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TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

PROJECT NO. 03-3040.30/TA

Great Lakes NS Remediation

Lot #: F7L200251

John Eberline
Cabrera Services Inc
633 Stablestone Dr
Chesterfield, MO 63017

TESTAMERICA LABORATORIES, INC.

Ivan Vania
Project Manager

December 27, 2007

13715 Rider Trail North Earth City, MO 63045 tel 314.298.8566 fax 314.298.8757 www.testamericainc.com

Case Narrative
LOT NUMBER: F7L200251

This report contains the analytical results for the 17 samples received under chain of custody by TestAmerica St. Louis on December 20, 2007. These samples are associated with your Great Lakes NS Remediation project.

The analytical results included in this report meet all applicable quality control procedure requirements except as noted on the following page.

The test results in this report meet all NELAP requirements for parameters in which accreditations are held by TestAmerica 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.

Gamma Spectroscopy - Cesium-137 & Hits (EML GA-01-R MOD)
The reporting limit for Actinium-228 was not met. There is activity in the samples above the MDA.
Affected Samples:
F7L200251 (1): SU06B-034
F7L200251 (3): SU6-113-1
F7L200251 (4): SU6-113-2
F7L200251 (6): SU6-115-2
F7L200251 (7): SU6-119-4
F7L200251 (8): SU6-128-4
F7L200251 (9): SU07-143PR
F7L200251 (10): SU07B-037
F7L200251 (11): SU7-B25-1
F7L200251 (12): SU8B-043PR
F7L200251 (14): SU9-180-1
F7L200251 (16): SU9-182-1
F7L200251 (17): SU9-183-1

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

F7L200251

CLIENT ANALYSIS SUMMARY

Storage Loc: RAD

Date Received: 2007-12-20

Analytical Due Date: 2008-01-04

Report Due Date: 2008-01-07

Report Type: W

EDD Code: 00

Project Manager: IV

Quote #: 77996

SDG:

Project: 03-3040.30/TA

Great Lakes NS Remediation

PO#:

Report to:

Client: 1352406 Cabrera Services, Inc.

#SMPS in LOT: 17

SAMPLE #	CLIENT SAMPLE ID	Site ID	Client Matrix	DATE/TIME SAMPLED	WORKORDER	A
1	SU06B-034			2007-11-07 / 1230	KEKAM	SOLID

SAMPLE COMMENTS:

XX	ZV		RAD SCREEN	RAD SCREEN	RA	IN-HOUSE RAD SCREEN	01	STANDARD TEST SET	PROT: A	WRK LOC	06
XX	0A	EML	GA-01-R MOD	Gamma Cs-137 & Hits by DOE GA-01-R MOD.	G6	Dry, Grind, and Fill Geometry	01	STANDARD TEST SET	PROT: B	WRK LOC	06

SAMPLE #	CLIENT SAMPLE ID	Site ID	Client Matrix	DATE/TIME SAMPLED	WORKORDER	A
2	SU6-111-1			2007-07-16 / 1600	KEKAW	SOLID

SAMPLE COMMENTS:

XX	ZV		RAD SCREEN	RAD SCREEN	RA	IN-HOUSE RAD SCREEN	01	STANDARD TEST SET	PROT: A	WRK LOC	06
XX	0A	EML	GA-01-R MOD	Gamma Cs-137 & Hits by DOE GA-01-R MOD.	G6	Dry, Grind, and Fill Geometry	01	STANDARD TEST SET	PROT: B	WRK LOC	06

SAMPLE #	CLIENT SAMPLE ID	Site ID	Client Matrix	DATE/TIME SAMPLED	WORKORDER	A
3	SU6-113-1			2007-07-17 / 1100	KEKA2	SOLID

SAMPLE COMMENTS:

XX	ZV		RAD SCREEN	RAD SCREEN	RA	IN-HOUSE RAD SCREEN	01	STANDARD TEST SET	PROT: A	WRK LOC	06
XX	0A	EML	GA-01-R MOD	Gamma Cs-137 & Hits by DOE GA-01-R MOD.	G6	Dry, Grind, and Fill Geometry	01	STANDARD TEST SET	PROT: B	WRK LOC	06

SAMPLE #	CLIENT SAMPLE ID	Site ID	Client Matrix	DATE/TIME SAMPLED	WORKORDER	A
4	SU6-113-2			2007-07-17 / 1100	KEKA4	SOLID

SAMPLE COMMENTS:

XX	ZV		RAD SCREEN	RAD SCREEN	RA	IN-HOUSE RAD SCREEN	01	STANDARD TEST SET	PROT: A	WRK LOC	06
XX	0A	EML	GA-01-R MOD	Gamma Cs-137 & Hits by DOE GA-01-R MOD.	G6	Dry, Grind, and Fill Geometry	01	STANDARD TEST SET	PROT: B	WRK LOC	06

SAMPLE #	CLIENT SAMPLE ID	Site ID	Client Matrix	DATE/TIME SAMPLED	WORKORDER	A
5	SU6-115-1			2007-07-16 / 1610	KEKA7	SOLID

SAMPLE COMMENTS:

XX	ZV		RAD SCREEN	RAD SCREEN	RA	IN-HOUSE RAD SCREEN	01	STANDARD TEST SET	PROT: A	WRK LOC	06
XX	0A	EML	GA-01-R MOD	Gamma Cs-137 & Hits by DOE GA-01-R MOD.	G6	Dry, Grind, and Fill Geometry	01	STANDARD TEST SET	PROT: B	WRK LOC	06

SAMPLE #	CLIENT SAMPLE ID	Site ID	Client Matrix	DATE/TIME SAMPLED	WORKORDER	A
6	SU6-115-2			2007-07-16 / 1610	KEKA9	SOLID

SAMPLE COMMENTS:

XX	ZV		RAD SCREEN	RAD SCREEN	RA	IN-HOUSE RAD SCREEN	01	STANDARD TEST SET	PROT: A	WRK LOC	06
XX	0A	EML	GA-01-R MOD	Gamma Cs-137 & Hits by DOE GA-01-R MOD.	G6	Dry, Grind, and Fill Geometry	01	STANDARD TEST SET	PROT: B	WRK LOC	06

SAMPLE #	CLIENT SAMPLE ID	Site ID	Client Matrix	DATE/TIME SAMPLED	WORKORDER	A
7	SU6-119-4			2007-07-16 / 1640	KEKCC	SOLID

SAMPLE COMMENTS:

XX	ZV		RAD SCREEN	RAD SCREEN	RA	IN-HOUSE RAD SCREEN	01	STANDARD TEST SET	PROT: A	WRK LOC	06
XX	0A	EML	GA-01-R MOD	Gamma Cs-137 & Hits by DOE GA-01-R MOD.	G6	Dry, Grind, and Fill Geometry	01	STANDARD TEST SET	PROT: B	WRK LOC	06

F7L200251 CLIENT ANALYSIS SUMMARY

Storage Loc: RAD

Project Manager: IV | Quote #: 77996 | SDG:

Project: 03-3040.30/TA | Great Lakes NS Remediation

PO#: | Report to:

Client: 1352406 Cabrera Services, Inc.

#SMPS in LOT: 17

Date Received: 2007-12-20
Analytical Due Date: 2008-01-04
Report Due Date: 2008-01-07
Report Type: W
EDD Code: 00

SAMPLE #	CLIENT SAMPLE ID	Site ID	Client Matrix	DATE/TIME SAMPLED	WORKORDER	A
8	SU6-128-4			2007-07-23 / 845	KEKCD	SOLID

SAMPLE COMMENTS:

XX	ZV		RAD SCREEN	RAD SCREEN	RA	IN-HOUSE RAD SCREEN	01	STANDARD TEST SET	PROT: A	WRK LOC	06
XX	0A	EML	GA-01-R MOD	Gamma Cs-137 & Hits by DOE GA-01-R MOD.	G6	Dry, Grind, and Fill Geometry	01	STANDARD TEST SET	PROT: B	WRK LOC	06

SAMPLE #	CLIENT SAMPLE ID	Site ID	Client Matrix	DATE/TIME SAMPLED	WORKORDER	A
9	SU07-143PR			2007-11-07 / 950	KEKCE	SOLID

SAMPLE COMMENTS:

XX	ZV		RAD SCREEN	RAD SCREEN	RA	IN-HOUSE RAD SCREEN	01	STANDARD TEST SET	PROT: A	WRK LOC	06
XX	0A	EML	GA-01-R MOD	Gamma Cs-137 & Hits by DOE GA-01-R MOD.	G6	Dry, Grind, and Fill Geometry	01	STANDARD TEST SET	PROT: B	WRK LOC	06

SAMPLE #	CLIENT SAMPLE ID	Site ID	Client Matrix	DATE/TIME SAMPLED	WORKORDER	A
10	SU07B-037			2007-11-07 / 1245	KEKCF	SOLID

SAMPLE COMMENTS:

XX	ZV		RAD SCREEN	RAD SCREEN	RA	IN-HOUSE RAD SCREEN	01	STANDARD TEST SET	PROT: A	WRK LOC	06
XX	0A	EML	GA-01-R MOD	Gamma Cs-137 & Hits by DOE GA-01-R MOD.	G6	Dry, Grind, and Fill Geometry	01	STANDARD TEST SET	PROT: B	WRK LOC	06

SAMPLE #	CLIENT SAMPLE ID	Site ID	Client Matrix	DATE/TIME SAMPLED	WORKORDER	A
11	SU7-B25-1			2007-08-23 / 1125	KEKCH	SOLID

SAMPLE COMMENTS:

XX	ZV		RAD SCREEN	RAD SCREEN	RA	IN-HOUSE RAD SCREEN	01	STANDARD TEST SET	PROT: A	WRK LOC	06
XX	0A	EML	GA-01-R MOD	Gamma Cs-137 & Hits by DOE GA-01-R MOD.	G6	Dry, Grind, and Fill Geometry	01	STANDARD TEST SET	PROT: B	WRK LOC	06

SAMPLE #	CLIENT SAMPLE ID	Site ID	Client Matrix	DATE/TIME SAMPLED	WORKORDER	A
12	SU8B-043PR			2007-11-12 / 850	KEKCJ	SOLID

SAMPLE COMMENTS:

XX	ZV		RAD SCREEN	RAD SCREEN	RA	IN-HOUSE RAD SCREEN	01	STANDARD TEST SET	PROT: A	WRK LOC	06
XX	0A	EML	GA-01-R MOD	Gamma Cs-137 & Hits by DOE GA-01-R MOD.	G6	Dry, Grind, and Fill Geometry	01	STANDARD TEST SET	PROT: B	WRK LOC	06

SAMPLE #	CLIENT SAMPLE ID	Site ID	Client Matrix	DATE/TIME SAMPLED	WORKORDER	A
13	SU8-B27-1			2007-08-23 / 1430	KEKCK	SOLID

SAMPLE COMMENTS:

XX	ZV		RAD SCREEN	RAD SCREEN	RA	IN-HOUSE RAD SCREEN	01	STANDARD TEST SET	PROT: A	WRK LOC	06
XX	0A	EML	GA-01-R MOD	Gamma Cs-137 & Hits by DOE GA-01-R MOD.	G6	Dry, Grind, and Fill Geometry	01	STANDARD TEST SET	PROT: B	WRK LOC	06

SAMPLE #	CLIENT SAMPLE ID	Site ID	Client Matrix	DATE/TIME SAMPLED	WORKORDER	A
14	SU9-180-1			2007-07-25 / 1535	KEKCM	SOLID

SAMPLE COMMENTS:

XX	ZV		RAD SCREEN	RAD SCREEN	RA	IN-HOUSE RAD SCREEN	01	STANDARD TEST SET	PROT: A	WRK LOC	06
XX	0A	EML	GA-01-R MOD	Gamma Cs-137 & Hits by DOE GA-01-R MOD.	G6	Dry, Grind, and Fill Geometry	01	STANDARD TEST SET	PROT: B	WRK LOC	06

SAMPLE #	CLIENT SAMPLE ID	Site ID	Client Matrix	DATE/TIME SAMPLED	WORKORDER	A

F7L200251

CLIENT ANALYSIS SUMMARY

Storage Loc: RAD

Date Received: 2007-12-20

Analytical Due Date: 2008-01-04

Report Due Date: 2008-01-07

Report Type: W

EDD Code: 00

Project Manager: IV

Quote #: 77996

SDG:

Project: 03-3040.30/TA

Great Lakes NS Remediation

PO#:

Report to:

Client: 1352406 Cabrera Services, Inc.

#SMPS in LOT: 17

SAMPLE #	CLIENT SAMPLE ID	Site ID	Client Matrix	DATE/TIME SAMPLED	WORKORDER	A
15	SU9-181-1			2007-07-25 / 1542	KEKCP	SOLID

SAMPLE COMMENTS:

XX	ZV		RAD SCREEN	RAD SCREEN	RA	IN-HOUSE RAD SCREEN	01	STANDARD TEST SET	PROT: A	WRK LOC	06
XX	0A	EML	GA-01-R MOD	Gamma Cs-137 & Hits by DOE GA-01-R MOD.	G6	Dry, Grind, and Fill Geometry	01	STANDARD TEST SET	PROT: B	WRK LOC	06

SAMPLE #	CLIENT SAMPLE ID	Site ID	Client Matrix	DATE/TIME SAMPLED	WORKORDER	A
16	SU9-182-1			2007-07-25 / 1600	KEKCQ	SOLID

SAMPLE COMMENTS:

XX	ZV		RAD SCREEN	RAD SCREEN	RA	IN-HOUSE RAD SCREEN	01	STANDARD TEST SET	PROT: A	WRK LOC	06
XX	0A	EML	GA-01-R MOD	Gamma Cs-137 & Hits by DOE GA-01-R MOD.	G6	Dry, Grind, and Fill Geometry	01	STANDARD TEST SET	PROT: B	WRK LOC	06

SAMPLE #	CLIENT SAMPLE ID	Site ID	Client Matrix	DATE/TIME SAMPLED	WORKORDER	A
17	SU9-183-1			2007-07-25 / 1610	KEKCR	SOLID

SAMPLE COMMENTS:

XX	ZV		RAD SCREEN	RAD SCREEN	RA	IN-HOUSE RAD SCREEN	01	STANDARD TEST SET	PROT: A	WRK LOC	06
XX	0A	EML	GA-01-R MOD	Gamma Cs-137 & Hits by DOE GA-01-R MOD.	G6	Dry, Grind, and Fill Geometry	01	STANDARD TEST SET	PROT: B	WRK LOC	06

LOT# F7L200251

TestAmerica St. Louis
13715 Rider Trail North

Earth City, MO 63045
phone 314.298.8566 fax 314.298.8757

1412

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

Client Contact	Project Manager: John Eberlin	Site Contact: Wade Fillingame	Date: 12/13/07	COC No: 2
Cabrera Services Inc	Tel/Fax:	Lab Contact:	Carrier: Courier	pg 1 of 2 COCs
633 Stablestone Dr	Analysis Turnaround Time			Job No. 03-3040.30/260
Chesterfield, MO 63017	Calendar (C) or Work Days (W) ____W_____			
(314) 703-6784 Phone	TAT if different from Below __15days_____			
(xxx) xxx-xxxx FAX	☐ 2 weeks			SDG No.
Project Name: Great Lakes Naval Station	☐ 1 week			
Site: Training Center	☐ 2 days			
P O # 08-3111	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type	Matrix	# of Cont.	Filtered Sample	Gamma Spec (Ac-228)	Sample Specific Notes:
SU06B-034	11/7/07	1230	Grab	Soil	1		X	
SU6-111-1	7/16/07	1600	Grab	Soil	1		X	
SU6-113-1	7/17/07	1100	Grab	Soil	1		X	
SU6-113-2	7/17/07	1100	Grab	Soil	1		X	
SU6-115-1	7/16/07	1610	Grab	Soil	1		X	
SU6-115-2	7/16/07	~~1640~~ 1610	Grab	Soil	1		X	
SU6-119-4	7/16/07	1640	Grab	Soil	1		X	
SU6-128-4	7/23/07	0845	Grab	Soil	1		X	
SU07-143PR	11/7/07	0950	Grab	Soil	1		X	
SU07B-037	11/7/07	1245	Grab	Soil	1		X	
SU7-B25-1	8/23/07	1125	Grab	Soil	1		X	
SU8B-043PR	11/12/07	0850	Grab	Soil	1		X	

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____

Possible Hazard Identification
☐ *Non-Hazard* ☐ *Flammable* ☐ *Skin Irritant* *Poison B* ☐ *Unknown* ☐

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For _____ Months*

Special Instructions/QC Requirements & Comments:

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	CABRERA	12/13/07 1230	[signature]	TA	12-20-07 0830
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:

TestAmerica St. Louis

TestAmerica St. Louis
13715 Rider Trail North

Earth City, MO 63045
phone 314.298.8566 fax 314.298.8757

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

Client Contact	Project Manager: John Eberlin	Site Contact: Wade Fillingame	Date: 12/13/07	COC No: 2
Cabrera Services Inc	Tel/Fax:	Lab Contact:	Carrier: Courier	pg 2 of 2 COCs
633 Stablestone Dr	Analysis Turnaround Time			Job No. 03-3040.30/260
Chesterfield, MO 63017	Calendar (C) or Work Days (W) ___W___			
(314) 703-6784 Phone	TAT if different from Below ___15days___			
(xxx) xxx-xxxx FAX	☐ 2 weeks			SDG No.
Project Name: Great Lakes Naval Station	☐ 1 week			
Site: Training Center	☐ 2 days			
P O # 08-3111	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type	Matrix	# of Cont.	Filtered Sample	Gamma Spec (Ac-228)	Sample Specific Notes:
SU8-B27-1	8/23/07	1430	Grab	Soil	1		X	
SU9-180-1	7/25/07	1535	Grab	Soil	1		X	
SU9-181-1	7/25/07	1542	Grab	Soil	1		X	
SU9-182-1	7/25/07	1600	Grab	Soil	1		X	
SU9-183-1	7/25/07	1616	Grab	Soil	1		X	

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____

Possible Hazard Identification
☐ *Non-Hazard* ☐ *Flammable* ☐ *Skin Irritant* *Poison B* ☐ *Unknown* ☐

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For _____ Months*

Special Instructions/QC Requirements & Comments:

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	CABLERA	12/13/07 1830	[signature]	TA	12-20-07 0830
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Lot #(s): F7L200251, 260, 262, 271

- 1412 -

Condition Upon Receipt Form

Client: Cabrera
Quote No: 77996
COC/RFA No: 2,3,4,1
Initiated By: [illegible]
Date: 12-20-07
Time: 0830

Shipping Information

Shipper Name: Client
Shipping # (s):*
1. N/A
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)	Are there custody seals present on the cooler?	8.	Y (N)	Are there custody seals present on bottles?
2.	Y N (N/A)	Do custody seals on cooler appear to be tampered with?	9.	Y N (N/A)	Do custody seals on bottles appear to be tampered with?
3.	(Y) N	Were contents of cooler frisked after opening, but before unpacking?	10.	Y N (N/A)	Was sample received with proper pH[1]? (If not, make note below)
4.	(Y) N	Sample received with Chain of Custody?	11.	Y N	If N/A- Was pH taken by original TestAmerica lab?
5.	(Y) N N/A	Does the Chain of Custody match sample ID's on the container(s)?	12.	(Y) N	Sample received in proper containers?
6.	Y (N)	Was sample received broken?	13.	Y N (N/A)	Headspace in VOA or TOX liquid samples? (If Yes, note sample ID's below)
7.	(Y) N	Is sample volume sufficient for analysis?	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: 12-21-07

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.

Revision 2

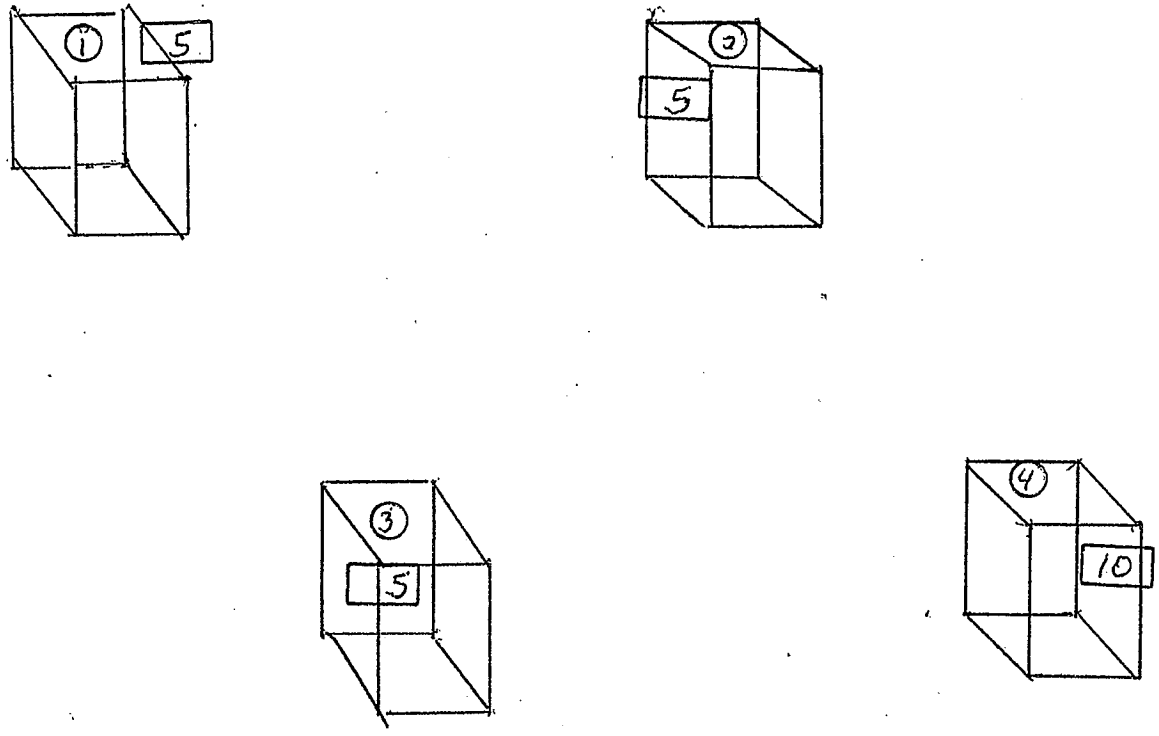
OP-001-02 Radiological Survey Sheet

Radiological Surveys

Location: Sample Containers Site: GLNTC PPV Areas	RWP# 003	Survey # 03-3040, 30-272	Survey Type:	pg. 1 of 1

Smear (CPM/100 cm²)					
Direct Count (CPM/Direct Frisk)					
No.	α	β	No.	α	β
1	0	62	26		
2	0	65	27		
3	1	49	28		
4	1	53	29		
5			30		
6			31		
7			32		
8			33		
9			34		
10			35	N	
11			36		
12	N		37		
13			38		
14			39		
15			40		
16			41		
17			42		
18			43		
19		NA	44		
20			45		
21			46		
22			47		NA
23			48		
24			49		
25			50		

circle one



Comments	Surveyed By:	Date:	Instrument	Serial #	α Eff.	β Eff.	α Bkg.	β Bkg	γ Bkg	Cal. Due
	K. Condon	12/13/07	Bicron	L8545	N/A	N/A	N/A	N/A	5	6/17/08
			2929	163827	.3649	.2385	.15	44.2	N/A	9/7/08
	Reviewed By:	Date:								
	[signature]	12/13/07								

Key

■	A/S Location
-	Boundary
○	Smear
□	Dose Rate μR /hr
*	Direct Reading CPM/direct frisk
△	Grab Sample

METHODS SUMMARY

F7L200251

PARAMETER	ANALYTICAL METHOD	PREPARATION METHOD
Gamma Spectroscopy - Cesium-137 & Hits	EML GA-01-R MOD	

References:

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

SAMPLE SUMMARY

F7L200251

WO #	SAMPLE#	CLIENT SAMPLE ID	SAMPLED DATE	SAMP TIME
KEKAM	001	SU06B-034	11/07/07	12:30
KEKAW	002	SU6-111-1	07/16/07	16:00
KEKA2	003	SU6-113-1	07/17/07	11:00
KEKA4	004	SU6-113-2	07/17/07	11:00
KEKA7	005	SU6-115-1	07/16/07	16:10
KEKA9	006	SU6-115-2	07/16/07	16:10
KEKCC	007	SU6-119-4	07/16/07	16:40
KEKCD	008	SU6-128-4	07/23/07	08:45
KEKCE	009	SU07-143PR	11/07/07	09:50
KEKCF	010	SU07B-037	11/07/07	12:45
KEKCH	011	SU7-B25-1	08/23/07	11:25
KEKCJ	012	SU8B-043PR	11/12/07	08:50
KEKCK	013	SU8-B27-1	08/23/07	14:30
KEKCM	014	SU9-180-1	07/25/07	15:35
KEKCP	015	SU9-181-1	07/25/07	15:42
KEKCQ	016	SU9-182-1	07/25/07	16:00
KEKCR	017	SU9-183-1	07/25/07	16:10

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.

Cabrera Services, Inc.

Client Sample ID: SU06B-034

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F7L200251-001
Work Order: KEKAM
Matrix: SOLID

Date Collected: 11/07/07 1230
Date Received: 12/20/07 0830

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Gamma Cs-137 & Hits by DOE GA-01-R MOD.				**pCi/g**		**Batch # 7357010**	**Yld %**
Actinium 228	**3.76**		**0.52**	0.25	**0.26**	**12/23/07**	**12/23/07**

NOTE(S)

Data are incomplete without the case narrative.

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

Cabrera Services, Inc.

Client Sample ID: SU06B-034 DUP

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F7L200251-001X
Work Order: KEKAM
Matrix: SOLID

Date Collected: 11/07/07 1230
Date Received: 12/20/07 0830

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Gamma Cs-137 & Hits by DOE GA-01-R MOD.				**pCi/g**		**Batch # 7357010**	**Yld %**
Actinium 228	**4.18**		**0.50**	0.25	**0.22**	**12/23/07**	**12/23/07**

NOTE(S)

Data are incomplete without the case narrative.

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

Cabrera Services, Inc.

Client Sample ID: SU6-111-1

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F7L200251-002
Work Order: KEKAW
Matrix: SOLID

Date Collected: 07/16/07 1600
Date Received: 12/20/07 0830

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Gamma Cs-137 & Hits by DOE GA-01-R MOD.				**pCi/g**		**Batch # 7357010**	**Yld %**
Actinium 228	**1.79**		**0.30**	0.25	**0.12**	**12/23/07**	**12/23/07**

NOTE(S)

Data are incomplete without the case narrative.

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

Cabrera Services, Inc.

Client Sample ID: SU6-113-1

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F7L200251-003
Work Order: KEKA2
Matrix: SOLID

Date Collected: 07/17/07 1100
Date Received: 12/20/07 0830

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Gamma Cs-137 & Hits by DOE GA-01-R MOD.				**pCi/g**		**Batch # 7357010**	**Yld %**
Actinium 228	**2.06**		**0.39**	0.25	**0.38**	**12/23/07**	**12/23/07**

NOTE(S)

Data are incomplete without the case narrative.

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

Cabrera Services, Inc.

Client Sample ID: SU6-113-2

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F7L200251-004
Work Order: KEKA4
Matrix: SOLID

Date Collected: 07/17/07 1100
Date Received: 12/20/07 0830

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Gamma Cs-137 & Hits by DOE GA-01-R MOD.				**pCi/g**		**Batch # 7357010**	**Yld %**
Actinium 228	**2.10**		**0.39**	0.25	**0.36**	**12/23/07**	**12/23/07**

NOTE(S)

Data are incomplete without the case narrative.

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

Cabrera Services, Inc.

Client Sample ID: SU6-115-1

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F7L200251-005
Work Order: KEKA7
Matrix: SOLID

Date Collected: 07/16/07 1610
Date Received: 12/20/07 0830

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Gamma Cs-137 & Hits by DOE GA-01-R MOD.				**pCi/g**		**Batch # 7357010**	**Yld %**
Actinium 228	**1.52**		**0.35**	0.25	**0.14**	**12/23/07**	**12/23/07**

NOTE(S)

Data are incomplete without the case narrative.

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

Cabrera Services, Inc.

Client Sample ID: SU6-115-2

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F7L200251-006
Work Order: KEKA9
Matrix: SOLID

Date Collected: 07/16/07 1610
Date Received: 12/20/07 0830

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Gamma Cs-137 & Hits by DOE GA-01-R MOD.				**pCi/g**		**Batch # 7357010**	**Yld %**
Actinium 228	**4.80**		**0.53**	0.25	**0.28**	**12/23/07**	**12/23/07**

NOTE(S)

Data are incomplete without the case narrative.

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

Cabrera Services, Inc.

Client Sample ID: SU6-119-4

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F7L200251-007
Work Order: KEKCC
Matrix: SOLID

Date Collected: 07/16/07 1640
Date Received: 12/20/07 0830

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Gamma Cs-137 & Hits by DOE GA-01-R MOD.				**pCi/g**		**Batch # 7357010**	**Yld %**
Actinium 228	**2.57**		**0.40**	0.25	**0.43**	**12/23/07**	**12/23/07**

NOTE(S)

Data are incomplete without the case narrative.

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

Cabrera Services, Inc.

Client Sample ID: SU6-128-4

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F7L200251-008
Work Order: KEKCD
Matrix: SOLID

Date Collected: 07/23/07 0845
Date Received: 12/20/07 0830

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Gamma Cs-137 & Hits by DOE GA-01-R MOD.				**pCi/g**		**Batch # 7357010**	**Yld %**
Actinium 228	**1.27**		**0.24**	0.25	**0.33**	**12/23/07**	**12/23/07**

NOTE(S)

Data are incomplete without the case narrative.

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

Cabrera Services, Inc.

Client Sample ID: SU07-143PR

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F7L200251-009
Work Order: KEKCE
Matrix: SOLID

Date Collected: 11/07/07 0950
Date Received: 12/20/07 0830

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Gamma Cs-137 & Hits by DOE GA-01-R MOD.				**pCi/g**		**Batch # 7357010**	**Yld %**
Actinium 228	**3.17**		**0.43**	0.25	**0.27**	**12/23/07**	**12/23/07**

NOTE(S)

Data are incomplete without the case narrative.

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

Cabrera Services, Inc.

Client Sample ID: SU07B-037

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F7L200251-010
Work Order: KEKCF
Matrix: SOLID

Date Collected: 11/07/07 1245
Date Received: 12/20/07 0830

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Gamma Cs-137 & Hits by DOE GA-01-R MOD.				**pCi/g**		**Batch # 7357010**	**Yld %**
Actinium 228	**3.46**		**0.46**	0.25	**0.36**	**12/23/07**	**12/23/07**

NOTE(S)

Data are incomplete without the case narrative.

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

Cabrera Services, Inc.

Client Sample ID: SU7-B25-1

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F7L200251-011
Work Order: KEKCH
Matrix: SOLID

Date Collected: 08/23/07 1125
Date Received: 12/20/07 0830

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Gamma Cs-137 & Hits by DOE GA-01-R MOD.				**pCi/g**		**Batch # 7357010**	**Yld %**
Actinium 228	**4.73**		**0.70**	0.25	**0.39**	**12/23/07**	**12/23/07**

NOTE(S)

Data are incomplete without the case narrative.

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

Cabrera Services, Inc.

Client Sample ID: SU8B-043PR

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F7L200251-012
Work Order: KEKCJ
Matrix: SOLID

Date Collected: 11/12/07 0850
Date Received: 12/20/07 0830

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Gamma Cs-137 & Hits by DOE GA-01-R MOD.				**pCi/g**		**Batch # 7357010**	**Yld %**
Actinium 228	**1.17**		**0.29**	0.25	**0.48**	**12/23/07**	**12/23/07**

NOTE(S)

Data are incomplete without the case narrative.

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

Cabrera Services, Inc.

Client Sample ID: SU8-B27-1

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F7L200251-013
Work Order: KEKCK
Matrix: SOLID

Date Collected: 08/23/07 1430
Date Received: 12/20/07 0830

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Gamma Cs-137 & Hits by DOE GA-01-R MOD.			**pCi/g**			**Batch # 7357010**	**Yld %**
Actinium 228	**2.46**		**0.40**	0.25	**0.23**	**12/23/07**	**12/23/07**

NOTE(S)

Data are incomplete without the case narrative.

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

Cabrera Services, Inc.

Client Sample ID: SU9-180-1

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F7L200251-014
Work Order: KEKCM
Matrix: SOLID

Date Collected: 07/25/07 1535
Date Received: 12/20/07 0830

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Gamma Cs-137 & Hits by DOE GA-01-R MOD.				**pCi/g**		**Batch # 7357010**	**Yld %**
Actinium 228	**0.98**		**0.29**	0.25	**0.36**	**12/23/07**	**12/23/07**

NOTE(S)

Data are incomplete without the case narrative.

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

Cabrera Services, Inc.

Client Sample ID: SU9-181-1

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F7L200251-015
Work Order: KEKCP
Matrix: SOLID

Date Collected: 07/25/07 1542
Date Received: 12/20/07 0830

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Gamma Cs-137 & Hits by DOE GA-01-R MOD.				**pCi/g**		**Batch # 7357010**	**Yld %**
Actinium 228	**1.46**		**0.30**	0.25	**0.15**	**12/23/07**	**12/23/07**

NOTE(S)

Data are incomplete without the case narrative.

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

Cabrera Services, Inc.

Client Sample ID: SU9-182-1

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F7L200251-016
Work Order: KEKCO
Matrix: SOLID

Date Collected: 07/25/07 1600
Date Received: 12/20/07 0830

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Gamma Cs-137 & Hits by DOE GA-01-R MOD.				**pCi/g**		**Batch # 7357010**	**Yld %**
Actinium 228	**0.80**		**0.31**	0.25	**0.49**	**12/23/07**	**12/23/07**

NOTE(S)

Data are incomplete without the case narrative.

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

Cabrera Services, Inc.

Client Sample ID: SU9-183-1

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F7L200251-017
Work Order: KEKCR
Matrix: SOLID

Date Collected: 07/25/07 1610
Date Received: 12/20/07 0830

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Gamma Cs-137 & Hits by DOE GA-01-R MOD.				**pCi/g**		**Batch # 7357010**	**Yld %**
Actinium 228	**1.21**		**0.31**	0.25	**0.48**	**12/23/07**	**12/23/07**
--- Other Detected Radionuclides ---							
Thallium 208	**0.63**		**0.17**		**0.12**	**12/23/07**	**12/23/07**
Thorium 234	**4.4**		**1.3**		**2.2**	**12/23/07**	**12/23/07**

NOTE(S)

Data are incomplete without the case narrative.

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

METHOD BLANK REPORT

Severn Trent Laboratories - Radiochemistry

Client Lot ID: F7L200251
Matrix: SOLID

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC		Prep Date	Lab Sample ID Analysis Date
Gamma Cs-137 & Hits by DOE GA-01-R MOD.			**pCi/g**	**Batch #**	**7357010**	**Yld %**		**F7L230000-010B**
Actinium 228	-0.02	U	0.26	0.25	0.25		12/23/07	12/23/07

NOTE(S)

Data are incomplete without the case narrative.

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

U Result is less than the sample detection limit.

Laboratory Control Sample Report

Severn Trent Laboratories - Radiochemistry

Client Lot ID: F7L200251
Matrix: SOLID

Parameter	Spike Amount	Result	Total Uncert. (2 σ+/-)	MDC	% Yld	% Rec	Lab Sample ID / QC Control Limits
Gamma Cs-137 & Hits by DOE GA-01-R MOD.			**pCi/g**	**GA-01-R MOD**			**F7L230000-010C**
Americium 241	103	107	8.5	1.4		104	(85 - 118)
Cesium 137	40.0	43.6	2.7	0.4		109	(91 - 120)
Cobalt 60	62.7	65.9	3.9	0.3		105	(91 - 112)
	Batch #:	7357010		**Analysis Date:**	12/23/07		

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: F7L200251
Matrix: SOLID

Date Sampled: 11/07/07
Date Received: 12/20/07

Parameter	SAMPLE Result	Total Uncert. (2σ+/-)	% Yld	DUPLICATE Result	Total Uncert. (2 σ+/-)	% Yld	QC Sample ID Precision	
Gamma Cs-137 & Hits by DOE GA-01-R MOD.			**pCi/g**	**GA-01-R MOD**			**F7L200251-001**	
Actinium 228	**3.76**	**0.52**		**4.18**	**0.50**		10	%RPD
	Batch #:	7357010	(Sample)	7357010	(Duplicate)			

NOTE(S)

Data are incomplete without the case narrative.
Calculations are performed before rounding to avoid round-off error in calculated results

GAMMA SPECTROSCOPY

Gamma Spectroscopy

Cesium-137

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Analysis Report for Gamma Spectroscopy

Batch: 7357010 **Operator:** 403293

SampID	WRKNO	Aliquot	Sigma	Instrument	Detector	CountDateTime	CountDuration
F7L200251-001	KEKAM1AC	385.80g	2.00	GammaVision	GV04	12 / 23 / 07 12:21	30

Analyte	Cmpnd#	Activity	TotalUnc	CountUnc	MDA	MLCC	Act/MDA
AC-228	1501	3.765E+000 pCi/g	5.245E-001	4.776E-001	2.642E-001	1.078E-001	14.25

SampID	WRKNO	Aliquot	Sigma	Instrument	Detector	CountDateTime	CountDuration
F7L200251-001X	KEKAM1AD	385.80g	2.00	GammaVision	GV01	12 / 23 / 07 13:03	30

Analyte	Cmpnd#	Activity	TotalUnc	CountUnc	MDA	MLCC	Act/MDA
AC-228	1501	4.176E+000 pCi/g	5.032E-001	4.421E-001	2.197E-001	9.456E-002	19.01

SampID	WRKNO	Aliquot	Sigma	Instrument	Detector	CountDateTime	CountDuration
F7L200251-002	KEKAW1AC	401.40g	2.00	GammaVision	GV05	12 / 23 / 07 12:22	30

Analyte	Cmpnd#	Activity	TotalUnc	CountUnc	MDA	MLCC	Act/MDA
AC-228	1501	1.791E+000 pCi/g	3.020E-001	2.839E-001	1.214E-001	0.000E+000	14.76

SampID	WRKNO	Aliquot	Sigma	Instrument	Detector	CountDateTime	CountDuration
F7L200251-003	KEKA21AC	370.40g	2.00	GammaVision	GV07	12 / 23 / 07 12:22	30

Analyte	Cmpnd#	Activity	TotalUnc	CountUnc	MDA	MLCC	Act/MDA
AC-228	1501	2.057E+000 pCi/g	3.938E-001	3.756E-001	3.831E-001	0.000E+000	5.37

SampID	WRKNO	Aliquot	Sigma	Instrument	Detector	CountDateTime	CountDuration
F7L200251-004	KEKA41AC	351.70g	2.00	GammaVision	GV03	12 / 23 / 07 13:04	30

Analyte	Cmpnd#	Activity	TotalUnc	CountUnc	MDA	MLCC	Act/MDA
AC-228	1501	2.106E+000 pCi/g	3.935E-001	3.744E-001	3.596E-001	1.634E-001	5.86

SampID	WRKNO	Aliquot	Sigma	Instrument	Detector	CountDateTime	CountDuration
F7L200251-005	KEKA71AC	358.10g	2.00	GammaVision	GV04	12 / 23 / 07 13:04	30

Analyte	Cmpnd#	Activity	TotalUnc	CountUnc	MDA	MLCC	Act/MDA
AC-228	1501	1.525E+000 pCi/g	3.543E-001	3.432E-001	1.423E-001	4.499E-002	10.72

SampID	WRKNO	Aliquot	Sigma	Instrument	Detector	CountDateTime	CountDuration
F7L200251-006	KEKA91AC	387.10g	2.00	GammaVision	GV05	12 / 23 / 07 13:05	30

Analyte	Cmpnd#	Activity	TotalUnc	CountUnc	MDA	MLCC	Act/MDA
AC-228	1501	4.803E+000 pCi/g	5.327E-001	4.555E-001	2.760E-001	0.000E+000	17.40

SampID	WRKNO	Aliquot	Sigma	Instrument	Detector	CountDateTime	CountDuration
F7L200251-007	KEKCC1AC	311.30g	2.00	GammaVision	GV07	12 / 23 / 07 13:05	30

Analyte	Cmpnd#	Activity	TotalUnc	CountUnc	MDA	MLCC	Act/MDA
AC-228	1501	2.571E+000 pCi/g	3.996E-001	3.712E-001	4.298E-001	0.000E+000	5.98

SampID	WRKNO	Aliquot	Sigma	Instrument	Detector	CountDateTime	CountDuration
F7L200251-008	KEKCD1AC	355.00g	2.00	GammaVision	GV01	12 / 23 / 07 13:41	30

Analyte	Cmpnd#	Activity	TotalUnc	CountUnc	MDA	MLCC	Act/MDA
AC-228	1501	1.272E+000 pCi/g	2.391E-001	2.276E-001	3.303E-001	1.486E-001	3.85

SampID	WRKNO	Aliquot	Sigma	Instrument	Detector	CountDateTime	CountDuration
F7L200251-009	KEKCE1AC	387.50g	2.00	GammaVision	GV03	12 / 23 / 07 13:42	30

Analyte	Cmpnd#	Activity	TotalUnc	CountUnc	MDA	MLCC	Act/MDA
AC-228	1501	3.170E+000 pCi/g	4.277E-001	3.868E-001	2.713E-001	1.207E-001	11.68

SampID	WRKNO	Aliquot	Sigma	Instrument	Detector	CountDateTime	CountDuration
F7L200251-010	KEKCF1AC	341.40g	2.00	GammaVision	GV04	12 / 23 / 07 13:42	30

Analyte	Cmpnd#	Activity	TotalUnc	CountUnc	MDA	MLCC	Act/MDA
AC-228	1501	3.463E+000 pCi/g	4.582E-001	4.125E-001	3.631E-001	1.541E-001	9.54

SampID	WRKNO	Aliquot	Sigma	Instrument	Detector	CountDateTime	CountDuration
F7L200251-011	KEKCH1AC	316.10g	2.00	GammaVision	GV05	12 / 23 / 07 13:43	30

Analyte	Cmpnd#	Activity	TotalUnc	CountUnc	MDA	MLCC	Act/MDA
AC-228	1501	4.729E+000 pCi/g	6.958E-001	6.404E-001	3.895E-001	0.000E+000	12.14

SampID	WRKNO	Aliquot	Sigma	Instrument	Detector	CountDateTime	CountDuration
F7L200251-012	KEKCJ1AC	315.40g	2.00	GammaVision	GV07	12 / 23 / 07 13:43	30

Analyte	Cmpnd#	Activity	TotalUnc	CountUnc	MDA	MLCC	Act/MDA
AC-228	1501	1.174E+000 pCi/g	2.915E-001	2.835E-001	4.849E-001	0.000E+000	2.42

SampID	WRKNO	Aliquot	Sigma	Instrument	Detector	CountDateTime	CountDuration
F7L200251-013	KEKCK1AC	361.50g	2.00	GammaVision	GV01	12 / 23 / 07 14:23	30

Analyte	Cmpnd#	Activity		TotalUnc	CountUnc	MDA	MLCC	Act/MDA
AC-228	1501	2.456E+000	pCi/g	3.988E-001	3.730E-001	2.251E-001	9.627E-002	10.91

SampID	WRKNO	Aliquot	Sigma	Instrument	Detector	CountDateTime	CountDuration
F7L200251-014	KEKCM1AC	356.80g	2.00	GammaVision	GV03	12 / 23 / 07 14:23	30

Analyte	Cmpnd#	Activity		TotalUnc	CountUnc	MDA	MLCC	Act/MDA
AC-228	1501	9.763E-001	pCi/g	2.878E-001	2.823E-001	3.614E-001	1.645E-001	2.70

SampID	WRKNO	Aliquot	Sigma	Instrument	Detector	CountDateTime	CountDuration
F7L200251-015	KEKCP1AC	347.70g	2.00	GammaVision	GV04	12 / 23 / 07 14:24	30

Analyte	Cmpnd#	Activity		TotalUnc	CountUnc	MDA	MLCC	Act/MDA
AC-228	1501	1.461E+000	pCi/g	3.003E-001	2.883E-001	1.466E-001	4.633E-002	9.97

SampID	WRKNO	Aliquot	Sigma	Instrument	Detector	CountDateTime	CountDuration
F7L200251-016	KEKCQ1AC	321.00g	2.00	GammaVision	GV05	12 / 23 / 07 14:25	30

Analyte	Cmpnd#	Activity		TotalUnc	CountUnc	MDA	MLCC	Act/MDA
AC-228	1501	8.041E-001	pCi/g	3.129E-001	3.095E-001	4.917E-001	0.000E+000	1.64

SampID	WRKNO	Aliquot	Sigma	Instrument	Detector	CountDateTime	CountDuration
F7L200251-017	KEKCR1AC	323.20g	2.00	GammaVision	GV07	12 / 23 / 07 14:25	30

Analyte	Cmpnd#	Activity		TotalUnc	CountUnc	MDA	MLCC	Act/MDA
AC-228	1501	1.208E+000	pCi/g	3.094E-001	3.015E-001	4.782E-001	0.000E+000	2.53

SampID	WRKNO	Aliquot	Sigma	Instrument	Detector	CountDateTime	CountDuration
F7L230000-010B	KEQKR1AA	372.80g	2.00	GammaVision	GV01	12 / 23 / 07 15:03	30

Analyte	Cmpnd#	Activity		TotalUnc	CountUnc	MDA	MLCC	Act/MDA
AC-228	1501	-2.055E-002	pCi/g	2.587E-001	2.587E-001	2.523E-001	1.103E-001	-0.08

SampID	WRKNO	Aliquot	Sigma	Instrument	Detector	CountDateTime	CountDuration
F7L230000-010C	KEQKR1AC	351.20g	2.00	GammaVision	GV03	12 / 23 / 07 15:04	30

Analyte	Cmpnd#	Activity		TotalUnc	CountUnc	MDA	MLCC	Act/MDA
AM-241	1493	1.071E+002	pCi/g	8.484E+000	1.839E+000	1.385E+000	6.879E-001	77.32
CO-60	1515	6.591E+001	pCi/g	3.912E+000	1.118E+000	3.050E-001	1.421E-001	216.07
CS-137	1518	4.362E+001	pCi/g	2.675E+000	8.662E-001	3.559E-001	1.731E-001	122.57

Laboratory Control Sample Information

Sample ID	WRKNO	Analyte	Activity		StdAdded	Recovery
F7L230000-010C	KEQKR1AC	CS-137	4.362E+001	pCi/g	4.002E+001	109.00%
		CO-60	6.591E+001	pCi/g	6.272E+001	105.08%
		AM-241	1.071E+002	pCi/g	1.031E+002	103.84%

Sample Duplicate Information

Sample ID	Dup Sample ID	Analyte	Samp Activity		Dup Activity	RPD	RER	DER	Flag
F7L200251-001	F7L200251-001X	AC-228	3.765E+000	pCi/g	4.176E+000	10.35%	4.000E-001	1.131E+000	

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Instrument Checks

TestAmerica **STL**

Gamma Spectroscopy Daily Check Summary

Detector: 1

Measurement Date/Time: 12/23/2007 12:45:25

	Minimum	Low	Current	High	Maximum	Result
Bkg Count Rate (CPS)	3.250	3.500	3.638	4.250	4.500	ok
Total Activity (Bq)	1841.0	1880.0	1921.6	1996.0	2035.0	ok
Peak Shift (keV)	-0.3000	-0.2000	-0.1684	0.2000	0.2500	ok
Avg FWHM Ratio	0.9000	0.9500	1.0027	1.0500	1.1000	ok
Avg FWTM Ratio	0.9000	0.9500	1.0093	1.1000	1.1500	ok

Detector: 3

Measurement Date/Time: 12/23/2007 12:48:08

	Minimum	Low	Current	High	Maximum	Result
Bkg Count Rate (CPS)	2.500	2.750	3.206	3.250	3.500	ok
Total Activity (Bq)	1835.0	1874.0	1948.4	1990.0	2029.0	ok
Peak Shift (keV)	-0.3000	-0.2500	-0.2107	0.2500	0.3000	ok
Avg FWHM Ratio	0.8500	0.9000	1.0342	1.1500	1.2500	ok
Avg FWTM Ratio	0.9000	0.9500	1.1792	1.1500	1.2500	High

Detector: 4

Measurement Date/Time: 12/23/2007 12:10:00

	Minimum	Low	Current	High	Maximum	Result
Bkg Count Rate (CPS)	1.150	1.200	1.344	1.450	1.500	ok
Total Activity (Bq)	1833.7	1872.3	1923.3	1988.2	2026.8	ok
Peak Shift (keV)	-0.5000	-0.2500	-0.1888	0.2500	0.5000	ok
Avg FWHM Ratio	0.7000	0.8000	0.9651	1.1000	1.2500	ok
Avg FWTM Ratio	0.7000	0.8000	0.9754	1.1000	1.2500	ok

Detector: 5

Measurement Date/Time: 12/23/2007 12:11:12

	Minimum	Low	Current	High	Maximum	Result
Bkg Count Rate (CPS)	1.250	1.500	1.915	2.000	2.250	ok
Total Activity (Bq)	1837.9	1876.6	1912.4	1992.7	2031.4	ok
Peak Shift (keV)	-0.2500	-0.1750	0.0031	0.1750	0.2500	ok
Avg FWHM Ratio	0.8500	0.9000	0.9973	1.1000	1.1500	ok
Avg FWTM Ratio	0.9000	0.9500	1.0164	1.1500	1.2000	ok

Gamma Spectroscopy Daily Check Summary

Detector: 6

Measurement Date/Time: 12/23/2007 12:10:21

	Minimum	Low	Current	High	Maximum	Result
Bkg Count Rate (CPS)	2.350	2.600	2.901	3.150	3.400	ok
Total Activity (Bq)	1829.3	1867.8	1899.2	1983.3	2021.8	ok
Peak Shift (keV)	-0.5000	-0.2500	-0.1349	0.2500	0.5000	ok
Avg FWHM Ratio	0.7500	0.9000	1.0167	1.1500	1.3000	ok
Avg FWTM Ratio	0.7500	0.9000	1.0641	1.1500	1.3000	ok

Detector: 7

Measurement Date/Time: 12/23/2007 12:10:31

	Minimum	Low	Current	High	Maximum	Result
Bkg Count Rate (CPS)	0.750	1.000	1.348	1.750	2.000	ok
Total Activity (Bq)	1850.0	1875.0	1910.3	1975.0	2000.0	ok
Peak Shift (keV)	-0.5000	-0.2500	0.0885	0.2500	0.5000	ok
Avg FWHM Ratio	0.8000	0.8500	0.9807	1.1500	1.2000	ok
Avg FWTM Ratio	0.8000	0.8500	1.0029	1.2000	1.2500	ok

Detector: 8

Measurement Date/Time: 12/23/2007 12:45:08

	Minimum	Low	Current	High	Maximum	Result
Bkg Count Rate (CPS)	1.250	1.500	1.527	2.000	2.250	ok
Total Activity (Bq)	1875.0	1900.0	1864.2	1995.0	2020.0	< MIN !!
Peak Shift (keV)	-0.2500	-0.2000	0.1958	0.2000	0.2500	ok
Avg FWHM Ratio	0.9000	0.9500	1.0383	1.1000	1.1500	ok
Avg FWTM Ratio	0.9000	0.9500	1.0462	1.1000	1.1550	ok

Notes: Low and High are 2 sigma warning limits. Minimum (<MIN) and Maximum (>MAX) are 3 sigma control limits (Fail).

Analyst _____

Date _____

GammaVision V6.01 QA Background Report 12/23/2007 11:33:39 AM

Detector: 1 Ge 1 SN/242
Measurement Number: 1279
Data Acquired On: 12/23/2007 11:13:30 AM
Real Time: 1206.96 Sec.
Live Time: 1200.00 Sec.
Status: OK

	Minimum	Low	Actual	High	Maximum
Background (CPS):	3.25	3.50	3.64	4.25	4.50

GammaVision V6.01 QA Background Report 12/23/2007 12:16:40 PM

Detector: 3 Ge 3 SN/155
Measurement Number: 1209
Data Acquired On: 12/23/2007 11:56:30 AM
Real Time: 1208.10 Sec.
Live Time: 1200.00 Sec.
Status: OK

	Minimum	Low	Actual	High	Maximum
Background (CPS):	2.50	2.75	3.21	3.25	3.50

GammaVision V6.01 QA Background Report 12/23/2007 11:33:52 AM

Detector: 4 Ge 4 SN/181
Measurement Number: 101
Data Acquired On: 12/23/2007 11:13:47 AM
Real Time: 1202.22 Sec.
Live Time: 1200.00 Sec.
Status: OK

	Minimum	Low	Actual	High	Maximum
Background (CPS):	1.15	1.20	1.34	1.45	1.50

GammaVision V6.01 QA Background Report 12/23/2007 11:33:58 AM

Detector: 5 Ge 5 SN/157
Measurement Number: 247
Data Acquired On: 12/23/2007 11:13:56 AM
Real Time: 1200.00 Sec.
Live Time: 1128.16 Sec.
Status: OK

	Minimum	Low	Actual	High	Maximum
Background (CPS):	1.25	1.50	1.91	2.00	2.25

GammaVision V6.01 QA Background Report 12/23/2007 11:34:14 AM

Detector: 7 Ge 7 SN/154
Measurement Number: 341
Data Acquired On: 12/23/2007 11:14:03 AM
Real Time: 1210.08 Sec.
Live Time: 1200.00 Sec.
Status: OK

	Minimum	Low	Actual	High	Maximum
Background (CPS):	0.75	1.00	1.35	1.75	2.00

GammaVision V6.01 QA Background Report 12/23/2007 11:35:00 AM

Detector: 8 Ge 8 SN/174
Measurement Number: 1227
Data Acquired On: 12/23/2007 11:14:14 AM
Real Time: 1244.44 Sec.
Live Time: 1200.00 Sec.
Status: OK

	Minimum	Low	Actual	High	Maximum
Background (CPS):	1.25	1.50	1.53	2.00	2.25

GammaVision Report Writer Version 2.04.0 G53W4.21 23-Dec-2007 12:45:23PM Page 1

DB Analysis ID: 32,957

Sample Description: 03-0366

Spectrum Filename: QA101259.Spc

Acquisition Information

Start Time:	23-Dec-2007 12:14:38PM		
Live Time:	1800.00	Real Time:	1822.24
Dead Time:	1.22 %		
Detector ID:	1		

Detector System: Ge 1 SN/242

Calibration

Description:	Ge1 air filter 74140-334 1_05_07		
Filename:	C:\User\Calibrations\Ge1 calibrations\GE1 AF interp_165_quad 01_05_07.Clb		
Energy Created:	05-Jan-2007 1:55:09PM	Efficiency Created:	05-Jan-2007 1:58:17PM
Zero Offset:	0.112 keV	Gain:	0.250 keV/Channel

Library 1 File:	STL QC.Lib	Library based peak stripping used.
Library 2 File:	Null.Lib	
Library 3 File:	Null.Lib	

Analysis Parameters

Start Channel:	100 for an energy of 25.11 keV
Stop Channel:	8,000 for an energy of 1999.43 keV
Peak rejection level:	40.000 %
Activity Scaling Factor:	1.0000 / 1.0000 = 1.0000
Detection Limit Method:	Nureg method 4.16
Sample Size:	1.00E+000
Additional random error:	0.0000
Additional systematic error:	0.0000
Fraction Limit:	0.0000%
Background Width:	Average of three points

Corrections	Status	Comments
Decay Correct to Date:	YES	01-Apr-2003 12:00:00PM
Decay During Acquisition:	NO	
Peaked Background Correction:	NO	
Absorption:	NO	
Geometry Correction:	NO	
Random Summing:	NO	

Energy Calibration Normalized Difference: 0.2789

SUMMARY OF NUCLIDES IN SAMPLE

Nuclide	Time of Count Activity Bq/SA	Time Corrected Activity Bq/SA	Uncertainty Counts 2 Sigma %	Uncertainty Total 2 Sigma %	Minimum Detectable Activity
CO-60	3.307E+002	6.159E+002	1.74	5.96	1.151E+000
CS-137	3.464E+002	3.862E+002	2.02	6.39	2.418E+000
AM-241	9.125E+002	9.195E+002	1.03	9.34	4.805E+000

= All peaks for activity calculation had bad shape

Total Activity (25.11 to 1,999.43 keV) 1,589.70 Bq/SA

Analyzed by: _____

403605

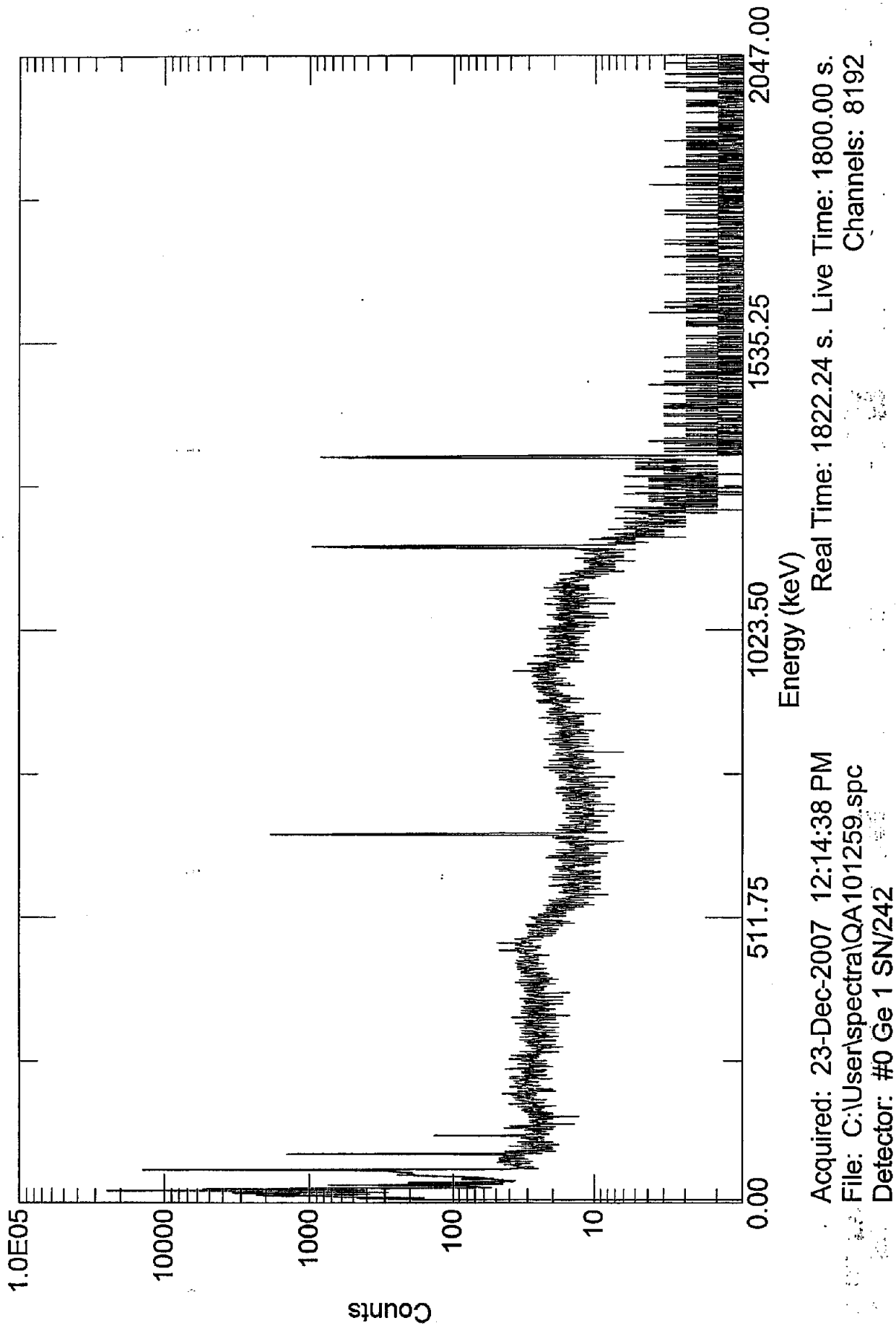
Reviewed by: _____

Supervisor

Laboratory: Test America

QA101259

03-0366



GammaVision Report Writer Version 2.04.0 G53W4.21 23-Dec-2007 12:48:06PM Page 1

DB Analysis ID: 32,958

Sample Description: 03-0368

Spectrum Filename: QA301294.Spc

Acquisition Information

Start Time:	23-Dec-2007 12:17:15PM		
Live Time:	1800.00	Real Time:	1825.74
Dead Time:	1.41 %		
Detector ID:	3		

Detector System: Ge 3 SN/155

Calibration

Description:	Ge3 Air filter 74140_334 interp_122_quad 01_09_07		
Filename:	C:\User\Calibrations\Ge3 cal post 5_8_06\Ge3 Air filter interp_122_quad 01_09_07.Clb		
Energy Created:	09-Jan-2007 10:31:35AM	Efficiency Created:	09-Jan-2007 10:36:46AM
Zero Offset:	0.372 keV	Gain:	0.250 keV/Channel

Library 1 File:	STL QC.Lib	Library based peak stripping used.
Library 2 File:	Null.Lib	
Library 3 File:	Null.Lib	

Analysis Parameters

Start Channel:	100 for an energy of 25.35 keV
Stop Channel:	8,000 for an energy of 2000.41 keV
Peak rejection level:	40.000 %
Activity Scaling Factor:	1.0000 / 1.0000 = 1.0000
Detection Limit Method:	Nureg method 4.16
Sample Size:	1.00E+000
Additional random error:	0.0000
Additional systematic error:	0.0000
Fraction Limit:	0.0000%
Background Width:	Average of three points

Corrections	Status	Comments
Decay Correct to Date:	YES	01-Apr-2003 12:00:00PM
Decay During Acquisition:	NO	
Peaked Background Correction:	NO	
Absorption:	NO	
Geometry Correction:	NO	
Random Summing:	NO	

Energy Calibration Normalized Diff-------- 0.2754

SUMMARY OF NUCLIDES IN SAMPLE

Nuclide		Time of Count Activity Bq/SA	Time Corrected Activity Bq/SA	Uncertainty Counts 2 Sigma %	Uncertainty Total 2 Sigma %	Minimum Detectable Activity
CO-60		3.446E+002	6.417E+002	1.74	5.96	1.767E+000
CS-137		3.524E+002	3.929E+002	2.05	6.21	2.864E+000
AM-241	#	9.069E+002	9.138E+002	1.01	9.33	4.917E+000

= All peaks for activity calculation had bad shape

Total Activity (25.35 to 2,000.41 keV) 1,603.89 Bq/SA

Analyzed by: _____

403605

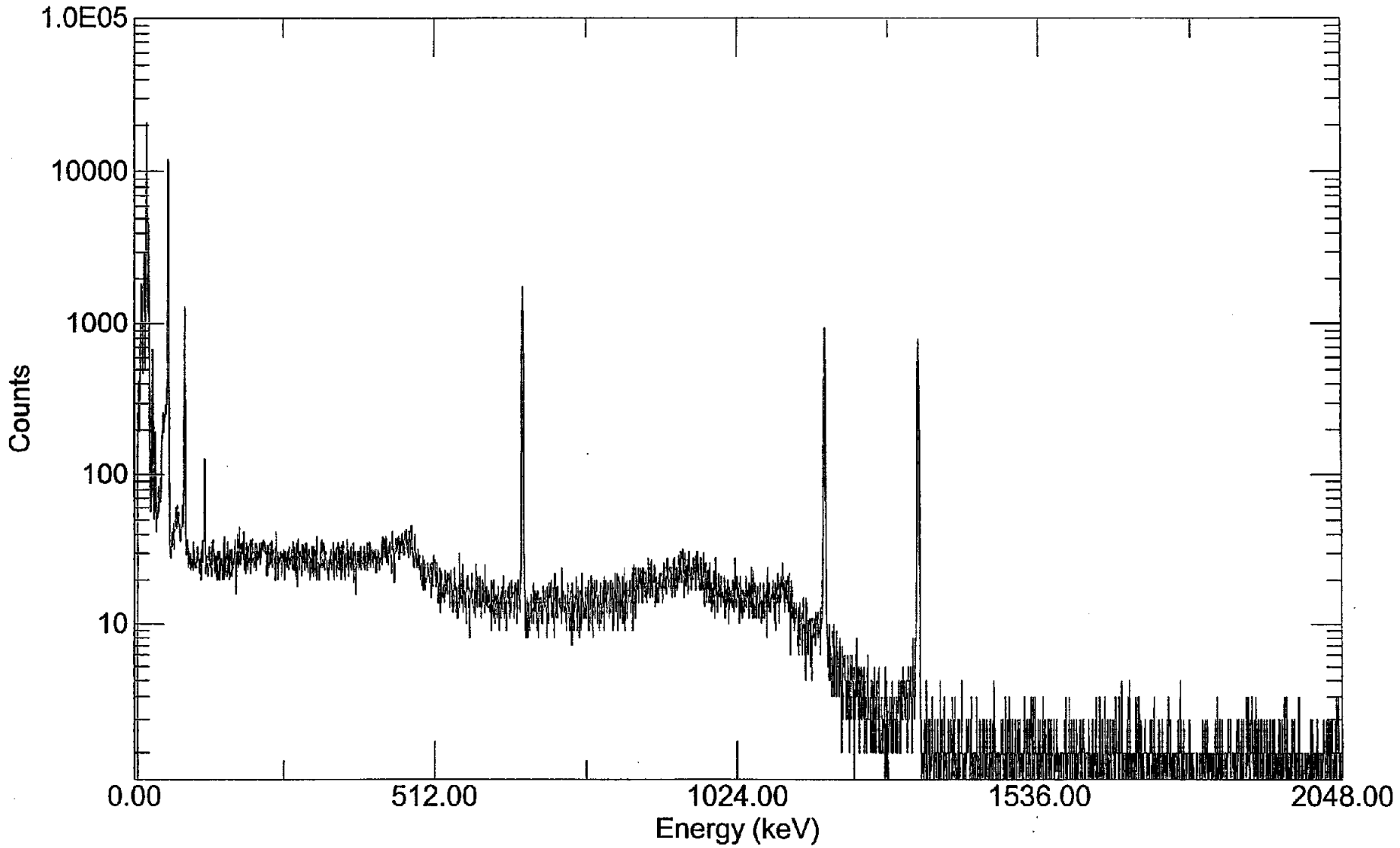
Reviewed by: _____

Supervisor

Laboratory: STL- St Louis

QA301294

03-0368



Acquired: 23-Dec-2007 12:17:15 PM
File: C:\User\spectra\QA301294.spc
Detector: #0 Ge 3 SN/155

Real Time: 1825.74 s. Live Time: 1800.00 s.
Channels: 8192

GammaVision Report Writer Version 2.04.0 G53W4.21 23-Dec-2007 12:09:59PM Page: 1

DB Analysis ID: 32,951

Sample Description: 03-0371

Spectrum Filename: QA400104.Spc

Acquisition Information

Start Time:	23-Dec-2007 11:38:52AM		
Live Time:	1800.00	Real Time:	1810.88
Dead Time:	0.60 %		
Detector ID:	4		

Detector System: Ge 4 SN/181

Calibration

Description:	Ge4 AirFilterCal_74140_334_05_08_07(EE)		
Filename:	C:\User\Calibrations\Ge4 Post 09_07_07(Ge6)\Ge4 AirFilterCal_74140_334_05_08_07		
Energy Created:	08-May-2007 1:28:13PM	Efficiency Created:	08-May-2007 1:39:26PM
Zero Offset:	0.017 keV	Gain:	0.250 keV/Channel

Library 1 File: STL QC.Lib Library based peak stripping used.
Library 2 File: Null.Lib
Library 3 File: Null.Lib

Analysis Parameters

Start Channel:	100 for an energy of 25.03 keV
Stop Channel:	8,000 for an energy of 1998.47 keV
Peak rejection level:	40.000 %
Activity Scaling Factor:	1.0000 / 1.0000 = 1.0000
Detection Limit Method:	Nureg method 4.16
Sample Size:	1.00E+000
Additional random error:	0.0000
Additional systematic error:	0.0000
Fraction Limit:	0.0000%
Background Width:	Average of three points

Corrections	Status	Comments
Decay Correct to Date:	YES	01-Apr-2003 12:00:00PM
Decay During Acquisition:	NO	
Peaked Background Correction:	NO	
Absorption:	NO	
Geometry Correction:	NO	
Random Summing:	NO	

Energy Calibration Normalized Difference: 0.1888

SUMMARY OF NUCLIDES IN SAMPLE

Nuclide	Time of Count Activity Bq/SA	Time Corrected Activity Bq/SA	Uncertainty Counts 2 Sigma %	Uncertainty Total 2 Sigma %	Minimum Detectable Activity
CO-60	3.230E+002	6.015E+002	2.23	6.11	1.381E+000
CS-137	3.587E+002	3.998E+002	2.62	6.50	4.056E+000
AM-241	9.150E+002	9.220E+002	1.12	9.28	4.985E+000

= All peaks for activity calculation had bad shape

Total Activity (25.03 to 1,998.47 keV) 1,596.71 Bq/SA

Analyzed by: _____

403605

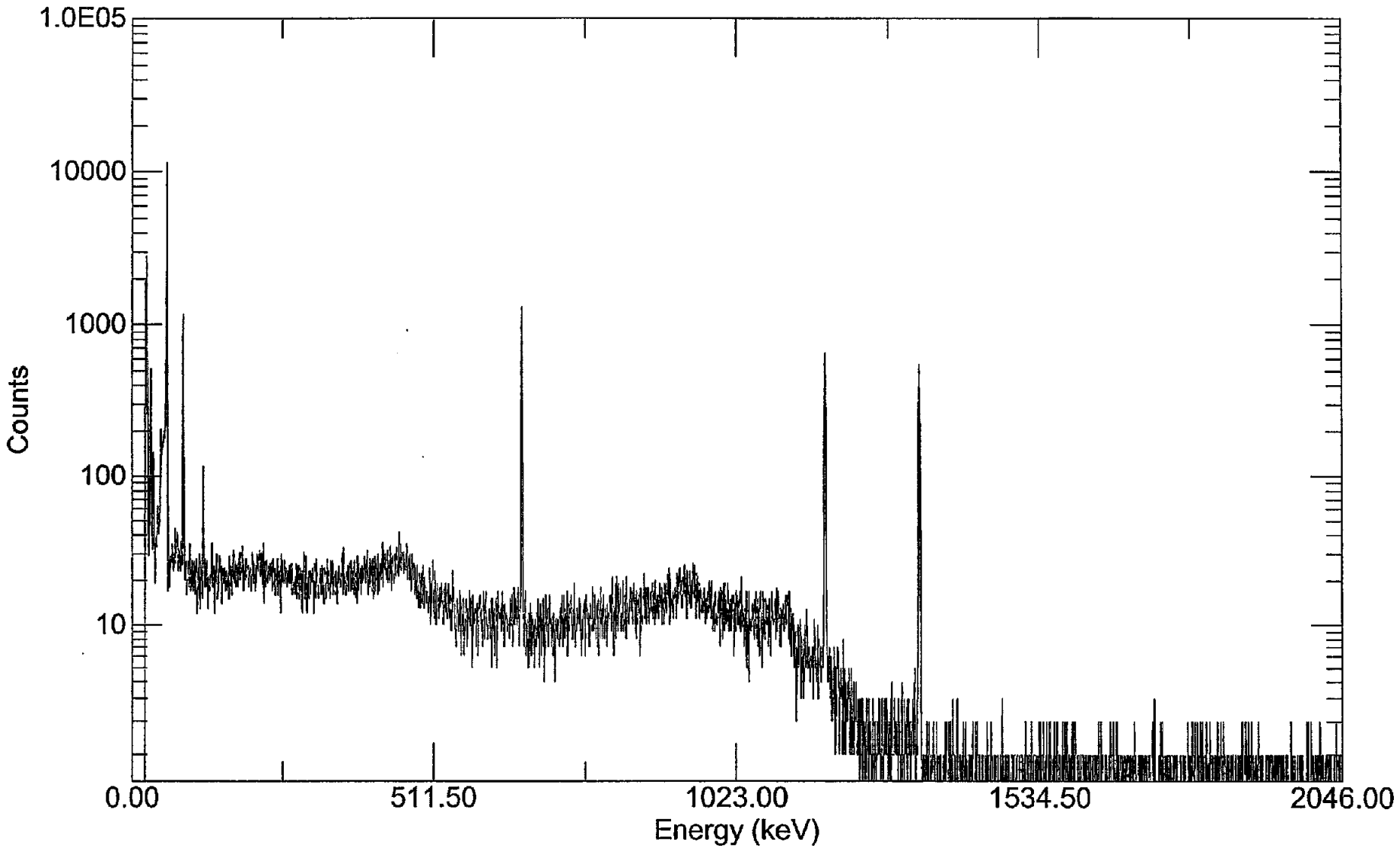
Reviewed by: _____

Supervisor

Laboratory: STL- St Louis

QA400104

03-0371



Acquired: 23-Dec-2007 11:38:52 AM
File: C:\User\spectra\QA400104.spc
Detector: #0 Ge 4 SN/181

Real Time: 1810.88 s. Live Time: 1800.00 s.
Channels: 8192

GammaVision Report Writer Version 2.04.0 G53W4.21 23-Dec-2007 12:11:10PM Page 1

DB Analysis ID: 32,954

Sample Description: 03-0370

Spectrum Filename: QA500094.Spc

Acquisition Information

Start Time:	23-Dec-2007 11:39:00AM		
Live Time:	1800.00	Real Time:	1897.84
Dead Time:	5.16 %		
Detector ID:	5		

Detector System: Ge 5 SN/157

Calibration

Description:	Ge5 airfilter 74140-334_032707 interp_165_quad		
Filename:	C:\User\Calibrations\Ge5 calibrations\Ge5 airfilter_032707_interp165quad.Clb		
Energy Created:	28-Mar-2007 6:08:23PM	Efficiency Created:	28-Mar-2007 6:10:41PM
Zero Offset:	0.272 keV	Gain:	0.250 keV/Channel

Library 1 File:	STL QC.Lib	Library based peak stripping used.
Library 2 File:	Null.Lib	
Library 3 File:	Null.Lib	

Analysis Parameters

Start Channel:	100 for an energy of 25.25 keV
Stop Channel:	8,000 for an energy of 2000.57 keV
Peak rejection level:	40.000 %
Activity Scaling Factor:	1.0000 / 1.0000 = 1.0000
Detection Limit Method:	Nureg method 4.16
Sample Size:	1.00E+000
Additional random error:	0.0000
Additional systematic error:	0.0000
Fraction Limit:	0.0000%
Background Width:	Average of three points

Corrections	Status	Comments
Decay Correct to Date:	YES	01-Apr-2003 12:00:00PM
Decay During Acquisition:	NO	
Peaked Background Correction:	NO	
Absorption:	NO	
Geometry Correction:	NO	
Random Summing:	NO	

Energy Calibration Normalized Difference: 0.0268

SUMMARY OF NUCLIDES IN SAMPLE

Nuclide	Time of Count Activity Bq/SA	Time Corrected Activity Bq/SA	Uncertainty Counts 2 Sigma %	Uncertainty Total 2 Sigma %	Minimum Detectable Activity
CO-60	3.326E+002	6.194E+002	2.16	6.10	1.535E+000
CS-137	3.435E+002	3.829E+002	2.47	6.55	3.202E+000
AM-241	9.032E+002	9.101E+002	1.07	9.34	4.639E+000

= All peaks for activity calculation had bad shape

Total Activity (25.25 to 2,000.57 keV) 1,579.32 Bq/SA

Analyzed by: _____

403605

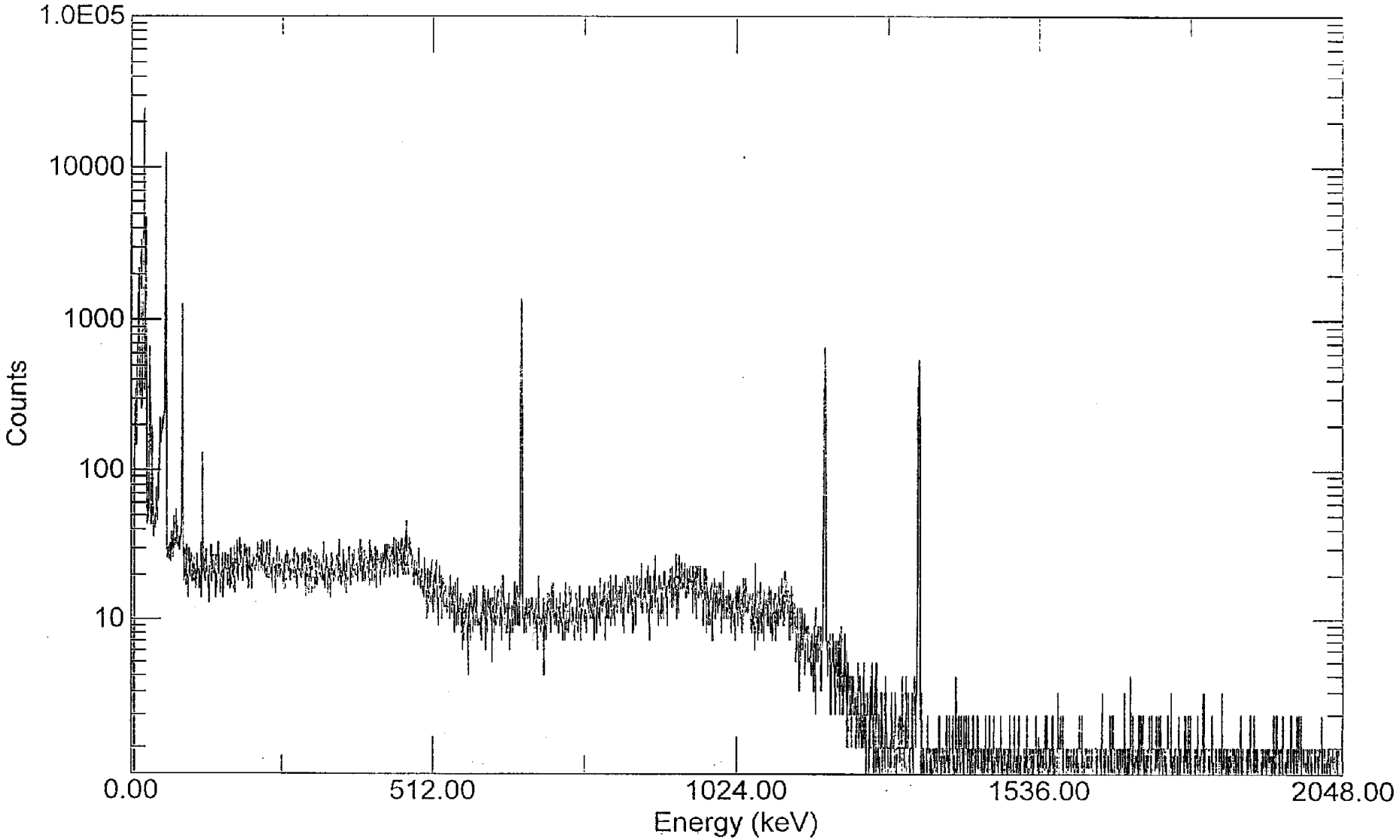
Reviewed by: _____

Supervisor

Laboratory: STL- St Louis

QA500094

03-0370



Acquired: 23-Dec-2007 11:39:00 AM
File: C:\User\spectra\QA500094.spc
Detector: #0 Ge 5 SN/157

