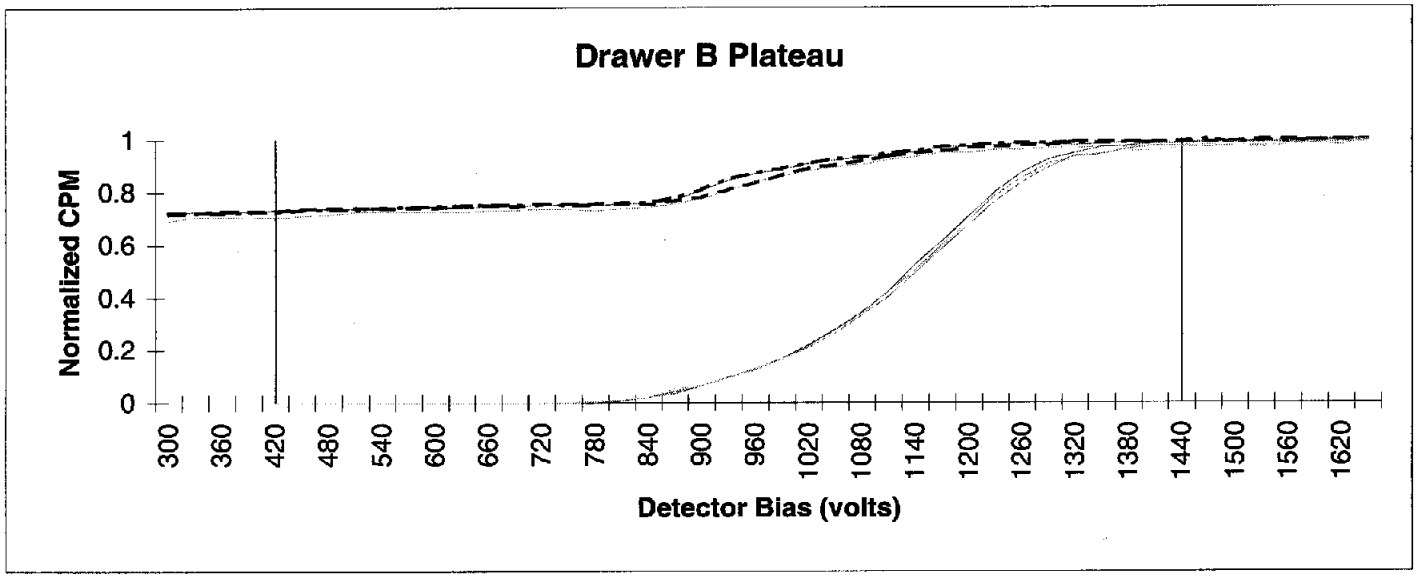
Optimum alpha only operating voltage: 420

	A1	A2	A3	A4
Beta slope at beta voltage	2.23%	1.59%	---	1.80%
Alpha slope at beta voltage	0.85%	0.35%	---	0.02%
Alpha slope at alpha voltage	-0.06%	1.61%	---	1.00%

Printed 3/1/2007 2:39 PM

Unit Type: LB4100/W
Date Performed: 3/1/07 09:48
FileName: PLAT000
Batch ID:

Unit Id: Blue
Application Revision: 2
Application Version: Standard



Optimum alpha beta simultaneous operating voltage: 1440

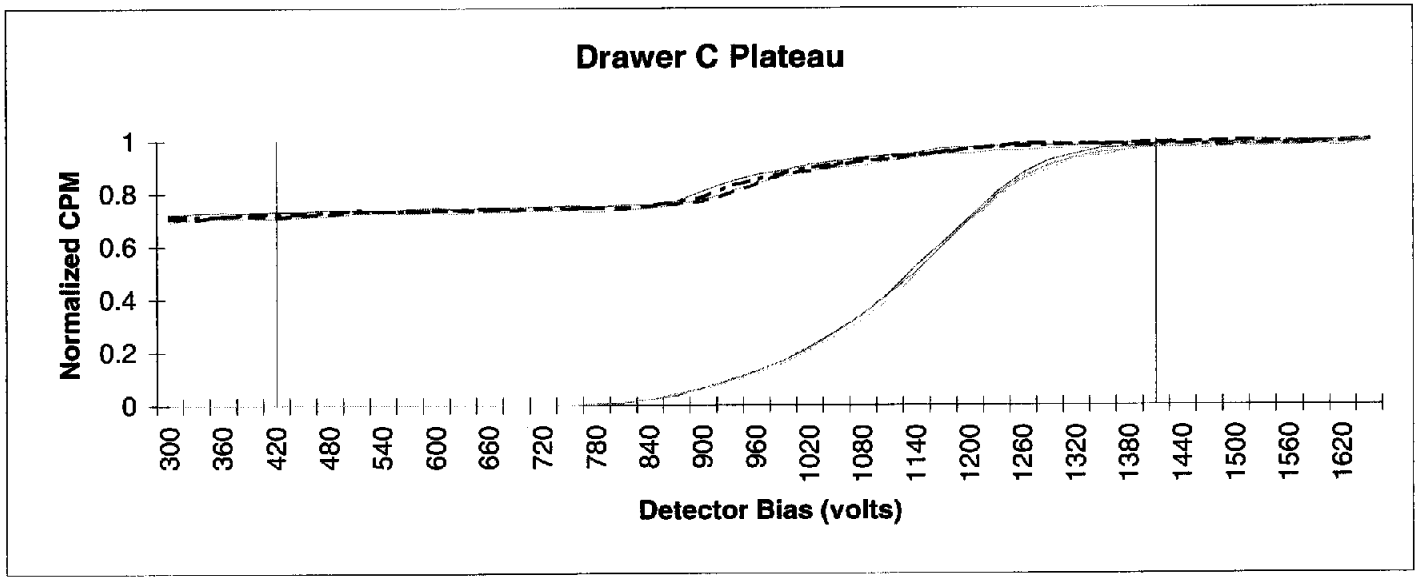
Optimum alpha only operating voltage: 420

	B1	B2	B3	B4
Beta slope at beta voltage	1.12%	2.08%	---	1.74%
Alpha slope at beta voltage	0.47%	0.12%	---	0.37%
Alpha slope at alpha voltage	1.06%	1.37%	---	1.63%

Printed 3/1/2007 2:39 PM

Unit Type: LB4100/W
Date Performed: 3/1/07 09:48
FileName: PLAT000
Batch ID:

Unit Id: Blue
Application Revision: 2
Application Version: Standard

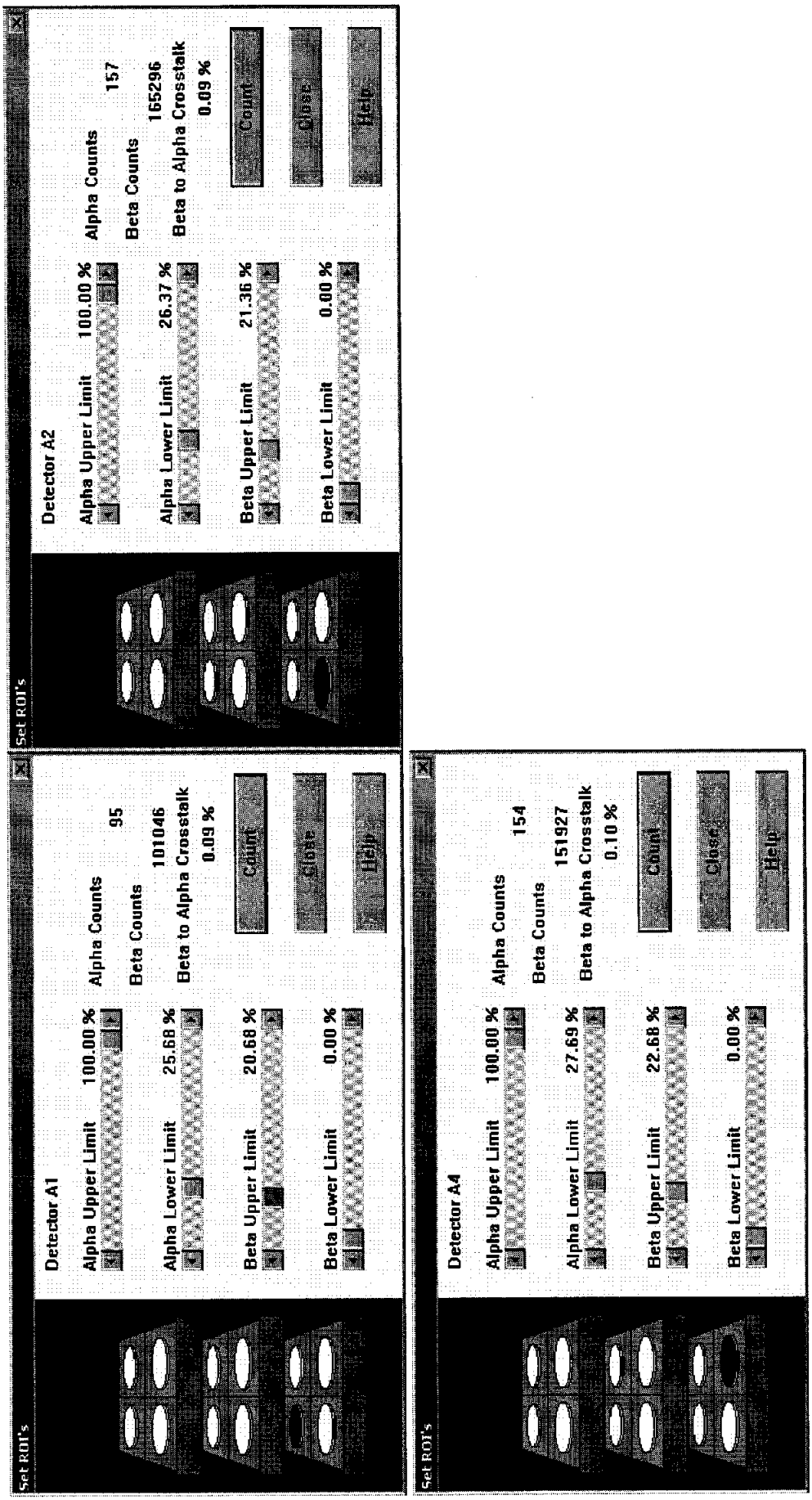


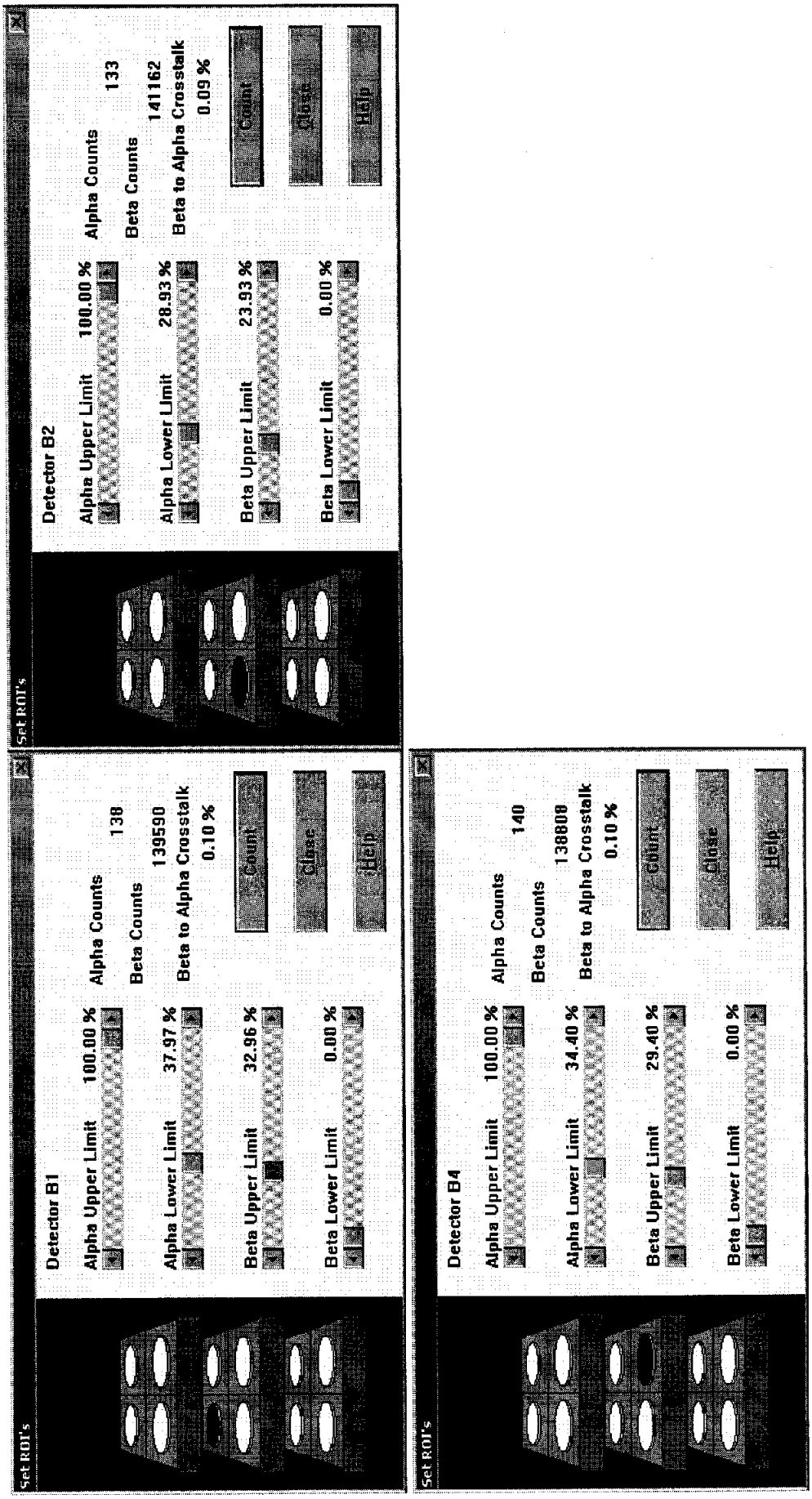
Optimum alpha beta simultaneous operating voltage: 1410

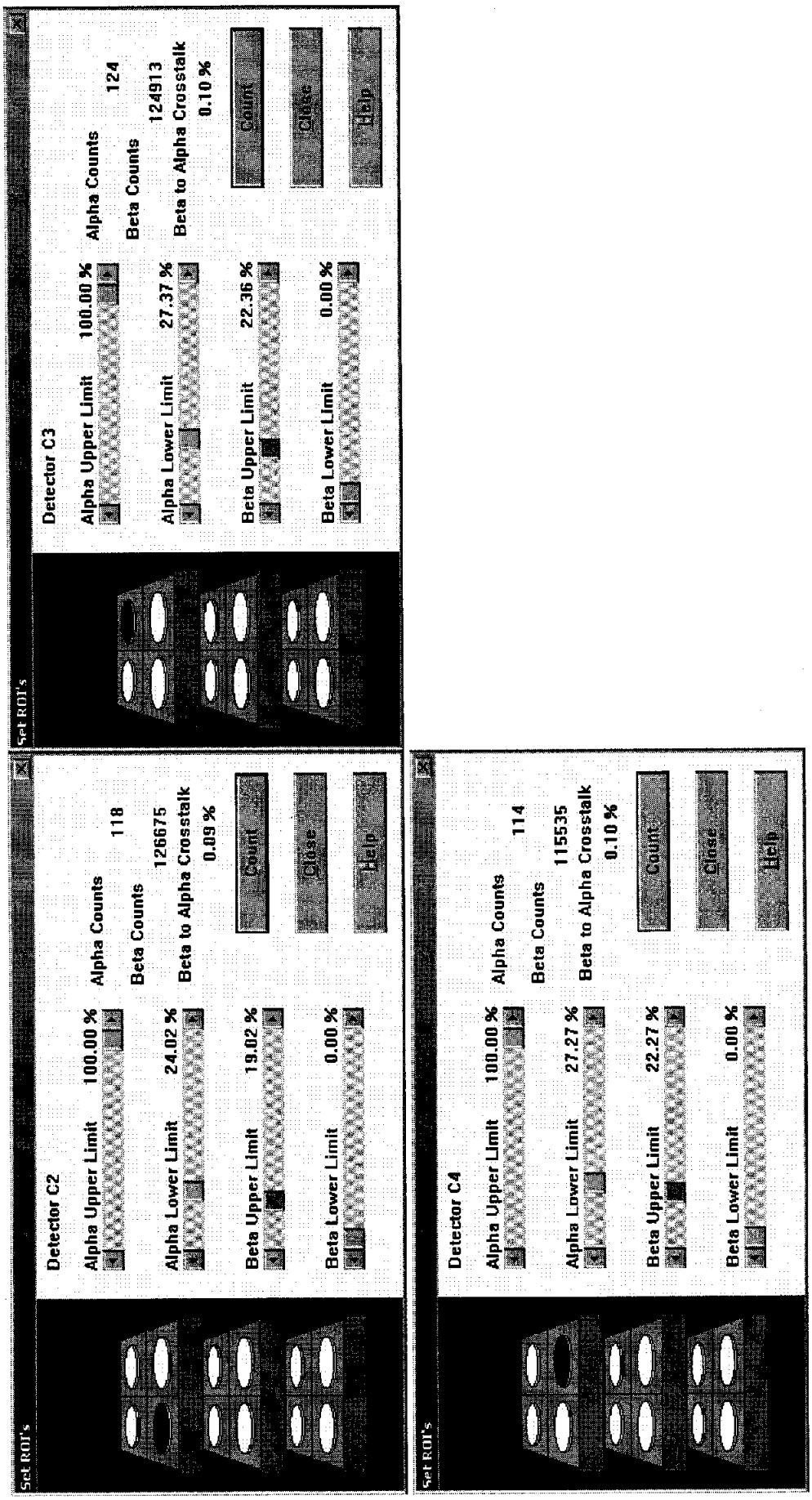
Optimum alpha only operating voltage: 420