Real Time: 1897.84 s. Live Time: 1800.00 s.
Channels: 8192

TestAmerica St. Louis

GammaVision Report Writer Version 2.04.0 G53W4.21 23-Dec-2007 12:10:29PM Page 1

DB Analysis ID: 32,953

Sample Description: 03-0372

Spectrum Filename: QA700211.Spc

Acquisition Information

Start Time:	23-Dec-2007 11:39:08AM		
Live Time:	1800.00	Real Time:	1828.52
Dead Time:	1.56 %		
Detector ID:	7		

Detector System: Ge 7 SN/154

Calibration

Description:	Ge7 air filter 74140-334 01_04_07		
Filename:	C:\User\Calibrations\Ge7 calibrations\Ge7 air filter 01_04_07.Clb		
Energy Created:	04-Jan-2007 9:44:57AM	Efficiency Created:	04-Jan-2007 9:55:23AM
Zero Offset:	0.082 keV	Gain:	0.250 keV/Channel

Library 1 File: STL QC.Lib Library based peak stripping used.
Library 2 File: Null.Lib
Library 3 File: Null.Lib

Analysis Parameters

Start Channel:	100 for an energy of 25.08 keV
Stop Channel:	8,000 for an energy of 2000.16 keV
Peak rejection level:	40.000 %
Activity Scaling Factor:	1.0000 / 1.0000 = 1.0000
Detection Limit Method:	Nureg method 4.16
Sample Size:	1.00E+000
Additional random error:	0.0000
Additional systematic error:	0.0000
Fraction Limit:	0.0000%
Background Width:	Average of three points

Corrections	Status	Comments
Decay Correct to Date:	YES	01-Apr-2003 12:00:00PM
Decay During Acquisition:	NO	
Peaked Background Correction:	NO	
Absorption:	NO	
Geometry Correction:	NO	
Random Summing:	NO	

Energy Calibration Normalized Difference: 0.1194

SUMMARY OF NUCLIDES IN SAMPLE

Nuclide	Time of Count Activity Bq/SA	Time Corrected Activity Bq/SA	Uncertainty Counts 2 Sigma %	Uncertainty Total 2 Sigma %	Minimum Detectable Activity
CO-60	3.277E+002	6.102E+002	1.93	6.01	1.731E+000
CS-137	3.489E+002	3.890E+002	2.14	6.24	2.913E+000
AM-241	9.042E+002	9.111E+002	0.95	8.44	4.204E+000

= All peaks for activity calculation had bad shape

Total Activity (25.08 to 2,000.16 keV) 1,580.84 Bq/SA

Analyzed by: _____

403605

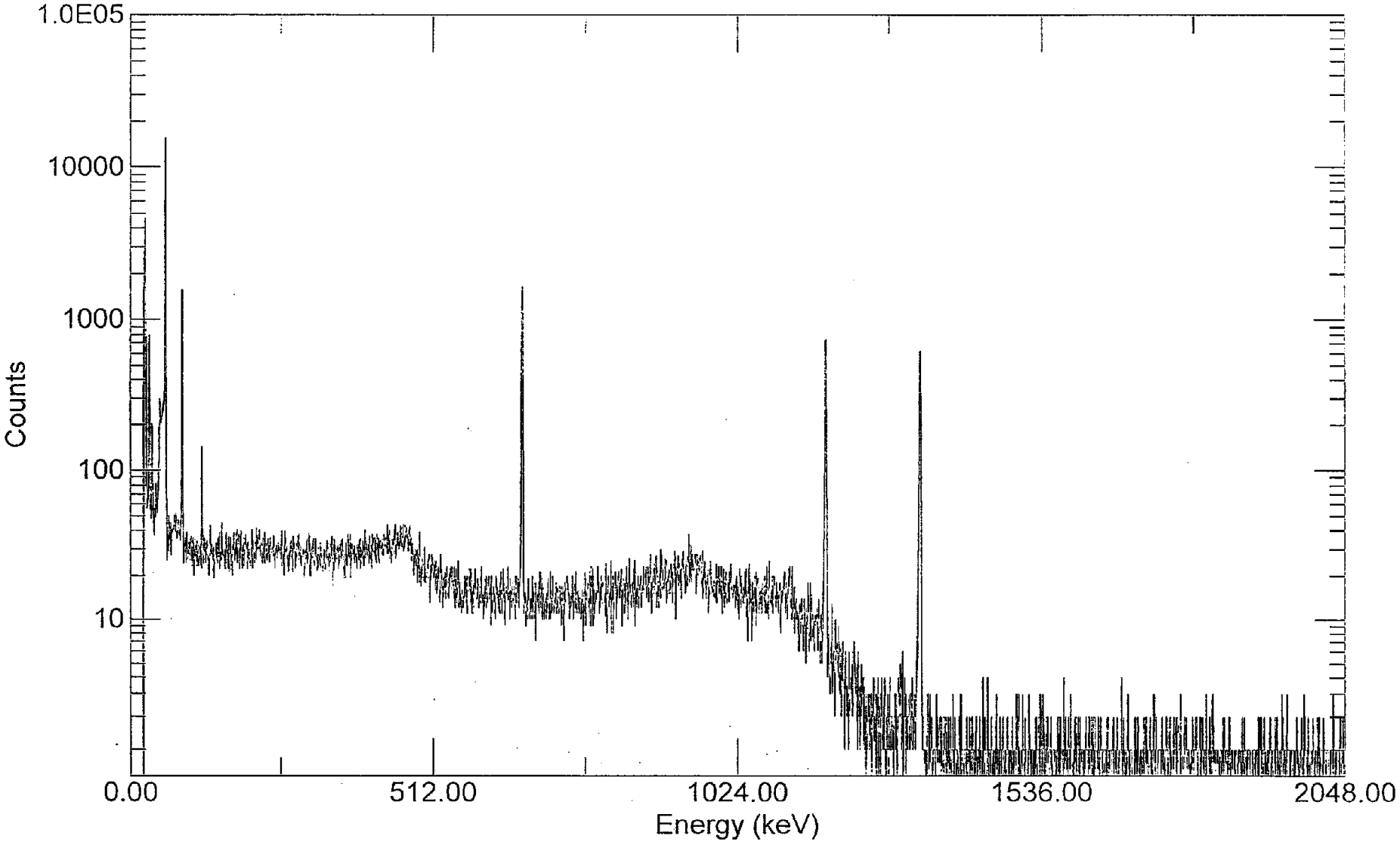
Reviewed by: _____

Supervisor

Laboratory: Test America

QA700211

03-0372



Acquired: 23-Dec-2007 11:39:08 AM
File: C:\User\spectra\QA700211.spc
Detector: #0 Ge 7 SN/154

Real Time: 1828.52 s. Live Time: 1800.00 s.
Channels: 8192

TestAmerica St. Louis

GammaVision Report Writer Version 2.04.0 G53W4.21 23-Dec-2007 12:45:06PM Page 1

DB Analysis ID: 32,956

Sample Description: 03-0373

Spectrum Filename: QA801157.Spc

Acquisition Information

Start Time:	23-Dec-2007 12:13:16PM		
Live Time:	1800.00	Real Time:	1879.12
Dead Time:	4.21 %		
Detector ID:	8		

Detector System: Ge 8 SN/174

Calibration

Description:	Ge8 air filter_interp>122<quad		
Filename:	C:\User\Calibrations\Ge8 post 11_03_06\Ge8 air filter interp_122_quad.Clb		
Energy Created:	06-Nov-2006 3:12:36PM	Efficiency Created:	06-Nov-2006 3:14:26PM
Zero Offset:	0.014 keV	Gain:	0.250 keV/Channel

Library 1 File: STL QC.Lib Library based peak stripping used.
Library 2 File: Null.Lib
Library 3 File: Null.Lib

Analysis Parameters

Start Channel:	100 for an energy of 25.02 keV
Stop Channel:	8,000 for an energy of 2000.35 keV
Peak rejection level:	40.000 %
Activity Scaling Factor:	1.0000 / 1.0000 = 1.0000
Detection Limit Method:	Nureg method 4.16
Sample Size:	1.00E+000
Additional random error:	0.0000
Additional systematic error:	0.0000
Fraction Limit:	0.0000%
Background Width:	Average of three points

Corrections	Status	Comments
Decay Correct to Date:	YES	01-Apr-2003 12:00:00PM
Decay During Acquisition:	NO	
Peaked Background Correction:	NO	
Absorption:	NO	
Geometry Correction:	NO	
Random Summing:	NO	

Energy Calibration Normalized Difference: 0.2791

SUMMARY OF NUCLIDES IN SAMPLE

Nuclide	Time of Count Activity Bq/SA	Time Corrected Activity Bq/SA	Uncertainty Counts 2 Sigma %	Uncertainty Total 2 Sigma %	Minimum Detectable Activity
CO-60	3.209E+002	5.976E+002	2.04	6.01	4.997E-001
CS-137	3.391E+002	3.780E+002	2.43	6.54	3.236E+000
AM-241	8.820E+002	8.887E+002	1.08	9.35	4.870E+000

= All peaks for activity calculation had bad shape

Total Activity (25.02 to 2,000.35 keV) 1,541.93 Bq/SA

Analyzed by: _____

403605

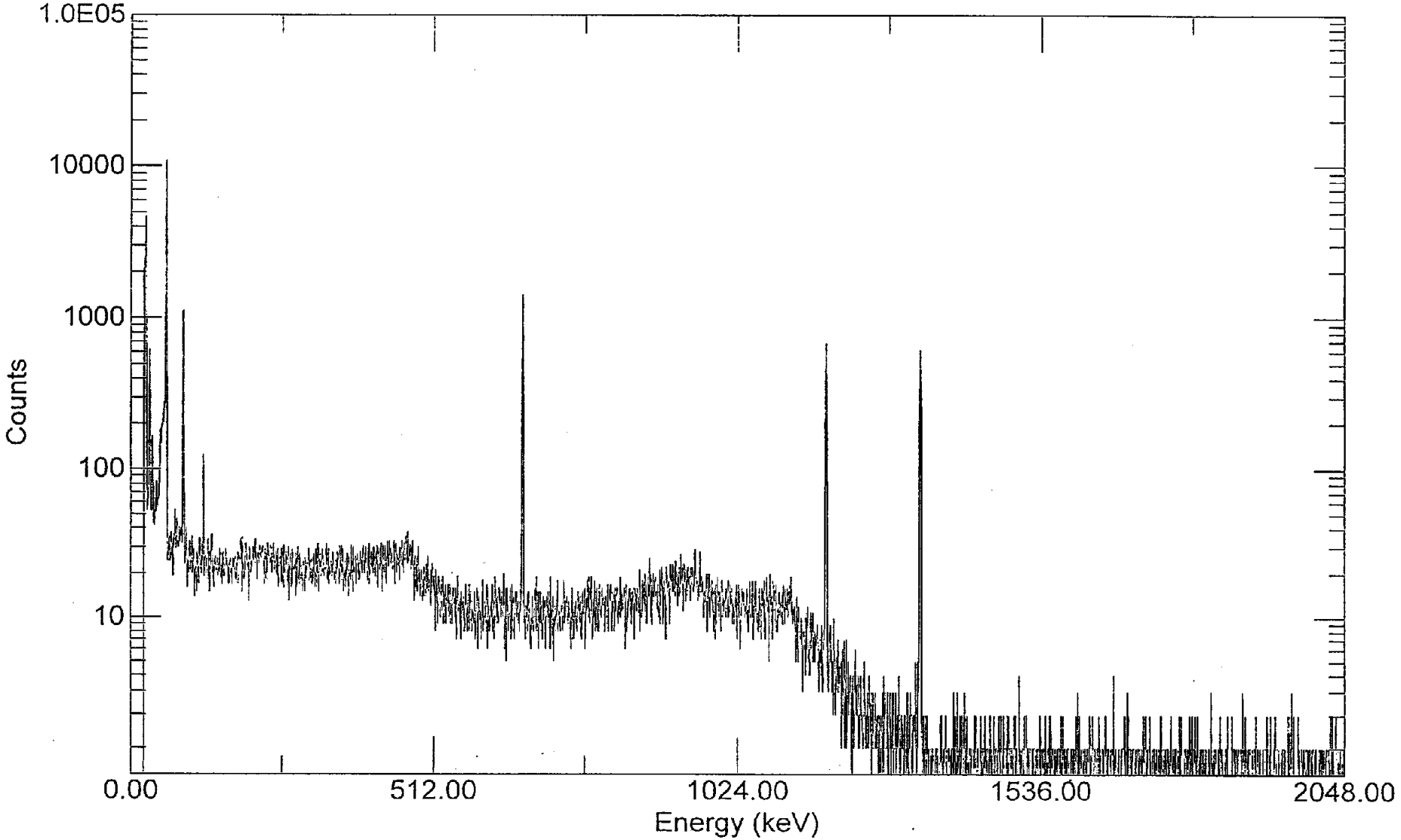
Reviewed by: _____

Supervisor

Laboratory: STL- St Louis

QA801157

03-0373



Acquired: 23-Dec-2007 12:13:16 PM
File: C:\User\spectra\QA801157.spc
Detector: #0 Ge 8 SN/174

Real Time: 1879.12 s. Live Time: 1800.00 s.
Channels: 8192

TestAmerica STL

Gamma Vision Long Backgrounds

November 2007

Ge1 background 11_21_07.Rpt

```
 ORTEC     g v - i (3135) Env32  G53W4.21  22-NOV-2007 08:17:48 Page    1
STL- St Louis                    Spectrum name: Ge1 background 11_21_07.An1

Sample description
     Ge1 background 11_21_07


Spectrum Filename: C:\User\spectra\Ge1 bkgd\Ge1 background 11_21_07.A

Acquisition information
       Start time:                 21-Nov-2007 20:12:47
       Live time:              43200
       Real time:              43454
       Dead time:                  0.59 %
       Detector ID:                    1

Detector system
     Ge 1 SN/242


Calibration
       Filename:                   GE1 AF interp_165_quad 01_05_07.Clb
     Ge1 air filter 74140-334 1_05_07


       Energy Calibration
            Created:               05-Jan-2007 13:55:09
            Zero offset:           0.112 keV
            Gain:                  0.250 keV/channel
            Quadratic:            -8.471E-09 keV/channel^2

       Efficiency Calibration
            Created:               05-Jan-2007 13:58:17
            Knee Energy:         165.85 keV
            Above the Knee:        Quadratic        Uncertainty =   1.63 %
            Log(Eff):             -5.325680E-02 + (-3.688631E-01*Log(E) ) +
                                   ( -3.389960E-02*Log(E)^2 )
            Below the Knee:        Interpolative    Uncertainty =   0.00 %

Library Files
       Main analysis library:      long bkgd_pbc.lib
       Library Match Width:        0.750
       Peak stripping:             Library based

Analysis parameters
       Analysis engine:            Env32   G53W4.21
       Start channel:            90 (    22.61keV )
       Stop channel:           8000 (  1999.43keV )
       Peak rejection level:     40.000%
       Peak search sensitivity:    3
       Sample Size:                1.0000E+00
       Activity scaling factor:    1.0000E+00/(  1.0000E+00*  1.0000E+00) =
                                   1.0000E+00
       Detection limit method:     Reg. Guide 4.16 Method

       Random error:               0.0000000E+00
       Systematic error:           0.0000000E+00
```

```
 ORTEC     g v - i (3135) Env32  G53W4.21  22-NOV-2007 08:17:48 Page    2
STL- St Louis                    Spectrum name: Ge1 background 11_21_07.An1
                                       Page 1
```

Ge1 background 11_21_07.Rpt

Fraction Limit: 0.000%
Background width: average of three points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	NO	
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	NO	
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 26 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1584

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. Bq/sampl	Nuc
29.48	1145.	8.01	0.82	7.917E-02	29.46	20.350	1.645E+00	I129
					29.78	37.840	8.846E-01	I129
33.55	364.	19.14	1.08	7.930E-02	33.61	10.230	1.039E+00	I129
39.64	367.	17.70	0.72	7.948E-02	39.57	7.500	1.425E+00	I129
43.95	83.	36.93	0.77	7.961E-02				
46.49	615.	6.96	0.78	7.969E-02	46.54	4.250	4.202E+00	PB210
63.22	886.	6.96	0.78	7.996E-02	63.29	4.820	5.319E+00	TH234
74.91	250.	16.22	0.81	7.953E-02				
77.12	227.	16.57	0.81	7.945E-02				
84.26	190.	20.36	0.82	7.919E-02	83.79	25.180	2.206E-01	RA223
92.53	1212.	5.11	1.09	7.822E-02	92.59	5.570	6.442E+00	TH234
143.45	191.	27.71	1.47	6.596E-02	143.76	10.960	6.125E-01	U235
185.73	526.	9.46	0.72	5.472E-02	185.71	57.200	3.892E-01	U235
205.37	116.	29.90	0.76	5.087E-02	205.31	5.010	1.050E+00	U235
216.58	124.	37.90	0.67	4.893E-02				
238.22	550.	10.88	0.92	4.561E-02	238.63	43.300	6.455E-01	PB212
241.65	168.	26.87	0.76	4.508E-02	242.00	7.430	1.164E+00	PB214
294.87	221.	20.40	1.06	3.889E-02	295.22	19.300	6.822E-01	PB214
321.82	106.	28.71	0.51	3.640E-02				
338.11	118.	0.12	1.08	3.504E-02	338.28	2.790	1.406E+00	RA223
351.65	288.	15.45	1.27	3.402E-02	351.93	37.600	5.210E-01	PB214
510.67	1595.	4.49	2.58	2.544E-02				
558.30	154.	21.25	1.00	2.370E-02				
582.63	214.	22.14	1.61	2.290E-02	583.19	84.500	2.562E-01	TL208
609.26	279.	18.64	1.59	2.209E-02	609.31	46.090	6.342E-01	BI214
678.61	106.	27.09	0.86	2.025E-02				
910.54	225.	19.20	0.94	1.591E-02				
968.65	78.	33.31	1.64	1.511E-02	968.97	15.800	PBC<MDA	AC228
1119.75	138.	28.36	0.92	1.337E-02	1120.29	15.100	1.582E+00	BI214
1460.80	301.	11.17	1.75	1.066E-02	1460.83	10.670	6.124E+00	K40
1764.41	115.	18.86	0.40	9.048E-03	1764.49	15.400	1.916E+00	BI214

ORTEC g v - i (3135) Env32 G53W4.21 22-NOV-2007 08:17:48 Page 3
STL- St Louis Spectrum name: Ge1 background 11_21_07.An1
Page 2

Ge1 background 11_21_07.Rpt

********** U N I D E N T I F I E D P E A K S U M M A R Y **********

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 2 Sigma %	FWHM keV	Suspected Nuclide	
175.36	43.91	424.	83.	0.002	73.85	0.772	EU-155	lD
299.08	74.87	807.	207.	0.005	48.16	0.699	PB-214	
307.91	77.08	673.	174.	0.004	52.38	0.864	PB-214	
573.39	143.45	712.	191.	0.004	55.42	1.469	TC-99M	l
742.53	185.73	586.	526.	0.012	18.92	0.716	U-235	l
821.10	205.37	381.	116.	0.003	59.80	0.757	U-235	l
865.96	216.58	565.	124.	0.003	75.80	0.669	TB-160	s
2042.53	510.67	504.	1595.	0.037	8.97	2.583	TL-208	s
2233.07	558.30	218.	154.	0.004	42.50	0.999	Y-91M	s
2714.42	678.61	154.	106.	0.002	54.18	0.859	AG-110M	sM
3642.42	910.54	329.	109.	0.003	50.65	0.937	AC-228	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.
M - Peak is close to a library peak.

This section based on library: long bkgd_pbc.lib

********** I D E N T I F I E D P E A K S U M M A R Y **********

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 2 Sigma %	FWHM keV
I-129	118.69	29.78	1412.	1845.	0.043	0.03	0.757D
I-129	133.99	33.61	705.	256.	0.006	31.86	0.761D
I-129	158.11	39.64	963.	367.	0.008	35.40	0.717s
PB-210	184.97	46.35	1060.	707.	0.016	20.60	0.662s
TH-234	252.44	63.22	832.	886.	0.020	13.92	0.776
RA-223	336.52	84.24	1308.	175.	0.004	60.22	0.815s
TH-234	369.70	92.53	789.	1212.	0.028	10.22	1.090s
RA-223	576.53	144.23	937.	32.	0.001	0.79	0.880D
Ra-226	744.47	186.21	938.	426.	0.010	22.51	0.924D
PB-212	952.51	238.22	700.	550.	0.013	21.77	0.919s
RA-224	959.36	239.93	1373.	-223.	-0.005	48.86	0.980
PB-214	966.24	241.65	538.	168.	0.004	53.74	0.758s
PB-214	1179.17	294.87	453.	221.	0.005	40.80	1.059
AC-228	1352.99	338.32	729.	118.	0.003	0.23	1.078D
PB-214	1406.31	351.65	405.	288.	0.007	30.91	1.275
TL-208	2330.44	582.63	348.	214.	0.005	44.27	1.612s
BI-214	2436.97	609.26	441.	279.	0.006	37.28	1.586s
AC-228	3644.09	910.96	250.	115.	0.003	43.01	1.596s

ORTEC g v - i (3135) Env32 G53W4.21 22-NOV-2007 08:17:48 Page 4
STL- St Louis Spectrum name: Ge1 background 11_21_07.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
AC-228	3874.95	968.65	299.	78.	0.002	66.62	1.642s
BI-214	4479.56	1119.75	190.	138.	0.003	56.71	0.922s
K-40	5844.32	1460.80	94.	301.	0.007	22.35	1.747
BI-214	7059.40	1764.41	47.	115.	0.003	37.72	0.398s

s - Peak fails shape tests.

Ge1 background 11_21_07.Rpt

D - Peak area deconvoluted.
A Derived peak area.

```
*****   S U M M A R Y   O F   L I B R A R Y   P E A K   U S A G E   *****
- Nuclide -  Average     ------------- Peak -------------
Name   Code  Activity     Energy   Activity Code MDA Value
             Bq/sample     keV     Bq/sample     Bq/sample      COMMENTS
-----------------------------------------------------------------------------

Be-7     C  -2.5924E-02
                          477.61-2.592E-02 %(  8.962E-01 1.02E+03 G
                             1 of   1 peaks found

K-40     N   6.1244E+00
                         1460.83 6.124E+00  (  9.744E-01 1.12E+01 G
                             1 of   1 peaks found

CO-60    F   8.3359E-03
                         1332.50 8.336E-03 &(  1.027E-01 3.57E+02 G
                         1173.24 7.132E-02 %   1.179E-01 5.06E+01 G
                             2 of   2 peaks found

I-129    I   1.4251E+00
                           29.78 1.425E+00 }   1.374E-01 1.37E-02 X
                           33.61 7.311E-01 -   3.607E-01 1.59E+01 X
                           39.57 1.425E+00 *(  5.721E-01 1.77E+01 G
                           34.61-4.163E-01 %   1.957E+00 1.41E+02 X
                             4 of   5 peaks found

CS-137   I  -6.5179E-03
                          661.66-6.518E-03 &(  1.302E-01 5.91E+02 G
                             1 of   1 peaks found

TL-208   N   2.5616E-01
                          583.19 2.562E-01 @(  1.073E-01 2.21E+01 G
                          860.56 4.219E-01 %   9.305E-01 6.68E+01 G
                             2 of   2 peaks found

PB-210   N   4.8319E+00
                           46.54 4.832E+00 *(  1.055E+00 1.03E+01 G
                             1 of   1 peaks found

PB-212   N   6.4547E-01
                          238.63 6.455E-01 @(  1.479E-01 1.09E+01 G
                          300.10 1.825E-01 %   2.408E+00 3.93E+02 G
                             2 of   2 peaks found

PB-214   N   5.7564E-01
                          351.93 5.210E-01  (  1.748E-01 1.55E+01 G
                          295.22 6.822E-01  (  3.145E-01 2.04E+01 G
                          242.00 1.164E+00 +   7.653E-01 2.69E+01 G
                             3 of   3 peaks found
```



```
Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

BI-214   N   6.3420E-01
                          609.31 6.342E-01 *(  2.286E-01 1.86E+01 G
                         1764.49 1.916E+00 +   5.739E-01 1.89E+01 G
```

```
                                Ge1 background 11_21_07.Rpt
                              1120.29 1.582E+00 +   7.673E-01 2.84E+01 G
                               768.36 5.845E-01 %   2.258E+00 1.16E+02 G
                                  4 of   4 peaks found

RA-223    N    3.4520E-01
                               83.79 2.037E-01 *   1.987E-01 3.01E+01 X
                              269.46 1.066E-01 &(  5.409E-01 1.52E+02 G
                              154.21 4.946E-01 %   9.325E-01 5.73E+01 G
                              144.23 3.452E-01 }   1.590E+00 3.93E-01 G
                              323.87-5.721E-01 %   2.109E+00 1.11E+02 G
                                  5 of   6 peaks found

RA-224    N   -2.7848E+00
                              240.99-2.785E+00  (  2.190E+00 2.44E+01 G
                                  1 of   1 peaks found

AC-228    N    6.9099E-01
                              911.20 6.508E-01  (  4.310E-01 2.15E+01 G
                              968.97 7.567E-01 *(  8.074E-01 3.33E+01 G
                              338.32 6.910E-01 }   7.535E-01 1.16E-01 G
                                  3 of   3 peaks found

TH-234    N    5.3187E+00
                               63.29 5.319E+00  (  8.239E-01 6.96E+00 G
                               92.59 6.442E+00 +   7.098E-01 5.11E+00 G
                                  2 of   2 peaks found

U-235     N    1.3269E-01
                              185.71 3.695E-02 }(  1.143E-01 9.33E+01 G
                              143.76 2.880E-01 }(  4.162E-01 4.42E+01 G
                              163.36 5.461E-01 }(  1.152E+00 6.40E+01 G
                              205.31 4.668E-01 }(  1.258E+00 8.14E+01 G
                                  4 of   4 peaks found

Ra-226    N    5.0340E+00
                              186.21 5.034E+00 }(  1.717E+00 1.13E+01 G
                                  1 of   1 peaks found

AM-241    T    1.7879E-02
                               59.54 1.788E-02 %(  1.230E-01 2.06E+02 G
                                  1 of   1 peaks found
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
```

```
  ORTEC     g v - i (3135) Env32  G53W4.21  22-NOV-2007 08:17:48 Page    6
 STL- St Louis                   Spectrum name: Ge1 background 11_21_07.An1

   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
```

to be found directly.

Nuclide Codes:
T - Thermal Neutron Activation
F - Fast Neutron Activation
I - Fission Product
N - Naturally Occurring Isotope
P - Photon Reaction
C - Charged Particle Reaction
M - No MDA Calculation
R - Coincidence Corrected
H - Halflife limit exceeded

Peak Codes:
G - Gamma Ray
X - X-Ray
P - Positron Decay
S - Single-Escape
D - Double-Escape
K - Key Line
A - Not in Average
C - Coincidence Peak

- -

********** D I S C A R D E D I S O T O P E P E A K S **********

Nuclide	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 2 Sigma %	Activity
RA-223	84.24	1308.	175.	0.004	60.22	2.037E-01
RA-223	144.23	937.	32.	0.001	0.79	3.452E-01
RA-224	239.93	1373.	-223.	-0.005	48.86	-2.785E+00
AC-228	910.96	250.	115.	0.003	43.01	6.508E-01
AC-228	968.65	299.	78.	0.002	66.62	7.567E-01

P - Peakbackground subtraction

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity Bq/sample	Uncertainty 2 Sigma Counting	MDA Bq/sample
Be-7	#A	-2.5924E-02	2.0493E+03%	8.962E-01
K-40		6.1244E+00	2.2349E+01%	9.744E-01
CO-60	#A	8.3359E-03	7.1489E+02%	1.027E-01
I-129		1.4251E+00	3.5397E+01%	5.721E-01
CS-137	#A	-6.5179E-03	1.1826E+03%	1.302E-01
TL-208	#	2.5616E-01	4.4272E+01%	1.073E-01
PB-210	#	4.8319E+00	2.0595E+01%	1.055E+00
PB-212	#	6.4547E-01	2.1768E+01%	1.479E-01
PB-214		5.7564E-01	2.5595E+01%	1.748E-01
BI-214		6.3420E-01	3.7279E+01%	2.286E-01
RA-223	#A	3.4520E-01	7.1896E+01%	5.409E-01
RA-224	#A	-2.7848E+00	4.8862E+01%	2.190E+00
AC-228	#	6.9099E-01	3.9651E+01%	4.310E-01
TH-234		5.3187E+00	1.3922E+01%	8.239E-01

U-235	A	1.3269E-01	8.8419E+01%	1.258E+00
Ra-226		5.0340E+00	2.5148E+01%	1.717E+00
AM-241	#A	1.7879E-02	4.1232E+02%	1.230E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.

Ge1 background 11_21_07.Rpt

F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (39.4 to 1999.4 keV) 1.981E+01 Bq/sample

Analyzed by: _____
403605

Reviewed by: _____
Supervisor

Laboratory: STL- St Louis

Ge2 background 11_21_07.Rpt

```
 ORTEC     g v - i (3135) Env32  G53W4.21  22-NOV-2007 07:42:59 Page    1
STL- St Louis                    Spectrum name: Ge2 background 11_21_07.An1

Sample description
     Ge2 background 11_21_07


Spectrum Filename: C:\User\spectra\Ge2 bkgd\Ge2 background 11_21_07.A

Acquisition information
       Start time:                 21-Nov-2007 19:39:03
       Live time:             43200
       Real time:             43328
       Dead time:                  0.30 %
       Detector ID:                    2

Detector system
     Ge 2 SN/182


Calibration
       Filename:                   Ge2 AF w_spacer 72002 poly. 121206 no Hg
                                   .Clb
     Ge2 72002-334 Air Filter Poly no Hg 121206


       Energy Calibration
            Created:               13-Dec-2006 07:56:27
            Zero offset:           0.102 keV
            Gain:                  0.250 keV/channel
            Quadratic:             6.874E-09 keV/channel^2

       Efficiency Calibration
            Created:               13-Dec-2006 07:58:09
            Type:                  Polynomial
            Uncertainty:           1.400 %
            Coefficients:         -0.388770  -4.607021   0.563706
                                  -0.059383   0.002602  -0.000047

Library Files
       Main analysis library:      long bkgd_pbc.lib
       Library Match Width:        0.750
       Peak stripping:             Library based

Analysis parameters
       Analysis engine:            Env32   G53W4.21
       Start channel:             90 (    22.60keV )
       Stop channel:            8000 (  1999.97keV )
       Peak rejection level:      40.000%
       Peak search sensitivity:   3
       Sample Size:               1.0000E+00
       Activity scaling factor:   1.0000E+00/(  1.0000E+00*  1.0000E+00) =
                                  1.0000E+00
       Detection limit method:    Reg. Guide 4.16 Method

       Random error:              0.0000000E+00
       Systematic error:          0.0000000E+00
       Fraction Limit;            0.000%
       Background width:          average of three points.

       Half lives decay limit:   12.000
                                     Page 1
```

Ge2 background 11_21_07.Rpt

ORTEC g v - i (3135) Env32 G53W4.21 22-NOV-2007 07:42:59 Page 2
STL- St Louis Spectrum name: Ge2 background 11_21_07.An1

Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	NO	
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	NO	
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 3 cutoff 20.00000 %
Energy Calibration
Normalized diff: 1.0000

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. Bq/sampl	Nuc
36.01	548.	9.94	2.31	1.554E-04	34.61	2.419	0.000E+00	I129
54.77	448.	20.63	0.48	2.979E-02				
70.79	795.	10.76	0.57	4.706E-02				
82.34	140.	38.03	1.07	5.505E-02				
104.48	141.	28.68	0.56	6.052E-02				
142.56	15.	0.90	1.13	5.781E-02	144.23	3.220	PBC<MDA	RA223
151.40	922.	7.90	0.80	5.654E-02				
172.73	246.	28.01	0.59	5.240E-02				
180.30	97.	34.82	0.46	5.091E-02				
270.17	94.	30.57	0.82	3.630E-02	269.46	13.700	4.365E-01	RA223
432.95	145.	13.12	1.10	2.330E-02				
774.09	107.	14.98	1.25	1.393E-02				

********** U N I D E N T I F I E D P E A K S U M M A R Y **********

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 2 Sigma %	FWHM keV	Suspected Nuclide	
143.68	36.01	765.	548.	0.013	16.63	2.308	CS-137	sM
218.74	54.77	1948.	448.	0.010	41.27	0.482	LU-177	sM
282.83	70.79	1564.	795.	0.018	21.52	0.570	AU-198	sM
417.63	104.48	526.	141.	0.003	57.36	0.563	U-235	sM
605.36	151.40	549.	1148.	0.027	8.26	0.797	KR-85M	sM
690.68	172.73	768.	246.	0.006	56.02	0.592	-	sM
1080.54	270.17	183.	94.	0.002	61.15	0.819	AC-228	l
1731.80	432.95	50.	145.	0.003	26.23	1.105	J-134	sM
3096.58	774.09	25.	107.	0.002	23.42	1.245	W-187	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.
M - Peak is close to a library peak.

Ge2 background 11_21_07.Rpt
This section based on library: long bkgd_pbc.lib

ORTEC g v - i (3135) Env32 G53W4.21 22-NOV-2007 07:42:59 Page 3
STL- St Louis Spectrum name: Ge2 background 11_21_07.An1

********** I D E N T I F I E D P E A K S U M M A R Y **********

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 2 Sigma %	FWHM keV
RA-223	329.04	82.34	1346.	140.	0.003	76.05	1.072s
RA-223	576.67	144.23	742.	15.	0.000	1.79	1.128D
RA-223	610.25	152.62	1317.	-226.	-0.005	47.36	1.137s
AC-228	1353.21	338.32	271.	-3.	0.000	-12.93	1.306D

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

Nuclide Name	Code	Average Activity Bq/sample	Peak Energy keV	Activity Bq/sample	Code	MDA Value Bq/sample	COMMENTS
Be-7	C	-4.6117E-02	477.61	-4.612E-02	%(	5.044E-01 3.17E+02	G
			1 of 1 peaks found				
K-40	N	-1.7222E-01	1460.83	-1.722E-01	%(	8.611E-01 1.44E+02	G
			1 of 1 peaks found				
CO-60	F	-8.3377E-03	1332.50	-8.338E-03	%(	7.747E-02 2.62E+02	G
			1173.24	6.175E-04	%	7.327E-02 3.29E+03	G
			2 of 2 peaks found				
I-129	I	-1.9497E-01	39.57	-1.950E-01	%(	1.419E+01 2.19E+03	G
			1 of 5 peaks found				
CS-137	I	-9.4394E-04	661.66	-9.439E-04	&(	6.847E-02 2.06E+03	G
			1 of 1 peaks found				
TL-208	N	-4.4122E-03	583.19	-4.412E-03	&(	6.480E-02 4.21E+02	G
			860.56	7.613E-04	&	4.117E-01 1.48E+04	G
			2 of 2 peaks found				
PB-210	N	-4.5169E-01	46.54	-4.517E-01	&(	8.363E+00 5.56E+02	G
			1 of 1 peaks found				
PB-212	N	-1.7207E-02	238.63	-1.721E-02	&(	1.488E-01 2.58E+02	G
			300.10	-4.113E-01	&	2.107E+00 1.53E+02	G
			2 of 2 peaks found				

```
                                Ge2 background 11_21_07.Rpt
PB-214    N   7.0784E-02
                              351.93 7.078E-02 %(  1.628E-01 6.95E+01 G
                              295.22-7.852E-02 &   3.395E-01 1.29E+02 G
0

 ORTEC     g v - i (3135) Env32  G53W4.21  22-NOV-2007 07:42:59 Page    4
STL- St Louis                   Spectrum name: Ge2 background 11_21_07.An1

 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                              242.00 1.721E-01 &   7.907E-01 1.37E+02 G
                                 3 of   3 peaks found

BI-214    N  -3.4801E-03
                              609.31-3.480E-03 &(  1.312E-01 1.08E+03 G
                             1764.49-1.363E-02 %   5.148E-01 1.02E+03 G
                             1120.29-1.887E-02 %   4.717E-01 6.99E+02 G
                              768.36 1.538E-01 &   1.164E+00 2.17E+02 G
                                 4 of   4 peaks found

RA-223    N   1.8540E-01
                               83.79 2.337E-01 *   2.900E-01 3.80E+01 X
                              269.46 1.854E-01 %(  4.423E-01 7.21E+01 G
                              154.21-1.660E+00 +   1.263E+00 2.37E+01 G
                              144.23 1.854E-01 }   1.612E+00 8.96E-01 G
                              323.87-2.960E-01 &   1.561E+00 1.57E+02 G
                              338.28 2.760E-01 }   2.283E+00 1.90E+02 G
                                 6 of   6 peaks found

RA-224    N   2.7670E-01
                              240.99 2.767E-01 &(  1.525E+00 1.65E+02 G
                                 1 of   1 peaks found

AC-228    N  -2.2436E-02
                              911.20-2.244E-02 %(  2.287E-01 2.88E+02 G
                              338.32-2.244E-02 }   5.553E-01 ******** G
                                 2 of   3 peaks found

TH-234    N   2.5408E-01
                               63.29 2.541E-01 %(  2.384E+00 2.82E+02 G
                               92.59-6.697E-02 %   1.236E+00 5.52E+02 G
                                 2 of   2 peaks found

U-235     N   6.1680E-02
                              185.71 2.368E-03 }(  1.010E-01 1.27E+03 G
                              143.76 1.920E-02 }(  5.448E-01 8.46E+02 G
                              163.36 5.295E-01 }(  1.179E+00 6.74E+01 G
                              205.31 3.574E-01 }(  1.228E+00 1.03E+02 G
                                 4 of   4 peaks found

Ra-226    N   0.0000E+00
                                 0 of   1 peaks found

AM-241    T   0.0000E+00
                                 0 of   1 peaks found
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
                                     Page 4
```

Ge2 background 11_21_07.Rpt

failed one or more qualification tests.
+ - Peak activity higher than counting uncertainty range.

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STL- St Louis Spectrum name: Ge2 background 11_21_07.An1

- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:
T - Thermal Neutron Activation
F - Fast Neutron Activation
I - Fission Product
N - Naturally Occurring Isotope
P - Photon Reaction
C - Charged Particle Reaction
M - No MDA Calculation
R - Coincidence Corrected
H - Halflife limit exceeded

Peak Codes:
G - Gamma Ray
X - X-Ray
P - Positron Decay
S - Single-Escape
D - Double-Escape
K - Key Line
A - Not in Average
C - Coincidence Peak

- -

********** D I S C A R D E D I S O T O P E P E A K S **********

Nuclide	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 2 Sigma %	Activity
RA-223	82.34	1346.	140.	0.003	76.05	2.337E-01
RA-223	152.62	1317.	-226.	-0.005	47.36	-1.660E+00

P - Peakbackground subtraction

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity Bq/sample	Uncertainty 2 Sigma Counting	MDA Bq/sample
Be-7	#A	-4.6117E-02	6.3413E+02%	5.044E-01
K-40	#A	-1.7222E-01	2.8889E+02%	8.611E-01
CO-60	#A	-8.3377E-03	5.2415E+02%	7.747E-02
I-129	#A	-1.9497E-01	4.3718E+03%	1.419E+01
CS-137	#A	-9.4394E-04	4.1142E+03%	6.847E-02
TL-208	#A	-4.4122E-03	8.4236E+02%	6.480E-02
PB-210	#A	-4.5169E-01	1.1128E+03%	8.363E+00
PB-212	#A	-1.7207E-02	5.1525E+02%	1.488E-01
PB-214	#A	7.0784E-02	1.3902E+02%	1.628E-01
BI-214	#A	-3.4801E-03	2.1577E+03%	1.312E-01
RA-223	#A	1.8540E-01	1.4419E+02%	4.423E-01
RA-224	#A	2.7670E-01	3.2921E+02%	1.525E+00
AC-228	#A	-2.2436E-02	5.7610E+02%	2.287E-01
TH-234	#A	2.5408E-01	5.6341E+02%	2.384E+00
U-235	#A	6.1680E-02	1.3487E+02%	1.228E+00
Ra-226	#A	0.0000E+00	7.4987E+03%	1.636E+00
AM-241	#A	0.0000E+00	1.4307E+04%	4.288E-01

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Ge2 background 11_21_07.Rpt
STL- St Louis
Spectrum name: Ge2 background 11_21_07.An1

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (22.6 to 2000.0 keV) 0.000E+00 Bq/sample

Analyzed by: _____
402630

Reviewed by: _____
Supervisor

Laboratory: STL- St Louis

Ge3 background 11_21_07.Rpt

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 ORTEC     g v - i (3135) Env32  G53W4.21  22-NOV-2007 08:29:30 Page    1
STL- St Louis                    Spectrum name: Ge3 background 11_21_07.An1

Sample description
     Ge3 background 11_21_07


Spectrum Filename: C:\User\spectra\Ge3 Bkd post 5_8_06\Ge3 background
                     11_21_07.An1

Acquisition information
       Start time:                 21-Nov-2007 20:14:21
       Live time:              43200
       Real time:              44044
       Dead time:                  1.92 %
       Detector ID:                    3

Detector system
     Ge 3 SN/155


Calibration
       Filename:                   Ge3 Air filter interp_122_quad 01_09_07.
                                   clb
     Ge3 Air filter 74140_334 interp_122_quad 01_09_07


       Energy Calibration
            Created:               09-Jan-2007 10:31:35
            Zero offset:           0.372 keV
            Gain:                  0.250 keV/channel
            Quadratic:             3.457E-08 keV/channel^2

       Efficiency Calibration
            Created:               09-Jan-2007 10:36:46
            Knee Energy:         122.07 keV
            Above the Knee:        Quadratic        Uncertainty =   1.42 %
            Log(Eff):             -2.114144E-01 + (-2.846233E-01*Log(E) ) +
                                   ( -4.247676E-02*Log(E)^2 )
            Below the Knee:        Interpolative    Uncertainty =   0.00 %

Library Files
       Main analysis library:      long bkgd_pbc.lib
       Library Match Width:        0.750
       Peak stripping:             Library based

Analysis parameters
       Analysis engine:            Env32   G53W4.21
       Start channel:             90 (    22.85keV )
       Stop channel:            8000 (  2000.41keV )
       Peak rejection level:      40.000%
       Peak search sensitivity:    3
       Sample Size:                1.0000E+00
       Activity scaling factor:    1.0000E+00/(  1.0000E+00*  1.0000E+00) =
                                   1.0000E+00
       Detection limit method:     Reg. Guide 4.16 Method

       Random error:               0.0000000E+00
```

```
 ORTEC     g v - i (3135) Env32  G53W4.21  22-NOV-2007 08:29:30 Page    2
                                   Page 1
```

Ge3 background 11_21_07.Rpt

STL- St Louis

Spectrum name: Ge3 background 11_21_07.An1

Systematic error: 0.0000000E+00
Fraction Limit: 0.000%
Background width: average of three points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	NO	
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	NO	
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 13 cutoff 20.00000 %

Energy Calibration
Normalized diff: 0.0700

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. Bq/sampl	Nuc
46.63	517.	11.73	0.85	8.618E-02	46.54	4.250	3.266E+00	PB210
63.31	592.	12.93	0.85	8.723E-02	63.29	4.820	3.262E+00	TH234
72.12	210.	21.86	0.87	8.589E-02				
74.95	648.	7.63	0.87	8.546E-02				
84.56	371.	11.37	0.88	8.406E-02	83.79	25.180	4.057E-01	RA223
87.41	211.	18.65	0.88	8.364E-02				
92.67	628.	10.80	1.19	8.268E-02	92.59	5.570	3.156E+00	TH234
143.71	8.	1.77	0.94	6.882E-02	143.76	10.960	PBC<MDA	U235
185.84	362.	17.45	1.25	5.738E-02	185.71	57.200	2.556E-01	U235
					186.21	3.590	4.080E+00	Ra226
238.33	498.	13.20	1.16	4.774E-02	238.63	43.300	5.582E-01	PB212
294.85	179.	32.86	0.88	4.062E-02				
338.11	52.	0.25	1.13	3.652E-02	338.28	2.790	1.113E+00	RA223
351.95	221.	17.02	1.15	3.541E-02	351.93	37.600	3.840E-01	PB214
569.39	140.	24.12	0.46	2.406E-02				
583.08	191.	16.67	0.43	2.359E-02	583.19	84.500	2.218E-01	TL208
609.47	167.	20.68	1.40	2.275E-02	609.31	46.090	3.679E-01	BI214
675.97	198.	19.41	0.25	2.087E-02				
1460.77	269.	12.60	0.77	1.067E-02	1460.83	10.670	5.472E+00	K40
1763.99	57.	24.52	2.37	8.978E-03	1764.49	15.400	9.488E-01	BI214

********** U N I D E N T I F I E D P E A K S U M M A R Y **********

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 2 Sigma %	FWHM keV	Suspected Nuclide	
287.30	72.26	948.	210.	0.005	43.72	0.865	W-187	]D
299.20	75.10	1479.	687.	0.016	24.09	0.945	PB-214	
347.97	87.28	676.	184.	0.004	51.12	0.891	PB-214	
1178.99	294.85	656.	179.	0.004	65.71	0.885	PB-214	]

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Page 2

Ge3 background 11_21_07.Rpt
STL- St Louis Spectrum name: Ge3 background 11_21_07.An1

Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	Suspected	
2277.83	569.39	207.	140.	0.003	48.24	0.461	PA-234	s
2704.31	675.97	179.	198.	0.005	38.82	0.248	AU-198	sM

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.
M - Peak is close to a library peak.

This section based on library: long bkgd_pbc.lib

********** I D E N T I F I E D P E A K S U M M A R Y **********

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 2 Sigma %	FWHM keV
I-129	116.48	29.46	1393.	-40.	-0.001	-33.03	0.821D
I-129	117.77	29.78	1360.	-75.	-0.002	-33.03	0.821D
PB-210	185.24	46.63	861.	517.	0.012	23.47	0.850
TH-234	252.02	63.31	1092.	592.	0.014	25.87	0.855s
RA-223	337.47	84.65	1341.	292.	0.007	37.32	0.877s
TH-234	369.57	92.67	882.	628.	0.015	21.59	1.192s
RA-223	576.02	144.23	823.	8.	0.000	3.54	0.939D
Ra-226	744.09	186.21	808.	362.	0.008	24.55	1.253D
PB-212	952.74	238.33	764.	498.	0.012	26.39	1.163s
RA-224	959.55	240.03	1211.	-150.	-0.003	67.51	1.037s
AC-228	1353.01	338.32	649.	52.	0.001	0.49	1.134D
PB-214	1407.56	351.95	596.	221.	0.005	34.04	1.148s
TL-208	2332.62	583.08	190.	191.	0.004	33.35	0.427s
BI-214	2438.23	609.47	511.	167.	0.004	41.37	1.396s
K-40	5843.24	1460.77	80.	269.	0.006	25.20	0.766s
BI-214	7055.28	1763.99	68.	57.	0.001	49.04	2.372s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

Name	Nuclide Code	Average Activity Bq/sample	Peak Energy keV	Peak Activity Bq/sample	Peak Code	Peak MDA Value Bq/sample	COMMENTS
Be-7	C	-1.0312E-01					
			477.61	-1.031E-01	&(	7.955E-01 2.29E+02	G
			1 of 1 peaks found				
K-40	N	5.4719E+00					
			1460.83	5.472E+00	(	9.030E-01 1.26E+01	G
			1 of 1 peaks found				

0

ORTEC g v - i (3135) Env32 G53W4.21 22-NOV-2007 08:29:30 Page 4
STL- St Louis Spectrum name: Ge3 background 11_21_07.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak MDA	Comments
CO-60	F 1.3070E-02					

```
                                Ge3 background 11_21_07.Rpt
                              1332.50 1.307E-02 &(  1.156E-01 2.59E+02 G
                              1173.24 4.078E-02 %   1.050E-01 7.74E+01 G
                                 2 of   2 peaks found

I-129     I  -5.4321E-02
                               29.78-5.432E-02 }   1.270E-01 ******** X
                               29.46-5.432E-02 }   2.391E-01 ******** X
                               33.61-2.491E-03 %   3.687E-01 4.40E+03 X
                               39.57-5.432E-02 %(  5.521E-01 3.04E+02 G
                               34.61-2.405E-01 &   1.844E+00 2.30E+02 X
                                 5 of   5 peaks found

CS-137    I   2.9708E-02
                              661.66 2.971E-02 &(  9.574E-02 9.65E+01 G
                                 1 of   1 peaks found

TL-208    N   2.2178E-01
                              583.19 2.218E-01 *(  7.773E-02 1.67E+01 G
                              860.56 3.902E-01 %   8.439E-01 6.55E+01 G
                                 2 of   2 peaks found

PB-210    N   3.2658E+00
                               46.54 3.266E+00  (  8.816E-01 1.17E+01 G
                                 1 of   1 peaks found

PB-212    N   5.5819E-01
                              238.63 5.582E-01 *(  1.474E-01 1.32E+01 G
                              300.10-8.649E-02 %   2.144E+00 7.37E+02 G
                                 2 of   2 peaks found

PB-214    N   3.8402E-01
                              351.93 3.840E-01 *(  2.025E-01 1.70E+01 G
                              295.22 2.825E-01 %   3.796E-01 4.12E+01 G
                              242.00-1.394E-01 %   8.727E-01 1.87E+02 G
                                 3 of   3 peaks found

BI-214    N   3.6794E-01
                              609.31 3.679E-01 *(  2.385E-01 2.07E+01 G
                             1764.49 9.488E-01 +   6.898E-01 2.45E+01 G
                             1120.29 5.281E-01 %   7.381E-01 4.32E+01 G
                              768.36 5.301E-01 %   1.791E+00 1.01E+02 G
                                 4 of   4 peaks found

RA-223    N   8.8424E-02
                               83.79 3.193E-01 *   1.894E-01 1.87E+01 X
                              269.46 8.842E-02 %(  5.004E-01 1.69E+02 G
                              154.21 1.288E-01 %   8.834E-01 2.05E+02 G
                              144.23 8.842E-02 }   1.424E+00 1.77E+00 G
                              323.87-1.253E-01 %   1.965E+00 4.67E+02 G
                                 5 of   6 peaks found

RA-224    N  -1.7921E+00
                              240.99-1.792E+00 &(  1.966E+00 3.38E+01 G
                                 1 of   1 peaks found
```



```
Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

AC-228    N   2.8991E-01
                              911.20 2.899E-01 %(  4.109E-01 4.37E+01 G
```

```
                                Ge3 background 11_21_07.Rpt
                              968.97 2.921E-01 %   6.997E-01 7.23E+01 G
                              338.32 2.899E-01 }   6.828E-01 2.46E-01 G
                                 3 of   3 peaks found

TH-234    N    3.2051E+00
                               63.29 3.262E+00 *(  8.629E-01 1.29E+01 G
                               92.59 3.156E+00 *(  7.091E-01 1.08E+01 G
                                 2 of   2 peaks found

U-235     N    0.0000E+00
                              143.76 1.575E-01 }   4.364E-01 8.36E+01 G
                              163.36 1.070E-02 }   1.003E+00 2.79E+03 G
                              205.31 3.099E-01 }   1.189E+00 1.15E+02 G
                                 3 of   4 peaks found

Ra-226    N    4.0797E+00
                              186.21 4.080E+00 }(  1.522E+00 1.23E+01 G
                                 1 of   1 peaks found

AM-241    T    3.0063E-02
                               59.54 3.006E-02 %(  1.121E-01 1.12E+02 G
                                 1 of   1 peaks found
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                        Peak Codes:
   T - Thermal Neutron Activation        G - Gamma Ray
   F - Fast Neutron Activation           X - X-Ray
   I - Fission Product                   P - Positron Decay
   N - Naturally Occurring Isotope       S - Single-Escape
   P - Photon Reaction                   D - Double-Escape
   C - Charged Particle Reaction         K - Key Line
   M - No MDA Calculation                A - Not in Average
```



```
   R - Coincidence Corrected             C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

 *************** D I S C A R D E D  I S O T O P E  P E A K S ***************
 Nuclide Centroid  Background  Net Area   Intensity   Uncert   Activity
           Energy   Counts     Counts     Cts/Sec  2 Sigma %
```

Ge3 background 11_21_07.Rpt

RA-223	84.65	1341.	292.	0.007	37.32	3.193E-01
RA-224	240.03	1211.	-150.	-0.003	67.51	-1.792E+00
PB-214	351.95	596.	221.	0.005	34.04	3.840E-01
BI-214	609.47	511.	167.	0.004	41.37	3.679E-01
BI-214	1763.99	68.	57.	0.001	49.04	9.488E-01

P - Peakbackground subtraction

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity Bq/sample	Uncertainty Counting 2 Sigma	MDA Bq/sample
Be-7	#A	-1.0312E-01	4.5896E+02%	7.955E-01
K-40		5.4719E+00	2.5202E+01%	9.030E-01
CO-60	#A	1.3070E-02	5.1750E+02%	1.156E-01
I-129	#A	-5.4321E-02	6.0811E+02%	5.521E-01
CS-137	#A	2.9708E-02	1.9304E+02%	9.574E-02
TL-208	#	2.2178E-01	3.3349E+01%	7.773E-02
PB-210		3.2658E+00	2.3466E+01%	8.816E-01
PB-212	#	5.5819E-01	2.6390E+01%	1.474E-01
PB-214	#	3.8402E-01	3.4038E+01%	2.025E-01
BI-214	#	3.6794E-01	4.1367E+01%	2.385E-01
RA-223	#A	8.8424E-02	3.3888E+02%	5.004E-01
RA-224	#A	-1.7921E+00	6.7509E+01%	1.966E+00
AC-228	#A	2.8991E-01	8.7364E+01%	4.109E-01
TH-234	#	3.2051E+00	1.6848E+01%	8.629E-01
U-235	#A	0.0000E+00	2.3063E+02%	1.189E+00
Ra-226	#	4.0797E+00	2.4547E+01%	1.522E+00
AM-241	#A	3.0063E-02	2.2457E+02%	1.121E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (22.8 to 2000.4 keV) 1.680E+01 Bq/sample

ORTEC g v - i (3135) Env32 G53W4.21 22-NOV-2007 08:29:30 Page 7
STL- St Louis Spectrum name: Ge3 background 11_21_07.An1

Analyzed by: _____
403605

Reviewed by: _____
Supervisor

Laboratory: STL- St Louis

Ge4 background 11_21_07.Rpt

```
 ORTEC     g v - i (3135) Env32  G53W4.21  22-NOV-2007 09:23:11 Page    1
STL- St Louis                    Spectrum name: Ge4 background 11_21_07.An1

Sample description
     Ge4 background 11_21_07


Spectrum Filename: C:\User\spectra\Ge4 Bkd post 09_07\Ge4 background
                   11_21_07.An1

Acquisition information
       Start time:                 21-Nov-2007 21:20:23
       Live time:              43200
       Real time:              43294
       Dead time:                  0.22 %
       Detector ID:                    4

Detector system
     Ge 4 SN/181


Calibration
       Filename:                   Ge4 AirFilterCal_74140_334_05_08_07(EE).
                                   Clb
     Ge4 AirFilterCal_74140_334_05_08_07(EE)


       Energy Calibration
            Created:               08-May-2007 13:28:13
            Zero offset:           0.017 keV
            Gain:                  0.250 keV/channel
            Quadratic:            -3.910E-08 keV/channel^2

       Efficiency Calibration
            Created:               08-May-2007 13:39:26
            Type:                  Polynomial
            Uncertainty:           0.775 %
            Coefficients:         -0.437839  -4.768164   0.564688
                                  -0.057886   0.002608  -0.000044

Library Files
       Main analysis library:      long bkgd_pbc.lib
       Library Match Width:        0.750
       Peak stripping:             Library based

Analysis parameters
       Analysis engine:            Env32   G53W4.21
       Start channel:             90 (    22.53keV )
       Stop channel:            8000 (  1998.47keV )
       Peak rejection level:      40.000%
       Peak search sensitivity:    3
       Sample Size:                1.0000E+00
       Activity scaling factor:    1.0000E+00/(  1.0000E+00*  1.0000E+00) =
                                   1.0000E+00
       Detection limit method:     Reg. Guide 4.16 Method

       Random error:               0.0000000E+00
       Systematic error:           0.0000000E+00
       Fraction Limit:             0.000%
       Background width:           average of three points.
```

Ge4 background 11_21_07.Rpt

ORTEC g v - i (3135) Env32 G53W4.21 22-NOV-2007 09:23:11 Page 2
STL- St Louis Spectrum name: Ge4 background 11_21_07.An1

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	NO	
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	NO	
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 13 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1398

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. Bq/sampl	Nuc
29.44	117.	0.15	0.80	5.859E-02	29.46	20.350	PBC<MDA	I129
46.39	500.	10.13	0.83	6.160E-02	46.54	4.250	4.417E+00	PB210
63.30	385.	12.06	0.82	6.390E-02	63.29	4.820	2.891E+00	TH234
74.86	126.	20.28	0.84	6.352E-02				
77.23	163.	16.49	0.85	6.347E-02				
92.41	578.	13.01	1.06	6.276E-02	92.59	5.570	3.825E+00	TH234
144.26	17.	0.88	0.90	5.339E-02	143.76	10.960	PBC<MDA	U235
185.83	266.	18.20	1.03	4.428E-02	185.71	57.200	2.430E-01	U235
					186.21	3.590	3.880E+00	Ra226
238.37	223.	16.36	1.06	3.532E-02	238.63	43.300	3.379E-01	PB212
294.99	85.	32.83	1.03	2.863E-02	295.22	19.300	PBC<MDA	PB214
338.12	34.	0.42	1.07	2.500E-02	338.28	2.790	1.109E+00	RA223
351.60	126.	21.13	1.08	2.404E-02	351.93	37.600	3.223E-01	PB214
510.71	983.	5.17	2.12	1.675E-02				
582.75	103.	27.40	0.89	1.482E-02	583.19	84.500	1.899E-01	TL208
608.54	126.	15.99	1.63	1.422E-02	609.31	46.090	4.449E-01	BI214
1024.06	31.	31.88	0.48	8.934E-03				
1119.29	112.	21.18	1.36	8.239E-03	1120.29	15.100	2.075E+00	BI214
1460.75	68.	19.15	1.89	6.425E-03	1460.83	10.670	2.293E+00	K40

********** U N I D E N T I F I E D P E A K S U M M A R Y **********

Peak Centroid Channel	Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 2 Sigma %	FWHM keV	Suspected Nuclide	
299.14	74.83	277.	115.	0.003	50.65	0.818	PB-214	
308.62	77.21	295.	148.	0.003	42.44	0.888	PB-214	
2042.44	510.71	228.	983.	0.023	10.33	2.116	TL-208	s
4096.82	1024.06	19.	31.	0.001	63.76	0.479	SR-91	s

ORTEC g v - i (3135) Env32 G53W4.21 22-NOV-2007 09:23:11 Page 3
STL- St Louis Spectrum name: Ge4 background 11_21_07.An1

Ge4 background 11_21_07.Rpt

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: long bkgd_pbc.lib

********** I D E N T I F I E D P E A K S U M M A R Y **********

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 2 Sigma %	FWHM keV
I-129	119.01	29.78	664.	117.	0.003	0.29	0.804D
PB-210	185.42	46.39	458.	500.	0.012	20.27	0.834s
TH-234	253.01	63.30	424.	385.	0.009	24.12	0.816
TH-234	369.42	92.41	822.	578.	0.013	26.02	1.057s
RA-223	576.64	144.23	522.	17.	0.000	1.75	0.905D
Ra-226	744.51	186.21	462.	266.	0.006	25.94	1.035D
PB-212	953.09	238.37	289.	223.	0.005	32.72	1.055
PB-214	1179.54	294.99	347.	85.	0.002	65.66	1.034s
AC-228	1352.85	338.32	320.	34.	0.001	0.85	1.071D
PB-214	1405.98	351.60	291.	126.	0.003	42.26	1.082s
TL-208	2331.16	582.87	184.	52.	0.001	78.17	1.269s
BI-214	2433.85	608.54	80.	126.	0.003	31.98	1.627s
BI-214	4478.11	1119.29	52.	112.	0.003	42.36	1.355s
K-40	5845.49	1460.75	51.	68.	0.002	38.29	1.887

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

Nuclide Name	Code	Average Activity Bq/sample	Peak Energy keV	Peak Activity Bq/sample	Peak Code	Peak MDA Value Bq/sample	COMMENTS
Be-7	C	2.5364E-01					
			477.61	2.536E-01	&(	7.571E-01 8.94E+01	G
			1 of 1 peaks found				
K-40	N	2.2933E+00					
			1460.83	2.293E+00	(	1.211E+00 1.91E+01	G
			1 of 1 peaks found				
CO-60	F	3.0919E-02					
			1332.50	3.092E-02	%(	1.270E-01 1.20E+02	G
			1173.24	-1.824E-03	%	1.272E-01 1.99E+03	G
			2 of 2 peaks found				

ORTEC g v - i (3135) Env32 G53W4.21 22-NOV-2007 09:23:11 Page 4
STL- St Louis Spectrum name: Ge4 background 11_21_07.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak MDA	Comments
I-129	I 1.2169E-01					
		29.78	1.217E-01	}	1.282E-01 1.45E-01	X
		33.61	9.651E-03	%	3.713E-01 1.14E+03	X
		39.57	1.217E-01	%(	5.647E-01 1.39E+02	G

Page 3

```
                                Ge4 background 11_21_07.Rpt
                               34.61 5.812E-01 %   1.700E+00 8.81E+01 X
                                 4 of   5 peaks found

CS-137    I    6.1529E-02
                              661.66 6.153E-02 &(  1.199E-01 5.93E+01 G
                                 1 of   1 peaks found

TL-208    N    9.7012E-02
                              583.19 9.701E-02 ?(  1.219E-01 3.91E+01 G
                              860.56 5.068E-02 %   8.374E-01 4.76E+02 G
                                 2 of   2 peaks found

PB-210    N    4.4166E+00
                               46.54 4.417E+00 @(  9.062E-01 1.01E+01 G
                                 1 of   1 peaks found

PB-212    N    3.3787E-01
                              238.63 3.379E-01  (  1.241E-01 1.64E+01 G
                              300.10 4.578E-01 %   2.233E+00 1.45E+02 G
                                 2 of   2 peaks found

PB-214    N    3.3387E-01
                              351.93 3.223E-01  (  2.104E-01 2.11E+01 G
                              295.22 3.563E-01 *(  3.752E-01 3.28E+01 G
                              242.00-8.994E-02 %   9.155E-01 3.02E+02 G
                                 3 of   3 peaks found

BI-214    N    4.4492E-01
                              609.31 4.449E-01  (  1.567E-01 1.60E+01 G
                             1764.49 3.905E-01 %   9.161E-01 7.06E+01 G
                             1120.29 2.075E+00 +   6.787E-01 2.12E+01 G
                              768.36 3.163E-02 %   2.265E+00 2.07E+03 G
                                 4 of   4 peaks found

RA-223    N    2.3215E-01
                               83.79-2.020E-04 %   1.551E-01 2.27E+04 X
                              269.46 2.321E-01 &(  4.980E-01 6.50E+01 G
                              154.21-5.419E-02 %   8.607E-01 4.71E+02 G
                              144.23 2.321E-01 }   1.470E+00 8.75E-01 G
                              323.87 1.302E-01 &   2.085E+00 4.74E+02 G
                                 5 of   6 peaks found

RA-224    N   -3.8759E-01
                              240.99-3.876E-01 %(  1.566E+00 1.21E+02 G
                                 1 of   1 peaks found

AC-228    N    2.7907E-01
                              911.20 2.791E-01 &(  4.692E-01 5.16E+01 G
                              968.97 2.956E-01 %   7.776E-01 7.89E+01 G
                              338.32 2.791E-01 }   7.075E-01 4.24E-01 G
                                 3 of   3 peaks found
```



```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TH-234    N    3.3918E+00
                               63.29 2.891E+00  (  7.418E-01 1.21E+01 G
                               92.59 3.825E+00  (  9.027E-01 1.30E+01 G
                                 2 of   2 peaks found
```

Ge4 background 11_21_07.Rpt

```
U-235     N    0.0000E+00
                            143.76 1.399E-01 }   4.508E-01 9.69E+01 G
                            163.36 3.179E-01 }   9.891E-01 9.36E+01 G
                            205.31 9.367E-02 }   9.329E-01 2.94E+02 G
                               3 of   4 peaks found

Ra-226    N    3.8798E+00
                            186.21 3.880E+00 }(  1.500E+00 1.30E+01 G
                               1 of   1 peaks found

AM-241    T    1.6676E-02
                             59.54 1.668E-02 %(  1.068E-01 1.91E+02 G
                               1 of   1 peaks found
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                        Peak Codes:
   T - Thermal Neutron Activation        G - Gamma Ray
   F - Fast Neutron Activation           X - X-Ray
   I - Fission Product                   P - Positron Decay
   N - Naturally Occurring Isotope       S - Single-Escape
   P - Photon Reaction                   D - Double-Escape
   C - Charged Particle Reaction         K - Key Line
   M - No MDA Calculation                A - Not in Average
   R - Coincidence Corrected             C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
```

ORTEC g v - i (3135) Env32 G53W4.21 22-NOV-2007 09:23:11 Page 6
STL- St Louis Spectrum name: Ge4 background 11_21_07.An1

********** D I S C A R D E D I S O T O P E P E A K S **********

Nuclide	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 2 Sigma %	Activity
PB-214	294.99	347.	85.	0.002	65.66	3.563E-01
PB-214	351.60	291.	126.	0.003	42.26	3.223E-01
K-40	1460.75	51.	68.	0.002	38.29	2.293E+00

P - Peakbackground subtraction

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide	Time of Count Activity	Uncertainty Counting	2 Sigma	MDA

Page 5

Ge4 background 11_21_07.Rpt

		Bq/sample		Bq/sample
Be-7	#A	2.5364E-01	1.7871E+02%	7.571E-01
K-40	#	2.2933E+00	3.8293E+01%	1.211E+00
CO-60	#A	3.0919E-02	2.4072E+02%	1.270E-01
I-129	#A	1.2169E-01	2.7780E+02%	5.647E-01
CS-137	#A	6.1529E-02	1.1860E+02%	1.199E-01
TL-208	#A	9.7012E-02	7.8165E+01%	1.219E-01
PB-210	#	4.4166E+00	2.0270E+01%	9.062E-01
PB-212		3.3787E-01	3.2718E+01%	1.241E-01
PB-214	#	3.3387E-01	3.9044E+01%	2.104E-01
BI-214	#	4.4492E-01	3.1983E+01%	1.567E-01
RA-223	#A	2.3215E-01	1.3001E+02%	4.980E-01
RA-224	#A	-3.8759E-01	2.4185E+02%	1.566E+00
AC-228	#A	2.7907E-01	1.0319E+02%	4.692E-01
TH-234		3.3918E+00	1.7740E+01%	7.418E-01
U-235	#A	0.0000E+00	5.8869E+02%	9.329E-01
Ra-226	#	3.8798E+00	2.5937E+01%	1.500E+00
AM-241	#A	1.6676E-02	3.8177E+02%	1.068E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (22.5 to 1998.5 keV) 1.257E+01 Bq/sample

Analyzed by: _____
403293

Reviewed by: _____
Supervisor

ORTEC g v - i (3135) Env32 G53W4.21 22-NOV-2007 09:23:11 Page 7
STL- St Louis Spectrum name: Ge4 background 11_21_07.An1

Laboratory: STL- St Louis

Ge5 background 11_21_07.Rpt

```
 ORTEC     g v - i (3135) Env32  G53W4.21  22-NOV-2007 07:48:45 Page    1
STL- St Louis                    Spectrum name: Ge5 background 11_21_07.An1

Sample description
     Ge5 background 11_21_07


Spectrum Filename: C:\User\spectra\Ge5 bkgd\Ge5 background 11_21_07.A

Acquisition information
       Start time:                 21-Nov-2007 19:23:41
       Live time:              43200
       Real time:              44675
       Dead time:                  3.30 %
       Detector ID:                    5

Detector system
     Ge 5 SN/157


Calibration
       Filename:                   Ge5 airfilter_032707_interp165quad.Clb
     Ge5 airfilter 74140-334_032707 interp_165_quad


       Energy Calibration
            Created:               28-Mar-2007 18:08:23
            Zero offset:           0.272 keV
            Gain:                  0.250 keV/channel
            Quadratic:             3.070E-08 keV/channel^2

       Efficiency Calibration
            Created:               28-Mar-2007 18:10:41
            Knee Energy:         165.85 keV
            Above the Knee:        Quadratic        Uncertainty =   1.34 %
            Log(Eff):              1.077627E+00 + (-7.017228E-01*Log(E) ) +
                                   ( -1.776439E-02*Log(E)^2 )
            Below the Knee:        Interpolative    Uncertainty =   0.00 %

Library Files
       Main analysis library:      long bkgd_pbc.lib
       Library Match Width:        0.750
       Peak stripping:             Library based

Analysis parameters
       Analysis engine:            Env32   G53W4.21
       Start channel:             90 (    22.75keV )
       Stop channel:            8000 (  2000.57keV )
       Peak rejection level:      40.000%
       Peak search sensitivity:    3
       Sample Size:                1.0000E+00
       Activity scaling factor:    1.0000E+00/(  1.0000E+00*  1.0000E+00) =
                                   1.0000E+00
       Detection limit method:     Reg. Guide 4.16 Method

       Random error:               0.0000000E+00
       Systematic error:           0.0000000E+00
```

```
 ORTEC     g v - i (3135) Env32  G53W4.21  22-NOV-2007 07:48:45 Page    2
STL- St Louis                    Spectrum name: Ge5 background 11_21_07.An1
```

Page 1

Ge5 background 11_21_07.Rpt

Fraction Limit: 0.000%
Background width: average of three points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	NO	
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	NO	
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 15 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1877

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. Bq/sampl	Nuc
29.93	102.	0.14	0.75	7.146E-02	29.46	20.350	PBC<MDA	I129
46.66	414.	12.87	0.65	7.098E-02	46.54	4.250	3.179E+00	PB210
59.65	80.	33.94	0.71	7.060E-02	59.54	35.700	7.300E-02	AM241
63.18	340.	14.64	0.84	7.034E-02	63.29	4.820	2.322E+00	TH234
74.83	114.	25.18	0.78	6.946E-02				
77.10	91.	30.11	0.78	6.929E-02				
84.34	74.	32.20	0.44	6.875E-02				
92.62	549.	10.31	1.09	6.772E-02	92.59	5.570	3.367E+00	TH234
185.73	327.	15.49	0.92	4.627E-02	185.71	57.200	2.861E-01	U235
					186.21	3.590	4.570E+00	Ra226
238.72	164.	27.40	0.69	3.699E-02	238.63	43.300	2.362E-01	PB212
338.06	31.	0.43	1.04	2.700E-02	338.28	2.790	PBC<MDA	RA223
351.81	195.	22.22	0.90	2.606E-02				
511.11	1014.	5.24	2.08	1.851E-02				
583.25	90.	23.25	0.78	1.638E-02	583.19	84.500	1.505E-01	TL208
609.47	162.	20.78	1.01	1.572E-02	609.31	46.090	5.158E-01	BI214
662.05	150.	19.17	1.43	1.456E-02	661.66	85.210	2.798E-01	CS137
1173.48	41.	36.79	1.77	8.488E-03	1173.24	99.900	PBC<MDA	CO60
1332.05	125.	20.63	1.02	7.518E-03				
1461.10	43.	27.61	1.99	6.882E-03	1460.83	10.670	1.351E+00	K40
1764.57	44.	23.86	0.33	5.736E-03	1764.49	15.400	1.162E+00	BI214

********** U N I D E N T I F I E D P E A K S U M M A R Y **********

Peak Centroid Channel	Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 2 Sigma %	FWHM keV	Suspected Nuclide	
298.47	74.83	392.	106.	0.002	67.56	0.809	PB-214	s
307.56	77.10	307.	79.	0.002	75.51	0.760	PB-214	
1407.10	351.81	306.	195.	0.005	44.45	0.904	PB-214	l
2044.52	511.11	240.	1014.	0.023	10.47	2.077	TL-208	s

ORTEC g v - i (3135) Env32 G53W4.21 22-NOV-2007 07:48:45 Page 3
STL- St Louis Spectrum name: Ge5 background 11_21_07.An1
Page 2

Ge5 background 11_21_07.Rpt

Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	Suspected
5328.04	1332.05	79.	100.	0.002	32.20	1.021	CO-60 s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: long bkgd_pbc.lib

********** I D E N T I F I E D P E A K S U M M A R Y **********

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 2 Sigma %	FWHM keV
I-129	118.14	29.78	830.	102.	0.002	0.28	0.749D
PB-210	185.71	46.66	583.	414.	0.010	25.73	0.654s
AM-241	237.70	59.65	260.	80.	0.002	67.89	0.710
TH-234	251.85	63.18	534.	340.	0.008	29.27	0.841s
TH-234	369.69	92.62	568.	549.	0.013	20.62	1.088s
RA-223	576.28	144.23	424.	-4.	0.000	-30.17	0.847D
Ra-226	744.31	186.21	464.	327.	0.008	21.65	0.916D
PB-212	954.48	238.72	410.	164.	0.004	54.79	0.693s
RA-223	1352.94	338.28	354.	-2.	0.000	-30.17	1.040D
AC-228	1353.09	338.32	340.	31.	0.001	0.85	1.040D
PB-214	1407.50	351.92	329.	125.	0.003	44.77	1.053s
TL-208	2333.17	583.25	87.	90.	0.002	46.51	0.781s
BI-214	2438.11	609.47	176.	162.	0.004	41.57	1.012
CS-137	2648.46	662.05	116.	150.	0.003	38.34	1.432s
CO-60	4694.02	1173.48	96.	41.	0.001	73.58	1.772s
K-40	5843.97	1461.10	49.	43.	0.001	55.23	1.988
BI-214	7056.93	1764.57	11.	44.	0.001	47.72	0.329s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

Name	Nuclide Code	Average Activity Bq/sample	Peak Energy keV	Peak Activity Bq/sample	Code	Peak MDA Value Bq/sample	COMMENTS
Be-7	C	2.9643E-03					
			477.61	2.964E-03	%(	9.373E-01 9.29E+03 G	
			1 of 1 peaks found				
K-40	N	1.3513E+00					
			1460.83	1.351E+00	?(	1.110E+00 2.76E+01 G	
			1 of 1 peaks found				

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STL- St Louis Spectrum name: Ge5 background 11_21_07.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak MDA	Comments
CO-60	F 9.5390E-02					
		1332.50	7.761E-02	%(	1.333E-01 5.28E+01 G	
		1173.24	1.132E-01	(	1.318E-01 3.68E+01 G	

Page 3

```
                                Ge5 background 11_21_07.Rpt
                                  2 of   2 peaks found

I-129     I   8.6894E-02
                                29.78 8.689E-02 }   1.172E-01 1.40E-01 X
                                33.61-3.808E-02 &   3.942E-01 3.09E+02 X
                                39.57 8.689E-02 %(  4.761E-01 1.64E+02 G
                                34.61-1.386E-01 %   1.664E+00 3.58E+02 X
                                  4 of   5 peaks found

CS-137    I   2.7980E-01
                               661.66 2.798E-01 @(  9.868E-02 1.92E+01 G
                                  1 of   1 peaks found

TL-208    N   1.5053E-01
                               583.19 1.505E-01 *(  7.723E-02 2.33E+01 G
                               860.56 1.989E-01 %   9.708E-01 1.44E+02 G
                                  2 of   2 peaks found

PB-210    N   3.1792E+00
                                46.54 3.179E+00  (  8.839E-01 1.29E+01 G
                                  1 of   1 peaks found

PB-212    N   2.3621E-01
                               238.63 2.362E-01  (  1.402E-01 2.74E+01 G
                               300.10 3.484E-01 %   2.091E+00 1.79E+02 G
                                  2 of   2 peaks found

PB-214    N   2.9533E-01
                               351.93 2.953E-01  (  2.061E-01 2.24E+01 G
                               295.22 2.432E-01 %   3.647E-01 4.60E+01 G
                               242.00 1.720E-01 &   8.469E-01 1.47E+02 G
                                  3 of   3 peaks found

BI-214    N   5.1580E-01
                               609.31 5.158E-01  (  2.058E-01 2.08E+01 G
                              1764.49 1.162E+00 +   4.698E-01 2.39E+01 G
                              1120.29 2.913E-01 &   7.470E-01 7.69E+01 G
                               768.36 7.370E-01 %   2.029E+00 8.25E+01 G
                                  4 of   4 peaks found

RA-223    N  -5.2038E-02
                                83.79-4.616E-02 %   1.480E-01 9.64E+01 X
                               269.46-5.204E-02 &(  5.080E-01 2.90E+02 G
                               154.21-7.645E-02 %   7.471E-01 2.90E+02 G
                               144.23-5.204E-02 }   1.255E+00 ******** G
                               323.87-8.898E-02 %   1.870E+00 6.20E+02 G
                               338.28-5.204E-02 }   2.778E+00 ******** G
                                  6 of   6 peaks found

RA-224    N  -7.1857E-01
                               240.99-7.186E-01 %(  1.725E+00 7.26E+01 G
                                  1 of   1 peaks found
```



```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

AC-228    N   2.3763E-01
                               911.20 2.376E-01 %(  4.360E-01 5.60E+01 G
                               968.97 2.100E-01 %   7.716E-01 1.09E+02 G
                               338.32 2.376E-01 }   6.746E-01 4.26E-01 G
```

```
                                Ge5 background 11_21_07.Rpt
                                  3 of   3 peaks found

TH-234    N   2.3217E+00
                                63.29 2.322E+00 @(  7.538E-01 1.46E+01 G
                                92.59 3.367E+00 +   6.983E-01 1.03E+01 G
                                  2 of   2 peaks found

U-235     N   0.0000E+00
                               143.76 2.214E-01 }   3.882E-01 5.34E+01 G
                               163.36 4.277E-01 }   8.636E-01 6.13E+01 G
                               205.31 3.536E-01 }   1.095E+00 9.31E+01 G
                                  3 of   4 peaks found

Ra-226    N   4.5696E+00
                               186.21 4.570E+00 }(  1.440E+00 1.08E+01 G
                                  1 of   1 peaks found

AM-241    T   7.3002E-02
                                59.54 7.300E-02  (  7.142E-02 3.39E+01 G
                                  1 of   1 peaks found
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                        Peak Codes:
   T - Thermal Neutron Activation        G - Gamma Ray
   F - Fast Neutron Activation           X - X-Ray
   I - Fission Product                   P - Positron Decay
   N - Naturally Occurring Isotope       S - Single-Escape
   P - Photon Reaction                   D - Double-Escape
   C - Charged Particle Reaction         K - Key Line
   M - No MDA Calculation                A - Not in Average
```

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  ORTEC     g v - i (3135) Env32  G53W4.21  22-NOV-2007 07:48:45 Page    6
 STL- St Louis                   Spectrum name: Ge5 background 11_21_07.An1

   R - Coincidence Corrected            C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

 *************** D I S C A R D E D  I S O T O P E  P E A K S ***************
 Nuclide Centroid  Background  Net Area   Intensity   Uncert   Activity
           Energy   Counts     Counts     Cts/Sec  2 Sigma %
 ------------------------------------------------------------------------
 PB-214    351.92      329.       125.     0.003     44.77   2.953E-01
                                  Page 5
```

Ge5 background 11_21_07.Rpt

CO-60	1173.48	96.	41.	0.001	73.58	1.132E-01

P - Peakbackground subtraction

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity Bq/sample	Uncertainty 2 Sigma Counting	MDA Bq/sample
Be-7	#A	2.9643E-03	1.8576E+04%	9.373E-01
K-40	#	1.3513E+00	5.5227E+01%	1.110E+00
CO-60	#A	9.5390E-02	6.4328E+01%	1.333E-01
I-129	#A	8.6894E-02	3.2744E+02%	4.761E-01
CS-137	#	2.7980E-01	3.8336E+01%	9.868E-02
TL-208	#	1.5053E-01	4.6508E+01%	7.723E-02
PB-210	#	3.1792E+00	2.5734E+01%	8.839E-01
PB-212		2.3621E-01	5.4790E+01%	1.402E-01
PB-214	#	2.9533E-01	4.4766E+01%	2.061E-01
BI-214		5.1580E-01	4.1569E+01%	2.058E-01
RA-223	#A	-5.2038E-02	5.7978E+02%	5.080E-01
RA-224	#A	-7.1857E-01	1.4516E+02%	1.725E+00
AC-228	#A	2.3763E-01	1.1204E+02%	4.360E-01
TH-234	#	2.3217E+00	2.9270E+01%	7.538E-01
U-235	#A	0.0000E+00	1.8625E+02%	1.095E+00
Ra-226		4.5696E+00	2.1655E+01%	1.440E+00
AM-241		7.3002E-02	6.7890E+01%	7.142E-02

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (22.8 to 2000.6 keV) 1.268E+01 Bq/sample

Analyzed by: _____
403293

Reviewed by: _____
Supervisor

ORTEC g v - i (3135) Env32 G53W4.21 22-NOV-2007 07:48:45 Page 7
STL- St Louis Spectrum name: Ge5 background 11_21_07.An1

Laboratory: STL- St Louis

Ge7 background 11_21_07.Rpt

```
 ORTEC     g v - i (3135) Env32  G53W4.21  22-NOV-2007 08:07:45 Page    1
STL- St Louis                    Spectrum name: Ge7 background 11_21_07.An1

Sample description
     Ge7 background 11_21_07


Spectrum Filename: C:\User\spectra\Ge7 bkgd\Ge7 background 11_21_07.A

Acquisition information
       Start time:                 21-Nov-2007 19:50:18
       Live time:              43200
       Real time:              44220
       Dead time:                  2.31 %
       Detector ID:                    7

Detector system
     Ge 7 SN/154


Calibration
       Filename:                   Ge7 air filter 01_04_07.Clb
     Ge7 air filter 74140-334 01_04_07


       Energy Calibration
            Created:               04-Jan-2007 09:44:57
            Zero offset:           0.082 keV
            Gain:                  0.250 keV/channel
            Quadratic:             5.157E-09 keV/channel^2

       Efficiency Calibration
            Created:               04-Jan-2007 09:55:23
            Knee Energy:         122.07 keV
            Above the Knee:        Quadratic        Uncertainty =   1.37 %
            Log(Eff):              6.564924E-01 + (-4.575726E-01*Log(E) ) +
                                   ( -3.880790E-02*Log(E)^2 )
            Below the Knee:        Quadratic        Uncertainty =   0.19 %
            Log(Eff):             -6.453588E+00 + ( 1.933612E+00*Log(E) ) +
                                   ( -2.285762E-01*Log(E)^2 )

Library Files
       Main analysis library:      long bkgd_pbc.lib
       Library Match Width:        0.750
       Peak stripping:             Library based

Analysis parameters
       Analysis engine:            Env32   G53W4.21
       Start channel:             90 (    22.58keV )
       Stop channel:            8000 (  2000.15keV )
       Peak rejection level:      40.000%
       Peak search sensitivity:    3
       Sample Size:                1.0000E+00
       Activity scaling factor:    1.0000E+00/(  1.0000E+00*  1.0000E+00) =
                                   1.0000E+00
       Detection limit method:     Reg. Guide 4.16 Method

D

 ORTEC     g v - i (3135) Env32  G53W4.21  22-NOV-2007 08:07:45 Page    2
STL- St Louis                    Spectrum name: Ge7 background 11_21_07.An1
                                       Page 1
```

Ge7 background 11_21_07.Rpt

Random error: 0.0000000E+00
Systematic error: 0.0000000E+00
Fraction Limit: 0.000%
Background width: average of three points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	NO	
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	NO	
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 10 cutoff 20.00000 %

Energy Calibration
Normalized diff: 0.2579

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. Bq/sampl	Nuc
23.39	188.	17.26	0.62	7.211E-02				
29.55	453.	11.10	0.94	7.991E-02	29.46	20.350	6.457E-01	I129
33.20	135.	27.90	0.47	8.331E-02				
40.27	166.	27.61	0.76	8.808E-02				
46.28	578.	11.03	0.77	9.072E-02	46.54	4.250	3.470E+00	PB210
63.10	498.	9.75	0.76	9.386E-02	63.29	4.820	2.548E+00	TH234
74.41	97.	24.75	0.88	9.388E-02				
77.06	125.	20.92	0.88	9.373E-02				
92.57	671.	8.34	0.99	9.212E-02	92.59	5.570	3.027E+00	TH234
143.96	102.	30.64	0.61	7.609E-02	143.76	10.960	2.842E-01	U235
145.13	1.	10.64	0.95	7.597E-02	144.23	3.220	PBC<MDA	RA223
185.59	330.	10.26	1.07	6.127E-02	185.71	57.200	2.178E-01	U235
197.70	154.	31.14	0.41	5.800E-02				
239.12	229.	23.87	1.02	4.911E-02	238.63	43.300	2.488E-01	PB212
337.98	32.	0.33	1.16	3.598E-02	338.28	2.790	PBC<MDA	RA223
346.03	83.	27.40	0.53	3.525E-02				
351.88	69.	36.45	1.18	3.471E-02	351.93	37.600	PBC<MDA	PB214
583.49	58.	39.50	1.42	2.168E-02	583.19	84.500	PBC<MDA	TL208

********** U N I D E N T I F I E D P E A K S U M M A R Y **********

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 2 Sigma %	FWHM keV	Suspected Nuclide	
93.24	23.39	273.	188.	0.004	34.51	0.619	SN-113	s
117.91	29.55	519.	453.	0.010	22.20	0.936	TE-132	l
132.50	33.20	385.	135.	0.003	55.79	0.465	BA-139	l
160.78	40.27	527.	101.	0.002	67.63	0.756	EU-152	s
297.58	74.47	297.	91.	0.002	67.11	0.693	PB-214	
308.21	77.12	258.	104.	0.002	55.87	0.612	PB-214	s

ORTEC g v - i (3135) Env32 G53W4.21 22-NOV-2007 08:07:45 Page 3
Page 2

Ge7 background 11_21_07.Rpt
STL- St Louis Spectrum name: Ge7 background 11_21_07.An1

Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	Suspected	
575.58	143.96	252.	102.	0.002	61.28	0.606	U-235	l
742.11	185.59	232.	330.	0.008	20.52	1.073	U-235	l
790.56	197.70	412.	154.	0.004	62.28	0.414	KR-89	sM
1383.93	346.03	117.	83.	0.002	54.79	0.534	HF-181	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.
M - Peak is close to a library peak.