	C1	C2	C3	C4
Beta slope at beta voltage	---	2.46%	2.85%	1.60%
Alpha slope at beta voltage	---	0.50%	-0.11%	-0.03%
Alpha slope at alpha voltage	---	0.78%	0.95%	1.26%

Printed 3/1/2007 2:39 PM


Set ROI's
Detector A1
Alpha Upper Limit 100.00 %
Alpha Counts 95
Alpha Lower Limit 25.68 %
Beta Counts 101046
Beta Upper Limit 20.68 %
Beta to Alpha Crosstalk 0.09 %
Beta Lower Limit 0.00 %
Count
Close
Help
Set ROI's
Detector A2
Alpha Upper Limit 100.00 %
Alpha Counts 157
Alpha Lower Limit 26.37 %
Beta Counts 165296
Beta Upper Limit 21.36 %
Beta to Alpha Crosstalk 0.09 %
Beta Lower Limit 0.00 %
Count
Close
Help
Set ROI's
Detector A4
Alpha Upper Limit 100.00 %
Alpha Counts 154
Alpha Lower Limit 27.69 %
Beta Counts 151927
Beta Upper Limit 22.68 %
Beta to Alpha Crosstalk 0.10 %
Beta Lower Limit 0.00 %
Count
Close
Help


Set ROI's
Detector B1
Alpha Upper Limit 100.00 %
Alpha Counts 138
Alpha Lower Limit 37.97 %
Beta Counts 139590
Beta Upper Limit 32.96 %
Beta to Alpha Crosstalk 0.10 %
Beta Lower Limit 0.00 %
Count
Close
Help
Set ROI's
Detector B2
Alpha Upper Limit 100.00 %
Alpha Counts 133
Alpha Lower Limit 28.93 %
Beta Counts 141162
Beta Upper Limit 23.93 %
Beta to Alpha Crosstalk 0.09 %
Beta Lower Limit 0.00 %
Count
Close
Help
Set ROI's
Detector B4
Alpha Upper Limit 100.00 %
Alpha Counts 140
Alpha Lower Limit 34.40 %
Beta Counts 138808
Beta Upper Limit 29.40 %
Beta to Alpha Crosstalk 0.10 %
Beta Lower Limit 0.00 %
Count
Close
Help


Set ROI's
Detector C2
Alpha Upper Limit 100.00 %
Alpha Counts 118
Alpha Lower Limit 24.02 %
Beta Counts 126675
Beta Upper Limit 19.02 %
Beta to Alpha Crosstalk 0.09 %
Beta Lower Limit 0.00 %
Count
Close
Help
Set ROI's
Detector C3
Alpha Upper Limit 100.00 %
Alpha Counts 124
Alpha Lower Limit 27.37 %
Beta Counts 124913
Beta Upper Limit 22.36 %
Beta to Alpha Crosstalk 0.10 %
Beta Lower Limit 0.00 %
Count
Close
Help
Set ROI's
Detector C4
Alpha Upper Limit 100.00 %
Alpha Counts 114
Alpha Lower Limit 27.27 %
Beta Counts 115535
Beta Upper Limit 22.27 %
Beta to Alpha Crosstalk 0.10 %
Beta Lower Limit 0.00 %
Count
Close
Help

TestAmerica STL

Blue 2007

Alpha Efficiency Curves

Alpha Attenuation Blue A1
03_2007

Data Set 1

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
A1	A11	0.0094	40.00	35215	880.375	4567.9	0.1927
A1	A12	0.0169	40.00	38247	956.175	4567.9	0.2093
A1	A13	0.0257	40.00	27140	678.500	4567.9	0.1485
A1	A14	0.0421	40.00	25417	635.425	4567.9	0.1391
A1	A15	0.0629	40.00	19188	479.700	4567.9	0.1050
A1	A16	0.0817	40.00	36984	924.600	9135.8	0.1012
A1	A17	0.1052	40.00	30924	773.100	9135.8	0.0846
A1	A18	0.1240	40.00	27210	680.250	9135.8	0.0745

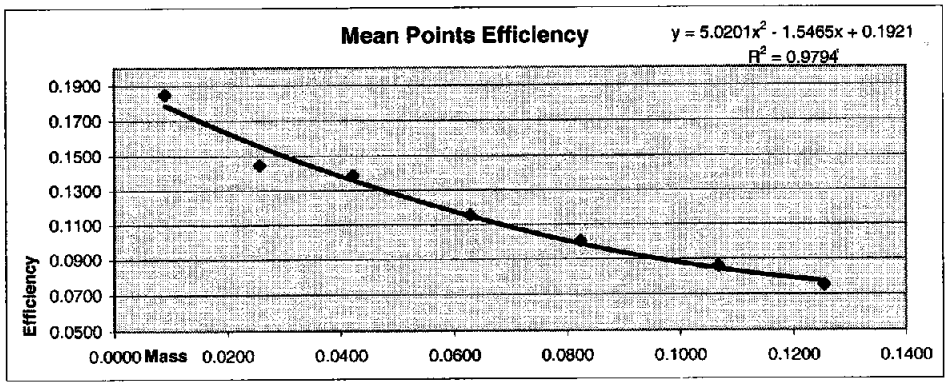
Alpha Attenuation Blue A1
03_2007

Data Set 2

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
A1	A21	0.0086	40.00	32322	808.050	4567.9	0.1769
A1	A22	0.0172	40.00	27029	675.725	4567.9	0.1479
A1	A23	0.0256	40.00	25729	643.225	4567.9	0.1408
A1	A24	0.0422	40.00	25288	632.200	4567.9	0.1384
A1	A25	0.0628	40.00	22970	574.250	4567.9	0.1257
A1	A26	0.0830	40.00	36459	911.475	9135.8	0.0998
A1	A27	0.1082	40.00	31872	796.800	9135.8	0.0872
A1	A28	0.1269	40.00	27710	692.750	9135.8	0.0758

Blue A1

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0094	0.0086	0.0090	0.1927	0.1769	0.1848	4.28%	-4.28%
0.0257	0.0256	0.0257	0.1485	0.1408	0.1447	2.67%	-2.67%
0.0421	0.0422	0.0421	0.1391	0.1384	0.1388	0.25%	-0.25%
0.0629	0.0628	0.0629	0.1050	0.1257	0.1154	-8.97%	8.97%
0.0817	0.0830	0.0823	0.1012	0.0998	0.1005	0.71%	-0.71%
0.1052	0.1082	0.1067	0.0846	0.0872	0.0859	-1.51%	1.51%
0.1240	0.1269	0.1255	0.0745	0.0758	0.0751	-0.91%	0.91%



lpha Attenuation Blue A2
3_2007

ata Set 1

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
A1	A11	0.0094	40.00	33916	847.900	4567.9	0.1856
A1	A12	0.0169	40.00	37413	935.325	4567.9	0.2048
A1	A13	0.0257	40.00	26520	663.000	4567.9	0.1451
A1	A14	0.0421	40.00	24567	614.175	4567.9	0.1345
A1	A15	0.0629	40.00	18575	464.375	4567.9	0.1017
A1	A16	0.0817	40.00	35554	888.850	9135.8	0.0973
A1	A17	0.1052	40.00	29897	747.425	9135.8	0.0818
A1	A18	0.1240	40.00	26139	653.475	9135.8	0.0715

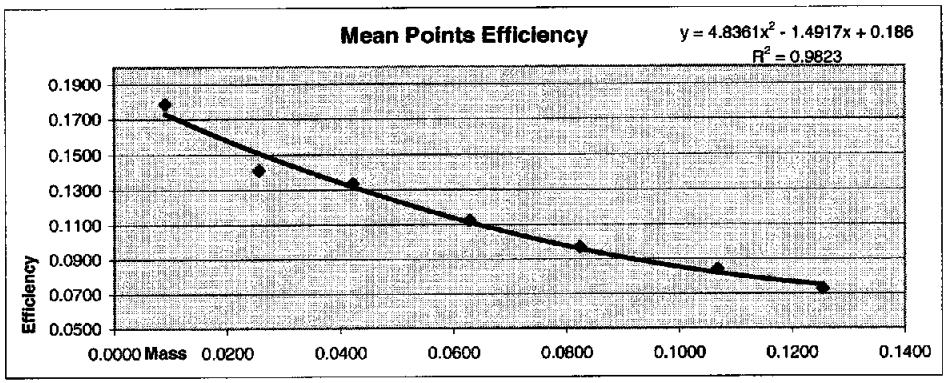
Alpha Attenuation Blue A2
03_2007

Data Set 2

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
A1	A21	0.0086	40.00	31378	784.450	4567.9	0.1717
A1	A22	0.0172	40.00	25918	647.950	4567.9	0.1418
A1	A23	0.0256	40.00	25051	626.275	4567.9	0.1371
A1	A24	0.0422	40.00	24203	605.075	4567.9	0.1325
A1	A25	0.0628	40.00	22504	562.600	4567.9	0.1232
A1	A26	0.0830	40.00	35397	884.925	9135.8	0.0969
A1	A27	0.1082	40.00	31539	788.475	9135.8	0.0863
A1	A28	0.1269	40.00	27044	676.100	9135.8	0.0740

lue A2

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0094	0.0086	0.0090	0.1856	0.1717	0.1787	3.89%	-3.89%
0.0257	0.0256	0.0257	0.1451	0.1371	0.1411	2.85%	-2.85%
0.0421	0.0422	0.0421	0.1345	0.1325	0.1335	0.75%	-0.75%
0.0629	0.0628	0.0629	0.1017	0.1232	0.1124	-9.56%	9.56%
0.0817	0.0830	0.0823	0.0973	0.0969	0.0971	0.22%	-0.22%
0.1052	0.1082	0.1067	0.0818	0.0863	0.0841	-2.67%	2.67%
0.1240	0.1269	0.1255	0.0715	0.0740	0.0728	-1.70%	1.70%



lpha Attenuation Blue A4
3_2007

ata Set 1

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
A1	A11	0.0094	40.00	34628	865.700	4567.9	0.1895
A1	A12	0.0169	40.00	37412	935.300	4567.9	0.2048
A1	A13	0.0257	40.00	26773	669.325	4567.9	0.1465
A1	A14	0.0421	40.00	24427	610.675	4567.9	0.1337
A1	A15	0.0629	40.00	18587	464.675	4567.9	0.1017
A1	A16	0.0817	40.00	35771	894.275	9135.8	0.0979
A1	A17	0.1052	40.00	30066	751.650	9135.8	0.0823
A1	A18	0.1240	40.00	26303	657.575	9135.8	0.0720

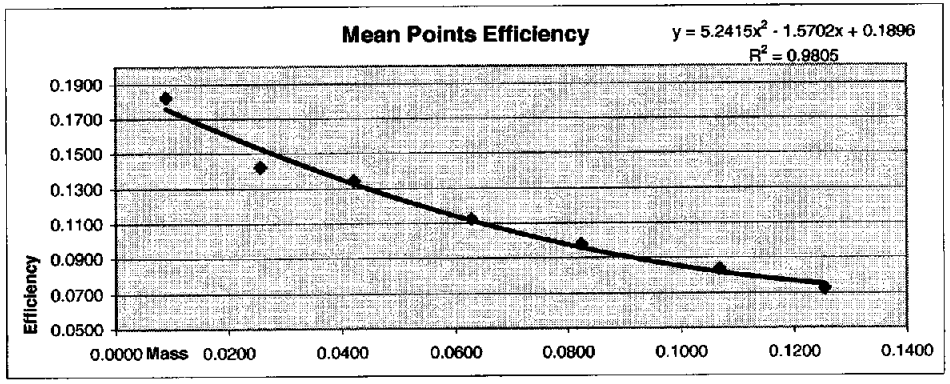
Alpha Attenuation Blue A4
03_2007

Data Set 2

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
A1	A21	0.0086	40.00	31941	798.525	4567.9	0.1748
A1	A22	0.0172	40.00	26351	658.775	4567.9	0.1442
A1	A23	0.0256	40.00	25189	629.725	4567.9	0.1379
A1	A24	0.0422	40.00	24694	617.350	4567.9	0.1351
A1	A25	0.0628	40.00	22475	561.875	4567.9	0.1230
A1	A26	0.0830	40.00	35726	893.150	9135.8	0.0978
A1	A27	0.1082	40.00	31140	778.500	9135.8	0.0852
A1	A28	0.1269	40.00	26864	671.600	9135.8	0.0735

lue A4

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0094	0.0086	0.0090	0.1895	0.1748	0.1822	4.04%	-4.04%
0.0257	0.0256	0.0257	0.1465	0.1379	0.1422	3.05%	-3.05%
0.0421	0.0422	0.0421	0.1337	0.1351	0.1344	-0.54%	0.54%
0.0629	0.0628	0.0629	0.1017	0.1230	0.1124	-9.47%	9.47%
0.0817	0.0830	0.0823	0.0979	0.0978	0.0978	0.06%	-0.06%
0.1052	0.1082	0.1067	0.0823	0.0852	0.0837	-1.75%	1.75%
0.1240	0.1269	0.1255	0.0720	0.0735	0.0727	-1.06%	1.06%



lpha Attenuation Blue B1
3_2007

ata Set 1

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
A1	A11	0.0094	40.00	33966	849.150	4567.9	0.1859
A1	A12	0.0169	40.00	36435	910.875	4567.9	0.1994
A1	A13	0.0257	40.00	26511	662.775	4567.9	0.1451
A1	A14	0.0421	40.00	23947	598.675	4567.9	0.1311
A1	A15	0.0629	40.00	18556	463.900	4567.9	0.1016
A1	A16	0.0817	40.00	35097	877.425	9135.8	0.0960
A1	A17	0.1052	40.00	29429	735.725	9135.8	0.0805
A1	A18	0.1240	40.00	25658	641.450	9135.8	0.0702

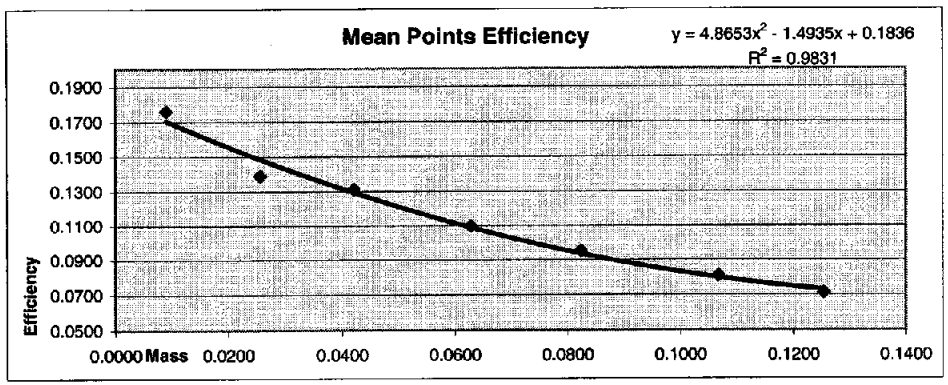
Alpha Attenuation Blue B1
03_2007

Data Set 2

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
A1	A21	0.0086	40.00	30403	760.075	4567.9	0.1664
A1	A22	0.0172	40.00	25662	641.550	4567.9	0.1404
A1	A23	0.0256	40.00	24221	605.525	4567.9	0.1326
A1	A24	0.0422	40.00	24007	600.175	4567.9	0.1314
A1	A25	0.0628	40.00	21549	538.725	4567.9	0.1179
A1	A26	0.0830	40.00	34668	866.700	9135.8	0.0949
A1	A27	0.1082	40.00	29635	740.875	9135.8	0.0811
A1	A28	0.1269	40.00	26311	657.775	9135.8	0.0720

lue B1

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0094	0.0086	0.0090	0.1859	0.1664	0.1761	5.54%	-5.54%
0.0257	0.0256	0.0257	0.1451	0.1326	0.1388	4.51%	-4.51%
0.0421	0.0422	0.0421	0.1311	0.1314	0.1312	-0.13%	0.13%
0.0629	0.0628	0.0629	0.1016	0.1179	0.1097	-7.46%	7.46%
0.0817	0.0830	0.0823	0.0960	0.0949	0.0955	0.61%	-0.61%
0.1052	0.1082	0.1067	0.0805	0.0811	0.0808	-0.35%	0.35%
0.1240	0.1269	0.1255	0.0702	0.0720	0.0711	-1.26%	1.26%



lpha Attenuation Blue B2
3_2007

Data Set 1

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
A1	A11	0.0094	40.00	35111	877.775	4567.9	0.1922
A1	A12	0.0169	40.00	38473	961.825	4567.9	0.2106
A1	A13	0.0257	40.00	27602	690.050	4567.9	0.1511
A1	A14	0.0421	40.00	25398	634.950	4567.9	0.1390
A1	A15	0.0629	40.00	19601	490.025	4567.9	0.1073
A1	A16	0.0817	40.00	37440	936.000	9135.8	0.1025
A1	A17	0.1052	40.00	31103	777.575	9135.8	0.0851
A1	A18	0.1240	40.00	27230	680.750	9135.8	0.0745

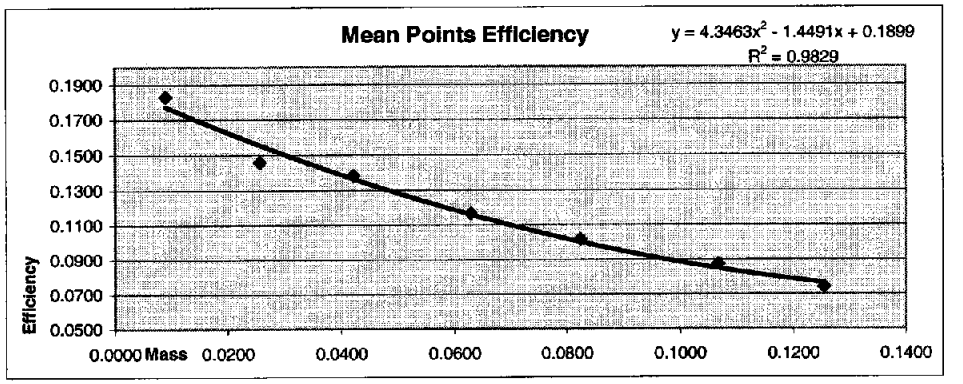
Alpha Attenuation Blue B2
03_2007

Data Set 2

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
A1	A21	0.0086	40.00	31757	793.925	4567.9	0.1738
A1	A22	0.0172	40.00	26934	673.350	4567.9	0.1474
A1	A23	0.0256	40.00	25701	642.525	4567.9	0.1407
A1	A24	0.0422	40.00	25174	629.350	4567.9	0.1378
A1	A25	0.0628	40.00	22992	574.800	4567.9	0.1258
A1	A26	0.0830	40.00	36739	918.475	9135.8	0.1005
A1	A27	0.1082	40.00	32662	816.550	9135.8	0.0894
A1	A28	0.1269	40.00	26932	673.300	9135.8	0.0737

lue B2

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0094	0.0086	0.0090	0.1922	0.1738	0.1830	5.02%	-5.02%
0.0257	0.0256	0.0257	0.1511	0.1407	0.1459	3.57%	-3.57%
0.0421	0.0422	0.0421	0.1390	0.1378	0.1384	0.44%	-0.44%
0.0629	0.0628	0.0629	0.1073	0.1258	0.1166	-7.96%	7.96%
0.0817	0.0830	0.0823	0.1025	0.1005	0.1015	0.95%	-0.95%
0.1052	0.1082	0.1067	0.0851	0.0894	0.0872	-2.44%	2.44%
0.1240	0.1269	0.1255	0.0745	0.0737	0.0741	0.55%	-0.55%



lpha Attenuation Blue B4
3_2007

ata Set 1

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
A1	A11	0.0094	40.00	33410	835.250	4567.9	0.1829
A1	A12	0.0169	40.00	36568	914.200	4567.9	0.2001
A1	A13	0.0257	40.00	26102	652.550	4567.9	0.1429
A1	A14	0.0421	40.00	24105	602.625	4567.9	0.1319
A1	A15	0.0629	40.00	18142	453.550	4567.9	0.0993
A1	A16	0.0817	40.00	35102	877.550	9135.8	0.0961
A1	A17	0.1052	40.00	28242	706.050	9135.8	0.0773
A1	A18	0.1240	40.00	25496	637.400	9135.8	0.0698

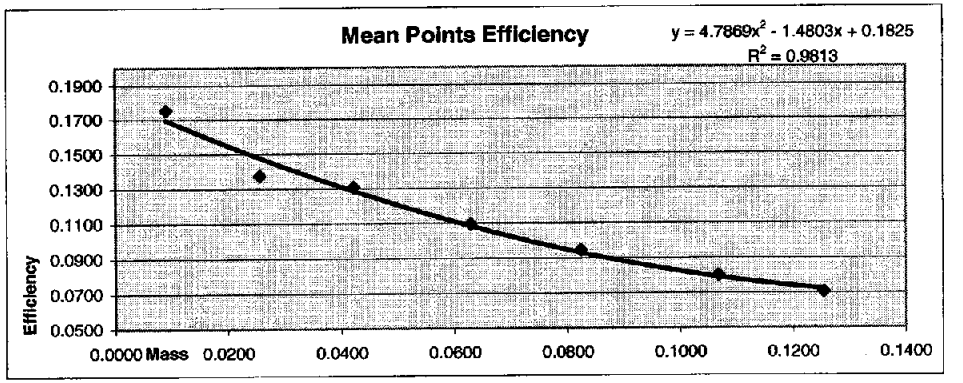
Alpha Attenuation Blue B4
03_2007

Data Set 2

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
A1	A21	0.0086	40.00	30667	766.675	4567.9	0.1678
A1	A22	0.0172	40.00	25312	632.800	4567.9	0.1385
A1	A23	0.0256	40.00	24130	603.250	4567.9	0.1321
A1	A24	0.0422	40.00	23677	591.925	4567.9	0.1296
A1	A25	0.0628	40.00	21885	547.125	4567.9	0.1198
A1	A26	0.0830	40.00	34125	853.125	9135.8	0.0934
A1	A27	0.1082	40.00	30213	755.325	9135.8	0.0827
A1	A28	0.1269	40.00	26080	652.000	9135.8	0.0714

lue B4

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0094	0.0086	0.0090	0.1829	0.1678	0.1753	4.28%	-4.28%
0.0257	0.0256	0.0257	0.1429	0.1321	0.1375	3.93%	-3.93%
0.0421	0.0422	0.0421	0.1319	0.1296	0.1308	0.90%	-0.90%
0.0629	0.0628	0.0629	0.0993	0.1198	0.1095	-9.35%	9.35%
0.0817	0.0830	0.0823	0.0961	0.0934	0.0947	1.41%	-1.41%
0.1052	0.1082	0.1067	0.0773	0.0827	0.0800	-3.37%	3.37%
0.1240	0.1269	0.1255	0.0698	0.0714	0.0706	-1.13%	1.13%



Alpha Attenuation Blue C2
03_2007

Data Set 1

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
A1	A11	0.0094	40.00	34562	864.050	4567.9	0.1892
A1	A12	0.0169	40.00	37483	937.075	4567.9	0.2051
A1	A13	0.0257	40.00	27041	676.025	4567.9	0.1480
A1	A14	0.0421	40.00	24819	620.475	4567.9	0.1358
A1	A15	0.0629	40.00	18770	469.250	4567.9	0.1027
A1	A16	0.0817	40.00	36055	901.375	9135.8	0.0987
A1	A17	0.1052	40.00	30592	764.800	9135.8	0.0837
A1	A18	0.1240	40.00	26353	658.825	9135.8	0.0721

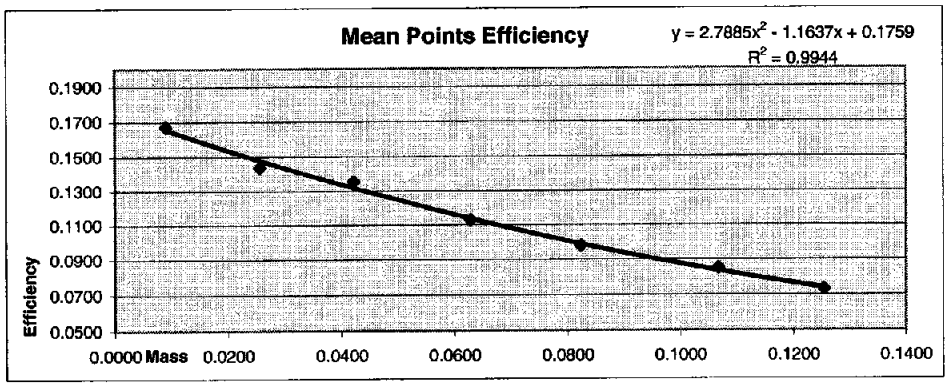
Alpha Attenuation Blue C2
03_2007

Data Set 2

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
A1	A21	0.0086	40.00	26516	662.900	4567.9	0.1451
A1	A22	0.0172	40.00	31908	797.700	4567.9	0.1746
A1	A23	0.0256	40.00	25441	636.025	4567.9	0.1392
A1	A24	0.0422	40.00	24700	617.500	4567.9	0.1352
A1	A25	0.0628	40.00	22469	561.725	4567.9	0.1230
A1	A26	0.0830	40.00	35559	888.975	9135.8	0.0973
A1	A27	0.1082	40.00	31439	785.975	9135.8	0.0860
A1	A28	0.1269	40.00	27064	676.600	9135.8	0.0741

Blue C2

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0094	0.0086	0.0090	0.1892	0.1451	0.1671	13.17%	-13.17%
0.0257	0.0256	0.0257	0.1480	0.1392	0.1436	3.05%	-3.05%
0.0421	0.0422	0.0421	0.1358	0.1352	0.1355	0.24%	-0.24%
0.0629	0.0628	0.0629	0.1027	0.1230	0.1128	-8.97%	8.97%
0.0817	0.0830	0.0823	0.0987	0.0973	0.0980	0.69%	-0.69%
0.1052	0.1082	0.1067	0.0837	0.0860	0.0849	-1.37%	1.37%
0.1240	0.1269	0.1255	0.0721	0.0741	0.0731	-1.33%	1.33%



lpha Attenuation Blue C3
3_2007

ata Set 1

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
A1	A11	0.0094	40.00	34375	859.375	4567.9	0.1881
A1	A12	0.0169	40.00	37840	946.000	4567.9	0.2071
A1	A13	0.0257	40.00	27462	686.550	4567.9	0.1503
A1	A14	0.0421	40.00	25025	625.625	4567.9	0.1370
A1	A15	0.0629	40.00	19054	476.350	4567.9	0.1043
A1	A16	0.0817	40.00	36482	912.050	9135.8	0.0998
A1	A17	0.1052	40.00	30195	754.875	9135.8	0.0826
A1	A18	0.1240	40.00	26709	667.725	9135.8	0.0731

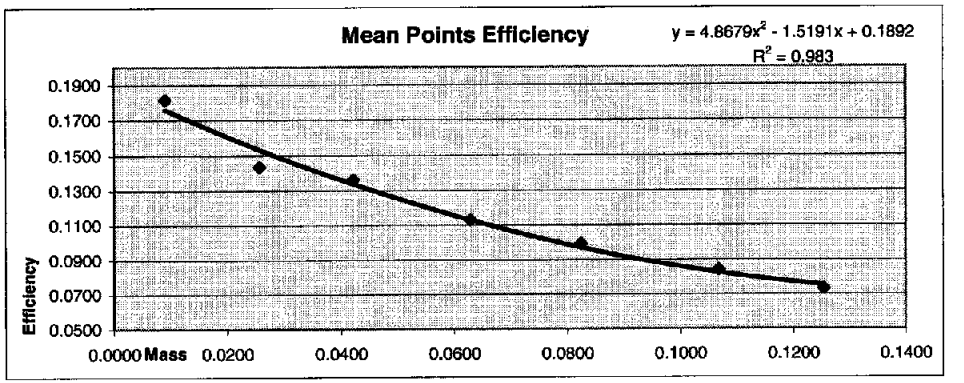
Alpha Attenuation Blue C3
03_2007

Data Set 2

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
A1	A21	0.0086	40.00	31972	799.300	4567.9	0.1750
A1	A22	0.0172	40.00	26651	666.275	4567.9	0.1459
A1	A23	0.0256	40.00	25016	625.400	4567.9	0.1369
A1	A24	0.0422	40.00	24704	617.600	4567.9	0.1352
A1	A25	0.0628	40.00	22227	555.675	4567.9	0.1216
A1	A26	0.0830	40.00	35959	898.975	9135.8	0.0984
A1	A27	0.1082	40.00	31413	785.325	9135.8	0.0860
A1	A28	0.1269	40.00	26738	668.450	9135.8	0.0732

lue C3

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0094	0.0086	0.0090	0.1881	0.1750	0.1816	3.62%	-3.62%
0.0257	0.0256	0.0257	0.1503	0.1369	0.1436	4.66%	-4.66%
0.0421	0.0422	0.0421	0.1370	0.1352	0.1361	0.65%	-0.65%
0.0629	0.0628	0.0629	0.1043	0.1216	0.1130	-7.69%	7.69%
0.0817	0.0830	0.0823	0.0998	0.0984	0.0991	0.72%	-0.72%
0.1052	0.1082	0.1067	0.0826	0.0860	0.0843	-1.98%	1.98%
0.1240	0.1269	0.1255	0.0731	0.0732	0.0731	-0.05%	0.05%



Alpha Attenuation Blue C4
03_2007

Data Set 1

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
A1	A11	0.0094	40.00	34104	852.600	4567.9	0.1867
A1	A12	0.0169	40.00	37074	926.850	4567.9	0.2029
A1	A13	0.0257	40.00	26735	668.375	4567.9	0.1463
A1	A14	0.0421	40.00	24733	618.325	4567.9	0.1354
A1	A15	0.0629	40.00	18830	470.750	4567.9	0.1031
A1	A16	0.0817	40.00	35695	892.375	9135.8	0.0977
A1	A17	0.1052	40.00	30192	754.800	9135.8	0.0826
A1	A18	0.1240	40.00	26272	656.800	9135.8	0.0719

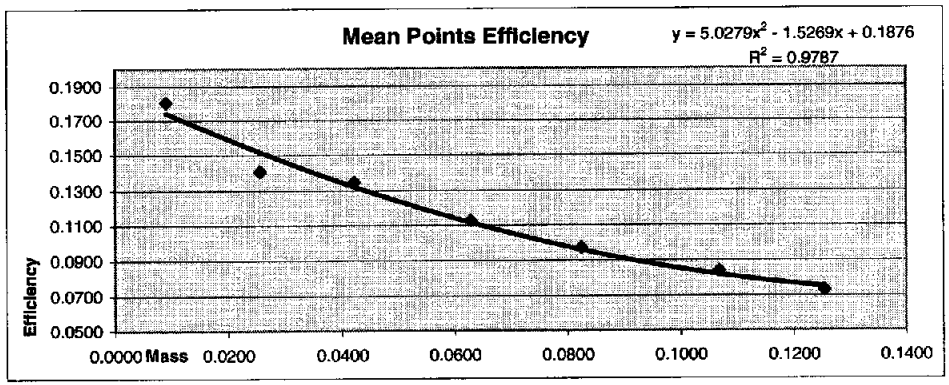
Alpha Attenuation Blue C4
03_2007

Data Set 2

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
A1	A21	0.0086	40.00	31873	796.825	4567.9	0.1744
A1	A22	0.0172	40.00	26226	655.650	4567.9	0.1435
A1	A23	0.0256	40.00	24706	617.650	4567.9	0.1352
A1	A24	0.0422	40.00	24479	611.975	4567.9	0.1340
A1	A25	0.0628	40.00	22290	557.250	4567.9	0.1220
A1	A26	0.0830	40.00	35400	885.000	9135.8	0.0969
A1	A27	0.1082	40.00	31219	780.475	9135.8	0.0854
A1	A28	0.1269	40.00	27085	677.125	9135.8	0.0741

Blue C4

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0094	0.0086	0.0090	0.1867	0.1744	0.1805	3.38%	-3.38%
0.0257	0.0256	0.0257	0.1463	0.1352	0.1408	3.94%	-3.94%
0.0421	0.0422	0.0421	0.1354	0.1340	0.1347	0.52%	-0.52%
0.0629	0.0628	0.0629	0.1031	0.1220	0.1125	-8.41%	8.41%
0.0817	0.0830	0.0823	0.0977	0.0969	0.0973	0.41%	-0.41%
0.1052	0.1082	0.1067	0.0826	0.0854	0.0840	-1.67%	1.67%
0.1240	0.1269	0.1255	0.0719	0.0741	0.0730	-1.52%	1.52%



TestAmerica STL

Blue 2007

Beta Efficiency Curves

Beta Attenuation Blue A1
Set 1 03/08,09/2007

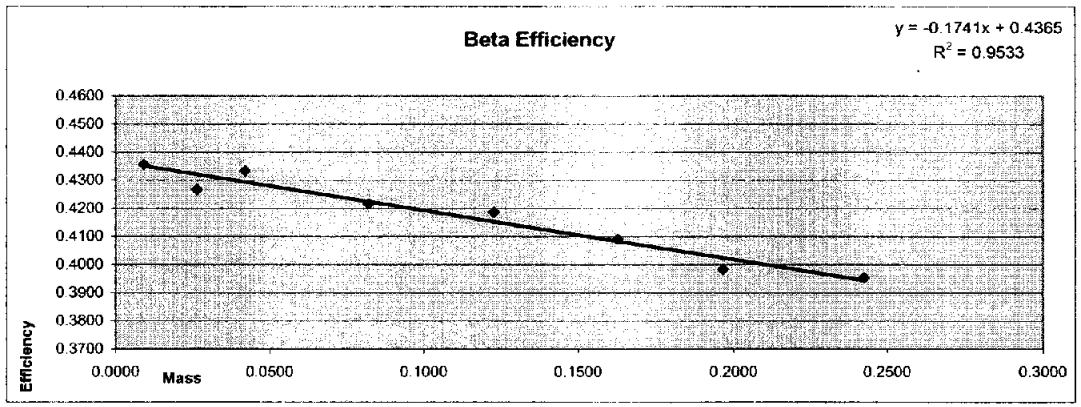
Std ID	Sample Wt	Count Time	Beta Counts	DPM 4044 CPM	Sr-90 Eff
B11	0.0093	20	36460	1823.000	0.4508
B12	0.0264	20	35672	1783.600	0.4410
B13	0.0425	20	35649	1782.450	0.4408
B14	0.0809	20	34014	1700.700	0.4205
B15	0.1227	20	33963	1698.150	0.4199
B16	0.1647	20	32790	1639.500	0.4054
B17	0.2003	20	31946	1597.300	0.3950
B18	0.2429	20	32198	1609.900	0.3981