This section based on library: long bkgd_pbc.lib

********** I D E N T I F I E D P E A K S U M M A R Y **********

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 2 Sigma %	FWHM keV
I-129	118.81	29.78	642.	281.	0.007	24.80	0.827D
I-129	133.40	33.43	566.	89.	0.002	78.15	0.831s
PB-210	184.80	46.28	634.	578.	0.013	22.05	0.767
TH-234	252.09	63.10	413.	498.	0.012	19.50	0.762s
TH-234	370.01	92.57	492.	671.	0.016	16.68	0.985s
RA-223	576.67	144.23	412.	1.	0.000	21.28	0.954D
Ra-226	744.60	186.21	407.	266.	0.006	24.76	1.000D
PB-212	956.25	239.12	460.	229.	0.005	47.75	1.021s
AC-228	1353.09	338.32	350.	32.	0.001	0.67	1.164D
PB-214	1407.31	351.88	284.	69.	0.002	72.91	1.179s
TL-208	2333.81	583.49	232.	58.	0.001	79.01	1.417s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

Nuclide Name	Code	Average Activity Bq/sample	Peak Energy keV	Peak Activity Bq/sample	Code	MDA Value Bq/sample	COMMENTS
Be-7	C	-2.6217E-01					
			477.61	-2.622E-01	%(	6.113E-01 7.04E+01 G	
			1 of 1 peaks found				
K-40	N	-7.6775E-02					
			1460.83	-7.677E-02	%(	1.012E+00 3.78E+02 G	
			1 of 1 peaks found				
CO-60	F	1.6295E-03					
			1332.50	1.630E-03	%(	9.943E-02 1.73E+03 G	
			1173.24	3.709E-02	%	9.526E-02 7.70E+01 G	
			2 of 2 peaks found				

ORTEC g v - i (3135) Env32 G53W4.21 22-NOV-2007 08:07:45 Page 4
STL- St Louis Spectrum name: Ge7 background 11_21_07.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak MDA	Comments

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Ge7 background 11_21_07.Rpt

```
I-129     I   2.2928E-01
                          29.78 2.147E-01 }   9.218E-02 1.24E+01 X
                          29.46 7.217E-02 }   1.816E-01 7.51E+01 X
                          33.61 2.419E-01     3.072E-01 3.91E+01 X
                          39.57 2.293E-01 %(  4.135E-01 5.49E+01 G
                          34.61-2.853E-01 &   1.439E+00 1.51E+02 X
                            5 of   5 peaks found

CS-137    I   2.5282E-02
                         661.66 2.528E-02 %(  9.732E-02 1.15E+02 G
                            1 of   1 peaks found

TL-208    N   7.3008E-02
                         583.19 7.301E-02 *(  9.303E-02 3.95E+01 G
                         860.56 4.559E-01 %   6.885E-01 4.66E+01 G
                            2 of   2 peaks found

PB-210    N   3.4696E+00
                          46.54 3.470E+00  (  7.203E-01 1.10E+01 G
                            1 of   1 peaks found

PB-212    N   2.4885E-01
                         238.63 2.488E-01 *(  1.116E-01 2.39E+01 G
                         300.10 4.881E-01 %   1.607E+00 9.88E+01 G
                            2 of   2 peaks found

PB-214    N   1.2280E-01
                         351.93 1.228E-01 @(  1.441E-01 3.65E+01 G
                         295.22 1.042E-01 &   2.667E-01 7.72E+01 G
                         242.00-7.215E-02 %   6.071E-01 2.50E+02 G
                            3 of   3 peaks found

BI-214    N   1.2372E-01
                         609.31 1.237E-01 %(  1.679E-01 4.20E+01 G
                        1764.49 3.233E-01 &   7.856E-01 7.30E+01 G
                        1120.29 1.921E-03 &   6.110E-01 9.08E+03 G
                         768.36-1.636E-02 &   1.410E+00 2.48E+03 G
                            4 of   4 peaks found

RA-223    N   5.2717E-03
                          83.79 6.497E-02 %   1.154E-01 5.41E+01 X
                         269.46 5.272E-03 &(  3.606E-01 2.02E+03 G
                         154.21 6.698E-02 &   5.727E-01 2.54E+02 G
                         144.23 5.272E-03 }   9.207E-01 1.06E+01 G
                         323.87 3.705E-01 &   1.454E+00 1.17E+02 G
                            5 of   6 peaks found

RA-224    N  -1.4485E-01
                         240.99-1.448E-01 %(  1.279E+00 2.63E+02 G
                            1 of   1 peaks found

AC-228    N   1.8327E-01
                         911.20 1.833E-01 %(  3.531E-01 5.87E+01 G
                         968.97 2.459E-01 %   5.187E-01 6.39E+01 G
                         338.32 1.833E-01 }   5.128E-01 3.35E-01 G
                            3 of   3 peaks found
```


Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments

Ge7 background 11_21_07.Rpt

```
TH-234    N   2.8048E+00
                          63.29 2.548E+00 @(  4.984E-01 9.75E+00 G
                          92.59 3.027E+00 @(  4.785E-01 8.34E+00 G
                            2 of   2 peaks found

U-235     N   3.7275E-02
                         185.71 2.114E-02 }(  7.270E-02 1.03E+02 G
                         163.36 2.303E-01 }(  6.865E-01 8.97E+01 G
                         205.31 2.573E-02 }(  8.217E-01 9.44E+02 G
                            3 of   4 peaks found

Ra-226    N   2.8025E+00
                         186.21 2.803E+00 }(  1.021E+00 1.24E+01 G
                            1 of   1 peaks found

AM-241    T   1.4071E-02
                          59.54 1.407E-02 %(  6.420E-02 1.36E+02 G
                            1 of   1 peaks found
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
D

 ORTEC     g v - i (3135) Env32  G53W4.21  22-NOV-2007 08:07:45 Page    6
STL- St Louis                   Spectrum name: Ge7 background 11_21_07.An1


*************** D I S C A R D E D  I S O T O P E  P E A K S ***************
Nuclide Centroid  Background  Net Area   Intensity   Uncert   Activity
          Energy    Counts     Counts     Cts/Sec  2 Sigma %
```

Nuclide	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 2 Sigma %	Activity
I-129	29.78	642.	281.	0.007	24.80	2.147E-01
I-129	33.43	566.	89.	0.002	78.15	2.419E-01

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Ge7 background 11_21_07.Rpt

PB-214	351.88	284.	69.	0.002	72.91	1.228E-01
TL-208	583.49	232.	58.	0.001	79.01	7.301E-02

P - Peakbackground subtraction

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity Bq/sample	Uncertainty Counting 2 Sigma	MDA Bq/sample
Be-7	#A	-2.6217E-01	1.4087E+02%	6.113E-01
K-40	#A	-7.6775E-02	7.5553E+02%	1.012E+00
CO-60	#A	1.6295E-03	3.4689E+03%	9.943E-02
I-129	#A	2.2928E-01	1.0977E+02%	4.135E-01
CS-137	#A	2.5282E-02	2.2936E+02%	9.732E-02
TL-208	#A	7.3008E-02	7.9007E+01%	9.303E-02
PB-210		3.4696E+00	2.2051E+01%	7.203E-01
PB-212	#	2.4885E-01	4.7748E+01%	1.116E-01
PB-214	#A	1.2280E-01	7.2905E+01%	1.441E-01
BI-214	#A	1.2372E-01	8.3934E+01%	1.679E-01
RA-223	#A	5.2717E-03	4.0366E+03%	3.606E-01
RA-224	#A	-1.4485E-01	5.2575E+02%	1.279E+00
AC-228	#A	1.8327E-01	1.1731E+02%	3.531E-01
TH-234	#	2.8048E+00	1.2828E+01%	4.984E-01
U-235	A	3.7275E-02	1.7944E+02%	8.217E-01
Ra-226		2.8025E+00	2.7743E+01%	1.021E+00
AM-241	#A	1.4071E-02	2.7247E+02%	6.420E-02

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (22.6 to 2000.2 keV) 9.363E+00 Bq/sample

Analyzed by: _____
403605

ORTEC g v - i (3135) Env32 G53W4.21 22-NOV-2007 08:07:45 Page 7
STL- St Louis Spectrum name: Ge7 background 11_21_07.An1

Reviewed by: _____
Supervisor

Laboratory: STL- St Louis

Ge8 background 11_21_07.Rpt

```
 ORTEC     g v - i (3135) Env32  G53W4.21  22-NOV-2007 08:20:03 Page    1
STL- St Louis                    Spectrum name: Ge8 background 11_21_07.An1

Sample description
     Ge8 background 11_21_07


Spectrum Filename: C:\User\spectra\Ge8 bkgd\Ge8 background 11_21_07.A

Acquisition information
       Start time:                 21-Nov-2007 19:52:01
       Live time:              43200
       Real time:              44857
       Dead time:                  3.69 %
       Detector ID:                    8

Detector system
     Ge 8 SN/174


Calibration
       Filename:                   Ge8 air filter interp_122_quad.Clb
     Ge8  air filter_interp>122<quad


       Energy Calibration
            Created:               06-Nov-2006 15:12:36
            Zero offset:           0.014 keV
            Gain:                  0.250 keV/channel
            Quadratic:            -3.050E-09 keV/channel^2

       Efficiency Calibration
            Created:               06-Nov-2006 15:14:26
            Knee Energy:         122.07 keV
            Above the Knee:        Quadratic        Uncertainty =   1.61 %
            Log(Eff):              5.381757E-01 + (-5.615420E-01*Log(E) ) +
                                   ( -2.515438E-02*Log(E)^2 )
            Below the Knee:        Interpolative    Uncertainty =   0.00 %

Library Files
       Main analysis library:      long bkgd_pbc.lib
       Library Match Width:        0.750
       Peak stripping:             Library based

Analysis parameters
       Analysis engine:            Env32   G53W4.21
       Start channel:             90 (    22.52keV )
       Stop channel:            8000 (  2000.35keV )
       Peak rejection level:      40.000%
       Peak search sensitivity:    3
       Sample Size:                1.0000E+00
       Activity scaling factor:    1.0000E+00/(  1.0000E+00*  1.0000E+00) =
                                   1.0000E+00
       Detection limit method:     Reg. Guide 4.16 Method

       Random error:               0.0000000E+00
       Systematic error:           0.0000000E+00
```

```
 ORTEC     g v - i (3135) Env32  G53W4.21  22-NOV-2007 08:20:03 Page    2
STL- St Louis                    Spectrum name: Ge8 background 11_21_07.An1
                                       Page 1
```

Ge8 background 11_21_07.Rpt

Fraction Limit: 0.000%
Background width: average of three points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	NO	
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	NO	
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 12 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1437

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. Bq/sampl	Nuc
25.85	439.	17.91	0.98	7.362E-02				
29.52	518.	9.97	1.11	7.364E-02	29.46	20.350	7.999E-01	I129
63.12	715.	5.42	0.88	7.330E-02	63.29	4.820	4.686E+00	TH234
84.28	175.	21.65	0.90	7.044E-02	83.79	25.180	2.282E-01	RA223
92.47	1398.	5.34	1.10	6.915E-02	92.59	5.570	8.402E+00	TH234
143.63	200.	22.54	1.08	5.660E-02	143.76	10.960	7.488E-01	U235
185.64	683.	7.50	1.00	4.588E-02	185.71	57.200	6.026E-01	U235
238.54	182.	14.96	1.31	3.726E-02	238.63	43.300	2.605E-01	PB212
295.25	68.	38.42	1.04	3.113E-02	295.22	19.300	PBC<MDA	PB214
338.25	38.	0.33	1.07	2.772E-02	338.28	2.790	1.569E+00	RA223
511.02	945.	5.33	2.38	1.941E-02				
598.49	154.	25.28	0.27	1.689E-02				
609.45	64.	35.63	1.28	1.662E-02	609.31	46.090	PBC<MDA	BI214
898.43	68.	24.98	0.28	1.175E-02				
1461.18	53.	25.04	1.84	7.527E-03	1460.83	10.670	1.526E+00	K40

********** U N I D E N T I F I E D P E A K S U M M A R Y **********

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 2 Sigma %	FWHM keV	Suspected Nuclide	
103.30	25.85	1327.	439.	0.010	25.33	0.977	CD-109	s
117.99	29.52	678.	518.	0.012	19.94	1.107	TE-132	l
742.34	185.64	388.	683.	0.016	15.00	0.995	U-235	l
2043.55	511.02	222.	945.	0.022	10.66	2.376	TL-208	s
2393.36	598.49	198.	154.	0.004	50.56	0.267	-	sM
3592.89	898.43	49.	68.	0.002	49.96	0.284	PA-234	s

ORTEC g v - i (3135) Env32 G53W4.21 22-NOV-2007 08:20:03 Page 3
STL- St Louis Spectrum name: Ge8 background 11_21_07.An1

s - Peak fails shape tests.
D - Peak area deconvoluted.

Ge8 background 11_21_07.Rpt

L - Peak written from unknown list.
C - Area < Critical level.
M - Peak is close to a library peak.

This section based on library: long bkgd_pbc.lib

********** I D E N T I F I E D P E A K S U M M A R Y **********

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 2 Sigma %	FWHM keV
I-129	119.04	29.78	1112.	348.	0.008	0.09	0.812D
TH-234	252.37	63.12	262.	715.	0.017	10.84	0.876
RA-223	337.73	84.47	568.	111.	0.003	63.59	0.858s
TH-234	369.72	92.47	715.	1398.	0.032	10.68	1.100s
U-235	574.85	143.76	431.	140.	0.003	45.31	1.085D
RA-223	576.73	144.23	414.	22.	0.001	0.55	0.910D
Ra-226	744.60	186.21	403.	563.	0.013	13.14	0.946D
PB-212	953.86	238.54	176.	182.	0.004	29.92	1.309s
PB-214	1180.65	295.25	305.	68.	0.002	76.83	1.036s
AC-228	1352.89	338.32	315.	38.	0.001	0.67	1.071D
BI-214	2437.17	609.45	229.	64.	0.001	71.27	1.282s
K-40	5843.55	1461.18	61.	53.	0.001	50.07	1.843s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity Bq/sample	Peak Energy keV	Peak Activity Bq/sample	Peak Code	Peak MDA Value Bq/sample	COMMENTS
Be-7	C	-2.4489E-01					
			477.61	-2.449E-01	%(	7.495E-01 9.17E+01	G
			1 of 1 peaks found				
K-40	N	1.5256E+00					
			1460.83	1.526E+00	@(	1.130E+00 2.50E+01	G
			1 of 1 peaks found				
CO-60	F	-1.7283E-03					
			1332.50	-1.728E-03	&(	1.225E-01 2.02E+03	G
			1173.24	-2.257E-02	%	1.247E-01 1.62E+02	G
			2 of 2 peaks found				
I-129	I	2.8897E-01					
			29.78	2.890E-01	}	1.314E-01 4.30E-02	X
			33.61	1.305E-01	%	4.324E-01 9.98E+01	X

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ORTEC g v - i (3135) Env32 G53W4.21 22-NOV-2007 08:20:03 Page 4
STL- St Louis Spectrum name: Ge8 background 11_21_07.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak MDA	Comments
		39.57	2.890E-01	%(	4.905E-01 5.17E+01	G
		34.61	6.433E-01	&	1.630E+00 7.66E+01	X
		4 of 5 peaks found				
CS-137	I	3.6626E-02				

```
                                Ge8 background 11_21_07.Rpt
                               661.66 3.663E-02 &(  1.022E-01 8.37E+01 G
                                  1 of   1 peaks found

TL-208    N   4.6043E-02
                               583.19 4.604E-02 &(  1.122E-01 7.35E+01 G
                               860.56 1.757E-01 %   7.705E-01 1.29E+02 G
                                  2 of   2 peaks found

PB-210    N   4.2338E-01
                                46.54 4.234E-01 %(  8.404E-01 6.03E+01 G
                                  1 of   1 peaks found

PB-212    N   2.6051E-01
                               238.63 2.605E-01  (  9.250E-02 1.50E+01 G
                               300.10 5.416E-01 %   1.886E+00 1.04E+02 G
                                  2 of   2 peaks found

PB-214    N   1.5095E-01
                               351.93 9.453E-02 %(  1.895E-01 6.09E+01 G
                               295.22 2.609E-01 *(  3.237E-01 3.84E+01 G
                               242.00 2.345E-01 %   7.541E-01 9.65E+01 G
                                  3 of   3 peaks found

BI-214    N   1.9362E-01
                               609.31 1.936E-01 *(  2.211E-01 3.56E+01 G
                              1764.49 4.167E-01 %   7.719E-01 5.68E+01 G
                              1120.29 1.241E-01 %   7.957E-01 1.88E+02 G
                               768.36-3.096E-01 &   1.899E+00 1.80E+02 G
                                  4 of   4 peaks found

RA-223    N   2.7553E-01
                                83.79 1.448E-01 *   1.483E-01 3.18E+01 X
                               269.46-8.982E-02 &(  4.789E-01 1.59E+02 G
                               154.21 2.897E-02 &   7.497E-01 7.65E+02 G
                               144.23 2.755E-01 }   1.244E+00 2.77E-01 G
                               323.87 1.690E-02 %   1.742E+00 3.03E+03 G
                                  5 of   6 peaks found

RA-224    N  -7.0362E-02
                               240.99-7.036E-02 &(  1.628E+00 6.86E+02 G
                                  1 of   1 peaks found

AC-228    N   2.7845E-01
                               911.20 2.784E-01 %(  4.056E-01 4.51E+01 G
                               968.97 3.615E-01 %   6.834E-01 5.76E+01 G
                               338.32 2.784E-01 }   6.330E-01 3.34E-01 G
                                  3 of   3 peaks found

TH-234    N   4.6861E+00
                                63.29 4.686E+00  (  5.121E-01 5.42E+00 G
                                92.59 8.402E+00 +   7.655E-01 5.34E+00 G
                                  2 of   2 peaks found
```

```
 ORTEC     g v - i (3135) Env32  G53W4.21  22-NOV-2007 08:20:03 Page    5
STL- St Louis                   Spectrum name: Ge8 background 11_21_07.An1

 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

U-235     N   1.2819E-01
                               185.71 5.276E-02 }(  1.331E-01 7.63E+01 G
                               143.76 5.218E-01 }(  3.715E-01 2.27E+01 G
                                  2 of   4 peaks found
```

Page 4

Ge8 background 11_21_07.Rpt

```
Ra-226   N   7.9373E+00
                          186.21 7.937E+00 }(  1.356E+00 6.57E+00 G
                             1 of   1 peaks found

AM-241   T  -7.7932E-03
                          59.54-7.793E-03 &(  9.695E-02 3.70E+02 G
                             1 of   1 peaks found
```

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
\+ - Peak activity higher than counting uncertainty range.
\- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:	Peak Codes:
T - Thermal Neutron Activation	G - Gamma Ray
F - Fast Neutron Activation	X - X-Ray
I - Fission Product	P - Positron Decay
N - Naturally Occurring Isotope	S - Single-Escape
P - Photon Reaction	D - Double-Escape
C - Charged Particle Reaction	K - Key Line
M - No MDA Calculation	A - Not in Average
R - Coincidence Corrected	C - Coincidence Peak
H - Halflife limit exceeded	

- -

********** D I S C A R D E D I S O T O P E P E A K S **********

Nuclide	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 2 Sigma %	Activity
I-129	29.78	1112.	348.	0.008	0.09	2.890E-01
RA-223	84.47	568.	111.	0.003	63.59	1.448E-01
RA-223	144.23	414.	22.	0.001	0.55	2.755E-01
PB-214	295.25	305.	68.	0.002	76.83	2.609E-01
BI-214	609.45	229.	64.	0.001	71.27	1.936E-01

ORTEC g v - i (3135) Env32 G53W4.21 22-NOV-2007 08:20:03 Page 6
STL- St Louis Spectrum name: Ge8 background 11_21_07.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
K-40		1461.18	61.	53.	0.001	50.07	1.526E+00

P - Peakbackground subtraction

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide	Time of Count Activity Bq/sample	Uncertainty 2 Sigma Counting	MDA Bq/sample

Ge8 background 11_21_07.Rpt

Be-7	#A	-2.4489E-01	1.8340E+02%	7.495E-01
K-40	#	1.5256E+00	5.0072E+01%	1.130E+00
CO-60	#A	-1.7283E-03	4.0408E+03%	1.225E-01
I-129	#A	2.8897E-01	1.0349E+02%	4.905E-01
CS-137	#A	3.6626E-02	1.6736E+02%	1.022E-01
TL-208	#A	4.6043E-02	1.4698E+02%	1.122E-01
PB-210	#A	4.2338E-01	1.2054E+02%	8.404E-01
PB-212		2.6051E-01	2.9920E+01%	9.250E-02
PB-214	#A	1.5095E-01	7.1988E+01%	1.895E-01
BI-214	#A	1.9362E-01	7.1268E+01%	2.211E-01
RA-223	#A	2.7553E-01	4.3437E+01%	4.789E-01
RA-224	#A	-7.0362E-02	1.3722E+03%	1.628E+00
AC-228	#A	2.7845E-01	9.0216E+01%	4.056E-01
TH-234		4.6861E+00	1.0837E+01%	5.121E-01
U-235	#A	1.2819E-01	4.5306E+01%	1.021E+00
Ra-226		7.9373E+00	1.4531E+01%	1.356E+00
AM-241	#A	-7.7932E-03	7.3956E+02%	9.695E-02

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (22.5 to 2000.3 keV) 1.301E+01 Bq/sample

Analyzed by: _____
403605

Reviewed by: _____
Supervisor

Laboratory: STL- St Louis

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Run Log

Logbook No.: 3021

TESTAMERICA
St. Louis

Gamma Counting Runlog

Date	Batch #	Sample #	Detector	Count Time	Geometry	Initials
12/22/7	7353501	KEGTHIAA	8	2 hrs	1L Mar	e
		KEIFMWICA	7			
		KEIFMWICJ	8			
12/23/7	Daily	Blg + Source	1,3-8	20+3 min	QA	e
12/23/7	7357010	KEKAMIAC	4	30 min	tumacon	
		KEKAWIAC	5			
		KEKAZIAC	7			
12/23/07	7357010	KEKAMIAD	1	30min	Tumacon	LW
		KEKAYIAC	3			
		KEKATIAC	4			
		KEKA9IAC	5			
		KEKCCIAC	7			
		KEKCDIAC	1			
		KEKCEIAC	3			
		KEKCFIAC	4			
		KEKCHIAC	5			
		KEKCJIAC	7			
		KEKCKIAC	1			
		KEKCMIAC	3			
		KEKCPIAC	4			
		KEKCQIAC	5			
		KEKCRIAC	7			
		KEQKRIAA	1			e
		KEQKRIAC	3			
	7352122	KEKFEIAC	4			
		KEKFFIAC	5			
		KEKFGIAC	7			

Reviewed By: _____ Date: 12/23/7

SOP Reference: STL-RD-0101 Rev 9 07/12/07
Form No.: SL-RAD-0026, Revised 7/20/06

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.: 3021

TESTAMERICA
St. Louis

Gamma Counting Runlog

Date	Batch #	Sample #	Detector	Count Time	Geometry	Initials
12/23/7	7356122	KSKF51AD	1	30min	tumacan	[illegible]
		KSKFP1AC	3			
		KSKFT1AC	4			
		KSKV1AC	5			
		KSKF01AC	7			
		KSKF11AC	1			
		KSKF51AC	3			
		KSKF71AC	4			
		KSKF81AC	5			
		KSKF91AC	7			
		KSKG01AC	1			
		KSKGF1AC	3			
		KSKGG1AC	4			
		KSQKC1AA	5			
		KSQKC1AC	7			
12/20/7	Daily	Pbkg + Source	1,3-8	20+30min	CNA	SE
	7339395	KC6QE1AD	1	30min	tumacan	
		KC6QL1AD	3			
		KDCLL1AA	4			
		KDCLL1AC	5			
	M070859	1L0307-1	7			

Reviewed By:_____ Date:_____

QC Type Suffixes: B=Blank; C=Laboratory Control Sample; L=Laboratory Control Sample Duplicate; S=Matrix Spike; D=Matrix Spike Duplicate; X=Sample Duplicate.

CS137 1/4/08

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Prep Report for Gamma Spectroscopy

Batch: 7357010 **Prep Analyst:** 403135

SampID	WRKNO	Aliquot	Dilution	Adjusted Aliquot	GeometryDesc
F7L200251-001	KEKAM1AC	3.8580E+002 g	1.00	3.8580E+002 g	Tuna Can
F7L200251-001X	KEKAM1AD	3.8580E+002 g	1.00	3.8580E+002 g	Tuna Can
F7L200251-002	KEKAW1AC	4.0140E+002 g	1.00	4.0140E+002 g	Tuna Can
F7L200251-003	KEKA21AC	3.7040E+002 g	1.00	3.7040E+002 g	Tuna Can
F7L200251-004	KEKA41AC	3.5170E+002 g	1.00	3.5170E+002 g	Tuna Can
F7L200251-005	KEKA71AC	3.5810E+002 g	1.00	3.5810E+002 g	Tuna Can
F7L200251-006	KEKA91AC	3.8710E+002 g	1.00	3.8710E+002 g	Tuna Can
F7L200251-007	KEKCC1AC	3.1130E+002 g	1.00	3.1130E+002 g	Tuna Can
F7L200251-008	KEKCD1AC	3.5500E+002 g	1.00	3.5500E+002 g	Tuna Can
F7L200251-009	KEKCE1AC	3.8750E+002 g	1.00	3.8750E+002 g	Tuna Can
F7L200251-010	KEKCF1AC	3.4140E+002 g	1.00	3.4140E+002 g	Tuna Can
F7L200251-011	KEKCH1AC	3.1610E+002 g	1.00	3.1610E+002 g	Tuna Can
F7L200251-012	KEKCJ1AC	3.1540E+002 g	1.00	3.1540E+002 g	Tuna Can
F7L200251-013	KEKCK1AC	3.6150E+002 g	1.00	3.6150E+002 g	Tuna Can
F7L200251-014	KEKCM1AC	3.5680E+002 g	1.00	3.5680E+002 g	Tuna Can
F7L200251-015	KEKCP1AC	3.4770E+002 g	1.00	3.4770E+002 g	Tuna Can
F7L200251-016	KEKCQ1AC	3.2100E+002 g	1.00	3.2100E+002 g	Tuna Can

SampID	WRKNO	Aliquot	Dilution	Adjusted Aliquot	GeometryDesc
F7L200251-017	KEKCR1AC	3.2320E+002 g	1.00	3.2320E+002 g	Tuna Can
F7L230000-010B	KEQKR1AA	3.7280E+002 g	1.00	3.7280E+002 g	Tuna Can
F7L230000-010C	KEQKR1AC	3.5120E+002 g	1.00	3.5120E+002 g	Tuna Can

Spike Information

Sample ID	Standard ID	Analyte	Std Conc	Aliquot	Ref Date	StdAdded
F7L230000-010C	GV Tuna Can	AM-241	2.289E+002 dpm/g	351.20 g	4/1/2004 12:00:00AM	1.031E+002 pCi/g
F7L230000-010C	GV Tuna Can	CO-60	1.392E+002 dpm/g	351.20 g	4/1/2004 12:00:00AM	6.272E+001 pCi/g
F7L230000-010C	GV Tuna Can	CS-137	8.884E+001 dpm/g	351.20 g	4/1/2004 12:00:00AM	4.002E+001 pCi/g

Spiked By | Spike Verified By | Spike Date

Standard Operating Procedures

SOPNumber	Title	Revision
☐ STL-RC-0025	Preparation Of Samples For Gamma Spectroscopy	4.00
☐ STL-RD-0101	Daily Operations Of A Germanium Spectroscopy System	6.00
☐ STL-RD-0103	Maintenance Of The Germanium Spectroscopy System	0.00

Reviewed By: 12/27/07 (Review Date)

Analyst/Relenquished By: 12/23/07 (Release Date)

Received By: 12/23/7 (Receipt Date)

DB Analysis ID: 32,959

Sample Description: 7357010_KEKAM1AC_F7L200251-001

Spectrum Filename: KEKAM1AC.An1

Acquisition Information

Start Time:	23-Dec-2007 12:21:31PM		
Live Time:	1800.00	Real Time:	1804.88
Dead Time:	0.27 %		
Detector ID:	4		

Detector System: Ge 4 SN/181

Calibration

Description:	Ge4_TunaCanCal_74139_334_05_15_07		
Filename:	C:\User\Calibrations\Ge4 Post 09_07_07(Ge6)\Ge4_TunaCanCal_74139_334_05_15_		
Energy Created:	08-May-2007 1:28:13PM	Efficiency Created:	15-May-2007 10:05:02AM
Zero Offset:	0.017 keV	Gain:	0.250 keV/Channel

Library 1 File: mmr06 short.lib Library based peak stripping used.
Library 2 File: Null.Lib
Library 3 File: Null.Lib

Analysis Parameters

Start Channel:	150 for an energy of 37.53 keV
Stop Channel:	8,000 for an energy of 1998.47 keV
Peak rejection level:	40.000 %
Activity Scaling Factor:	1.0000 / 1.0000 = 1.0000
Detection Limit Method:	Nureg method 4.16
Sample Size:	1.00E+000
Additional random error:	0.0000
Additional systematic error:	0.0000
Fraction Limit:	0.0000%
Background Width:	Average of three points

Corrections	Status	Comments
Decay Correct to Date:	YES	23-Dec-2007 12:00:00PM
Decay During Acquisition:	NO	
Peaked Background Correction:	YES	Ge4 PBC table 11_26_07.Pbc
Absorption:	NO	
Geometry Correction:	NO	
Random Summing:	NO	

Energy Calibration Normalized Differe 0.2241

UNIDENTIFIED PEAK SUMMARY

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncertainty 1 Sigma%	FWHM keV	Suspected Nuclide	Code
187.76	46.98	153.13	23.87	0.013	76.12	0.463		s
298.93	74.78	374.00	307.00	0.171	13.59	0.583	PB-214	s
308.45	77.16	185.17	504.83	0.280	6.36	0.880	PB-214	
336.37	84.14	221.36	81.64	0.045	28.05	0.774	TA-182	s
348.54	87.19	375.35	30.65	0.017	91.21	1.238		s
359.73	89.99	154.01	143.99	0.080	14.76	0.660	PB-214	sM
516.36	129.16	256.77	126.23	0.070	20.04	0.523	AC-228	s
837.22	209.39	102.67	177.33	0.099	14.45	1.083	AC-228	s
2040.23	510.16	40.50	147.50	0.082	13.05	1.052	J-133	s

s = Peak fails shape tests.

D = Peak area deconvoluted.

IDENTIFIED PEAK SUMMARY

Nuclide	Library Used	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncertainty 1 Sigma%	FWHM keV	Code
PB-210	1	186.08	46.56	202.49	15.67	0.009	54.82	0.819	s
AM-241	1	237.99	59.54	326.67	-11.72	-0.007	220.03	0.830	s
TH-234	1	252.60	63.19	226.03	84.97	0.047	28.02	1.140	s
EU-155	1	348.67	87.22	326.83	180.36	0.100	16.01	0.854	s
TH-234	1	370.14	92.59	460.34	-22.84	-0.013	2424.09	0.859	D
AC-228	1	373.18	93.35	187.88	179.02	0.099	1.90	0.860	D
U-235	1	373.18	93.35	276.96	5.68	0.003	57.39	0.860	s D
EU-155	1	421.46	105.43	230.07	39.15	0.022	57.08	0.871	s
EU-152	1	487.69	121.99	253.18	-8.32	-0.005	272.61	0.885	s
EU-154	1	490.33	122.65	226.16	1.71	0.001	1248.73	0.886	s
Pa-234	1	523.19	130.87	267.63	-1.56	-0.001	1481.85	0.894	s
U-235	1	576.30	144.15	224.00	10.73	0.006	199.70	0.904	
U-235	1	653.76	163.52	213.18	1.92	0.001	1077.30	0.922	s
U-235	1	823.71	206.02	169.72	1.78	0.001	1036.86	0.958	s
PB-212	1	954.15	238.63	80.62	1039.88	0.578	3.29	0.986	D
RA-224	1	963.56	240.99	166.75	97.25	0.054	21.34	0.988	D
PB-214	1	967.61	242.00	152.00	63.00	0.035	30.41	0.989	D
TL-208	1	1106.88	276.82	72.00	104.00	0.058	21.50	0.988	s
I-131	1	1130.37	282.70	78.62	-16.33	-0.009	80.66	1.025	
PB-214	1	1179.60	295.00	51.04	133.96	0.074	12.68	1.191	
PB-212	1	1199.59	300.00	79.33	108.67	0.060	21.74	1.089	
AC-228	1	1351.64	338.02	56.33	223.67	0.124	10.24	0.942	
EU-152	1	1373.90	343.58	37.18	9.83	0.005	93.38	1.076	s
PB-214	1	1406.07	351.63	76.74	223.26	0.124	11.52	1.116	s
I-131	1	1457.50	364.48	89.24	0.00	0.000	1335.95	1.092	s
BE-7	1	1911.68	478.02	69.24	-4.91	-0.003	243.69	1.185	s
CS-134	1	2250.50	562.71	35.45	13.35	0.007	68.75	1.254	s
CS-134	1	2276.94	569.32	69.01	0.00	0.000	848.53	1.259	s D
Pa-234	1	2277.54	569.47	58.00	-0.23	0.000	-209.58	1.259	s D
TL-208	1	2330.84	582.79	28.18	337.82	0.188	6.80	1.137	
CS-134	1	2432.18	608.12	41.76	3.60	0.002	259.12	1.286	s
BI-214	1	2435.23	608.88	22.58	184.42	0.102	8.86	1.331	s
I-131	1	2548.56	637.21	38.88	-1.98	-0.001	450.38	1.312	s
CS-137	1	2645.97	661.55	40.38	3.46	0.002	265.32	1.331	s
EU-154	1	2892.09	723.06	79.98	-10.56	-0.006	123.64	1.378	s
BI-212	1	2907.37	726.87	33.78	58.82	0.033	19.11	1.381	s
PA-234M	1	3072.21	768.07	40.07	5.13	0.003	180.11	1.411	s
EU-152	1	3117.27	779.33	31.36	-0.51	0.000	1560.55	1.420	s
BI-212	1	3141.76	785.45	17.50	13.71	0.008	50.91	1.425	s
CS-134	1	3187.74	796.94	38.98	-4.89	-0.003	186.17	1.433	s
CS-134	1	3207.81	801.95	51.08	0.00	0.000	1010.70	1.437	s
TL-208	1	3440.83	860.17	2.67	34.33	0.019	19.34	0.485	s
EU-154	1	3489.71	872.38	31.01	-5.21	-0.003	157.27	1.490	s
Pa-234	1	3521.12	880.23	20.61	0.15	0.000	4321.70	1.495	s
Pa-234	1	3537.75	884.39	23.72	-3.97	-0.002	180.75	1.497	s

AC-228	1	3643.74	910.87	6.67	203.33	0.113	7.49	0.920	s
Pa-234	1	3779.41	944.76	19.13	1.07	0.001	586.10	1.543	s
EU-152	1	3860.72	965.07	103.19	1.99	0.001	726.07	1.556	s
AC-228	1	3874.67	968.56	6.00	154.00	0.086	9.09	0.969	s
EU-154	1	4003.14	1000.65	8.08	4.60	0.003	99.00	1.579	s
PA-234M	1	4004.36	1000.96	20.29	3.10	0.002	212.94	1.582	s
EU-154	1	4019.64	1004.77	37.00	0.00	0.000	860.23	1.585	s
EU-152	1	4444.85	1110.99	22.32	1.06	0.001	639.28	1.659	s
BI-214	1	4477.76	1119.21	4.65	55.35	0.031	12.91	0.520	s
CO-60	1	4689.65	1172.13	21.59	-4.98	-0.003	139.47	1.701	s
EU-154	1	5103.59	1275.51	21.70	1.23	0.001	542.36	1.768	s
CO-60	1	5320.53	1329.68	14.82	-0.66	0.000	828.19	1.806	s
EU-152	1	5633.55	1407.84	9.45	5.13	0.003	95.64	1.854	s
K-40	1	5843.61	1460.28	2.83	231.17	0.128	6.54	1.748	
BI-214	1	7062.19	1764.46	9.07	12.31	0.007	44.82	2.066	s

s = Peak fails shape tests.

D = Peak area deconvoluted.

A = Derived Aveage Activity.

SUMMARY OF LIBRARY PEAK USAGE

Nuclide Name	Nuclide Code	Library Used	Average Activity Becquerels	Peak Energy keV	Peak Activity Becquerels	Peak Analysis Code	Peak MDA Value Becquerels	Peak Code	Peak Comments	
EU-155	T F I	1	7.197E+000	105.31	2.992E+000	* (	5.610E+000G		1.8E+003	21.20
			7.197E+000	86.54	1.010E+001	* (	4.870E+000G		1.8E+003	30.70
AM-241	T	1	-7.196E-001	59.54	-7.196E-001	& (	5.337E+000G		1.6E+005	35.90
CO-60	T F	1	-6.784E-002	1332.50	-6.784E-002	% (	2.108E+000G		1.9E+003	99.98
			-6.784E-002	1173.24	-4.562E-001	%	2.234E+000G		1.9E+003	99.90
PB-212	N	1	5.485E+001	238.63	5.485E+001	(P	2.350E+000G		7.0E+002	43.30
			5.485E+001	300.03	9.236E+001	+	3.758E+001G		7.0E+002	3.28
RA-224	N	1	5.461E+001	240.99	5.461E+001	(	3.532E+001G		7.0E+002	4.10
			5.375E+001	93.35	5.375E+001	- E	1.999E+001X	A	2.1E+003	5.56
AC-228	N	1	5.375E+001	911.07	5.202E+001	(	3.771E+000G		2.1E+003	29.00
			5.375E+001	968.97	6.887E+001	+	6.316E+000G		2.1E+003	17.46
			5.375E+001	338.32	5.792E+001	(	9.759E+000G		2.1E+003	12.01
TH-234	N	1	3.676E+001	63.29	3.676E+001	* (P	3.148E+001G		1.6E+012	4.82
			3.676E+001	92.59	-6.849E+000	% P	3.079E+001G		1.6E+012	5.58
BI-212	N	1	3.058E+001	727.33	3.058E+001	* (	1.549E+001G		7.0E+002	11.82
			3.058E+001	785.51	8.170E+001	%	1.323E+002G		7.0E+002	1.10
EU-154	T F I	1	-3.043E+000	873.23	-3.043E+000	% (	1.673E+001G		3.1E+003	12.27
			-3.043E+000	123.10	6.747E-002	&	2.878E+000G		3.1E+003	40.79
			-3.043E+000	1274.54	3.438E-001	%	6.816E+000G		3.1E+003	35.19
			-3.043E+000	723.36	-3.195E+000	%	1.343E+001G		3.1E+003	20.22
			-3.043E+000	1004.77	0.000E+000	%	1.388E+001G		3.1E+003	18.01
			-3.043E+000	996.33	3.470E+000	%	1.203E+001G		3.1E+003	10.60
PA-234	N	1	2.975E+001	1001.00	2.975E+001	% (	2.272E+002G		1.6E+012	.84
			2.975E+001	766.41	1.120E+002	&	7.036E+002G		1.6E+012	.29
K-40	N	1	2.395E+002	1460.83	2.395E+002	(P	1.093E+001G		4.7E+011	10.67
CS-137	T F I	1	2.302E-001	661.66	2.302E-001	% (	2.151E+000G		1.1E+004	85.21
BI-214	N	1	2.114E+001	609.31	2.114E+001	@ (P	2.849E+000G		5.8E+005	46.09
			2.114E+001	1120.29	3.230E+001	+ P	7.441E+000G		5.8E+005	15.10
			2.114E+001	1764.49	1.049E+001	%	1.427E+001G		5.8E+005	15.40
TL-208	F N	1	2.023E+001	583.02	2.032E+001	(P	1.652E+000G		7.0E+002	84.50
			2.023E+001	277.28	4.282E+001	+	1.740E+001G		7.0E+002	6.31
			2.023E+001	860.56	1.956E+001	(	5.879E+000G		7.0E+002	12.42
BE-7	N P C	1	-1.990E+000	477.60	-1.990E+000	% (	1.680E+001G		5.3E+001	10.52
CS-134	T F I	1	1.937E-001	604.71	1.937E-001	% (	1.765E+000G		7.5E+002	97.62
			1.937E-001	795.87	-3.789E-001	%	2.465E+000G		7.5E+002	85.53
			1.937E-001	569.32	0.000E+000	&)	1.069E+001G		7.5E+002	15.38
			1.937E-001	801.95	0.000E+000	&	2.765E+001G		7.5E+002	8.69
			1.937E-001	563.24	7.887E+000	%	1.799E+001G		7.5E+002	8.35
PB-214	N	1	1.917E+001	351.93	1.915E+001	(P	3.733E+000G		5.8E+005	37.60
			1.917E+001	295.09	1.906E+001	(P	5.123E+000G		5.8E+005	19.30
			1.917E+001	242.00	1.959E+001	(	1.871E+001G		5.8E+005	7.43
U-235	N	1	1.632E+000	143.79	1.632E+000	& (	1.103E+001G		2.6E+011	10.96
			1.632E+000	205.33	7.221E-001	%	2.571E+001G		2.6E+011	5.01
			1.632E+000	163.38	6.656E-001	&	2.451E+001G		2.6E+011	5.08

			1.632E+000	93.35	1.632E+000	%		E	2.306E+001X	2.6E+011	5.81
Pa-234	N	1	-1.414E-001	131.29	-1.414E-001	&	(		7.141E+000G	1.6E+012	18.00
			-1.414E-001	569.47	-1.414E-001	&			2.320E+001G	1.6E+012	8.20
			-1.414E-001	946.02	6.113E-001	%			1.319E+001G	1.6E+012	13.40
			-1.414E-001	883.24	-2.987E+000	%			1.913E+001G	1.6E+012	9.60
			-1.414E-001	880.53	1.789E-001	%			2.869E+001G	1.6E+012	6.00
PB-210	N	1	1.298E+001	46.54	1.298E+001	*	(	P	5.719E+001G	8.1E+003	4.25
			1.172E+000	1112.07	6.786E-001	%			1.587E+001G	4.9E+003	13.64
			1.172E+000	1408.00	2.612E+000	%			8.681E+000G	4.9E+003	21.00
EU-152	T F	1	1.172E+000	344.29	1.172E+000	&	(		3.712E+000G	4.9E+003	26.50
			1.172E+000	121.78	-4.692E-001	%			4.333E+000G	4.9E+003	28.58
			1.172E+000	778.92	-2.564E-001	%			1.449E+001G	4.9E+003	12.94
			1.172E+000	964.11	1.058E+000	%			2.664E+001G	4.9E+003	14.61
I-131	T F I	1	0.000E+000	364.48	0.000E+000	&	(		1.905E+000G	8.0E+000	81.70
			0.000E+000	284.30	-7.067E+000	&			1.905E+001G	8.0E+000	6.14
			0.000E+000	636.97	-1.518E+000	%			2.432E+001G	8.0E+000	7.17

Analysis Codes:

% = Peak fails sensitivity test
? = Peak is too narrow
- = Peak activity lower than counting uncertainty range
= = Peak outside analysis energy range
(= This peak is used in the nuclide activity average
P = Peakbackround subtraction
* = Peak is too wide, but only one peak in library
@ = Peak is too wide at FW25M, but OK at FWHM
A = Derived Average Activity
E = Energy Duplication
+ = Peak activity higher than counting uncertainty range
! = Peak is part of a multiplet and this area went negative during deconvolution
$ = Peak identified, but first peak of this nuclide failed one or more qualification tests
& = Calculated peak centroid is not close enough to the library energy centroid for positive identification

Nuclide Codes:

T = Thermal Neutron Activation
F = Fast Neutron Activation
I = Fission Product
P = Photon Reaction
N = Naturally Occurring Isotope
C = Charged Particle Reaction
M = No MDA Calculation

Peak Codes:

G = Gamma Ray
X = X-Ray
P = Positron Decay
S = Single - Escape
D = Double - Escape
K = Key Line
A = Not in Average

SUMMARY OF NUCLIDES IN SAMPLE

Nuclide		Time of Count Activity Bq/sample	Time Corrected Activity Bq/sample	Uncertainty Counts 1 Sigma %	Uncertainty Total 1 Sigma %	Minimum Detectable Activity
BE-7	<	-1.990E+000	-1.990E+000	243.69	243.71	1.680E+001
K-40		2.395E+002	2.395E+002	6.62	7.24	1.093E+001
CO-60	<	-6.784E-002	-6.784E-002	828.19	828.20	2.108E+000
I-131	<			1,335.95	1,335.96	1.905E+000
CS-134	<	1.937E-001	1.937E-001	259.12	259.14	1.765E+000
EU-154	<	-3.043E+000	-3.043E+000	157.27	157.29	1.673E+001
PB-210	<	1.298E+001	1.298E+001	127.64	127.70	5.719E+001
PB-212		5.485E+001	5.485E+001	3.32	4.47	2.350E+000
PB-214		1.917E+001	1.917E+001	11.70	12.05	3.733E+000
BI-212	<	3.058E+001	3.058E+001	19.11	19.33	1.549E+001
Pa-234	<	-1.414E-001	-1.414E-001	1,481.85	1,481.86	7.141E+000
TH-234	#	3.676E+001	3.676E+001	33.31	33.51	3.148E+001
CS-137	<	2.302E-001	2.302E-001	265.32	265.34	2.151E+000
EU-152	<	1.172E+000	1.172E+000	93.38	93.42	3.712E+000
EU-155	<	7.197E+000	7.197E+000	16.01	16.36	5.610E+000
TL-208		2.023E+001	2.023E+001	6.85	7.43	1.652E+000
RA-224		5.461E+001	5.462E+001	21.34	21.55	3.532E+001
BI-214		2.114E+001	2.114E+001	9.11	9.56	2.849E+000
AC-228		5.375E+001	5.375E+001	6.34	6.97	3.771E+000
PA-234M	<	2.975E+001	2.975E+001	212.94	212.96	2.272E+002
U-235	<	1.632E+000	1.632E+000	199.70	199.72	1.103E+001
AM-241	<	-7.196E-001	-7.196E-001	220.03	220.07	5.337E+000

= All peaks for activity calculation had bad shape

Total Activity (37.53 to 1,998.47 keV) 500.00 Bq/sample

Analyzed by: _____

403605

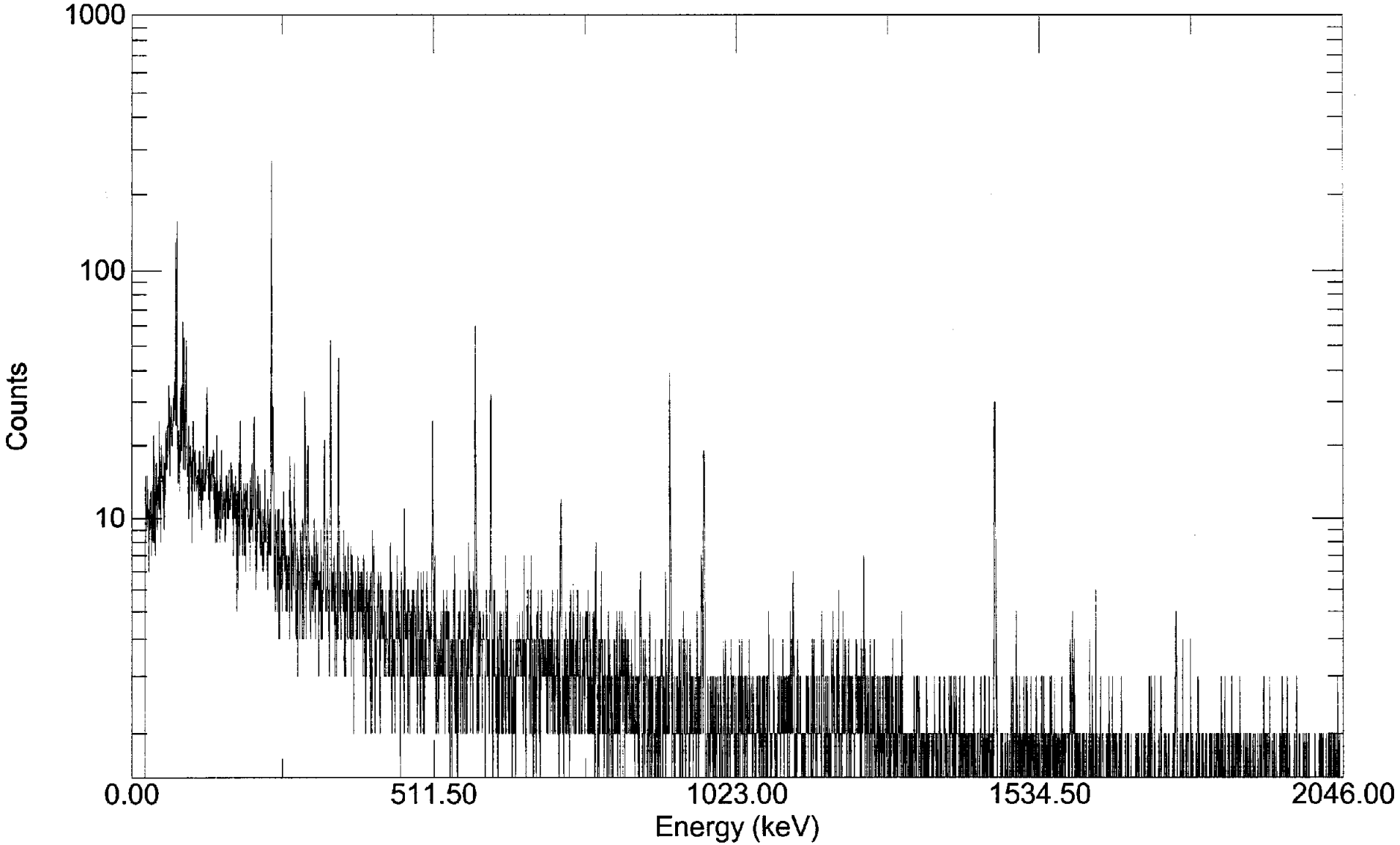
Reviewed by: _____

Supervisor

Laboratory: STL- St Louis

KEKAM1AC

7357010_KEKAM1AC_F7L200251-001



Acquired: 23-Dec-2007 12:21:31 PM
File: C:\User\spectra\KEKAM1AC.spc
Detector: #0 Ge 4 SN/181

Real Time: 1804.88 s. Live Time: 1800.00 s.
Channels: 8192

TestAmerica St. Louis

DB Analysis ID: 32,962

Sample Description: 7357010_KEKAM1AD_F7L200251-001X

Spectrum Filename: KEKAM1AD.An1

Acquisition Information

Start Time:	23-Dec-2007 1:03:38PM		
Live Time:	1800.00	Real Time:	1811.44
Dead Time:	0.63 %		
Detector ID:	1		

Detector System: Ge 1 SN/242

Calibration

Description:	Ge1 Tunacan 74139-334 1_15_07		
Filename:	C:\User\Calibrations\Ge1 calibrations\Ge1 Tunacan polynomial 01_15_07.Clb		
Energy Created:	15-Jan-2007 5:43:37PM	Efficiency Created:	15-Jan-2007 5:44:16PM
Zero Offset:	0.212 keV	Gain:	0.250 keV/Channel

Library 1 File: mmr06 short.lib Library based peak stripping used.
Library 2 File: Null.Lib
Library 3 File: Null.Lib

Analysis Parameters

Start Channel:	150 for an energy of 37.71 keV
Stop Channel:	8,000 for an energy of 1999.84 keV
Peak rejection level:	40.000 %
Activity Scaling Factor:	1.0000 / 1.0000 = 1.0000
Detection Limit Method:	Nureg method 4.16
Sample Size:	1.00E+000
Additional random error:	0.0000
Additional systematic error:	0.0000
Fraction Limit:	0.0000%
Background Width:	Average of three points

Corrections	Status	Comments
Decay Correct to Date:	YES	23-Dec-2007 12:00:00PM
Decay During Acquisition:	NO	
Peaked Background Correction:	YES	Ge1 PBC table 11_26_07.Pbc
Absorption:	NO	
Geometry Correction:	NO	
Random Summing:	NO	

Energy Calibration Normalized Differe 0.2340

UNIDENTIFIED PEAK SUMMARY

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncertainty 1 Sigma%	FWHM keV	Suspected Nuclide	Code
298.19	74.76	339.17	367.83	0.204	9.91	0.831	PB-214	
307.74	77.15	359.67	609.33	0.339	6.86	0.889	PB-214	
347.87	87.18	272.81	204.19	0.113	13.41	0.815	PB-214	
359.09	89.99	191.67	180.33	0.100	14.58	0.953	PB-214	M
514.16	128.76	215.00	114.00	0.063	20.46	0.591	AC-228	s
836.65	209.38	141.00	162.00	0.090	16.63	0.886	AC-228	
1077.99	269.72	140.00	150.00	0.083	20.48	1.167	AC-228	s
1308.98	327.46	65.00	162.00	0.090	13.92	0.962	AC-228	s
2041.50	510.58	70.00	248.00	0.138	10.87	1.018	TL-208	s
2435.12	608.98	260.65	27.35	0.015	85.66	1.242		
2751.14	687.98	8.67	28.33	0.016	26.36	0.601	AG-110M	s

s = Peak fails shape tests.

D = Peak area deconvoluted.

IDENTIFIED PEAK SUMMARY

Nuclide	Library Used	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncertainty 1 Sigma%	FWHM keV	Code
PB-210	1	184.75	46.40	240.89	14.96	0.008	48.66	0.813	s
AM-241	1	240.66	60.38	410.89	-12.32	-0.007	234.34	0.824	s
TH-234	1	251.39	63.06	394.23	81.77	0.045	31.85	0.896	
EU-155	1	345.31	86.54	597.38	-2.41	-0.001	1435.65	0.849	
TH-234	1	369.50	92.59	356.38	48.62	0.027	26.90	0.855	D
U-235	1	372.54	93.35	335.45	-0.48	0.000	-513.12	0.855	s D
AC-228	1	372.54	93.35	282.48	247.98	0.138	1.27	0.855	D
EU-155	1	421.56	105.61	329.57	36.53	0.020	72.19	0.866	s
EU-152	1	486.51	121.84	377.20	-20.46	-0.011	136.05	0.881	s
EU-154	1	495.12	124.00	309.81	-1.81	-0.001	1377.99	0.882	s
Pa-234	1	529.29	132.54	331.15	-3.11	-0.002	829.36	0.890	s
U-235	1	573.76	143.66	325.84	-0.88	0.000	890.06	0.901	s
U-235	1	651.54	163.10	240.92	2.99	0.002	367.76	0.919	s
U-235	1	819.60	205.12	240.51	-2.54	-0.001	5533.71	0.957	s
PB-212	1	953.66	238.63	120.81	1302.19	0.723	2.94	0.987	D
RA-224	1	963.07	240.99	192.12	139.88	0.078	16.37	0.989	D
PB-214	1	967.12	242.00	213.12	76.88	0.043	26.55	0.990	D
TL-208	1	1108.96	277.46	115.50	72.50	0.040	33.57	1.072	
I-131	1	1140.65	285.38	113.29	-1.08	-0.001	1397.82	1.028	s
PB-214	1	1179.62	295.12	108.21	166.79	0.093	14.35	0.950	
PB-212	1	1199.08	299.99	73.67	109.33	0.061	18.10	1.121	
AC-228	1	1352.04	338.23	91.91	327.09	0.182	8.73	1.085	s
EU-152	1	1371.45	343.08	90.19	5.72	0.003	238.43	1.081	
PB-214	1	1406.61	351.87	115.49	294.51	0.164	9.66	1.083	s
I-131	1	1444.91	361.44	34.00	24.40	0.014	39.40	1.099	s
BE-7	1	1911.55	478.10	62.09	14.62	0.008	80.57	1.198	s
CS-134	1	2247.16	561.99	59.16	0.03	0.000	38740.28	1.273	s
CS-134	1	2276.47	569.32	39.61	8.20	0.005	3.97	1.278	s D
Pa-234	1	2277.07	569.47	42.21	8.31	0.005	15.61	1.278	s D
TL-208	1	2331.59	583.10	46.25	470.75	0.262	5.48	0.915	s
CS-134	1	2418.04	604.71	533.39	-1.86	-0.001	1759.54	1.309	s
BI-214	1	2435.36	609.04	65.90	205.79	0.114	8.30	1.313	
I-131	1	2547.11	636.97	80.36	0.00	0.000	1267.78	1.337	s
CS-137	1	2652.29	663.27	59.03	-7.69	-0.004	145.82	1.358	s
EU-154	1	2888.24	722.25	81.12	-6.11	-0.003	212.36	1.411	
BI-212	1	2905.97	726.68	51.33	133.67	0.074	17.73	1.196	
PA-234M	1	3062.86	765.90	49.05	-4.55	-0.003	222.64	1.447	s
EU-152	1	3113.44	778.54	42.31	-0.24	0.000	3809.37	1.458	s
BI-212	1	3140.61	785.33	6.50	35.50	0.020	21.10	1.060	s
CS-134	1	3177.84	794.64	33.81	62.78	0.035	18.19	1.472	s
CS-134	1	3210.21	802.73	41.05	0.05	0.000	19911.74	1.477	s
TL-208	1	3439.84	860.13	11.33	99.67	0.055	13.28	0.386	s
EU-154	1	3491.81	873.12	34.62	0.08	0.000	10285.53	1.537	s
Pa-234	1	3519.68	880.09	33.30	-1.98	-0.001	417.42	1.543	s
Pa-234	1	3527.69	882.09	28.03	3.11	0.002	247.46	1.546	s

AC-228	1	3643.33	910.99	12.97	363.03	0.202	5.72	1.220	
Pa-234	1	3789.23	947.46	35.48	-0.51	0.000	1653.16	1.598	s
EU-152	1	3844.88	961.37	52.11	4.04	0.002	257.57	1.613	
AC-228	1	3871.75	968.09	20.75	255.25	0.142	7.52	1.905	
EU-154	1	3994.54	998.78	31.89	-1.62	-0.001	500.40	1.640	s
PA-234M	1	4000.21	1000.20	36.42	9.98	0.006	91.20	1.643	s
EU-154	1	4018.34	1004.73	36.06	7.60	0.004	117.44	1.647	s
EU-152	1	4451.25	1112.94	26.69	1.07	0.001	692.48	1.735	s
BI-214	1	4479.94	1120.11	37.93	44.41	0.025	21.34	1.741	s
CO-60	1	4675.06	1168.88	19.14	0.25	0.000	2439.53	1.784	s
EU-154	1	5105.94	1276.57	33.25	-1.41	-0.001	584.76	1.866	s
CO-60	1	5329.70	1332.50	42.11	-5.69	-0.003	166.75	1.912	s
EU-152	1	5630.21	1407.60	19.24	7.96	0.004	85.65	1.972	s
K-40	1	5841.65	1460.45	12.54	355.46	0.197	5.21	1.867	
BI-214	1	7057.67	1764.35	8.13	28.37	0.016	19.02	2.246	s

s = Peak fails shape tests.

D = Peak area deconvoluted.

A = Derived Aveage Activity.

SUMMARY OF LIBRARY PEAK USAGE

Nuclide Name	Nuclide Code	Library Used	Average Activity Becquerels	Peak Energy keV	Peak Activity Becquerels	Peak Analysis Code	Peak MDA Value Becquerels	Peak Code	Peak Comments	
PB-210	N	1	9.451E+000	46.54	9.451E+000	% (P	4.739E+001G		8.1E+003	4.25
			7.247E-001	284.30	-3.556E-001	%	1.723E+001G		8.0E+000	6.14
			7.247E-001	636.97	0.000E+000	%	2.254E+001G		8.0E+000	7.17
I-131	T F I	1	7.247E-001	364.48	7.247E-001	(	8.877E-001G		8.0E+000	81.70
RA-224	N	1	6.142E+001	240.99	6.142E+001	(	2.955E+001G		7.0E+002	4.10
AC-228	N	1	5.961E+001	911.07	5.839E+001	(P	3.135E+000G		2.1E+003	29.00
			5.961E+001	968.97	7.120E+001	+ P	6.677E+000G		2.1E+003	17.46
			5.961E+001	338.32	6.256E+001	@ (P	9.064E+000G		2.1E+003	12.01
			5.961E+001	93.35	5.961E+001	- E	1.948E+001X	A	2.1E+003	5.56
AM-241	T	1	-5.958E-001	59.54	-5.958E-001	% (	4.697E+000G		1.6E+005	35.90
PA-234	N	1	5.941E+001	1001.00	5.941E+001	& (	1.836E+002G		1.6E+012	.84
			5.941E+001	766.41	-6.400E+001	%	4.971E+002G		1.6E+012	.29
			5.378E+001	300.03	7.011E+001	+	2.739E+001G		7.0E+002	3.28
PB-212	N	1	5.378E+001	238.63	5.378E+001	(P	2.227E+000G		7.0E+002	43.30
EU-152	T F	1	5.024E-001	344.29	5.024E-001	% (	4.124E+000G		4.9E+003	26.50
			5.024E-001	121.78	-9.418E-001	%	4.291E+000G		4.9E+003	28.58
			5.024E-001	778.92	-7.815E-002	%	1.067E+001G		4.9E+003	12.94
			5.024E-001	964.11	1.342E+000	%	1.208E+001G		4.9E+003	14.61
			5.024E-001	1112.07	4.195E-001	&	1.054E+001G		4.9E+003	13.64
			5.024E-001	1408.00	2.424E+000	%	7.053E+000G		4.9E+003	21.00
BI-212	N	1	4.509E+001	727.33	4.509E+001	(	1.218E+001G		7.0E+002	11.82
			4.509E+001	785.51	1.358E+002	+	5.579E+001G		7.0E+002	1.10
BE-7	N P C	1	4.113E+000	477.60	4.113E+000	% (	1.109E+001G		5.3E+001	10.52
CO-60	T F	1	-3.490E-001	1332.50	-3.490E-001	% (	2.022E+000G		1.9E+003	99.98
			-3.490E-001	1173.24	1.422E-002	&	1.291E+000G		1.9E+003	99.90
			3.401E+000	569.47	3.401E+000	!	1.350E+001G		1.6E+012	8.20
			3.401E+000	946.02	-1.828E-001	%	1.089E+001G		1.6E+012	13.40
			3.401E+000	883.24	1.478E+000	&	1.302E+001G		1.6E+012	9.60
			3.401E+000	880.53	-1.506E+000	%	2.247E+001G		1.6E+012	6.00
Pa-234	N	1	3.401E+000	131.29	-2.302E-001	% (	6.478E+000G		1.6E+012	18.00
CS-137	T F I	1	-3.368E-001	661.66	-3.368E-001	% (	1.687E+000G		1.1E+004	85.21
EU-154	T F I	1	2.987E-002	873.23	2.987E-002	% (	1.112E+001G		3.1E+003	12.27
			2.987E-002	123.10	-5.843E-002	%	2.737E+000G		3.1E+003	40.79
			2.987E-002	1274.54	-2.377E-001	&	4.989E+000G		3.1E+003	35.19
			2.987E-002	723.36	-1.200E+000	%	8.776E+000G		3.1E+003	20.22
			2.987E-002	1004.77	2.109E+000	%	8.516E+000G		3.1E+003	18.01
			2.987E-002	996.33	-7.573E-001	%	1.360E+001G		3.1E+003	10.60
TH-234	N	1	2.780E+001	63.29	2.780E+001	% (P	3.238E+001G		1.6E+012	4.82
			2.780E+001	92.59	1.166E+001	% P	2.175E+001G		1.6E+012	5.58
EU-155	T F I	1	2.259E+000	105.31	2.259E+000	* (	5.400E+000G		1.8E+003	21.20
			2.259E+000	86.54	-1.073E-001	&	5.194E+000G		1.8E+003	30.70
K-40	N	1	2.194E+002	1460.83	2.194E+002	(P	1.186E+001G		4.7E+011	10.67
TL-208	F N	1	1.902E+001	583.02	1.902E+001	(P	1.390E+000G		7.0E+002	84.50
			1.902E+001	277.28	2.283E+001	+	1.662E+001G		7.0E+002	6.31

			1.902E+001	860.56	3.597E+001	+				6.640E+000G	7.0E+002	12.42
PB-214	N	1	1.837E+001	351.93	1.853E+001	@	(	P		3.320E+000G	5.8E+005	37.60
			1.837E+001	295.09	1.796E+001		(	P		5.511E+000G	5.8E+005	19.30
			1.837E+001	242.00	1.868E+001		(	P		1.719E+001G	5.8E+005	7.43
CS-134 T F I		1	1.789E+000	604.71	-6.667E-002	%	(			3.959E+000G	7.5E+002	97.62
			1.789E+000	795.87	3.116E+000	?	(			1.479E+000G	7.5E+002	85.53
			1.789E+000	569.32	1.789E+000	!				6.991E+000G	7.5E+002	15.38
			1.789E+000	801.95	2.235E-002	%				1.599E+001G	7.5E+002	8.69
			1.789E+000	563.24	1.120E-002	&				1.538E+001G	7.5E+002	8.35
BI-214	N	1	1.544E+001	609.31	1.572E+001		(	P		3.097E+000G	5.8E+005	46.09
			1.544E+001	1120.29	1.588E+001		(	P		1.123E+001G	5.8E+005	15.10
			1.544E+001	1764.49	1.415E+001	?	(	P		7.976E+000G	5.8E+005	15.40
U-235	N	1	-1.102E-001	143.79	-1.102E-001	%	(	P		1.082E+001G	2.6E+011	10.96
			-1.102E-001	205.33	-8.214E-001	%		P		2.428E+001G	2.6E+011	5.01
			-1.102E-001	163.38	8.441E-001	%		P		2.119E+001G	2.6E+011	5.08
			-1.102E-001	93.35	-1.102E-001	!			E	2.026E+001X	2.6E+011	5.81

Analysis Codes:

% = Peak fails sensitivity test

? = Peak is too narrow

- = Peak activity lower than counting uncertainty range

= = Peak outside analysis energy range

(= This peak is used in the nuclide activity average

P = Peakbackround subtraction

* = Peak is too wide, but only one peak in library

@ = Peak is too wide at FW25M, but OK at FWHM

A = Derived Average Activity

E = Energy Duplication

+ = Peak activity higher than counting uncertainty range

! = Peak is part of a multiplet and this area went negative during deconvolution

$ = Peak identified, but first peak of this nuclide failed one or more qualification tests

& = Calculated peak centroid is not close enough to the library energy centroid for positive identification

Nuclide Codes:

T = Thermal Neutron Activation

F = Fast Neutron Activation

I = Fission Product

P = Photon Reaction

N = Naturally Occurring Isotope

C = Charged Particle Reaction

M = No MDA Calculation

Peak Codes:

G = Gamma Ray

X = X-Ray

P = Positron Decay

S = Single - Escape

D = Double - Escape

K = Key Line

A = Not in Average

SUMMARY OF NUCLIDES IN SAMPLE

Nuclide		Time of Count Activity Bq/sample	Time Corrected Activity Bq/sample	Uncertainty Counts 1 Sigma %	Uncertainty Total 1 Sigma %	Minimum Detectable Activity
CS-134	<	1.789E+000	1.789E+000	18.19	18.42	3.959E+000
EU-154	<	2.987E-002	2.987E-002	10,285.53	10,285.53	1.112E+001
EU-155	<	2.259E+000	2.259E+000	72.19	72.27	5.400E+000
PB-214		1.837E+001	1.837E+001	10.05	10.45	3.320E+000
BI-212		4.509E+001	4.509E+001	17.73	17.96	1.218E+001
BI-214	<	1.544E+001	1.544E+001	8.77	9.24	3.097E+000
TH-234		2.780E+001	2.780E+001	46.23	46.37	3.238E+001
PA-234M	<	5.941E+001	5.941E+001	91.20	91.24	1.836E+002
BE-7	<	4.113E+000	4.115E+000	80.57	80.62	1.109E+001
K-40		2.194E+002	2.194E+002	5.40	6.14	1.186E+001
CO-60	<	-3.490E-001	-3.490E-001	166.75	166.77	2.022E+000
I-131	<	7.247E-001	7.275E-001	39.40	39.51	8.877E-001
CS-137	<	-3.368E-001	-3.368E-001	145.82	145.85	1.687E+000
EU-152	<	5.024E-001	5.024E-001	238.43	238.45	4.124E+000
TL-208		1.902E+001	1.902E+001	5.58	6.29	1.390E+000
RA-224		6.142E+001	6.143E+001	16.37	16.64	2.955E+001
PB-210	<	9.451E+000	9.451E+000	144.47	144.52	4.739E+001
PB-212		5.378E+001	5.379E+001	2.99	4.23	2.227E+000
AC-228		5.961E+001	5.961E+001	5.29	6.02	3.135E+000
Pa-234	<	3.401E+000	3.401E+000	38.13	38.25	6.478E+000
U-235	<	-1.102E-001	-1.102E-001	4,655.27	4,655.27	1.082E+001
AM-241	<	-5.958E-001	-5.958E-001	234.34	234.37	4.697E+000

= All peaks for activity calculation had bad shape

Total Activity (37.71 to 1,999.84 keV) 476.66 Bq/sample

Analyzed by: _____

403293

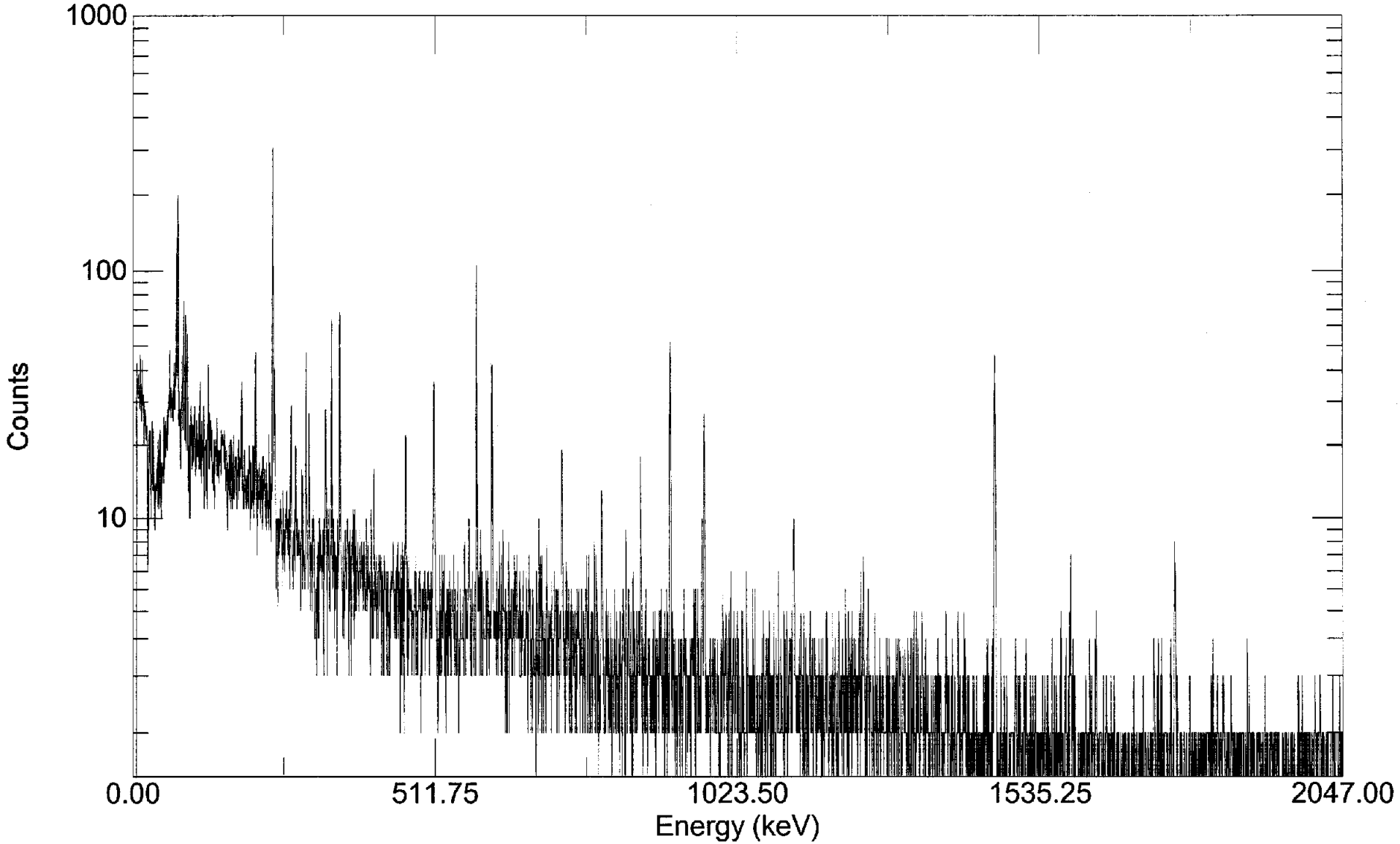
Reviewed by: _____

Supervisor

Laboratory: Test America

KEKAM1AD

7357010_KEKAM1AD_F7L200251-001X



Acquired: 23-Dec-2007 1:03:38 PM
File: C:\User\spectra\KEKAM1AD.spc
Detector: #0 Ge 1 SN/242

Real Time: 1811.44 s. Live Time: 1800.00 s.
Channels: 8192

DB Analysis ID: 32,961

Sample Description: 7357010_KEKAW1AC_F7L200251-002

Spectrum Filename: KEKAW1AC.An1

Acquisition Information

Start Time:	23-Dec-2007 12:22:21PM		
Live Time:	1800.00	Real Time:	1850.56
Dead Time:	2.73 %		
Detector ID:	5		

Detector System: Ge 5 SN/157

Calibration

Description:	Ge5 TunaCanCal_74139-334_05_08_07		
Filename:	C:\User\Calibrations\Ge5 calibrations\Ge5 TunaCanCal_74139-334_05_08_07.Clb		
Energy Created:	28-Mar-2007 6:08:23PM	Efficiency Created:	08-May-2007 3:55:34PM
Zero Offset:	0.272 keV	Gain:	0.250 keV/Channel

Library 1 File: mmr06 short.lib Library based peak stripping used.
Library 2 File: Null.Lib
Library 3 File: Null.Lib

Analysis Parameters

Start Channel:	150 for an energy of 37.74 keV
Stop Channel:	8,000 for an energy of 2000.57 keV
Peak rejection level:	40.000 %
Activity Scaling Factor:	1.0000 / 1.0000 = 1.0000
Detection Limit Method:	Nureg method 4.16
Sample Size:	1.00E+000
Additional random error:	0.0000
Additional systematic error:	0.0000
Fraction Limit:	0.0000%
Background Width:	Average of three points

Corrections

	Status	Comments
Decay Correct to Date:	YES	23-Dec-2007 12:00:00PM
Decay During Acquisition:	NO	
Peaked Background Correction:	YES	Ge5 PBC table 11 26 07.Pbc
Absorption:	NO	
Geometry Correction:	NO	
Random Summing:	NO	

Energy Calibration Normalized Difference: 0.0878

UNIDENTIFIED PEAK SUMMARY

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncertainty 1 Sigma%	FWHM keV	Suspected Nuclide	Code
297.48	74.58	219.00	170.00	0.094	19.02	1.020	BI-207	s
307.05	76.97	209.00	229.00	0.127	14.48	0.912	PB-214	
334.81	83.91	88.00	69.00	0.038	22.68	0.794	TA-182	s
347.39	87.05	205.46	24.54	0.014	85.04	1.079		s
358.19	89.75	63.00	63.00	0.035	21.82	0.884	PB-214	
369.40	92.73	114.75	76.25	0.042	22.93	0.795	TH-234	D
839.27	209.94	63.33	57.67	0.032	31.10	0.740	NP-239	s
1180.77	295.26	134.73	14.27	0.008	118.07	1.099		
1310.58	327.70	48.33	66.67	0.037	28.01	0.800	AC-228	s
1407.69	351.96	146.72	7.28	0.004	238.22	1.100		

s = Peak fails shape tests.