Beta Attenuation Blue A1
Set 2

Std ID	Sample Wt	Count Time	Beta Counts	DPM 4044 CPM	Sr-90 Eff
B21	0.0091	20	33999	1699.950	0.4204
B22	0.0265	20	33343	1667.150	0.4123
B23	0.0415	20	34443	1722.150	0.4259
B24	0.0830	20	34176	1708.800	0.4226
B25	0.1230	20	33748	1687.400	0.4173
B26	0.1611	20	33379	1668.950	0.4127
B27	0.1932	20	32482	1624.100	0.4016
B28	0.2421	20	31755	1587.750	0.3926

Blue A1

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0093	0.0091	0.0092	0.4508	0.4204	0.4356	3.49%	-3.49%
0.0264	0.0265	0.0265	0.4410	0.4123	0.4267	3.37%	-3.37%
0.0425	0.0415	0.0420	0.4408	0.4259	0.4333	1.72%	-1.72%
0.0809	0.0830	0.0820	0.4205	0.4226	0.4216	-0.24%	0.24%
0.1227	0.1230	0.1229	0.4199	0.4173	0.4186	0.32%	-0.32%
0.1647	0.1611	0.1629	0.4054	0.4127	0.4091	-0.89%	0.89%
0.2003	0.1932	0.1968	0.3950	0.4016	0.3983	-0.83%	0.83%
0.2429	0.2421	0.2425	0.3981	0.3926	0.3954	0.69%	-0.69%



Beta Attenuation Blue A2
Set 1 03/08,09/2007

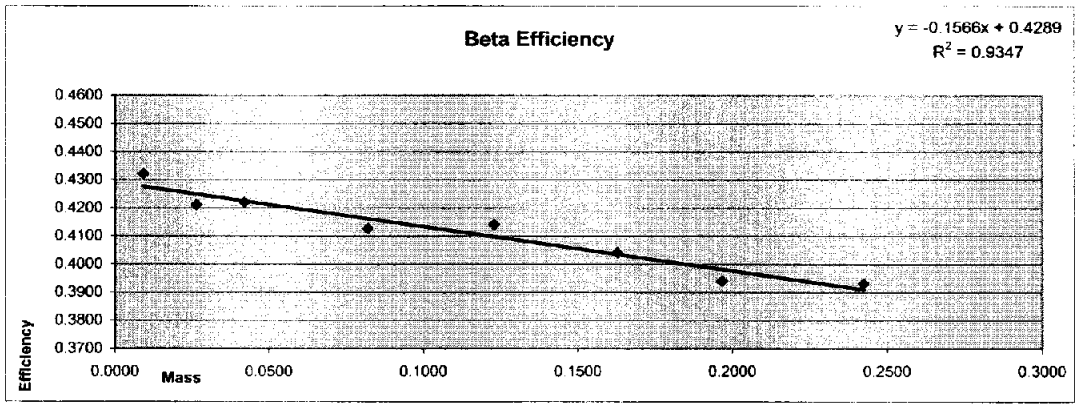
Std ID	Sample Wt	Count Time	Beta Counts	DPM 4044 CPM	Sr-90 Eff
B11	0.0093	20	36093	1804.650	0.4463
B12	0.0264	20	35500	1775.000	0.4389
B13	0.0425	20	34887	1744.350	0.4313
B14	0.0809	20	33577	1678.850	0.4151
B15	0.1227	20	33772	1688.600	0.4176
B16	0.1647	20	32352	1617.600	0.4000
B17	0.2003	20	31773	1588.650	0.3928
B18	0.2429	20	31783	1589.150	0.3930

Beta Attenuation Blue A2
Set 2

Std ID	Sample Wt	Count Time	Beta Counts	DPM 4044 CPM	Sr-90 Eff
B21	0.0091	20	33795	1689.750	0.4178
B22	0.0265	20	32623	1631.150	0.4034
B23	0.0415	20	33351	1667.550	0.4124
B24	0.0830	20	33168	1658.400	0.4101
B25	0.1230	20	33195	1659.750	0.4104
B26	0.1611	20	33020	1651.000	0.4083
B27	0.1932	20	31965	1598.250	0.3952
B28	0.2421	20	31804	1590.200	0.3932

Blue A2

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0093	0.0091	0.0092	0.4463	0.4178	0.4320	3.29%	-3.29%
0.0264	0.0265	0.0265	0.4389	0.4034	0.4211	4.22%	-4.22%
0.0425	0.0415	0.0420	0.4313	0.4124	0.4218	2.25%	-2.25%
0.0809	0.0830	0.0820	0.4151	0.4101	0.4126	0.61%	-0.61%
0.1227	0.1230	0.1229	0.4176	0.4104	0.4140	0.86%	-0.86%
0.1647	0.1611	0.1629	0.4000	0.4083	0.4041	-1.02%	1.02%
0.2003	0.1932	0.1968	0.3928	0.3952	0.3940	-0.30%	0.30%
0.2429	0.2421	0.2425	0.3930	0.3932	0.3931	-0.03%	0.03%



Beta Attenuation Blue A4
Set 1 03/08,09/2007

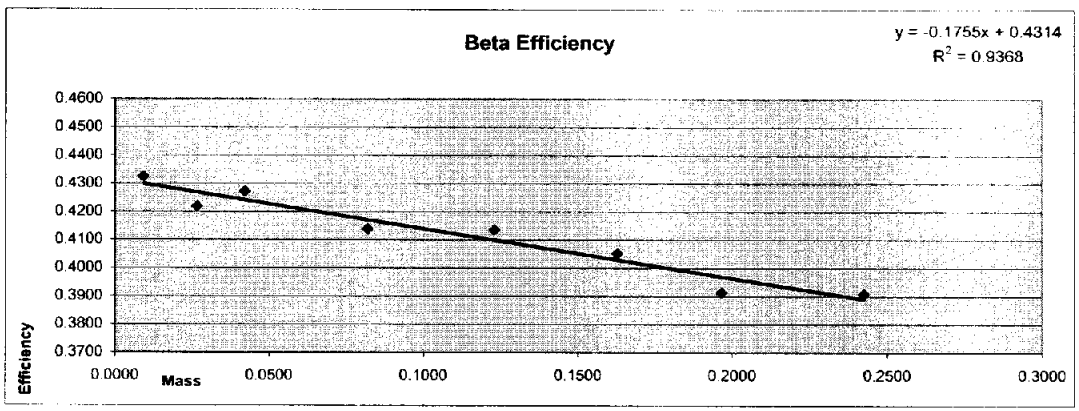
Std ID	Sample Wt	Count Time	Beta Counts	DPM 4044 CPM	Sr-90 Eff
B11	0.0093	20	35995	1799.750	0.4450
B12	0.0264	20	35326	1766.300	0.4368
B13	0.0425	20	35451	1772.550	0.4383
B14	0.0809	20	33398	1669.900	0.4129
B15	0.1227	20	33369	1668.450	0.4126
B16	0.1647	20	32557	1627.850	0.4025
B17	0.2003	20	31406	1570.300	0.3883
B18	0.2429	20	31755	1587.750	0.3926

Beta Attenuation Blue A4
Set 2

Std ID	Sample Wt	Count Time	Beta Counts	DPM 4044 CPM	Sr-90 Eff
B21	0.0091	20	33950	1697.500	0.4198
B22	0.0265	20	32893	1644.650	0.4067
B23	0.0415	20	33642	1682.100	0.4159
B24	0.0830	20	33534	1676.700	0.4146
B25	0.1230	20	33518	1675.900	0.4144
B26	0.1611	20	32983	1649.150	0.4078
B27	0.1932	20	31907	1595.350	0.3945
B28	0.2421	20	31467	1573.350	0.3891

Blue A4

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0093	0.0091	0.0092	0.4450	0.4198	0.4324	2.92%	-2.92%
0.0264	0.0265	0.0265	0.4368	0.4067	0.4217	3.57%	-3.57%
0.0425	0.0415	0.0420	0.4383	0.4159	0.4271	2.62%	-2.62%
0.0809	0.0830	0.0820	0.4129	0.4146	0.4138	-0.20%	0.20%
0.1227	0.1230	0.1229	0.4126	0.4144	0.4135	-0.22%	0.22%
0.1647	0.1611	0.1629	0.4025	0.4078	0.4052	-0.65%	0.65%
0.2003	0.1932	0.1968	0.3883	0.3945	0.3914	-0.79%	0.79%
0.2429	0.2421	0.2425	0.3926	0.3891	0.3908	0.46%	-0.46%



Beta Attenuation Blue B1
Set 1 03/08,09/2007

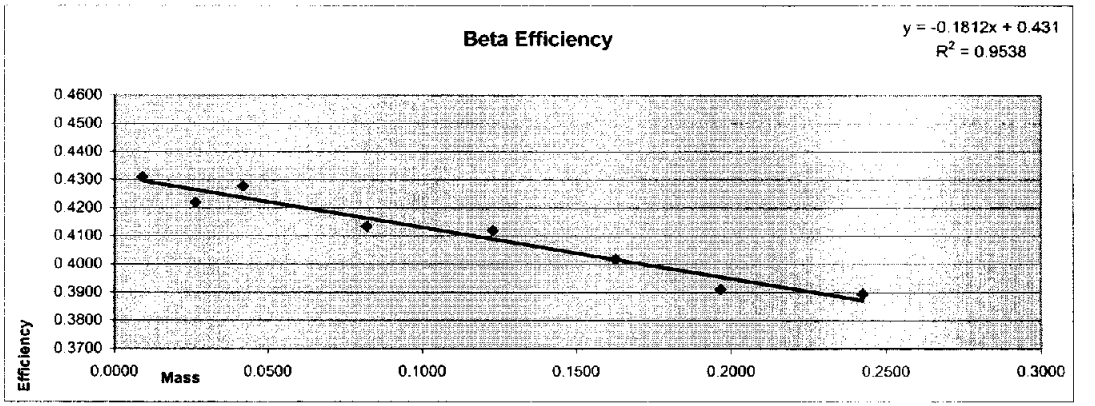
Std ID	Sample Wt	Count Time	Beta Counts	DPM 4044 CPM	Sr-90 Eff
B11	0.0093	20	35977	1798.850	0.4448
B12	0.0264	20	35496	1774.800	0.4389
B13	0.0425	20	35480	1774.000	0.4387
B14	0.0809	20	33466	1673.300	0.4138
B15	0.1227	20	33552	1677.600	0.4148
B16	0.1647	20	32221	1611.050	0.3984
B17	0.2003	20	31605	1580.250	0.3908
B18	0.2429	20	31596	1579.800	0.3907

Beta Attenuation Blue B1
Set 2

Std ID	Sample Wt	Count Time	Beta Counts	DPM 4044 CPM	Sr-90 Eff
B21	0.0091	20	33719	1685.950	0.4169
B22	0.0265	20	32741	1637.050	0.4048
B23	0.0415	20	33689	1684.450	0.4165
B24	0.0830	20	33404	1670.200	0.4130
B25	0.1230	20	33066	1653.300	0.4088
B26	0.1611	20	32776	1638.800	0.4052
B27	0.1932	20	31652	1582.600	0.3913
B28	0.2421	20	31398	1569.900	0.3882

Blue B1

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0093	0.0091	0.0092	0.4448	0.4169	0.4309	3.24%	-3.24%
0.0264	0.0265	0.0265	0.4389	0.4048	0.4218	4.04%	-4.04%
0.0425	0.0415	0.0420	0.4387	0.4165	0.4276	2.59%	-2.59%
0.0809	0.0830	0.0820	0.4138	0.4130	0.4134	0.09%	-0.09%
0.1227	0.1230	0.1229	0.4148	0.4088	0.4118	0.73%	-0.73%
0.1647	0.1611	0.1629	0.3984	0.4052	0.4018	-0.85%	0.85%
0.2003	0.1932	0.1968	0.3908	0.3913	0.3911	-0.07%	0.07%
0.2429	0.2421	0.2425	0.3907	0.3882	0.3894	0.31%	-0.31%



Beta Attenuation Blue B2
Set 1 03/08,09/2007

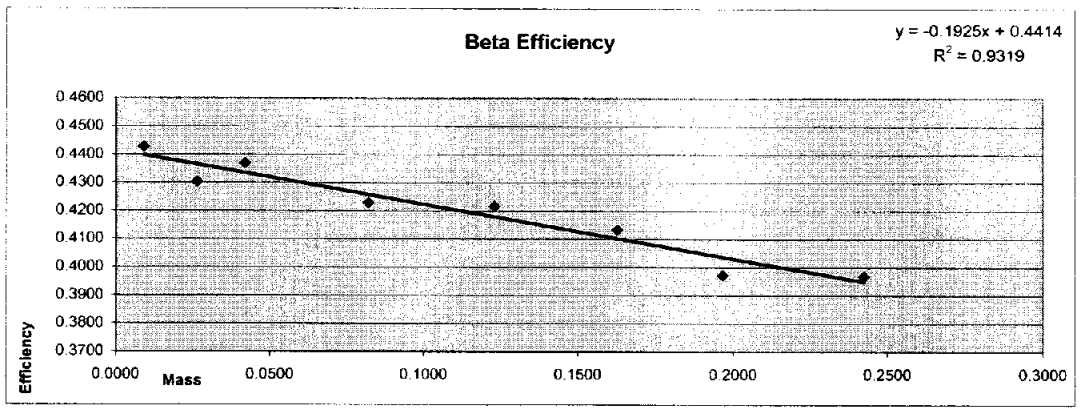
Std ID	Sample Wt	Count Time	Beta Counts	DPM 4044 CPM	Sr-90 Eff
B11	0.0093	20	36862	1843.100	0.4558
B12	0.0264	20	36406	1820.300	0.4501
B13	0.0425	20	36051	1802.550	0.4457
B14	0.0809	20	34067	1703.350	0.4212
B15	0.1227	20	34485	1724.250	0.4264
B16	0.1647	20	33128	1656.400	0.4096
B17	0.2003	20	32169	1608.450	0.3977
B18	0.2429	20	32291	1614.550	0.3992

Beta Attenuation Blue B2
Set 2

Std ID	Sample Wt	Count Time	Beta Counts	DPM 4044 CPM	Sr-90 Eff
B21	0.0091	20	34756	1737.800	0.4297
B22	0.0265	20	33173	1658.650	0.4102
B23	0.0415	20	34597	1729.850	0.4278
B24	0.0830	20	34322	1716.100	0.4244
B25	0.1230	20	33707	1685.350	0.4168
B26	0.1611	20	33723	1686.150	0.4170
B27	0.1932	20	32083	1604.150	0.3967
B28	0.2421	20	31903	1595.150	0.3944

Blue B2

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0093	0.0091	0.0092	0.4558	0.4297	0.4427	2.94%	-2.94%
0.0264	0.0265	0.0265	0.4501	0.4102	0.4301	4.65%	-4.65%
0.0425	0.0415	0.0420	0.4457	0.4278	0.4367	2.06%	-2.06%
0.0809	0.0830	0.0820	0.4212	0.4244	0.4228	-0.37%	0.37%
0.1227	0.1230	0.1229	0.4264	0.4168	0.4216	1.14%	-1.14%
0.1647	0.1611	0.1629	0.4096	0.4170	0.4133	-0.89%	0.89%
0.2003	0.1932	0.1968	0.3977	0.3967	0.3972	0.13%	-0.13%
0.2429	0.2421	0.2425	0.3992	0.3944	0.3968	0.60%	-0.60%



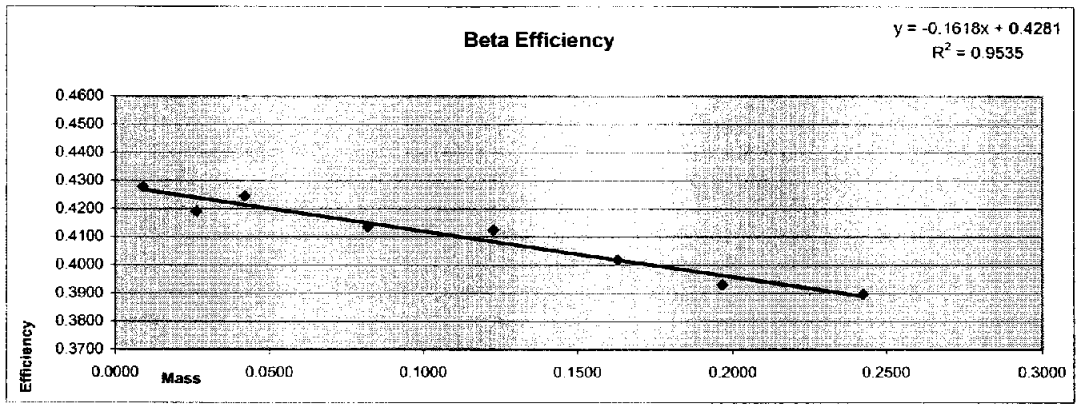
Beta Attenuation Blue B4
Set 1 03/08,09/2007

Std ID	Sample Wt	Count Time	Beta Counts	DPM 4044 CPM	Sr-90 Eff
B11	0.0093	20	35637	1781.850	0.4406
B12	0.0264	20	35199	1759.950	0.4352
B13	0.0425	20	35029	1751.450	0.4331
B14	0.0809	20	33699	1684.950	0.4167
B15	0.1227	20	33449	1672.450	0.4136
B16	0.1647	20	31909	1595.450	0.3945
B17	0.2003	20	31500	1575.000	0.3895
B18	0.2429	20	31668	1583.400	0.3915

Beta Attenuation Blue B4
Set 2

Std ID	Sample Wt	Count Time	Beta Counts	DPM 4044 CPM	Sr-90 Eff
B21	0.0091	20	33544	1677.200	0.4147
B22	0.0265	20	32582	1629.100	0.4028
B23	0.0415	20	33614	1680.700	0.4156
B24	0.0830	20	33184	1659.200	0.4103
B25	0.1230	20	33267	1663.350	0.4113
B26	0.1611	20	33096	1654.800	0.4092
B27	0.1932	20	32068	1603.400	0.3965
B28	0.2421	20	31359	1567.950	0.3877

Blue B4 Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0093	0.0091	0.0092	0.4406	0.4147	0.4277	3.03%	-3.03%
0.0264	0.0265	0.0265	0.4352	0.4028	0.4190	3.86%	-3.86%
0.0425	0.0415	0.0420	0.4331	0.4156	0.4244	2.06%	-2.06%
0.0809	0.0830	0.0820	0.4167	0.4103	0.4135	0.77%	-0.77%
0.1227	0.1230	0.1229	0.4136	0.4113	0.4124	0.27%	-0.27%
0.1647	0.1611	0.1629	0.3945	0.4092	0.4019	-1.83%	1.83%
0.2003	0.1932	0.1968	0.3895	0.3965	0.3930	-0.89%	0.89%
0.2429	0.2421	0.2425	0.3915	0.3877	0.3896	0.49%	-0.49%



Beta Attenuation Blue C2
Set 1 03/08,09/2007

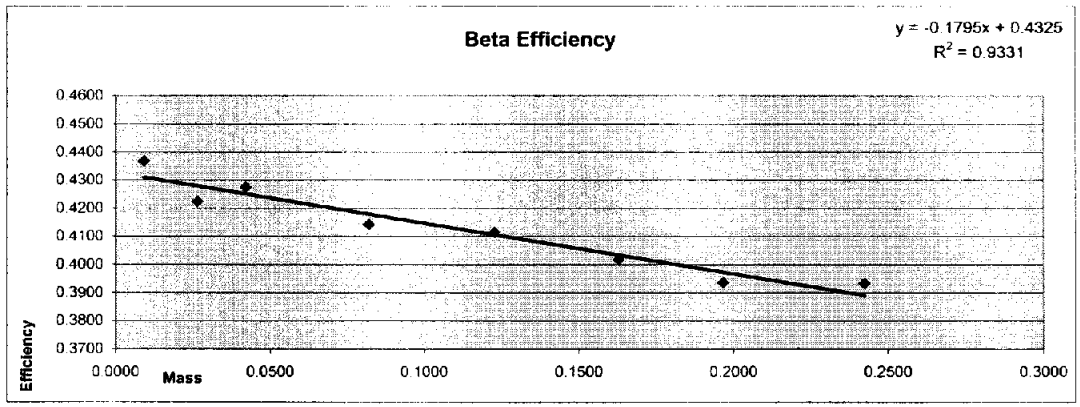
Std ID	Sample Wt	Count Time	Beta Counts	DPM 4044 CPM	Sr-90 Eff
B11	0.0093	20	36273	1813.650	0.4485
B12	0.0264	20	35419	1770.950	0.4379
B13	0.0425	20	35307	1765.350	0.4365
B14	0.0809	20	33504	1675.200	0.4142
B15	0.1227	20	33275	1663.750	0.4114
B16	0.1647	20	32332	1616.600	0.3998
B17	0.2003	20	31476	1573.800	0.3892
B18	0.2429	20	32193	1609.650	0.3980

Beta Attenuation Blue C2
Set 2

Std ID	Sample Wt	Count Time	Beta Counts	DPM 4044 CPM	Sr-90 Eff
B21	0.0091	20	34377	1718.850	0.4250
B22	0.0265	20	32905	1645.250	0.4068
B23	0.0415	20	33846	1692.300	0.4185
B24	0.0830	20	33512	1675.600	0.4143
B25	0.1230	20	33281	1664.050	0.4115
B26	0.1611	20	32678	1633.900	0.4040
B27	0.1932	20	32208	1610.400	0.3982
B28	0.2421	20	31439	1571.950	0.3887

Blue C2

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0093	0.0091	0.0092	0.4485	0.4250	0.4368	2.68%	-2.68%
0.0264	0.0265	0.0265	0.4379	0.4068	0.4224	3.68%	-3.68%
0.0425	0.0415	0.0420	0.4365	0.4185	0.4275	2.11%	-2.11%
0.0809	0.0830	0.0820	0.4142	0.4143	0.4143	-0.01%	0.01%
0.1227	0.1230	0.1229	0.4114	0.4115	0.4114	-0.01%	0.01%
0.1647	0.1611	0.1629	0.3998	0.4040	0.4019	-0.53%	0.53%
0.2003	0.1932	0.1968	0.3892	0.3982	0.3937	-1.15%	1.15%
0.2429	0.2421	0.2425	0.3980	0.3887	0.3934	1.18%	-1.18%



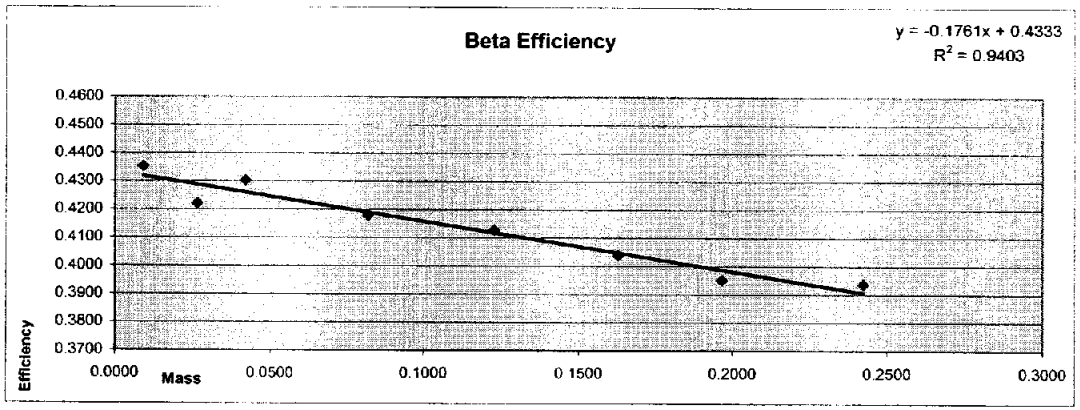
Beta Attenuation Blue C3
Set 1 03/08,09/2007

Std ID	Sample Wt	Count Time	Beta Counts	DPM 4044 CPM	Sr-90 Eff
B11	0.0093	20	36267	1813.350	0.4484
B12	0.0264	20	35484	1774.200	0.4387
B13	0.0425	20	35587	1779.350	0.4400
B14	0.0809	20	33680	1684.000	0.4164
B15	0.1227	20	33562	1678.100	0.4150
B16	0.1647	20	32510	1625.500	0.4020
B17	0.2003	20	31553	1577.650	0.3901
B18	0.2429	20	32027	1601.350	0.3960

Beta Attenuation Blue C3
Set 2

Std ID	Sample Wt	Count Time	Beta Counts	DPM 4044 CPM	Sr-90 Eff
B21	0.0091	20	34123	1706.150	0.4219
B22	0.0265	20	32777	1638.850	0.4053
B23	0.0415	20	34006	1700.300	0.4205
B24	0.0830	20	33906	1695.300	0.4192
B25	0.1230	20	33187	1659.350	0.4103
B26	0.1611	20	32799	1639.950	0.4055
B27	0.1932	20	32358	1617.900	0.4001
B28	0.2421	20	31645	1582.250	0.3913

Blue C3 Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0093	0.0091	0.0092	0.4484	0.4219	0.4352	3.05%	-3.05%
0.0264	0.0265	0.0265	0.4387	0.4053	0.4220	3.97%	-3.97%
0.0425	0.0415	0.0420	0.4400	0.4205	0.4302	2.27%	-2.27%
0.0809	0.0830	0.0820	0.4164	0.4192	0.4178	-0.33%	0.33%
0.1227	0.1230	0.1229	0.4150	0.4103	0.4126	0.56%	-0.56%
0.1647	0.1611	0.1629	0.4020	0.4055	0.4037	-0.44%	0.44%
0.2003	0.1932	0.1968	0.3901	0.4001	0.3951	-1.26%	1.26%
0.2429	0.2421	0.2425	0.3960	0.3913	0.3936	0.60%	-0.60%



Beta Attenuation Blue C4
Set 1 03/08,09/2007

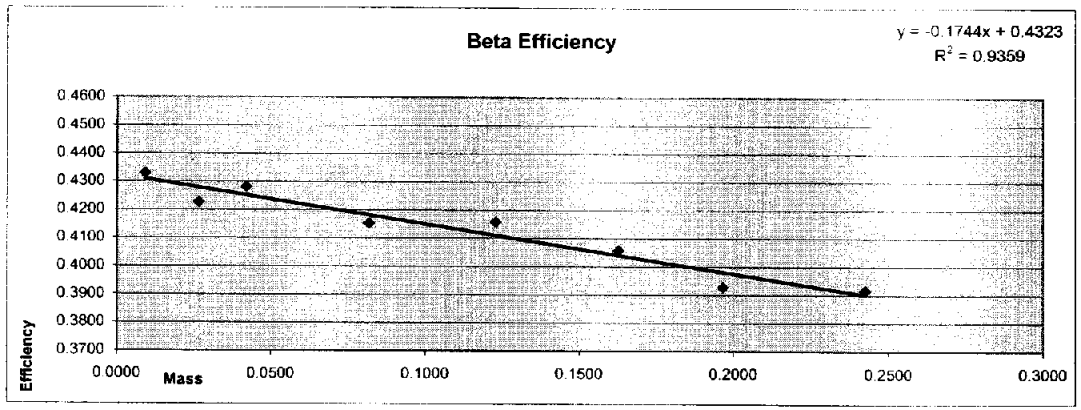
Std ID	Sample Wt	Count Time	Beta Counts	DPM 4044 CPM	Sr-90 Eff
B11	0.0093	20	36169	1808.450	0.4472
B12	0.0264	20	35284	1764.200	0.4363
B13	0.0425	20	35304	1765.200	0.4365
B14	0.0809	20	33419	1670.950	0.4132
B15	0.1227	20	33694	1684.700	0.4166
B16	0.1647	20	32299	1614.950	0.3993
B17	0.2003	20	31268	1563.400	0.3866
B18	0.2429	20	31675	1583.750	0.3916

Beta Attenuation Blue C4
Set 2

Std ID	Sample Wt	Count Time	Beta Counts	DPM 4044 CPM	Sr-90 Eff
B21	0.0091	20	33847	1692.350	0.4185
B22	0.0265	20	33073	1653.650	0.4089
B23	0.0415	20	33940	1697.000	0.4196
B24	0.0830	20	33732	1686.600	0.4171
B25	0.1230	20	33553	1677.650	0.4148
B26	0.1611	20	33323	1666.150	0.4120
B27	0.1932	20	32263	1613.150	0.3989
B28	0.2421	20	31679	1583.950	0.3917

Blue C4

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0093	0.0091	0.0092	0.4472	0.4185	0.4328	3.32%	-3.32%
0.0264	0.0265	0.0265	0.4363	0.4089	0.4226	3.23%	-3.23%
0.0425	0.0415	0.0420	0.4365	0.4196	0.4281	1.97%	-1.97%
0.0809	0.0830	0.0820	0.4132	0.4171	0.4151	-0.47%	0.47%
0.1227	0.1230	0.1229	0.4166	0.4148	0.4157	0.21%	-0.21%
0.1647	0.1611	0.1629	0.3993	0.4120	0.4057	-1.56%	1.56%
0.2003	0.1932	0.1968	0.3866	0.3989	0.3927	-1.57%	1.57%
0.2429	0.2421	0.2425	0.3916	0.3917	0.3917	-0.01%	0.01%

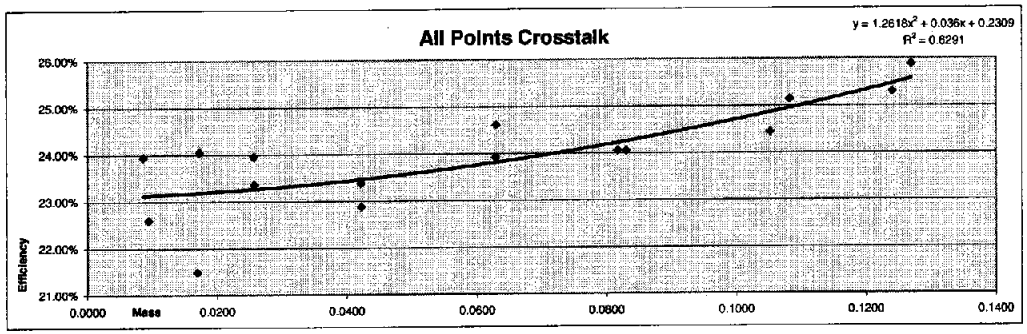


TestAmerica STL

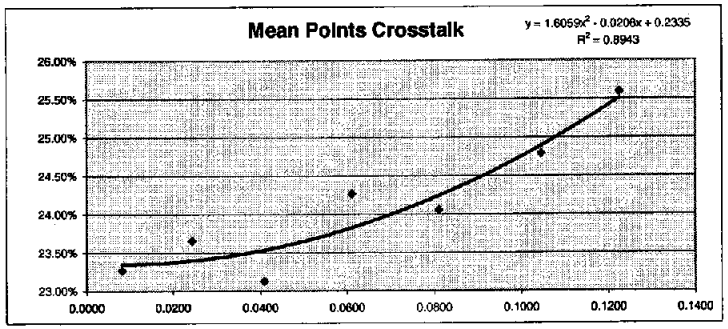
Blue 2007

Crosstalk Correction Curves

Blue A1 Detector ID	Sample ID	Mass	Count Time	Alpha Counts	Beta Counts	Alpha CPM	Beta CPM	% α into β	
0	A11	0.0094	40.00	35215	10275	880.38	256.88	22.59%	Min
0	A12	0.0169	40.00	38247	10473	956.18	261.83	21.50%	21.50%
0	A13	0.0257	40.00	27140	8272	678.50	206.80	23.36%	
0	A14	0.0421	40.00	25417	7755	635.43	193.88	23.38%	Max
0	A15	0.0629	40.00	19188	6263	479.70	156.58	24.61%	25.88%
0	A16	0.0817	40.00	36984	11714	924.60	292.85	24.05%	
0	A17	0.1052	40.00	30924	10002	773.10	250.05	24.44%	Mean
0	A18	0.1240	40.00	27210	9217	680.25	230.43	25.30%	23.94%
0	A21	0.0086	40.00	32322	10177	808.05	254.43	23.95%	
0	A22	0.0172	40.00	27029	8559	675.73	213.98	24.05%	
0	A23	0.0256	40.00	25729	8103	643.23	202.58	23.95%	
0	A24	0.0422	40.00	25288	7500	632.20	187.50	22.87%	
0	A25	0.0628	40.00	22970	7222	574.25	180.55	23.92%	
0	A26	0.0830	40.00	36459	11547	911.48	288.68	24.05%	
0	A27	0.1082	40.00	31872	10704	796.80	267.60	25.14%	
0	A28	0.1269	40.00	27710	9676	692.75	241.90	25.88%	

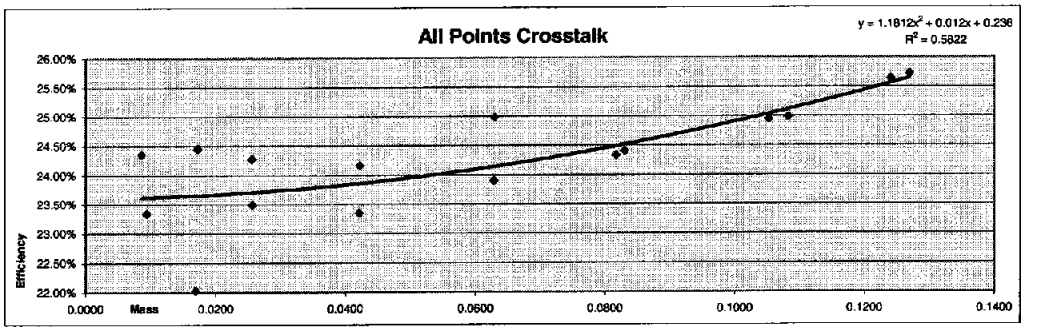


Blue A1 Mean Mass	Mean % α into β	
0.0083	23.27%	Min
0.0245	23.66%	22.77%
0.0409	23.13%	Max
0.0612	24.26%	25.59%
0.0811	24.05%	Mean
0.1046	24.79%	23.94%
0.1226	25.59%	