D = Peak area deconvoluted.

IDENTIFIED PEAK SUMMARY

Nuclide	Library Used	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncertainty 1 Sigma%	FWHM keV	Code
PB-210	1	185.58	46.63	110.67	5.44	0.003	63.77	0.749	s
AM-241	1	235.81	59.18	169.89	-14.94	-0.008	159.75	0.761	s
TH-234	1	251.80	63.17	192.65	20.17	0.011	57.62	0.764	
EU-155	1	347.51	87.08	185.61	84.13	0.047	25.36	0.788	s
TH-234	1	369.59	92.60	181.02	60.42	0.034	24.00	0.795	s
AC-228	1	372.61	93.35	-52.49	91.49	0.051	2.30	0.795	D
U-235	1	372.61	93.35	164.74	4.71	0.003	42.33	0.795	s D
EU-155	1	416.83	104.40	137.85	14.19	0.008	119.99	0.808	s
EU-152	1	488.10	122.20	143.71	-9.14	-0.005	188.42	0.824	s
EU-154	1	491.69	123.10	152.34	-1.17	-0.001	1491.24	0.826	s
Pa-234	1	529.22	132.48	90.60	3.08	0.002	441.34	0.834	s
U-235	1	572.27	143.23	88.76	8.91	0.005	119.07	0.847	s
U-235	1	653.64	163.56	93.96	0.35	0.000	582.42	0.867	s
U-235	1	812.29	203.20	44.60	1.15	0.001	824.26	0.909	s
PB-212	1	954.12	238.63	120.48	398.52	0.221	7.55	0.804	
RA-224	1	958.88	239.82	412.08	-118.58	-0.066	25.89	0.944	
PB-214	1	971.46	242.96	109.19	-0.02	0.000	68462.47	0.945	
TL-208	1	1109.10	277.35	57.80	17.56	0.010	65.71	0.980	s
I-131	1	1135.41	283.93	55.97	-10.18	-0.006	108.60	0.987	s
PB-214	1	1180.53	295.20	42.84	108.15	0.060	12.49	0.998	
PB-212	1	1199.18	299.86	26.67	54.33	0.030	23.99	0.555	s
AC-228	1	1353.03	338.30	50.17	85.57	0.048	15.93	1.040	
EU-152	1	1378.87	344.76	49.41	-4.16	-0.002	244.17	1.045	s
PB-214	1	1407.63	351.95	40.76	125.22	0.070	10.88	1.053	
I-131	1	1454.76	363.72	27.46	9.23	0.005	86.78	1.065	s
BE-7	1	1916.51	479.11	33.20	-4.99	-0.003	169.49	1.173	s
CS-134	1	2251.18	562.76	15.90	8.28	0.005	76.48	1.252	
CS-134	1	2277.45	569.32	26.02	-0.59	0.000	-38.43	1.258	s D
Pa-234	1	2278.05	569.47	25.86	0.46	0.000	118.89	1.258	s D
TL-208	1	2333.75	583.39	8.25	175.75	0.098	7.96	1.048	
CS-134	1	2417.27	604.27	25.92	-3.58	-0.002	208.00	1.290	s
BI-214	1	2437.76	609.39	14.40	102.60	0.057	11.07	1.477	
I-131	1	2546.66	636.61	32.13	-4.62	-0.003	179.62	1.319	s
CS-137	1	2646.89	661.66	67.57	-6.25	-0.003	1107.43	1.342	s
EU-154	1	2896.71	724.10	42.64	-6.13	-0.003	155.90	1.397	s
BI-212	1	2909.22	727.23	0.00	57.00	0.032	13.25	0.700	s
PA-234M	1	3065.58	766.32	28.36	0.09	0.000	8654.67	1.434	s
EU-152	1	3116.85	779.14	23.02	1.84	0.001	375.74	1.445	s
BI-212	1	3141.48	785.29	17.16	4.97	0.003	126.08	1.451	s
CS-134	1	3180.17	794.96	14.99	12.77	0.007	51.21	1.460	s
CS-134	1	3208.14	801.96	18.24	-0.67	0.000	908.68	1.465	s
TL-208	1	3441.84	860.38	12.90	5.20	0.003	107.08	1.516	s
EU-154	1	3492.37	873.01	18.99	-3.16	-0.002	202.76	1.527	s
Pa-234	1	3528.18	881.97	12.36	2.76	0.002	189.89	1.533	s
Pa-234	1	3544.95	886.16	15.51	-0.76	0.000	743.09	1.535	s
AC-228	1	3644.51	911.05	0.00	108.00	0.060	9.62	0.675	s

Pa-234	1	3773.78	943.37	18.81	0.40	0.000	1529.32	1.588	s
EU-152	1	3843.30	960.75	10.89	0.35	0.000	1352.08	1.603	s
AC-228	1	3875.83	968.88	0.00	63.00	0.035	12.60	0.719	s
EU-154	1	3984.85	996.15	24.26	-1.92	-0.001	370.64	1.630	s
PA-234M	1	4008.47	1002.05	14.09	8.37	0.005	72.24	1.633	s
EU-154	1	4020.75	1005.12	30.29	-4.48	-0.002	179.93	1.637	s
EU-152	1	4450.27	1112.52	27.83	-2.10	-0.001	361.52	1.723	s
BI-214	1	4479.94	1119.94	25.89	5.33	0.003	141.72	1.730	s
CO-60	1	4690.82	1172.68	23.44	2.01	0.001	348.21	1.772	s
EU-154	1	5096.96	1274.25	13.20	2.31	0.001	231.54	1.850	s
CO-60	1	5332.95	1333.28	13.49	0.34	0.000	1553.99	1.894	s
EU-152	1	5629.57	1407.47	15.62	-2.38	-0.001	243.52	1.950	s
K-40	1	5843.48	1460.98	0.00	253.00	0.141	6.29	2.076	
BI-214	1	7058.71	1765.01	5.23	19.82	0.011	24.61	2.196	

s = Peak fails shape tests.

D = Peak area deconvoluted.

A = Derived Aveage Activity.

SUMMARY OF LIBRARY PEAK USAGE

Nuclide Name	Nuclide Code	Library Used	Average Activity Becquerels	Peak Energy keV	Peak Activity Becquerels		Peak Analysis Code		Peak MDA Value Becquerels		Peak Code	Peak Comments	
AM-241	T	1	-8.498E-001	59.54	-8.498E-001	%	(	P	3.610E+000G			1.6E+005	35.90
PA-234M	N	1	7.653E+001	1001.00	7.653E+001	%	(		1.847E+002G			1.6E+012	.84
			7.653E+001	766.41	1.823E+000	&			5.763E+002G			1.6E+012	.29
RA-224	N	1	-6.403E+001	240.99	-6.403E+001	&	(		5.254E+001G			7.0E+002	4.10
			-4.762E-001	964.11	1.769E-001	%			9.195E+000G			4.9E+003	14.61
			-4.762E-001	1112.07	-1.284E+000	%			1.667E+001G			4.9E+003	13.64
			-4.762E-001	1408.00	-1.147E+000	%			1.017E+001G			4.9E+003	21.00
EU-152	T F	1	-4.762E-001	344.29	-4.762E-001	%	(		4.064E+000G			4.9E+003	26.50
			-4.762E-001	121.78	-4.994E-001	%			3.200E+000G			4.9E+003	28.58
			-4.762E-001	778.92	8.878E-001	&			1.208E+001G			4.9E+003	12.94
CS-137	T F I	1	-3.992E-001	661.66	-3.992E-001	&	(	P	2.619E+000G			1.1E+004	85.21
PB-210	N	1	3.991E+000	46.54	3.991E+000	*	(	P	3.799E+001G			8.1E+003	4.25
I-131	T F I	1	3.615E-001	364.48	3.615E-001	%	(		1.062E+000G			8.0E+000	81.70
			3.615E-001	284.30	-4.230E+000	%			1.562E+001G			8.0E+000	6.14
			3.615E-001	636.97	-3.395E+000	%			2.140E+001G			8.0E+000	7.17
CO-60	T F	1	3.249E-002	1332.50	3.249E-002	&	(		1.915E+000G			1.9E+003	99.98
			3.249E-002	1173.24	1.749E-001	%			2.202E+000G			1.9E+003	99.90
BI-212	N	1	2.842E+001	727.33	2.842E+001		(		3.674E+000G			7.0E+002	11.82
			2.842E+001	785.51	2.839E+001	%			1.257E+002G			7.0E+002	1.10
Pa-234	N	1	2.694E-001	131.29	2.694E-001	%	(		4.122E+000G			1.6E+012	18.00
			2.694E-001	569.47	2.694E-001	%			1.540E+001G			1.6E+012	8.20
			2.694E-001	946.02	2.200E-001	&			1.251E+001G			1.6E+012	13.40
			2.694E-001	883.24	-5.464E-001	%			1.517E+001G			1.6E+012	9.60
			2.694E-001	880.53	3.174E+000	&			2.195E+001G			1.6E+012	6.00
AC-228	N	1	2.660E+001	911.16	2.641E+001		(		1.802E+000G			2.1E+003	29.00
			2.660E+001	968.97	2.690E+001		(		3.147E+000G			2.1E+003	17.46
			2.660E+001	338.32	2.129E+001	-			8.887E+000G			2.1E+003	12.01
			2.660E+001	93.35	2.660E+001			E	2.142E+000G		A	2.1E+003	5.56
K-40	N	1	2.473E+002	1460.83	2.473E+002		(		7.204E+000G			4.7E+011	10.67
PB-212	N	1	2.021E+001	238.63	2.021E+001		(	P	2.731E+000G			7.0E+002	43.30
			2.021E+001	300.03	4.437E+001	+			2.187E+001G			7.0E+002	3.28
BE-7	N P C	1	-1.940E+000	477.60	-1.940E+000	%	(		1.150E+001G			5.3E+001	10.52

CS-134	T F I		1	-1.848E-001	604.71	-1.848E-001	%	(		1.365E+000G		7.5E+002	97.62
				-1.848E-001	795.87	9.479E-001	%			1.541E+000G		7.5E+002	85.53
				-1.848E-001	569.32	-1.848E-001	%			8.234E+000G		7.5E+002	15.38
				-1.848E-001	801.95	-4.932E-001	%			1.663E+001G		7.5E+002	8.69
				-1.848E-001	563.24	4.697E+000	%			1.208E+001G		7.5E+002	8.35
EU-154	T F I		1	-1.766E+000	873.23	-1.766E+000	%	(		1.285E+001G		3.1E+003	12.27
				-1.766E+000	123.10	-4.494E-002	%			2.308E+000G		3.1E+003	40.79
				-1.766E+000	1274.54	6.125E-001	%			5.198E+000G		3.1E+003	35.19
				-1.766E+000	723.36	-1.779E+000	&			9.614E+000G		3.1E+003	20.22
				-1.766E+000	1004.77	-1.911E+000	%			1.209E+001G		3.1E+003	18.01
				-1.766E+000	996.33	-1.378E+000	%			1.846E+001G		3.1E+003	10.60
TH-234		N	1	1.320E+001	63.29	8.169E+000	%	(	P	2.730E+001G		1.6E+012	4.82
				1.320E+001	92.59	1.754E+001	*	(	P	1.898E+001G		1.6E+012	5.58
U-235		N	1	1.312E+000	143.79	1.312E+000	%	(	P	6.859E+000G		2.6E+011	10.96
				1.312E+000	205.33	4.499E-001	&			1.320E+001G		2.6E+011	5.01
				1.312E+000	163.38	1.157E-001	%		P	1.601E+001G		2.6E+011	5.08
				1.312E+000	93.35	1.312E+000	&			E 1.740E+001X		2.6E+011	5.81
BI-214		N	1	1.129E+001	609.31	1.129E+001		(	P	2.244E+000G		5.8E+005	46.09
				1.129E+001	1120.29	2.961E+000	%			1.467E+001G		5.8E+005	15.10
				1.129E+001	1764.49	1.580E+001	+		P	1.066E+001G		5.8E+005	15.40
EU-155	T F I		1	1.052E+000	105.31	1.052E+000	*	(		4.257E+000G		1.8E+003	21.20
				1.052E+000	86.54	4.550E+000	*			3.580E+000G	A	1.8E+003	30.70
PB-214		N	1	1.032E+001	351.93	1.032E+001		(	P	2.675E+000G		5.8E+005	37.60
				1.032E+001	295.09	1.479E+001	+		P	4.541E+000G		5.8E+005	19.30
				1.032E+001	242.00	-6.454E-003	%			1.537E+001G		5.8E+005	7.43
TL-208	F	N	1	1.015E+001	583.02	1.015E+001		(	P	9.299E-001G		7.0E+002	84.50
				1.015E+001	277.28	6.949E+000	%			1.509E+001G		7.0E+002	6.31
				1.015E+001	860.56	2.834E+000	%			1.060E+001G		7.0E+002	12.42

Analysis Codes:

% = Peak fails sensitivity test

? = Peak is too narrow

- = Peak activity lower than counting uncertainty range

= = Peak outside analysis energy range

(= This peak is used in the nuclide activity average

P = Peakbackround subtraction

* = Peak is too wide, but only one peak in library

@ = Peak is too wide at FW25M, but OK at FWHM

A = Derived Average Activity

E = Energy Duplication

+ = Peak activity higher than counting uncertainty range

! = Peak is part of a multiplet and this area went negative during deconvolution

$ = Peak identified, but first peak of this nuclide failed one or more qualification tests

& = Calculated peak centroid is not close enough to the library energy centroid for positive identification

Nuclide Codes:

T = Thermal Neutron Activation	F = Fast Neutron Activation	I = Fission Product
P = Photon Reaction	N = Naturally Occurring Isotope	C = Charged Particle Reaction
M = No MDA Calculation		

Peak Codes:

G = Gamma Ray	X = X-Ray	P = Positron Decay
S = Single - Escape	D = Double - Escape	K = Key Line
A = Not in Average		

SUMMARY OF NUCLIDES IN SAMPLE

Nuclide		Time of Count Activity Bq/sample	Time Corrected Activity Bq/sample	Uncertainty Counts 1 Sigma %	Uncertainty Total 1 Sigma %	Minimum Detectable Activity
BE-7	#	-1.940E+000	-1.940E+000	169.49	169.52	1.150E+001
K-40		2.473E+002	2.473E+002	6.29	6.94	7.204E+000
CO-60	#	3.249E-002	3.249E-002	1,553.99	1,554.00	1.915E+000
I-131	#	3.615E-001	3.619E-001	86.78	86.83	1.062E+000
CS-134	#	-1.848E-001	-1.848E-001	208.00	208.02	1.365E+000
EU-154	#	-1.766E+000	-1.766E+000	202.76	202.78	1.285E+001
PB-210	#	3.991E+000	3.991E+000	266.30	266.32	3.799E+001
PB-212		2.021E+001	2.021E+001	7.68	8.24	2.731E+000
PB-214	#	1.032E+001	1.032E+001	11.34	11.70	2.675E+000
BI-212		2.842E+001	2.842E+001	13.25	13.56	3.674E+000
CS-137	#	-3.992E-001	-3.992E-001	2,214.86	2,214.87	2.619E+000
EU-152	#	-4.762E-001	-4.762E-001	244.17	244.18	4.064E+000
EU-155	#	1.052E+000	1.052E+000	119.99	120.04	4.257E+000
TL-208		1.015E+001	1.015E+001	8.13	8.63	9.299E-001
BI-214		1.129E+001	1.129E+001	11.79	12.14	2.244E+000
RA-224	#	-6.403E+001	-6.403E+001	25.89	26.06	5.254E+001
AC-228		2.660E+001	2.660E+001	7.93	8.43	1.802E+000
TH-234	#	1.320E+001	1.320E+001	33.08	33.29	2.730E+001
PA-234M	#	7.653E+001	7.653E+001	72.24	72.29	1.847E+002
U-235	#	1.312E+000	1.312E+000	152.14	152.17	6.859E+000
Pa-234	#	2.694E-001	2.694E-001	441.34	441.35	4.122E+000
AM-241	#	-8.498E-001	-8.498E-001	195.18	195.22	3.610E+000

= All peaks for activity calculation had bad shape

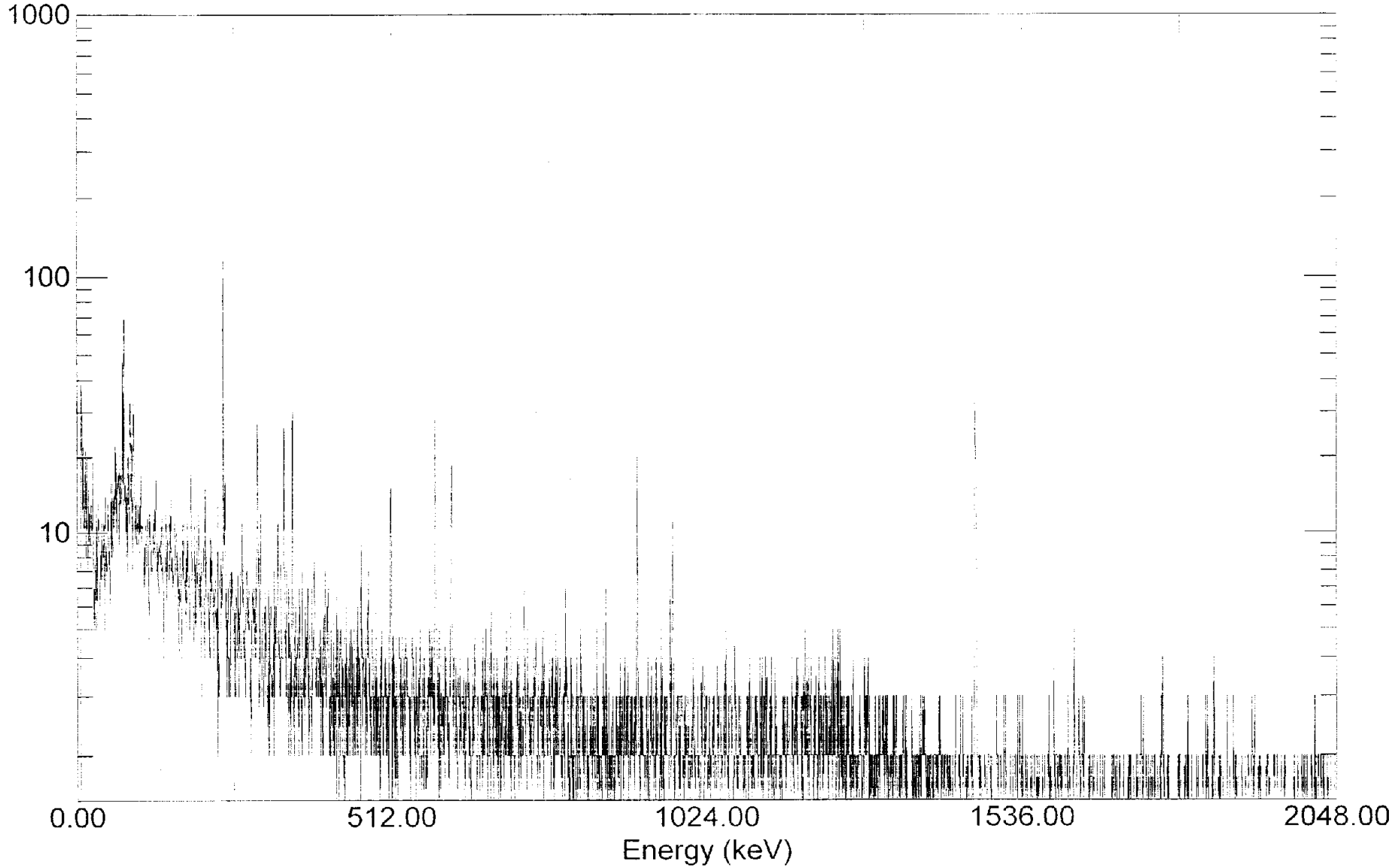
Total Activity (37.74 to 2,000.57 keV) 343.97 Bq/sample

Analyzed by: 403605

Laboratory: STL- St Louis

KEKAW1AC

7357010_KEKAW1AC_F7L200251-002



Acquired: 23-Dec-2007 12:22:21 PM
File: C:\User\spectra\KEKAW1AC.spc
Detector: #0 Ge 5 SN/157

Real Time: 1850.56 s. Live Time: 1800.00 s.
Channels: 8192

TestAmerica St. Louis

DB Analysis ID: 32,960

Sample Description: 7357010_KEKA21AC_F7L200251-003

Spectrum Filename: KEKA21AC.An1

Acquisition Information

Start Time:	23-Dec-2007 12:22:50PM		
Live Time:	1800.00	Real Time:	1818.24
Dead Time:	1.00 %		
Detector ID:	7		

Detector System: Ge 7 SN/154

Calibration

Description:	Ge7 Tunacan 74139_334 01_16_07		
Filename:	C:\User\Calibrations\Ge7 calibrations\Ge7 Tunacan 01_16_07.Clb		
Energy Created:	16-Jan-2007 4:24:37PM	Efficiency Created:	16-Jan-2007 4:27:00PM
Zero Offset:	0.231 keV	Gain:	0.250 keV/Channel

Library 1 File: mmr06 short.lib — Library based peak stripping used.
Library 2 File: Null.Lib
Library 3 File: Null.Lib

Analysis Parameters

Start Channel:	150 for an energy of 37.72 keV
Stop Channel:	8,000 for an energy of 2000.15 keV
Peak rejection level:	40.000 %
Activity Scaling Factor:	1.0000 / 1.0000 = 1.0000
Detection Limit Method:	Nureg method 4.16
Sample Size:	1.00E+000
Additional random error:	0.0000
Additional systematic error:	0.0000
Fraction Limit:	0.0000%
Background Width:	Average of three points

Corrections

	Status	Comments
Decay Correct to Date:	YES	23-Dec-2007 12:00:00PM
Decay During Acquisition:	NO	
Peaked Background Correction:	YES	Ge7 PBC table 11 26 07.Pbc
Absorption:	NO	
Geometry Correction:	NO	
Random Summing:	NO	

Energy Calibration Normalized Difference: 0.2876

UNIDENTIFIED PEAK SUMMARY

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncertainty 1 Sigma%	FWHM keV	Suspected Nuclide	Code
297.96	74.70	480.00	297.00	0.165	15.85	0.687	PB-214	
307.81	77.17	336.00	569.00	0.316	7.46	0.883	PB-214	
348.04	87.19	219.27	174.73	0.097	14.17	0.875	PB-214	D
358.92	89.94	186.00	154.00	0.086	14.89	0.854	PB-214	M
371.59	93.11	443.00	0.00	0.000	2976.58	1.219		s
1353.12	338.45	285.76	20.24	0.011	120.20	1.315		
2042.22	510.69	53.33	174.67	0.097	13.83	0.657	TL-208	s

s = Peak fails shape tests.

D = Peak area deconvoluted.

IDENTIFIED PEAK SUMMARY

Nuclide	Library Used	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncertainty 1 Sigma%	FWHM keV	Code
PB-210	1	187.06	46.99	144.44	103.56	0.058	19.65	0.606	s
AM-241	1	237.32	59.55	358.00	-6.73	-0.004	399.64	0.846	s
TH-234	1	253.14	63.50	426.03	18.12	0.010	74.98	0.850	s
EU-155	1	345.32	86.54	457.95	-13.65	-0.008	223.29	0.874	D
TH-234	1	371.37	93.05	416.90	110.25	0.061	21.90	0.881	s
U-235	1	372.56	93.35	346.53	-9.36	-0.005	-260.15	0.882	s D
AC-228	1	372.56	93.35	567.02	0.00	0.000	2679.55	0.882	s D
EU-155	1	420.90	105.43	210.00	79.00	0.044	38.37	0.634	s
EU-152	1	486.56	121.84	238.42	11.35	0.006	194.70	0.912	s
EU-154	1	493.27	123.52	239.49	13.54	0.008	163.87	0.913	s
Pa-234	1	521.59	130.60	290.39	-31.42	-0.017	78.75	0.922	s
U-235	1	574.56	143.84	288.61	-17.61	-0.010	138.50	0.935	s
U-235	1	652.89	163.42	205.89	1.12	0.001	1808.39	0.955	s
U-235	1	817.12	204.47	172.11	31.37	0.017	61.78	0.999	s
PB-212	1	953.80	238.63	129.69	942.31	0.524	3.63	1.034	D
RA-224	1	963.22	240.99	216.23	99.77	0.055	23.12	1.036	D
PB-214	1	967.26	242.00	152.55	71.45	0.040	27.16	1.037	D
TL-208	1	1108.56	277.31	44.00	57.00	0.032	24.12	0.343	s
I-131	1	1130.99	282.92	77.54	-13.75	-0.008	94.52	1.081	
PB-214	1	1180.55	295.31	83.33	222.67	0.124	11.48	0.964	s
PB-212	1	1200.06	300.19	88.67	101.33	0.056	24.25	1.513	s
AC-228	1	1352.90	338.39	59.63	242.43	0.135	7.84	1.136	
EU-152	1	1375.07	343.93	82.80	10.96	0.006	121.18	1.142	s
PB-214	1	1407.63	352.07	77.88	274.12	0.152	9.73	1.047	s
I-131	1	1457.00	364.41	59.32	15.12	0.008	76.51	1.163	s
BE-7	1	1903.20	475.94	42.19	-0.12	0.000	7592.94	1.277	s
CS-134	1	2248.88	562.35	42.06	12.87	0.007	76.50	1.363	s
CS-134	1	2276.76	569.32	76.03	0.00	0.000	948.68	1.369	s D
Pa-234	1	2277.35	569.47	53.21	-4.63	-0.003	-156.73	1.369	s D
TL-208	1	2332.45	583.24	27.74	335.26	0.186	6.78	1.446	s
CS-134	1	2421.96	605.62	75.67	-5.50	-0.003	227.66	1.403	s
BI-214	1	2437.03	609.38	39.63	223.37	0.124	10.35	1.230	s
I-131	1	2546.26	636.69	47.49	-3.55	-0.002	279.55	1.435	s
CS-137	1	2648.46	662.24	50.83	12.80	0.007	78.74	1.459	s
EU-154	1	2899.90	725.09	104.69	-26.25	-0.015	58.47	1.519	s
BI-212	1	2909.73	727.55	42.24	45.69	0.025	24.97	1.523	s
PA-234M	1	3071.57	768.00	27.25	23.41	0.013	37.71	1.561	s
EU-152	1	3124.46	781.23	28.65	1.67	0.001	459.63	1.573	s
BI-212	1	3144.56	786.25	34.24	2.17	0.001	387.03	1.579	s
CS-134	1	3179.86	795.08	17.90	40.28	0.022	21.66	1.589	
CS-134	1	3205.53	801.49	29.43	5.08	0.003	157.54	1.595	s
TL-208	1	3441.20	860.41	7.17	72.83	0.040	15.74	0.488	s
EU-154	1	3492.90	873.33	30.84	-3.01	-0.002	266.77	1.662	s
Pa-234	1	3513.38	878.45	26.26	-4.08	-0.002	184.19	1.669	s
Pa-234	1	3531.80	883.05	26.09	0.13	0.000	5511.71	1.672	s
AC-228	1	3645.67	911.52	31.24	146.59	0.081	9.86	1.698	s

Pa-234	1	3783.46	945.97	25.39	7.42	0.004	102.84	1.731	s
EU-152	1	3859.62	965.00	76.86	15.93	0.009	81.79	1.748	s
AC-228	1	3876.42	969.20	60.00	95.52	0.053	15.37	1.752	s
EU-154	1	3984.04	996.11	22.94	1.18	0.001	582.88	1.778	s
PA-234M	1	4014.88	1003.82	19.95	-0.60	0.000	1055.09	1.782	s
EU-154	1	4018.71	1004.77	28.65	0.00	0.000	756.94	1.785	s
EU-152	1	4446.19	1111.64	35.23	-3.56	-0.002	241.98	1.884	s
BI-214	1	4483.92	1121.07	4.50	43.50	0.024	18.99	0.466	s
CO-60	1	4698.90	1174.82	25.87	1.88	0.001	390.09	1.939	s
EU-154	1	5096.24	1274.15	18.22	2.72	0.002	229.73	2.030	s
CO-60	1	5327.32	1331.92	16.51	-2.72	-0.002	219.87	2.081	s
EU-152	1	5630.60	1407.75	21.99	1.20	0.001	561.80	2.147	s
K-40	1	5844.42	1461.20	6.50	330.50	0.184	5.89	1.840	
BI-214	1	7058.11	1764.65	8.15	13.24	0.007	41.04	2.447	s

s = Peak fails shape tests.

D = Peak area deconvoluted.

A = Derived Aveage Activity.

SUMMARY OF LIBRARY PEAK USAGE

Nuclide Name	Nuclide Code	Library Used	Average Activity Becquerels	Peak Energy keV	Peak Activity Becquerels		Peak Analysis Code	Peak MDA Value Becquerels		Peak Code	Peak Comments	
CS-134	T F I	1	9.257E-001	604.71	-2.095E-001	%	(	1.647E+000G			7.5E+002	97.62
			9.257E-001	795.87	2.221E+000		(	1.237E+000G			7.5E+002	85.53
			9.257E-001	569.32	0.000E+000	&	}	8.192E+000G			7.5E+002	15.38
			9.257E-001	801.95	2.773E+000	%		1.529E+001G			7.5E+002	8.69
			9.257E-001	563.24	5.382E+000	%		1.377E+001G			7.5E+002	8.35
EU-152	T F	1	9.213E-001	344.29	9.213E-001	%	(	3.790E+000G			4.9E+003	26.50
			9.213E-001	121.78	4.477E-001	%		2.946E+000G			4.9E+003	28.58
			9.213E-001	778.92	5.979E-001	%		9.897E+000G			4.9E+003	12.94
			9.213E-001	964.11	6.060E+000	%		1.658E+001G			4.9E+003	14.61
			9.213E-001	1112.07	-1.638E+000	%		1.399E+001G			4.9E+003	13.64
			9.213E-001	1408.00	4.413E-001	%		9.059E+000G			4.9E+003	21.00
PA-234M	N	1	9.145E+001	1001.00	-4.136E+000	%	(	1.613E+002G			1.6E+012	.84
			9.145E+001	766.41	3.636E+002	&	(	4.199E+002G			1.6E+012	.29
PB-210	N	1	6.183E+001	46.54	6.183E+001	*	(	P 3.506E+001G			8.1E+003	4.25
CS-137	T F I	1	6.041E-001	661.66	6.041E-001	%	(	P 1.696E+000G			1.1E+004	85.21
			4.342E-001	636.97	-1.927E+000	&		1.890E+001G			8.0E+000	7.17
I-131	T F I	1	4.342E-001	364.48	4.342E-001	%	(	1.109E+000G			8.0E+000	81.70
			4.342E-001	284.30	-4.186E+000	%		1.332E+001G			8.0E+000	6.14
EU-155	T F I	1	4.220E+000	105.31	4.220E+000	*	(	3.752E+000G			1.8E+003	21.20
			4.220E+000	86.54	-5.338E-001	%		4.005E+000G		A	1.8E+003	30.70
RA-224	N	1	3.940E+001	240.99	3.940E+001		(	2.813E+001G			7.0E+002	4.10
PB-212	N	1	3.495E+001	238.63	3.495E+001		(	P 2.069E+000G			7.0E+002	43.30
			3.495E+001	300.03	6.063E+001	+		2.788E+001G			7.0E+002	3.28
BE-7	N P C	1	-3.463E-002	477.60	-3.463E-002	&	(	9.434E+000G			5.3E+001	10.52
AM-241	T	1	-2.906E-001	59.54	-2.906E-001	&	(	3.926E+000G			1.6E+005	35.90
AC-228	N	1	2.818E+001	911.16	2.677E+001		(	5.251E+000G			2.1E+003	29.00
			2.818E+001	968.97	3.054E+001		(	1.241E+001G			2.1E+003	17.46
			2.818E+001	338.32	4.423E+001	+		7.059E+000G			2.1E+003	12.01
			2.818E+001	93.35	0.000E+000	%	}	E 1.875E+001G		A	2.1E+003	5.56
K-40	N	1	2.482E+002	1460.83	2.482E+002		(	1.096E+001G			4.7E+011	10.67
CO-60	T F	1	-2.004E-001	1332.50	-2.004E-001	%	(	1.596E+000G			1.9E+003	99.98
			-2.004E-001	1173.24	1.237E-001	%		1.741E+000G			1.9E+003	99.90

				-1.990E+000	946.02	3.027E+000	&			1.069E+001G	1.6E+012	13.40
				-1.990E+000	883.24	7.049E-002	&			1.424E+001G	1.6E+012	9.60
				-1.990E+000	880.53	-3.501E+000	%			2.279E+001G	1.6E+012	6.00
Pa-234		N	1	-1.990E+000	131.29	-1.990E+000	&	(		5.202E+000G	1.6E+012	18.00
				-1.990E+000	569.47	-1.990E+000	&			1.578E+001G	1.6E+012	8.20
U-235		N	1	-1.878E+000	143.79	-1.878E+000	%	(		8.734E+000G	2.6E+011	10.96
				-1.878E+000	205.33	8.934E+000	&			1.818E+001G	2.6E+011	5.01
				-1.878E+000	163.38	2.731E-001	%			1.691E+001G	2.6E+011	5.08
				-1.878E+000	93.35	-1.878E+000	!		E	1.795E+001X	2.6E+011	5.81
BI-214		N	1	1.816E+001	609.31	1.813E+001	@	(	P	2.602E+000G	5.8E+005	46.09
				1.816E+001	1120.29	1.822E+001		(		5.276E+000G	5.8E+005	15.10
				1.816E+001	1764.49	8.258E+000	%			9.985E+000G	5.8E+005	15.40
BI-212		N	1	1.687E+001	727.33	1.687E+001		(		1.219E+001G	7.0E+002	11.82
				1.687E+001	785.51	9.209E+000	%			1.271E+002G	7.0E+002	1.10
				1.641E+001	295.09	2.230E+001	*			4.533E+000G	5.8E+005	19.30
				1.641E+001	242.00	1.563E+001		(		1.318E+001G	5.8E+005	7.43
PB-214		N	1	1.641E+001	351.93	1.657E+001	@	(	P	2.649E+000G	5.8E+005	37.60
TH-234		N	1	1.493E+001	63.29	5.499E+000	%	(	P	3.002E+001G	1.6E+012	4.82
				1.493E+001	92.59	2.308E+001	*	(	P	2.049E+001G	1.6E+012	5.58
TL-208	F	N	1	1.443E+001	583.02	1.428E+001	@	(	P	1.161E+000G	7.0E+002	84.50
				1.443E+001	277.28	1.652E+001		(		9.741E+000G	7.0E+002	6.31
				1.443E+001	860.56	2.958E+001	*			6.166E+000G	7.0E+002	12.42
				-1.255E+000	123.10	3.748E-001	%			2.071E+000G	3.1E+003	40.79
				-1.255E+000	1274.54	5.482E-001	%			4.549E+000G	3.1E+003	35.19
				-1.255E+000	723.36	-5.642E+000	&			1.083E+001G	3.1E+003	20.22
				-1.255E+000	1004.77	0.000E+000	&			8.841E+000G	3.1E+003	18.01
				-1.255E+000	996.33	6.348E-001	%			1.350E+001G	3.1E+003	10.60
EU-154	T F I		1	-1.255E+000	873.23	-1.255E+000	%	(		1.190E+001G	3.1E+003	12.27

Analysis Codes:

% = Peak fails sensitivity test

? = Peak is too narrow

- = Peak activity lower than counting uncertainty range

= = Peak outside analysis energy range

(= This peak is used in the nuclide activity average

P = Peakbackround subtraction

* = Peak is too wide, but only one peak in library

@ = Peak is too wide at FW25M, but OK at FWHM

A = Derived Average Activity

E = Energy Duplication

+ = Peak activity higher than counting uncertainty range

! = Peak is part of a multiplet and this area went negative during deconvolution

$ = Peak identified, but first peak of this nuclide failed one or more qualification tests

& = Calculated peak centroid is not close enough to the library energy centroid for positive identification

Nuclide Codes:

T = Thermal Neutron Activation	F = Fast Neutron Activation	I = Fission Product
P = Photon Reaction	N = Naturally Occurring Isotope	C = Charged Particle Reaction
M = No MDA Calculation		

Peak Codes:

G = Gamma Ray	X = X-Ray	P = Positron Decay
S = Single - Escape	D = Double - Escape	K = Key Line
A = Not in Average		

SUMMARY OF NUCLIDES IN SAMPLE

Nuclide		Time of Count Activity Bq/sample	Time Corrected Activity Bq/sample	Uncertainty Counts 1 Sigma %	Uncertainty Total 1 Sigma %	Minimum Detectable Activity
CS-134	#	9.257E-001	9.257E-001	21.66	21.85	1.647E+000
CS-137	#	6.041E-001	6.041E-001	83.32	83.37	1.696E+000
EU-155	#	4.220E+000	4.220E+000	38.37	38.52	3.752E+000
BI-212	#	1.687E+001	1.687E+001	24.97	25.14	1.219E+001
BI-214		1.816E+001	1.816E+001	10.44	10.84	2.602E+000
TH-234	#	1.493E+001	1.493E+001	27.45	27.70	3.002E+001
PA-234M	#	9.145E+001	9.145E+001	37.71	37.82	1.613E+002
BE-7	#	-3.463E-002	-3.464E-002	7,592.94	7,592.94	9.434E+000
K-40		2.482E+002	2.482E+002	5.89	6.58	1.096E+001
CO-60	#	-2.004E-001	-2.004E-001	219.87	219.89	1.596E+000
I-131	#	4.342E-001	4.348E-001	76.51	76.57	1.109E+000
EU-152	#	9.213E-001	9.213E-001	121.18	121.22	3.790E+000
EU-154	#	-1.255E+000	-1.255E+000	266.77	266.78	1.190E+001
TL-208		1.443E+001	1.443E+001	6.82	7.41	1.161E+000
PB-210	#	6.183E+001	6.183E+001	24.22	24.53	3.506E+001
PB-212		3.495E+001	3.495E+001	3.66	4.73	2.069E+000
PB-214		1.641E+001	1.641E+001	9.84	10.25	2.649E+000
RA-224		3.940E+001	3.940E+001	23.12	23.32	2.813E+001
AC-228	#	2.818E+001	2.818E+001	9.13	9.57	5.251E+000
Pa-234	#	-1.990E+000	-1.990E+000	78.75	78.81	5.202E+000
U-235	#	-1.878E+000	-1.878E+000	138.50	138.53	8.734E+000
AM-241	#	-2.906E-001	-2.906E-001	399.64	399.66	3.926E+000

= All peaks for activity calculation had bad shape

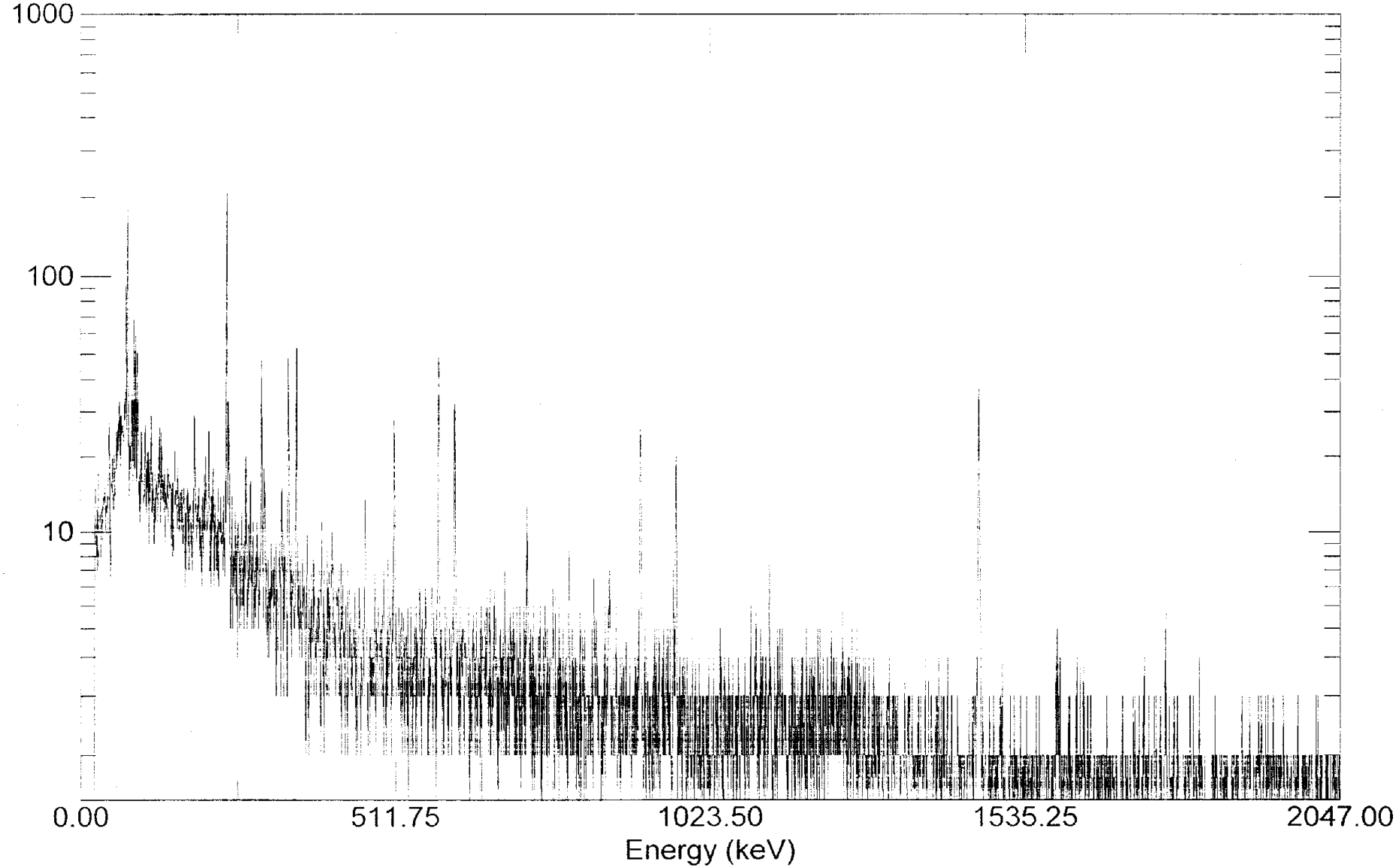
Total Activity (37.72 to 2,000.15 keV) 437.65 Bq/sample

Analyzed by: 403605

Laboratory: Test America

KEKA21AC

7357010_KEKA21AC_F7L200251-003



Acquired: 23-Dec-2007 12:22:50 PM
File: C:\User\spectra\KEKA21AC.spc
Detector: #0 Ge 7 SN/154

Real Time: 1818.24 s. Live Time: 1800.00 s.
Channels: 8192

TestAmerica St. Louis

DB Analysis ID: 32,963

Sample Description: 7357010_KEKA41AC_F7L200251-004

Spectrum Filename: KEKA41AC.An1

Acquisition Information

Start Time:	23-Dec-2007 1:04:21PM		
Live Time:	1800.00	Real Time:	1814.50
Dead Time:	0.80 %		
Detector ID:	3		

Detector System: Ge 3 SN/155

Calibration

Description:	Ge3 74139_334 Tunacan cal 01_11_07		
Filename:	C:\User\Calibrations\Ge3 cal post 5_8_06\Ge3 Tunacan 74139_334 01_11_07.Clb		
Energy Created:	10-Jan-2007 5:13:35PM	Efficiency Created:	11-Jan-2007 1:43:34PM
Zero Offset:	0.416 keV	Gain:	0.250 keV/Channel

Library 1 File: mmr06 short.lib Library based peak stripping used.
Library 2 File: Null.Lib
Library 3 File: Null.Lib

Analysis Parameters

Start Channel:	150 for an energy of 37.87 keV
Stop Channel:	8,000 for an energy of 2000.50 keV
Peak rejection level:	40.000 %
Activity Scaling Factor:	1.0000 / 1.0000 = 1.0000
Detection Limit Method:	Nureg method 4.16
Sample Size:	1.00E+000
Additional random error:	0.0000
Additional systematic error:	0.0000
Fraction Limit:	0.0000%
Background Width:	Average of three points

Corrections	Status	Comments
Decay Correct to Date:	YES	23-Dec-2007 12:00:00PM
Decay During Acquisition:	NO	
Peaked Background Correction:	YES	Ge3 PBC table 11_26_07.Pbc
Absorption:	NO	
Geometry Correction:	NO	
Random Summing:	NO	

Energy Calibration Normalized Differe 0.1463

UNIDENTIFIED PEAK SUMMARY

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncertainty 1 Sigma%	FWHM keV	Suspected Nuclide	Code
297.72	74.76	575.17	268.83	0.149	18.50	0.847	PB-214	
306.79	77.03	678.33	395.67	0.220	15.08	0.928	PB-214	
347.55	87.21	323.06	117.94	0.066	23.44	0.784	PB-214	
357.98	89.81	190.00	101.00	0.056	21.71	0.726	PB-214	
837.50	209.58	195.50	116.50	0.065	19.34	0.766	NP-239	s
1352.03	338.11	297.67	50.33	0.028	50.49	1.127		s
1849.40	462.36	43.50	93.50	0.052	19.93	0.680	CS-138	s
3644.21	910.92	185.56	34.44	0.019	58.47	1.557		

s = Peak fails shape tests.

D = Peak area deconvoluted.

IDENTIFIED PEAK SUMMARY

Nuclide	Library Used	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncertainty 1 Sigma%	FWHM keV	Code
PB-210	1	185.36	46.70	234.89	31.41	0.017	41.37	0.864	
AM-241	1	241.27	60.67	351.15	1.11	0.001	2387.22	0.878	s
TH-234	1	252.04	63.36	493.88	12.98	0.007	82.94	0.882	s
EU-155	1	344.88	86.54	647.04	9.01	0.005	400.78	0.906	
TH-234	1	369.10	92.59	594.16	-30.05	-0.017	868.66	0.912	s
AC-228	1	372.14	93.35	330.10	123.40	0.069	1.97	0.913	s D
U-235	1	372.14	93.35	330.10	6.65	0.004	41.68	0.913	s D
EU-155	1	421.10	105.58	261.88	32.57	0.018	72.41	0.925	s
EU-152	1	482.54	120.92	216.05	5.26	0.003	397.58	0.942	s
EU-154	1	491.26	123.10	295.64	-1.34	-0.001	1816.71	0.943	s
Pa-234	1	520.61	130.43	314.40	-42.69	-0.024	60.69	0.952	
U-235	1	576.37	144.36	280.87	12.19	0.007	166.76	0.964	s
U-235	1	652.13	163.28	216.89	22.14	0.012	96.44	0.984	s
U-235	1	823.01	205.96	209.32	13.74	0.008	151.39	1.027	s
PB-212	1	953.82	238.63	182.76	1005.24	0.558	3.58	1.060	D
RA-224	1	963.24	240.99	342.91	136.09	0.076	21.07	1.062	D
PB-214	1	967.29	242.00	215.58	96.42	0.054	23.82	1.063	D
TL-208	1	1107.36	276.99	108.00	97.00	0.054	27.10	0.331	s
I-131	1	1135.96	284.13	116.47	-12.33	-0.007	126.98	1.105	s
PB-214	1	1178.28	294.70	98.98	235.02	0.131	11.90	1.326	s
PB-212	1	1199.27	299.94	51.33	87.67	0.049	18.35	1.162	s
AC-228	1	1352.48	338.22	129.58	195.86	0.109	10.75	1.158	s
EU-152	1	1374.67	343.76	73.22	19.28	0.011	66.76	1.164	s
PB-214	1	1405.76	351.53	91.54	360.46	0.200	8.44	1.354	s
I-131	1	1460.00	365.08	84.51	10.15	0.006	131.91	1.184	s
BE-7	1	1906.64	476.67	44.76	11.39	0.006	88.17	1.292	s
CS-134	1	2252.14	563.00	48.88	-0.16	0.000	6106.06	1.372	s
CS-134	1	2277.45	569.32	42.16	2.68	0.001	267.54	1.378	s D
Pa-234	1	2278.04	569.47	47.38	-7.43	-0.004	-178.14	1.378	s D
TL-208	1	2332.24	583.01	26.63	373.38	0.207	5.79	1.545	
CS-134	1	2422.11	605.47	90.98	-8.36	-0.005	164.96	1.410	s
BI-214	1	2436.88	609.16	47.95	264.05	0.147	8.98	1.062	s
I-131	1	2552.37	638.02	46.12	-0.78	0.000	1231.56	1.440	s
CS-137	1	2644.60	661.07	55.10	11.27	0.006	97.77	1.462	s
EU-154	1	2876.67	719.07	14.32	-2.89	-0.002	194.14	1.518	s
BI-212	1	2909.97	727.39	15.50	110.50	0.061	12.99	0.832	s
PA-234M	1	3062.56	765.53	45.34	-0.56	0.000	1713.83	1.556	s
EU-152	1	3115.12	778.67	33.57	-4.48	-0.002	188.75	1.567	s
BI-212	1	3141.68	785.31	31.61	10.40	0.006	82.46	1.572	s
CS-134	1	3180.52	795.01	38.62	31.76	0.018	32.87	1.582	s
CS-134	1	3208.27	801.95	68.39	0.00	0.000	1169.57	1.587	s
TL-208	1	3442.42	860.48	34.34	30.60	0.017	32.56	1.638	s
EU-154	1	3489.46	872.24	37.85	-2.41	-0.001	366.08	1.649	s
Pa-234	1	3522.64	880.53	88.75	0.00	0.000	1332.26	1.655	s
Pa-234	1	3535.52	883.75	30.12	8.02	0.004	103.04	1.657	s

AC-228	1	3644.46	910.98	33.45	173.71	0.097	8.78	1.681	
Pa-234	1	3794.77	948.56	28.46	4.33	0.002	180.86	1.710	s
EU-152	1	3858.75	964.55	153.93	1.73	0.001	1015.64	1.726	s
AC-228	1	3875.40	968.72	60.64	128.00	0.071	12.34	1.730	
EU-154	1	3986.49	996.49	28.29	2.19	0.001	350.70	1.753	s
PA-234M	1	4005.06	1001.13	35.35	1.58	0.001	536.82	1.756	s
EU-154	1	4017.30	1004.19	29.66	1.64	0.001	475.53	1.760	s
EU-152	1	4448.78	1112.07	27.84	0.00	0.000	746.24	1.847	s
BI-214	1	4479.99	1119.88	1.94	84.06	0.047	10.78	0.688	s
CO-60	1	4699.27	1174.71	40.34	-4.76	-0.003	194.04	1.896	s
EU-154	1	5100.03	1274.93	42.03	-5.02	-0.003	187.87	1.975	s
CO-60	1	5332.13	1332.98	24.73	-1.42	-0.001	503.49	2.019	s
EU-152	1	5632.07	1408.00	30.48	0.00	0.000	780.73	2.076	s
K-40	1	5840.58	1460.16	11.21	357.79	0.199	5.21	2.364	
BI-214	1	7055.83	1764.21	15.10	39.02	0.022	19.76	2.326	

s = Peak fails shape tests.

D = Peak area deconvoluted.

A = Derived Aveage Activity.

SUMMARY OF LIBRARY PEAK USAGE

Nuclide Name	Nuclide Code	Library Used	Average Activity Becquerels	Peak Energy keV	Peak Activity Becquerels	Peak Analysis Code	Peak MDA Value Becquerels	Peak Code	Peak Comments	
PA-234	N	1	9.282E+000	1001.00	9.282E+000	% (	1.783E+002G		1.6E+012	.84
			9.282E+000	766.41	-7.640E+000	&	4.673E+002G		1.6E+012	.29
EU-154	T F I	1	-8.726E-001	873.23	-8.726E-001	% (	1.134E+001G		3.1E+003	12.27
			-8.726E-001	123.10	-4.015E-002	%	2.482E+000G		3.1E+003	40.79
			-8.726E-001	1274.54	-8.426E-001	%	5.522E+000G		3.1E+003	35.19
			-8.726E-001	723.36	-5.526E-001	&	3.887E+000G		3.1E+003	20.22
			-8.726E-001	1004.77	4.485E-001	%	7.673E+000G		3.1E+003	18.01
			-8.726E-001	996.33	1.008E+000	%	1.268E+001G		3.1E+003	10.60
CO-60	T F	1	-8.665E-002	1332.50	-8.665E-002	% (	1.583E+000G		1.9E+003	99.98
			-8.665E-002	1173.24	-2.638E-001	%	1.789E+000G		1.9E+003	99.90
CS-134	T F I	1	5.639E-001	604.71	-2.901E-001	% (	1.636E+000G		7.5E+002	97.62
			5.639E-001	795.87	1.539E+000	(	1.534E+000G		7.5E+002	85.53
			5.639E-001	569.32	5.639E-001	%	6.942E+000G		7.5E+002	15.38
			5.639E-001	801.95	0.000E+000	%	1.977E+001G		7.5E+002	8.69
			5.639E-001	563.24	-6.236E-002	%	1.358E+001G		7.5E+002	8.35
RA-224	N	1	5.622E+001	240.99	5.622E+001	(	3.677E+001G		7.0E+002	4.10
AM-241	T	1	4.911E-002	59.54	4.911E-002	% (	3.980E+000G		1.6E+005	35.90
CS-137	T F I	1	4.788E-001	661.66	4.788E-001	% (	1.584E+000G		1.1E+004	85.21
TH-234	N	1	4.042E+000	63.29	4.042E+000	% (P	3.309E+001G		1.6E+012	4.82
			4.042E+000	92.59	-6.659E+000	% P	2.577E+001G		1.6E+012	5.58
PB-212	N	1	3.905E+001	238.63	3.905E+001	(P	2.552E+000G		7.0E+002	43.30
			3.905E+001	300.03	5.320E+001	+	2.191E+001G		7.0E+002	3.28
BI-212	N	1	3.626E+001	727.33	3.626E+001	(	6.910E+000G		7.0E+002	11.82
			3.626E+001	785.51	3.881E+001	%	1.078E+002G		7.0E+002	1.10
BE-7	N P C	1	3.075E+000	477.60	3.075E+000	& (	9.146E+000G		5.3E+001	10.52
			-2.935E+000	880.53	0.000E+000	%	3.466E+001G		1.6E+012	6.00
Pa-234	N	1	-2.935E+000	131.29	-2.935E+000	& (	5.867E+000G		1.6E+012	18.00
			-2.935E+000	569.47	-2.935E+000	%	1.374E+001G		1.6E+012	8.20
			-2.935E+000	946.02	1.519E+000	%	9.678E+000G		1.6E+012	13.40
			-2.935E+000	883.24	3.735E+000	%	1.317E+001G		1.6E+012	9.60
I-131	T F I	1	2.869E-001	364.48	2.869E-001	& (	1.288E+000G		8.0E+000	81.70
			2.869E-001	284.30	-3.839E+000	%	1.650E+001G		8.0E+000	6.14
			2.869E-001	636.97	-3.844E-001	&	1.686E+001G		8.0E+000	7.17
AC-228	N	1	2.740E+001	911.07	2.740E+001	(P	4.679E+000G		2.1E+003	29.00
			2.740E+001	968.97	3.510E+001	+	1.070E+001G		2.1E+003	17.46
			2.740E+001	338.32	3.558E+001	* P	1.013E+001G		2.1E+003	12.01
			2.740E+001	93.35	2.740E+001	! E	1.940E+001X	A	2.1E+003	5.56
			2.233E+001	242.00	2.205E+001	(	1.626E+001G		5.8E+005	7.43
PB-214	N	1	2.233E+001	351.93	2.156E+001	@ (P	2.828E+000G		5.8E+005	37.60
			2.233E+001	295.09	2.394E+001	* (P	4.998E+000G		5.8E+005	19.30
K-40	N	1	2.210E+002	1460.83	2.210E+002	(P	1.131E+001G		4.7E+011	10.67
BI-214	N	1	1.955E+001	609.31	1.951E+001	(P	2.585E+000G		5.8E+005	46.09
			1.955E+001	1120.29	2.973E+001	+ P	3.254E+000G		5.8E+005	15.10
			1.955E+001	1764.49	1.968E+001	? (P	1.050E+001G		5.8E+005	15.40

EU-155	T F I		1	1.864E+000	105.31	1.864E+000	*	(		4.472E+000G	1.8E+003	21.20
				1.864E+000	86.54	3.701E-001	%			4.982E+000G	1.8E+003	30.70
PB-210		N	1	1.820E+001	46.54	1.820E+001	%	(	P	4.295E+001G	8.1E+003	4.25
EU-152	T F		1	1.609E+000	344.29	1.609E+000	%	(		3.553E+000G	4.9E+003	26.50
				1.609E+000	121.78	2.246E-001	&			3.040E+000G	4.9E+003	28.58
				1.609E+000	778.92	-1.413E+000	%			9.364E+000G	4.9E+003	12.94
				1.609E+000	964.11	5.659E-001	%			1.977E+001G	4.9E+003	14.61
				1.609E+000	1112.07	0.000E+000	&			1.063E+001G	4.9E+003	13.64
				1.609E+000	1408.00	0.000E+000	%			8.656E+000G	4.9E+003	21.00
TL-208	F	N	1	1.457E+001	583.02	1.457E+001		(	P	1.044E+000G	7.0E+002	84.50
				1.457E+001	277.28	2.884E+001	*			1.520E+001G	7.0E+002	6.31
				1.457E+001	860.56	1.081E+001	-			1.060E+001G	7.0E+002	12.42
U-235		N	1	1.413E+000	143.79	1.413E+000	&	(	P	9.364E+000G	2.6E+011	10.96
				1.413E+000	205.33	4.168E+000	%			2.128E+001G	2.6E+011	5.01
				1.413E+000	163.38	5.830E+000	%			1.879E+001G	2.6E+011	5.08
				1.413E+000	93.35	1.413E+000	%		E	1.857E+001X	2.6E+011	5.81

Analysis Codes:

% = Peak fails sensitivity test

? = Peak is too narrow

- = Peak activity lower than counting uncertainty range

= = Peak outside analysis energy range

(= This peak is used in the nuclide activity average

P = Peakbackround subtraction

* = Peak is too wide, but only one peak in library

@ = Peak is too wide at FW25M, but OK at FWHM

A = Derived Average Activity

E = Energy Duplication

+ = Peak activity higher than counting uncertainty range

! = Peak is part of a multiplet and this area went negative during deconvolution

$ = Peak identified, but first peak of this nuclide failed one or more qualification tests

& = Calculated peak centroid is not close enough to the library energy centroid for positive identification

Nuclide Codes:

T = Thermal Neutron Activation

F = Fast Neutron Activation

I = Fission Product

P = Photon Reaction

N = Naturally Occurring Isotope

C = Charged Particle Reaction

M = No MDA Calculation

Peak Codes:

G = Gamma Ray

X = X-Ray

P = Positron Decay

S = Single - Escape

D = Double - Escape

K = Key Line

A = Not in Average

SUMMARY OF NUCLIDES IN SAMPLE

Nuclide		Time of Count Activity Bq/sample	Time Corrected Activity Bq/sample	Uncertainty Counts 1 Sigma %	Uncertainty Total 1 Sigma %	Minimum Detectable Activity
BE-7	<	3.075E+000	3.077E+000	88.17	88.21	9.146E+000
K-40		2.210E+002	2.210E+002	5.37	6.12	1.131E+001
CO-60	<	-8.665E-002	-8.666E-002	503.49	503.50	1.583E+000
I-131	<	2.869E-001	2.880E-001	131.91	131.95	1.288E+000
CS-134	<	5.639E-001	5.639E-001	32.87	33.00	1.636E+000
CS-137	<	4.788E-001	4.788E-001	97.77	97.81	1.584E+000
EU-152	<	1.609E+000	1.609E+000	66.76	66.82	3.553E+000
EU-154	<	-8.726E-001	-8.726E-001	366.08	366.09	1.134E+001
EU-155	<	1.864E+000	1.864E+000	72.41	72.49	4.472E+000
TL-208		1.457E+001	1.457E+001	5.91	6.58	1.044E+000
BI-212		3.626E+001	3.626E+001	12.99	13.31	6.910E+000
BI-214		1.955E+001	1.955E+001	9.22	9.66	2.585E+000
AC-228	<	2.740E+001	2.741E+001	8.89	9.34	4.679E+000
TH-234	<	4.042E+000	4.042E+000	240.66	240.69	3.309E+001
PA-234M	<	9.282E+000	9.282E+000	536.82	536.83	1.783E+002
U-235	<	1.413E+000	1.413E+000	196.08	196.10	9.364E+000
RA-224		5.622E+001	5.622E+001	21.07	21.28	3.677E+001
PB-210	<	1.820E+001	1.820E+001	69.72	69.83	4.295E+001
PB-212		3.905E+001	3.905E+001	3.66	4.72	2.552E+000
PB-214		2.233E+001	2.233E+001	8.66	9.12	2.828E+000
Pa-234	<	-2.935E+000	-2.935E+000	60.69	60.77	5.867E+000
AM-241	<	4.911E-002	4.911E-002	2,387.22	2,387.22	3.980E+000

= All peaks for activity calculation had bad shape

Total Activity (37.87 to 2,000.50 keV) 409.01 Bq/sample

Analyzed by: _____

403293

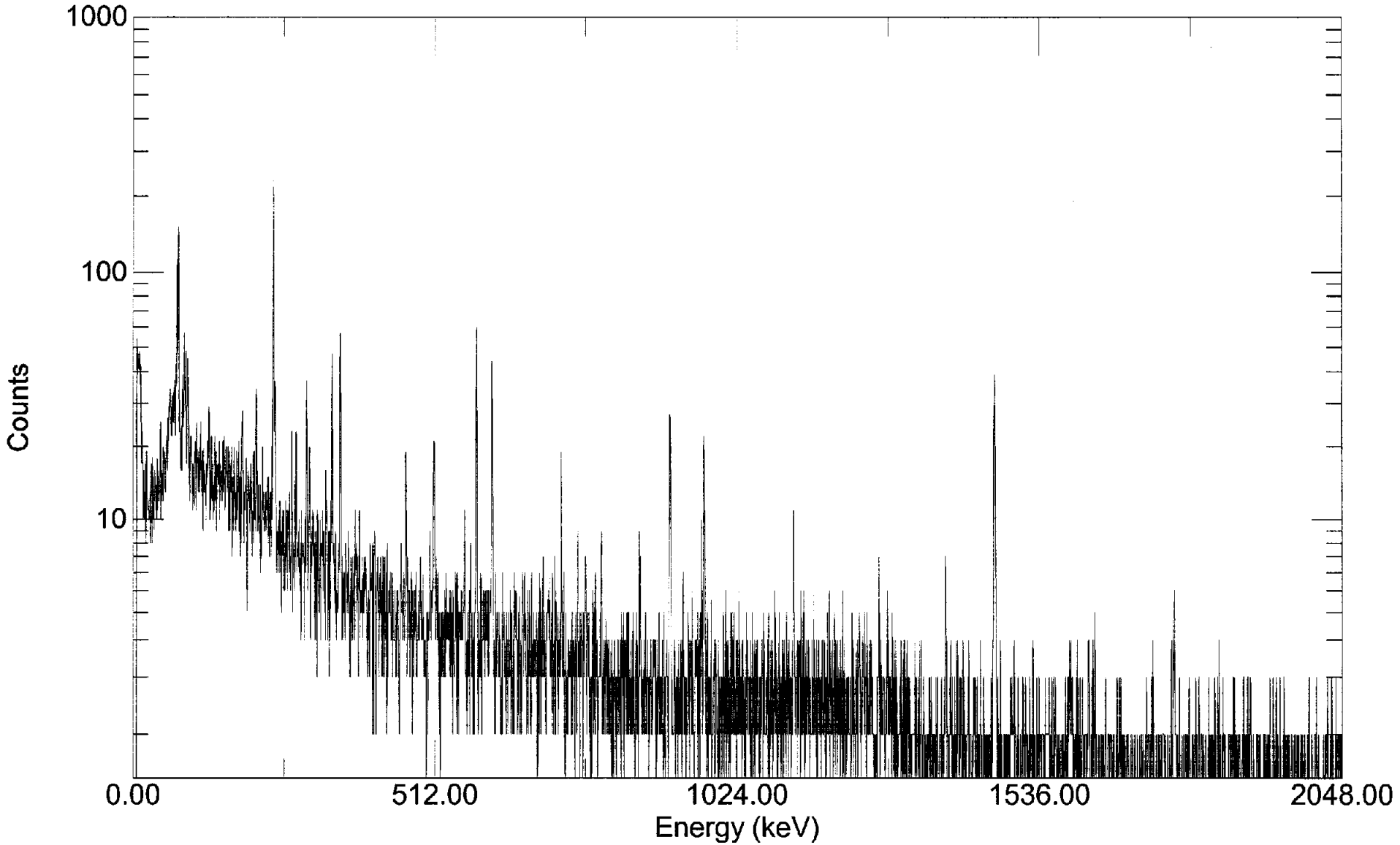
Reviewed by: _____

Supervisor

Laboratory: STL- St Louis

KEKA41AC

7357010_KEKA41AC_F7L200251-004



Acquired: 23-Dec-2007 1:04:21 PM
File: C:\User\spectra\KEKA41AC.spc
Detector: #0 Ge 3 SN/155

Real Time: 1814.50 s. Live Time: 1800.00 s.
Channels: 8192

TestAmerica St. Louis

DB Analysis ID: 32,964

Sample Description: 7357010_KEKA71AC_F7L200251-005

Spectrum Filename: KEKA71AC.An1

Acquisition Information

Start Time:	23-Dec-2007 1:04:53PM		
Live Time:	1800.00	Real Time:	1804.52
Dead Time:	0.25 %		
Detector ID:	4		

Detector System: Ge 4 SN/181

Calibration

Description:	Ge4_TunaCanCal_74139_334_05_15_07		
Filename:	C:\User\Calibrations\Ge4 Post 09_07_07(Ge6)\Ge4_TunaCanCal_74139_334_05_15_(		
Energy Created:	08-May-2007 1:28:13PM	Efficiency Created:	15-May-2007 10:05:02AM
Zero Offset:	0.017 keV	Gain:	0.250 keV/Channel

Library 1 File: mmr06 short.lib Library based peak stripping used.
Library 2 File: Null.Lib
Library 3 File: Null.Lib

Analysis Parameters

Start Channel:	150 for an energy of 37.53 keV
Stop Channel:	8,000 for an energy of 1998.47 keV
Peak rejection level:	40.000 %
Activity Scaling Factor:	1.0000 / 1.0000 = 1.0000
Detection Limit Method:	Nureg method 4.16
Sample Size:	1.00E+000
Additional random error:	0.0000
Additional systematic error:	0.0000
Fraction Limit:	0.0000%
Background Width:	Average of three points

Corrections	Status	Comments
Decay Correct to Date:	YES	23-Dec-2007 12:00:00PM
Decay During Acquisition:	NO	
Peaked Background Correction:	YES	Ge4 PBC table 11_26_07.Pbc
Absorption:	NO	
Geometry Correction:	NO	
Random Summing:	NO	

Energy Calibration Normalized Differe 0.1887

Test America St. Louis

UNIDENTIFIED PEAK SUMMARY

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncertainty 1 Sigma%	FWHM keV	Suspected Nuclide	Code
298.77	74.74	186.33	144.67	0.080	18.74	0.528	PB-214	s
308.29	77.12	246.00	282.00	0.157	12.62	0.846	PB-214	
348.95	87.29	103.48	102.52	0.057	17.16	0.740	PB-214	
359.73	89.99	96.67	69.33	0.039	23.38	1.071	PB-214	sM

s = Peak fails shape tests.

D = Peak area deconvoluted.

IDENTIFIED PEAK SUMMARY

Nuclide	Library Used	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncertainty 1 Sigma%	FWHM keV	Code
PB-210	1	186.72	46.72	61.31	27.69	0.015	25.23	1.213	s
AM-241	1	235.28	58.86	161.68	-3.84	-0.002	471.27	0.830	s
TH-234	1	252.16	63.09	181.03	81.97	0.046	28.09	1.139	s
EU-155	1	345.96	86.54	254.86	3.64	0.002	623.22	0.854	s
TH-234	1	370.14	92.59	259.83	37.50	0.021	37.51	0.859	D
AC-228	1	373.18	93.35	128.09	67.32	0.037	3.38	0.860	D
U-235	1	373.18	93.35	195.66	11.19	0.006	21.84	0.860	s D
EU-155	1	422.42	105.67	105.90	28.35	0.016	54.66	0.871	s
EU-152	1	494.30	123.64	61.72	22.41	0.012	53.90	0.885	s
EU-154	1	499.95	125.05	80.29	8.54	0.005	152.33	0.886	s
Pa-234	1	524.66	131.23	161.16	6.07	0.003	298.76	0.894	s
U-235	1	576.20	144.12	118.44	21.14	0.012	76.00	0.904	s
U-235	1	655.19	163.88	94.26	-11.25	-0.006	125.67	0.922	s
U-235	1	819.05	204.85	67.79	4.10	0.002	288.24	0.958	s
PB-212	1	953.26	238.41	75.96	437.04	0.243	6.08	0.905	
RA-224	1	958.66	239.76	446.68	-129.16	-0.072	24.76	0.988	
PB-214	1	965.80	241.55	51.00	101.00	0.056	17.29	1.181	s
TL-208	1	1108.99	277.35	53.16	29.88	0.017	39.05	1.019	s
I-131	1	1136.06	284.12	60.78	7.39	0.004	153.66	1.025	s
PB-214	1	1180.31	295.18	41.88	121.12	0.067	14.12	1.094	
PB-212	1	1202.61	300.76	31.50	47.50	0.026	28.96	0.473	s
AC-228	1	1350.64	337.77	34.00	150.00	0.083	12.94	1.070	s
EU-152	1	1378.29	344.68	30.46	0.58	0.000	1343.12	1.076	s
PB-214	1	1406.08	351.63	36.24	206.76	0.115	9.47	1.068	
I-131	1	1462.83	365.81	45.54	-3.06	-0.002	316.69	1.092	s
BE-7	1	1909.97	477.60	55.81	0.00	0.000	1056.54	1.185	s
CS-134	1	2264.17	566.13	20.04	1.24	0.001	517.37	1.254	s
CS-134	1	2276.94	569.32	34.42	0.00	0.000	600.00	1.259	s D
Pa-234	1	2277.54	569.47	30.23	0.90	0.001	163.92	1.259	s D
TL-208	1	2331.26	582.90	13.18	176.82	0.098	8.84	1.282	
CS-134	1	2412.32	603.16	-0.98	1.13	0.001	88.62	1.286	s
BI-214	1	2435.59	608.97	8.42	136.58	0.076	8.78	1.083	
I-131	1	2546.92	636.80	23.75	-0.49	0.000	1419.33	1.312	s
CS-137	1	2644.08	661.08	27.43	13.63	0.008	60.72	1.331	s
EU-154	1	2899.44	724.90	50.94	-12.36	-0.007	86.45	1.378	s
BI-212	1	2907.55	726.92	21.49	20.04	0.011	39.61	1.381	s
PA-234M	1	3068.19	767.06	36.21	-0.68	0.000	1249.60	1.411	s
EU-152	1	3111.74	777.95	21.35	-2.29	-0.001	293.12	1.420	s
BI-212	1	3144.38	786.10	20.44	2.73	0.002	241.98	1.425	
CS-134	1	3180.35	795.09	15.88	10.44	0.006	62.24	1.433	s
CS-134	1	3206.24	801.56	18.81	-3.32	-0.002	192.88	1.437	s
TL-208	1	3441.79	860.41	25.07	7.45	0.004	101.83	1.481	s
EU-154	1	3493.09	873.23	15.03	0.00	0.000	548.31	1.490	s
Pa-234	1	3523.54	880.84	28.49	-2.68	-0.001	288.61	1.495	s
Pa-234	1	3533.59	883.35	19.44	0.09	0.000	6849.45	1.497	s

AC-228	1	3644.13	910.96	0.00	79.00	0.044	11.25	0.909	s
Pa-234	1	3776.31	943.99	20.52	1.58	0.001	412.35	1.543	s
EU-152	1	3853.34	963.23	35.52	1.95	0.001	437.45	1.556	s
AC-228	1	3874.52	968.52	25.01	26.41	0.015	33.11	1.559	s
EU-154	1	3978.83	994.58	17.79	-3.68	-0.002	170.46	1.579	s
PA-234M	1	4005.31	1001.20	11.92	2.13	0.001	239.04	1.582	s
EU-154	1	4022.28	1005.44	12.98	-0.93	-0.001	559.14	1.585	s
EU-152	1	4454.34	1113.36	21.60	-1.27	-0.001	523.73	1.659	s
BI-214	1	4481.91	1120.24	21.06	17.41	0.010	33.59	1.665	s
CO-60	1	4692.27	1172.78	8.63	7.29	0.004	68.01	1.701	s
EU-154	1	5104.21	1275.66	13.25	-0.04	0.000	11590.08	1.768	s
CO-60	1	5331.84	1332.50	0.00	0.00	0.000	100.00	1.806	s
EU-152	1	5636.95	1408.69	19.07	0.14	0.000	4354.11	1.854	s
K-40	1	5843.76	1460.32	2.83	196.17	0.109	7.09	1.159	s
BI-214	1	7060.91	1764.14	2.40	15.12	0.008	29.51	2.066	s

s = Peak fails shape tests.

D = Peak area deconvoluted.

A = Derived Aveage Activity.

SUMMARY OF LIBRARY PEAK USAGE

Nuclide Name	Nuclide Code	Library Used	Average Activity Becquerels	Peak Energy keV	Peak Activity Becquerels	Peak Analysis Code	Peak MDA Value Becquerels	Peak MDA Code	Peak Comments	
CS-137	T F I	1	9.070E-001	661.66	9.070E-001	% (	1.805E+000G		1.1E+004	85.21
RA-224	N	1	-7.254E+001	240.99	-7.254E+001	(	5.683E+001G		7.0E+002	4.10
			6.963E-002	1408.00	7.241E-002	&	1.175E+001G		4.9E+003	21.00
EU-152	T F	1	6.963E-002	344.29	6.963E-002	% (	3.390E+000G		4.9E+003	26.50
			6.963E-002	121.78	1.263E+000	&	2.217E+000G		4.9E+003	28.58
			6.963E-002	778.92	-1.151E+000	%	1.220E+001G		4.9E+003	12.94
			6.963E-002	964.11	1.040E+000	%	1.623E+001G		4.9E+003	14.61
			6.963E-002	1112.07	-8.172E-001	%	1.564E+001G		4.9E+003	13.64
CS-134	T F I	1	6.066E-002	604.71	6.066E-002	% (	3.962E-001G		7.5E+002	97.62
			6.066E-002	795.87	8.090E-001	%	1.649E+000G		7.5E+002	85.53
			6.066E-002	569.32	0.000E+000	% }	9.403E+000G		7.5E+002	15.38
			6.066E-002	801.95	-2.547E+000	%	1.760E+001G		7.5E+002	8.69
			6.066E-002	563.24	7.340E-001	%	1.392E+001G		7.5E+002	8.35
Pa-234	N	1	5.487E-001	131.29	5.487E-001	% (	5.596E+000G		1.6E+012	18.00
			5.487E-001	569.47	5.487E-001	%	1.721E+001G		1.6E+012	8.20
			5.487E-001	946.02	9.043E-001	&	1.361E+001G		1.6E+012	13.40
			5.487E-001	883.24	6.865E-002	&	1.752E+001G		1.6E+012	9.60
			5.487E-001	880.53	-3.217E+000	%	3.315E+001G		1.6E+012	6.00
TH-234	N	1	3.546E+001	63.29	3.546E+001	@ (P	2.830E+001G		1.6E+012	4.82
			3.546E+001	92.59	1.124E+001	% P	2.333E+001G		1.6E+012	5.58
U-235	N	1	3.217E+000	143.79	3.217E+000	% (	8.131E+000G		2.6E+011	10.96
			3.217E+000	205.33	1.662E+000	&	1.665E+001G		2.6E+011	5.01
			3.217E+000	163.38	-3.897E+000	%	1.661E+001G		2.6E+011	5.08
			3.217E+000	93.35	3.217E+000	! E	1.951E+001X		2.6E+011	5.81
AM-241	T	1	-2.357E-001	59.54	-2.357E-001	% (	3.804E+000G		1.6E+005	35.90
PB-212	N	1	2.305E+001	238.63	2.305E+001	(P	2.285E+000G		7.0E+002	43.30
			2.305E+001	300.03	4.037E+001	*	2.453E+001G		7.0E+002	3.28
PB-210	N	1	2.294E+001	46.54	2.294E+001	% (P	3.248E+001G		8.1E+003	4.25
EU-155	T F I	1	2.167E+000	105.31	2.167E+000	% (	3.873E+000G		1.8E+003	21.20
			2.167E+000	86.54	2.036E-001	%	4.318E+000G		1.8E+003	30.70
PA-234	N	1	2.043E+001	1001.00	2.043E+001	% (	1.801E+002G		1.6E+012	.84
			2.043E+001	766.41	-1.495E+001	&	6.718E+002G		1.6E+012	.29
K-40	N	1	2.032E+002	1460.83	2.032E+002	(P	1.093E+001G		4.7E+011	10.67
AC-228	N	1	2.021E+001	911.07	2.021E+001	(	1.885E+000G		2.1E+003	29.00
			2.021E+001	968.97	1.181E+001	-	1.163E+001G		2.1E+003	17.46
			2.021E+001	338.32	3.884E+001	*	7.738E+000G		2.1E+003	12.01
			2.021E+001	93.35	2.021E+001	E	1.665E+001X	A	2.1E+003	5.56
PB-214	N	1	1.756E+001	351.93	1.773E+001	(P	2.638E+000G		5.8E+005	37.60
			1.756E+001	295.09	1.724E+001	(P	4.677E+000G		5.8E+005	19.30
			1.756E+001	242.00	3.141E+001	*	1.119E+001G		5.8E+005	7.43
BI-214	N	1	1.565E+001	609.31	1.565E+001	(P	1.860E+000G		5.8E+005	46.09
			1.565E+001	1120.29	1.016E+001	% P	1.406E+001G		5.8E+005	15.10
			1.565E+001	1764.49	1.289E+001	-	8.458E+000G		5.8E+005	15.40
I-131	T F I	1	-1.249E-001	364.48	-1.249E-001	* (	1.392E+000G		8.0E+000	81.70

				-1.249E-001	284.30	3.197E+000	%		1.689E+001G	8.0E+000	6.14
				-1.249E-001	636.97	-3.736E-001	%		1.946E+001G	8.0E+000	7.17
TL-208	F	N	1	1.075E+001	583.02	1.064E+001		(P	1.181E+000G	7.0E+002	84.50
				1.075E+001	277.28	1.230E+001	?	(	1.511E+001G	7.0E+002	6.31
				1.075E+001	860.56	4.245E+000	%		1.484E+001G	7.0E+002	12.42
BI-212		N	1	1.042E+001	727.33	1.042E+001	?	(	1.264E+001G	7.0E+002	11.82
				1.042E+001	785.51	1.627E+001	%		1.417E+002G	7.0E+002	1.10
EU-154	T F I		1	0.000E+000	873.23	0.000E+000	%	(	1.213E+001G	3.1E+003	12.27
				0.000E+000	123.10	3.376E-001	&		1.758E+000G	3.1E+003	40.79
				0.000E+000	1274.54	-1.241E-002	%		5.491E+000G	3.1E+003	35.19
				0.000E+000	723.36	-3.740E+000	&		1.088E+001G	3.1E+003	20.22
				0.000E+000	1004.77	-4.143E-001	&		8.711E+000G	3.1E+003	18.01
				0.000E+000	996.33	-2.771E+000	%		1.686E+001G	3.1E+003	10.60
BE-7		N P C	1	0.000E+000	477.60	0.000E+000	%	(	1.520E+001G	5.3E+001	10.52
CO-60	T F		1	0.000E+000	1332.50	0.000E+000	&	(	7.522E-001G	1.9E+003	99.98
				0.000E+000	1173.24	6.680E-001	%		1.504E+000G	1.9E+003	99.90

Analysis Codes:

% = Peak fails sensitivity test
? = Peak is too narrow
- = Peak activity lower than counting uncertainty range
= = Peak outside analysis energy range
(= This peak is used in the nuclide activity average
P = Peakbackround subtraction
* = Peak is too wide, but only one peak in library
@ = Peak is too wide at FW25M, but OK at FWHM
A = Derived Average Activity
E = Energy Duplication
+ = Peak activity higher than counting uncertainty range
! = Peak is part of a multiplet and this area went negative during deconvolution
$ = Peak identified, but first peak of this nuclide failed one or more qualification tests
& = Calculated peak centroid is not close enough to the library energy centroid for positive identification

Nuclide Codes:

T = Thermal Neutron Activation
F = Fast Neutron Activation
I = Fission Product
P = Photon Reaction
N = Naturally Occurring Isotope
C = Charged Particle Reaction
M = No MDA Calculation

Peak Codes:

G = Gamma Ray
X = X-Ray
P = Positron Decay
S = Single - Escape
D = Double - Escape
K = Key Line
A = Not in Average

SUMMARY OF NUCLIDES IN SAMPLE

Nuclide		Time of Count Activity Bq/sample	Time Corrected Activity Bq/sample	Uncertainty Counts 1 Sigma %	Uncertainty Total 1 Sigma %	Minimum Detectable Activity
I-131	<	-1.249E-001	-1.254E-001	316.69	316.70	1.392E+000
CS-134	<	6.066E-002	6.067E-002	88.62	88.67	3.962E-001
EU-154	<			548.31	548.31	1.213E+001
PB-212		2.305E+001	2.305E+001	6.20	6.89	2.285E+000
PB-214		1.756E+001	1.756E+001	8.74	9.20	2.638E+000
BI-212	#	1.042E+001	1.042E+001	39.61	39.72	1.264E+001
Pa-234	<	5.487E-001	5.487E-001	298.76	298.78	5.596E+000
TH-234	#	3.546E+001	3.546E+001	33.59	33.79	2.830E+001
BE-7	<			1.056.54	1.056.55	1.520E+001
K-40		2.032E+002	2.032E+002	7.19	7.76	1.093E+001
CO-60	<			100.00	100.04	7.522E-001
CS-137	#	9.070E-001	9.070E-001	60.72	60.79	1.805E+000
EU-152	<	6.963E-002	6.963E-002	1.343.12	1.343.12	3.390E+000
EU-155	<	2.167E+000	2.167E+000	54.66	54.76	3.873E+000
TL-208		1.075E+001	1.075E+001	8.95	9.40	1.181E+000
RA-224	<	-7.254E+001	-7.254E+001	24.76	24.94	5.683E+001
PB-210		2.294E+001	2.294E+001	44.20	44.37	3.248E+001
BI-214		1.565E+001	1.565E+001	9.12	9.56	1.860E+000
AC-228		2.021E+001	2.021E+001	11.25	11.61	1.885E+000
PA-234M	<	2.043E+001	2.043E+001	239.04	239.06	1.801E+002
U-235	<	3.217E+000	3.217E+000	76.00	76.06	8.131E+000
AM-241	<	-2.357E-001	-2.357E-001	471.27	471.28	3.804E+000

= All peaks for activity calculation had bad shape

Total Activity (37.53 to 1,998.47 keV) 336.35 Bq/sample

Analyzed by: _____

403293

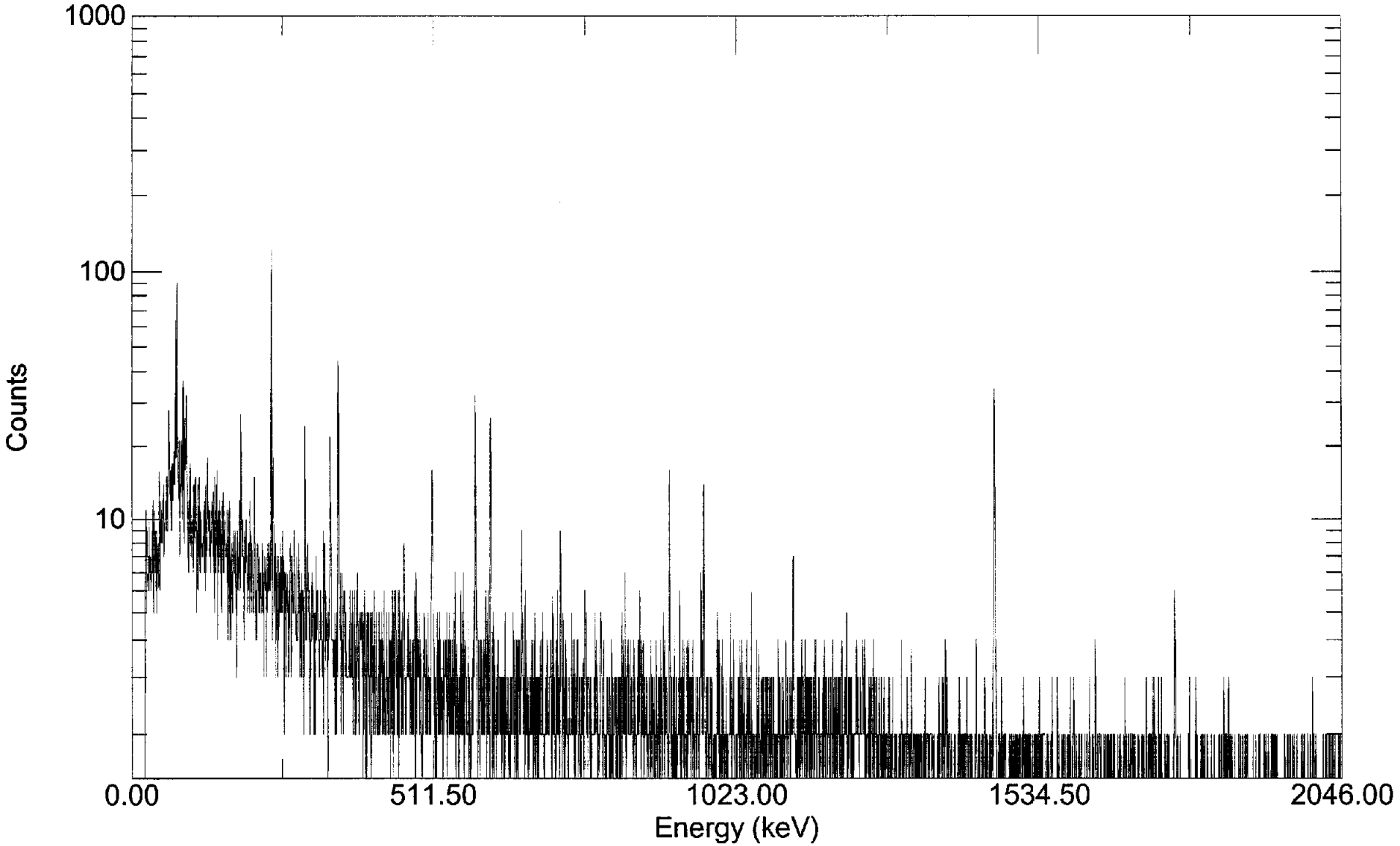
Reviewed by: _____

Supervisor

Laboratory: STL- St Louis

KEKA71AC

7357010_KEKA71AC_F7L200251-005



Acquired: 23-Dec-2007 1:04:53 PM
File: C:\User\spectra\KEKA71AC.spc
Detector: #0 Ge 4 SN/181

Real Time: 1804.52 s. Live Time: 1800.00 s.
Channels: 8192

TestAmerica St. Louis

DB Analysis ID: 32,966

Sample Description: 7357010_KEKA91AC_F7L200251-006

Spectrum Filename: KEKA91AC.An1

Acquisition Information

Start Time:	23-Dec-2007 1:05:25PM		
Live Time:	1800.00	Real Time:	1858.64
Dead Time:	3.15 %		
Detector ID:	5		

Detector System: Ge 5 SN/157

Calibration

Description:	Ge5 TunaCanCal_74139-334_05_08_07		
Filename:	C:\User\Calibrations\Ge5 calibrations\Ge5 TunaCanCal_74139-334_05_08_07.Clb		
Energy Created:	28-Mar-2007 6:08:23PM	Efficiency Created:	08-May-2007 3:55:34PM
Zero Offset:	0.272 keV	Gain:	0.250 keV/Channel

Library 1 File: mmr06 short.lib Library based peak stripping used.
Library 2 File: Null.Lib
Library 3 File: Null.Lib

Analysis Parameters

Start Channel:	150 for an energy of 37.74 keV
Stop Channel:	8,000 for an energy of 2000.57 keV
Peak rejection level:	40.000 %
Activity Scaling Factor:	1.0000 / 1.0000 = 1.0000
Detection Limit Method:	Nureg method 4.16
Sample Size:	1.00E+000
Additional random error:	0.0000
Additional systematic error:	0.0000
Fraction Limit:	0.0000%
Background Width:	Average of three points

Corrections

	Status	Comments
Decay Correct to Date:	YES	23-Dec-2007 12:00:00PM
Decay During Acquisition:	NO	
Peaked Background Correction:	YES	Ge5 PBC table 11 26 07.Pbc
Absorption:	NO	
Geometry Correction:	NO	
Random Summing:	NO	

Energy Calibration Normalized Difference: 0.0706

UNIDENTIFIED PEAK SUMMARY

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncertainty 1 Sigma%	FWHM keV	Suspected Nuclide	Code
297.43	74.57	534.00	351.00	0.195	14.21	0.853	PB-214	s
307.17	77.00	290.00	552.00	0.307	6.83	0.750	PB-214	
347.47	87.07	448.79	53.21	0.030	57.95	0.829		s
358.81	89.90	188.84	167.16	0.093	13.96	0.855	PB-214	
395.09	98.97	223.33	131.67	0.073	25.18	0.756	AC-228	s
515.39	129.02	179.23	172.77	0.096	13.34	0.933	AC-228	
837.06	209.38	168.71	216.29	0.120	10.88	0.718	AC-228	s
1311.77	328.00	60.67	73.33	0.041	22.64	0.908	AC-228	
1852.27	463.06	46.67	117.33	0.065	17.80	0.795	AC-228	s
2042.13	510.51	51.00	193.00	0.107	11.96	1.039	J-133	s

s = Peak fails shape tests.

D = Peak area deconvoluted.

IDENTIFIED PEAK SUMMARY

Nuclide	Library Used	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncertainty 1 Sigma%	FWHM keV	Code
PB-210	1	183.91	46.21	164.76	57.24	0.032	32.62	0.717	s
AM-241	1	237.27	59.54	374.62	-17.56	-0.010	193.06	0.761	s
TH-234	1	252.95	63.46	437.79	21.66	0.012	82.95	0.764	s
EU-155	1	347.81	87.16	359.49	210.46	0.117	14.49	0.788	s
TH-234	1	370.96	92.94	405.65	120.41	0.067	21.04	0.795	s
U-235	1	372.61	93.35	295.87	8.19	0.005	42.25	0.795	s D
AC-228	1	372.61	93.35	264.00	236.64	0.131	1.38	1.234	s D
EU-155	1	421.51	105.57	288.61	36.35	0.020	68.14	0.808	s
EU-152	1	489.32	122.51	234.84	-0.42	0.000	5157.34	0.824	s
EU-154	1	491.89	123.15	248.43	6.32	0.004	354.96	0.826	s
Pa-234	1	520.02	130.18	308.43	-38.94	-0.022	65.77	0.834	s
U-235	1	574.82	143.87	269.90	15.48	0.009	130.92	0.847	s
U-235	1	653.86	163.61	202.79	8.72	0.005	189.52	0.867	s
U-235	1	820.84	205.33	188.06	5.16	0.003	378.27	0.909	s
PB-212	1	954.18	238.65	222.81	1277.19	0.710	3.79	0.881	
RA-224	1	963.54	240.99	100.02	85.98	0.048	19.67	0.944	D
PB-214	1	967.59	242.00	84.08	-0.51	0.000	2544.28	0.945	D
TL-208	1	1109.53	277.46	70.00	100.00	0.056	20.08	1.821	s
I-131	1	1138.90	284.80	133.00	-12.91	-0.007	129.36	0.987	
PB-214	1	1180.09	295.09	114.58	188.42	0.105	15.04	1.083	s
PB-212	1	1200.58	300.21	80.50	88.50	0.049	24.69	1.267	s
AC-228	1	1353.09	338.32	61.33	273.67	0.152	8.72	0.963	
EU-152	1	1376.17	344.09	67.93	17.88	0.010	69.34	1.045	s
PB-214	1	1407.57	351.93	77.21	228.79	0.127	10.73	0.675	s
I-131	1	1457.76	364.47	87.05	-9.08	-0.005	148.98	1.065	s
BE-7	1	1905.50	476.36	49.85	3.00	0.002	337.30	1.173	s
CS-134	1	2251.16	562.75	33.90	15.45	0.009	59.05	1.252	s
CS-134	1	2277.45	569.32	37.85	4.68	0.003	8.10	1.258	s D
Pa-234	1	2278.05	569.47	41.61	-5.85	-0.003	-224.28	1.258	s D
TL-208	1	2333.45	583.32	44.25	408.75	0.227	6.11	1.171	
CS-134	1	2419.84	604.91	49.62	5.73	0.003	178.90	1.290	
BI-214	1	2437.66	609.36	33.40	175.60	0.098	10.28	1.258	
I-131	1	2545.35	636.28	41.33	-2.06	-0.001	446.14	1.319	s
CS-137	1	2647.67	661.85	50.38	10.54	0.006	61.05	1.342	s
EU-154	1	2889.23	722.23	56.08	-3.12	-0.002	344.37	1.397	s
BI-212	1	2909.49	727.30	15.83	90.17	0.050	13.86	0.868	s
PA-234M	1	3061.03	765.18	44.15	-4.43	-0.002	217.35	1.434	s
EU-152	1	3125.40	781.27	28.82	0.51	0.000	1500.67	1.445	s
BI-212	1	3142.35	785.51	28.64	2.06	0.001	374.01	1.451	s
CS-134	1	3179.57	794.82	28.74	37.40	0.021	26.04	1.460	s
CS-134	1	3205.99	801.42	24.66	-4.33	-0.002	169.32	1.465	s
TL-208	1	3442.10	860.45	0.00	84.00	0.047	10.91	1.042	s
EU-154	1	3491.71	872.85	26.83	-1.49	-0.001	499.81	1.527	s
Pa-234	1	3522.44	880.53	25.44	0.00	0.000	713.36	1.533	s
Pa-234	1	3530.75	882.61	20.73	-1.22	-0.001	535.73	1.535	s
AC-228	1	3645.12	911.20	8.33	263.67	0.146	6.64	1.282	

Pa-234	1	3786.82	946.63	23.61	1.16	0.001	600.60	1.588	s
EU-152	1	3856.73	964.11	510.06	0.00	0.000	3193.92	1.603	s
AC-228	1	3873.77	968.37	12.00	179.00	0.099	9.06	1.321	s
EU-154	1	3984.46	996.05	27.24	-3.62	-0.002	210.43	1.630	s
PA-234M	1	4006.16	1001.47	19.23	9.43	0.005	73.37	1.633	s
EU-154	1	4015.17	1003.72	29.72	-3.23	-0.002	245.38	1.637	s
EU-152	1	4450.53	1112.59	26.26	1.30	0.001	565.87	1.723	s
BI-214	1	4483.83	1120.91	0.00	61.00	0.034	12.80	1.081	s
CO-60	1	4695.88	1173.94	27.00	-3.74	-0.002	203.20	1.772	s
EU-154	1	5098.13	1274.54	44.00	0.00	0.000	938.08	1.850	s
CO-60	1	5323.84	1331.00	24.15	-5.90	-0.003	124.74	1.894	s
EU-152	1	5636.13	1409.11	14.81	2.96	0.002	193.05	1.950	s
K-40	1	5843.19	1460.90	0.00	231.00	0.128	6.58	1.418	s
BI-214	1	7057.45	1764.70	13.24	13.68	0.008	39.87	2.196	s

s = Peak fails shape tests.

D = Peak area deconvoluted.

A = Derived Aveage Activity.

SUMMARY OF LIBRARY PEAK USAGE

Nuclide Name	Nuclide Code	Library Used	Average Activity Becquerels	Peak Energy keV	Peak Activity Becquerels	Peak Analysis Code			Peak MDA Value Becquerels		Peak Code	Peak Comments	
AM-241	T	1	-9.992E-001	59.54	-9.992E-001	&	(	P	5.286E+000G			1.6E+005	35.90
PA-234M	N	1	8.625E+001	1001.00	8.625E+001	%	(		2.116E+002G			1.6E+012	.84
			8.625E+001	766.41	-9.275E+001	&			7.049E+002G			1.6E+012	.29
EU-154	T F I	1	-8.296E-001	873.23	-8.296E-001	%	(		1.499E+001G			3.1E+003	12.27
			-8.296E-001	123.10	2.421E-001	%			2.918E+000G			3.1E+003	40.79
			-8.296E-001	1274.54	0.000E+000	%			8.898E+000G			3.1E+003	35.19
			-8.296E-001	723.36	-9.045E-001	%			1.091E+001G			3.1E+003	20.22
			-8.296E-001	1004.77	-1.375E+000	%			1.199E+001G			3.1E+003	18.01
			-8.296E-001	996.33	-2.606E+000	%			1.945E+001G			3.1E+003	10.60
			6.879E+001	93.35	6.879E+001			E	2.280E+001G		A	2.1E+003	5.56
AC-228	N	1	6.879E+001	911.16	6.448E+001		(		3.953E+000G			2.1E+003	29.00
			6.879E+001	968.97	7.643E+001		(		8.050E+000G			2.1E+003	17.46
			6.879E+001	338.32	6.809E+001		(		9.755E+000G			2.1E+003	12.01
CS-137	T F I	1	6.730E-001	661.66	6.730E-001	&	(	P	2.285E+000G			1.1E+004	85.21
PB-212	N	1	6.530E+001	238.63	6.477E+001		(	P	3.665E+000G			7.0E+002	43.30
			6.530E+001	300.03	7.227E+001		(		3.636E+001G			7.0E+002	3.28
			-5.703E-001	1173.24	-3.258E-001	%			2.346E+000G			1.9E+003	99.90
CO-60	T F	1	-5.703E-001	1332.50	-5.703E-001	%	(		2.475E+000G			1.9E+003	99.98
RA-224	N	1	4.642E+001	240.99	4.642E+001		(		2.663E+001G			7.0E+002	4.10
BI-212	N	1	4.495E+001	727.33	4.495E+001		(		1.060E+001G			7.0E+002	11.82
			4.495E+001	785.51	1.176E+001	&			1.579E+002G			7.0E+002	1.10
PB-210	N	1	4.203E+001	46.54	4.203E+001	*	(	P	4.591E+001G			8.1E+003	4.25
I-131	T F I	1	-3.558E-001	364.48	-3.558E-001	%	(		1.809E+000G			8.0E+000	81.70
			-3.558E-001	284.30	-5.367E+000	&			2.347E+001G			8.0E+000	6.14
			-3.558E-001	636.97	-1.516E+000	%			2.401E+001G			8.0E+000	7.17
Pa-234	N	1	-3.410E+000	131.29	-3.410E+000	%	(		7.405E+000G			1.6E+012	18.00
			-3.410E+000	569.47	-3.410E+000	&			1.912E+001G			1.6E+012	8.20
			-3.410E+000	946.02	6.319E-001	%			1.383E+001G			1.6E+012	13.40
			-3.410E+000	883.24	-8.784E-001	%			1.723E+001G			1.6E+012	9.60
			-3.410E+000	880.53	0.000E+000	%			3.014E+001G			1.6E+012	6.00
EU-155	T F I	1	2.695E+000	105.31	2.695E+000	%	(		6.069E+000G			1.8E+003	21.20
			2.695E+000	86.54	1.138E+001	*			4.925E+000G		A	1.8E+003	30.70

TL-208	F	N	1	2.362E+001	583.02	2.362E+001		(	P	1.948E+000G	7.0E+002	84.50
				2.362E+001	277.28	3.957E+001	*			1.650E+001G	7.0E+002	6.31
				2.362E+001	860.56	4.579E+001	+			4.017E+000G	7.0E+002	12.42
TH-234		N	1	2.282E+001	63.29	8.773E+000	*	(	P	4.060E+001G	1.6E+012	4.82
				2.282E+001	92.59	3.495E+001	*	(	P	2.803E+001G	1.6E+012	5.58
U-235		N	1	2.279E+000	143.79	2.279E+000	%	(	P	1.166E+001G	2.6E+011	10.96
				2.279E+000	205.33	2.014E+000	%			2.599E+001G	2.6E+011	5.01
				2.279E+000	163.38	2.915E+000	&		P	2.310E+001G	2.6E+011	5.08
				2.279E+000	93.35	2.279E+000	%		E	2.306E+001X	2.6E+011	5.81
K-40		N	1	2.258E+002	1460.83	2.258E+002		(		7.204E+000G	4.7E+011	10.67
				2.049E+000	1112.07	7.920E-001	%			1.624E+001G	4.9E+003	13.64
				2.049E+000	1408.00	1.423E+000	%			9.939E+000G	4.9E+003	21.00
EU-152	T F		1	2.049E+000	344.29	2.049E+000	%	(		4.711E+000G	4.9E+003	26.50
				2.049E+000	121.78	-2.297E-002	&			4.050E+000G	4.9E+003	28.58
				2.049E+000	778.92	2.450E-001	%			1.337E+001G	4.9E+003	12.94
				2.049E+000	964.11	0.000E+000	%			5.488E+001G	4.9E+003	14.61
BI-214		N	1	1.932E+001	609.31	1.932E+001		(	P	3.262E+000G	5.8E+005	46.09
				1.932E+001	1120.29	3.387E+001	+			4.092E+000G	5.8E+005	15.10
				1.932E+001	1764.49	1.090E+001	%		P	1.568E+001G	5.8E+005	15.40
PB-214		N	1	1.885E+001	351.93	1.885E+001	@	(	P	3.597E+000G	5.8E+005	37.60
				1.885E+001	295.09	2.576E+001	+		P	7.191E+000G	5.8E+005	19.30
				1.885E+001	242.00	-1.526E-001	%			1.359E+001G	5.8E+005	7.43
CS-134	T F I		1	1.454E+000	604.71	2.956E-001	%	(		1.834E+000G	7.5E+002	97.62
				1.454E+000	795.87	2.777E+000	?	(		2.056E+000G	7.5E+002	85.53
				1.454E+000	569.32	1.454E+000	&			9.758E+000G	7.5E+002	15.38
				1.454E+000	801.95	-3.180E+000	%			1.901E+001G	7.5E+002	8.69
				1.454E+000	563.24	8.768E+000	&			1.693E+001G	7.5E+002	8.35
BE-7		N P C	1	1.169E+000	477.60	1.169E+000	&	(		1.386E+001G	5.3E+001	10.52

Analysis Codes:

% = Peak fails sensitivity test

- = Peak activity lower than counting uncertainty range

(= This peak is used in the nuclide activity average

* = Peak is too wide, but only one peak in library

A = Derived Average Activity

+ = Peak activity higher than counting uncertainty range

! = Peak is part of a multiplet and this area went negative during deconvolution

$ = Peak identified, but first peak of this nuclide failed one or more qualification tests

? = Peak is too narrow

= = Peak outside analysis energy range

P = Peakbackround subtraction

@ = Peak is too wide at FW25M, but OK at FWHM

E = Energy Duplication

& = Calculated peak centroid is not close enough to the library energy centroid for positive identification

Nuclide Codes:

T = Thermal Neutron Activation	F = Fast Neutron Activation	I = Fission Product
P = Photon Reaction	N = Naturally Occurring Isotope	C = Charged Particle Reaction
M = No MDA Calculation		

Peak Codes:

G = Gamma Ray	X = X-Ray	P = Positron Decay
S = Single - Escape	D = Double - Escape	K = Key Line
A = Not in Average		

SUMMARY OF NUCLIDES IN SAMPLE

Nuclide		Time of Count Activity Bq/sample	Time Corrected Activity Bq/sample	Uncertainty Counts 1 Sigma %	Uncertainty Total 1 Sigma %	Minimum Detectable Activity
I-131	#	-3.558E-001	-3.572E-001	148.98	149.01	1.809E+000
CS-134	#	1.454E+000	1.454E+000	26.04	26.20	1.834E+000
EU-154	#	-8.296E-001	-8.296E-001	499.81	499.82	1.499E+001
PB-212		6.530E+001	6.530E+001	3.81	4.84	3.665E+000
PB-214	#	1.885E+001	1.885E+001	10.97	11.34	3.597E+000
BI-212		4.495E+001	4.495E+001	13.86	14.16	1.060E+001
Pa-234	#	-3.410E+000	-3.410E+000	65.77	65.84	7.405E+000
TH-234	#	2.282E+001	2.282E+001	25.04	25.31	4.060E+001
BE-7	#	1.169E+000	1.170E+000	337.30	337.32	1.386E+001
K-40		2.258E+002	2.258E+002	6.58	7.20	7.204E+000
CO-60	#	-5.703E-001	-5.703E-001	124.74	124.77	2.475E+000
CS-137	#	6.730E-001	6.730E-001	97.26	97.30	2.285E+000
EU-152	#	2.049E+000	2.049E+000	69.34	69.40	4.711E+000
EU-155	#	2.695E+000	2.695E+000	68.14	68.22	6.069E+000
TL-208		2.362E+001	2.362E+001	6.17	6.81	1.948E+000
PB-210	#	4.203E+001	4.203E+001	42.47	42.64	4.591E+001
BI-214		1.932E+001	1.932E+001	10.67	11.06	3.262E+000
RA-224		4.642E+001	4.642E+001	19.67	19.90	2.663E+001
AC-228		6.879E+001	6.879E+001	4.74	5.55	3.953E+000
PA-234M	#	8.625E+001	8.625E+001	73.37	73.43	2.116E+002
U-235	#	2.279E+000	2.279E+000	151.85	151.88	1.166E+001
AM-241	#	-9.992E-001	-9.992E-001	229.47	229.51	5.286E+000

= All peaks for activity calculation had bad shape

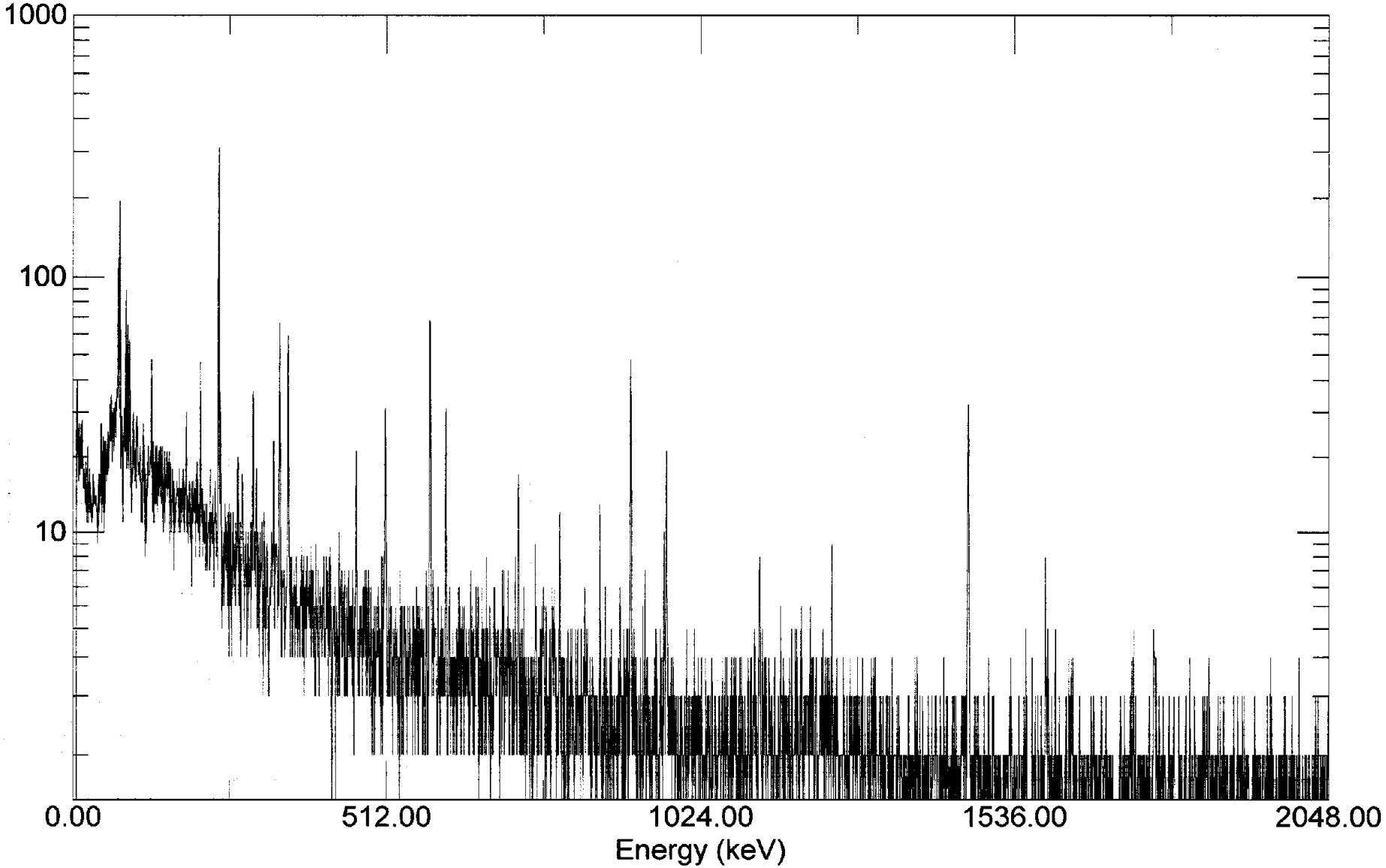
Total Activity (37.74 to 2,000.57 keV) 513.06 Bq/sample

Analyzed by: 403293

Laboratory: STL- St Louis

KEKA91AC

7357010_KEKA91AC_F7L200251-006



Acquired: 23-Dec-2007 1:05:25 PM
File: C:\User\spectra\KEKA91AC.spc
Detector: #0 Ge 5 SN/157

Real Time: 1858.64 s. Live Time: 1800.00 s.
Channels: 8192

TestAmerica St. Louis

DB Analysis ID: 32,965

Sample Description: 7357010_KEKCC1AC_F7L200251-007

Spectrum Filename: KEKCC1AC.An1

Acquisition Information

Start Time: 23-Dec-2007 1:05:56PM
Live Time: 1800.00 Real Time: 1818.26
Dead Time: 1.00 %
Detector ID: 7

Detector System: Ge 7 SN/154

Calibration

Description: Ge7 Tunacan 74139_334 01_16_07
Filename: C:\User\Calibrations\Ge7 calibrations\Ge7 Tunacan 01_16_07.Clb
Energy Created: 16-Jan-2007 4:24:37PM Efficiency Created: 16-Jan-2007 4:27:00PM
Zero Offset: 0.231 keV Gain: 0.250 keV/Channel

Library 1 File: mmr06 short.lib Library based peak stripping used.
Library 2 File: Null.Lib
Library 3 File: Null.Lib

Analysis Parameters

Start Channel: 150 for an energy of 37.72 keV
Stop Channel: 8,000 for an energy of 2000.15 keV
Peak rejection level: 40.000 %
Activity Scaling Factor: 1.0000 / 1.0000 = 1.0000
Detection Limit Method: Nureg method 4.16
Sample Size: 1.00E+000
Additional random error: 0.0000
Additional systematic error: 0.0000
Fraction Limit: 0.0000%
Background Width: Average of three points

Corrections

	Status	Comments
Decay Correct to Date:	YES	23-Dec-2007 12:00:00PM
Decay During Acquisition:	NO	
Peaked Background Correction:	YES	Ge7 PBC table 11 26 07.Pbc
Absorption:	NO	
Geometry Correction:	NO	
Random Summing:	NO	

Energy Calibration Normalized Difference: 0.1287

UNIDENTIFIED PEAK SUMMARY

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncertainty 1 Sigma%	FWHM keV	Suspected Nuclide	Code
298.30	74.79	577.50	296.50	0.165	18.15	0.753	PB-214	
307.60	77.11	459.17	445.83	0.248	10.89	0.926	PB-214	
348.04	87.22	221.22	226.78	0.126	11.41	0.522	PB-214	s
358.55	89.85	186.00	143.00	0.079	15.87	0.808	PB-214	s
371.69	93.13	524.00	0.00	0.000	3237.28	0.744		s
1353.09	338.44	259.22	29.78	0.017	78.62	0.954		

s = Peak fails shape tests.

D = Peak area deconvoluted.

IDENTIFIED PEAK SUMMARY

Nuclide	Library Used	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncertainty 1 Sigma%	FWHM keV	Code
PB-210	1	184.74	46.40	248.39	3.42	0.002	79.29	0.832	s
AM-241	1	236.50	59.34	322.28	19.13	0.011	134.65	0.846	s
TH-234	1	252.24	63.28	398.19	49.56	0.028	40.86	0.850	s
EU-155	1	345.32	86.54	492.55	-7.45	-0.004	423.01	0.874	s
TH-234	1	370.87	92.93	456.10	118.46	0.066	21.63	0.881	s
AC-228	1	372.56	93.35	565.99	0.00	0.000	2817.80	0.882	s D
U-235	1	372.56	93.35	329.07	-10.80	-0.006	-236.57	0.882	s D
EU-155	1	421.31	105.54	235.85	37.36	0.021	60.39	0.894	s
EU-152	1	484.78	121.40	191.26	5.11	0.003	385.17	0.912	s
EU-154	1	490.10	122.73	201.07	2.99	0.002	674.27	0.913	s
Pa-234	1	519.35	130.04	283.56	-34.39	-0.019	71.32	0.922	s
U-235	1	574.40	143.80	235.78	-20.32	-0.011	109.15	0.935	s
U-235	1	652.73	163.38	262.35	-2.71	-0.002	846.74	0.955	s
U-235	1	825.64	206.60	204.92	-1.12	-0.001	1802.40	0.999	s
PB-212	1	953.80	238.63	142.49	895.51	0.498	3.78	1.034	D
RA-224	1	963.22	240.99	258.56	103.44	0.057	24.08	1.036	D
PB-214	1	967.26	242.00	176.85	91.15	0.051	23.14	1.037	D
TL-208	1	1107.80	277.13	79.17	88.83	0.049	25.12	0.374	s
I-131	1	1131.51	283.05	101.93	3.30	0.002	435.95	1.081	s
PB-214	1	1180.70	295.35	47.50	215.50	0.120	9.07	1.153	s
PB-212	1	1202.09	300.69	85.50	95.50	0.053	24.91	1.045	s
AC-228	1	1353.28	338.49	121.96	151.89	0.084	13.10	1.136	
EU-152	1	1377.08	344.43	112.19	-8.20	-0.005	185.89	1.142	s
PB-214	1	1407.80	352.11	76.55	352.45	0.196	8.19	1.097	
I-131	1	1453.89	363.63	55.32	8.03	0.004	135.69	1.163	s
BE-7	1	1910.76	477.83	54.42	-2.49	-0.001	424.31	1.277	s
CS-134	1	2237.17	559.43	23.05	6.47	0.004	112.02	1.363	s
CS-134	1	2276.76	569.32	36.65	6.56	0.004	132.42	1.369	s D
Pa-234	1	2277.35	569.47	44.04	-5.07	-0.003	-155.35	1.369	s D
TL-208	1	2332.79	583.33	47.41	325.59	0.181	8.13	1.400	s
CS-134	1	2427.07	606.89	74.04	-13.25	-0.007	95.90	1.403	s
BI-214	1	2436.76	609.32	23.47	260.53	0.145	7.59	1.536	
I-131	1	2543.67	636.04	39.17	1.07	0.001	836.08	1.435	s
CS-137	1	2629.98	657.62	26.63	-0.64	0.000	6716.82	1.459	s
EU-154	1	2890.35	722.70	63.14	0.28	0.000	3994.76	1.519	s
BI-212	1	2908.52	727.25	22.67	99.33	0.055	15.93	0.679	s
PA-234M	1	3067.08	766.88	54.91	-5.38	-0.003	199.68	1.561	s
EU-152	1	3115.24	778.92	19.85	0.00	0.000	630.06	1.573	s
BI-212	1	3144.65	786.27	6.67	60.33	0.034	17.50	1.160	s
CS-134	1	3180.01	795.11	28.41	23.71	0.013	37.85	1.589	s
CS-134	1	3211.78	803.05	32.98	-2.41	-0.001	343.01	1.595	s
TL-208	1	3442.17	860.65	28.47	26.94	0.015	34.00	1.650	
EU-154	1	3490.35	872.69	26.02	-0.35	0.000	2064.51	1.662	s
Pa-234	1	3526.62	881.76	18.63	12.30	0.007	57.23	1.669	s
Pa-234	1	3536.74	884.29	32.33	-3.15	-0.002	261.33	1.672	s
AC-228	1	3645.27	911.42	27.41	170.00	0.094	8.82	1.698	s

Pa-234	1	3775.54	943.99	20.95	-0.30	0.000	2141.58	1.731	s
EU-152	1	3850.67	962.77	58.09	-7.79	-0.004	143.01	1.748	s
AC-228	1	3876.32	969.18	42.92	89.27	0.050	14.82	1.752	s
EU-154	1	3984.93	996.33	53.26	0.00	0.000	1032.08	1.778	s
PA-234M	1	4004.44	1001.21	34.17	2.04	0.001	410.27	1.782	s
EU-154	1	4024.94	1006.33	31.96	1.56	0.001	520.28	1.785	s
EU-152	1	4450.03	1112.60	39.94	-6.46	-0.004	143.76	1.884	s
BI-214	1	4481.86	1120.56	0.00	91.00	0.051	10.48	0.380	s
CO-60	1	4695.11	1173.87	40.87	-3.74	-0.002	247.12	1.939	s
EU-154	1	5096.69	1274.27	22.12	4.27	0.002	163.08	2.030	s
CO-60	1	5329.63	1332.50	17.83	0.00	0.000	597.22	2.081	s
EU-152	1	5631.41	1407.95	15.08	8.27	0.005	74.97	2.147	s
K-40	1	5843.98	1461.09	0.00	319.00	0.177	5.60	1.679	s
BI-214	1	7059.95	1765.11	15.87	15.68	0.009	43.91	2.447	s

s = Peak fails shape tests.

D = Peak area deconvoluted.

A = Derived Aveage Activity.

SUMMARY OF LIBRARY PEAK USAGE

Nuclide Name	Nuclide Code	Library Used	Average Activity Becquerels	Peak Energy keV	Peak Activity Becquerels	Peak Analysis Code	Peak MDA Value Becquerels	Peak Code	Peak Comments	
AM-241	T	1	8.266E-001	59.54	8.266E-001	& (	3.731E+000G		1.6E+005	35.90
BE-7	N P C	1	-7.113E-001	477.60	-7.113E-001	& (	1.061E+001G		5.3E+001	10.52
EU-152	T F	1	-6.893E-001	344.29	-6.893E-001	% (	4.375E+000G		4.9E+003	26.50
			-6.893E-001	121.78	2.017E-001	%	2.650E+000G		4.9E+003	28.58
			-6.893E-001	778.92	0.000E+000	%	8.400E+000G		4.9E+003	12.94
			-6.893E-001	964.11	-2.963E+000	%	1.455E+001G		4.9E+003	14.61
			-6.893E-001	1112.07	-2.977E+000	%	1.481E+001G		4.9E+003	13.64
			-6.893E-001	1408.00	3.050E+000	%	7.675E+000G		4.9E+003	21.00
RA-224	N	1	4.085E+001	240.99	4.085E+001	(	3.066E+001G		7.0E+002	4.10
BI-212	N	1	3.669E+001	727.33	3.669E+001	* (	9.195E+000G		7.0E+002	11.82
			3.669E+001	785.51	2.558E+002	*	6.251E+001G		7.0E+002	1.10
CS-134	T F I	1	3.418E-001	604.71	-5.043E-001	% (	1.630E+000G		7.5E+002	97.62
			3.418E-001	795.87	1.307E+000	(	1.519E+000G		7.5E+002	85.53
			3.418E-001	569.32	1.503E+000	% }	7.517E+000G		7.5E+002	15.38
			3.418E-001	801.95	-1.317E+000	%	1.610E+001G		7.5E+002	8.69
			3.418E-001	563.24	2.705E+000	%	1.048E+001G		7.5E+002	8.35
PB-212	N	1	3.322E+001	238.63	3.322E+001	(P	2.164E+000G		7.0E+002	43.30
			3.322E+001	300.03	5.714E+001	+	2.740E+001G		7.0E+002	3.28
CS-137	T F I	1	-3.010E-002	661.66	-3.010E-002	% (P	1.263E+000G		1.1E+004	85.21
AC-228	N	1	2.961E+001	911.16	3.104E+001	(	4.950E+000G		2.1E+003	29.00
			2.961E+001	968.97	2.854E+001	(	1.063E+001G		2.1E+003	17.46
			2.961E+001	338.32	2.771E+001	(	9.882E+000G		2.1E+003	12.01
			2.961E+001	93.35	0.000E+000	% } E	1.829E+001G	A	2.1E+003	5.56
K-40	N	1	2.396E+002	1460.83	2.396E+002	(	5.536E+000G		4.7E+011	10.67
I-131	T F I	1	2.306E-001	364.48	2.306E-001	% (	1.074E+000G		8.0E+000	81.70
			2.306E-001	284.30	1.005E+000	&	1.515E+001G		8.0E+000	6.14
			2.306E-001	636.97	5.784E-001	%	1.730E+001G		8.0E+000	7.17
			-2.178E+000	883.24	-1.693E+000	%	1.569E+001G		1.6E+012	9.60
			-2.178E+000	880.53	1.055E+001	%	1.957E+001G		1.6E+012	6.00
Pa-234	N	1	-2.178E+000	131.29	-2.178E+000	% (	5.142E+000G		1.6E+012	18.00
			-2.178E+000	569.47	-2.178E+000	%	1.446E+001G		1.6E+012	8.20
			-2.178E+000	946.02	-1.238E-001	%	9.810E+000G		1.6E+012	13.40

U-235		N	1	-2.167E+000	143.79	-2.167E+000	&	(		7.922E+000G	2.6E+011	10.96
				-2.167E+000	205.33	-3.203E-001	%			1.977E+001G	2.6E+011	5.01
				-2.167E+000	163.38	-6.593E-001	%			1.901E+001G	2.6E+011	5.08
				-2.167E+000	93.35	-2.167E+000	!		E	1.751E+001X	2.6E+011	5.81
				2.123E+001	242.00	1.993E+001		(		1.415E+001G	5.8E+005	7.43
PB-214		N	1	2.123E+001	351.93	2.130E+001		(	P	2.628E+000G	5.8E+005	37.60
				2.123E+001	295.09	2.159E+001	@	(		3.489E+000G	5.8E+005	19.30
BI-214		N	1	2.115E+001	609.31	2.115E+001		(	P	2.053E+000G	5.8E+005	46.09
				2.115E+001	1120.29	3.812E+001	+			3.087E+000G	5.8E+005	15.10
				2.115E+001	1764.49	9.778E+000	%			1.326E+001G	5.8E+005	15.40
PB-210		N	1	2.039E+000	46.54	2.039E+000	*	(	P	4.547E+001G	8.1E+003	4.25
TH-234		N	1	2.028E+001	63.29	1.504E+001	%	(	P	2.905E+001G	1.6E+012	4.82
				2.028E+001	92.59	2.480E+001	*	(	P	2.140E+001G	1.6E+012	5.58
EU-155	T F I		1	1.996E+000	105.31	1.996E+000	%	(		3.968E+000G	1.8E+003	21.20
				1.996E+000	86.54	-2.912E-001	%			4.149E+000G	A 1.8E+003	30.70
				-1.459E-001	1274.54	8.597E-001	&			4.957E+000G	3.1E+003	35.19
				-1.459E-001	723.36	6.052E-002	%			8.540E+000G	3.1E+003	20.22
				-1.459E-001	1004.77	4.972E-001	%			9.289E+000G	3.1E+003	18.01
				-1.459E-001	996.33	0.000E+000	%			1.980E+001G	3.1E+003	10.60
EU-154	T F I		1	-1.459E-001	873.23	-1.459E-001	%	(		1.102E+001G	3.1E+003	12.27
				-1.459E-001	123.10	8.261E-002	%			1.904E+000G	3.1E+003	40.79
PA-234M		N	1	1.402E+001	1001.00	1.402E+001	&	(		2.054E+002G	1.6E+012	.84
				1.402E+001	766.41	-8.349E+001	%			5.785E+002G	1.6E+012	.29
TL-208	F	N	1	1.387E+001	583.02	1.387E+001	@	(	P	1.482E+000G	7.0E+002	84.50
				1.387E+001	277.28	2.574E+001	*			1.280E+001G	7.0E+002	6.31
				1.387E+001	860.56	1.094E+001	-			1.120E+001G	7.0E+002	12.42
CO-60	T F		1	0.000E+000	1332.50	0.000E+000	%	(		1.650E+000G	1.9E+003	99.98
				0.000E+000	1173.24	-2.466E-001	%			2.142E+000G	1.9E+003	99.90

Analysis Codes:

% = Peak fails sensitivity test

? = Peak is too narrow

- = Peak activity lower than counting uncertainty range

= = Peak outside analysis energy range

(= This peak is used in the nuclide activity average

P = Peakbackround subtraction

* = Peak is too wide, but only one peak in library

@ = Peak is too wide at FW25M, but OK at FWHM

A = Derived Average Activity

E = Energy Duplication

+ = Peak activity higher than counting uncertainty range

! = Peak is part of a multiplet and this area went negative during deconvolution

$ = Peak identified, but first peak of this nuclide failed one or more qualification tests

& = Calculated peak centroid is not close enough to the library energy centroid for positive identification

Nuclide Codes:

T = Thermal Neutron Activation	F = Fast Neutron Activation	I = Fission Product
P = Photon Reaction	N = Naturally Occurring Isotope	C = Charged Particle Reaction
M = No MDA Calculation		

Peak Codes:

G = Gamma Ray	X = X-Ray	P = Positron Decay
S = Single - Escape	D = Double - Escape	K = Key Line
A = Not in Average		

SUMMARY OF NUCLIDES IN SAMPLE

Nuclide		Time of Count Activity Bq/sample	Time Corrected Activity Bq/sample	Uncertainty Counts 1 Sigma %	Uncertainty Total 1 Sigma %	Minimum Detectable Activity
BE-7	#	-7.113E-001	-7.118E-001	424.31	424.32	1.061E+001
K-40		2.396E+002	2.396E+002	5.60	6.32	5.536E+000
CO-60	#			597.22	597.23	1.650E+000
I-131	#	2.306E-001	2.316E-001	135.69	135.72	1.074E+000
CS-134	#	3.418E-001	3.418E-001	37.85	37.96	1.630E+000
CS-137	#	-3.010E-002	-3.010E-002	14.563.06	14.563.06	1.263E+000
EU-152	#	-6.893E-001	-6.893E-001	185.89	185.92	4.375E+000
EU-155	#	1.996E+000	1.996E+000	60.39	60.48	3.968E+000
TL-208	#	1.387E+001	1.387E+001	8.19	8.68	1.482E+000
BI-212	#	3.669E+001	3.669E+001	15.93	16.19	9.195E+000
BI-214		2.115E+001	2.115E+001	7.66	8.18	2.053E+000
RA-224		4.085E+001	4.085E+001	24.08	24.27	3.066E+001
TH-234	#	2.028E+001	2.028E+001	26.73	26.98	2.905E+001
PA-234M	#	1.402E+001	1.402E+001	410.27	410.28	2.054E+002
U-235	#	-2.167E+000	-2.167E+000	109.15	109.19	7.922E+000
EU-154	#	-1.459E-001	-1.459E-001	2.064.51	2.064.51	1.102E+001
PB-210	#	2.039E+000	2.039E+000	638.83	638.84	4.547E+001
PB-212		3.322E+001	3.322E+001	3.82	4.85	2.164E+000
PB-214		2.123E+001	2.123E+001	8.25	8.74	2.628E+000
AC-228	#	2.961E+001	2.961E+001	7.22	7.77	4.950E+000
Pa-234	#	-2.178E+000	-2.178E+000	71.32	71.38	5.142E+000
AM-241	#	8.266E-001	8.266E-001	134.65	134.71	3.731E+000

= All peaks for activity calculation had bad shape

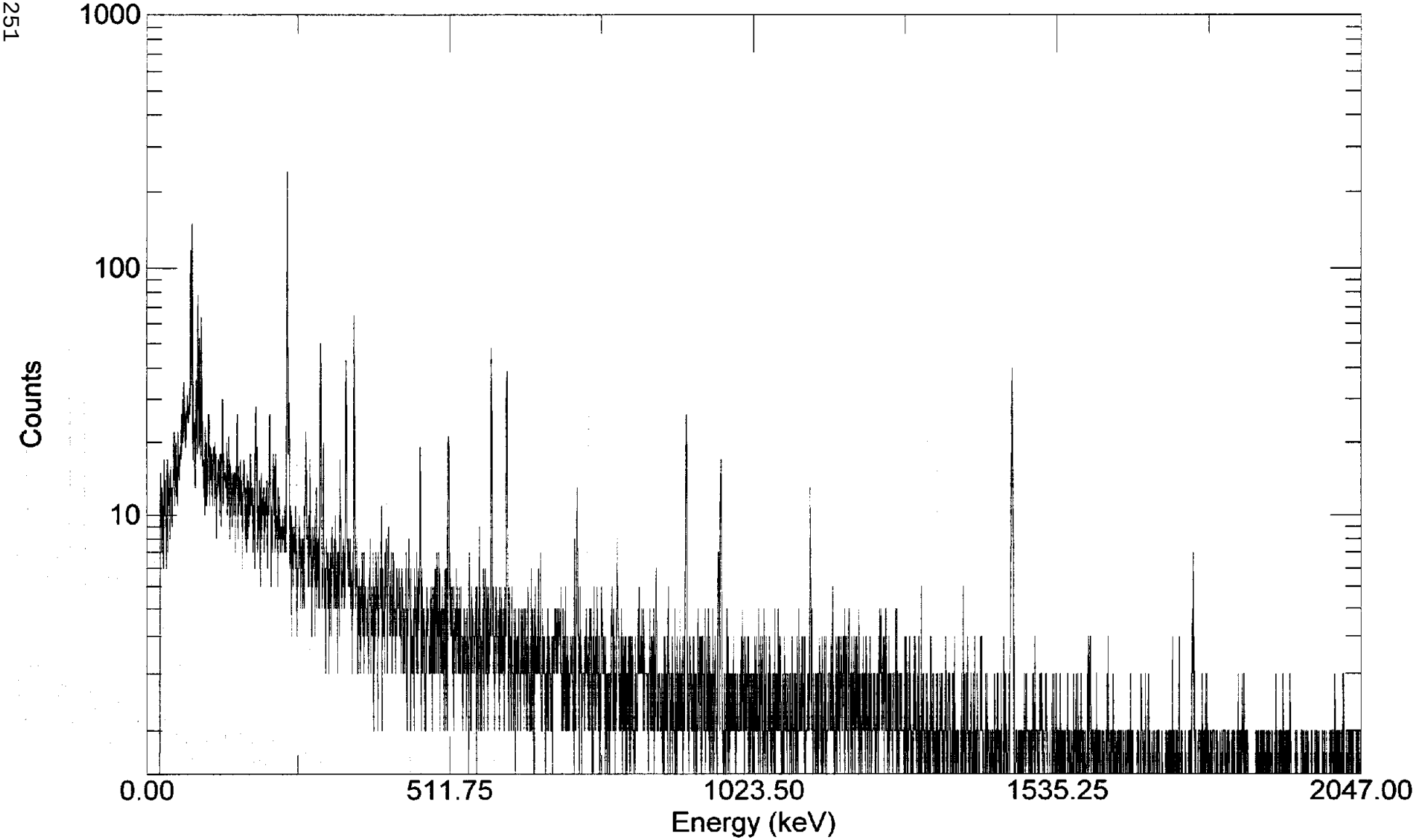
Total Activity (37.72 to 2,000.15 keV) 406.60 Bq/sample

Analyzed by: 403293

Laboratory: Test America

KEKCC1AC

7357010_KEKCC1AC_F7L200251-007



Acquired: 23-Dec-2007 1:05:57 PM
File: C:\User\spectra\KEKCC1AC.spc
Detector: #0 Ge 7 SN/154

Real Time: 1818.26 s. Live Time: 1800.00 s.
Channels: 8192

TestAmerica St. Louis

DB Analysis ID: 32,967

Sample Description: 7357010_KEKCD1AC_F7L200251-008

Spectrum Filename: KEKCD1AC.An1

Acquisition Information

Start Time:	23-Dec-2007 1:41:38PM		
Live Time:	1800.00	Real Time:	1810.70
Dead Time:	0.59 %		
Detector ID:	1		

Detector System: Ge 1 SN/242

Calibration

Description:	Ge1 Tunacan 74139-334 1_15_07		
Filename:	C:\User\Calibrations\Ge1 calibrations\Ge1 Tunacan polynomial 01_15_07.Clb		
Energy Created:	15-Jan-2007 5:43:37PM	Efficiency Created:	15-Jan-2007 5:44:16PM
Zero Offset:	0.212 keV	Gain:	0.250 keV/Channel

Library 1 File: mmr06 short.lib Library based peak stripping used.
Library 2 File: Null.Lib
Library 3 File: Null.Lib

Analysis Parameters

Start Channel:	150 for an energy of 37.71 keV
Stop Channel:	8,000 for an energy of 1999.84 keV
Peak rejection level:	40.000 %
Activity Scaling Factor:	1.0000 / 1.0000 = 1.0000
Detection Limit Method:	Nureg method 4.16
Sample Size:	1.00E+000
Additional random error:	0.0000
Additional systematic error:	0.0000
Fraction Limit:	0.0000%
Background Width:	Average of three points

Corrections	Status	Comments
Decay Correct to Date:	YES	23-Dec-2007 12:00:00PM
Decay During Acquisition:	NO	
Peaked Background Correction:	YES	Ge1 PBC table 11_26_07.Pbc
Absorption:	NO	
Geometry Correction:	NO	
Random Summing:	NO	

Energy Calibration Normalized Differe 0.1908

UNIDENTIFIED PEAK SUMMARY

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncertainty 1 Sigma%	FWHM keV	Suspected Nuclide	Code
223.47	56.08	45.33	32.67	0.018	36.02	0.688	HF-181	
298.49	74.84	282.67	170.33	0.095	20.39	0.696	PB-214	
307.47	77.08	313.33	307.67	0.171	13.26	0.764	PB-214	
335.60	84.11	111.81	56.19	0.031	29.77	0.744	TA-182	
347.76	87.16	143.10	135.90	0.075	15.12	0.586	PB-214	s
743.25	186.03	110.00	137.00	0.076	18.08	1.229	PA-234	s
1351.49	338.09	147.22	29.78	0.017	60.47	0.709		s
2041.36	510.55	46.67	135.33	0.075	15.75	1.323	J-133	s
2435.65	609.11	206.68	33.32	0.019	63.43	1.370		
3643.88	911.13	103.74	39.26	0.022	40.01	0.892		s

s = Peak fails shape tests.

D = Peak area deconvoluted.

IDENTIFIED PEAK SUMMARY

Nuclide	Library Used	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncertainty 1 Sigma%	FWHM keV	Code
PB-210	1	183.69	46.14	151.96	82.04	0.046	23.09	1.120	s
AM-241	1	240.18	60.26	241.96	-11.54	-0.006	192.86	0.824	s
TH-234	1	252.18	63.26	215.40	79.60	0.044	24.29	0.604	s
EU-155	1	344.87	86.43	349.37	-25.90	-0.014	103.94	0.849	
TH-234	1	370.39	92.81	250.01	117.99	0.066	18.76	1.398	s
AC-228	1	372.54	93.35	481.39	0.00	0.000	2349.47	0.855	s D
U-235	1	372.54	93.35	245.41	-9.86	-0.005	-368.97	0.855	s D
EU-155	1	421.21	105.52	206.95	12.17	0.007	169.67	0.866	s
EU-152	1	485.58	121.61	181.30	8.81	0.005	218.63	0.881	s
EU-154	1	491.59	123.11	188.38	8.91	0.005	220.47	0.882	s
Pa-234	1	522.67	130.88	208.68	-26.61	-0.015	79.18	0.890	s
U-235	1	573.60	143.62	187.03	-18.22	-0.010	134.87	0.901	s
U-235	1	662.89	165.94	133.53	1.21	0.001	389.12	0.919	s
U-235	1	820.39	205.32	117.40	0.52	0.000	573.36	0.957	s
PB-212	1	953.66	238.63	96.87	478.00	0.266	5.09	0.987	D
RA-224	1	963.07	240.99	124.10	54.90	0.030	31.71	0.989	D
PB-214	1	967.12	242.00	128.51	41.49	0.023	35.19	0.990	D
TL-208	1	1107.42	277.07	72.38	15.41	0.009	82.12	1.021	s
I-131	1	1142.21	285.77	55.50	-3.31	-0.002	322.79	1.028	s
PB-214	1	1179.52	295.10	69.21	133.79	0.074	13.69	0.985	
PB-212	1	1199.41	300.07	64.00	72.00	0.040	27.50	0.840	
AC-228	1	1351.88	338.19	62.57	98.98	0.055	14.25	1.076	s
EU-152	1	1377.37	344.56	67.61	5.79	0.003	205.14	1.081	s
PB-214	1	1406.26	351.78	34.65	283.35	0.157	6.62	1.174	s
I-131	1	1455.90	364.19	59.88	0.82	0.000	1341.88	1.099	s
BE-7	1	1900.31	475.29	21.37	-0.08	0.000	8145.15	1.198	s
CS-134	1	2251.12	562.98	37.63	3.37	0.002	262.95	1.273	s
CS-134	1	2276.47	569.32	54.48	0.00	0.000	812.40	1.278	s D
Pa-234	1	2277.07	569.47	45.50	-4.81	-0.003	-155.97	1.278	s D
TL-208	1	2330.54	582.84	21.92	183.08	0.102	8.42	1.245	s
CS-134	1	2418.04	604.71	429.80	-1.86	-0.001	1579.80	1.309	s
BI-214	1	2435.63	609.11	40.59	185.10	0.103	8.11	1.313	
I-131	1	2547.97	637.19	35.27	12.32	0.007	73.87	1.337	s
CS-137	1	2646.63	661.85	37.39	2.25	0.001	390.72	1.358	s
EU-154	1	2899.28	725.01	68.60	-12.89	-0.007	95.07	1.411	s
BI-212	1	2906.91	726.91	34.93	26.69	0.015	36.82	1.414	s
PA-234M	1	3064.92	766.41	50.46	0.00	0.000	1004.58	1.447	s
EU-152	1	3113.26	778.50	32.94	-0.43	0.000	1911.75	1.458	s
BI-212	1	3141.34	785.52	30.41	8.43	0.005	98.71	1.463	s
CS-134	1	3179.39	795.03	21.48	21.43	0.012	37.44	1.472	s
CS-134	1	3206.03	801.69	37.11	-3.23	-0.002	272.19	1.477	s
TL-208	1	3440.93	860.40	5.67	59.33	0.033	16.61	0.457	s
EU-154	1	3492.95	873.40	24.78	2.83	0.002	255.83	1.537	s
Pa-234	1	3519.37	880.01	10.90	2.75	0.002	180.44	1.546	s
Pa-234	1	3521.10	880.44	19.28	2.33	0.001	274.11	1.543	s

AC-228	1	3643.76	911.10	27.12	93.44	0.052	12.17	1.569	s
Pa-234	1	3785.50	946.53	41.17	-6.38	-0.004	147.74	1.598	s
EU-152	1	3848.71	962.33	40.30	-3.28	-0.002	279.12	1.613	s
AC-228	1	3874.39	968.75	38.48	64.47	0.036	17.36	1.617	
EU-154	1	3986.08	996.67	32.78	0.47	0.000	1737.01	1.640	s
PA-234M	1	4003.71	1001.07	30.27	4.00	0.002	201.05	1.643	s
EU-154	1	4019.19	1004.94	32.53	-2.70	-0.002	304.46	1.647	s
EU-152	1	4447.80	1112.07	13.81	0.00	0.000	525.62	1.735	s
BI-214	1	4479.52	1120.00	32.10	38.70	0.021	22.17	1.741	
CO-60	1	4692.51	1173.24	26.64	0.00	0.000	729.95	1.784	s
EU-154	1	5100.09	1275.11	15.98	7.88	0.004	80.12	1.866	s
CO-60	1	5332.37	1333.16	27.67	-3.53	-0.002	217.31	1.912	s
EU-152	1	5630.81	1407.75	14.34	4.38	0.002	131.33	1.972	s
K-40	1	5841.93	1460.52	12.54	468.46	0.260	4.56	1.826	
BI-214	1	7056.56	1764.08	7.58	20.22	0.011	22.09	2.246	s

s = Peak fails shape tests.

D = Peak area deconvoluted.

A = Derived Aveage Activity.

SUMMARY OF LIBRARY PEAK USAGE

Nuclide Name	Nuclide Code	Library Used	Average Activity Becquerels	Peak Energy keV	Peak Activity Becquerels	Peak Analysis Code	Peak MDA Value Becquerels	Peak MDA Code	Peak Comments	
CS-137	T F I	1	9.838E-002	661.66	9.838E-002	% (	1.367E+000G		1.1E+004	85.21
BI-212	N	1	9.003E+000	727.33	9.003E+000	(	1.020E+001G		7.0E+002	11.82
			9.003E+000	785.51	3.224E+001	%	1.086E+002G		7.0E+002	1.10
EU-155	T F I	1	7.524E-001	105.31	7.524E-001	* (	4.314E+000G		1.8E+003	21.20
			7.524E-001	86.54	-1.154E+000	&	4.000E+000G		1.8E+003	30.70
TL-208	F N	1	7.396E+000	583.02	7.396E+000	@ (P	9.908E-001G		7.0E+002	84.50
			7.396E+000	277.28	4.852E+000	&	1.333E+001G		7.0E+002	6.31
			7.396E+000	860.56	2.141E+001	+	4.981E+000G		7.0E+002	12.42
AM-241	T	1	-5.579E-001	59.54	-5.579E-001	* (	3.635E+000G		1.6E+005	35.90
PB-210	N	1	5.182E+001	46.54	5.182E+001	* (P	3.800E+001G		8.1E+003	4.25
EU-152	T F	1	5.083E-001	344.29	5.083E-001	% (	3.603E+000G		4.9E+003	26.50
			5.083E-001	121.78	4.058E-001	%	3.013E+000G		4.9E+003	28.58
			5.083E-001	778.92	-1.376E-001	%	9.519E+000G		4.9E+003	12.94
			5.083E-001	964.11	-1.090E+000	%	1.073E+001G		4.9E+003	14.61
			5.083E-001	1112.07	0.000E+000	%	7.885E+000G		4.9E+003	13.64
			5.083E-001	1408.00	1.334E+000	%	6.201E+000G		4.9E+003	21.00
CS-134	T F I	1	4.612E-001	604.71	-6.667E-002	% (	3.564E+000G		7.5E+002	97.62
			4.612E-001	795.87	1.064E+000	(	1.206E+000G		7.5E+002	85.53
			4.612E-001	569.32	0.000E+000	% }	7.618E+000G		7.5E+002	15.38
			4.612E-001	801.95	-1.588E+000	%	1.527E+001G		7.5E+002	8.69
			4.612E-001	563.24	1.345E+000	&	1.248E+001G		7.5E+002	8.35
K-40	N	1	2.891E+002	1460.83	2.891E+002	(P	1.186E+001G		4.7E+011	10.67
TH-234	N	1	2.773E+001	63.29	2.707E+001	(P	2.418E+001G		1.6E+012	4.82
			2.773E+001	92.59	2.830E+001	* (P	1.833E+001G		1.6E+012	5.58
I-131	T F I	1	2.431E-002	364.48	2.431E-002	% (	1.152E+000G		8.0E+000	81.70
			2.431E-002	284.30	-1.091E+000	&	1.233E+001G		8.0E+000	6.14
			2.431E-002	636.97	6.245E+000	%	1.540E+001G		8.0E+000	7.17
RA-224	N	1	2.411E+001	240.99	2.411E+001	(	2.399E+001G		7.0E+002	4.10
PA-234	N	1	2.379E+001	1001.00	2.379E+001	& (	1.688E+002G		1.6E+012	[illegible].84
			2.379E+001	766.41	0.000E+000	&	5.037E+002G		1.6E+012	[illegible].29
U-235	N	1	-2.270E+000	143.79	-2.270E+000	% (P	8.277E+000G		2.6E+011	10.96
			-2.270E+000	205.33	1.689E-001	% P	1.723E+001G		2.6E+011	5.01
			-2.270E+000	163.38	3.406E-001	& P	1.597E+001G		2.6E+011	5.08
			-2.270E+000	93.35	-2.270E+000	!	1.742E+001X	E	2.6E+011	5.81
BE-7	N P C	1	-2.260E-002	477.60	-2.260E-002	% (	6.821E+000G		5.3E+001	10.52
CO-60	T F	1	-2.167E-001	1332.50	-2.167E-001	% (	1.671E+000G		1.9E+003	99.98
			-2.167E-001	1173.24	0.000E+000	%	1.496E+000G		1.9E+003	99.90
PB-212	N	1	1.974E+001	238.63	1.974E+001	(P	2.006E+000G		7.0E+002	43.30
			1.974E+001	300.03	4.617E+001	+	2.564E+001G		7.0E+002	3.28
			-1.970E+000	946.02	-2.278E+000	&	1.165E+001G		1.6E+012	13.40
			-1.970E+000	883.24	1.305E+000	%	8.603E+000G		1.6E+012	9.60
			-1.970E+000	880.53	1.771E+000	%	1.759E+001G		1.6E+012	6.00
Pa-234	N	1	-1.970E+000	131.29	-1.970E+000	% (	5.183E+000G		1.6E+012	18.00
			-1.970E+000	569.47	-1.970E+000	%	1.398E+001G		1.6E+012	8.20

PB-214	N	1	1.782E+001	351.93	1.782E+001	@	(	P	1.896E+000G		5.8E+005	37.60
			1.782E+001	295.09	1.441E+001	-		P	4.466E+000G		5.8E+005	19.30
			1.782E+001	242.00	1.008E+001	%		P	1.350E+001G		5.8E+005	7.43
AC-228	N	1	1.671E+001	911.07	1.503E+001		(	P	4.339E+000G		2.1E+003	29.00
			1.671E+001	968.97	1.798E+001		(	P	8.820E+000G		2.1E+003	17.46
			1.671E+001	338.32	1.893E+001	@	(	P	7.569E+000G		2.1E+003	12.01
			1.671E+001	93.35	0.000E+000	%		} E	1.820E+001X	A	2.1E+003	5.56
BI-214	N	1	1.407E+001	609.31	1.414E+001		(	P	2.475E+000G		5.8E+005	46.09
			1.407E+001	1120.29	1.384E+001		(	P	1.041E+001G		5.8E+005	15.10
			1.407E+001	1764.49	1.009E+001	-		P	7.749E+000G		5.8E+005	15.40
			1.044E+000	123.10	2.877E-001	&			2.153E+000G		3.1E+003	40.79
			1.044E+000	1274.54	1.329E+000	%			3.599E+000G		3.1E+003	35.19
			1.044E+000	723.36	-2.531E+000	%			8.114E+000G		3.1E+003	20.22
			1.044E+000	1004.77	-7.501E-001	%			8.126E+000G		3.1E+003	18.01
			1.044E+000	996.33	2.192E-001	%			1.377E+001G		3.1E+003	10.60
EU-154	T F I	1	1.044E+000	873.23	1.044E+000	%	(		9.561E+000G		3.1E+003	12.27

Analysis Codes:

% = Peak fails sensitivity test

? = Peak is too narrow

- = Peak activity lower than counting uncertainty range

= = Peak outside analysis energy range

(= This peak is used in the nuclide activity average

P = Peakbackround subtraction

* = Peak is too wide, but only one peak in library

@ = Peak is too wide at FW25M, but OK at FWHM

A = Derived Average Activity

E = Energy Duplication

+ = Peak activity higher than counting uncertainty range

! = Peak is part of a multiplet and this area went negative during deconvolution

$ = Peak identified, but first peak of this nuclide failed one or more qualification tests

& = Calculated peak centroid is not close enough to the library energy centroid for positive identification

Nuclide Codes:

T = Thermal Neutron Activation

F = Fast Neutron Activation

I = Fission Product

P = Photon Reaction

N = Naturally Occurring Isotope

C = Charged Particle Reaction

M = No MDA Calculation

Peak Codes:

G = Gamma Ray

X = X-Ray

P = Positron Decay

S = Single - Escape

D = Double - Escape

K = Key Line

A = Not in Average

SUMMARY OF NUCLIDES IN SAMPLE

Nuclide		Time of Count Activity Bq/sample	Time Corrected Activity Bq/sample	Uncertainty Counts 1 Sigma %	Uncertainty Total 1 Sigma %	Minimum Detectable Activity
BE-7	<	-2.260E-002	-2.262E-002	8,145.15	8,145.15	6.821E+000
K-40		2.891E+002	2.891E+002	4.68	5.52	1.186E+001
CO-60	<	-2.167E-001	-2.167E-001	217.31	217.33	1.671E+000
I-131	<	2.431E-002	2.446E-002	1,341.88	1,341.89	1.152E+000
CS-134	<	4.612E-001	4.613E-001	37.44	37.55	3.564E+000
CS-137	<	9.838E-002	9.838E-002	390.72	390.73	1.367E+000
EU-155	<	7.524E-001	7.524E-001	169.67	169.70	4.314E+000
PB-214		1.782E+001	1.782E+001	6.90	7.47	1.896E+000
BI-212	<	9.003E+000	9.003E+000	36.82	36.93	1.020E+001
BI-214	<	1.407E+001	1.407E+001	8.62	9.09	2.475E+000
TH-234		2.773E+001	2.773E+001	22.26	22.56	2.418E+001
PA-234M	<	2.379E+001	2.379E+001	201.05	201.07	1.688E+002
EU-152	<	5.083E-001	5.083E-001	205.14	205.16	3.603E+000
EU-154	<	1.044E+000	1.044E+000	255.83	255.85	9.561E+000
TL-208	#	7.396E+000	7.396E+000	8.83	9.29	9.908E-001
RA-224		2.411E+001	2.411E+001	31.71	31.85	2.399E+001
PB-210	#	5.182E+001	5.182E+001	31.38	31.62	3.800E+001
PB-212		1.974E+001	1.974E+001	5.33	6.11	2.006E+000
AC-228	<	1.671E+001	1.671E+001	8.94	9.39	4.339E+000
Pa-234	<	-1.970E+000	-1.970E+000	79.18	79.24	5.183E+000
U-235	<	-2.270E+000	-2.270E+000	162.58	162.60	8.277E+000
AM-241	<	-5.579E-001	-5.579E-001	192.86	192.89	3.635E+000

= All peaks for activity calculation had bad shape

Total Activity (37.71 to 1,999.84 keV) 437.72 Bq/sample

Analyzed by: _____

403293

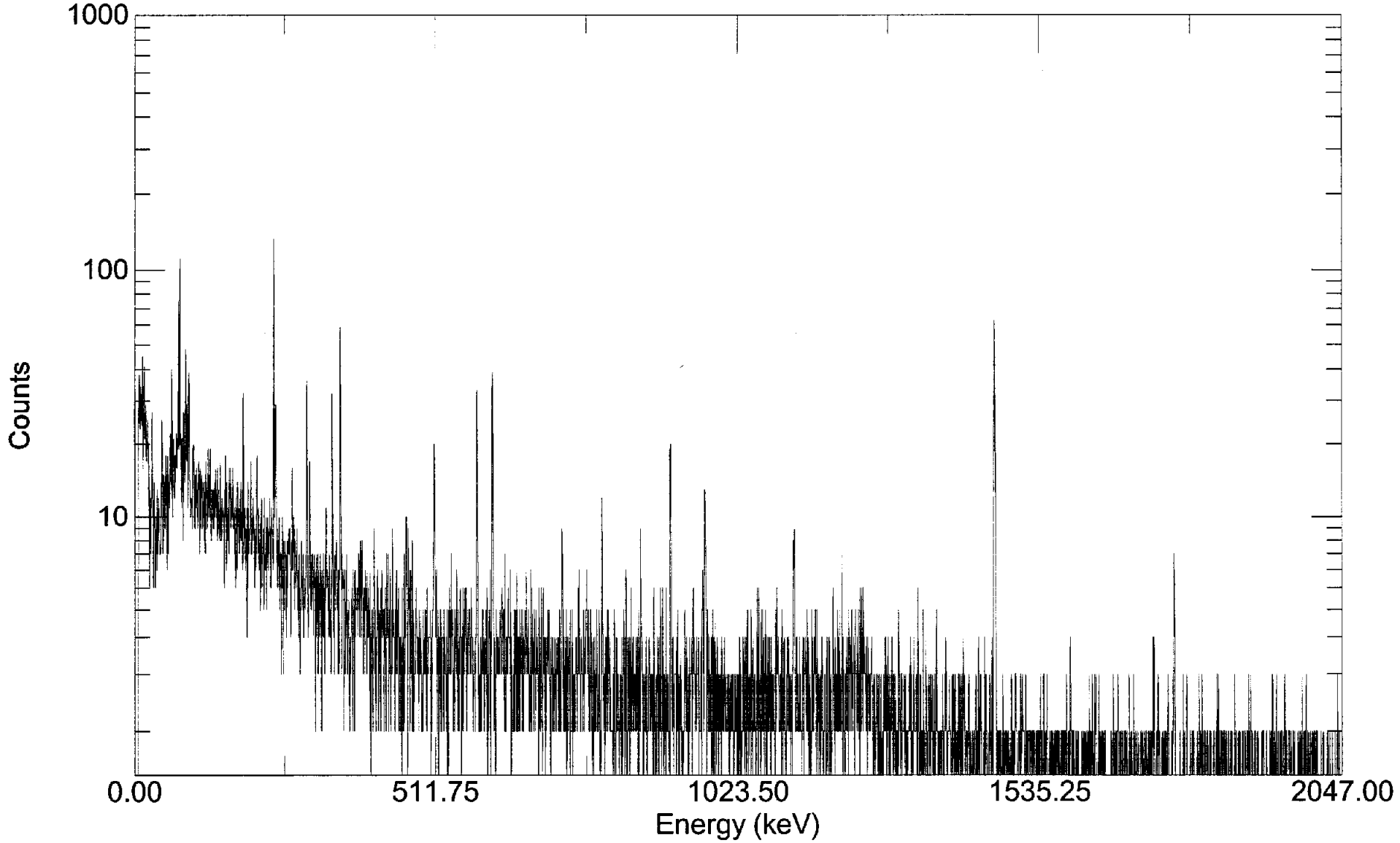
Reviewed by: _____

Supervisor

Laboratory: Test America

KEKCD1AC

7357010_KEKCD1AC_F7L200251-008



Acquired: 23-Dec-2007 1:41:37 PM
File: C:\User\spectra\KEKCD1AC.spc
Detector: #0 Ge 1 SN/242

Real Time: 1810.70 s. Live Time: 1800.00 s.
Channels: 8192

TestAmerica St. Louis

DB Analysis ID: 32,968

Sample Description: 7357010_KEKCE1AC_F7L200251-009

Spectrum Filename: KEKCE1AC.An1

Acquisition Information

Start Time:	23-Dec-2007 1:42:03PM		
Live Time:	1800.00	Real Time:	1815.34
Dead Time:	0.85 %		
Detector ID:	3		

Detector System: Ge 3 SN/155

Calibration

Description:	Ge3 74139_334 Tunacan cal 01_11_07		
Filename:	C:\User\Calibrations\Ge3 cal post 5_8_06\Ge3 Tunacan 74139_334 01_11_07.Clb		
Energy Created:	10-Jan-2007 5:13:35PM	Efficiency Created:	11-Jan-2007 1:43:34PM
Zero Offset:	0.416 keV	Gain:	0.250 keV/Channel

Library 1 File: mmr06 short.lib Library based peak stripping used.
Library 2 File: Null.Lib
Library 3 File: Null.Lib

Analysis Parameters

Start Channel:	150 for an energy of 37.87 keV
Stop Channel:	8,000 for an energy of 2000.50 keV
Peak rejection level:	40.000 %
Activity Scaling Factor:	1.0000 / 1.0000 = 1.0000
Detection Limit Method:	Nureg method 4.16
Sample Size:	1.00E+000
Additional random error:	0.0000
Additional systematic error:	0.0000
Fraction Limit:	0.0000%
Background Width:	Average of three points

Corrections	Status	Comments
Decay Correct to Date:	YES	23-Dec-2007 12:00:00PM
Decay During Acquisition:	NO	
Peaked Background Correction:	YES	Ge3 PBC table 11_26_07.Pbc
Absorption:	NO	
Geometry Correction:	NO	
Random Summing:	NO	

Energy Calibration Normalized Differe 0.2060

Testamerica St. Louis

UNIDENTIFIED PEAK SUMMARY

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncertainty 1 Sigma%	FWHM keV	Suspected Nuclide	Code
297.69	74.76	671.50	256.50	0.143	20.74	0.597	PB-214	s
306.66	77.00	687.17	402.83	0.224	14.19	0.809	PB-214	
346.99	87.07	412.43	36.57	0.020	80.26	0.908		
358.59	89.97	198.87	224.13	0.125	11.13	1.037	PB-214	sM
743.00	185.97	258.33	217.67	0.121	19.55	1.263	RA-226	s
1179.21	294.93	284.72	46.28	0.026	53.62	1.387		s
1311.57	328.00	54.00	95.00	0.053	18.56	0.929	AC-228	
1407.02	351.84	329.61	74.39	0.041	36.41	1.313	PB-214	s
1852.12	463.04	56.00	82.00	0.046	23.20	0.378	AC-228	s

s = Peak fails shape tests.