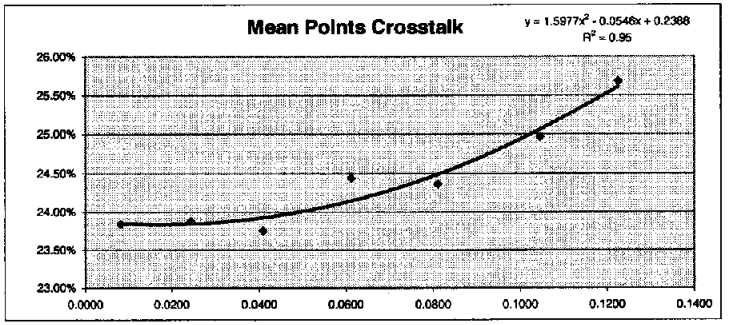


Blue A2

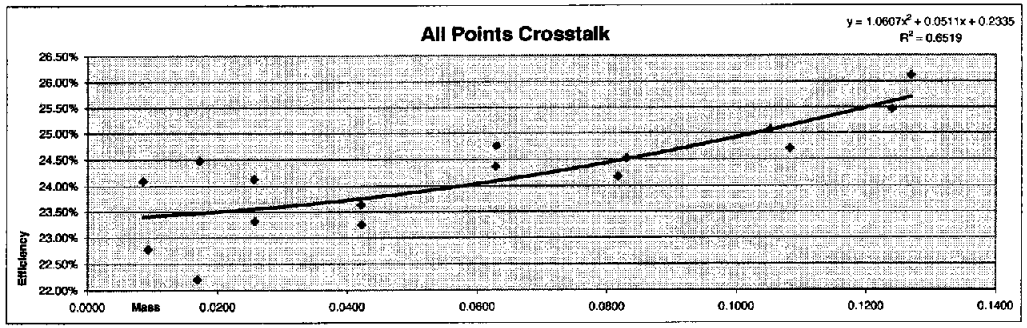
Blue A2 Detector ID	Sample ID	Mass	Count Time	Alpha Counts	Beta Counts	Alpha CPM	Beta CPM	% α into β	
0	A11	0.0094	40.00	33916	10324	847.90	258.10	23.34%	Min
0	A12	0.0169	40.00	37413	10570	935.33	264.25	22.03%	22.03%
0	A13	0.0257	40.00	26520	8142	663.00	203.55	23.49%	
0	A14	0.0421	40.00	24567	7480	614.18	187.00	23.34%	Max
0	A15	0.0629	40.00	18575	6185	464.38	154.63	24.98%	25.72%
0	A16	0.0817	40.00	35554	11430	888.85	285.75	24.33%	
0	A17	0.1052	40.00	29897	9936	747.43	248.40	24.94%	Mean
0	A18	0.1240	40.00	26139	9015	653.48	225.38	25.64%	24.27%
0	A21	0.0086	40.00	31378	10101	784.45	252.53	24.35%	
0	A22	0.0172	40.00	25918	8386	647.95	209.65	24.45%	
0	A23	0.0256	40.00	25051	8029	626.28	200.73	24.27%	
0	A24	0.0422	40.00	24203	7712	605.08	192.80	24.16%	
0	A25	0.0628	40.00	22504	7068	562.60	176.70	23.90%	
0	A26	0.0830	40.00	35397	11423	884.93	285.58	24.40%	
0	A27	0.1082	40.00	31539	10503	788.48	262.58	24.98%	
0	A28	0.1269	40.00	27044	9365	676.10	234.13	25.72%	



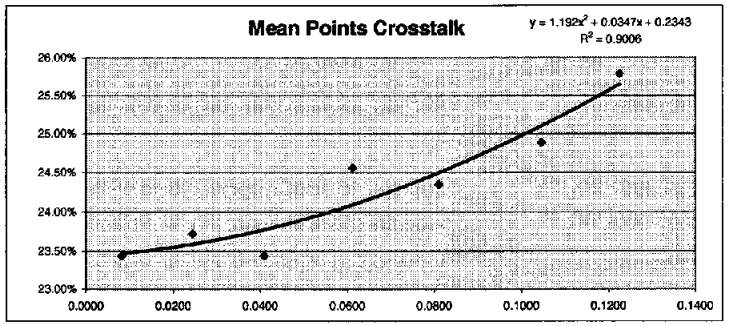
Blue A2 Mean Mass	Mean % α into β	
0.0083	23.84%	Min
0.0245	23.88%	23.24%
0.0409	23.75%	Max
0.0612	24.44%	25.68%
0.0811	24.36%	Mean
0.1046	24.96%	24.27%
0.1226	25.68%	



Blue A4 Detector ID	Sample ID	Mass	Count Time	Alpha Counts	Beta Counts	Alpha CPM	Beta CPM	% α into β	
0	A11	0.0094	40.00	34628	10212	865.70	255.30	22.77%	Min
0	A12	0.0169	40.00	37412	10678	935.30	266.95	22.20%	22.20%
0	A13	0.0257	40.00	26773	8137	669.33	203.43	23.31%	
0	A14	0.0421	40.00	24427	7559	610.68	188.98	23.63%	Max
0	A15	0.0629	40.00	18587	6115	464.68	152.88	24.76%	26.12%
0	A16	0.0817	40.00	35771	11404	894.28	285.10	24.17%	
0	A17	0.1052	40.00	30066	10055	751.65	251.38	25.06%	Mean
0	A18	0.1240	40.00	26303	8986	657.58	224.65	25.46%	24.19%
0	A21	0.0086	40.00	31941	10141	798.53	253.53	24.10%	
0	A22	0.0172	40.00	26351	8541	658.78	213.53	24.48%	
0	A23	0.0256	40.00	25189	8013	629.73	200.33	24.13%	
0	A24	0.0422	40.00	24694	7479	617.35	186.98	23.25%	
0	A25	0.0628	40.00	22475	7242	561.88	181.05	24.37%	
0	A26	0.0830	40.00	35726	11605	893.15	290.13	24.52%	
0	A27	0.1082	40.00	31140	10217	778.50	255.43	24.70%	
0	A28	0.1269	40.00	26864	9496	671.60	237.40	26.12%	

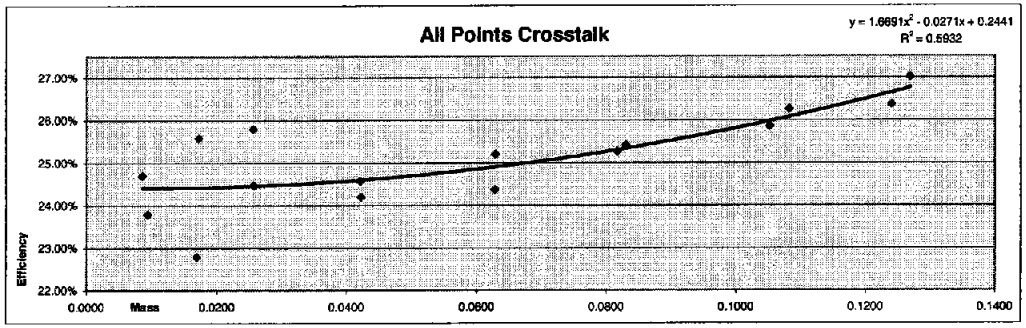


Blue A4 Mean Mass	Mean % α into β	
0.0083	23.44%	Min
0.0245	23.72%	23.34%
0.0409	23.44%	Max
0.0612	24.56%	25.79%
0.0811	24.35%	Mean
0.1046	24.88%	24.19%
0.1226	25.79%	

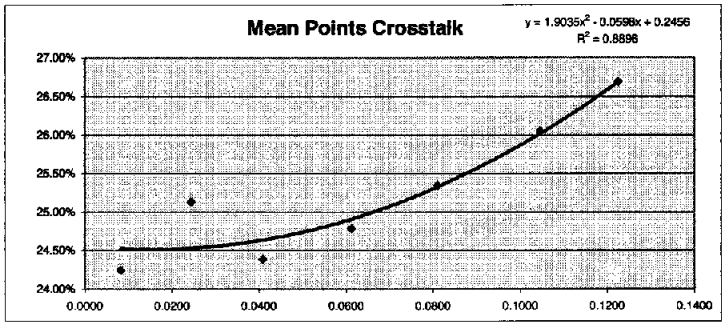


Blue B1

Blue B1 Detector ID	Sample ID	Mass	Count Time	Alpha Counts	Beta Counts	Alpha CPM	Beta CPM	% α into β	
0	A11	0.0094	40.00	33966	10600	849.15	265.00	23.78%	Min
0	A12	0.0169	40.00	36435	10753	910.88	268.83	22.79%	22.79%
0	A13	0.0257	40.00	26511	8565	662.78	214.63	24.46%	
0	A14	0.0421	40.00	23947	7800	598.68	195.00	24.57%	Max
0	A15	0.0629	40.00	18556	6252	463.90	156.30	25.20%	27.02%
0	A16	0.0817	40.00	35097	11868	877.43	296.70	25.27%	
0	A17	0.1052	40.00	29429	10262	735.73	256.55	25.85%	Mean
0	A18	0.1240	40.00	25658	9184	641.45	229.60	26.36%	25.10%
0	A21	0.0086	40.00	30403	9973	760.08	249.33	24.70%	
0	A22	0.0172	40.00	25662	8825	641.55	220.63	25.59%	
0	A23	0.0256	40.00	24221	8422	605.53	210.55	25.80%	
0	A24	0.0422	40.00	24007	7665	600.18	191.63	24.20%	
0	A25	0.0628	40.00	21549	6943	538.73	173.58	24.37%	
0	A26	0.0830	40.00	34668	11816	866.70	295.40	25.42%	
0	A27	0.1082	40.00	29635	10551	740.88	263.78	26.26%	
0	A28	0.1269	40.00	26311	9742	657.78	243.55	27.02%	

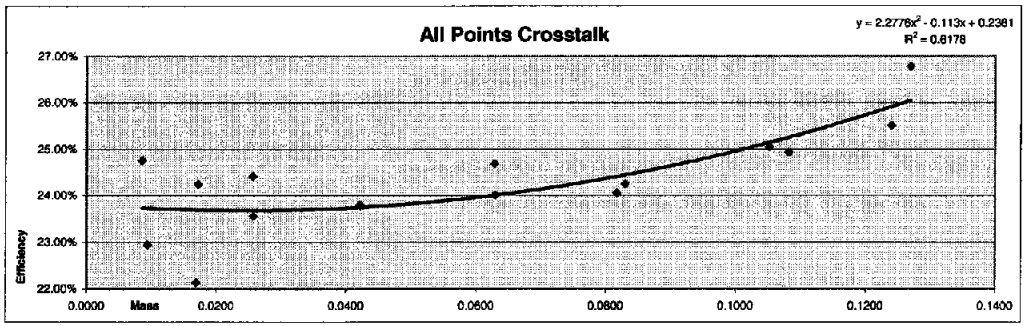


Blue B1 Mean Mass	Mean % α into β	
0.0083	24.24%	Min
0.0245	25.13%	24.19%
0.0409	24.39%	Max
0.0612	24.78%	26.69%
0.0811	25.34%	Mean
0.1046	26.06%	25.10%
0.1226	26.69%	

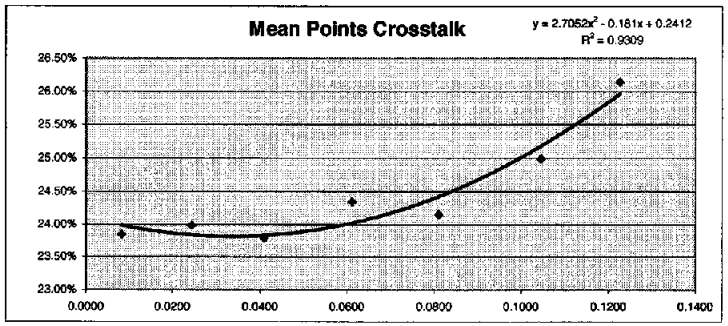


Blue B2

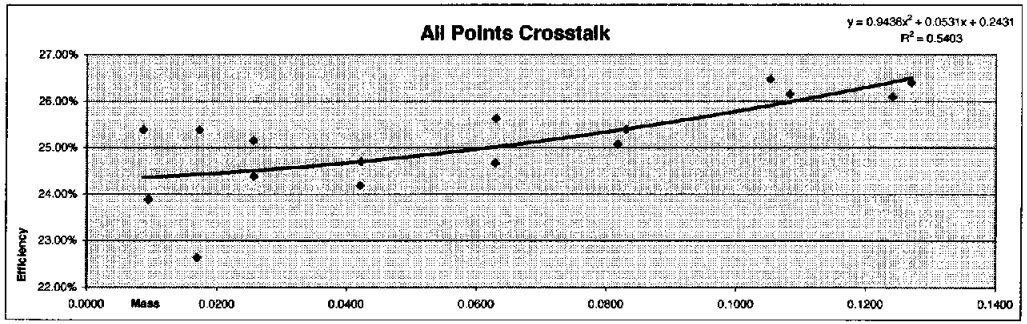
Blue B2 Detector ID	Sample ID	Mass	Count Time	Alpha Counts	Beta Counts	Alpha CPM	Beta CPM	% α into β	
0	A11	0.0094	40.00	35111	10451	877.78	261.26	22.94%	Min
0	A12	0.0169	40.00	38473	10940	961.83	273.50	22.14%	22.14%
0	A13	0.0257	40.00	27602	8506	690.05	212.65	23.56%	
0	A14	0.0421	40.00	25398	7930	634.95	198.25	23.79%	Max
0	A15	0.0629	40.00	19601	6192	490.03	154.80	24.01%	26.78%
0	A16	0.0817	40.00	37440	11854	936.00	296.35	24.05%	
0	A17	0.1052	40.00	31103	10393	777.58	259.83	25.05%	Mean
0	A18	0.1240	40.00	27230	9323	680.75	233.08	25.51%	24.30%
0	A21	0.0086	40.00	31757	10446	793.93	261.15	24.75%	
0	A22	0.0172	40.00	26934	8617	673.35	215.43	24.24%	
0	A23	0.0256	40.00	25701	8300	642.53	207.50	24.41%	
0	A24	0.0422	40.00	25174	7854	629.35	196.35	23.78%	
0	A25	0.0628	40.00	22992	7535	574.80	188.38	24.68%	
0	A26	0.0830	40.00	36739	11760	918.48	294.00	24.25%	
0	A27	0.1082	40.00	32662	10849	816.55	271.23	24.93%	
0	A28	0.1269	40.00	26932	9850	673.30	246.25	26.76%	



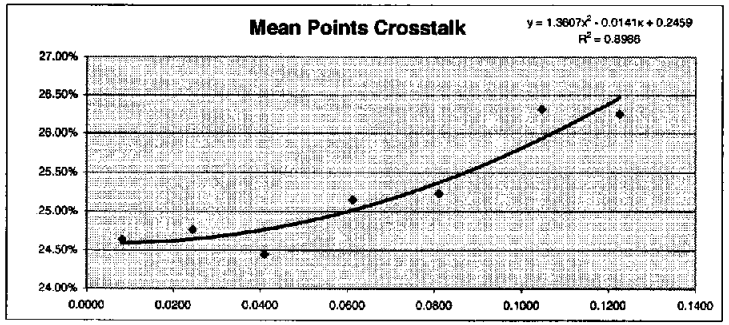
Blue B2 Mean Mass	Mean % α into β	
0.0083	23.84%	Min
0.0245	23.98%	23.19%
0.0409	23.79%	Max
0.0612	24.34%	26.14%
0.0811	24.15%	Mean
0.1046	24.99%	24.30%
0.1226	26.14%	



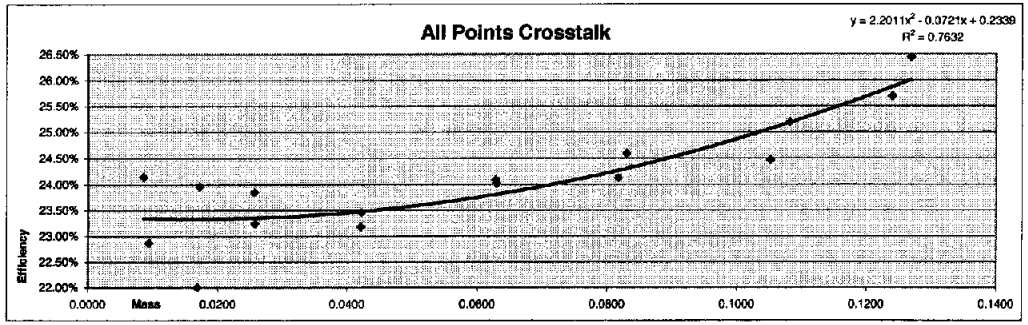
Blue B4 Detector ID	Sample ID	Mass	Count Time	Alpha Counts	Beta Counts	Alpha CPM	Beta CPM	% α into β	
0	A11	0.0094	40.00	33410	10485	835.25	262.13	23.89%	Min
0	A12	0.0169	40.00	36568	10700	914.20	267.50	22.64%	22.64%
0	A13	0.0257	40.00	26102	8416	652.55	210.40	24.38%	
0	A14	0.0421	40.00	24105	7693	602.63	192.33	24.19%	Max
0	A15	0.0629	40.00	18142	6252	453.55	156.30	25.63%	26.47%
0	A16	0.0817	40.00	35102	11748	877.55	293.70	25.08%	
0	A17	0.1052	40.00	28242	10169	706.05	254.23	26.47%	Mean
0	A18	0.1240	40.00	25496	9003	637.40	225.08	26.10%	25.10%
0	A21	0.0086	40.00	30667	10432	766.68	260.80	25.38%	
0	A22	0.0172	40.00	25312	8607	632.80	215.18	25.38%	
0	A23	0.0256	40.00	24130	8107	603.25	202.68	25.15%	
0	A24	0.0422	40.00	23677	7767	591.93	194.18	24.70%	
0	A25	0.0628	40.00	21885	7166	547.13	179.15	24.67%	
0	A26	0.0830	40.00	34125	11612	853.13	290.30	25.39%	
0	A27	0.1082	40.00	30213	10701	755.33	267.53	26.15%	
0	A28	0.1269	40.00	26080	9356	652.00	233.90	26.40%	



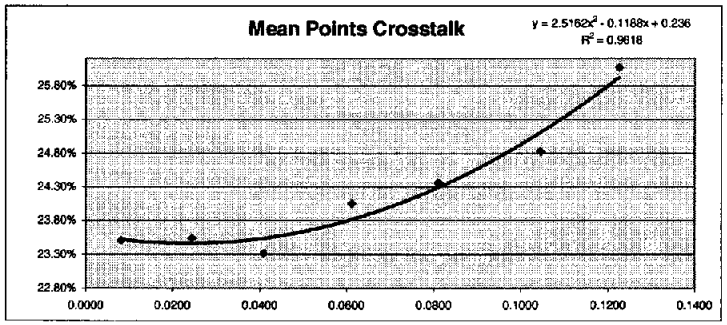
Blue B4 Mean Mass	Mean % α into β	
0.0083	24.63%	Min
0.0245	24.76%	24.01%
0.0409	24.45%	Max
0.0612	25.15%	26.31%
0.0811	25.23%	Mean
0.1046	26.31%	25.10%
0.1226	26.25%	