D = Peak area deconvoluted.

IDENTIFIED PEAK SUMMARY

Nuclide	Library Used	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncertainty 1 Sigma%	FWHM keV	Code
PB-210	1	184.48	46.49	246.89	14.68	0.008	60.95	0.864	
AM-241	1	244.56	61.49	366.76	6.31	0.004	430.88	0.878	s
TH-234	1	252.75	63.53	535.60	15.01	0.008	82.08	0.882	
EU-155	1	347.11	87.10	566.15	126.43	0.070	28.06	0.906	
TH-234	1	364.60	91.47	605.99	-119.71	-0.067	37.85	0.912	s
AC-228	1	372.14	93.35	218.83	204.65	0.114	1.36	1.116	s D
U-235	1	372.14	93.35	404.70	-1.40	-0.001	-3225.36	0.913	s D
EU-155	1	420.46	105.42	326.37	37.09	0.021	70.81	0.925	s
EU-152	1	489.59	122.68	276.01	-0.10	0.000	23939.23	0.942	s
EU-154	1	490.49	122.91	294.07	-1.12	-0.001	2175.41	0.943	s
Pa-234	1	525.96	131.77	353.10	-15.90	-0.009	169.04	0.952	s
U-235	1	574.05	143.78	305.34	-2.56	-0.001	5916.89	0.964	s
U-235	1	652.60	163.40	252.73	-12.32	-0.007	184.75	0.984	s
U-235	1	817.95	204.69	189.06	23.76	0.013	84.37	1.027	s
PB-212	1	954.47	238.80	281.75	1272.25	0.707	4.10	0.977	s
RA-224	1	960.09	240.20	1202.35	-202.07	-0.112	25.27	1.062	s
PB-214	1	962.21	240.73	570.39	-6.32	-0.004	536.30	1.063	s
TL-208	1	1108.73	277.33	98.67	52.33	0.029	38.88	0.993	s
I-131	1	1136.64	284.30	161.80	-8.78	-0.005	207.73	1.105	s
PB-214	1	1179.95	295.12	157.37	164.74	0.092	12.92	1.116	s
PB-212	1	1200.01	300.13	130.50	120.50	0.067	24.64	0.693	s
AC-228	1	1353.27	338.42	72.98	257.02	0.143	9.65	1.510	s
EU-152	1	1365.64	341.51	65.37	-0.08	0.000	15221.36	1.164	s
PB-214	1	1407.33	351.92	136.58	224.08	0.124	9.47	1.171	s
I-131	1	1463.07	365.85	91.08	-10.45	-0.006	132.75	1.184	s
BE-7	1	1907.04	476.77	48.95	1.77	0.001	563.91	1.292	s
CS-134	1	2252.00	562.96	56.24	18.34	0.010	62.35	1.372	s
CS-134	1	2277.45	569.32	46.69	3.17	0.002	290.52	1.378	s D
Pa-234	1	2278.04	569.47	39.25	-2.77	-0.002	-184.73	1.378	s D
TL-208	1	2332.00	582.95	42.96	429.04	0.238	5.95	1.528	s
CS-134	1	2427.09	606.71	80.61	-3.03	-0.002	423.66	1.410	s
BI-214	1	2436.31	609.02	54.95	247.05	0.137	9.30	1.380	
I-131	1	2546.34	636.51	49.33	7.06	0.004	145.58	1.440	s
CS-137	1	2646.72	661.60	56.57	3.67	0.002	294.24	1.462	s
EU-154	1	2893.03	723.16	91.33	-14.62	-0.008	96.09	1.518	s
BI-212	1	2907.87	726.87	36.67	145.33	0.081	14.61	1.070	s
PA-234M	1	3062.56	765.53	63.12	-3.44	-0.002	330.95	1.556	s
EU-152	1	3131.69	782.81	20.05	1.25	0.001	515.84	1.567	s
BI-212	1	3141.69	785.31	26.43	11.51	0.006	69.68	1.572	s
CS-134	1	3177.94	794.37	35.31	31.99	0.018	31.67	1.582	s
CS-134	1	3207.54	801.77	43.52	2.86	0.002	331.33	1.587	s
TL-208	1	3441.97	860.37	8.67	74.33	0.041	14.77	0.922	s
EU-154	1	3493.90	873.35	42.69	-0.26	0.000	3599.39	1.649	s
Pa-234	1	3520.91	880.10	29.26	-0.17	0.000	4624.34	1.655	s
Pa-234	1	3532.41	882.97	32.16	-3.56	-0.002	231.41	1.657	s

AC-228	1	3644.34	910.95	22.18	284.82	0.158	7.31	1.678	
Pa-234	1	3779.19	944.67	26.02	-1.35	-0.001	541.80	1.710	s
EU-152	1	3855.86	963.83	168.20	-0.91	-0.001	2015.22	1.726	
AC-228	1	3874.67	968.53	7.67	227.33	0.126	7.54	1.382	
EU-154	1	3986.55	996.51	33.25	1.89	0.001	438.01	1.753	s
PA-234M	1	4002.87	1000.59	30.00	4.71	0.003	170.63	1.756	s
EU-154	1	4015.78	1003.81	27.03	-0.68	0.000	1089.82	1.760	s
EU-152	1	4444.80	1111.08	19.21	7.82	0.004	86.97	1.847	s
BI-214	1	4480.10	1119.91	6.61	57.39	0.032	15.61	0.601	s
CO-60	1	4693.37	1173.24	61.52	0.00	0.000	1109.21	1.896	s
EU-154	1	5099.09	1274.70	35.15	2.71	0.002	315.68	1.975	s
CO-60	1	5329.22	1332.25	24.85	3.88	0.002	188.57	2.019	s
EU-152	1	5629.49	1407.36	17.84	6.28	0.003	103.20	2.076	s
K-40	1	5840.86	1460.23	11.21	395.79	0.220	4.96	1.705	
BI-214	1	7055.58	1764.14	15.18	20.28	0.011	30.69	2.326	s

s = Peak fails shape tests.

D = Peak area deconvoluted.

A = Derived Aveage Activity.

SUMMARY OF LIBRARY PEAK USAGE

Nuclide Name	Nuclide Code	Library Used	Average Activity Becquerels	Peak Energy keV	Peak Activity Becquerels	Peak Analysis Code	Peak MDA Value Becquerels	Peak Code	Peak Comments	
EU-154	T F I	1	-9.291E-002	873.23	-9.291E-002	% (	1.198E+001G		3.1E+003	12.27
			-9.291E-002	123.10	-3.343E-002	&	2.476E+000G		3.1E+003	40.79
			-9.291E-002	1274.54	4.540E-001	%	5.089E+000G		3.1E+003	35.19
			-9.291E-002	723.36	-2.793E+000	%	9.026E+000G		3.1E+003	20.22
			-9.291E-002	1004.77	-1.854E-001	%	7.358E+000G		3.1E+003	18.01
			-9.291E-002	996.33	8.708E-001	%	1.364E+001G		3.1E+003	10.60
PB-210	N	1	8.503E+000	46.54	8.503E+000	% (P	4.399E+001G		8.1E+003	4.25
RA-224	N	1	-8.347E+001	240.99	-8.347E+001	* (	6.787E+001G		7.0E+002	4.10
CS-134	T F I	1	6.676E-001	604.71	-1.049E-001	% (	1.546E+000G		7.5E+002	97.62
			6.676E-001	795.87	1.549E+000	? (	1.472E+000G		7.5E+002	85.53
			6.676E-001	569.32	6.676E-001	%	7.276E+000G		7.5E+002	15.38
			6.676E-001	801.95	1.372E+000	%	1.604E+001G		7.5E+002	8.69
			6.676E-001	563.24	7.058E+000	%	1.449E+001G		7.5E+002	8.35
			-6.269E-003	964.11	-2.977E-001	%	2.063E+001G		4.9E+003	14.61
			-6.269E-003	1112.07	3.043E+000	&	9.005E+000G		4.9E+003	13.64
			-6.269E-003	1408.00	1.910E+000	%	6.816E+000G		4.9E+003	21.00
EU-152	T F	1	-6.269E-003	344.29	-6.269E-003	% (	3.370E+000G		4.9E+003	26.50
			-6.269E-003	121.78	-4.191E-003	%	3.421E+000G		4.9E+003	28.58
			-6.269E-003	778.92	3.929E-001	&	7.431E+000G		4.9E+003	12.94
PB-212	N	1	4.942E+001	238.63	4.942E+001	@ (P	3.144E+000G		7.0E+002	43.30
			4.942E+001	300.03	7.313E+001	+	3.395E+001G		7.0E+002	3.28
BE-7	N P C	1	4.778E-001	477.60	4.778E-001	% (	9.530E+000G		5.3E+001	10.52
BI-212	N	1	4.769E+001	727.33	4.769E+001	(	1.015E+001G		7.0E+002	11.82
			4.769E+001	785.51	4.295E+001	&	9.948E+001G		7.0E+002	1.10
TH-234	N	1	4.673E+000	63.29	4.673E+000	% (P	3.443E+001G		1.6E+012	4.82
			4.673E+000	92.59	-2.652E+001	% P	2.602E+001G		1.6E+012	5.58
AC-228	N	1	4.545E+001	911.07	4.493E+001	(P	3.890E+000G		2.1E+003	29.00
			4.545E+001	968.97	6.235E+001	+	4.282E+000G		2.1E+003	17.46
			4.545E+001	338.32	4.669E+001	* (P	7.723E+000G		2.1E+003	12.01
			4.545E+001	93.35	4.545E+001	E	1.591E+001X	A	2.1E+003	5.56
EU-155	T F I	1	3.940E+000	105.31	2.123E+000	* (	4.974E+000G		1.8E+003	21.20
			3.940E+000	86.54	5.195E+000	(	4.668E+000G		1.8E+003	30.70
U-235	N	1	-2.967E-001	143.79	-2.967E-001	& (P	9.750E+000G		2.6E+011	10.96
			-2.967E-001	205.33	7.210E+000	%	2.026E+001G		2.6E+011	5.01
			-2.967E-001	163.38	-3.243E+000	%	2.022E+001G		2.6E+011	5.08
			-2.967E-001	93.35	-2.967E-001	! E	2.050E+001X		2.6E+011	5.81
I-131	T F I	1	-2.956E-001	364.48	-2.956E-001	% (	1.334E+000G		8.0E+000	81.70
			-2.956E-001	284.30	-2.732E+000	%	1.930E+001G		8.0E+000	6.14
			-2.956E-001	636.97	3.466E+000	&	1.739E+001G		8.0E+000	7.17
AM-241	T	1	2.790E-001	59.54	2.790E-001	& (	4.064E+000G		1.6E+005	35.90
PA-234	N	1	2.763E+001	1001.00	2.763E+001	& (	1.655E+002G		1.6E+012	.84
			2.763E+001	766.41	-4.717E+001	%	5.447E+002G		1.6E+012	.29
K-40	N	1	2.445E+002	1460.83	2.445E+002	(P	1.131E+001G		4.7E+011	10.67
CO-60	T F	1	2.374E-001	1332.50	2.374E-001	% (	1.587E+000G		1.9E+003	99.98

				2.374E-001	1173.24	0.000E+000	%			2.174E+000G	1.9E+003	99.90
BI-214		N	1	1.876E+001	609.31	1.826E+001		(	P	2.753E+000G	5.8E+005	46.09
				1.876E+001	1120.29	2.030E+001		(	P	5.195E+000G	5.8E+005	15.10
				1.876E+001	1764.49	1.023E+001	-		P	1.052E+001G	5.8E+005	15.40
TL-208	F	N	1	1.666E+001	583.02	1.674E+001		(	P	1.297E+000G	7.0E+002	84.50
				1.666E+001	277.28	1.556E+001		(		1.457E+001G	7.0E+002	6.31
				1.666E+001	860.56	2.626E+001	+			5.803E+000G	7.0E+002	12.42
CS-137	T F I		1	1.560E-001	661.66	1.560E-001	%	(		1.604E+000G	1.1E+004	85.21
PB-214		N	1	1.455E+001	351.93	1.340E+001	*	(	P	3.419E+000G	5.8E+005	37.60
				1.455E+001	295.09	1.678E+001	@	(	P	6.230E+000G	5.8E+005	19.30
				1.455E+001	242.00	-1.444E+000	%			2.607E+001G	5.8E+005	7.43
Pa-234		N	1	-1.093E+000	131.29	-1.093E+000	%	(		6.206E+000G	1.6E+012	18.00
				-1.093E+000	569.47	-1.093E+000	%			1.260E+001G	1.6E+012	8.20
				-1.093E+000	946.02	-4.734E-001	%			9.295E+000G	1.6E+012	13.40
				-1.093E+000	883.24	-1.658E+000	%			1.357E+001G	1.6E+012	9.60
				-1.093E+000	880.53	-1.232E-001	%			2.076E+001G	1.6E+012	6.00

Analysis Codes:

% = Peak fails sensitivity test
? = Peak is too narrow
- = Peak activity lower than counting uncertainty range
= = Peak outside analysis energy range
(= This peak is used in the nuclide activity average
P = Peakbackround subtraction
* = Peak is too wide, but only one peak in library
@ = Peak is too wide at FW25M, but OK at FWHM
A = Derived Average Activity
E = Energy Duplication
+ = Peak activity higher than counting uncertainty range
! = Peak is part of a multiplet and this area went negative during deconvolution
$ = Peak identified, but first peak of this nuclide failed one or more qualification tests
& = Calculated peak centroid is not close enough to the library energy centroid for positive identification

Nuclide Codes:

T = Thermal Neutron Activation
F = Fast Neutron Activation
I = Fission Product
P = Photon Reaction
N = Naturally Occurring Isotope
C = Charged Particle Reaction
M = No MDA Calculation

Peak Codes:

G = Gamma Ray
X = X-Ray
P = Positron Decay
S = Single - Escape
D = Double - Escape
K = Key Line
A = Not in Average

SUMMARY OF NUCLIDES IN SAMPLE

Nuclide		Time of Count Activity Bq/sample	Time Corrected Activity Bq/sample	Uncertainty Counts 1 Sigma %	Uncertainty Total 1 Sigma %	Minimum Detectable Activity
CO-60	<	2.374E-001	2.374E-001	188.57	188.59	1.587E+000
I-131	<	-2.956E-001	-2.974E-001	132.75	132.78	1.334E+000
CS-134	<	6.676E-001	6.676E-001	31.67	31.80	1.546E+000
EU-154	<	-9.291E-002	-9.291E-002	3,599.39	3,599.39	1.198E+001
RA-224	<	-8.347E+001	-8.348E+001	25.27	25.44	6.787E+001
PB-210	<	8.503E+000	8.503E+000	150.35	150.40	4.399E+001
PB-212	#	4.942E+001	4.943E+001	4.17	5.13	3.144E+000
PB-214	<	1.455E+001	1.455E+001	8.25	8.74	3.419E+000
BE-7	<	4.778E-001	4.782E-001	563.91	563.92	9.530E+000
K-40		2.445E+002	2.445E+002	5.10	5.88	1.131E+001
CS-137	<	1.560E-001	1.560E-001	294.24	294.25	1.604E+000
EU-152	<	-6.269E-003	-6.269E-003	15,221.36	15,221.36	3.370E+000
EU-155	<	3.940E+000	3.940E+000	28.06	28.26	4.974E+000
TL-208		1.666E+001	1.666E+001	6.06	6.71	1.297E+000
BI-212		4.769E+001	4.769E+001	14.61	14.90	1.015E+001
BI-214		1.876E+001	1.876E+001	9.38	9.81	2.753E+000
AC-228		4.545E+001	4.545E+001	6.10	6.75	3.890E+000
TH-234	<	4.673E+000	4.673E+000	217.09	217.12	3.443E+001
PA-234M	<	2.763E+001	2.763E+001	170.63	170.65	1.655E+002
U-235	<	-2.967E-001	-2.967E-001	10,871.62	10,871.62	9.750E+000
Pa-234	<	-1.093E+000	-1.093E+000	169.04	169.07	6.206E+000
AM-241	<	2.790E-001	2.790E-001	430.88	430.90	4.064E+000

= All peaks for activity calculation had bad shape

Total Activity (37.87 to 2,000.50 keV) 422.48 Bq/sample

Analyzed by: _____

403293

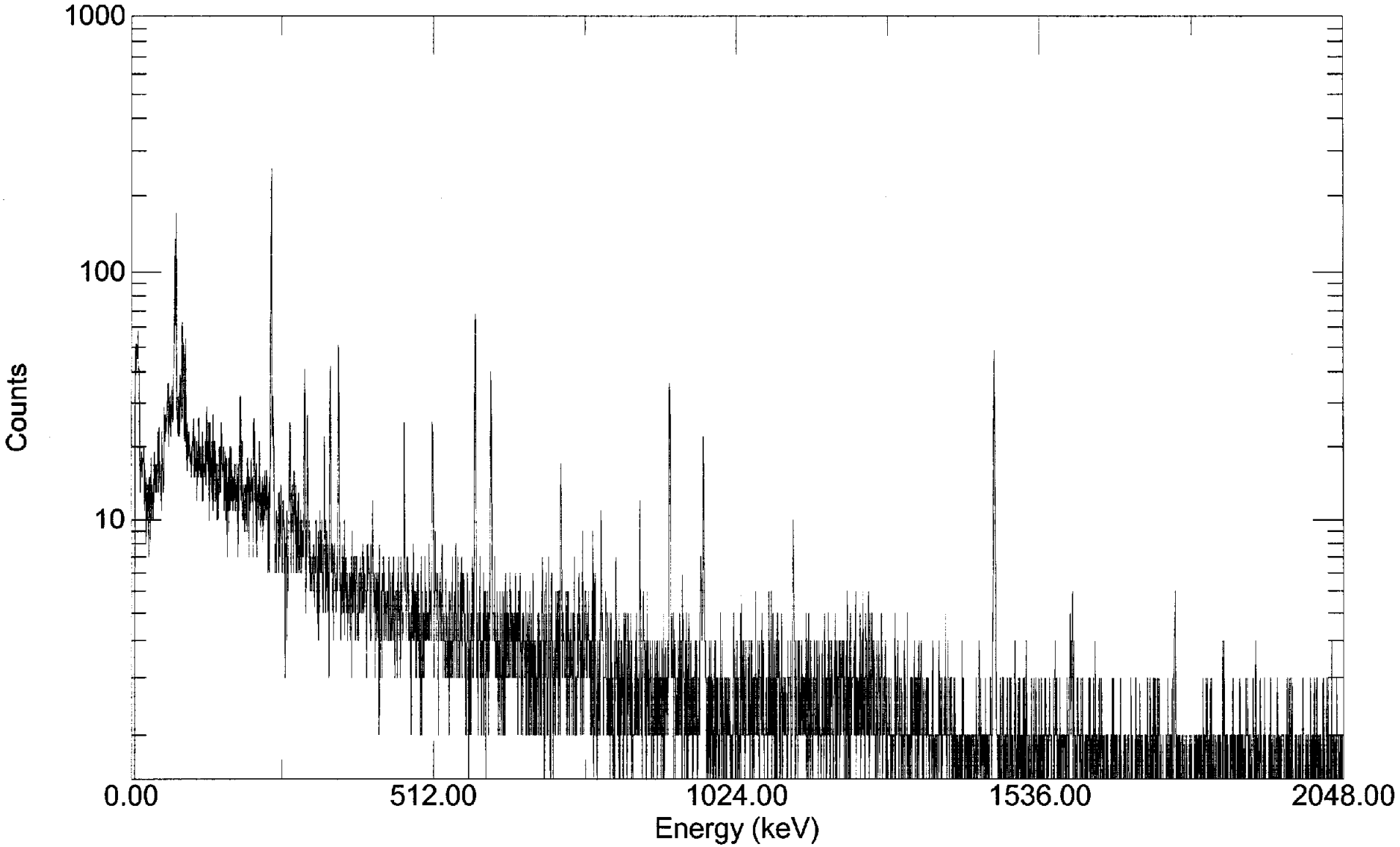
Reviewed by: _____

Supervisor

Laboratory: STL- St Louis

KEKCE1AC

7357010_KEKCE1AC_F7L200251-009



Acquired: 23-Dec-2007 1:42:03 PM
File: C:\User\spectra\KEKCE1AC.spc
Detector: #0 Ge 3 SN/155

Real Time: 1815.34 s. Live Time: 1800.00 s.
Channels: 8192

TestAmerica St. Louis

DB Analysis ID: 32,969

Sample Description: 7357010_KEKCF1AC_F7L200251-010

Spectrum Filename: KEKCF1AC.An1

Acquisition Information

Start Time:	23-Dec-2007 1:42:39PM		
Live Time:	1800.00	Real Time:	1804.86
Dead Time:	0.27 %		
Detector ID:	4		

Detector System: Ge 4 SN/181

Calibration

Description:	Ge4_TunaCanCal_74139_334_05_15_07		
Filename:	C:\User\Calibrations\Ge4 Post 09_07_07(Ge6)\Ge4_TunaCanCal_74139_334_05_15_(		
Energy Created:	08-May-2007 1:28:13PM	Efficiency Created:	15-May-2007 10:05:02AM
Zero Offset:	0.017 keV	Gain:	0.250 keV/Channel

Library 1 File: mmr06 short.lib Library based peak stripping used.
Library 2 File: Null.Lib
Library 3 File: Null.Lib

Analysis Parameters

Start Channel:	150 for an energy of 37.53 keV
Stop Channel:	8,000 for an energy of 1998.47 keV
Peak rejection level:	40.000 %
Activity Scaling Factor:	1.0000 / 1.0000 = 1.0000
Detection Limit Method:	Nureg method 4.16
Sample Size:	1.00E+000
Additional random error:	0.0000
Additional systematic error:	0.0000
Fraction Limit:	0.0000%
Background Width:	Average of three points

Corrections	Status	Comments
Decay Correct to Date:	YES	23-Dec-2007 12:00:00PM
Decay During Acquisition:	NO	
Peaked Background Correction:	YES	Ge4 PBC table 11_26_07.Pbc
Absorption:	NO	
Geometry Correction:	NO	
Random Summing:	NO	

Energy Calibration Normalized Differe 0.2308

UNIDENTIFIED PEAK SUMMARY

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncertainty 1 Sigma%	FWHM keV	Suspected Nuclide	Code
299.38	74.89	362.67	244.33	0.136	16.55	0.798	PB-214	
308.38	77.15	317.33	422.67	0.235	9.58	0.831	PB-214	
349.23	87.36	186.12	132.88	0.074	16.91	1.172	PB-214	s
359.52	89.93	150.33	85.67	0.048	22.94	0.709	PB-214	M
1080.59	270.25	67.50	134.50	0.075	16.72	0.898	AC-228	s

s = Peak fails shape tests.

D = Peak area deconvoluted.

IDENTIFIED PEAK SUMMARY

Nuclide	Library Used	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncertainty 1 Sigma%	FWHM keV	Code
PB-210	1	186.37	46.63	191.52	9.96	0.006	62.69	0.819	s
AM-241	1	238.75	59.73	304.70	-13.58	-0.008	183.74	0.830	s
TH-234	1	253.78	63.49	243.53	59.47	0.033	39.11	1.005	s
EU-155	1	345.96	86.54	334.91	8.48	0.005	307.02	0.854	s
TH-234	1	370.14	92.59	300.37	105.93	0.059	20.10	0.859	D
AC-228	1	373.18	93.35	171.24	145.71	0.081	1.79	0.860	D
U-235	1	373.18	93.35	262.80	4.12	0.002	76.44	0.860	s D
EU-155	1	421.06	105.32	200.39	31.91	0.018	65.19	0.871	s
EU-152	1	486.84	121.78	200.41	1.26	0.001	1596.60	0.885	s
EU-154	1	490.32	122.64	169.78	0.70	0.000	2650.88	0.886	s
Pa-234	1	521.20	130.37	201.56	-15.17	-0.008	134.81	0.894	s
U-235	1	574.48	143.69	209.81	7.77	0.004	265.99	0.904	s
U-235	1	652.92	163.31	161.85	13.99	0.008	131.33	0.922	s
U-235	1	824.26	206.15	135.84	-0.32	0.000	5207.72	0.958	
PB-212	1	954.15	238.63	62.70	770.30	0.428	3.82	0.986	D
RA-224	1	963.56	240.99	125.10	96.90	0.054	19.23	0.988	D
PB-214	1	967.61	242.00	139.29	73.71	0.041	25.46	0.989	D
TL-208	1	1109.06	277.37	52.00	92.00	0.051	20.39	0.627	s
I-131	1	1134.57	283.75	55.26	-5.91	-0.003	182.45	1.025	s
PB-214	1	1179.47	294.97	78.54	175.46	0.097	13.30	0.854	
PB-212	1	1199.74	300.04	40.00	64.00	0.036	24.07	0.480	s
AC-228	1	1351.83	338.06	51.33	193.67	0.108	11.37	0.960	
EU-152	1	1374.69	343.78	45.93	6.03	0.003	163.95	1.076	s
PB-214	1	1406.16	351.65	69.41	262.59	0.146	9.92	1.123	s
I-131	1	1459.49	364.98	51.67	-1.04	-0.001	985.52	1.092	s
BE-7	1	1911.53	477.98	38.65	0.63	0.000	1403.92	1.185	s
CS-134	1	2251.82	563.04	34.25	-3.06	-0.002	276.36	1.254	s
CS-134	1	2276.94	569.32	50.41	-0.69	0.000	-50.24	1.259	s D
Pa-234	1	2277.54	569.47	49.74	-2.26	-0.001	-185.00	1.259	s D
TL-208	1	2330.59	582.73	13.52	277.48	0.154	6.74	1.342	
CS-134	1	2425.63	606.48	41.59	-4.15	-0.002	225.07	1.286	s
BI-214	1	2436.10	609.10	21.92	158.08	0.088	9.67	1.360	
I-131	1	2558.91	639.79	25.03	-1.20	-0.001	595.45	1.312	s
CS-137	1	2657.01	664.31	18.22	4.68	0.003	136.98	1.331	s
EU-154	1	2899.16	724.82	56.65	-7.26	-0.004	151.26	1.378	s
BI-212	1	2906.96	726.77	12.33	86.67	0.048	15.27	1.104	
PA-234M	1	3059.02	764.77	35.13	-0.23	0.000	3631.33	1.411	s
EU-152	1	3115.64	778.92	41.84	0.00	0.000	914.74	1.420	s
BI-212	1	3143.44	785.87	33.56	5.09	0.003	166.81	1.425	
CS-134	1	3171.33	792.83	25.51	-6.18	-0.003	122.36	1.433	s
CS-134	1	3217.44	804.36	27.54	-3.86	-0.002	198.88	1.437	s
TL-208	1	3439.15	859.75	5.67	48.33	0.027	19.20	1.172	
EU-154	1	3491.00	872.71	19.26	-0.88	0.000	712.99	1.490	s
Pa-234	1	3520.26	880.02	26.19	-3.71	-0.002	201.91	1.495	s
Pa-234	1	3533.38	883.30	20.91	-0.54	0.000	1212.01	1.497	s

AC-228	1	3643.67	910.85	10.67	158.33	0.088	9.49	1.212	
Pa-234	1	3782.24	945.47	16.30	5.49	0.003	112.46	1.543	s
EU-152	1	3848.91	962.13	34.87	-2.82	-0.002	301.83	1.556	s
AC-228	1	3875.39	968.74	0.00	100.00	0.056	10.00	0.945	s
EU-154	1	3986.55	996.51	22.25	-4.85	-0.003	144.90	1.579	s
PA-234M	1	4003.24	1000.68	10.96	3.57	0.002	141.43	1.582	s
EU-154	1	4020.56	1005.00	21.79	-0.68	0.000	985.07	1.585	s
EU-152	1	4444.21	1110.83	21.22	-1.37	-0.001	484.30	1.659	s
BI-214	1	4481.54	1120.15	4.65	46.35	0.026	14.00	0.562	s
CO-60	1	4690.12	1172.25	24.11	-2.27	-0.001	312.92	1.701	s
EU-154	1	5096.73	1273.79	19.06	-2.88	-0.002	222.14	1.768	s
CO-60	1	5332.08	1332.56	16.61	-0.64	0.000	904.10	1.806	s
EU-152	1	5633.98	1407.94	5.99	6.70	0.004	64.54	1.854	s
K-40	1	5844.28	1460.45	2.83	277.17	0.154	5.98	1.746	
BI-214	1	7059.43	1763.77	4.06	20.36	0.011	26.21	2.066	s

s = Peak fails shape tests.

D = Peak area deconvoluted.

A = Derived Aveage Activity.

SUMMARY OF LIBRARY PEAK USAGE

Nuclide Name	Nuclide Code	Library Used	Average Activity Becquerels	Peak Energy keV	Peak Activity Becquerels	Peak Analysis Code	Peak MDA Value Becquerels	Peak MDA Code	Peak Comments	
AM-241	T	1	-8.340E-001	59.54	-8.340E-001	& (	5.161E+000G		1.6E+005	35.90
PB-210	N	1	8.253E+000	46.54	8.253E+000	% (P	5.569E+001G		8.1E+003	4.25
EU-152	T F	1	7.197E-001	344.29	7.197E-001	% (	4.089E+000G		4.9E+003	26.50
			7.197E-001	121.78	7.081E-002	&	3.872E+000G		4.9E+003	28.58
			7.197E-001	778.92	0.000E+000	&	1.653E+001G		4.9E+003	12.94
			7.197E-001	964.11	-1.503E+000	%	1.609E+001G		4.9E+003	14.61
			7.197E-001	1112.07	-8.771E-001	%	1.552E+001G		4.9E+003	13.64
			7.197E-001	1408.00	3.412E+000	%	7.192E+000G		4.9E+003	21.00
CO-60	T F	1	-6.570E-002	1332.50	-6.570E-002	% (	2.215E+000G		1.9E+003	99.98
			-6.570E-002	1173.24	-2.082E-001	&	2.346E+000G		1.9E+003	99.90
RA-224	N	1	5.442E+001	240.99	5.442E+001	(	3.079E+001G		7.0E+002	4.10
EU-154	T F I	1	-5.138E-001	873.23	-5.138E-001	% (	1.352E+001G		3.1E+003	12.27
			-5.138E-001	123.10	2.751E-002	&	2.508E+000G		3.1E+003	40.79
			-5.138E-001	1274.54	-8.047E-001	%	6.436E+000G		3.1E+003	35.19
			-5.138E-001	723.36	-2.196E+000	%	1.143E+001G		3.1E+003	20.22
			-5.138E-001	1004.77	-3.018E-001	%	1.093E+001G		3.1E+003	18.01
			-5.138E-001	996.33	-3.654E+000	%	1.861E+001G		3.1E+003	10.60
BI-212	N	1	4.506E+001	727.33	4.506E+001	(	9.918E+000G		7.0E+002	11.82
			4.506E+001	785.51	3.037E+001	%	1.771E+002G		7.0E+002	1.10
AC-228	N	1	4.374E+001	911.07	4.051E+001	(	4.587E+000G		2.1E+003	29.00
			4.374E+001	968.97	4.472E+001	(	3.296E+000G		2.1E+003	17.46
			4.374E+001	338.32	5.015E+001	(	9.348E+000G		2.1E+003	12.01
			4.374E+001	93.35	4.374E+001	E	1.912E+001X	A	2.1E+003	5.56
I-131	T F I	1	-4.226E-002	364.48	-4.226E-002	% (	1.476E+000G		8.0E+000	81.70
			-4.226E-002	284.30	-2.559E+000	%	1.616E+001G		8.0E+000	6.14
			-4.226E-002	636.97	-9.206E-001	%	1.992E+001G		8.0E+000	7.17
			4.063E+001	300.03	5.440E+001	+	2.735E+001G		7.0E+002	3.28
PB-212	N	1	4.063E+001	238.63	4.063E+001	(P	2.089E+000G		7.0E+002	43.30
PA-234	N	1	3.421E+001	1001.00	3.421E+001	% (	1.738E+002G		1.6E+012	[illegible].84
			3.421E+001	766.41	-5.051E+000	%	6.626E+002G		1.6E+012	[illegible].29
CS-137	T F I	1	3.115E-001	661.66	3.115E-001	% (	1.504E+000G		1.1E+004	85.21
TH-234	N	1	2.896E+001	63.29	2.573E+001	% (P	3.263E+001G		1.6E+012	4.82
			2.896E+001	92.59	3.176E+001	(P	2.503E+001G		1.6E+012	5.58
K-40	N	1	2.871E+002	1460.83	2.871E+002	(P	1.093E+001G		4.7E+011	10.67
BE-7	N P C	1	2.547E-001	477.60	2.547E-001	% (	1.283E+001G		5.3E+001	10.52
EU-155	T F I	1	2.439E+000	105.31	2.439E+000	% (	5.250E+000G		1.8E+003	21.20
			2.439E+000	86.54	4.750E-001	&	4.927E+000G		1.8E+003	30.70
PB-214	N	1	2.330E+001	351.93	2.252E+001	@ (P	3.562E+000G		5.8E+005	37.60
			2.330E+001	295.09	2.497E+001	(P	6.263E+000G		5.8E+005	19.30
			2.330E+001	242.00	2.292E+001	(	1.795E+001G		5.8E+005	7.43
CS-134	T F I	1	-2.232E-001	604.71	-2.232E-001	% (	1.761E+000G		7.5E+002	97.62
			-2.232E-001	795.87	-4.790E-001	%	2.034E+000G		7.5E+002	85.53
			-2.232E-001	569.32	-2.232E-001	%	1.159E+001G		7.5E+002	15.38
			-2.232E-001	801.95	-2.964E+000	%	2.086E+001G		7.5E+002	8.69

				-2.232E-001	563.24	-1.808E+000	%			1.771E+001G	7.5E+002	8.35
BI-214		N	1	1.793E+001	609.31	1.812E+001		(	P	2.811E+000G	5.8E+005	46.09
				1.793E+001	1120.29	2.705E+001	+		P	7.441E+000G	5.8E+005	15.10
				1.793E+001	1764.49	1.736E+001	?	(		1.031E+001G	5.8E+005	15.40
TL-208	F	N	1	1.669E+001	583.02	1.669E+001		(	P	1.194E+000G	7.0E+002	84.50
				1.669E+001	277.28	3.788E+001	+			1.495E+001G	7.0E+002	6.31
				1.669E+001	860.56	2.753E+001	+			7.863E+000G	7.0E+002	12.42
				-1.372E+000	569.47	-1.372E+000	%			2.161E+001G	1.6E+012	8.20
				-1.372E+000	946.02	3.135E+000	%			1.230E+001G	1.6E+012	13.40
				-1.372E+000	883.24	-4.044E-001	%			1.809E+001G	1.6E+012	9.60
				-1.372E+000	880.53	-4.458E+000	%			3.192E+001G	1.6E+012	6.00
Pa-234		N	1	-1.372E+000	131.29	-1.372E+000	%	(		6.230E+000G	1.6E+012	18.00
U-235		N	1	1.183E+000	143.79	1.183E+000	&	(		1.069E+001G	2.6E+011	10.96
				1.183E+000	205.33	-1.284E-001	%			2.311E+001G	2.6E+011	5.01
				1.183E+000	163.38	4.848E+000	%			2.148E+001G	2.6E+011	5.08
				1.183E+000	93.35	1.183E+000	%		E	2.249E+001X	2.6E+011	5.81

Analysis Codes:

% = Peak fails sensitivity test
? = Peak is too narrow
- = Peak activity lower than counting uncertainty range
= = Peak outside analysis energy range
(= This peak is used in the nuclide activity average
P = Peakbackround subtraction
* = Peak is too wide, but only one peak in library
@ = Peak is too wide at FW25M, but OK at FWHM
A = Derived Average Activity
E = Energy Duplication
+ = Peak activity higher than counting uncertainty range
! = Peak is part of a multiplet and this area went negative during deconvolution
$ = Peak identified, but first peak of this nuclide failed one or more qualification tests
& = Calculated peak centroid is not close enough to the library energy centroid for positive identification

Nuclide Codes:

T = Thermal Neutron Activation
F = Fast Neutron Activation
I = Fission Product
P = Photon Reaction
N = Naturally Occurring Isotope
C = Charged Particle Reaction
M = No MDA Calculation

Peak Codes:

G = Gamma Ray
X = X-Ray
P = Positron Decay
S = Single - Escape
D = Double - Escape
K = Key Line
A = Not in Average

SUMMARY OF NUCLIDES IN SAMPLE

Nuclide		Time of Count Activity Bq/sample	Time Corrected Activity Bq/sample	Uncertainty Counts 1 Sigma %	Uncertainty Total 1 Sigma %	Minimum Detectable Activity
BE-7	<	2.547E-001	2.549E-001	1,403.92	1,403.92	1.283E+001
K-40		2.871E+002	2.871E+002	6.04	6.71	1.093E+001
CO-60	<	-6.570E-002	-6.570E-002	904.10	904.10	2.215E+000
I-131	<	-4.226E-002	-4.252E-002	985.52	985.52	1.476E+000
CS-134	<	-2.232E-001	-2.232E-001	225.07	225.09	1.761E+000
EU-154	<	-5.138E-001	-5.138E-001	712.99	712.99	1.352E+001
EU-155	<	2.439E+000	2.439E+000	65.19	65.28	5.250E+000
PB-214		2.330E+001	2.330E+001	10.12	10.52	3.562E+000
BI-212		4.506E+001	4.507E+001	15.27	15.54	9.918E+000
BI-214		1.793E+001	1.793E+001	9.99	10.40	2.811E+000
TH-234		2.896E+001	2.896E+001	24.66	24.94	3.263E+001
PA-234M	<	3.421E+001	3.421E+001	141.43	141.46	1.738E+002
CS-137	<	3.115E-001	3.115E-001	136.98	137.02	1.504E+000
EU-152	<	7.197E-001	7.197E-001	163.95	163.97	4.089E+000
TL-208		1.669E+001	1.670E+001	6.79	7.38	1.194E+000
RA-224		5.442E+001	5.442E+001	19.23	19.46	3.079E+001
PB-210	<	8.253E+000	8.253E+000	193.71	193.75	5.569E+001
PB-212		4.063E+001	4.063E+001	3.87	4.88	2.089E+000
AC-228		4.374E+001	4.375E+001	5.96	6.61	4.587E+000
Pa-234	<	-1.372E+000	-1.372E+000	134.81	134.84	6.230E+000
U-235	<	1.183E+000	1.183E+000	265.99	266.01	1.069E+001
AM-241	<	-8.340E-001	-8.340E-001	183.74	183.78	5.161E+000

= All peaks for activity calculation had bad shape

Total Activity (37.53 to 1,998.47 keV) 557.89 Bq/sample

Analyzed by: _____

403293

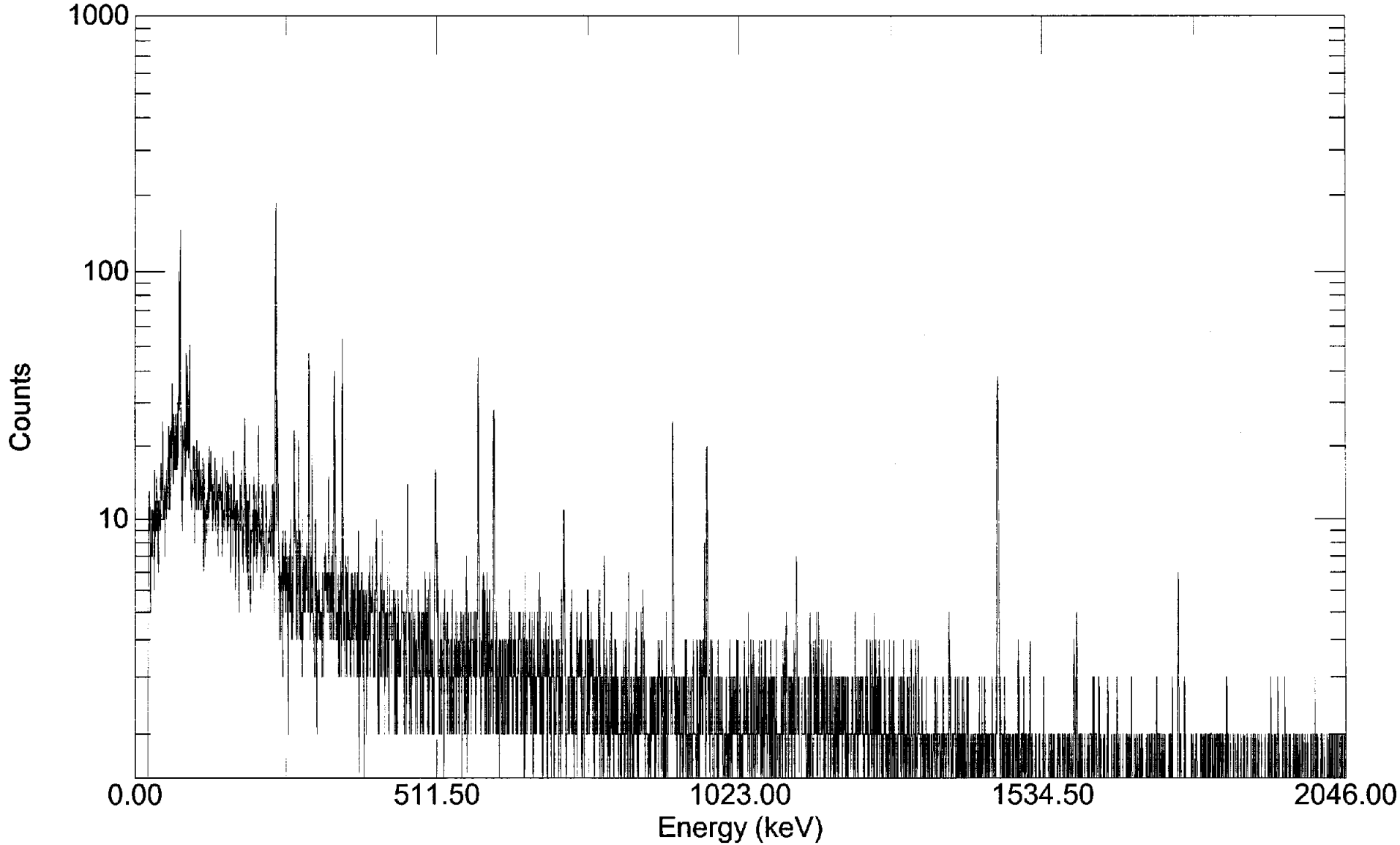
Reviewed by: _____

Supervisor

Laboratory: STL- St Louis

KEKCF1AC

7357010_KEKCF1AC_F7L200251-010



Acquired: 23-Dec-2007 1:42:39 PM
File: C:\User\spectra\KEKCF1AC.spc
Detector: #0 Ge 4 SN/181

Real Time: 1804.86 s. Live Time: 1800.00 s.
Channels: 8192

DB Analysis ID: 32,971

Sample Description: 7357010_KEKCH1AC_F7L200251-011

Spectrum Filename: KEKCH1AC.An1

Acquisition Information

Start Time:	23-Dec-2007 1:43:08PM		
Live Time:	1800.00	Real Time:	1961.56
Dead Time:	8.24 %		
Detector ID:	5		

Detector System: Ge 5 SN/157

Calibration

Description:	Ge5 TunaCanCal_74139-334_05_08_07		
Filename:	C:\User\Calibrations\Ge5 calibrations\Ge5 TunaCanCal_74139-334_05_08_07.Clb		
Energy Created:	28-Mar-2007 6:08:23PM	Efficiency Created:	08-May-2007 3:55:34PM
Zero Offset:	0.272 keV	Gain:	0.250 keV/Channel

Library 1 File: mmr06 short.lib Library based peak stripping used.
Library 2 File: Null.Lib
Library 3 File: Null.Lib

Analysis Parameters

Start Channel:	150 for an energy of 37.74 keV
Stop Channel:	8,000 for an energy of 2000.57 keV
Peak rejection level:	40.000 %
Activity Scaling Factor:	1.0000 / 1.0000 = 1.0000
Detection Limit Method:	Nureg method 4.16
Sample Size:	1.00E+000
Additional random error:	0.0000
Additional systematic error:	0.0000
Fraction Limit:	0.0000%
Background Width:	Average of three points

Corrections

	Status	Comments
Decay Correct to Date:	YES	23-Dec-2007 12:00:00PM
Decay During Acquisition:	NO	
Peaked Background Correction:	YES	Ge5 PBC table 11 26 07.Pbc
Absorption:	NO	
Geometry Correction:	NO	
Random Summing:	NO	

Energy Calibration Normalized Difference: 0.1559

UNIDENTIFIED PEAK SUMMARY

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncertainty 1 Sigma%	FWHM keV	Suspected Nuclide	Code
297.76	74.65	405.17	402.83	0.224	10.98	0.711	PB-214	
307.14	76.99	381.00	486.00	0.270	9.22	0.797	PB-214	
334.96	83.95	247.50	83.50	0.046	28.80	0.650	TA-182	
347.06	86.97	440.72	46.28	0.026	65.81	0.991		s
358.26	89.77	161.33	145.67	0.081	16.85	0.841	PB-214	sM
612.19	153.20	93.33	83.67	0.046	23.75	0.753	CS-136	
742.25	185.70	156.00	151.00	0.084	20.21	1.008	U-235	s
836.31	209.20	62.00	121.00	0.067	12.94	0.686	AC-228	
1081.42	270.44	50.67	111.33	0.062	15.48	0.714	AC-228	s
2043.03	510.73	52.50	168.50	0.094	13.63	1.072	TL-208	s

s = Peak fails shape tests.

D = Peak area deconvoluted.

IDENTIFIED PEAK SUMMARY

Nuclide	Library Used	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncertainty 1 Sigma%	FWHM keV	Code
PB-210	1	185.31	46.56	177.26	54.74	0.030	38.42	0.802	
AM-241	1	237.25	59.54	298.98	-3.31	-0.002	2431.75	0.761	s
TH-234	1	252.80	63.42	256.83	106.17	0.059	25.33	0.758	s
EU-155	1	347.38	87.05	327.56	182.05	0.101	15.89	0.788	s
TH-234	1	369.56	92.59	277.01	68.99	0.038	26.67	0.795	D
U-235	1	372.61	93.35	262.72	12.80	0.007	22.34	0.795	s D
AC-228	1	372.61	93.35	362.13	52.26	0.029	48.32	0.795	D
EU-155	1	420.49	105.31	218.96	40.52	0.023	53.98	0.808	
EU-152	1	486.61	121.83	224.65	-2.75	-0.002	773.25	0.824	s
EU-154	1	493.53	123.56	214.40	3.44	0.002	603.60	0.826	s
Pa-234	1	524.63	131.33	268.08	8.96	0.005	260.50	0.834	s
U-235	1	571.81	143.12	177.98	24.21	0.013	72.84	0.847	
U-235	1	654.58	163.79	151.79	22.00	0.012	74.97	0.867	s
U-235	1	820.73	205.30	138.44	5.61	0.003	299.77	0.909	s
PB-212	1	954.31	238.68	179.31	1181.69	0.656	3.78	0.953	
RA-224	1	963.54	240.99	127.81	78.19	0.043	23.37	0.944	D
PB-214	1	967.59	242.00	171.46	50.54	0.028	39.25	0.945	D
TL-208	1	1107.76	277.02	99.67	93.33	0.052	25.69	1.251	s
I-131	1	1138.42	284.68	71.67	6.90	0.004	177.58	0.987	s
PB-214	1	1180.37	295.16	39.91	140.09	0.078	11.72	0.889	
PB-212	1	1200.54	300.20	45.50	104.50	0.058	16.83	0.952	s
AC-228	1	1353.15	338.33	74.67	231.33	0.129	11.06	0.970	s
EU-152	1	1379.44	344.90	48.71	5.21	0.003	194.36	1.045	
PB-214	1	1406.99	351.79	55.21	244.79	0.136	9.02	1.231	s
I-131	1	1449.80	362.48	42.87	-1.62	-0.001	578.63	1.065	s
BE-7	1	1910.04	477.50	51.38	-2.62	-0.001	392.09	1.173	s
CS-134	1	2253.16	563.25	48.12	0.44	0.000	2236.00	1.252	s
CS-134	1	2277.45	569.32	42.77	0.00	0.000	824.62	1.258	s D
Pa-234	1	2278.05	569.47	38.89	1.35	0.001	151.97	1.258	s D
TL-208	1	2333.47	583.32	21.08	345.92	0.192	6.01	1.278	
CS-134	1	2420.54	605.08	36.97	4.99	0.003	177.98	1.290	s
BI-214	1	2438.37	609.54	15.73	159.27	0.088	8.84	1.347	s
I-131	1	2545.58	636.34	42.48	0.14	0.000	6372.12	1.319	s
CS-137	1	2646.89	661.66	68.25	-6.25	-0.003	1113.55	1.342	s
EU-154	1	2899.77	724.87	60.64	-12.49	-0.007	92.63	1.397	s
BI-212	1	2910.27	727.49	28.69	64.15	0.036	17.19	1.400	s
PA-234M	1	3066.35	766.51	44.43	-0.13	0.000	7465.04	1.434	s
EU-152	1	3117.26	779.24	32.48	-5.07	-0.003	165.13	1.445	s
BI-212	1	3144.51	786.05	30.15	6.44	0.004	126.89	1.451	s
CS-134	1	3183.78	795.87	23.44	0.00	0.000	684.69	1.460	s
CS-134	1	3206.35	801.51	31.62	-3.32	-0.002	245.82	1.465	s
TL-208	1	3443.73	860.85	22.30	29.58	0.016	29.12	1.516	
EU-154	1	3488.55	872.06	29.22	-2.99	-0.002	262.08	1.527	s
Pa-234	1	3521.90	880.40	31.89	-3.38	-0.002	242.21	1.533	s
Pa-234	1	3534.22	883.48	17.13	5.59	0.003	113.03	1.535	s
AC-228	1	3645.57	911.31	11.67	222.33	0.124	7.82	1.524	

Pa-234	1	3780.63	945.08	20.49	6.51	0.004	105.80	1.588	s
EU-152	1	3850.31	962.51	29.13	1.15	0.001	670.39	1.603	s
AC-228	1	3873.75	968.36	7.33	171.67	0.095	8.89	1.222	s
EU-154	1	3983.74	995.87	28.72	-5.03	-0.003	157.04	1.630	s
PA-234M	1	4004.26	1001.00	49.88	0.00	0.000	998.75	1.633	s
EU-154	1	4016.75	1004.12	21.53	-0.59	0.000	1120.62	1.637	s
EU-152	1	4446.48	1111.58	29.34	-2.02	-0.001	386.50	1.723	s
BI-214	1	4482.32	1120.54	28.23	35.04	0.019	27.30	1.730	s
CO-60	1	4692.08	1172.99	21.86	4.55	0.003	152.70	1.772	s
EU-154	1	5097.03	1274.27	25.08	-2.99	-0.002	244.19	1.850	s
CO-60	1	5331.71	1332.97	15.77	4.95	0.003	121.96	1.894	s
EU-152	1	5630.45	1407.69	15.36	0.76	0.000	740.40	1.950	s
K-40	1	5843.59	1461.00	0.00	232.00	0.129	6.57	1.730	
BI-214	1	7059.21	1765.14	1.85	31.15	0.017	17.41	0.667	s

s = Peak fails shape tests.

D = Peak area deconvoluted.

A = Derived Aveage Activity.

SUMMARY OF LIBRARY PEAK USAGE

Nuclide Name	Nuclide Code	Library Used	Average Activity Becquerels	Peak Energy keV	Peak Activity Becquerels		Peak Analysis Code		Peak MDA Value Becquerels		Peak Code	Peak Comments	
Pa-234	N	1	7.849E-001	131.29	7.849E-001	%	(		6.920E+000	G		1.6E+012	18.00
			7.849E-001	569.47	7.849E-001	&			1.853E+001	G		1.6E+012	8.20
			7.849E-001	946.02	3.554E+000	%			1.299E+001	G		1.6E+012	13.40
			7.849E-001	883.24	4.023E+000	&			1.585E+001	G		1.6E+012	9.60
			7.849E-001	880.53	-3.890E+000	%			3.337E+001	G		1.6E+012	6.00
I-131	T F I	1	-6.326E-002	364.48	-6.326E-002	&	(		1.301E+000	G		8.0E+000	81.70
			-6.326E-002	284.30	2.869E+000	%			1.753E+001	G		8.0E+000	6.14
			-6.326E-002	636.97	1.064E-001	&			2.431E+001	G		8.0E+000	7.17
			5.993E+001	300.03	8.534E+001	*			2.788E+001	G		7.0E+002	3.28
PB-212	N	1	5.993E+001	238.63	5.993E+001		(	P	3.302E+000	G		7.0E+002	43.30
			5.973E-001	1408.00	3.648E-001	%			1.010E+001	G		4.9E+003	21.00
EU-152	T F	1	5.973E-001	344.29	5.973E-001	%	(		4.037E+000	G		4.9E+003	26.50
			5.973E-001	121.78	-1.502E-001	&			3.964E+000	G		4.9E+003	28.58
			5.973E-001	778.92	-2.443E+000	%			1.411E+001	G		4.9E+003	12.94
			5.973E-001	964.11	5.845E-001	%			1.416E+001	G		4.9E+003	14.61
			5.973E-001	1112.07	-1.231E+000	%			1.707E+001	G		4.9E+003	13.64
AC-228	N	1	5.531E+001	911.16	5.437E+001		(		4.555E+000	G		2.1E+003	29.00
			5.531E+001	968.97	7.330E+001	+			6.545E+000	G		2.1E+003	17.46
			5.531E+001	338.32	5.756E+001	*	(		1.069E+001	G		2.1E+003	12.01
			5.531E+001	93.35	1.519E+001	-	}	E	2.107E+001	G	A	2.1E+003	5.56
CO-60	T F	1	4.786E-001	1332.50	4.786E-001	&	(		2.050E+000	G		1.9E+003	99.98
			4.786E-001	1173.24	3.965E-001	%			2.135E+000	G		1.9E+003	99.90
TH-234	N	1	4.301E+001	63.29	4.301E+001	*	(	P	3.135E+001	G		1.6E+012	4.82
			4.301E+001	92.59	2.003E+001	-		P	2.330E+001	G		1.6E+012	5.58
RA-224	N	1	4.222E+001	240.99	4.222E+001		(		2.991E+001	G		7.0E+002	4.10
PB-210	N	1	4.019E+001	46.54	4.019E+001	%	(	P	4.755E+001	G		8.1E+003	4.25
CS-137	T F I	1	-3.992E-001	661.66	-3.992E-001	%	(	P	2.632E+000	G		1.1E+004	85.21
U-235	N	1	3.562E+000	143.79	3.562E+000	%	(	P	9.548E+000	G		2.6E+011	10.96
			3.562E+000	205.33	2.187E+000	%			2.245E+001	G		2.6E+011	5.01
			3.562E+000	163.38	7.355E+000	%		P	2.010E+001	G		2.6E+011	5.08
			3.562E+000	93.35	3.562E+000	!		E	2.177E+001	X		2.6E+011	5.81
Bi-212	N	1	3.198E+001	727.33	3.198E+001		(		1.379E+001	G		7.0E+002	11.82

				3.198E+001	785.51	3.676E+001	%			1.616E+002G	7.0E+002	1.10
EU-155	T F I		1	3.004E+000	105.31	3.004E+000	%	(		5.312E+000G	1.8E+003	21.20
				3.004E+000	86.54	9.847E+000	*			4.708E+000G	A 1.8E+003	30.70
CS-134	T F I		1	2.577E-001	604.71	2.577E-001	%	(		1.602E+000G	7.5E+002	97.62
				2.577E-001	795.87	0.000E+000	&			1.876E+000G	7.5E+002	85.53
				2.577E-001	569.32	0.000E+000	&		}	1.022E+001G	7.5E+002	15.38
				2.577E-001	801.95	-2.440E+000	%			2.126E+001G	7.5E+002	8.69
				2.577E-001	563.24	2.495E-001	&			1.988E+001G	7.5E+002	8.35
K-40		N	1	2.268E+002	1460.83	2.268E+002		(		7.204E+000G	4.7E+011	10.67
TL-208	F	N	1	1.999E+001	583.02	1.999E+001		(	P	1.393E+000G	7.0E+002	84.50
				1.999E+001	277.28	3.693E+001	*			1.948E+001G	7.0E+002	6.31
				1.999E+001	860.56	1.612E+001	-			1.347E+001G	7.0E+002	12.42
PB-214		N	1	1.983E+001	351.93	2.017E+001	*	(	P	3.076E+000G	5.8E+005	37.60
				1.983E+001	295.09	1.915E+001		(	P	4.396E+000G	5.8E+005	19.30
				1.983E+001	242.00	1.511E+001	-			1.905E+001G	5.8E+005	7.43
AM-241	T		1	-1.885E-001	59.54	-1.885E-001	*	(	P	4.739E+000G	1.6E+005	35.90
BI-214		N	1	1.800E+001	609.31	1.753E+001	@	(	P	2.332E+000G	5.8E+005	46.09
				1.800E+001	1120.29	1.946E+001	?	(		1.525E+001G	5.8E+005	15.10
				1.800E+001	1764.49	2.484E+001	+		P	7.211E+000G	5.8E+005	15.40
EU-154	T F I		1	-1.670E+000	873.23	-1.670E+000	%	(		1.558E+001G	3.1E+003	12.27
				-1.670E+000	123.10	1.320E-001	%			2.718E+000G	3.1E+003	40.79
				-1.670E+000	1274.54	-7.901E-001	%			6.894E+000G	3.1E+003	35.19
				-1.670E+000	723.36	-3.622E+000	%			1.131E+001G	3.1E+003	20.22
				-1.670E+000	1004.77	-2.513E-001	&			1.037E+001G	3.1E+003	18.01
				-1.670E+000	996.33	-3.620E+000	%			1.991E+001G	3.1E+003	10.60
BE-7		N P C	1	-1.019E+000	477.60	-1.019E+000	%	(		1.405E+001G	5.3E+001	10.52
PA-234M		N	1	0.000E+000	1001.00	0.000E+000	%	(		3.257E+002G	1.6E+012	.84
				0.000E+000	766.41	-2.645E+000	%			7.070E+002G	1.6E+012	.29

Analysis Codes:

% = Peak fails sensitivity test

- = Peak activity lower than counting uncertainty range

(= This peak is used in the nuclide activity average

* = Peak is too wide, but only one peak in library

A = Derived Average Activity

+ = Peak activity higher than counting uncertainty range

! = Peak is part of a multiplet and this area went negative during deconvolution

$ = Peak identified, but first peak of this nuclide failed one or more qualification tests

? = Peak is too narrow

= = Peak outside analysis energy range

P = Peakbackround subtraction

@ = Peak is too wide at FW25M, but OK at FWHM

E = Energy Duplication

& = Calculated peak centroid is not close enough to the library energy centroid for positive identification

Nuclide Codes:

T = Thermal Neutron Activation	F = Fast Neutron Activation	I = Fission Product
P = Photon Reaction	N = Naturally Occurring Isotope	C = Charged Particle Reaction
M = No MDA Calculation		

Peak Codes:

G = Gamma Ray	X = X-Ray	P = Positron Decay
S = Single - Escape	D = Double - Escape	K = Key Line
A = Not in Average		

SUMMARY OF NUCLIDES IN SAMPLE

Nuclide		Time of Count Activity Bq/sample	Time Corrected Activity Bq/sample	Uncertainty Counts 1 Sigma %	Uncertainty Total 1 Sigma %	Minimum Detectable Activity
BE-7	#	-1.019E+000	-1.020E+000	392.09	392.10	1.405E+001
K-40		2.268E+002	2.268E+002	6.57	7.19	7.204E+000
CO-60	#	4.786E-001	4.786E-001	121.96	121.99	2.050E+000
I-131	#	-6.326E-002	-6.365E-002	578.63	578.64	1.301E+000
CS-134	#	2.577E-001	2.577E-001	177.98	178.01	1.602E+000
EU-154	#	-1.670E+000	-1.670E+000	262.08	262.10	1.558E+001
PB-214		1.983E+001	1.983E+001	7.54	8.07	3.076E+000
BI-212	#	3.198E+001	3.198E+001	17.19	17.43	1.379E+001
BI-214		1.800E+001	1.800E+001	9.22	9.66	2.332E+000
Pa-234	#	7.849E-001	7.849E-001	260.50	260.52	6.920E+000
TH-234		4.301E+001	4.301E+001	28.71	28.95	3.135E+001
CS-137	#	-3.992E-001	-3.992E-001	2,227.11	2,227.11	2.632E+000
EU-152	#	5.973E-001	5.973E-001	194.36	194.38	4.037E+000
EU-155	#	3.004E+000	3.004E+000	53.98	54.08	5.312E+000
TL-208		1.999E+001	1.999E+001	6.08	6.73	1.393E+000
PB-210		4.019E+001	4.019E+001	50.54	50.69	4.755E+001
PB-212		5.993E+001	5.993E+001	3.81	4.84	3.302E+000
RA-224		4.222E+001	4.222E+001	23.37	23.56	2.991E+001
AC-228		5.531E+001	5.531E+001	6.77	7.36	4.555E+000
PA-234M	#			998.75	998.76	3.257E+002
U-235	#	3.562E+000	3.562E+000	80.29	80.34	9.548E+000
AM-241	#	-1.885E-001	-1.885E-001	4,863.49	4,863.49	4.739E+000

= All peaks for activity calculation had bad shape

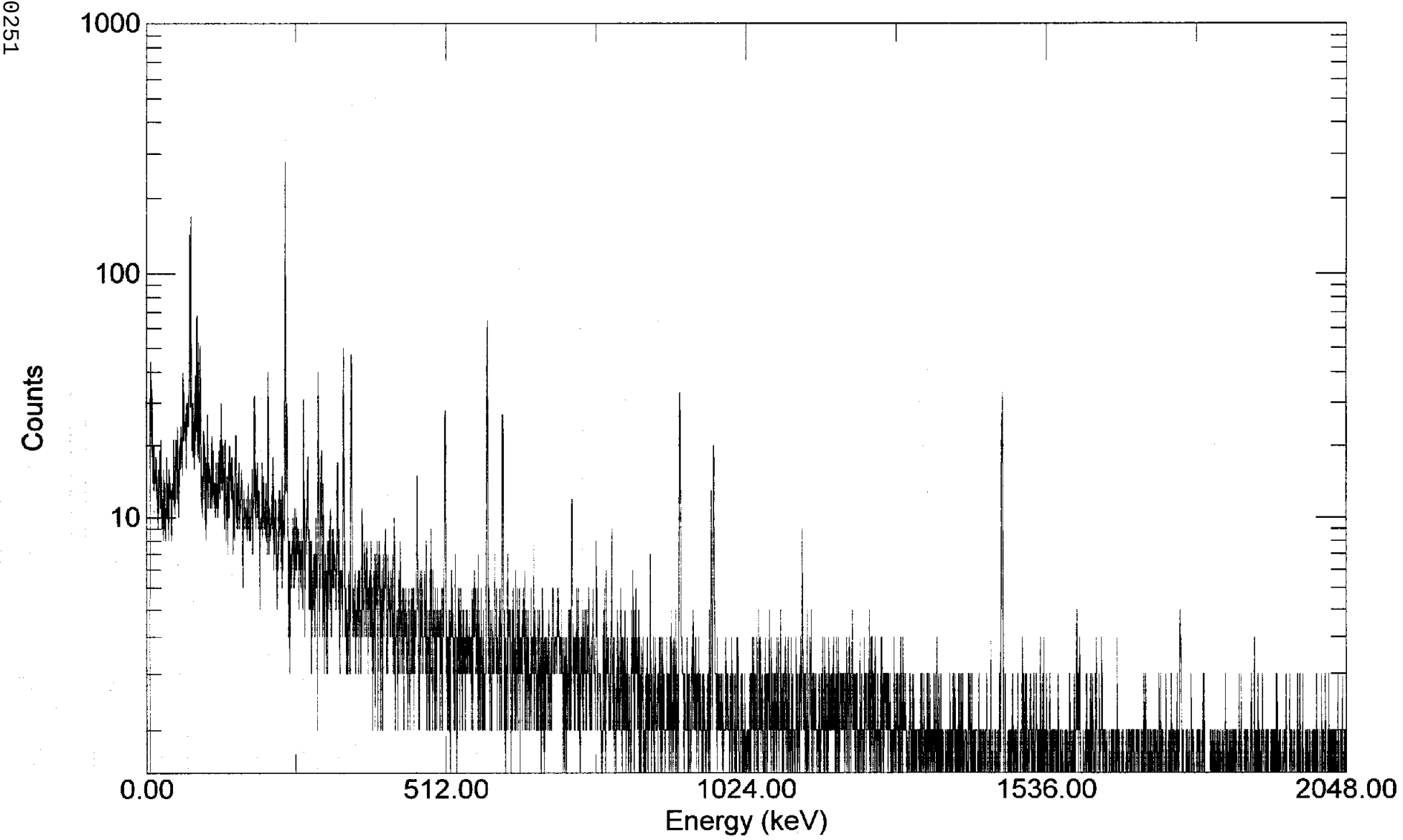
Total Activity (37.74 to 2,000.57 keV) 485.05 Bq/sample

Analyzed by: 403293

Laboratory: STL- St Louis

KEKCH1AC

7357010_KEKCH1AC_F7L200251-011



Acquired: 23-Dec-2007 1:43:07 PM
File: C:\User\spectra\KEKCH1AC.spc
Detector: #0 Ge 5 SN/157

Real Time: 1961.56 s. Live Time: 1800.00 s.
Channels: 8192

TestAmerica St. Louis

DB Analysis ID: 32,970

Sample Description: 7357010_KEKCJ1AC_F7L200251-012

Spectrum Filename: KEKCJ1AC.An1

Acquisition Information

Start Time:	23-Dec-2007 1:43:41PM		
Live Time:	1800.00	Real Time:	1818.42
Dead Time:	1.01 %		
Detector ID:	7		

Detector System: Ge 7 SN/154

Calibration

Description:	Ge7 Tunacan 74139_334 01_16_07		
Filename:	C:\User\Calibrations\Ge7 calibrations\Ge7 Tunacan 01_16_07.Clb		
Energy Created:	16-Jan-2007 4:24:37PM	Efficiency Created:	16-Jan-2007 4:27:00PM
Zero Offset:	0.231 keV	Gain:	0.250 keV/Channel

Library 1 File: mmr06 short.lib Library based peak stripping used.
Library 2 File: Null.Lib
Library 3 File: Null.Lib

Analysis Parameters

Start Channel:	150 for an energy of 37.72 keV
Stop Channel:	8,000 for an energy of 2000.15 keV
Peak rejection level:	40.000 %
Activity Scaling Factor:	1.0000 / 1.0000 = 1.0000
Detection Limit Method:	Nureg method 4.16
Sample Size:	1.00E+000
Additional random error:	0.0000
Additional systematic error:	0.0000
Fraction Limit:	0.0000%
Background Width:	Average of three points

Corrections

	Status	Comments
Decay Correct to Date:	YES	23-Dec-2007 12:00:00PM
Decay During Acquisition:	NO	
Peaked Background Correction:	YES	Ge7 PBC table 11 26 07.Pbc
Absorption:	NO	
Geometry Correction:	NO	
Random Summing:	NO	

Energy Calibration Normalized Difference: 0.2047

UNIDENTIFIED PEAK SUMMARY

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncertainty 1 Sigma%	FWHM keV	Suspected Nuclide	Code
297.71	74.64	291.00	205.00	0.114	18.05	0.848	PB-214	
307.85	77.18	276.67	384.33	0.214	10.35	1.032	PB-214	
742.67	185.86	137.50	120.50	0.067	23.92	0.922	RA-226	s
1353.35	338.50	104.63	15.37	0.009	97.49	0.570		s

s = Peak fails shape tests.

D = Peak area deconvoluted.

IDENTIFIED PEAK SUMMARY

Nuclide	Library Used	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncertainty 1 Sigma%	FWHM keV	Code
PB-210	1	184.85	46.43	105.77	65.23	0.036	21.29	0.945	s
AM-241	1	238.31	59.80	198.71	23.78	0.013	86.29	0.846	s
TH-234	1	252.48	63.34	256.66	35.00	0.019	41.20	0.850	s
EU-155	1	347.46	87.08	272.95	73.45	0.041	33.88	0.874	s
TH-234	1	371.81	93.16	331.35	30.18	0.017	44.35	0.881	s
U-235	1	372.56	93.35	295.51	0.00	0.000	2186.32	0.882	s D
AC-228	1	372.56	93.35	235.14	65.36	0.036	2.53	0.882	s D
EU-155	1	422.31	105.79	132.99	30.05	0.017	57.26	0.894	s
EU-152	1	490.56	122.84	130.77	5.13	0.003	318.41	0.912	s
EU-154	1	491.55	123.09	131.16	9.18	0.005	179.42	0.913	s
Pa-234	1	524.25	131.27	193.58	-6.79	-0.004	292.50	0.922	s
U-235	1	576.58	144.35	129.85	23.86	0.013	70.58	0.935	s
U-235	1	648.93	162.43	87.78	10.52	0.006	129.71	0.955	s
U-235	1	819.39	205.03	102.32	7.10	0.004	204.95	0.999	s
PB-212	1	953.80	238.63	108.67	515.33	0.286	5.12	1.034	D
RA-224	1	963.22	240.99	165.24	56.76	0.032	34.67	1.036	D
PB-214	1	967.26	242.00	99.43	62.57	0.035	25.84	1.037	D
TL-208	1	1102.89	275.90	65.12	5.94	0.003	196.48	1.074	s
I-131	1	1137.06	284.44	81.16	-0.45	0.000	2815.17	1.081	s
PB-214	1	1180.09	295.20	47.50	163.50	0.091	11.63	1.352	s
PB-212	1	1200.14	300.21	81.05	23.61	0.013	57.72	1.097	s
AC-228	1	1353.80	338.62	57.19	76.29	0.042	18.10	1.136	s
EU-152	1	1379.20	344.96	53.56	12.85	0.007	85.27	1.142	
PB-214	1	1407.82	352.12	34.38	278.62	0.155	7.31	1.315	s
I-131	1	1458.66	364.83	59.95	-3.95	-0.002	281.42	1.163	s
BE-7	1	1909.47	477.51	28.15	4.77	0.003	163.97	1.277	s
CS-134	1	2248.57	562.27	22.99	7.36	0.004	99.24	1.363	s
CS-134	1	2276.76	569.32	25.06	-1.41	-0.001	-36.51	1.369	s D
Pa-234	1	2277.35	569.47	37.13	-1.00	-0.001	-125.72	1.369	s D
TL-208	1	2332.42	583.24	19.41	160.59	0.089	10.20	1.350	
CS-134	1	2426.69	606.80	41.75	-8.46	-0.005	113.30	1.403	s
BI-214	1	2436.73	609.31	2.13	186.87	0.104	7.27	1.441	s
I-131	1	2554.52	638.75	33.09	-4.33	-0.002	193.76	1.435	s
CS-137	1	2646.14	661.66	42.37	19.87	0.011	49.43	1.459	s
EU-154	1	2887.24	721.92	46.25	-6.78	-0.004	147.04	1.519	s
BI-212	1	2908.60	727.27	36.50	22.94	0.013	42.70	1.523	s
PA-234M	1	3065.20	766.41	38.00	0.00	0.000	871.78	1.561	s
EU-152	1	3111.04	777.87	24.27	1.19	0.001	593.39	1.573	s
BI-212	1	3144.54	786.24	25.11	1.94	0.001	372.00	1.579	s
CS-134	1	3183.03	795.87	30.23	0.00	0.000	777.50	1.589	s
CS-134	1	3207.92	802.09	27.22	-0.20	0.000	3733.21	1.595	s
TL-208	1	3442.29	860.68	25.48	8.35	0.005	92.19	1.650	s
EU-154	1	3492.03	873.11	25.57	2.60	0.001	281.63	1.662	s
Pa-234	1	3521.83	880.56	30.04	-1.68	-0.001	467.28	1.669	s
Pa-234	1	3532.73	883.29	32.17	-2.40	-0.001	340.64	1.672	s
AC-228	1	3644.85	911.31	36.83	79.24	0.044	15.60	1.698	s

Pa-234	1	3782.92	945.83	19.51	1.98	0.001	323.90	1.731	s
EU-152	1	3852.12	963.13	51.57	-5.27	-0.003	197.62	1.748	s
AC-228	1	3877.28	969.42	35.42	38.39	0.021	27.22	1.752	s
EU-154	1	3984.93	996.33	41.00	0.00	0.000	905.54	1.778	s
PA-234M	1	4002.89	1000.82	29.28	-0.19	0.000	4021.81	1.782	s
EU-154	1	4018.44	1004.71	25.86	2.31	0.001	318.04	1.785	s
EU-152	1	4448.02	1112.10	34.07	-3.29	-0.002	257.07	1.884	s
BI-214	1	4481.34	1120.43	31.56	9.03	0.005	94.04	1.891	s
CO-60	1	4692.58	1173.24	29.99	0.00	0.000	774.49	1.939	s
EU-154	1	5091.69	1273.02	19.75	0.10	0.000	6470.86	2.030	s
CO-60	1	5324.45	1331.21	23.44	-1.70	-0.001	410.55	2.081	s
EU-152	1	5631.62	1408.00	96.42	0.00	0.000	1388.69	2.147	s
K-40	1	5844.06	1461.11	0.00	346.00	0.192	5.38	1.798	
BI-214	1	7061.23	1765.43	9.24	18.63	0.010	32.69	2.447	s

s = Peak fails shape tests.

D = Peak area deconvoluted.

A = Derived Aveage Activity.

SUMMARY OF LIBRARY PEAK USAGE

Nuclide Name	Code	Library Used	Average Activity Becquerels	Peak Energy keV	Peak Activity Becquerels		Analysis Code	MDA Value Becquerels	Code	Comments	
CS-137	T F I	1	9.380E-001	661.66	9.380E-001	%	(P	1.560E+000G		1.1E+004	85.21
BI-212	N	1	8.473E+000	727.33	8.473E+000	*	(	1.140E+001G		7.0E+002	11.82
			8.473E+000	785.51	8.233E+000	%		1.105E+002G		7.0E+002	1.10
TL-208	F N	1	6.840E+000	583.02	6.840E+000		(P	9.898E-001G		7.0E+002	84.50
			6.840E+000	277.28	1.721E+000	&		1.168E+001G		7.0E+002	6.31
			6.840E+000	860.56	3.392E+000	&		1.065E+001G		7.0E+002	12.42
			-4.298E-001	880.53	-1.442E+000	%		2.422E+001G		1.6E+012	6.00
Pa-234	N	1	-4.298E-001	131.29	-4.298E-001	%	(	4.279E+000G		1.6E+012	18.00
			-4.298E-001	569.47	-4.298E-001	%		1.337E+001G		1.6E+012	8.20
			-4.298E-001	946.02	8.068E-001	%		9.507E+000G		1.6E+012	13.40
			-4.298E-001	883.24	-1.288E+000	%		1.565E+001G		1.6E+012	9.60
PB-210	N	1	3.895E+001	46.54	3.895E+001	*	(P	3.023E+001G		8.1E+003	4.25
CS-134	T F I	1	-3.223E-001	604.71	-3.223E-001	%	(	1.250E+000G		7.5E+002	97.62
			-3.223E-001	795.87	0.000E+000	&		1.562E+000G		7.5E+002	85.53
			-3.223E-001	569.32	-3.223E-001	%		5.966E+000G		7.5E+002	15.38
			-3.223E-001	801.95	-1.082E-001	&		1.476E+001G		7.5E+002	8.69
			-3.223E-001	563.24	3.076E+000	&		1.047E+001G		7.5E+002	8.35
K-40	N	1	2.599E+002	1460.83	2.599E+002		(	5.536E+000G		4.7E+011	10.67
U-235	N	1	2.545E+000	143.79	2.545E+000	%	(	5.953E+000G		2.6E+011	10.96
			2.545E+000	205.33	2.022E+000	%		1.420E+001G		2.6E+011	5.01
			2.545E+000	163.38	2.556E+000	&		1.127E+001G		2.6E+011	5.08
			2.545E+000	93.35	0.000E+000	%	} E	1.488E+001X		2.6E+011	5.81
RA-224	N	1	2.242E+001	240.99	2.242E+001		(	2.473E+001G		7.0E+002	4.10
PB-212	N	1	1.911E+001	238.63	1.911E+001		(P	1.902E+000G		7.0E+002	43.30
			1.911E+001	300.03	1.413E+001	%		2.672E+001G		7.0E+002	3.28
PB-214	N	1	1.668E+001	351.93	1.684E+001	@	(P	1.815E+000G		5.8E+005	37.60
			1.668E+001	295.09	1.638E+001	*	(	3.489E+000G		5.8E+005	19.30
			1.668E+001	242.00	1.368E+001	-		1.076E+001G		5.8E+005	7.43
EU-155	T F I	1	1.605E+000	105.31	1.605E+000	%	(	3.015E+000G		1.8E+003	21.20
			1.605E+000	86.54	2.872E+000			3.116E+000G	A	1.8E+003	30.70
BI-214	N	1	1.517E+001	609.31	1.517E+001	*	(P	7.727E-001G		5.8E+005	46.09
			1.517E+001	1120.29	3.783E+000	%		1.210E+001G		5.8E+005	15.10

			1.517E+001	1764.49	1.162E+001	-			1.052E+001G		5.8E+005	15.40
AC-228	N	1	1.370E+001	911.16	1.447E+001	@	(		5.659E+000G		2.1E+003	29.00
			1.370E+001	968.97	1.227E+001		(		9.732E+000G		2.1E+003	17.46
			1.370E+001	338.32	1.392E+001		(		6.923E+000G		2.1E+003	12.01
			1.370E+001	93.35	1.370E+001	!		E	1.555E+001G	A	2.1E+003	5.56
BE-7	N P C	1	1.363E+000	477.60	1.363E+000	%	(		7.848E+000G		5.3E+001	10.52
PA-234M	N	1	-1.307E+000	1001.00	-1.307E+000	%	(		1.915E+002G		1.6E+012	.84
			-1.307E+000	766.41	0.000E+000	%			4.883E+002G		1.6E+012	.29
CO-60	T F	1	-1.251E-001	1332.50	-1.251E-001	&	(		1.863E+000G		1.9E+003	99.98
			-1.251E-001	1173.24	0.000E+000	%			1.861E+000G		1.9E+003	99.90
I-131	T F I	1	-1.136E-001	364.48	-1.136E-001	%	(		1.114E+000G		8.0E+000	81.70
			-1.136E-001	284.30	-1.380E-001	%			1.361E+001G		8.0E+000	6.14
			-1.136E-001	636.97	-2.352E+000	&			1.602E+001G		8.0E+000	7.17
EU-154	T F I	1	1.083E+000	873.23	1.083E+000	&	(		1.093E+001G		3.1E+003	12.27
			1.083E+000	123.10	2.542E-001	%			1.552E+000G		3.1E+003	40.79
			1.083E+000	1274.54	1.957E-002	%			4.714E+000G		3.1E+003	35.19
			1.083E+000	723.36	-1.456E+000	%			7.392E+000G		3.1E+003	20.22
			1.083E+000	1004.77	7.389E-001	%			8.443E+000G		3.1E+003	18.01
			1.083E+000	996.33	0.000E+000	&			1.755E+001G		3.1E+003	10.60
			1.079E+000	778.92	4.253E-001	&			9.186E+000G		4.9E+003	12.94
			1.079E+000	964.11	-2.005E+000	%			1.377E+001G		4.9E+003	14.61
			1.079E+000	1112.07	-1.514E+000	&			1.378E+001G		4.9E+003	13.64
			1.079E+000	1408.00	0.000E+000	%			1.788E+001G		4.9E+003	21.00
EU-152	T F	1	1.079E+000	344.29	1.079E+000	%	(		3.093E+000G		4.9E+003	26.50
			1.079E+000	121.78	2.023E-001	%			2.209E+000G		4.9E+003	28.58
TH-234	N	1	1.062E+001	63.29	1.062E+001	%	(	P	2.348E+001G		1.6E+012	4.82
			1.062E+001	92.59	6.319E+000	%		P	1.833E+001G		1.6E+012	5.58
AM-241	T	1	1.028E+000	59.54	1.028E+000	*	(		2.955E+000G		1.6E+005	35.90

Analysis Codes:

% = Peak fails sensitivity test

- = Peak activity lower than counting uncertainty range

(= This peak is used in the nuclide activity average

* = Peak is too wide, but only one peak in library

A = Derived Average Activity

+ = Peak activity higher than counting uncertainty range

! = Peak is part of a multiplet and this area went negative during deconvolution

$ = Peak identified, but first peak of this nuclide failed one or more qualification tests

? = Peak is too narrow

= = Peak outside analysis energy range

P = Peakbackround subtraction

@ = Peak is too wide at FW25M, but OK at FWHM

E = Energy Duplication

& = Calculated peak centroid is not close enough to the library energy centroid for positive identification

Nuclide Codes:

T = Thermal Neutron Activation	F = Fast Neutron Activation	I = Fission Product
P = Photon Reaction	N = Naturally Occurring Isotope	C = Charged Particle Reaction
M = No MDA Calculation		

Peak Codes:

G = Gamma Ray	X = X-Ray	P = Positron Decay
S = Single - Escape	D = Double - Escape	K = Key Line
A = Not in Average		

SUMMARY OF NUCLIDES IN SAMPLE

Nuclide		Time of Count Activity Bq/sample	Time Corrected Activity Bq/sample	Uncertainty Counts 1 Sigma %	Uncertainty Total 1 Sigma %	Minimum Detectable Activity
K-40		2.599E+002	2.599E+002	5.38	6.12	5.536E+000
CO-60	#	-1.251E-001	-1.251E-001	410.55	410.56	1.863E+000
I-131	#	-1.136E-001	-1.143E-001	281.42	281.44	1.114E+000
CS-134	#	-3.223E-001	-3.223E-001	113.30	113.34	1.250E+000
EU-154	#	1.083E+000	1.083E+000	281.63	281.65	1.093E+001
BE-7	#	1.363E+000	1.365E+000	163.97	164.00	7.848E+000
CS-137	#	9.380E-001	9.380E-001	51.29	51.37	1.560E+000
EU-152	#	1.079E+000	1.079E+000	85.27	85.31	3.093E+000
EU-155	#	1.605E+000	1.605E+000	57.26	57.36	3.015E+000
TL-208		6.840E+000	6.840E+000	10.35	10.75	9.898E-001
BI-212	#	8.473E+000	8.474E+000	42.70	42.80	1.140E+001
BI-214	#	1.517E+001	1.517E+001	7.36	7.90	7.727E-001
RA-224		2.242E+001	2.242E+001	34.67	34.80	2.473E+001
AC-228	#	1.370E+001	1.370E+001	12.07	12.41	5.659E+000
TH-234	#	1.062E+001	1.062E+001	65.63	65.74	2.348E+001
PA-234M	#	-1.307E+000	-1.307E+000	4,021.81	4,021.81	1.915E+002
U-235	#	2.545E+000	2.545E+000	70.58	70.65	5.953E+000
PB-210	#	3.895E+001	3.895E+001	29.15	29.41	3.023E+001
PB-212		1.911E+001	1.912E+001	5.22	6.01	1.902E+000
PB-214		1.668E+001	1.668E+001	6.89	7.46	1.815E+000
Pa-234	#	-4.298E-001	-4.298E-001	292.50	292.52	4.279E+000
AM-241	#	1.028E+000	1.028E+000	86.29	86.38	2.955E+000

= All peaks for activity calculation had bad shape

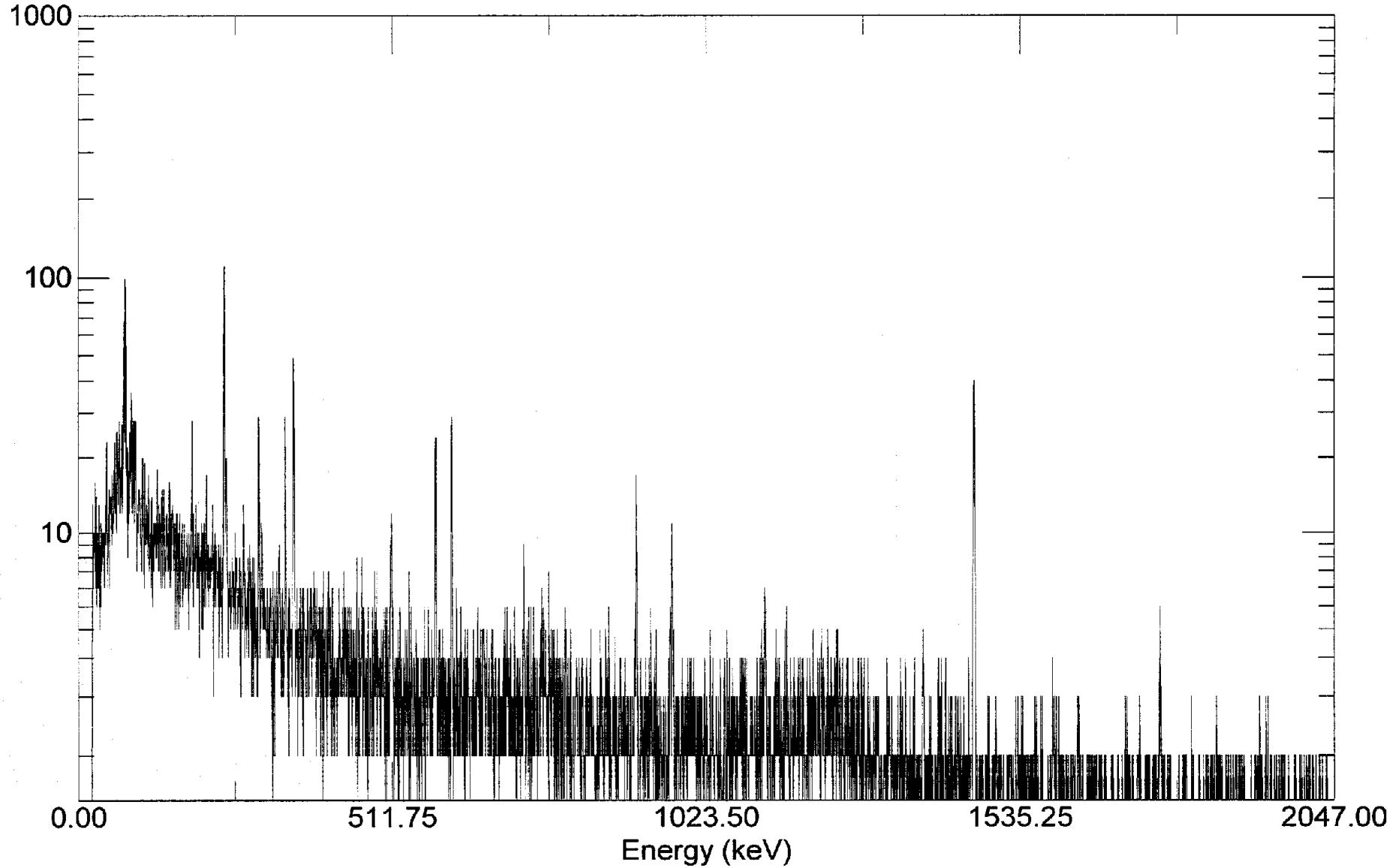
Total Activity (37.72 to 2,000.15 keV) 379.05 Bq/sample

Analyzed by: 403293

Laboratory: Test America

KEKCJ1AC

7357010_KEKCJ1AC_F7L200251-012



Acquired: 23-Dec-2007 1:43:40 PM
File: C:\User\spectra\KEKCJ1AC.spc
Detector: #0 Ge 7 SN/154

Real Time: 1818.42 s. Live Time: 1800.00 s.
Channels: 8192

DB Analysis ID: 32,972

Sample Description: 7357010_KEKCK1AC_F7L200251-013

Spectrum Filename: KEKCK1AC.An1

Acquisition Information

Start Time:	23-Dec-2007 2:23:28PM		
Live Time:	1800.00	Real Time:	1811.58
Dead Time:	0.64 %		
Detector ID:	1		

Detector System: Ge 1 SN/242

Calibration

Description:	Ge1 Tunacan 74139-334 1_15_07		
Filename:	C:\User\Calibrations\Ge1 calibrations\Ge1 Tunacan polynomial 01_15_07.Clb		
Energy Created:	15-Jan-2007 5:43:37PM	Efficiency Created:	15-Jan-2007 5:44:16PM
Zero Offset:	0.212 keV	Gain:	0.250 keV/Channel

Library 1 File: mmr06 short.lib Library based peak stripping used.
Library 2 File: Null.Lib
Library 3 File: Null.Lib

Analysis Parameters

Start Channel:	150 for an energy of 37.71 keV
Stop Channel:	8,000 for an energy of 1999.84 keV
Peak rejection level:	40.000 %
Activity Scaling Factor:	1.0000 / 1.0000 = 1.0000
Detection Limit Method:	Nureg method 4.16
Sample Size:	1.00E+000
Additional random error:	0.0000
Additional systematic error:	0.0000
Fraction Limit:	0.0000%
Background Width:	Average of three points

Corrections	Status	Comments
Decay Correct to Date:	YES	23-Dec-2007 12:00:00PM
Decay During Acquisition:	NO	
Peaked Background Correction:	YES	Ge1 PBC table 11_26_07.Pbc
Absorption:	NO	
Geometry Correction:	NO	
Random Summing:	NO	

Energy Calibration Normalized Differe 0.1260

UNIDENTIFIED PEAK SUMMARY

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncertainty 1 Sigma%	FWHM keV	Suspected Nuclide	Code
184.56	46.35	204.84	19.16	0.011	108.07	0.639		s
298.22	74.77	378.67	302.33	0.168	13.60	0.938	PB-214	
307.75	77.15	323.00	473.00	0.263	8.75	0.655	PB-214	
347.67	87.13	196.14	201.86	0.112	12.08	1.004	PB-214	
358.90	89.94	190.67	123.33	0.069	20.89	0.683	PB-214	M
743.13	186.00	92.00	151.00	0.084	13.68	1.142	PA-234	s
836.12	209.25	161.04	143.96	0.080	15.00	1.000	AC-228	s
1081.33	270.55	91.67	126.33	0.070	19.39	0.748	AC-228	s
1178.96	294.96	285.46	59.54	0.033	42.17	1.056		s
1405.54	351.60	365.89	83.11	0.046	34.35	0.983	PB-214	s
1850.00	462.71	18.00	77.00	0.043	15.85	0.573	CS-138	s
2435.79	609.15	274.52	28.48	0.016	84.39	1.358		

s = Peak fails shape tests.

D = Peak area deconvoluted.

IDENTIFIED PEAK SUMMARY

Nuclide	Library Used	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncertainty 1 Sigma%	FWHM keV	Code
PB-210	1	184.96	46.45	237.90	18.05	0.010	45.36	0.813	s
AM-241	1	236.29	59.29	328.55	4.70	0.003	547.12	0.824	s
TH-234	1	251.77	63.16	224.90	75.10	0.042	23.21	0.894	
EU-155	1	341.16	85.51	475.31	-72.01	-0.040	44.41	0.849	
TH-234	1	369.50	92.59	297.74	86.26	0.048	18.37	0.855	D
AC-228	1	372.54	93.35	267.78	136.62	0.076	1.83	0.855	D
U-235	1	372.54	93.35	271.54	7.16	0.004	38.73	0.855	s D
EU-155	1	421.60	105.61	228.92	46.95	0.026	47.85	0.866	s
EU-152	1	483.63	121.12	244.66	-10.63	-0.006	210.36	0.881	s
EU-154	1	492.00	123.22	245.59	10.53	0.006	212.81	0.882	s
Pa-234	1	522.59	130.86	317.44	-26.18	-0.015	98.23	0.890	s
U-235	1	573.14	143.50	242.92	13.22	0.007	131.18	0.901	s
U-235	1	651.11	162.99	223.45	-14.86	-0.008	179.06	0.919	s
U-235	1	823.17	206.01	162.68	12.02	0.007	129.27	0.957	s
PB-212	1	953.20	238.52	161.58	785.42	0.436	4.49	0.996	
RA-224	1	958.99	239.96	956.83	-229.82	-0.128	20.15	0.989	s
PB-214	1	965.72	241.65	284.70	74.48	0.041	30.97	0.990	s
TL-208	1	1109.19	277.52	116.00	101.00	0.056	27.61	1.250	s
I-131	1	1139.01	284.97	74.92	11.60	0.006	109.55	1.028	s
PB-214	1	1179.36	295.06	105.68	186.25	0.103	10.08	1.037	s
PB-212	1	1198.06	299.73	53.67	55.33	0.031	27.66	1.030	
AC-228	1	1351.10	337.99	121.91	269.09	0.149	12.38	0.703	s
EU-152	1	1377.14	344.50	87.60	-3.00	-0.002	444.63	1.081	s
PB-214	1	1406.20	351.76	111.40	287.91	0.160	7.45	1.088	s
I-131	1	1457.80	364.67	59.31	9.71	0.005	116.65	1.099	s
BE-7	1	1911.78	478.15	49.13	11.22	0.006	93.27	1.198	s
CS-134	1	2253.39	563.55	52.27	14.31	0.008	76.17	1.273	s
CS-134	1	2276.47	569.32	50.72	0.00	0.000	0.00	1.278	s D
Pa-234	1	2277.07	569.47	43.99	-4.73	-0.003	-190.32	1.278	s D
TL-208	1	2331.62	583.11	30.92	338.08	0.188	6.38	1.380	
CS-134	1	2418.04	604.71	527.04	0.00	0.000	3246.66	1.309	s
BI-214	1	2435.91	609.18	56.27	232.57	0.129	7.48	1.313	
I-131	1	2552.87	638.41	42.39	0.23	0.000	3996.01	1.337	s
CS-137	1	2647.07	661.96	42.97	19.24	0.011	53.31	1.358	s
EU-154	1	2905.98	726.68	62.15	11.90	0.007	98.05	1.411	s
BI-212	1	2907.59	727.08	40.82	53.93	0.030	21.59	1.414	
PA-234M	1	3072.11	768.21	35.28	29.99	0.017	33.44	1.447	s
EU-152	1	3118.95	779.92	41.85	-5.18	-0.003	181.90	1.458	s
BI-212	1	3139.89	785.15	35.43	13.12	0.007	69.84	1.463	s
CS-134	1	3178.31	794.76	29.55	17.91	0.010	49.01	1.472	s
CS-134	1	3205.49	801.55	38.38	6.87	0.004	133.10	1.477	s
TL-208	1	3440.82	860.38	8.67	54.33	0.030	18.46	1.281	
EU-154	1	3496.03	874.17	39.14	-3.21	-0.002	281.06	1.537	s
Pa-234	1	3525.63	881.57	30.12	0.19	0.000	4029.19	1.543	s
Pa-234	1	3538.31	884.74	24.33	2.89	0.002	248.79	1.546	s

AC-228	1	3643.61	911.06	11.81	204.19	0.113	7.42	1.560	
Pa-234	1	3783.07	945.92	35.08	1.81	0.001	468.07	1.598	s
EU-152	1	3857.55	964.54	42.91	19.69	0.011	52.17	1.613	s
AC-228	1	3875.91	969.13	36.41	89.33	0.050	13.62	1.617	s
EU-154	1	3991.05	997.91	33.76	-5.52	-0.003	154.94	1.640	s
PA-234M	1	4002.99	1000.89	22.45	11.30	0.006	66.34	1.643	s
EU-154	1	4023.06	1005.91	40.93	-3.27	-0.002	282.39	1.647	s
EU-152	1	4446.71	1111.80	34.75	-4.08	-0.002	210.08	1.735	s
BI-214	1	4480.06	1120.14	35.12	36.96	0.021	23.58	1.741	s
CO-60	1	4690.35	1172.70	42.02	-5.68	-0.003	166.76	1.784	s
EU-154	1	5098.41	1274.69	24.89	2.58	0.001	280.18	1.866	s
CO-60	1	5334.61	1333.72	29.53	-3.40	-0.002	232.73	1.912	s
EU-152	1	5631.56	1407.94	20.26	9.25	0.005	76.29	1.972	s
K-40	1	5842.14	1460.57	12.54	412.46	0.229	4.85	1.921	
BI-214	1	7057.39	1764.28	21.54	26.42	0.015	25.76	2.246	s

s = Peak fails shape tests.

D = Peak area deconvoluted.

A = Derived Aveage Activity.

SUMMARY OF LIBRARY PEAK USAGE

Nuclide Name	Nuclide Code	Library Used	Average Activity Becquerels	Peak Energy keV	Peak Activity Becquerels	Peak Analysis Code	Peak MDA Value Becquerels	Peak Code	Peak Comments	
CS-137	T F I	1	8.425E-001	661.66	8.425E-001 %	(	1.456E+000G		1.1E+004	85.21
AC-228	N	1	3.284E+001	911.07	3.284E+001	(P	3.011E+000G		2.1E+003	29.00
			3.284E+001	968.97	2.492E+001 -	P	8.600E+000G		2.1E+003	17.46
			3.284E+001	338.32	5.147E+001 +	P	1.036E+001G		2.1E+003	12.01
			3.284E+001	93.35	3.284E+001 -	E	1.898E+001X	A	2.1E+003	5.56
PB-212	N	1	3.265E+001	238.63	3.244E+001	(P	2.558E+000G		7.0E+002	43.30
			3.265E+001	300.03	3.548E+001	(	2.363E+001G		7.0E+002	3.28
BE-7	N P C	1	3.155E+000	477.60	3.155E+000 %	(	9.949E+000G		5.3E+001	10.52
EU-155	T F I	1	2.904E+000	105.31	2.904E+000 *	(	4.528E+000G		1.8E+003	21.20
			2.904E+000	86.54	-3.207E+000 %		4.646E+000G		1.8E+003	30.70
I-131	T F I	1	2.885E-001	364.48	2.885E-001 %	(	1.147E+000G		8.0E+000	81.70
			2.885E-001	284.30	3.821E+000 %		1.418E+001G		8.0E+000	6.14
			2.885E-001	636.97	1.169E-001 %		1.675E+001G		8.0E+000	7.17
EU-152	T F	1	-2.636E-001	344.29	-2.636E-001 &	(	4.068E+000G		4.9E+003	26.50
			-2.636E-001	121.78	-4.893E-001 %		3.480E+000G		4.9E+003	28.58
			-2.636E-001	778.92	-1.675E+000 %		1.062E+001G		4.9E+003	12.94
			-2.636E-001	964.11	6.542E+000 %		1.104E+001G		4.9E+003	14.61
			-2.636E-001	1112.07	-1.608E+000 %		1.188E+001G		4.9E+003	13.64
			-2.636E-001	1408.00	2.817E+000 %		7.215E+000G		4.9E+003	21.00
K-40	N	1	2.545E+002	1460.83	2.545E+002	(P	1.186E+001G		4.7E+011	10.67
TH-234	N	1	2.294E+001	63.29	2.554E+001	(P	2.468E+001G		1.6E+012	4.82
			2.294E+001	92.59	2.069E+001	(P	1.994E+001G		1.6E+012	5.58
AM-241	T	1	2.273E-001	59.54	2.273E-001 &	(	4.214E+000G		1.6E+005	35.90
CO-60	T F	1	-2.084E-001	1332.50	-2.084E-001 %	(	1.720E+000G		1.9E+003	99.98
			-2.084E-001	1173.24	-3.175E-001 %		1.840E+000G		1.9E+003	99.90
			-1.938E+000	883.24	1.372E+000 %		1.222E+001G		1.6E+012	9.60
			-1.938E+000	880.53	1.465E-001 %		2.147E+001G		1.6E+012	6.00
Pa-234	N	1	-1.938E+000	131.29	-1.938E+000 &	(	6.346E+000G		1.6E+012	18.00
			-1.938E+000	569.47	-1.938E+000 %		1.376E+001G		1.6E+012	8.20
			-1.938E+000	946.02	6.478E-001 %		1.083E+001G		1.6E+012	13.40
			1.869E+001	295.09	2.005E+001	(P	5.450E+000G		5.8E+005	19.30
			1.869E+001	242.00	1.810E+001 *	(P	1.977E+001G		5.8E+005	7.43
PB-214	N	1	1.869E+001	351.93	1.811E+001 @	(P	3.264E+000G		5.8E+005	37.60
BI-212	N	1	1.819E+001	727.33	1.819E+001	(	1.096E+001G		7.0E+002	11.82
			1.819E+001	785.51	5.018E+001 %		1.164E+002G		7.0E+002	1.10
BI-214	N	1	1.777E+001	609.31	1.777E+001	(P	2.878E+000G		5.8E+005	46.09
			1.777E+001	1120.29	1.322E+001 -	P	1.084E+001G		5.8E+005	15.10
			1.777E+001	1764.49	1.318E+001 -	P	1.214E+001G		5.8E+005	15.40
U-235	N	1	1.647E+000	143.79	1.647E+000 *	(P	9.386E+000G		2.6E+011	10.96
			1.647E+000	205.33	3.893E+000 %	P	2.012E+001G		2.6E+011	5.01
			1.647E+000	163.38	-4.198E+000 %	P	2.044E+001G		2.6E+011	5.08
			1.647E+000	93.35	1.647E+000 !	E	1.829E+001X		2.6E+011	5.81
PA-234	N	1	1.594E+002	1001.00	6.728E+001 %	(	1.476E+002G		1.6E+012	.84
			1.594E+002	766.41	4.217E+002 ?	(	4.274E+002G		1.6E+012	.29

TL-208	F	N	1	1.366E+001	583.02	1.366E+001		(	P	1.156E+000G	7.0E+002	84.50
				1.366E+001	277.28	3.180E+001	+			1.665E+001G	7.0E+002	6.31
				1.366E+001	860.56	1.961E+001	+			5.929E+000G	7.0E+002	12.42
				-1.185E+000	1274.54	4.356E-001	%			4.378E+000G	3.1E+003	35.19
				-1.185E+000	723.36	2.338E+000	&			7.748E+000G	3.1E+003	20.22
				-1.185E+000	1004.77	-9.065E-001	%			9.024E+000G	3.1E+003	18.01
				-1.185E+000	996.33	-2.585E+000	%			1.396E+001G	3.1E+003	10.60
EU-154	T F I		1	-1.185E+000	873.23	-1.185E+000	%	(		1.176E+001G	3.1E+003	12.27
				-1.185E+000	123.10	3.399E-001	&			2.446E+000G	3.1E+003	40.79
PB-210		N	1	1.140E+001	46.54	1.140E+001	%	(	P	4.711E+001G	8.1E+003	4.25
RA-224		N	1	-1.009E+002	240.99	-1.009E+002	*	(		6.449E+001G	7.0E+002	4.10
CS-134	T F I		1	0.000E+000	604.71	0.000E+000	%	(		3.936E+000G	7.5E+002	97.62
				0.000E+000	795.87	8.886E-001	%			1.392E+000G	7.5E+002	85.53
				0.000E+000	569.32	0.000E+000	%			7.834E+000G	7.5E+002	15.38
				0.000E+000	801.95	3.374E+000	%			1.551E+001G	7.5E+002	8.69
				0.000E+000	563.24	5.709E+000	%			1.452E+001G	7.5E+002	8.35

Analysis Codes:

% = Peak fails sensitivity test

? = Peak is too narrow

- = Peak activity lower than counting uncertainty range

= = Peak outside analysis energy range

(= This peak is used in the nuclide activity average

P = Peakbackround subtraction

* = Peak is too wide, but only one peak in library

@ = Peak is too wide at FW25M, but OK at FWHM

A = Derived Average Activity

E = Energy Duplication

+ = Peak activity higher than counting uncertainty range

! = Peak is part of a multiplet and this area went negative during deconvolution

$ = Peak identified, but first peak of this nuclide failed one or more qualification tests

& = Calculated peak centroid is not close enough to the library energy centroid for positive identification

Nuclide Codes:

T = Thermal Neutron Activation

F = Fast Neutron Activation

I = Fission Product

P = Photon Reaction

N = Naturally Occurring Isotope

C = Charged Particle Reaction

M = No MDA Calculation

Peak Codes:

G = Gamma Ray

X = X-Ray

P = Positron Decay

S = Single - Escape

D = Double - Escape

K = Key Line

A = Not in Average

SUMMARY OF NUCLIDES IN SAMPLE

Nuclide		Time of Count Activity Bq/sample	Time Corrected Activity Bq/sample	Uncertainty Counts 1 Sigma %	Uncertainty Total 1 Sigma %	Minimum Detectable Activity
BE-7	<	3.155E+000	3.159E+000	93.27	93.32	9.949E+000
K-40		2.545E+002	2.545E+002	5.00	5.79	1.186E+001
CO-60	<	-2.084E-001	-2.084E-001	232.73	232.75	1.720E+000
I-131	<	2.885E-001	2.910E-001	116.65	116.69	1.147E+000
CS-134	<			3,246.66	3,246.66	3.936E+000
CS-137	<	8.425E-001	8.425E-001	53.31	53.39	1.456E+000
EU-152	<	-2.636E-001	-2.636E-001	444.63	444.64	4.068E+000
EU-155	<	2.904E+000	2.904E+000	47.85	47.97	4.528E+000
TL-208		1.366E+001	1.366E+001	6.55	7.15	1.156E+000
BI-212	<	1.819E+001	1.819E+001	21.59	21.79	1.096E+001
BI-214	<	1.777E+001	1.777E+001	7.85	8.37	2.878E+000
TH-234		2.294E+001	2.294E+001	22.62	22.92	2.468E+001
PA-234M	<	1.594E+002	1.594E+002	33.44	33.56	1.476E+002
U-235	<	1.647E+000	1.647E+000	168.31	168.33	9.386E+000
EU-154	<	-1.185E+000	-1.185E+000	281.06	281.07	1.176E+001
RA-224	<	-1.009E+002	-1.009E+002	20.15	20.37	6.449E+001
PB-210	<	1.140E+001	1.140E+001	119.41	119.47	4.711E+001
PB-212		3.265E+001	3.266E+001	4.62	5.50	2.558E+000
PB-214	<	1.869E+001	1.869E+001	7.76	8.27	3.264E+000
AC-228		3.284E+001	3.284E+001	7.59	8.12	3.011E+000
Pa-234	<	-1.938E+000	-1.938E+000	98.23	98.27	6.346E+000
AM-241	<	2.273E-001	2.273E-001	547.12	547.13	4.214E+000

= All peaks for activity calculation had bad shape

Total Activity (37.71 to 1,999.84 keV) 356.64 Bq/sample

Analyzed by: _____

403293

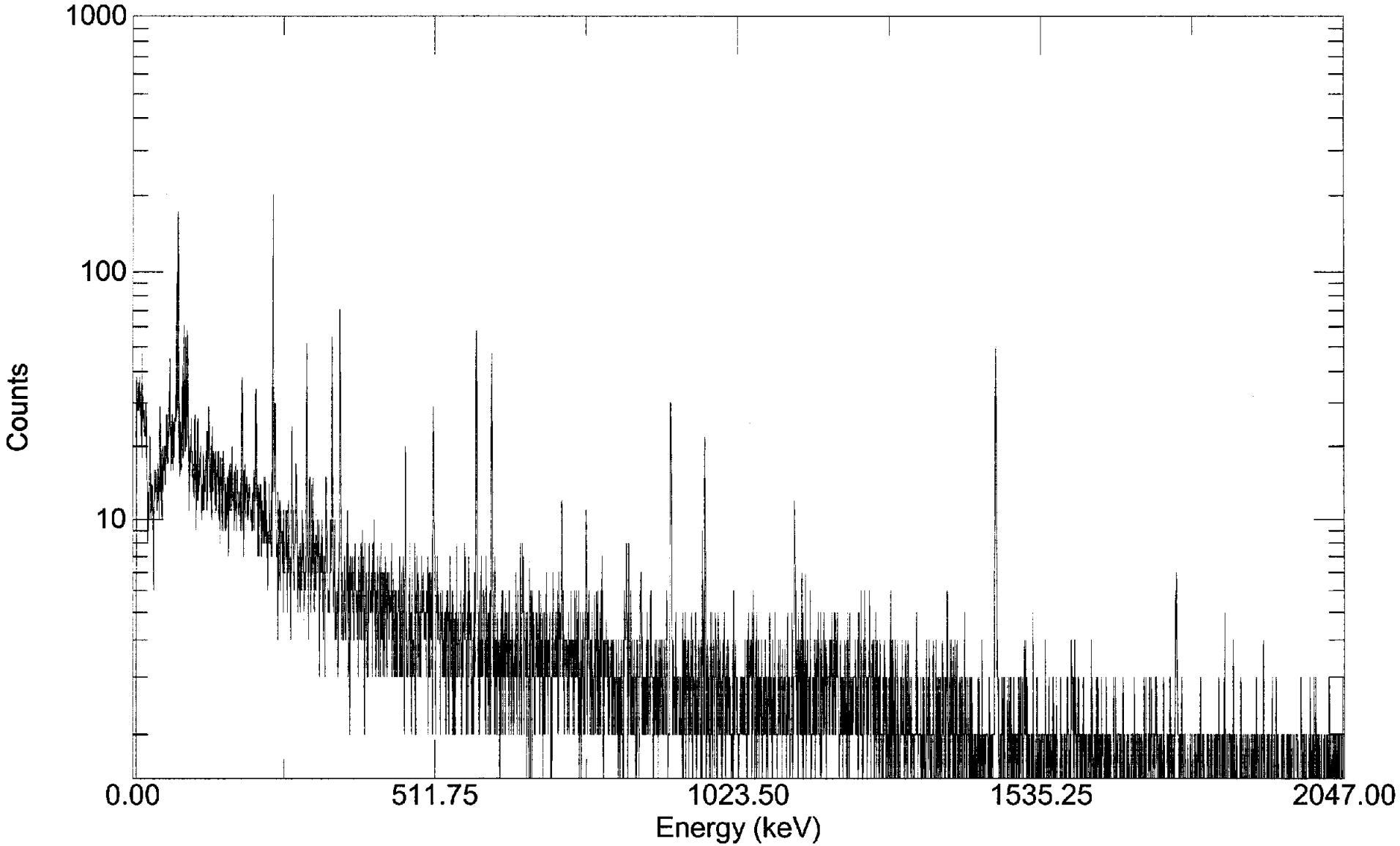
Reviewed by: _____

Supervisor

Laboratory: Test America

KEKCK1AC

7357010_KEKCK1AC_F7L200251-013



Acquired: 23-Dec-2007 2:23:28 PM
File: C:\User\spectra\KEKCK1AC.spc
Detector: #0 Ge 1 SN/242

Real Time: 1811.58 s. Live Time: 1800.00 s.
Channels: 8192

TestAmerica St. Louis

DB Analysis ID: 32,973

Sample Description: 7357010_KEKCM1AC_F7L200251-014

Spectrum Filename: KEKCM1AC.An1

Acquisition Information

Start Time:	23-Dec-2007 2:23:56PM		
Live Time:	1800.00	Real Time:	1815.42
Dead Time:	0.85 %		
Detector ID:	3		

Detector System: Ge 3 SN/155

Calibration

Description:	Ge3 74139_334 Tunacan cal 01_11_07		
Filename:	C:\User\Calibrations\Ge3 cal post 5_8_06\Ge3 Tunacan 74139_334 01_11_07.Clb		
Energy Created:	10-Jan-2007 5:13:35PM	Efficiency Created:	11-Jan-2007 1:43:34PM
Zero Offset:	0.416 keV	Gain:	0.250 keV/Channel

Library 1 File: mmr06 short.lib Library based peak stripping used.
Library 2 File: Null.Lib
Library 3 File: Null.Lib

Analysis Parameters

Start Channel:	150 for an energy of 37.87 keV
Stop Channel:	8,000 for an energy of 2000.50 keV
Peak rejection level:	40.000 %
Activity Scaling Factor:	1.0000 / 1.0000 = 1.0000
Detection Limit Method:	Nureg method 4.16
Sample Size:	1.00E+000
Additional random error:	0.0000
Additional systematic error:	0.0000
Fraction Limit:	0.0000%
Background Width:	Average of three points

Corrections	Status	Comments
Decay Correct to Date:	YES	23-Dec-2007 12:00:00PM
Decay During Acquisition:	NO	
Peaked Background Correction:	YES	Ge3 PBC table 11_26_07.Pbc
Absorption:	NO	
Geometry Correction:	NO	
Random Summing:	NO	

Energy Calibration Normalized Differe 0.1451

UNIDENTIFIED PEAK SUMMARY

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncertainty 1 Sigma%	FWHM keV	Suspected Nuclide	Code
298.18	74.88	546.00	219.00	0.122	22.38	0.899	PB-214	
307.22	77.14	425.00	385.00	0.214	11.66	1.127	BI-207	s
347.28	87.14	366.83	49.17	0.027	56.91	0.911		s
741.29	185.55	211.50	280.50	0.156	13.55	1.050	U-235	s
1354.56	338.74	142.51	52.49	0.029	35.00	0.583	AC-228	s
2436.80	609.14	547.75	58.25	0.032	58.31	1.677		s

s = Peak fails shape tests.

D = Peak area deconvoluted.

IDENTIFIED PEAK SUMMARY

Nuclide	Library Used	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncertainty 1 Sigma%	FWHM keV	Code
PB-210	1	184.75	46.55	143.53	43.47	0.024	31.94	0.814	
AM-241	1	241.95	60.84	330.89	-17.66	-0.010	147.59	0.878	s
TH-234	1	250.09	62.87	286.02	106.98	0.059	25.07	0.785	s
EU-155	1	346.20	86.87	479.63	121.85	0.068	26.99	0.906	s
TH-234	1	370.34	92.90	309.50	197.50	0.110	17.03	1.497	s
AC-228	1	372.14	93.35	743.40	0.00	0.000	2817.80	0.913	s D
U-235	1	372.14	93.35	348.40	10.22	0.006	27.80	0.913	s D
EU-155	1	419.71	105.23	260.33	6.26	0.003	366.61	0.925	s
EU-152	1	486.91	122.01	227.78	3.11	0.002	688.69	0.942	s
EU-154	1	490.24	122.85	217.19	-2.50	-0.001	836.45	0.943	s
Pa-234	1	524.63	131.43	272.59	-6.22	-0.003	377.73	0.952	s
U-235	1	574.01	143.77	292.24	18.75	0.010	117.35	0.964	s
U-235	1	652.83	163.45	214.68	26.00	0.014	82.08	0.984	s
U-235	1	828.25	207.27	202.39	-15.19	-0.008	134.95	1.027	s
PB-212	1	953.22	238.48	248.75	439.25	0.244	8.70	1.275	s
RA-224	1	959.72	240.11	721.81	-130.45	-0.072	30.41	1.062	
PB-214	1	967.25	241.99	191.67	196.33	0.109	17.07	0.781	s
TL-208	1	1109.18	277.44	137.09	16.28	0.009	104.66	1.098	s
I-131	1	1133.54	283.53	119.60	-6.58	-0.004	238.40	1.105	s
PB-214	1	1179.36	294.97	76.82	465.18	0.258	6.11	1.168	s
PB-212	1	1200.64	300.29	91.83	86.17	0.048	28.94	1.814	s
AC-228	1	1352.89	338.32	114.92	69.53	0.039	24.05	1.158	s
EU-152	1	1377.99	344.59	85.34	-8.86	-0.005	151.28	1.164	s
PB-214	1	1406.72	351.77	93.20	756.80	0.420	4.80	1.304	s
I-131	1	1457.83	364.54	72.73	12.55	0.007	100.16	1.184	s
BE-7	1	1912.54	478.14	66.22	8.27	0.005	143.40	1.292	s
CS-134	1	2251.75	562.90	47.10	0.02	0.000	43557.93	1.372	s
CS-134	1	2277.45	569.32	67.42	0.51	0.000	977.19	1.378	s D
Pa-234	1	2278.04	569.47	59.35	-1.08	-0.001	-161.42	1.378	s D
TL-208	1	2331.80	582.90	36.96	164.04	0.091	10.74	1.562	
CS-134	1	2431.15	607.73	448.95	3.37	0.002	891.50	1.410	s
BI-214	1	2437.16	609.23	62.03	518.15	0.288	4.80	1.415	s
I-131	1	2537.51	634.31	17.41	2.40	0.001	254.35	1.440	s
CS-137	1	2647.73	661.85	49.12	18.31	0.010	58.97	1.462	s
EU-154	1	2899.47	724.77	65.56	-6.27	-0.003	186.88	1.518	s
BI-212	1	2906.54	726.53	15.50	64.50	0.036	19.62	0.408	s
PA-234M	1	3072.41	767.99	51.85	47.01	0.026	26.11	1.556	s
EU-152	1	3111.94	777.87	29.27	-0.66	0.000	1166.02	1.567	s
BI-212	1	3141.27	785.20	45.32	3.48	0.002	278.42	1.572	s
CS-134	1	3178.55	794.52	21.18	7.78	0.004	91.01	1.582	s
CS-134	1	3218.32	804.46	38.91	-1.19	-0.001	749.83	1.587	s
TL-208	1	3446.08	861.39	5.00	43.00	0.024	19.87	0.487	s
EU-154	1	3493.35	873.21	29.73	7.15	0.004	114.17	1.649	s
Pa-234	1	3521.63	880.28	20.80	2.17	0.001	305.53	1.655	s
Pa-234	1	3533.65	883.28	32.92	-2.80	-0.002	296.04	1.657	s

AC-228	1	3643.62	910.77	34.91	82.37	0.046	14.49	1.681	s
Pa-234	1	3792.89	948.09	34.79	-0.47	0.000	1798.31	1.710	s
EU-152	1	3854.75	963.55	64.94	-2.19	-0.001	524.31	1.726	s
AC-228	1	3875.25	968.68	50.27	27.83	0.015	40.71	1.730	s
EU-154	1	3986.71	996.55	41.92	0.33	0.000	2799.29	1.753	s
PA-234M	1	4004.52	1001.00	32.75	0.00	0.000	809.26	1.756	s
EU-154	1	4016.83	1004.08	28.32	-0.83	0.000	911.36	1.760	s
EU-152	1	4447.74	1111.81	26.53	7.22	0.004	107.55	1.847	s
BI-214	1	4480.14	1119.92	32.61	103.31	0.057	12.26	1.854	s
CO-60	1	4684.15	1170.93	29.85	0.96	0.001	811.04	1.896	s
EU-154	1	5096.62	1274.08	33.57	-1.43	-0.001	580.60	1.975	s
CO-60	1	5332.93	1333.18	30.42	-1.36	-0.001	581.87	2.019	s
EU-152	1	5630.82	1407.69	26.88	3.03	0.002	248.63	2.076	s
K-40	1	5841.13	1460.30	11.21	325.79	0.181	5.45	1.768	
BI-214	1	7054.49	1763.87	11.11	76.07	0.042	12.49	2.326	s

s = Peak fails shape tests.

D = Peak area deconvoluted.

A = Derived Aveage Activity.

SUMMARY OF LIBRARY PEAK USAGE

Nuclide Name	Code	Library Used	Average Activity Becquerels	Peak Energy keV	Peak Activity Becquerels		Analysis Code	MDA Value Becquerels	Code	Comments	
CO-60	T F	1	-8.290E-002	1332.50	-8.290E-002	%	(	1.738E+000G		1.9E+003	99.98
			-8.290E-002	1173.24	5.318E-002	%		1.560E+000G		1.9E+003	99.90
AM-241	T	1	-7.806E-001	59.54	-7.806E-001	&	(	3.867E+000G		1.6E+005	35.90
CS-137	T F I	1	7.775E-001	661.66	7.775E-001	%	(	1.502E+000G		1.1E+004	85.21
			-7.390E-001	1112.07	2.810E+000	%		1.040E+001G		4.9E+003	13.64
			-7.390E-001	1408.00	9.226E-001	&		8.179E+000G		4.9E+003	21.00
EU-152	T F	1	-7.390E-001	344.29	-7.390E-001	%	(	3.818E+000G		4.9E+003	26.50
			-7.390E-001	121.78	1.328E-001	%		3.119E+000G		4.9E+003	28.58
			-7.390E-001	778.92	-2.080E-001	%		8.800E+000G		4.9E+003	12.94
			-7.390E-001	964.11	-7.160E-001	%		1.315E+001G		4.9E+003	14.61
TL-208	F N	1	6.399E+000	583.02	6.399E+000		(P	1.211E+000G		7.0E+002	84.50
			6.399E+000	277.28	4.841E+000	%		1.703E+001G		7.0E+002	6.31
			6.399E+000	860.56	1.519E+001	*		4.638E+000G		7.0E+002	12.42
RA-224	N	1	-5.389E+001	240.99	-5.389E+001		(	5.284E+001G		7.0E+002	4.10
PB-214	N	1	4.585E+001	351.93	4.526E+001	*	(P	2.852E+000G		5.8E+005	37.60
			4.585E+001	295.09	4.738E+001	@	(P	4.436E+000G		5.8E+005	19.30
			4.585E+001	242.00	4.489E+001	*	(	1.537E+001G		5.8E+005	7.43
Pa-234	N	1	-4.274E-001	131.29	-4.274E-001	%	(	5.475E+000G		1.6E+012	18.00
			-4.274E-001	569.47	-4.274E-001	&		1.525E+001G		1.6E+012	8.20
			-4.274E-001	946.02	-1.634E-001	&		1.060E+001G		1.6E+012	13.40
			-4.274E-001	883.24	-1.303E+000	%		1.372E+001G		1.6E+012	9.60
			-4.274E-001	880.53	1.610E+000	&		1.782E+001G		1.6E+012	6.00
TH-234	N	1	3.892E+001	63.29	3.331E+001	*	(P	2.538E+001G		1.6E+012	4.82
			3.892E+001	92.59	4.376E+001	*	(P	1.877E+001G		1.6E+012	5.58
BI-214	N	1	3.796E+001	609.31	3.829E+001		(P	2.912E+000G		5.8E+005	46.09
			3.796E+001	1120.29	3.654E+001		(P	1.037E+001G		5.8E+005	15.10
			3.796E+001	1764.49	3.836E+001	?	(P	9.199E+000G		5.8E+005	15.40
I-131	T F I	1	3.548E-001	364.48	3.548E-001	&	(	1.200E+000G		8.0E+000	81.70
			3.548E-001	284.30	-2.047E+000	&		1.671E+001G		8.0E+000	6.14
			3.548E-001	636.97	1.177E+000	%		1.087E+001G		8.0E+000	7.17
EU-155	T F I	1	3.108E+000	105.31	3.584E-001	%	(	4.459E+000G		1.8E+003	21.20
			3.108E+000	86.54	5.007E+000	*	(	4.305E+000G		1.8E+003	30.70
EU-154	T F I	1	2.584E+000	873.23	2.584E+000	&	(	1.016E+001G		3.1E+003	12.27
			2.584E+000	123.10	-7.487E-002	&		2.139E+000G		3.1E+003	40.79
			2.584E+000	1274.54	-2.392E-001	%		4.983E+000G		3.1E+003	35.19
			2.584E+000	723.36	-1.198E+000	%		7.727E+000G		3.1E+003	20.22
			2.584E+000	1004.77	-2.272E-001	%		7.514E+000G		3.1E+003	18.01
			2.584E+000	996.33	1.511E-001	&		1.516E+001G		3.1E+003	10.60
PB-210	N	1	2.519E+001	46.54	2.519E+001	%	(P	3.391E+001G		8.1E+003	4.25
BE-7	N P C	1	2.233E+000	477.60	2.233E+000	&	(	1.097E+001G		5.3E+001	10.52
U-235	N	1	2.173E+000	143.79	2.173E+000	%	(P	9.546E+000G		2.6E+011	10.96
			2.173E+000	205.33	-4.608E+000	&		2.094E+001G		2.6E+011	5.01
			2.173E+000	163.38	6.846E+000	%		1.869E+001G		2.6E+011	5.08
			2.173E+000	93.35	2.173E+000	!		E 1.906E+001X		2.6E+011	5.81

Bi-212	N	1	2.117E+001	727.33	2.117E+001	@	(		6.910E+000G		7.0E+002	11.82
			2.117E+001	785.51	1.300E+001	%			1.271E+002G		7.0E+002	1.10
K-40	N	1	2.013E+002	1460.83	2.013E+002		(	P	1.131E+001G		4.7E+011	10.67
PB-212	N	1	1.706E+001	238.63	1.706E+001		(	P	2.960E+000G		7.0E+002	43.30
			1.706E+001	300.03	5.229E+001	+			2.875E+001G		7.0E+002	3.28
PA-234	N	1	1.675E+002	1001.00	0.000E+000	%	(		1.722E+002G		1.6E+012	.84
			1.675E+002	766.41	6.444E+002	?	(		4.971E+002G		1.6E+012	.29
			1.289E+001	93.35	0.000E+000	+		} E	1.992E+001X	A	2.1E+003	5.56
AC-228	N	1	1.289E+001	911.07	1.300E+001	@	(	P	4.771E+000G		2.1E+003	29.00
			1.289E+001	968.97	7.632E+000	%			9.804E+000G		2.1E+003	17.46
			1.289E+001	338.32	1.263E+001	*	(	P	9.566E+000G		2.1E+003	12.01
CS-134 T F I		1	1.168E-001	604.71	1.168E-001	&	(		3.520E+000G		7.5E+002	97.62
			1.168E-001	795.87	3.769E-001	%			1.170E+000G		7.5E+002	85.53
			1.168E-001	569.32	1.074E-001	&		}	8.625E+000G		7.5E+002	15.38
			1.168E-001	801.95	-5.683E-001	%			1.523E+001G		7.5E+002	8.69
			1.168E-001	563.24	8.575E-003	%			1.335E+001G		7.5E+002	8.35

Analysis Codes:

% = Peak fails sensitivity test

? = Peak is too narrow

- = Peak activity lower than counting uncertainty range

= = Peak outside analysis energy range

(= This peak is used in the nuclide activity average

P = Peakbackround subtraction

* = Peak is too wide, but only one peak in library

@ = Peak is too wide at FW25M, but OK at FWHM

A = Derived Average Activity

E = Energy Duplication

+ = Peak activity higher than counting uncertainty range

! = Peak is part of a multiplet and this area went negative during deconvolution

$ = Peak identified, but first peak of this nuclide failed one or more qualification tests

& = Calculated peak centroid is not close enough to the library energy centroid for positive identification

Nuclide Codes:

T = Thermal Neutron Activation

F = Fast Neutron Activation

I = Fission Product

P = Photon Reaction

N = Naturally Occurring Isotope

C = Charged Particle Reaction

M = No MDA Calculation

Peak Codes:

G = Gamma Ray

X = X-Ray

P = Positron Decay

S = Single - Escape

D = Double - Escape

K = Key Line

A = Not in Average

SUMMARY OF NUCLIDES IN SAMPLE

Nuclide		Time of Count Activity Bq/sample	Time Corrected Activity Bq/sample	Uncertainty Counts 1 Sigma %	Uncertainty Total 1 Sigma %	Minimum Detectable Activity
BE-7	<	2.233E+000	2.235E+000	143.40	143.43	1.097E+001
K-40		2.013E+002	2.013E+002	5.63	6.35	1.131E+001
CO-60	<	-8.290E-002	-8.290E-002	581.87	581.88	1.738E+000
I-131	<	3.548E-001	3.579E-001	100.16	100.20	1.200E+000
CS-134	<	1.168E-001	1.168E-001	891.50	891.50	3.520E+000
EU-154	<	2.584E+000	2.584E+000	114.17	114.20	1.016E+001
PB-210		2.519E+001	2.519E+001	47.76	47.91	3.391E+001
PB-212		1.706E+001	1.706E+001	9.11	9.58	2.960E+000
PB-214	#	4.585E+001	4.585E+001	4.86	5.65	2.852E+000
BI-212	#	2.117E+001	2.117E+001	19.62	19.83	6.910E+000
Pa-234	<	-4.274E-001	-4.274E-001	377.73	377.74	5.475E+000
TH-234	#	3.892E+001	3.892E+001	18.20	18.57	2.538E+001
CS-137	<	7.775E-001	7.775E-001	58.97	59.04	1.502E+000
EU-152	<	-7.390E-001	-7.390E-001	151.28	151.31	3.818E+000
EU-155	<	3.108E+000	3.108E+000	26.99	27.19	4.459E+000
TL-208		6.399E+000	6.400E+000	11.26	11.62	1.211E+000
RA-224	<	-5.389E+001	-5.390E+001	30.41	30.56	5.284E+001
BI-214	<	3.796E+001	3.796E+001	4.86	5.66	2.912E+000
AC-228	<	1.289E+001	1.289E+001	14.46	14.74	4.771E+000
PA-234M	<	1.675E+002	1.675E+002	26.11	26.27	1.722E+002
U-235	<	2.173E+000	2.173E+000	130.77	130.80	9.546E+000
AM-241	<	-7.806E-001	-7.806E-001	147.59	147.64	3.867E+000

= All peaks for activity calculation had bad shape

Total Activity (37.87 to 2,000.50 keV) 330.66 Bq/sample

Analyzed by: _____

403293

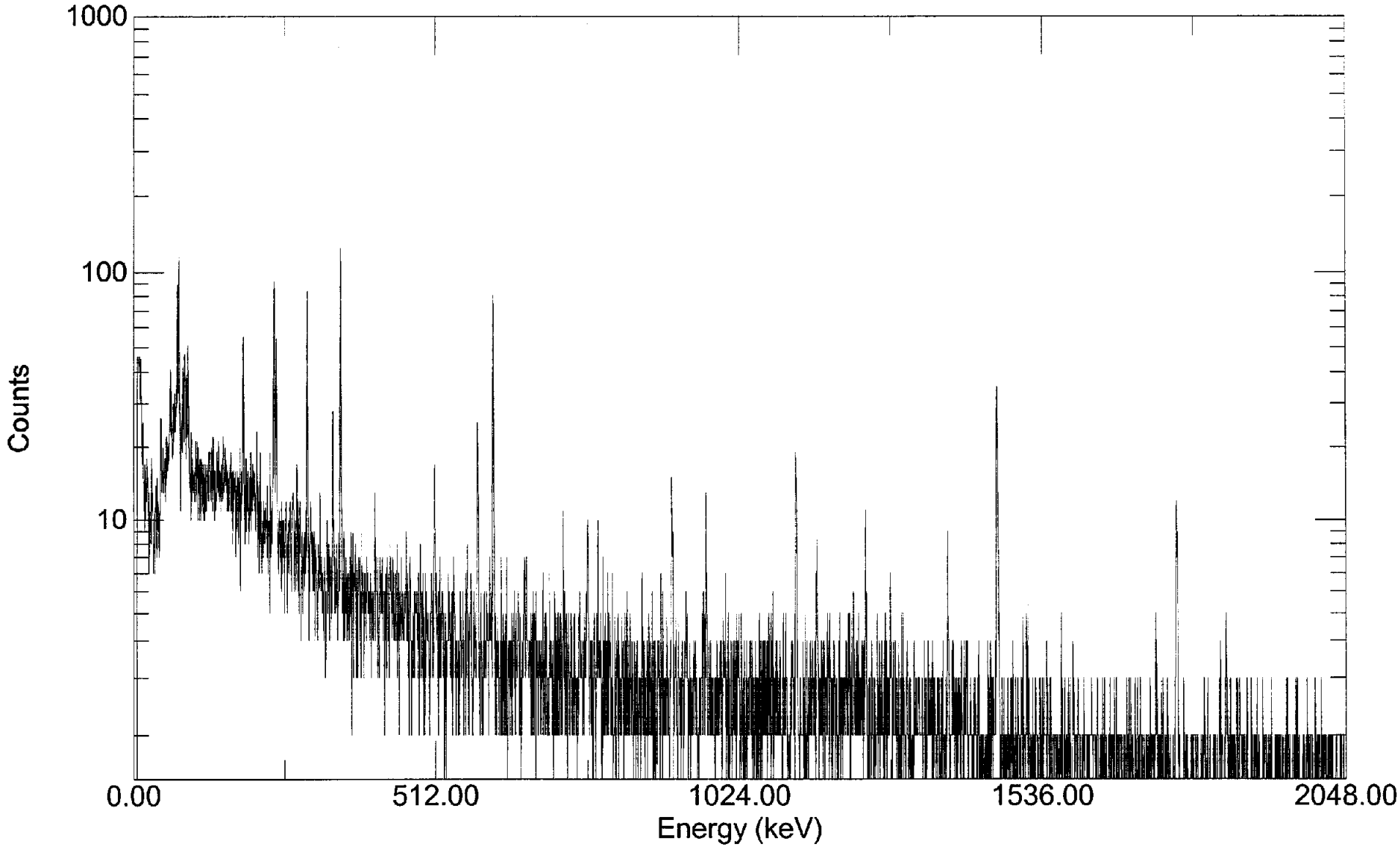
Reviewed by: _____

Supervisor

Laboratory: STL- St Louis

KEKCM1AC

7357010_KEKCM1AC_F7L200251-014



Acquired: 23-Dec-2007 2:23:56 PM
File: C:\User\spectra\KEKCM1AC.spc
Detector: #0 Ge 3 SN/155

Real Time: 1815.42 s. Live Time: 1800.00 s.
Channels: 8192

TestAmerica St. Louis

DB Analysis ID: 32,974

Sample Description: 7357010_KEKCP1AC_F7L200251-015

Spectrum Filename: KEKCP1AC.An1

Acquisition Information

Start Time:	23-Dec-2007 2:24:35PM		
Live Time:	1800.00	Real Time:	1804.70
Dead Time:	0.26 %		
Detector ID:	4		

Detector System: Ge 4 SN/181

Calibration

Description:	Ge4_TunaCanCal_74139_334_05_15_07		
Filename:	C:\User\Calibrations\Ge4 Post 09_07_07(Ge6)\Ge4_TunaCanCal_74139_334_05_15_		
Energy Created:	08-May-2007 1:28:13PM	Efficiency Created:	15-May-2007 10:05:02AM
Zero Offset:	0.017 keV	Gain:	0.250 keV/Channel

Library 1 File: mmr06 short.lib Library based peak stripping used.
Library 2 File: Null.Lib
Library 3 File: Null.Lib

Analysis Parameters

Start Channel:	150 for an energy of 37.53 keV
Stop Channel:	8,000 for an energy of 1998.47 keV
Peak rejection level:	40.000 %
Activity Scaling Factor:	1.0000 / 1.0000 = 1.0000
Detection Limit Method:	Nureg method 4.16
Sample Size:	1.00E+000
Additional random error:	0.0000
Additional systematic error:	0.0000
Fraction Limit:	0.0000%
Background Width:	Average of three points

Corrections	Status	Comments
Decay Correct to Date:	YES	23-Dec-2007 12:00:00PM
Decay During Acquisition:	NO	
Peaked Background Correction:	YES	Ge4 PBC table 11_26_07.Pbc
Absorption:	NO	
Geometry Correction:	NO	
Random Summing:	NO	

Energy Calibration Normalized Differe 0.1580

UNIDENTIFIED PEAK SUMMARY

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncertainty 1 Sigma%	FWHM keV	Suspected Nuclide	Code
298.56	74.69	297.50	245.50	0.136	15.16	0.619	PB-214	s
308.33	77.13	163.33	433.67	0.241	6.80	0.771	PB-214	
348.67	87.22	302.17	39.83	0.022	63.73	1.082		s
359.89	90.03	121.67	83.33	0.046	24.23	0.736	PB-214	M
408.55	102.20	43.17	28.83	0.016	38.36	0.286		s
743.72	186.01	138.00	211.00	0.117	14.04	1.011	PA-234	s
835.00	208.84	80.02	65.98	0.037	22.79	0.652	LU-177	s

s = Peak fails shape tests.

D = Peak area deconvoluted.

IDENTIFIED PEAK SUMMARY

Nuclide	Library Used	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncertainty 1 Sigma%	FWHM keV	Code
PB-210	1	185.32	46.37	185.81	54.19	0.030	38.76	0.797	
AM-241	1	237.87	59.51	224.18	-18.32	-0.010	117.95	0.830	s
TH-234	1	252.85	63.26	212.36	121.64	0.068	22.46	0.866	
EU-155	1	348.92	87.28	253.52	129.67	0.072	19.46	0.854	s
TH-234	1	370.14	92.59	210.76	78.24	0.043	21.32	0.859	D
U-235	1	373.18	93.35	234.99	12.54	0.007	24.66	0.860	s D
AC-228	1	373.18	93.35	222.17	62.59	0.035	2.96	0.860	D
EU-155	1	421.03	105.32	171.56	24.05	0.013	79.68	0.871	s
EU-152	1	489.40	122.41	190.60	13.50	0.008	147.14	0.885	s
EU-154	1	496.67	124.23	201.57	-15.51	-0.009	131.96	0.886	s
Pa-234	1	521.71	130.50	166.79	-0.99	-0.001	1850.55	0.894	s
U-235	1	575.74	144.01	194.50	23.67	0.013	85.82	0.904	s
U-235	1	652.39	163.18	157.62	11.98	0.007	150.96	0.922	s
U-235	1	821.05	205.35	148.36	8.06	0.004	216.50	0.958	s
PB-212	1	953.69	238.52	113.29	320.71	0.178	8.08	1.002	
RA-224	1	959.25	239.91	563.23	-140.67	-0.078	25.31	0.988	
PB-214	1	966.81	241.80	103.33	155.67	0.086	15.78	0.916	s
TL-208	1	1107.93	277.08	81.93	16.71	0.009	80.42	1.019	
I-131	1	1135.03	283.86	59.96	-3.73	-0.002	298.17	1.025	s
PB-214	1	1179.78	295.05	67.54	360.46	0.200	7.19	1.058	
PB-212	1	1196.80	299.30	42.00	48.00	0.027	30.62	0.602	s
AC-228	1	1351.20	337.91	39.67	73.33	0.041	20.47	0.390	s
EU-152	1	1374.37	343.70	61.96	-7.53	-0.004	152.30	1.076	s
PB-214	1	1406.31	351.68	52.91	576.09	0.320	4.97	1.005	
I-131	1	1459.10	364.88	41.14	3.03	0.002	304.43	1.092	s
BE-7	1	1908.76	477.29	27.20	5.89	0.003	131.92	1.185	s
CS-134	1	2259.73	565.02	32.41	0.43	0.000	1888.12	1.254	s
CS-134	1	2276.94	569.32	27.96	0.91	0.001	686.22	1.259	s D
Pa-234	1	2277.54	569.47	30.18	-0.15	0.000	-165.46	1.259	s D
TL-208	1	2330.55	582.72	15.68	131.32	0.073	10.80	1.316	
CS-134	1	2418.53	604.71	846.16	5.48	0.003	752.05	1.286	s
BI-214	1	2435.72	609.01	31.08	404.92	0.225	5.82	1.430	
I-131	1	2555.83	639.02	23.75	-2.00	-0.001	351.39	1.312	s
CS-137	1	2644.21	661.11	37.77	13.36	0.007	70.60	1.331	s
EU-154	1	2898.98	724.78	46.82	-10.61	-0.006	96.27	1.378	s
BI-212	1	2906.88	726.75	19.72	25.76	0.014	31.35	1.381	
PA-234M	1	3067.23	766.82	36.58	-0.01	0.000	65345.61	1.411	s
EU-152	1	3122.72	780.69	9.45	8.21	0.005	63.45	1.420	s
BI-212	1	3142.25	785.57	23.41	18.44	0.010	43.81	1.425	s
CS-134	1	3187.72	796.93	22.24	-0.87	0.000	776.53	1.433	s
CS-134	1	3216.60	804.15	24.21	-4.32	-0.002	168.10	1.437	s
TL-208	1	3440.66	860.13	4.50	34.50	0.019	22.31	0.392	s
EU-154	1	3491.39	872.80	29.35	1.76	0.001	440.60	1.490	s
Pa-234	1	3518.97	879.70	18.97	1.29	0.001	485.17	1.495	s
Pa-234	1	3531.69	882.87	21.37	3.14	0.002	215.93	1.497	s

AC-228	1	3644.49	911.06	0.00	77.00	0.043	11.40	1.233	
Pa-234	1	3783.72	945.84	21.05	-0.29	0.000	2279.99	1.543	s
EU-152	1	3866.42	966.50	35.33	-7.02	-0.004	125.60	1.556	s
AC-228	1	3875.84	968.85	2.67	38.33	0.021	18.09	0.620	s
EU-154	1	3985.84	996.33	25.15	0.13	0.000	5639.87	1.579	s
PA-234M	1	4004.29	1000.94	20.11	5.42	0.003	124.71	1.582	s
EU-154	1	4019.53	1004.75	30.74	-5.25	-0.003	155.64	1.585	s
EU-152	1	4450.73	1112.46	23.21	2.29	0.001	304.38	1.659	s
BI-214	1	4480.72	1119.95	9.65	100.35	0.056	11.07	1.117	s
CO-60	1	4694.55	1173.35	18.34	2.93	0.002	214.50	1.701	s
EU-154	1	5096.98	1273.85	14.25	5.68	0.003	102.95	1.768	s
CO-60	1	5335.21	1333.34	12.13	3.39	0.002	155.12	1.806	s
EU-152	1	5634.17	1407.99	11.76	7.37	0.004	75.46	1.854	s
K-40	1	5844.17	1460.42	2.83	171.17	0.095	7.58	0.569	s
BI-214	1	7059.96	1763.90	0.00	74.00	0.041	11.62	1.398	s

s = Peak fails shape tests.

D = Peak area deconvoluted.

A = Derived Aveage Activity.

SUMMARY OF LIBRARY PEAK USAGE

Nuclide Name	Nuclide Code	Library Used	Average Activity Becquerels	Peak Energy keV	Peak Activity Becquerels	Peak Analysis Code	Peak MDA Value Becquerels	Peak Code	Peak Comments	
EU-152	T F	1	-8.978E-001	344.29	-8.978E-001	% (	4.698E+000G		4.9E+003	26.50
			-8.978E-001	121.78	7.613E-001	&	3.780E+000G		4.9E+003	28.58
			-8.978E-001	778.92	4.128E+000	%	8.571E+000G		4.9E+003	12.94
			-8.978E-001	964.11	-3.736E+000	%	1.619E+001G		4.9E+003	14.61
			-8.978E-001	1112.07	1.472E+000	%	1.615E+001G		4.9E+003	13.64
			-8.978E-001	1408.00	3.753E+000	%	9.525E+000G		4.9E+003	21.00
			-8.941E-002	946.02	-1.631E-001	%	1.376E+001G		1.6E+012	13.40
			-8.941E-002	883.24	2.363E+000	&	1.827E+001G		1.6E+012	9.60
			-8.941E-002	880.53	1.552E+000	%	2.765E+001G		1.6E+012	6.00
Pa-234	N	1	-8.941E-002	131.29	-8.941E-002	% (	5.689E+000G		1.6E+012	18.00
			-8.941E-002	569.47	-8.941E-002	%	1.719E+001G		1.6E+012	8.20
CS-137	T F I	1	8.888E-001	661.66	8.888E-001	* (	2.086E+000G		1.1E+004	85.21
TL-208	F N	1	7.901E+000	583.02	7.901E+000	(P	1.273E+000G		7.0E+002	84.50
			7.901E+000	277.28	6.880E+000	%	1.848E+001G		7.0E+002	6.31
			7.901E+000	860.56	1.965E+001	+	7.175E+000G		7.0E+002	12.42
RA-224	N	1	-7.900E+001	240.99	-7.900E+001	(	6.363E+001G		7.0E+002	4.10
TH-234	N	1	5.262E+001	63.29	5.262E+001	(P	3.055E+001G		1.6E+012	4.82
			5.262E+001	92.59	2.346E+001	- P	2.110E+001G		1.6E+012	5.58
PA-234	N	1	5.191E+001	1001.00	5.191E+001	& (	2.262E+002G		1.6E+012	[illegible].84
			5.191E+001	766.41	-2.860E-001	%	6.749E+002G		1.6E+012	[illegible].29
EU-155	T F I	1	5.046E+000	105.31	1.838E+000	* (	4.873E+000G		1.8E+003	21.20
			5.046E+000	86.54	7.262E+000	& (	4.307E+000G		1.8E+003	30.70
PB-214	N	1	4.986E+001	351.93	4.941E+001	(P	3.139E+000G		5.8E+005	37.60
			4.986E+001	295.09	5.129E+001	(P	5.835E+000G		5.8E+005	19.30
			4.986E+001	242.00	4.841E+001	* (	1.557E+001G		5.8E+005	7.43
BI-214	N	1	4.641E+001	609.31	4.641E+001	(P	3.288E+000G		5.8E+005	46.09
			4.641E+001	1120.29	5.855E+001	+ P	1.003E+001G		5.8E+005	15.10
			4.641E+001	1764.49	6.307E+001	+	6.282E+000G		5.8E+005	15.40
PB-210	N	1	4.490E+001	46.54	4.490E+001	% (P	5.488E+001G		8.1E+003	4.25
U-235	N	1	3.603E+000	143.79	3.603E+000	% (	1.030E+001G		2.6E+011	10.96
			3.603E+000	205.33	3.269E+000	%	2.411E+001G		2.6E+011	5.01
			3.603E+000	163.38	4.152E+000	%	2.121E+001G		2.6E+011	5.08
			3.603E+000	93.35	3.603E+000	!	2.131E+001X	E	2.6E+011	5.81
CO-60	T F	1	3.460E-001	1332.50	3.460E-001	& (	1.933E+000G		1.9E+003	99.98
			3.460E-001	1173.24	2.690E-001	&	2.078E+000G		1.9E+003	99.90
CS-134	T F I	1	2.945E-001	604.71	2.945E-001	& (	7.433E+000G		7.5E+002	97.62
			2.945E-001	795.87	-6.721E-002	&	1.913E+000G		7.5E+002	85.53
			2.945E-001	569.32	2.945E-001	%	8.855E+000G		7.5E+002	15.38
			2.945E-001	801.95	-3.316E+000	%	1.968E+001G		7.5E+002	8.69
			2.945E-001	563.24	2.527E-001	&	1.727E+001G		7.5E+002	8.35
BE-7	N P C	1	2.383E+000	477.60	2.383E+000	% (	1.094E+001G		5.3E+001	10.52
AC-228	N	1	1.879E+001	911.07	1.970E+001	(	1.885E+000G		2.1E+003	29.00
			1.879E+001	968.97	1.714E+001	(	4.615E+000G		2.1E+003	17.46
			1.879E+001	338.32	1.899E+001	(	8.302E+000G		2.1E+003	12.01

			1.879E+001	93.35	1.879E+001			E	2.167E+001	X	A 2.1E+003	5.56
K-40	N	1	1.773E+002	1460.83	1.773E+002		(	P	1.093E+001	G	4.7E+011	10.67
PB-212	N	1	1.692E+001	238.63	1.692E+001		(	P	2.759E+000	G	7.0E+002	43.30
			1.692E+001	300.03	4.080E+001	+			2.797E+001	G	7.0E+002	3.28
BI-212	N	1	1.339E+001	727.33	1.339E+001		(		1.217E+001	G	7.0E+002	11.82
			1.339E+001	785.51	1.099E+002	%			1.505E+002	G	7.0E+002	1.10
			1.237E-001	636.97	-1.533E+000	%			1.946E+001	G	8.0E+000	7.17
I-131	T F I	1	1.237E-001	364.48	1.237E-001	&	(		1.329E+000	G	8.0E+000	81.70
			1.237E-001	284.30	-1.613E+000	%			1.678E+001	G	8.0E+000	6.14
AM-241	T	1	-1.125E+000	59.54	-1.125E+000	%	(		4.450E+000	G	1.6E+005	35.90
			1.030E+000	123.10	-6.131E-001	%			2.723E+000	G	3.1E+003	40.79
			1.030E+000	1274.54	1.585E+000	%			5.667E+000	G	3.1E+003	35.19
			1.030E+000	723.36	-3.209E+000	%			1.047E+001	G	3.1E+003	20.22
			1.030E+000	1004.77	-2.345E+000	%			1.275E+001	G	3.1E+003	18.01
			1.030E+000	996.33	9.491E-002	%			1.966E+001	G	3.1E+003	10.60
EU-154	T F I	1	1.030E+000	873.23	1.030E+000	%	(		1.632E+001	G	3.1E+003	12.27

Analysis Codes:

% = Peak fails sensitivity test
? = Peak is too narrow
- = Peak activity lower than counting uncertainty range
= = Peak outside analysis energy range
(= This peak is used in the nuclide activity average
P = Peakbackround subtraction
* = Peak is too wide, but only one peak in library
@ = Peak is too wide at FW25M, but OK at FWHM
A = Derived Average Activity
E = Energy Duplication
+ = Peak activity higher than counting uncertainty range
! = Peak is part of a multiplet and this area went negative during deconvolution
$ = Peak identified, but first peak of this nuclide failed one or more qualification tests
& = Calculated peak centroid is not close enough to the library energy centroid for positive identification

Nuclide Codes:

T = Thermal Neutron Activation
F = Fast Neutron Activation
I = Fission Product
P = Photon Reaction
N = Naturally Occurring Isotope
C = Charged Particle Reaction
M = No MDA Calculation

Peak Codes:

G = Gamma Ray
X = X-Ray
P = Positron Decay
S = Single - Escape
D = Double - Escape
K = Key Line
A = Not in Average

SUMMARY OF NUCLIDES IN SAMPLE

Nuclide		Time of Count Activity Bq/sample	Time Corrected Activity Bq/sample	Uncertainty Counts 1 Sigma %	Uncertainty Total 1 Sigma %	Minimum Detectable Activity
CS-134	<	2.945E-001	2.946E-001	752.05	752.06	7.433E+000
CS-137	<	8.888E-001	8.888E-001	70.60	70.66	2.086E+000
EU-155	<	5.046E+000	5.047E+000	19.46	19.75	4.873E+000
PB-214		4.986E+001	4.986E+001	5.02	5.78	3.139E+000
BI-212	<	1.339E+001	1.339E+001	31.35	31.48	1.217E+001
BI-214		4.641E+001	4.641E+001	5.89	6.56	3.288E+000
TH-234		5.262E+001	5.262E+001	25.42	25.68	3.055E+001
PA-234M	<	5.191E+001	5.191E+001	124.71	124.74	2.262E+002
BE-7	<	2.383E+000	2.387E+000	131.92	131.95	1.094E+001
K-40		1.773E+002	1.773E+002	7.71	8.24	1.093E+001
CO-60	<	3.460E-001	3.460E-001	155.12	155.15	1.933E+000
I-131	<	1.237E-001	1.247E-001	304.43	304.45	1.329E+000
EU-152	<	-8.978E-001	-8.978E-001	152.30	152.33	4.698E+000
EU-154	<	1.030E+000	1.030E+000	440.60	440.61	1.632E+001
TL-208		7.901E+000	7.901E+000	10.98	11.35	1.273E+000
RA-224	<	-7.900E+001	-7.901E+001	25.31	25.48	6.363E+001
PB-210		4.490E+001	4.490E+001	53.65	53.79	5.488E+001
PB-212		1.692E+001	1.692E+001	8.32	8.84	2.759E+000
AC-228		1.879E+001	1.879E+001	9.87	10.28	1.885E+000
Pa-234	<	-8.941E-002	-8.941E-002	1.850.55	1.850.55	5.689E+000
U-235	<	3.603E+000	3.603E+000	85.82	85.87	1.030E+001
AM-241	<	-1.125E+000	-1.125E+000	117.95	118.01	4.450E+000

= All peaks for activity calculation had bad shape

Total Activity (37.53 to 1,998.47 keV) 369.83 Bq/sample

Analyzed by: _____

403293

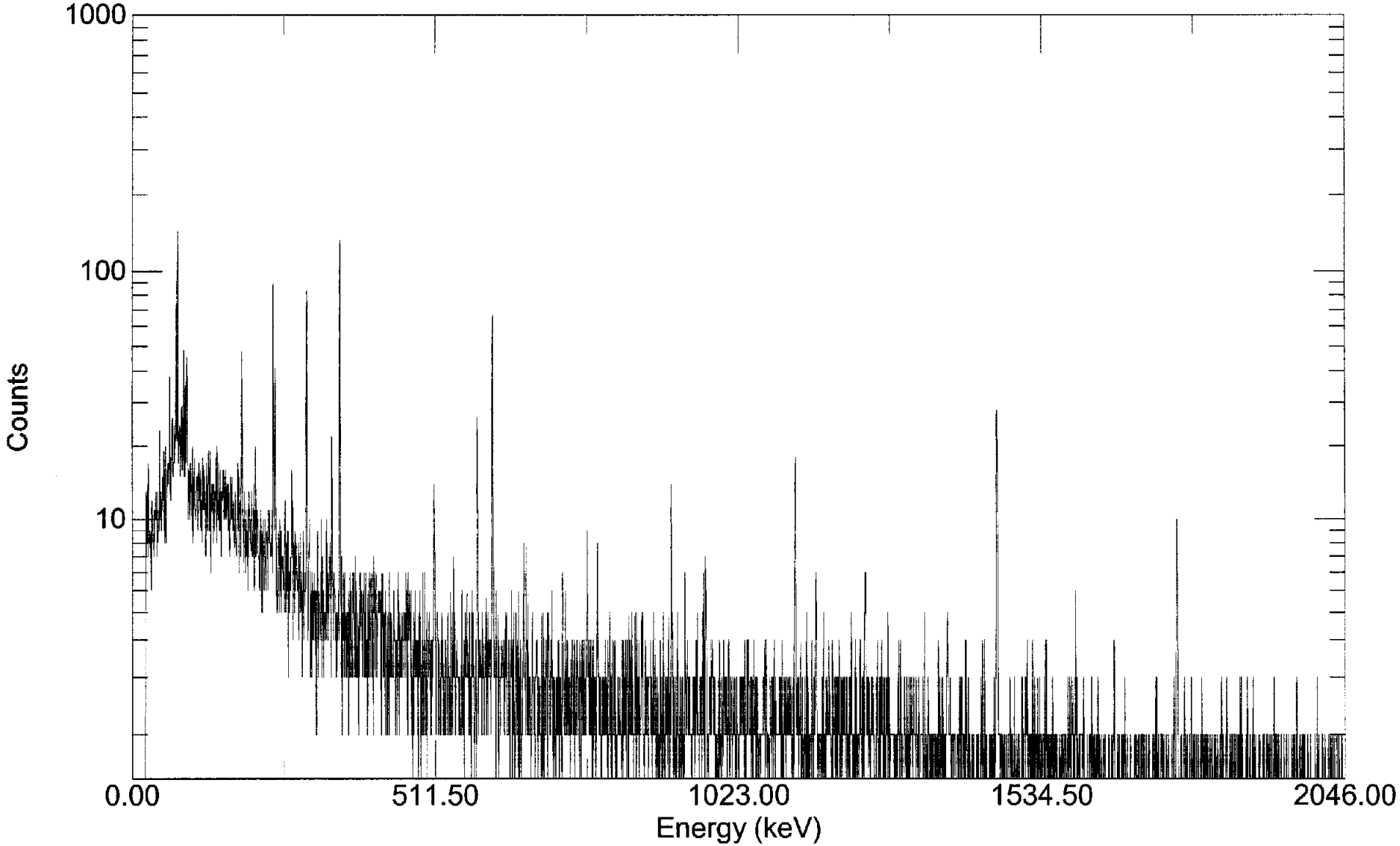
Reviewed by: _____

Supervisor

Laboratory: STL- St Louis

KEKCP1AC

7357010_KEKCP1AC_F7L200251-015



Acquired: 23-Dec-2007 2:24:35 PM
File: C:\User\spectra\KEKCP1AC.spc
Detector: #0 Ge 4 SN/181

Real Time: 1804.70 s. Live Time: 1800.00 s.
Channels: 8192

TestAmerica St. Louis

DB Analysis ID: 32,976

Sample Description: 7357010_KEKCQ1AC_F7L200251-016

Spectrum Filename: KEKCQ1AC.An1

Acquisition Information

Start Time:	23-Dec-2007 2:25:05PM		
Live Time:	1800.00	Real Time:	1915.36
Dead Time:	6.02 %		
Detector ID:	5		

Detector System: Ge 5 SN/157

Calibration

Description:	Ge5 TunaCanCal_74139-334_05_08_07		
Filename:	C:\User\Calibrations\Ge5 calibrations\Ge5 TunaCanCal_74139-334_05_08_07.Clb		
Energy Created:	28-Mar-2007 6:08:23PM	Efficiency Created:	08-May-2007 3:55:34PM
Zero Offset:	0.272 keV	Gain:	0.250 keV/Channel

Library 1 File: mmr06 short.lib Library based peak stripping used.
Library 2 File: Null.Lib
Library 3 File: Null.Lib

Analysis Parameters

Start Channel:	150 for an energy of 37.74 keV
Stop Channel:	8,000 for an energy of 2000.57 keV
Peak rejection level:	40.000 %
Activity Scaling Factor:	1.0000 / 1.0000 = 1.0000
Detection Limit Method:	Nureg method 4.16
Sample Size:	1.00E+000
Additional random error:	0.0000
Additional systematic error:	0.0000
Fraction Limit:	0.0000%
Background Width:	Average of three points

Corrections

	Status	Comments
Decay Correct to Date:	YES	23-Dec-2007 12:00:00PM
Decay During Acquisition:	NO	
Peaked Background Correction:	YES	Ge5 PBC table 11 26 07.Pbc
Absorption:	NO	
Geometry Correction:	NO	
Random Summing:	NO	

Energy Calibration Normalized Difference: 0.2334

UNIDENTIFIED PEAK SUMMARY

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncertainty 1 Sigma%	FWHM keV	Suspected Nuclide	Code
297.91	74.69	258.00	217.00	0.121	16.29	0.866	PB-214	
307.12	76.99	216.00	333.00	0.185	10.39	0.798	PB-214	
323.28	81.03	108.17	52.83	0.029	35.88	0.750	SB-125	
346.89	86.93	223.01	24.99	0.014	86.85	0.404		s
742.86	185.85	65.17	154.83	0.086	12.99	1.177	U-235	s

s = Peak fails shape tests.