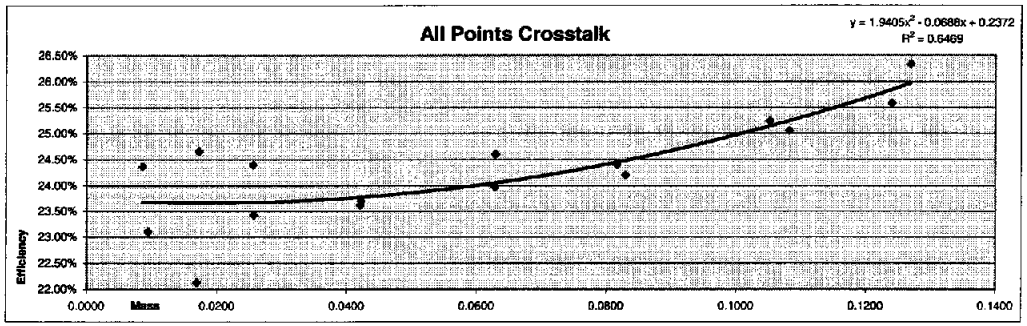
Blue C2 Detector ID	Sample ID	Mass	Count Time	Alpha Counts	Beta Counts	Alpha CPM	Beta CPM	% α into β	
0	A11	0.0094	40.00	34562	10247	864.05	256.18	22.87%	Min
0	A12	0.0169	40.00	37483	10571	937.08	264.28	22.00%	22.00%
0	A13	0.0257	40.00	27041	8186	676.03	204.65	23.24%	
0	A14	0.0421	40.00	24819	7489	620.48	187.23	23.18%	Max
0	A15	0.0629	40.00	18770	5933	469.25	148.33	24.02%	26.44%
0	A16	0.0817	40.00	36055	11464	901.38	286.60	24.13%	
0	A17	0.1052	40.00	30592	9909	764.80	247.73	24.47%	Mean
0	A18	0.1240	40.00	26353	9111	658.83	227.78	25.69%	24.08%
0	A21	0.0086	40.00	26516	8441	662.90	211.03	24.15%	
0	A22	0.0172	40.00	31908	10050	797.70	251.25	23.95%	
0	A23	0.0256	40.00	25441	7964	636.03	199.10	23.84%	
0	A24	0.0422	40.00	24700	7568	617.50	189.20	23.45%	
0	A25	0.0628	40.00	22469	7128	561.73	178.20	24.08%	
0	A26	0.0830	40.00	35559	11595	888.98	289.88	24.59%	
0	A27	0.1082	40.00	31439	10586	785.98	264.65	25.19%	
0	A28	0.1269	40.00	27064	9729	676.60	243.23	26.44%	



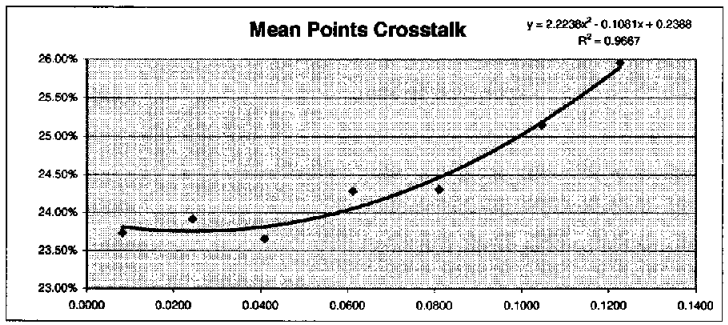
Blue C2 Mean Mass	Mean % α into β	
0.0083	23.51%	Min
0.0245	23.54%	22.98%
0.0409	23.32%	Max
0.0612	24.05%	26.07%
0.0811	24.36%	Mean
0.1046	24.83%	24.08%
0.1226	26.07%	



Blue C3 Detector ID	Sample ID	Mass	Count Time	Alpha Counts	Beta Counts	Alpha CPM	Beta CPM	% α into β	
0	A11	0.0094	40.00	34375	10324	859.38	258.10	23.10%	Min
0	A12	0.0169	40.00	37840	10752	946.00	268.80	22.13%	22.13%
0	A13	0.0257	40.00	27462	8401	686.55	210.03	23.43%	
0	A14	0.0421	40.00	25025	7737	625.63	193.43	23.62%	Max
0	A15	0.0629	40.00	19054	6218	476.35	155.45	24.60%	26.33%
0	A16	0.0817	40.00	36482	11779	912.05	294.48	24.41%	
0	A17	0.1052	40.00	30195	10195	754.88	254.88	25.24%	Mean
0	A18	0.1240	40.00	26709	9182	667.73	229.55	25.58%	24.30%
0	A21	0.0086	40.00	31972	10301	799.30	257.53	24.37%	
0	A22	0.0172	40.00	26651	8723	666.28	218.08	24.66%	
0	A23	0.0256	40.00	25016	8073	625.40	201.83	24.40%	
0	A24	0.0422	40.00	24704	7672	617.60	191.80	23.70%	
0	A25	0.0628	40.00	22227	7006	555.68	175.15	23.97%	
0	A26	0.0830	40.00	35959	11481	898.98	287.03	24.20%	
0	A27	0.1082	40.00	31413	10498	785.33	262.45	25.05%	
0	A28	0.1269	40.00	26738	9557	668.45	238.93	26.33%	

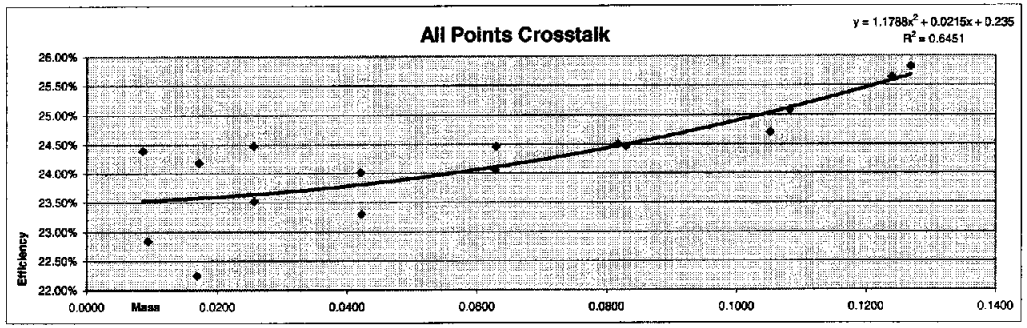


Blue C3 Mean Mass	Mean % α into β	
0.0083	23.73%	Min
0.0245	23.91%	23.39%
0.0409	23.66%	Max
0.0612	24.29%	25.96%
0.0811	24.30%	Mean
0.1046	25.14%	24.30%
0.1226	25.96%	

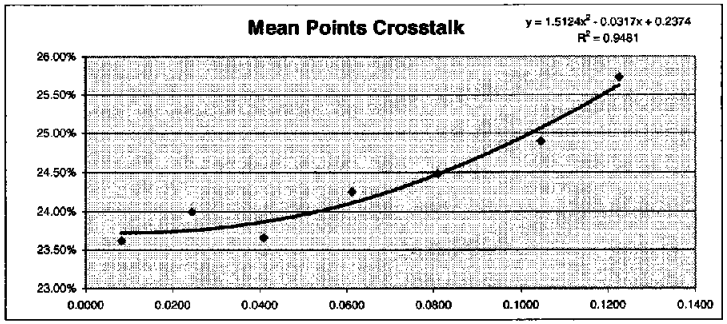


Blue C4

Blue C4 Detector ID	Sample ID	Mass	Count Time	Alpha Counts	Beta Counts	Alpha CPM	Beta CPM	% α into β	
0	A11	0.0094	40.00	34104	10098	852.60	252.45	22.85%	Min
0	A12	0.0169	40.00	37074	10608	926.85	265.20	22.25%	22.25%
0	A13	0.0257	40.00	26735	8220	668.38	205.50	23.52%	
0	A14	0.0421	40.00	24733	7815	618.33	195.38	24.01%	Max
0	A15	0.0629	40.00	18830	6097	470.75	152.43	24.46%	25.82%
0	A16	0.0817	40.00	35695	11587	892.38	289.68	24.51%	
0	A17	0.1052	40.00	30192	9905	754.80	247.63	24.70%	Mean
0	A18	0.1240	40.00	26272	9057	656.80	226.43	25.64%	24.23%
0	A21	0.0086	40.00	31873	10283	796.83	257.08	24.39%	
0	A22	0.0172	40.00	26226	8363	655.65	209.08	24.18%	
0	A23	0.0256	40.00	24706	8007	617.65	200.18	24.48%	
0	A24	0.0422	40.00	24479	7436	611.98	185.90	23.30%	
0	A25	0.0628	40.00	22290	7059	557.25	176.48	24.05%	
0	A26	0.0830	40.00	35400	11465	885.00	286.63	24.46%	
0	A27	0.1082	40.00	31219	10452	780.48	261.30	25.08%	
0	A28	0.1269	40.00	27085	9427	677.13	235.68	26.82%	



Blue C4 Mean Mass	Mean % α into β	
0.0083	23.62%	Min
0.0245	24.00%	23.21%
0.0409	23.66%	Max
0.0612	24.26%	25.73%
0.0811	24.49%	Mean
0.1046	24.89%	24.23%
0.1226	25.73%	



SEVERN TRENT STL

Alpha and Beta Calibration Standards

Beta calibration stds.	8/31/2005	salt solution SLRB-B		SET 1		
Beta standard, RAD04-0095, 2316.6 dpm/mL Sr/Y90 on 08/07/2001						
Std #	mLs RAD04-0095	mLs salt solution	gross mass	tare mass	reweigh 2/7/6	mass 2/7/6
1	1	0.1000	8.8980	8.8888	8.8981	0.0093
2	1	0.3000	8.9490	8.9230	8.9494	0.0264
3	1	0.5000	9.0149	8.9703	9.0128	0.0425
4	1	1.0000	9.0419	8.9602	9.0411	0.0809
5	1	1.5000	9.0033	8.8764	8.9991	0.1227
6	1	2.0000	9.0833	8.9072	9.0719	0.1647
7	1	2.5000	9.1219	8.9194	9.1197	0.2003
8	1	3.0000	9.1769	8.9241	9.167	0.2429

Alpha calibration standards		salt solution SLRB-B		SET 1		
Alpha standard, 03-071, 4567.9 dpm/mL Th-230 on 10/07/2003						
Std #	mLs 03-071	mLs salt solution	gross mass	tare mass	reweigh 3/7/7	mass 3/7/7
1	1	0.1000	8.9369	8.9273	8.9367	0.0094
2	1	0.2000	8.9958	8.9783	8.9952	0.0169
3	1	0.3000	8.9737	8.9470	8.9727	0.0257
4	1	0.5000	8.9206	8.8766	8.9187	0.0421
5	1	0.7500	8.9565	8.8888	8.9517	0.0629
6	2	1.0000	9.0043	8.9170	8.9987	0.0817
7	2	1.3000	9.0092	8.8992	9.0044	0.1052
8	2	1.5000	9.0413	8.9088	9.0328	0.1240

spiked by:	Joel Kempema	verified by:	Sarah Hurst

Beta calibration stds. 9/9/2005 salt solution SLRB-B

Beta standard, RAD04-0095, 1043.5 dpm/mL Sr/Y90 on 08/07/2001.

Std #	mLs RAD04-0095	mLs salt solution	gross mass	tare mass	reweigh 2/3/7	mass 2/3/7
1	1	0.1000	8.9140	8.9056	8.9147	0.0091
2	1	0.3000	8.9226	8.8939	8.9204	0.0265
3	1	0.5000	8.8978	8.8559	8.8974	0.0415
4	1	1.0000	8.9580	8.8715	8.9545	0.0830
5	1	1.5000	9.0437	8.9139	9.0369	0.1230
6	1	2.0000	9.0249	8.8592	9.0203	0.1611
7	1	2.5000	9.1269	8.9239	9.1171	0.1932
8	1	3.0000	9.1390	8.8872	9.1293	0.2421

Alpha calibration standards salt solution SLRB-B

Alpha standard, 03-071, 4567.9 dpm/mL Th-230 on 10/07/2003

Std #	mLs 03-071	mLs salt solution	gross mass	tare mass	reweigh 2/3/7	mass 2/3/7
1	1	0.1000	8.9143	8.9061	8.9147	0.0086
2	1	0.2000	8.9348	8.9182	8.9354	0.0172
3	1	0.3000	8.9231	8.8980	8.9236	0.0256
4	1	0.5000	8.9518	8.9082	8.9504	0.0422
5	1	0.7500	8.9683	8.9026	8.9654	0.0628
6	2	1.0000	9.0179	8.9303	9.0133	0.0830
7	2	1.3000	8.9901	8.8763	8.9845	0.1082
8	2	1.5000	9.0533	8.9206	9.0475	0.1269

spiked by: Joel Kempema verified by: Ivan Vania

STL St. Louis

Standards Preparation Logbook Record

Feb-21-2007

Logbook: \\Qstlmo01\Stdslog\RAD_STD.std

RAD02-0051, Th-230 02-047 Analyst: boxr

Vendor: Isotope Products Laboratories Lot No.: IPL 909-12
Solvent: 0.3M HNO3
Date Prep./Opened: 05-08-2002 Date Received: 03-15-2002
Date Expires(1): 05-08-2007 (5 Years)
Th-230 parent, vial# 909-12

Component	Initial Conc (dpm/mL)	Final Conc (dpm/mL)
Th-230	2,196.7	2,196.7

Reviewed By: _____

Page 1 of 1

Isotope Products Laboratories
An Eckert & Ziegler Company

24937 Avenue Tibbitts
Valencia, California 91355

Tel 661·309·1010
Fax 661·257·8303

CERTIFICATE OF CALIBRATION
ALPHA STANDARD SOLUTION

Radionuclide:	Th-230	**Customer:**	SEVERN TRENT LABORATORIES, INC.
Half-life:	(7.54 ± 0.03)E+04 years	**P.O. No.:**	1311118-000
Catalog No.:	7230	**Reference Date:**	15-Mar-02 12:00 PST
Source No.:	909-12	**Contained Radioactivity:**	99.45 **nCi** 3680 **Bq**

Physical Description:

A. Mass of solution: 5.01533 g in 5 mL flame-sealed ampoule
B. Chemical form: $Th(NO_3)_4$ in 0.1M HNO_3
C. Carrier content: None
D. Density: 1.0016 g/mL @ 20°C.

Radioimpurities:

None detected

Radionuclide Concentration: 19.83 nCi/g, 733.7 Bq/g

Method of Calibration:

This source was prepared from a weighed aliquot of solution whose activity in µCi/g was determined using a liquid scintillation counter.

Uncertainty of Measurement:

A. Type A (random) uncertainty: ± 2.7 %
B. Type B (systematic) uncertainty: ± 2.0 %
C. Uncertainty in aliquot weighing: ± 0.4 %
D. Total uncertainty at the 99% confidence level: ± 3.4 %

Notes:

- See reverse side for leak test(s) performed on this source.
- IPL participates in a NIST measurement assurance program to establish and maintain implicit traceability for a number of nuclides, based on the blind assay (and later NIST certification) of Standard Reference Materials (As in NRC Regulatory Guide 4.15).
- Nuclear data was taken from "Table of Radioactive Isotopes", edited by Virginia Shirley, 1986.
- This solution has a working life of 5 years.

Quality Control

11-Mar-02
Date Signed

IPL Ref. No.: 909-12

STL St. Louis

Standards Preparation Logbook Record

Jan-26-2006

Logbook: \\Qstlmo01\Stdslog\RAD_STD.std

RAD01-0025, Sr 90 01-093 Analyst: hicksb

Vendor: Analytics Vendor's Expiration Date: 08-07-2006
Solvent: 1M HNO3
Date Prep./Opened: 09-19-2001 Date Received: 08-07-2001
Date Expires(1): 09-19-2006 (5 Years)
Date Expires(2): 09-19-2006 (5 Years)
Current Sr 90, beta spike parent, vial# 62204-334

Component	Initial Conc (dpm/mL)	Final Conc (dpm/mL)
Sr 90	23,166	23,166

RAD04-0095, Sr-90 Analyst: hicksb

Solvent: 0.5M HNO3 Volume (ml): 100.00
Date Prep./Opened: 10-07-2004 Date Consumed: 01-05-2006
Date Expires(1): 10-07-2005 (1 Year)
Date Expires(2): 04-17-2004 (1 Year)

Parent Std No.: RAD01-0025, Sr 90 01-093 Aliquot Amount (ml): 10.000
Parent Date Expires(1): 09-19-2006 Parent Date Expires(2): 09-19-2006

Component	Initial Conc (dpm/mL)	Final Conc (dpm/mL)
Sr 90	23,166	2,316.6

Reviewed By: _____

Strontium 90

Initial Activity:	23.166 dpm		
Reference Date:	8/7/2001		
Current Date:	3/8/2007	(or date at which you wish to determine activity)	
Elapsed Time:	2039.000 days		
Half Life:	10409.63 days		
Exponential Term:	0.873042		
Corrected Activity:	20.2249 dpm	9.110315 pCi	0.337082 Bq
Activity (Sr/Y-90)	40.4498 dpm	18.22063 pCi	0.674163 Bq

Strontium 90

Initial Activity:	23.166 dpm		
Reference Date:	8/7/2001		
Current Date:	3/9/2007	(or date at which you wish to determine activity)	
Elapsed Time:	2040.000 days		
Half Life:	10409.63 days		
Exponential Term:	0.872984		
Corrected Activity:	20.22355 dpm	9.109709 pCi	0.337059 Bq
Activity (Sr/Y-90)	40.44711 dpm	18.21942 pCi	0.674118 Bq

ANALYTICS

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

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

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

62204-334

Sr-90 5 mL Liquid in Flame Sealed Vial

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

Radionuclide purity and calibration were checked by germanium gamma-ray spectrometry and liquid scintillation counting. The nuclear decay rate and assay date for this source are given below.

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:	Sr-90
ACTIVITY (dps):	3.897 E4
HALF-LIFE:	28.79 years
CALIBRATION DATE:	August 7, 2001 12:00 EST
TOTAL UNCERTAINTY*:	4.0%
SYSTEMATIC:	3.5%
RANDOM:	0.5%

*99% Confidence Level

Impurities: γ-impurities <0.1%

4.99897 grams 0.1M HCl solution with 30 μg/g Sr carrier.

P O NUMBER 1097166, Item 1

SOURCE PREPARED BY: M. D. Currie
M. D. Currie, Radiochemist

Q A APPROVED: 8-8-01

TestAmerica STL

Calibration Standard Data

Beta calibration stds.	8/31/2005	salt solution SLRB-B		SET 1		
Beta standard, RAD04-0095, 2316.6 dpm/mL Sr/Y90 on 08/07/2001						
Std #	mLs RAD04-0095	mLs salt solution	gross mass	tare mass	reweigh 2/7/6	mass 2/7/6
1	1	0.1000	8.8980	8.8888	8.8981	0.0093
2	1	0.3000	8.9490	8.9230	8.9494	0.0264
3	1	0.5000	9.0149	8.9703	9.0128	0.0425
4	1	1.0000	9.0419	8.9602	9.0411	0.0809
5	1	1.5000	9.0033	8.8764	8.9991	0.1227
6	1	2.0000	9.0833	8.9072	9.0719	0.1647
7	1	2.5000	9.1219	8.9194	9.1197	0.2003
8	1	3.0000	9.1769	8.9241	9.167	0.2429

Alpha calibration standards		salt solution SLRB-B		SET 1		
Alpha standard, 03-071, 4567.9 dpm/mL Th-230 on 10/07/2003						
Std #	mLs 03-071	mLs salt solution	gross mass	tare mass	reweigh 3/7/7	mass 3/7/7
1	1	0.1000	8.9369	8.9273	8.9367	0.0094
2	1	0.2000	8.9958	8.9783	8.9952	0.0169
3	1	0.3000	8.9737	8.9470	8.9727	0.0257
4	1	0.5000	8.9206	8.8766	8.9187	0.0421
5	1	0.7500	8.9565	8.8888	8.9517	0.0629
6	2	1.0000	9.0043	8.9170	8.9987	0.0817
7	2	1.3000	9.0092	8.8992	9.0044	0.1052
8	2	1.5000	9.0413	8.9088	9.0328	0.1240

spiked by:	Joel Kempema	verified by:	Sarah Hurst

Alpha Beta calibration standards 9/02/05

Beta calibration stds.			salt solution SLRB-B		SET 2	
Beta standard, RAD04-0095, 1043.5 dpm/mL on 08/07/01 Sr/Y90.						
Std #	mLs RAD04-0095	mLs salt solution	gross mass	tare mass	reweigh 2/23/7	net mass 2/23/7
1	1	0.1000	8.9140	8.9056	8.9147	0.0091
2	1	0.3000	8.9197	8.8939	8.9204	0.0265
3	1	0.5000	8.8978	8.8559	8.8974	0.0415
4	1	1.0000	8.9580	8.8715	8.9545	0.0830
5	1	1.5000	9.0437	8.9139	9.0369	0.1230
6	1	2.0000	9.0249	8.8592	9.0203	0.1611
7	1	2.5000	9.1269	8.9239	9.1171	0.1932
8	1	3.0000	9.1390	8.8872	9.1293	0.2421

alpha calibration standards			salt solution SLRB-B		SET 2	
Alpha standard, 03-071, 4567.9 dpm/mL Th-230 on 12/19/02						
Std #	mLs	mLs salt solution	gross mass	tare mass	reweigh 3/7/7	mass 3/7/7
1	1	0.1000	8.9143	8.9061	8.9147	0.0086
2	1	0.2000	8.9348	8.9182	8.9354	0.0172
3	1	0.3000	8.9231	8.8980	8.9236	0.0256
4	1	0.5000	8.9518	8.9082	8.9504	0.0422
5	1	0.7500	8.9683	8.9026	8.9654	0.0628
6	2	1.0000	9.0179	8.9303	9.0133	0.0830
7	2	1.3000	8.9901	8.8763	8.9845	0.1082
8	2	1.5000	9.0533	8.9206	9.0475	0.1269
spiked by:	Joel Kempema		verified by:	N/A		

alpha beta standards second set

ANALYTICS

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

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

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

65090-334

Th-230 5 mL Liquid in Flame Sealed Vial

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

Radionuclide purity and calibration were checked by germanium gamma-ray spectrometry and liquid scintillation counting. The nuclear decay rate and assay date for this source are given below.

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:	Th-230
ACTIVITY (dps):	7.654 E3
HALF-LIFE:	7.538 E4 Years
CALIBRATION DATE:	December 19, 2002 12:00 EST
TOTAL UNCERTAINTY*:	3.5%
SYSTEMATIC:	2.6%
RANDOM:	0.9%

*99% Confidence Level

Impurities: γ-impurities <0.1%, α-impurities <0.05%

5.17738 grams 0.5M HNO_3 solution.

P O NUMBER 1614557-000 OP, Item 3

SOURCE PREPARED BY: M. Taskaeva, Radiochemist

Q A APPROVED: 12-19-02

STL St. Louis

Standards Preparation Logbook Record

Jan-05-2006

Logbook: \\Qstlmo01\Stdslog\RAD_STD.std

RAD03-0085, Th 230 03-071 Analyst: hicksb

Vendor: Analytics
Solvent: 0.5M HNO3
Date Prep./Opened: 10-07-2003 Date Received: 12-19-2002
Date Expires(1): 10-07-2008 (5 Years)
Date Expires(2): 10-07-2008 (5 Years)
parent, vial# 65090-334

Component	Initial Conc (dpm/mL)	Final Conc (dpm/mL)
Th230	4,567.9	4,567.9

RAD06-0001, Th-230 Analyst: dillardj

Solvent: 0.5M HNO3 Volume (ml): 200.00
Date Prep./Opened: 01-04-2006
Date Expires(1): 01-04-2007 (1 Year)
Date Expires(2): 01-04-2007 (1 Year)

Parent Std No.: RAD03-0085, Th 230 03-071 Aliquot Amount (ml): 1.0000
Parent Date Expires(1): 10-07-2008 Parent Date Expires(2): 10-07-2008

Component	Initial Conc (dpm/mL)	Final Conc (dpm/mL)
Th230	4,567.9	22.840

Reviewed By: _____

Thorium 230

10/7/03

ANALYTICS

SOURCE ID: 65090-334

Radioactivity: 7,654 dps

Reference time: 12-19-2002 12:00 EST

Useful life: indefinite

Initial mass = 5.17738 grams

Mass transferred = 5.1498 grams

$$\frac{5.1498\,g}{5.17738\,g} \times 7{,}654\ dps \times \frac{60\ dpm}{1\ dps} \div 100\,mL = \boxed{4{,}567.9\ \frac{dpm}{mL}}$$

ANALYTICS

1380 Seaboard Ind.Blvd.* Atlanta, GA 30318 * USA * 404-352-6677

Th-230

SRS 65090-334 Amount 0.207 µCi QA

Date 12/19/02 12:00 EST Exp. ----------

PO # 1614557-000 OP, Item 3

5.17738 grams 0.5M HNO3 solution

CAUTION RADIOACTIVE MATERIAL

SEVERN TRENT SERVICES

Logbook: 2060

Radiochemistry
Standards Preparation Logbook

Date Prep'd	Expir. Date	Standard ID Number	Isotope	Parent ID Number	Parent Activity	Parent Ref. Date	Aliquot	Dilution Volume	Change in Time	T ½	Final Activity	Solvent/ Lot #	Prep'd Initials	Cal. Ver. Initials	Comments
11-12-03	11-12-04	03-082	P32	IPL 7032	1.103 µCi/g ~~41,991,206.6 dpm~~	15 NOV 03	4.8987 g	100 ml		14.29 days	119,957 dpm/ml ~~119,912.8~~	TK2-4-04	SDB	MFM	From Pg 10 STEVES
11-12-03	11-12-04	03-083	P32	03-052	119957 dpm/ml ~~119,912.8~~	15 NOV 03	1 ml	50 ml		14.29 days	~~2,398.2~~ dpm/ml	2399.15 TK2-4-04	SDB	MFM	Lab Book
9-11-03	9-11-04	03-069	Pu238	02-032	68.235 11-19-03 ~~756.1~~	11-15-99 dpm/ml	95 ml	190 ml	1396 days	87.7 y	decay corr 11-19-03 ~~33.4069~~ 16.22	1M HNO3	MFM	JK	from page 28
9-11-03	9-11-04	03-069	Pu239	02-031 ~~02-033~~ TK 11-19-03	64.025 11-19-03 ~~128.05~~ dpm/ml	11-15-99 dpm/ml	95 ml	190 ml	1396 days	24110 y	32.0125 ~~32.0251~~ TK 11-19-03	1M HNO3	MFM	TK	from page 28
11-21-03	11-21-04	Rad03-0083 ~~03-070~~	Tc-99	02-028	95,341.2 dpm/ml	10-96	1 ml	200 ml		2.1E5	476.7 dpm/ml	KOH	SDB		Rad Capture ID Rad03-0083
12-9-03	12-9-04	03-084	Ra228	01012	1,018 dpm/mL	2/16/01	2 mL	100 mL		5.75 y	20.36 dpm/mL	0.5M HNO3	BH	~~BHF~~	
12-9-03	12-9-04	03-085	Th230	03-071	4,567.9 dpm/mL	12/19/02	1 mL	200 mL		7.538 E4	22.84 dpm/mL	0.5M HNO3	BH	LE	
12/31/03	12/31/08	03-086	Fe-55	681-78-3	.203 µCi/g	11/1/2000	4.9917 g	100 mL		999 days	10,133.2 pCi/mL	0.5M HNO3	BH		
12/31/03	12/31/04	03-087	Fe-55	03-086	10,133.2 pCi/mL	11/1/2000	5 mL	100 mL		999 days	506.7 pCi/mL	0.5M HNO3	BH		
1-5-04	1-5-05	Rad04-0001	UNAT	01-018	235.26 dpm/mL	3-201	20 mL	80 mL	N/A	4.5 E9 yrs	58.94 dpm/mL	0.5M HNO3	MFM		
1/12/04	1/12/05	Rad04-0007	Ra228	01012	1,018 dpm/mL	2/16/01	2 mL	100 mL		5.75 y	20.36 dpm/mL	0.5M HNO3	BH	BBF	
2/12/04	2/12/04	RAD-0015	Sr90	03-038	2,316.57 dpm/mL	9/19/01	5 mL	500 mL		28.5 y	23.16 dpm/mL	0.5M HNO3	BH	BBF	

Additional Comments:

ANALYTICS

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CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

62204-334

Sr-90 5 mL Liquid in Flame Sealed Vial

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

Radionuclide purity and calibration were checked by germanium gamma-ray spectrometry and liquid scintillation counting. The nuclear decay rate and assay date for this source are given below.

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:	Sr-90
ACTIVITY (dps):	3.897 E4
HALF-LIFE:	28.79 years
CALIBRATION DATE:	August 7, 2001 12:00 EST
TOTAL UNCERTAINTY*:	4.0%
SYSTEMATIC:	3.5%
RANDOM:	0.5%

*99% Confidence Level

Impurities: γ-impurities <0.1%

4.99897 grams 0.1M HCl solution with 30 μg/g Sr carrier.

P O NUMBER 1097166, Item 1

SOURCE PREPARED BY: M. D. Currie
M. D. Currie, Radiochemist

Q A APPROVED: 8-8-01

STL St. Louis

Standards Preparation Logbook Record

Feb-14-2006

Logbook: \\Qstlmo01\Stdslog\RAD_STD.std

RAD01-0025, Sr 90 01-093 Analyst: hicksb

Vendor: Analytics Vendor's Expiration Date: 08-07-2006
Solvent: 1M HNO3
Date Prep./Opened: 09-19-2001 Date Received: 08-07-2001
Date Expires(1): 09-19-2006 (5 Years)
Date Expires(2): 09-19-2006 (5 Years)
Current Sr 90, beta spike parent, vial# 62204-334

Component	Initial Conc (dpm/mL)	Final Conc (dpm/mL)
Sr 90	23,166	23,166

RAD04-0095, Sr-90 Analyst: hicksb

Solvent: 0.5M HNO3 Volume (ml): 100.00
Date Prep./Opened: 10-07-2004 Date Consumed: 01-05-2006
Date Expires(1): 10-07-2005 (1 Year)
Date Expires(2): 04-17-2004 (1 Year)

Parent Std No.: RAD01-0025, Sr 90 01-093 Aliquot Amount (ml): 10.000
Parent Date Expires(1): 09-19-2006 Parent Date Expires(2): 09-19-2006

Component	Initial Conc (dpm/mL)	Final Conc (dpm/mL)
Sr 90	23,166	2,316.6

Reviewed By: _____

SR-90 Parent Ampoule for 2nd source CPC cal.

9/19/01
BMW

#62204-334

ampoule activity: ~~3,8970~~ dps 38,970 dps.
½ life : 28.79 yrs
Calibration date: August 7, 2001 12:00 EST
Uncertainty 4.0%

STANDARDS LOG PARENT DILUTION # 01-093

$\left(\frac{38970 \text{ decays}}{1 \text{ sec}}\right)\left(\frac{60 \text{ sec}}{1 \text{ min}}\right)$ = 2,338,200 dpm in ampoule

$\left(\frac{2338200}{2.22}\right)$ = 1053243.2 pCi/m in ampoule - Actual, 1043553.363 pCi/m
÷100 = 10435.8 pCi/ml

Actual Amount Transferred.... 4.9531 g

093
FQ
-094

4.9531 g / 4.99897 actual = 0.9908 0.9908 x 2.3382 x 10^6 = 2,316,688.56 dpm

$\left(\frac{2,316,688}{100 \text{ ml}}\right)$ = 23,166 dpm/ml or 104.3 pCi/ml

231.66 dpm/ml
MK 12-13-02

ANALYTICS
1380 Seaboard Ind Blvd * Atlanta, GA 30318 * USA * 404-352-8677
Sr-90
SRS 62204-334 Amount 1.053 µCi QA VMN
Date 08/07/01 12:00 EST Exp. ----------
PO # 1097166, Item 1
4.99897 grams 0.1M HCl solution

CAUTION RADIOACTIVE MATERIAL

SEVERN TRENT SERVICES

R ochemistry
Standards Preparation Logbook

Date Prep'd	Expir. Date	Standard ID Number	Isotope	Parent ID Number	Parent Activity	Parent Ref. Date	Aliquot	Dilution Volume	Change in Time	T ½	Final Activity	Solvent/ Lot #	Prep'd Initials	Cal. Ver. Initials	Comments
9/18/01	12/18/01	01-087	UNAT CAL STD	01085	10 µg/mL	9/18/01	1.5 mL	100 mL	N/A	N/A	150 ng/mL	.8 M HNO3	BMW	JTK	nanogram/mL
		01-088					1.0 mL				100 ng/mL			JTK	
		01-089					0.5 mL				50 ng/mL			JTK	
		01-090		01088	100 ng/mL		10 mL	100 mL			10 ng/mL			JTK	
		01-091		01-089	50 ng/mL		10 mL	100.0 mL			5 ng/mL			JTK	
		01-092		01-088	100 ng/mL		1.0 mL	100.0 mL			1 ng/mL			JTK	
9/19/01	9/19/02	01-093	SR-90	ampule C2204-334	38,897 dps	8/7/01	4.7531 g	100.0 mL	N/A	28.79 K	~~104.3 pCi/mL~~ 10435 pCi/mL 23,166 dpm/mL	.8 M HNO3	BMW	JTK	
9/19/01	9/19/02	01-094	SR90	01093	10435.8 pCi/mL	9/19/01	1.0 mL	100.0 mL	N/A	28.79 K	104.3 pCi/mL 231.66 dpm/mL	.8 M HNO3	BMW	JTK	
9/26/01	9/26/02	Ba-28	STD. Barium Carrier	Mo28-KPCM BaCl2	N/A	3/23/98	28.46 g	1000.0 mL	N/A	N/A	27.2 mg/mL	Reagent 1/20	BMW	JTK	See Ant capture weight sheet.
10/4/01	10/4/02 ~~10/4/02~~ 10/4/03	01-095	U-232	97-105	10,994 dpm/mL	9-6-97	1 mL	500 mL	—	70 yr	21.99 dpm	1M HNO3	CAM	JTK	
10/12/01	10/12/02	01-096	Ra226	98-006	1316 dpm/mL	4/12/98	1.0 mL	100.0 mL	—	1600 yr	13.16 dpm/mL	1M HNO3	AM	JTK	
10/18/01	10/18/02 ~~10/18/01~~ 10/18/03	01-097	(ABT) SR90/Y90	01032	1765.4 dpm/mL	3/28/98	2.0 mL	100.0 mL	N/A	28.5 yr	(35.31) total ~~33.99~~ dpm/mL	~~1M~~ HNO3	BMW	AW	Decay Correct = 1699.65 dpm/mL

decay corrected 34.87 JTK 10-29-01

Additional Comments:

SL-RAD-044, revised 3/2/01
:Qstlmo05\qa\FORMS\ST-LOUIS\RAD\RAD044.doc