D = Peak area deconvoluted.

IDENTIFIED PEAK SUMMARY

Nuclide	Library Used	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncertainty 1 Sigma%	FWHM keV	Code
PB-210	1	185.64	46.65	124.93	59.07	0.033	28.97	0.895	
AM-241	1	239.75	60.16	190.81	12.58	0.007	124.44	0.761	s
TH-234	1	251.45	63.08	192.83	83.17	0.046	28.18	0.583	s
EU-155	1	347.16	86.99	202.45	69.01	0.038	31.54	0.788	s
TH-234	1	369.75	92.64	176.19	172.81	0.096	14.99	0.904	s
AC-228	1	372.61	93.35	180.60	32.85	0.018	5.59	0.795	s D
U-235	1	372.61	93.35	180.60	8.20	0.005	30.57	0.795	s D
EU-155	1	422.37	105.78	174.50	-14.27	-0.008	133.59	0.808	
EU-152	1	487.33	122.01	137.48	11.54	0.006	146.69	0.824	s
EU-154	1	492.27	123.25	142.98	4.03	0.002	422.78	0.826	s
Pa-234	1	522.75	130.86	131.03	14.77	0.008	112.62	0.834	s
U-235	1	573.89	143.63	138.54	15.50	0.009	94.73	0.847	s
U-235	1	652.92	163.38	155.81	-0.77	0.000	1428.01	0.867	
U-235	1	820.91	205.35	81.27	19.12	0.011	70.50	0.909	s
PB-212	1	953.92	238.58	94.81	305.19	0.170	8.62	0.918	
PB-214	1	966.59	241.75	50.67	130.33	0.072	13.64	0.885	s
RA-224	1	967.66	242.01	38.50	134.44	0.075	10.82	0.944	
TL-208	1	1110.08	277.60	72.37	-2.94	-0.002	412.70	0.980	s
I-131	1	1139.06	284.84	52.62	6.85	0.004	154.60	0.987	
PB-214	1	1179.76	295.01	57.58	257.42	0.143	9.56	0.934	s
PB-212	1	1200.63	300.23	60.92	6.60	0.004	171.77	1.002	s
AC-228	1	1352.53	338.18	51.45	38.52	0.021	30.88	1.040	s
EU-152	1	1376.63	344.20	84.88	-13.01	-0.007	103.94	1.045	s
PB-214	1	1407.62	351.94	54.54	397.46	0.221	6.83	1.174	
I-131	1	1457.80	364.48	60.29	0.00	0.000	1098.05	1.065	s
BE-7	1	1910.43	477.59	68.31	0.00	0.000	1168.87	1.173	s
CS-134	1	2255.56	563.85	30.71	-3.30	-0.002	243.59	1.252	s
CS-134	1	2277.45	569.32	24.16	0.01	0.000	583.00	1.258	s D
Pa-234	1	2278.05	569.47	14.80	2.22	0.001	65.69	1.258	s D
TL-208	1	2334.46	583.57	20.42	113.58	0.063	12.16	1.170	
CS-134	1	2418.20	604.50	31.58	6.45	0.004	129.29	1.290	s
BI-214	1	2438.17	609.49	20.73	248.27	0.138	6.99	1.566	s
I-131	1	2548.19	636.99	26.18	3.77	0.002	198.69	1.319	s
CS-137	1	2649.10	662.21	18.58	110.42	0.061	12.27	1.359	s
EU-154	1	2888.89	722.15	31.12	-5.67	-0.003	145.35	1.397	s
BI-212	1	2907.02	726.68	0.00	46.00	0.026	14.74	0.625	s
PA-234M	1	3065.96	766.41	33.00	0.00	0.000	812.40	1.434	s
EU-152	1	3114.29	778.50	20.72	3.75	0.002	179.33	1.445	s
BI-212	1	3142.55	785.56	0.00	44.00	0.024	15.08	0.750	s
CS-134	1	3180.43	795.03	15.91	8.14	0.005	77.66	1.460	s
CS-134	1	3204.08	800.94	28.88	-5.43	-0.003	146.39	1.465	s
TL-208	1	3439.35	859.76	4.00	20.00	0.011	31.62	1.008	s
EU-154	1	3497.84	874.38	15.41	-0.08	0.000	7392.83	1.527	s
Pa-234	1	3522.44	880.53	14.89	0.00	0.000	545.68	1.533	s
Pa-234	1	3534.90	883.65	19.15	2.26	0.001	282.34	1.535	s
AC-228	1	3645.25	911.24	20.64	38.99	0.022	22.98	1.559	s

Pa-234	1	3780.44	945.04	16.11	5.56	0.003	110.49	1.588	s
EU-152	1	3857.21	964.23	25.72	2.08	0.001	352.31	1.603	s
AC-228	1	3876.56	969.07	30.02	8.60	0.005	96.34	1.607	s
EU-154	1	3989.61	997.33	16.14	5.17	0.003	118.47	1.630	s
PA-234M	1	4004.96	1001.17	27.22	-1.68	-0.001	445.01	1.633	s
EU-154	1	4019.44	1004.79	17.92	6.39	0.004	101.71	1.637	s
EU-152	1	4449.43	1112.31	28.97	-2.75	-0.002	283.09	1.723	s
BI-214	1	4482.71	1120.63	3.83	64.17	0.036	14.17	0.500	s
CO-60	1	4693.66	1173.39	21.04	-1.07	-0.001	615.36	1.772	s
EU-154	1	5095.57	1273.90	20.20	-1.62	-0.001	400.12	1.850	s
CO-60	1	5333.49	1333.41	13.23	-0.66	0.000	794.02	1.894	s
EU-152	1	5634.06	1408.59	9.92	5.63	0.003	89.60	1.950	s
K-40	1	5843.93	1461.09	0.00	221.00	0.123	6.73	1.715	
BI-214	1	7056.82	1764.54	8.01	30.65	0.017	20.60	2.196	s

s = Peak fails shape tests.

D = Peak area deconvoluted.

A = Derived Aveage Activity.

SUMMARY OF LIBRARY PEAK USAGE

Nuclide Name	Nuclide Code	Library Used	Average Activity Becquerels	Peak Energy keV	Peak Activity Becquerels	Peak Analysis Code	Peak MDA Value Becquerels	Peak Code	Peak Comments	
AC-228	N	1	9.550E+000	911.16	9.536E+000	(	5.840E+000G		2.1E+003	29.00
			9.550E+000	968.97	3.672E+000	%	1.206E+001G		2.1E+003	17.46
			9.550E+000	338.32	9.583E+000	(	8.991E+000G		2.1E+003	12.01
			9.550E+000	93.35	9.550E+000	+ E	1.899E+001G	A	2.1E+003	5.56
RA-224	N	1	7.259E+001	240.99	7.259E+001	(	1.708E+001G		7.0E+002	4.10
AM-241	T	1	7.155E-001	59.54	7.155E-001	% (P	3.816E+000G		1.6E+005	35.90
CS-137	T F I	1	7.052E+000	661.66	7.052E+000	* (P	1.456E+000G		1.1E+004	85.21
TL-208	F N	1	6.563E+000	583.02	6.563E+000	(P	1.373E+000G		7.0E+002	84.50
			6.563E+000	277.28	-1.165E+000	%	1.676E+001G		7.0E+002	6.31
			6.563E+000	860.56	1.090E+001	+	6.557E+000G		7.0E+002	12.42
CO-60	T F	1	-6.337E-002	1332.50	-6.337E-002	% (	1.900E+000G		1.9E+003	99.98
			-6.337E-002	1173.24	-9.301E-002	%	2.099E+000G		1.9E+003	99.90
PB-210	N	1	4.337E+001	46.54	4.337E+001	(P	4.024E+001G		8.1E+003	4.25
TH-234	N	1	4.253E+001	63.29	3.369E+001	@ (P	2.731E+001G		1.6E+012	4.82
			4.253E+001	92.59	5.016E+001	* (P	1.874E+001G		1.6E+012	5.58
EU-154	T F I	1	-4.197E-002	873.23	-4.197E-002	% (	1.173E+001G		3.1E+003	12.27
			-4.197E-002	123.10	1.543E-001	&	2.239E+000G		3.1E+003	40.79
			-4.197E-002	1274.54	-4.287E-001	%	6.260E+000G		3.1E+003	35.19
			-4.197E-002	723.36	-1.645E+000	%	8.328E+000G		3.1E+003	20.22
			-4.197E-002	1004.77	2.723E+000	%	9.564E+000G		3.1E+003	18.01
			-4.197E-002	996.33	3.716E+000	%	1.542E+001G		3.1E+003	10.60
PB-214	N	1	3.420E+001	351.93	3.275E+001	(P	3.059E+000G		5.8E+005	37.60
			3.420E+001	295.09	3.520E+001	@ (P	5.206E+000G		5.8E+005	19.30
			3.420E+001	242.00	3.897E+001	* (	1.073E+001G		5.8E+005	7.43
CS-134	T F I	1	3.331E-001	604.71	3.331E-001	% (	1.492E+000G		7.5E+002	97.62
			3.331E-001	795.87	6.043E-001	%	1.581E+000G		7.5E+002	85.53
			3.331E-001	569.32	3.582E-003	&	7.965E+000G		7.5E+002	15.38
			3.331E-001	801.95	-3.992E+000	%	2.040E+001G		7.5E+002	8.69
			3.331E-001	563.24	-1.874E+000	%	1.619E+001G		7.5E+002	8.35
BI-214	N	1	2.660E+001	609.31	2.732E+001	(P	2.633E+000G		5.8E+005	46.09
			2.660E+001	1120.29	3.563E+001	+	6.571E+000G		5.8E+005	15.10
			2.660E+001	1764.49	2.444E+001	? (P	1.268E+001G		5.8E+005	15.40

BI-212	N	1	2.293E+001	727.33	2.293E+001		(		3.674E+000G		7.0E+002	11.82
			2.293E+001	785.51	2.513E+002	+			4.208E+001G		7.0E+002	1.10
U-235	N	1	2.282E+000	143.79	2.282E+000	%	(	P	8.470E+000G		2.6E+011	10.96
			2.282E+000	205.33	7.458E+000	%			1.745E+001G		2.6E+011	5.01
			2.282E+000	163.38	-2.563E-001	&		P	2.036E+001G		2.6E+011	5.08
			2.282E+000	93.35	2.282E+000	?		E	1.818E+001X		2.6E+011	5.81
K-40	N	1	2.160E+002	1460.83	2.160E+002		(		7.204E+000G		4.7E+011	10.67
PB-212	N	1	1.548E+001	238.63	1.548E+001		(	P	2.439E+000G		7.0E+002	43.30
			1.548E+001	300.03	5.388E+000	&			3.192E+001G		7.0E+002	3.28
			-1.539E+001	766.41	0.000E+000	&			6.171E+002G		1.6E+012	.29
PA-234M	N	1	-1.539E+001	1001.00	-1.539E+001	&	(		2.471E+002G		1.6E+012	.84
EU-152 T F		1	-1.490E+000	344.29	-1.490E+000	%	(		5.230E+000G		4.9E+003	26.50
			-1.490E+000	121.78	6.305E-001	%			3.134E+000G		4.9E+003	28.58
			-1.490E+000	778.92	1.807E+000	&			1.153E+001G		4.9E+003	12.94
			-1.490E+000	964.11	1.056E+000	&			1.339E+001G		4.9E+003	14.61
			-1.490E+000	1112.07	-1.681E+000	%			1.698E+001G		4.9E+003	13.64
			-1.490E+000	1408.00	2.711E+000	%			8.369E+000G		4.9E+003	21.00
Pa-234	N	1	1.294E+000	131.29	1.294E+000	*	(		4.909E+000G		1.6E+012	18.00
			1.294E+000	569.47	1.294E+000	&			1.204E+001G		1.6E+012	8.20
			1.294E+000	946.02	3.035E+000	%			1.168E+001G		1.6E+012	13.40
			1.294E+000	883.24	1.625E+000	%			1.664E+001G		1.6E+012	9.60
			1.294E+000	880.53	0.000E+000	&			2.379E+001G		1.6E+012	6.00
EU-155 T F I		1	-1.058E+000	105.31	-1.058E+000	%	(		4.764E+000G		1.8E+003	21.20
			-1.058E+000	86.54	3.733E+000				3.733E+000G	A	1.8E+003	30.70
BE-7	N P C	1	0.000E+000	477.60	0.000E+000	%	(		1.604E+001G		5.3E+001	10.52
I-131 T F I		1	0.000E+000	364.48	0.000E+000	%	(		1.523E+000G		8.0E+000	81.70
			0.000E+000	284.30	2.847E+000	%			1.518E+001G		8.0E+000	6.14
			0.000E+000	636.97	2.771E+000	%			1.951E+001G		8.0E+000	7.17

Analysis Codes:

% = Peak fails sensitivity test

- = Peak activity lower than counting uncertainty range

(= This peak is used in the nuclide activity average

* = Peak is too wide, but only one peak in library

A = Derived Average Activity

+ = Peak activity higher than counting uncertainty range

! = Peak is part of a multiplet and this area went negative during deconvolution

$ = Peak identified, but first peak of this nuclide failed one or more qualification tests

? = Peak is too narrow

= = Peak outside analysis energy range

P = Peakbackround subtraction

@ = Peak is too wide at FW25M, but OK at FWHM

E = Energy Duplication

& = Calculated peak centroid is not close enough to the library energy centroid for positive identification

Nuclide Codes:

T = Thermal Neutron Activation	F = Fast Neutron Activation	I = Fission Product
P = Photon Reaction	N = Naturally Occurring Isotope	C = Charged Particle Reaction
M = No MDA Calculation		

Peak Codes:

G = Gamma Ray	X = X-Ray	P = Positron Decay
S = Single - Escape	D = Double - Escape	K = Key Line
A = Not in Average		

SUMMARY OF NUCLIDES IN SAMPLE

Nuclide		Time of Count Activity Bq/sample	Time Corrected Activity Bq/sample	Uncertainty Counts 1 Sigma %	Uncertainty Total 1 Sigma %	Minimum Detectable Activity
BE-7	#			1,168.87	1,168.87	1.604E+001
K-40		2.160E+002	2.160E+002	6.73	7.34	7.204E+000
CO-60	#	-6.337E-002	-6.338E-002	794.02	794.02	1.900E+000
I-131	#			1,098.05	1,098.05	1.523E+000
CS-134	#	3.331E-001	3.331E-001	129.29	129.33	1.492E+000
EU-154	#	-4.197E-002	-4.197E-002	7,392.83	7,392.83	1.173E+001
EU-155	#	-1.058E+000	-1.058E+000	133.59	133.64	4.764E+000
PB-214		3.420E+001	3.420E+001	6.03	6.68	3.059E+000
BI-212		2.293E+001	2.294E+001	14.74	15.03	3.674E+000
BI-214		2.660E+001	2.660E+001	7.18	7.74	2.633E+000
CS-137	#	7.052E+000	7.052E+000	12.97	13.29	1.456E+000
EU-152	#	-1.490E+000	-1.490E+000	103.94	103.98	5.230E+000
TL-208		6.563E+000	6.563E+000	12.56	12.88	1.373E+000
PB-210		4.337E+001	4.337E+001	37.44	37.64	4.024E+001
PB-212		1.548E+001	1.548E+001	8.81	9.30	2.439E+000
RA-224		7.259E+001	7.260E+001	10.82	11.22	1.708E+001
AC-228	#	9.550E+000	9.550E+000	19.24	19.46	5.840E+000
Pa-234	#	1.294E+000	1.294E+000	112.62	112.66	4.909E+000
U-235	#	2.282E+000	2.282E+000	109.85	109.89	8.470E+000
AM-241	#	7.155E-001	7.155E-001	157.22	157.26	3.816E+000
TH-234	#	4.253E+001	4.253E+001	16.97	17.37	2.731E+001
PA-234M	#	-1.539E+001	-1.539E+001	445.01	445.02	2.471E+002

= All peaks for activity calculation had bad shape

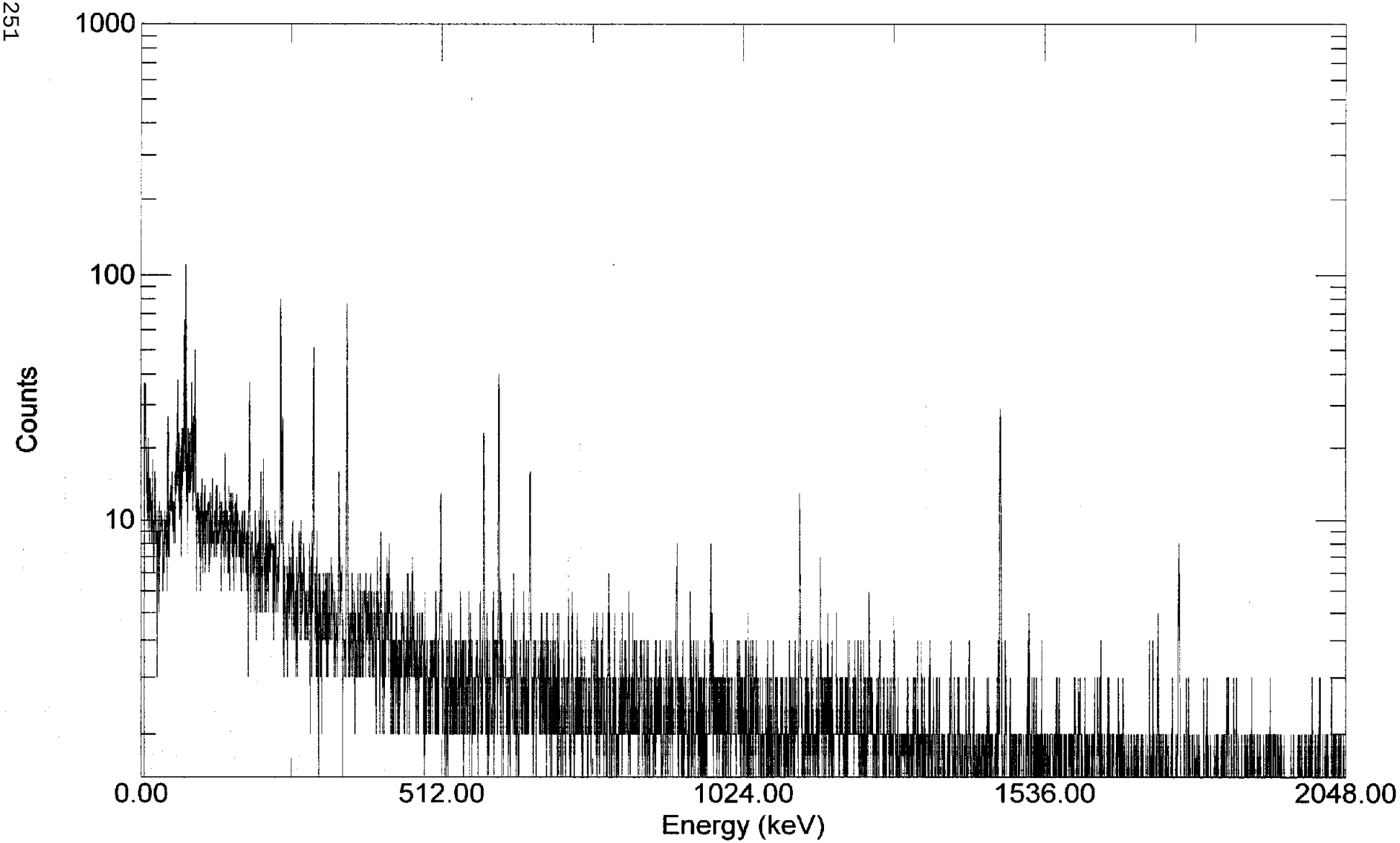
Total Activity (37.74 to 2,000.57 keV) 487.34 Bq/sample

Analyzed by: 403293

Laboratory: STL- St Louis

KEKCQ1AC

7357010_KEKCQ1AC_F7L200251-016



Acquired: 23-Dec-2007 2:25:05 PM
File: C:\User\spectra\KEKCQ1AC.spc
Detector: #0 Ge 5 SN/157

Real Time: 1915.36 s. Live Time: 1800.00 s.
Channels: 8192

DB Analysis ID: 32,975

Sample Description: 7357010_KEKCR1AC_F7L200251-017

Spectrum Filename: KEKCR1AC.An1

Acquisition Information

Start Time:	23-Dec-2007 2:25:38PM		
Live Time:	1800.00	Real Time:	1819.42
Dead Time:	1.07 %		
Detector ID:	7		

Detector System: Ge 7 SN/154

Calibration

Description:	Ge7 Tunacan 74139_334 01_16_07		
Filename:	C:\User\Calibrations\Ge7 calibrations\Ge7 Tunacan 01_16_07.Clb		
Energy Created:	16-Jan-2007 4:24:37PM	Efficiency Created:	16-Jan-2007 4:27:00PM
Zero Offset:	0.231 keV	Gain:	0.250 keV/Channel

Library 1 File: mmr06 short.lib Library based peak stripping used.
Library 2 File: Null.Lib
Library 3 File: Null.Lib

Analysis Parameters

Start Channel:	150 for an energy of 37.72 keV
Stop Channel:	8,000 for an energy of 2000.15 keV
Peak rejection level:	40.000 %
Activity Scaling Factor:	1.0000 / 1.0000 = 1.0000
Detection Limit Method:	Nureg method 4.16
Sample Size:	1.00E+000
Additional random error:	0.0000
Additional systematic error:	0.0000
Fraction Limit:	0.0000%
Background Width:	Average of three points

Corrections

	Status	Comments
Decay Correct to Date:	YES	23-Dec-2007 12:00:00PM
Decay During Acquisition:	NO	
Peaked Background Correction:	YES	Ge7 PBC table 11 26 07.Pbc
Absorption:	NO	
Geometry Correction:	NO	
Random Summing:	NO	

Energy Calibration Normalized Difference: 0.1976

UNIDENTIFIED PEAK SUMMARY

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncertainty 1 Sigma%	FWHM keV	Suspected Nuclide	Code
298.53	74.80	316.94	330.04	0.183	9.41	0.862	PB-214	D
307.69	77.14	465.00	534.00	0.297	9.16	0.891	PB-214	
323.38	81.06	150.00	53.00	0.029	39.03	0.800	SB-125	
334.93	83.95	226.37	99.63	0.055	23.59	0.509	TA-182	s
347.64	87.12	236.18	199.82	0.111	12.98	0.986	PB-214	s
358.47	89.83	170.00	92.00	0.051	25.38	0.755	PB-214	M
573.11	143.48	212.94	28.06	0.016	75.92	0.438		s
742.39	185.79	212.67	301.33	0.167	11.94	1.083	U-235	s

s = Peak fails shape tests.

D = Peak area deconvoluted.

IDENTIFIED PEAK SUMMARY

Nuclide	Library Used	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncertainty 1 Sigma%	FWHM keV	Code
PB-210	1	185.92	46.70	142.10	94.90	0.053	18.28	0.610	s
AM-241	1	238.52	59.85	435.22	-27.90	-0.016	107.42	0.846	s
TH-234	1	254.10	63.74	338.08	130.92	0.073	23.91	0.956	
EU-155	1	345.32	86.54	485.88	8.69	0.005	360.37	0.874	s
TH-234	1	370.95	92.95	371.96	304.04	0.169	13.64	0.928	s
U-235	1	372.56	93.35	357.88	21.50	0.012	12.43	0.882	s D
AC-228	1	372.56	93.35	357.88	68.91	0.038	2.62	0.882	s D
EU-155	1	420.23	105.26	301.74	3.42	0.002	721.22	0.894	s
EU-152	1	477.77	119.65	160.72	2.10	0.001	857.83	0.912	s
EU-154	1	491.32	123.03	265.44	1.26	0.001	1826.41	0.913	s
Pa-234	1	523.08	130.97	326.44	-12.10	-0.007	213.18	0.922	s
U-235	1	574.00	143.70	293.65	40.44	0.022	61.96	0.935	s
U-235	1	652.73	163.38	285.81	0.00	0.000	2390.84	0.955	s
U-235	1	820.13	205.22	197.59	35.51	0.020	58.44	0.999	
PB-212	1	954.09	238.70	301.21	693.79	0.385	7.38	1.145	
RA-224	1	959.70	240.11	739.22	-162.68	-0.090	24.90	1.036	
PB-214	1	967.28	242.00	137.50	249.50	0.139	10.83	0.935	
TL-208	1	1107.04	276.93	44.00	37.00	0.021	34.36	0.300	s
I-131	1	1131.45	283.04	74.85	1.15	0.001	1063.47	1.081	s
PB-214	1	1180.93	295.40	73.33	525.67	0.292	5.52	1.030	
PB-212	1	1198.99	299.92	103.00	19.23	0.011	78.06	1.097	s
AC-228	1	1353.40	338.51	82.75	81.59	0.045	19.27	1.136	s
EU-152	1	1376.87	344.38	71.49	4.72	0.003	257.71	1.142	s
PB-214	1	1407.47	352.03	87.88	837.12	0.465	4.46	1.165	
I-131	1	1455.91	364.14	85.99	-0.22	0.000	5948.27	1.163	s
BE-7	1	1909.41	477.50	52.56	9.00	0.005	118.64	1.277	s
CS-134	1	2253.90	563.61	45.48	3.91	0.002	248.84	1.363	s
CS-134	1	2276.76	569.32	61.50	0.00	0.000	905.54	1.369	s D
Pa-234	1	2277.35	569.47	55.25	-1.78	-0.001	-163.35	1.369	s D
TL-208	1	2332.53	583.26	47.41	175.59	0.098	13.30	1.127	
CS-134	1	2406.32	601.71	26.84	13.92	0.008	59.05	1.403	s
BI-214	1	2437.32	609.46	38.30	607.70	0.338	4.73	1.557	
I-131	1	2544.34	636.21	27.48	6.12	0.003	127.63	1.435	s
CS-137	1	2646.69	661.79	45.30	50.95	0.028	22.95	1.459	s
EU-154	1	2893.42	723.47	54.08	-5.08	-0.003	209.40	1.519	s
BI-212	1	2908.47	727.23	32.39	15.59	0.009	57.52	1.523	s
PA-234M	1	3065.20	766.41	67.45	0.00	0.000	1161.44	1.561	s
EU-152	1	3118.92	779.84	34.26	4.51	0.003	189.63	1.573	s
BI-212	1	3152.73	788.29	29.36	4.52	0.003	175.90	1.579	s
CS-134	1	3179.82	795.06	39.25	3.24	0.002	279.12	1.589	s
CS-134	1	3206.42	801.71	41.26	-0.11	0.000	7976.19	1.595	s
TL-208	1	3435.48	858.98	26.73	-1.45	-0.001	509.34	1.650	s
EU-154	1	3494.58	873.75	35.64	1.89	0.001	452.87	1.662	s
Pa-234	1	3523.17	880.90	41.73	-1.75	-0.001	527.25	1.669	s
Pa-234	1	3533.22	883.41	37.08	0.63	0.000	1365.79	1.672	s
AC-228	1	3645.84	911.56	37.68	78.12	0.043	15.86	1.698	s

Pa-234	1	3784.57	946.24	30.00	3.68	0.002	216.71	1.731	s
EU-152	1	3854.91	963.83	37.66	10.46	0.006	88.53	1.748	s
AC-228	1	3875.49	968.97	45.55	18.61	0.010	56.29	1.752	s
EU-154	1	3983.91	996.08	23.17	-0.31	0.000	2227.65	1.778	s
PA-234M	1	4003.60	1001.00	65.62	0.00	0.000	1145.62	1.782	s
EU-154	1	4018.69	1004.77	35.91	-4.27	-0.002	204.33	1.785	s
EU-152	1	4449.59	1112.49	36.80	-1.15	-0.001	751.12	1.884	s
BI-214	1	4482.28	1120.66	7.50	138.50	0.077	10.27	1.594	
CO-60	1	4670.51	1167.72	16.20	0.36	0.000	1611.42	1.939	s
EU-154	1	5098.45	1274.71	31.95	-1.90	-0.001	427.68	2.030	s
CO-60	1	5353.60	1338.50	16.30	-0.13	0.000	4554.20	2.081	s
EU-152	1	5607.45	1401.96	14.30	6.56	0.004	90.44	2.147	s
K-40	1	5845.32	1461.43	26.74	182.93	0.102	8.41	2.192	s
BI-214	1	7059.34	1764.96	0.00	79.00	0.044	11.25	0.658	s

s = Peak fails shape tests.

D = Peak area deconvoluted.

A = Derived Aveage Activity.

SUMMARY OF LIBRARY PEAK USAGE

Nuclide Name	Nuclide Code	Library Used	Average Activity Becquerels	Peak Energy keV	Peak Activity Becquerels	Peak Analysis Code	Peak MDA Value Becquerels	Peak Code	Peak Comments	
CO-60	T F	1	-9.261E-003	1332.50	-9.261E-003	% (	1.587E+000G		1.9E+003	99.98
			-9.261E-003	1173.24	2.341E-002	&	1.415E+000G		1.9E+003	99.90
EU-154	T F I	1	7.861E-001	873.23	7.861E-001	% (	1.271E+001G		3.1E+003	12.27
			7.861E-001	123.10	3.495E-002	%	2.176E+000G		3.1E+003	40.79
			7.861E-001	1274.54	-3.818E-001	%	5.847E+000G		3.1E+003	35.19
			7.861E-001	723.36	-1.092E+000	%	7.947E+000G		3.1E+003	20.22
			7.861E-001	1004.77	-1.365E+000	%	9.794E+000G		3.1E+003	18.01
			7.861E-001	996.33	-1.653E-001	%	1.356E+001G		3.1E+003	10.60
Pa-234	N	1	-7.662E-001	131.29	-7.662E-001	& (	5.505E+000G		1.6E+012	18.00
			-7.662E-001	569.47	-7.662E-001	%	1.605E+001G		1.6E+012	8.20
			-7.662E-001	946.02	1.503E+000	%	1.152E+001G		1.6E+012	13.40
			-7.662E-001	883.24	3.401E-001	%	1.670E+001G		1.6E+012	9.60
			-7.662E-001	880.53	-1.501E+000	&	2.813E+001G		1.6E+012	6.00
TL-208	F N	1	7.479E+000	583.02	7.479E+000	(	1.482E+000G	P	7.0E+002	84.50
			7.479E+000	277.28	1.072E+001	+	9.741E+000G		7.0E+002	6.31
			7.479E+000	860.56	-5.908E-001	%	1.088E+001G		7.0E+002	12.42
RA-224	N	1	-6.425E+001	240.99	-6.425E+001	(	5.111E+001G		7.0E+002	4.10
I-131	T F I	1	-6.338E-003	364.48	-6.338E-003	% (	1.319E+000G		8.0E+000	81.70
			-6.338E-003	284.30	3.517E-001	%	1.310E+001G		8.0E+000	6.14
			-6.338E-003	636.97	3.323E+000	%	1.473E+001G		8.0E+000	7.17
BI-212	N	1	5.757E+000	727.33	5.757E+000	% (	1.080E+001G		7.0E+002	11.82
			5.757E+000	785.51	1.917E+001	%	1.186E+002G		7.0E+002	1.10
PB-210	N	1	5.666E+001	46.54	5.666E+001	* (	3.479E+001G	P	8.1E+003	4.25
CS-134	T F I	1	5.301E-001	604.71	5.301E-001	% (	1.022E+000G		7.5E+002	97.62
			5.301E-001	795.87	1.786E-001	%	1.760E+000G		7.5E+002	85.53
			5.301E-001	569.32	0.000E+000	%	8.443E+000G	}	7.5E+002	15.38
			5.301E-001	801.95	-6.227E-002	%	1.783E+001G		7.5E+002	8.69
			5.301E-001	563.24	1.636E+000	&	1.427E+001G		7.5E+002	8.35
TH-234	N	1	5.257E+001	63.29	3.973E+001	(	2.683E+001G	P	1.6E+012	4.82
			5.257E+001	92.59	6.365E+001	* (	1.938E+001G	P	1.6E+012	5.58
PB-214	N	1	5.167E+001	351.93	5.059E+001	(	2.804E+000G	P	5.8E+005	37.60
			5.167E+001	295.09	5.266E+001	(	4.269E+000G		5.8E+005	19.30

			5.167E+001	242.00	5.457E+001		(		1.254E+001G		5.8E+005	7.43
BI-214	N	1	4.932E+001	609.31	4.934E+001		(	P	2.561E+000G		5.8E+005	46.09
			4.932E+001	1120.29	5.801E+001	+			6.481E+000G		5.8E+005	15.10
			4.932E+001	1764.49	4.926E+001		(		4.596E+000G		5.8E+005	15.40
U-235	N	1	4.313E+000	143.79	4.313E+000	%	(		8.807E+000G		2.6E+011	10.96
			4.313E+000	205.33	1.011E+001	%			1.943E+001G		2.6E+011	5.01
			4.313E+000	163.38	0.000E+000	%			1.981E+001G		2.6E+011	5.08
			4.313E+000	93.35	4.313E+000	!		E	1.823E+001X		2.6E+011	5.81
			3.962E-001	964.11	3.981E+000	%			1.191E+001G		4.9E+003	14.61
			3.962E-001	1112.07	-5.302E-001	%			1.427E+001G		4.9E+003	13.64
			3.962E-001	1408.00	2.418E+000	%			7.499E+000G		4.9E+003	21.00
EU-152 T F		1	3.962E-001	344.29	3.962E-001	%	(		3.538E+000G		4.9E+003	26.50
			3.962E-001	121.78	8.273E-002	%			2.438E+000G		4.9E+003	28.58
			3.962E-001	778.92	1.613E+000	%			1.073E+001G		4.9E+003	12.94
BE-7	N P C	1	2.576E+000	477.60	2.576E+000	&	(		1.044E+001G		5.3E+001	10.52
PB-212	N	1	2.573E+001	238.63	2.573E+001		(	P	3.100E+000G		7.0E+002	43.30
			2.573E+001	300.03	1.150E+001	%			2.992E+001G		7.0E+002	3.28
CS-137 T F I		1	2.405E+000	661.66	2.405E+000	?	(	P	1.608E+000G		1.1E+004	85.21
EU-155 T F I		1	1.825E-001	105.31	1.825E-001	&	(		4.469E+000G		1.8E+003	21.20
			1.825E-001	86.54	3.397E-001	%			4.122E+000G	A	1.8E+003	30.70
AC-228	N	1	1.445E+001	911.16	1.427E+001		(		5.718E+000G		2.1E+003	29.00
			1.445E+001	968.97	5.949E+000	%			1.092E+001G		2.1E+003	17.46
			1.445E+001	338.32	1.488E+001	*	(		8.227E+000G		2.1E+003	12.01
			1.445E+001	93.35	1.445E+001	+		E	1.905E+001G	A	2.1E+003	5.56
K-40	N	1	1.374E+002	1460.83	1.374E+002		(		2.013E+001G		4.7E+011	10.67
AM-241 T		1	-1.205E+000	59.54	-1.205E+000	*	(		4.317E+000G		1.6E+005	35.90
PA-234M	N	1	0.000E+000	1001.00	0.000E+000	%	(		2.774E+002G		1.6E+012	.84
			0.000E+000	766.41	0.000E+000	%			6.366E+002G		1.6E+012	.29

Analysis Codes:

% = Peak fails sensitivity test

- = Peak activity lower than counting uncertainty range

(= This peak is used in the nuclide activity average

* = Peak is too wide, but only one peak in library

A = Derived Average Activity

+ = Peak activity higher than counting uncertainty range

! = Peak is part of a multiplet and this area went negative during deconvolution

$ = Peak identified, but first peak of this nuclide failed one or more qualification tests

? = Peak is too narrow

= = Peak outside analysis energy range

P = Peakbackround subtraction

@ = Peak is too wide at FW25M, but OK at FWHM

E = Energy Duplication

& = Calculated peak centroid is not close enough to the library energy centroid for positive identification

Nuclide Codes:

T = Thermal Neutron Activation	F = Fast Neutron Activation	I = Fission Product
P = Photon Reaction	N = Naturally Occurring Isotope	C = Charged Particle Reaction
M = No MDA Calculation		

Peak Codes:

G = Gamma Ray	X = X-Ray	P = Positron Decay
S = Single - Escape	D = Double - Escape	K = Key Line
A = Not in Average		

SUMMARY OF NUCLIDES IN SAMPLE

Nuclide		Time of Count Activity Bq/sample	Time Corrected Activity Bq/sample	Uncertainty Counts 1 Sigma %	Uncertainty Total 1 Sigma %	Minimum Detectable Activity
BE-7	#	2.576E+000	2.579E+000	118.64	118.68	1.044E+001
K-40	#	1.374E+002	1.374E+002	8.41	8.90	2.013E+001
CO-60	#	-9.261E-003	-9.261E-003	4,554.20	4,554.20	1.587E+000
I-131	#	-6.338E-003	-6.394E-003	5,948.27	5,948.27	1.319E+000
CS-134	#	5.301E-001	5.302E-001	59.05	59.12	1.022E+000
EU-154	#	7.861E-001	7.861E-001	452.87	452.88	1.271E+001
PB-210	#	5.666E+001	5.666E+001	22.92	23.25	3.479E+001
PB-212		2.573E+001	2.574E+001	7.48	8.06	3.100E+000
PB-214		5.167E+001	5.167E+001	4.32	5.19	2.804E+000
BI-212	#	5.757E+000	5.757E+000	57.52	57.59	1.080E+001
CS-137	#	2.405E+000	2.405E+000	23.29	23.47	1.608E+000
EU-152	#	3.962E-001	3.962E-001	257.71	257.72	3.538E+000
EU-155	#	1.825E-001	1.825E-001	721.22	721.23	4.469E+000
TL-208		7.479E+000	7.480E+000	13.48	13.79	1.482E+000
BI-214		4.932E+001	4.932E+001	4.75	5.56	2.561E+000
RA-224	#	-6.425E+001	-6.426E+001	24.90	25.08	5.111E+001
AC-228	#	1.445E+001	1.445E+001	12.48	12.80	5.718E+000
TH-234		5.257E+001	5.257E+001	14.90	15.35	2.683E+001
PA-234M	#			1,145.62	1,145.62	2.774E+002
U-235	#	4.313E+000	4.313E+000	61.96	62.03	8.807E+000
AM-241	#	-1.205E+000	-1.205E+000	107.42	107.49	4.317E+000
Pa-234	#	-7.662E-001	-7.662E-001	213.18	213.20	5.505E+000

= All peaks for activity calculation had bad shape

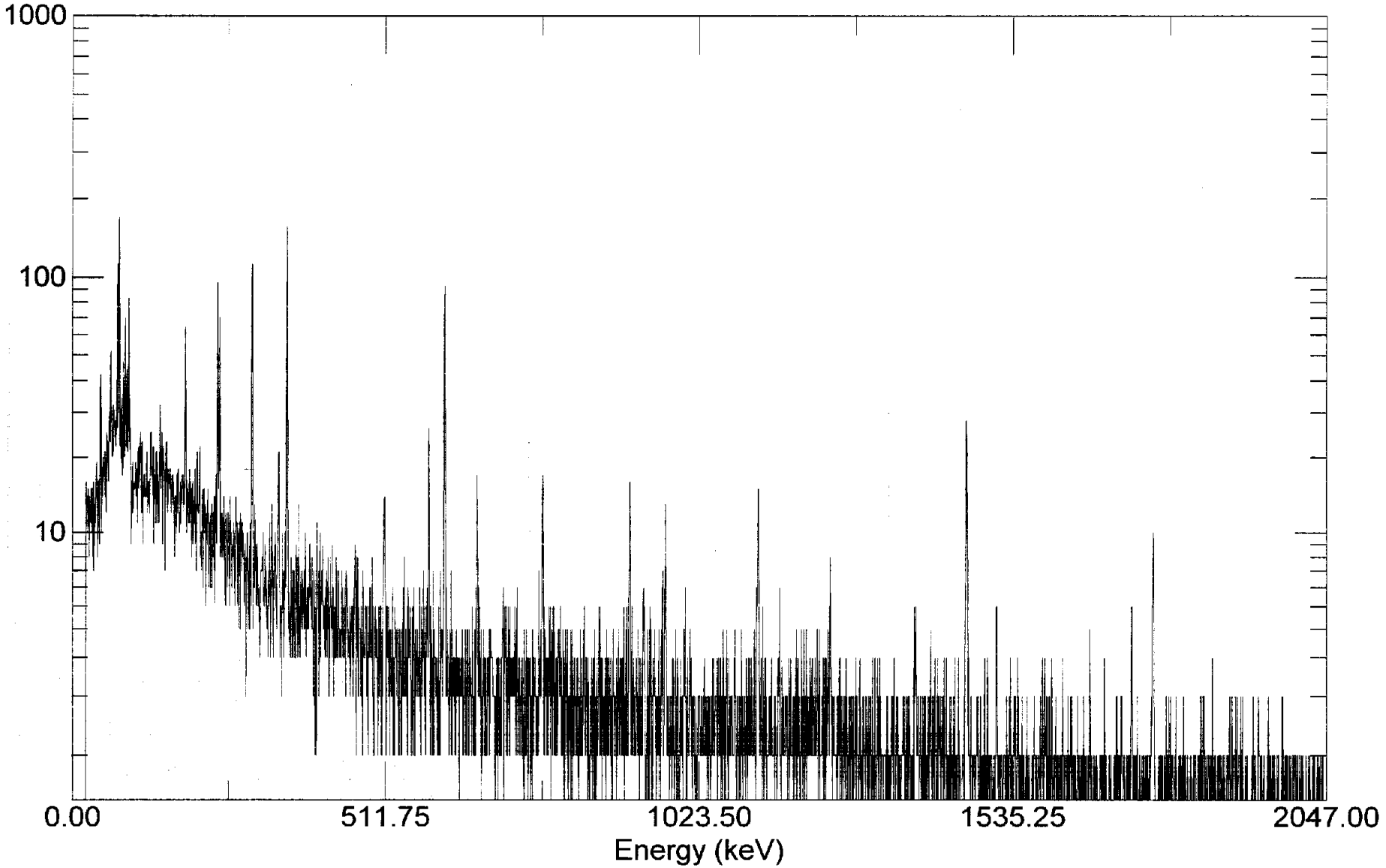
Total Activity (37.72 to 2,000.15 keV) 245.83 Bq/sample

Analyzed by: 403293

Laboratory: Test America

KEKCR1AC

7357010_KEKCR1AC_F7L200251-017



Acquired: 23-Dec-2007 2:25:38 PM
File: C:\User\spectra\KEKCR1AC.spc
Detector: #0 Ge 7 SN/154

Real Time: 1819.42 s. Live Time: 1800.00 s.
Channels: 8192

TestAmerica St. Louis

DB Analysis ID: 32,977

Sample Description: 7357010_KEQKR1AA_F7L230000-010B

Spectrum Filename: KEQKR1AA.An1

Acquisition Information

Start Time:	23-Dec-2007 3:03:33PM		
Live Time:	1800.00	Real Time:	1809.64
Dead Time:	0.53 %		
Detector ID:	1		

Detector System: Ge 1 SN/242

Calibration

Description:	Ge1 Tunacan 74139-334 1_15_07		
Filename:	C:\User\Calibrations\Ge1 calibrations\Ge1 Tunacan polynomial 01_15_07.Clb		
Energy Created:	15-Jan-2007 5:43:37PM	Efficiency Created:	15-Jan-2007 5:44:16PM
Zero Offset:	0.212 keV	Gain:	0.250 keV/Channel

Library 1 File: mmr06 short.lib Library based peak stripping used.
Library 2 File: Null.Lib
Library 3 File: Null.Lib

Analysis Parameters

Start Channel:	150 for an energy of 37.71 keV
Stop Channel:	8,000 for an energy of 1999.84 keV
Peak rejection level:	40.000 %
Activity Scaling Factor:	1.0000 / 1.0000 = 1.0000
Detection Limit Method:	Nureg method 4.16
Sample Size:	1.00E+000
Additional random error:	0.0000
Additional systematic error:	0.0000
Fraction Limit:	0.0000%
Background Width:	Average of three points

Corrections	Status	Comments
Decay Correct to Date:	YES	23-Dec-2007 12:00:00PM
Decay During Acquisition:	NO	
Peaked Background Correction:	YES	Ge1 PBC table 11_26_07.Pbc
Absorption:	NO	
Geometry Correction:	NO	
Random Summing:	NO	

Energy Calibration Normalized Differe 0.2271

UNIDENTIFIED PEAK SUMMARY

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncertainty Sigma%	FWHM keV	Suspected Nuclide	Code

s = Peak fails shape tests.

D = Peak area deconvoluted.

IDENTIFIED PEAK SUMMARY

Nuclide	Library Used	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncertainty 1 Sigma%	FWHM keV	Code
PB-210	1	184.46	46.33	49.46	20.54	0.011	23.38	1.029	s
AM-241	1	236.22	59.27	39.21	4.19	0.002	217.04	0.824	s
TH-234	1	252.72	63.39	58.56	-2.56	-0.001	27.95	0.327	s
EU-155	1	343.88	86.18	43.49	2.24	0.001	421.66	0.849	s
TH-234	1	369.95	92.70	74.51	24.49	0.014	17.02	1.065	s
AC-228	1	372.54	93.35	29.93	-1.18	-0.001	-178.40	0.855	s D
U-235	1	372.54	93.35	29.93	4.33	0.002	22.80	0.855	s D
EU-155	1	419.04	104.98	26.16	8.76	0.005	89.24	0.866	s
EU-152	1	484.09	121.24	34.34	-3.52	-0.002	241.55	0.881	s
EU-154	1	491.32	123.05	32.63	-0.62	0.000	1305.66	0.882	s
Pa-234	1	524.87	131.43	38.87	-4.28	-0.002	211.81	0.890	s
U-235	1	574.75	143.90	29.34	8.01	0.004	67.53	0.901	s
U-235	1	653.75	163.65	30.98	-4.87	-0.003	402.43	0.919	s
U-235	1	818.80	204.92	26.89	-4.09	-0.002	367.27	0.957	s
PB-212	1	952.37	238.31	29.58	0.42	0.000	27.48	0.639	s
RA-224	1	961.77	240.66	34.25	-0.23	0.000	3529.47	0.989	s
PB-214	1	969.56	242.61	36.17	-6.42	-0.004	1284.23	0.990	s
TL-208	1	1104.34	276.30	18.43	-0.86	0.000	710.50	1.021	s
I-131	1	1135.08	283.99	21.31	5.60	0.003	124.00	1.028	s
PB-214	1	1179.17	295.01	23.02	-1.99	-0.001	81.77	1.037	s
PB-212	1	1196.40	299.32	14.15	3.49	0.002	161.67	1.042	s
AC-228	1	1352.23	338.27	20.59	-1.85	-0.001	191.74	1.076	s
EU-152	1	1375.51	344.09	12.98	6.08	0.003	93.11	1.081	s
PB-214	1	1407.31	352.04	28.62	-8.52	-0.005	174.68	1.088	s
I-131	1	1457.07	364.48	31.28	0.00	0.000	790.96	1.099	s
BE-7	1	1907.39	477.06	18.79	-1.45	-0.001	430.29	1.198	s
CS-134	1	2253.72	563.63	19.56	-2.93	-0.002	221.28	1.273	s
CS-134	1	2276.47	569.32	19.63	0.00	0.000	0.00	1.278	s D
Pa-234	1	2277.07	569.47	19.67	-0.77	0.000	-67.04	1.278	s D
TL-208	1	2331.90	583.18	16.65	3.01	0.002	43.89	1.290	s
CS-134	1	2418.04	604.71	32.00	0.00	0.000	800.00	1.309	s
BI-214	1	2435.24	609.01	24.24	-5.06	-0.003	85.87	1.313	
I-131	1	2547.11	636.97	8.54	0.00	0.000	413.38	1.337	s
CS-137	1	2642.77	660.89	16.65	-3.06	-0.002	197.32	1.358	s
EU-154	1	2892.67	723.36	41.38	0.00	0.000	909.69	1.411	s
BI-212	1	2906.44	726.80	11.06	3.58	0.002	141.46	1.414	s
PA-234M	1	3063.06	765.95	16.57	1.08	0.001	539.24	1.447	s
EU-152	1	3115.80	779.13	13.69	4.07	0.002	137.72	1.458	s
BI-212	1	3139.09	784.95	13.74	2.07	0.001	263.23	1.463	s
CS-134	1	3183.06	795.94	14.35	-1.33	-0.001	412.64	1.472	s
CS-134	1	3208.49	802.30	11.33	1.67	0.001	295.53	1.477	s
TL-208	1	3441.38	860.52	8.11	1.79	0.001	236.64	1.527	s
EU-154	1	3492.60	873.32	13.61	0.64	0.000	828.27	1.537	s
Pa-234	1	3518.70	879.84	16.45	-1.60	-0.001	367.85	1.543	s
Pa-234	1	3532.30	883.24	0.00	0.00	0.000	100.00	1.546	s

AC-228	1	3642.81	910.86	16.49	-1.76	-0.001	168.86	1.569	s
Pa-234	1	3783.57	946.05	11.99	-1.13	-0.001	444.35	1.598	s
EU-152	1	3859.94	965.14	8.82	3.10	0.002	146.97	1.613	s
AC-228	1	3869.87	967.62	16.49	-6.09	-0.003	191.02	1.617	s
EU-154	1	3984.73	996.33	23.87	0.00	0.000	690.88	1.640	s
PA-234M	1	4003.99	1001.14	4.43	1.59	0.001	203.76	1.643	s
EU-154	1	4018.52	1004.77	24.05	0.00	0.000	693.57	1.647	s
EU-152	1	4447.80	1112.07	0.00	0.00	0.000	100.00	1.735	s
BI-214	1	4480.66	1120.29	5.75	-5.75	-0.003	100.00	1.741	s
CO-60	1	4692.51	1173.24	0.00	0.00	0.000	100.00	1.784	s
EU-154	1	5097.46	1274.45	6.65	-0.14	0.000	2639.50	1.866	s
CO-60	1	5329.72	1332.50	0.00	0.00	0.000	100.00	1.912	s
EU-152	1	5626.73	1406.73	6.54	1.75	0.001	219.96	1.972	s
K-40	1	5842.44	1460.65	16.79	-6.37	-0.004	62.06	2.013	s
BI-214	1	7068.85	1767.15	15.16	-4.62	-0.003	2531.07	2.246	s

s = Peak fails shape tests.

D = Peak area deconvoluted.

A = Derived Aveage Activity.

SUMMARY OF LIBRARY PEAK USAGE

Nuclide Name	Nuclide Code	Library Used	Average Activity Becquerels	Peak Energy keV	Peak Activity Becquerels		Analysis Code	MDA Value Becquerels	Code	Comments	
			9.974E-001	163.38	-1.376E+000	%	P	8.091E+000G		2.6E+011	5.08
			9.974E-001	93.35	9.974E-001	?	E	6.489E+000X		2.6E+011	5.81
U-235	N	1	9.974E-001	143.79	9.974E-001	% (	P	3.482E+000G		2.6E+011	10.96
			9.974E-001	205.33	-1.326E+000	%	P	8.703E+000G		2.6E+011	5.01
PA-234	N	1	9.439E+000	1001.00	9.439E+000	% (		7.450E+001G		1.6E+012	.84
			9.439E+000	766.41	1.526E+001	&		3.049E+002G		1.6E+012	.29
TH-234	N	1	-8.713E-001	63.29	-8.713E-001	% (	P	1.305E+001G		1.6E+012	4.82
			-8.713E-001	92.59	5.874E+000	%	P	1.030E+001G		1.6E+012	5.58
EU-155	T F I	1	5.417E-001	105.31	5.417E-001	& (		1.642E+000G		1.8E+003	21.20
			5.417E-001	86.54	9.977E-002	%		1.489E+000G		1.8E+003	30.70
PB-214	N	1	-5.357E-001	351.93	-5.357E-001	& (	P	1.739E+000G		5.8E+005	37.60
			-5.357E-001	295.09	-2.142E-001	%	P	2.699E+000G		5.8E+005	19.30
			-5.357E-001	242.00	-1.561E+000	%	P	7.469E+000G		5.8E+005	7.43
EU-152	T F	1	5.339E-001	344.29	5.339E-001	% (		1.712E+000G		4.9E+003	26.50
			5.339E-001	121.78	-1.619E-001	%		1.382E+000G		4.9E+003	28.58
			5.339E-001	778.92	1.316E+000	%		6.449E+000G		4.9E+003	12.94
			5.339E-001	964.11	1.029E+000	%		5.499E+000G		4.9E+003	14.61
			5.339E-001	1112.07	0.000E+000	&		2.901E+000G		4.9E+003	13.64
			5.339E-001	1408.00	5.333E-001	%		4.455E+000G		4.9E+003	21.00
BE-7	N P C	1	-4.084E-001	477.60	-4.084E-001	% (		6.444E+000G		5.3E+001	10.52
K-40	N	1	-3.932E+000	1460.83	-3.932E+000	% (	P	1.346E+001G		4.7E+011	10.67
BI-214	N	1	-3.864E-001	609.31	-3.864E-001	% (	P	1.960E+000G		5.8E+005	46.09
			-3.864E-001	1120.29	-2.056E+000	%	P	4.965E+000G		5.8E+005	15.10
			-3.864E-001	1764.49	-2.307E+000	%	P	1.040E+001G		5.8E+005	15.40
Pa-234	N	1	-3.165E-001	131.29	-3.165E-001	% (		2.351E+000G		1.6E+012	18.00
			-3.165E-001	569.47	-3.165E-001	%		9.571E+000G		1.6E+012	8.20
			-3.165E-001	946.02	-4.031E-001	%		6.736E+000G		1.6E+012	13.40
			-3.165E-001	883.24	0.000E+000	%		3.504E+000G		1.6E+012	9.60
			-3.165E-001	880.53	-1.212E+000	%		1.640E+001G		1.6E+012	6.00
			-2.835E-001	968.97	-1.698E+000	%	P	6.035E+000G		2.1E+003	17.46
			-2.835E-001	338.32	-3.541E-001	%	P	4.563E+000G		2.1E+003	12.01
			-2.835E-001	93.35	-2.835E-001	?	E	6.780E+000X	A	2.1E+003	5.56
AC-228	N	1	-2.835E-001	911.07	-2.835E-001	% (	P	3.479E+000G		2.1E+003	29.00
			2.352E-001	723.36	0.000E+000	%		6.420E+000G		3.1E+003	20.22
			2.352E-001	1004.77	0.000E+000	%		7.092E+000G		3.1E+003	18.01
			2.352E-001	996.33	0.000E+000	%		1.194E+001G		3.1E+003	10.60
EU-154	T F I	1	2.352E-001	873.23	2.352E-001	& (		7.345E+000G		3.1E+003	12.27
			2.352E-001	123.10	-2.008E-002	&		9.473E-001G		3.1E+003	40.79
			2.352E-001	1274.54	-2.343E-002	%		2.484E+000G		3.1E+003	35.19
AM-241	T	1	2.024E-001	59.54	2.024E-001	& (		1.542E+000G		1.6E+005	35.90
PB-212	N	1	1.721E-002	238.63	1.721E-002	% (	P	1.159E+000G		7.0E+002	43.30
			1.721E-002	300.03	2.236E+000	%		1.298E+001G		7.0E+002	3.28
CS-137	T F I	1	-1.338E-001	661.66	-1.338E-001	% (		9.513E-001G		1.1E+004	85.21
PB-210	N	1	1.297E+001	46.54	1.297E+001	* (	P	2.241E+001G		8.1E+003	4.25

TL-208	F	N	1	1.215E-001	583.02	1.215E-001	%	(	P	8.776E-001G	7.0E+002	84.50
				1.215E-001	277.28	-2.722E-001	%			7.152E+000G	7.0E+002	6.31
				1.215E-001	860.56	6.473E-001	%			5.768E+000G	7.0E+002	12.42
BI-212		N	1	1.209E+000	727.33	1.209E+000	%	(		6.141E+000G	7.0E+002	11.82
				1.209E+000	785.51	7.898E+000	&			7.643E+001G	7.0E+002	1.10
RA-224		N	1	-1.031E-001	240.99	-1.031E-001	%	(		1.317E+001G	7.0E+002	4.10
CO-60	T F		1	0.000E+000	1332.50	0.000E+000	%	(		4.523E-001G	1.9E+003	99.98
				0.000E+000	1173.24	0.000E+000	%			4.119E-001G	1.9E+003	99.90
I-131	T F I		1	0.000E+000	364.48	0.000E+000	&	(		8.548E-001G	8.0E+000	81.70
				0.000E+000	284.30	1.845E+000	%			7.979E+000G	8.0E+000	6.14
				0.000E+000	636.97	0.000E+000	%			8.276E+000G	8.0E+000	7.17
CS-134	T F I		1	0.000E+000	604.71	0.000E+000	%	(		1.043E+000G	7.5E+002	97.62
				0.000E+000	795.87	-6.591E-002	%			1.011E+000G	7.5E+002	85.53
				0.000E+000	569.32	0.000E+000	%			5.097E+000G	7.5E+002	15.38
				0.000E+000	801.95	8.196E-001	%			9.034E+000G	7.5E+002	8.69
				0.000E+000	563.24	-1.169E+000	%			9.303E+000G	7.5E+002	8.35

Analysis Codes:

% = Peak fails sensitivity test
? = Peak is too narrow
- = Peak activity lower than counting uncertainty range
= = Peak outside analysis energy range
(= This peak is used in the nuclide activity average
P = Peakbackround subtraction
* = Peak is too wide, but only one peak in library
@ = Peak is too wide at FW25M, but OK at FWHM
A = Derived Average Activity
E = Energy Duplication
+ = Peak activity higher than counting uncertainty range
! = Peak is part of a multiplet and this area went negative during deconvolution
$ = Peak identified, but first peak of this nuclide failed one or more qualification tests
& = Calculated peak centroid is not close enough to the library energy centroid for positive identification

Nuclide Codes:

T = Thermal Neutron Activation
F = Fast Neutron Activation
I = Fission Product
P = Photon Reaction
N = Naturally Occurring Isotope
C = Charged Particle Reaction
M = No MDA Calculation

Peak Codes:

G = Gamma Ray
X = X-Ray
P = Positron Decay
S = Single - Escape
D = Double - Escape
K = Key Line
A = Not in Average

SUMMARY OF NUCLIDES IN SAMPLE

Nuclide		Time of Count Activity Bq/sample	Time Corrected Activity Bq/sample	Uncertainty Counts 1 Sigma %	Uncertainty Total 1 Sigma %	Minimum Detectable Activity
BE-7	<	-4.084E-001	-4.091E-001	430.29	430.30	6.444E+000
K-40	<	-3.932E+000	-3.932E+000	184.23	184.25	1.346E+001
CO-60	<			100.00	100.04	4.523E-001
I-131	<			790.96	790.97	8.548E-001
CS-134	<			800.00	800.01	1.043E+000
CS-137	<	-1.338E-001	-1.338E-001	197.32	197.35	9.513E-001
EU-152	<	5.339E-001	5.339E-001	93.11	93.16	1.712E+000
EU-155	<	5.417E-001	5.417E-001	89.24	89.30	1.642E+000
TL-208	<	1.215E-001	1.215E-001	174.01	174.03	8.776E-001
EU-154	<	2.352E-001	2.352E-001	828.27	828.28	7.345E+000
RA-224	<	-1.031E-001	-1.032E-001	3,529.47	3,529.47	1.317E+001
PB-210	#	1.297E+001	1.297E+001	56.91	57.04	2.241E+001
PB-212	<	1.721E-002	1.721E-002	1,538.83	1,538.84	1.159E+000
PB-214	<	-5.357E-001	-5.357E-001	420.53	420.54	1.739E+000
Pa-234	<	-3.165E-001	-3.165E-001	211.81	211.83	2.351E+000
AM-241	<	2.024E-001	2.024E-001	217.04	217.07	1.542E+000
BI-212	<	1.209E+000	1.209E+000	141.46	141.49	6.141E+000
BI-214	<	-3.864E-001	-3.864E-001	283.25	283.27	1.960E+000
AC-228	<	-2.835E-001	-2.835E-001	629.26	629.26	3.479E+000
TH-234	<	-8.713E-001	-8.713E-001	430.44	430.46	1.305E+001
PA-234M	<	9.439E+000	9.439E+000	203.76	203.78	7.450E+001
U-235	<	9.974E-001	9.974E-001	99.09	99.14	3.482E+000

= All peaks for activity calculation had bad shape

Total Activity (37.71 to 1,999.84 keV) 0.00 Bq/sample

Analyzed by: _____

403605

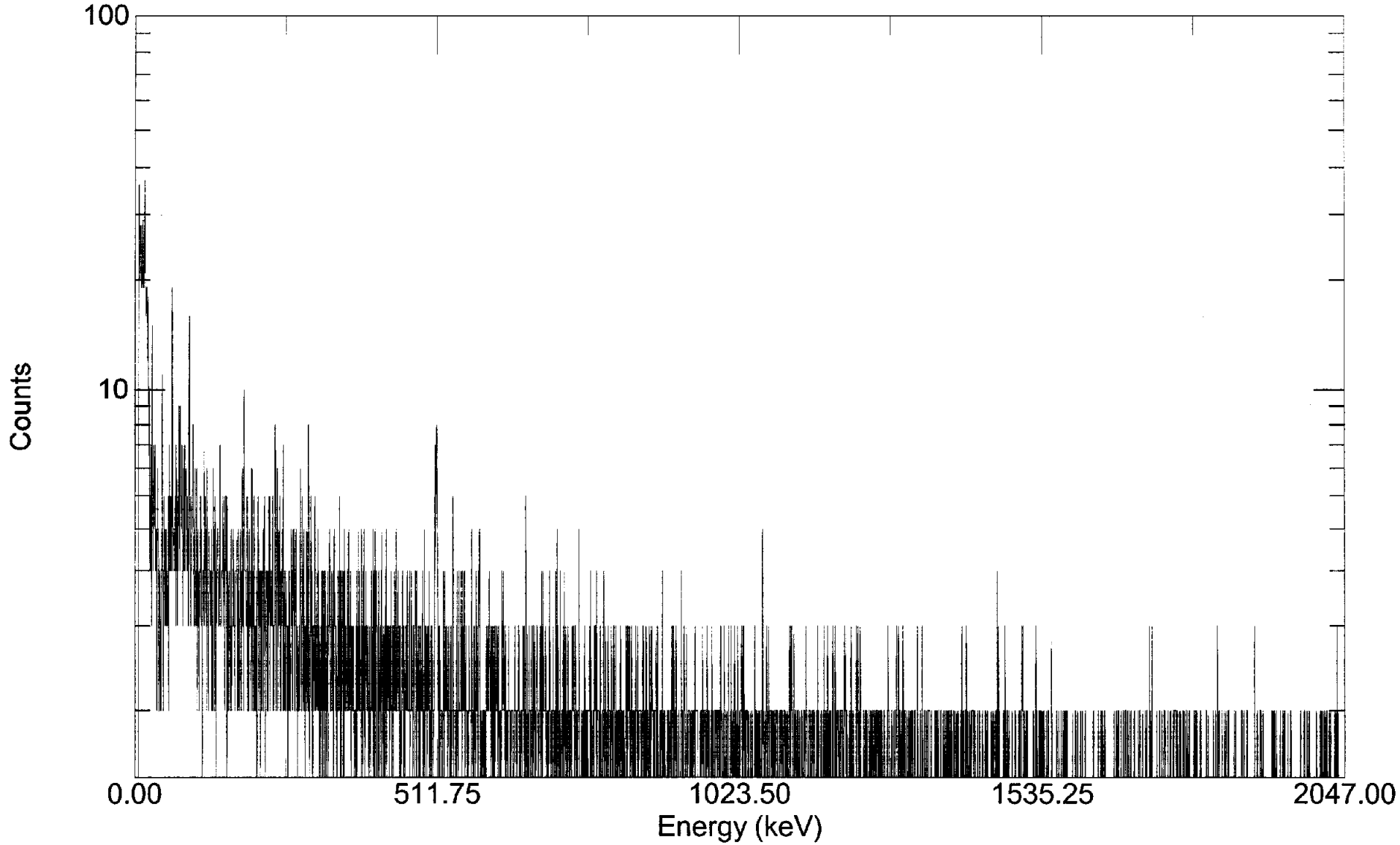
Reviewed by: _____

Supervisor

Laboratory: Test America

KEQKR1AA

7357010_KEQKR1AA_F7L230000-010B



Acquired: 23-Dec-2007 3:03:33 PM
File: C:\User\spectra\KEQKR1AA.spc
Detector: #0 Ge 1 SN/242

Real Time: 1809.64 s. Live Time: 1800.00 s.
Channels: 8192

DB Analysis ID: 32,978

Sample Description: 7357010_KEQKR1AC_F7L230000-010C

Spectrum Filename: KEQKR1AC.An1

Acquisition Information

Start Time:	23-Dec-2007 3:04:26PM		
Live Time:	1800.00	Real Time:	1824.48
Dead Time:	1.34 %		
Detector ID:	3		

Detector System: Ge 3 SN/155

Calibration

Description:	Ge3 74139_334 Tunacan cal 01_11_07		
Filename:	C:\User\Calibrations\Ge3 cal post 5_8_06\Ge3 Tunacan 74139_334 01_11_07.Clb		
Energy Created:	10-Jan-2007 5:13:35PM	Efficiency Created:	11-Jan-2007 1:43:34PM
Zero Offset:	0.416 keV	Gain:	0.250 keV/Channel

Library 1 File: mmr06 short.lib Library based peak stripping used.
Library 2 File: Null.Lib
Library 3 File: Null.Lib

Analysis Parameters

Start Channel:	150 for an energy of 37.87 keV
Stop Channel:	8,000 for an energy of 2000.50 keV
Peak rejection level:	40.000 %
Activity Scaling Factor:	1.0000 / 1.0000 = 1.0000
Detection Limit Method:	Nureg method 4.16
Sample Size:	1.00E+000
Additional random error:	0.0000
Additional systematic error:	0.0000
Fraction Limit:	0.0000%
Background Width:	Average of three points

Corrections	Status	Comments
Decay Correct to Date:	YES	01-Apr-2004 12:00:00PM
Decay During Acquisition:	NO	
Peaked Background Correction:	YES	Ge3 PBC table 11_26_07.Pbc
Absorption:	NO	
Geometry Correction:	NO	
Random Summing:	NO	

Energy Calibration Normalized Differe 0.1307

UNIDENTIFIED PEAK SUMMARY

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncertainty 1 Sigma%	FWHM keV	Suspected Nuclide	Code
144.98	36.62	1728.00	267.00	0.148	27.65	1.091	CE-144	s
350.30	87.90	9785.61	1125.39	0.625	12.78	0.973	PB-214	s
487.04	122.05	2346.67	248.33	0.138	28.31	1.063	CO-57	s

s = Peak fails shape tests.

D = Peak area deconvoluted.

IDENTIFIED PEAK SUMMARY

Nuclide	Library Used	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncertainty 1 Sigma%	FWHM keV	Code
PB-210	1	184.57	46.51	9750.69	26985.30	14.992	1.03	0.937	s
AM-241	1	236.52	59.48	7443.00	31293.00	17.385	0.86	0.911	s
TH-234	1	245.24	61.66	3253.78	-771.65	-0.429	11.36	0.882	s
EU-155	1	350.50	87.95	3121.26	6003.71	3.335	1.84	0.906	s
TH-234	1	363.37	91.16	1573.02	-54.31	-0.030	198.51	0.912	s
U-235	1	372.14	93.35	1992.48	-2.29	-0.001	-1918.15	0.913	s D
AC-228	1	372.14	93.35	1883.85	128.07	0.071	36.41	0.913	s D
EU-155	1	412.03	103.31	1157.27	-21.40	-0.012	225.87	0.925	s
EU-152	1	486.47	121.90	1740.03	865.97	0.481	7.61	0.942	s
EU-154	1	491.26	123.10	1691.94	6.70	0.004	869.09	0.943	s
Pa-234	1	524.34	131.36	1608.15	-0.25	0.000	22535.29	0.952	s
U-235	1	572.41	143.37	1438.26	-4.20	-0.002	2610.11	0.964	s
U-235	1	650.47	162.86	1222.77	24.12	0.013	206.07	0.984	s
U-235	1	822.06	205.72	1424.00	-11.00	-0.006	486.22	1.027	s
PB-212	1	953.72	238.61	1081.58	189.42	0.105	32.38	0.771	s
RA-224	1	961.35	240.51	1525.43	-43.48	-0.024	127.95	1.062	s
PB-214	1	966.85	241.89	1478.61	-2.15	-0.001	2525.25	1.063	s
TL-208	1	1106.26	276.71	1053.28	33.77	0.019	136.98	1.098	s
I-131	1	1134.55	283.78	1108.99	-37.37	-0.021	127.08	1.105	s
PB-214	1	1186.62	296.78	855.11	-1.21	-0.001	1490.60	1.116	s
PB-212	1	1199.84	300.09	1030.91	-19.87	-0.011	229.66	1.121	s
AC-228	1	1354.55	338.74	1098.57	22.64	0.013	189.95	1.158	s
EU-152	1	1378.66	344.76	1039.31	-23.50	-0.013	195.10	1.164	s
PB-214	1	1407.63	352.00	1073.13	29.50	0.016	120.26	1.171	s
I-131	1	1457.68	364.50	937.52	38.56	0.021	113.44	1.184	s
BE-7	1	1904.81	476.21	906.24	21.39	0.012	200.18	1.292	
CS-134	1	2249.74	562.40	479.73	32.65	0.018	96.47	1.372	s
CS-134	1	2277.45	569.32	567.42	2.23	0.001	1189.04	1.378	s D
Pa-234	1	2278.04	569.47	502.05	-0.04	0.000	-389.88	1.378	s D
TL-208	1	2332.23	583.01	684.53	26.72	0.015	107.44	1.390	s
CS-134	1	2408.24	602.00	430.45	13.54	0.008	218.36	1.410	s
BI-214	1	2435.36	608.78	608.89	40.89	0.023	73.96	1.415	s
I-131	1	2538.80	634.63	461.25	21.68	0.012	141.76	1.440	s
CS-137	1	2646.19	661.47	435.00	12245.00	6.803	0.99	1.624	
EU-154	1	2893.28	723.22	504.57	35.22	0.020	91.77	1.518	s
BI-212	1	2909.72	727.33	563.01	-2.16	-0.001	1555.43	1.521	s
PA-234M	1	3064.59	766.04	570.97	29.42	0.016	116.32	1.556	s
EU-152	1	3117.33	779.22	587.15	16.75	0.009	206.05	1.567	s
BI-212	1	3140.93	785.12	577.78	9.35	0.005	365.03	1.572	s
CS-134	1	3180.62	795.04	618.85	32.69	0.018	109.02	1.582	s
CS-134	1	3208.21	801.94	688.25	-8.71	-0.005	427.45	1.587	s
TL-208	1	3442.62	860.53	806.45	12.05	0.007	334.60	1.638	s
EU-154	1	3488.83	872.08	714.76	0.10	0.000	38638.91	1.649	s
Pa-234	1	3523.83	880.83	782.57	-27.61	-0.015	144.54	1.655	s
Pa-234	1	3530.35	882.46	738.30	-13.10	-0.007	294.59	1.657	s

AC-228	1	3643.85	910.83	830.05	27.37	0.015	138.95	1.681	s
Pa-234	1	3791.69	947.79	992.83	-5.49	-0.003	812.93	1.710	s
EU-152	1	3859.52	964.75	921.20	29.46	0.016	146.87	1.726	s
AC-228	1	3873.16	968.16	840.71	-7.39	-0.004	556.42	1.730	s
EU-154	1	3985.85	996.33	713.48	0.00	0.000	3777.50	1.753	s
PA-234M	1	4001.32	1000.20	686.26	-20.15	-0.011	185.21	1.756	s
EU-154	1	4017.86	1004.33	699.82	-0.18	0.000	20909.94	1.760	s
EU-152	1	4448.78	1112.07	636.02	0.00	0.000	3566.56	1.847	s
BI-214	1	4481.18	1120.18	544.01	47.84	0.027	67.65	1.854	s
CO-60	1	4691.56	1172.78	437.33	9455.67	5.253	1.28	1.911	
EU-154	1	5111.08	1277.70	74.28	-4.10	-0.002	301.53	1.975	s
CO-60	1	5328.08	1331.97	63.00	8593.00	4.774	1.12	2.094	s
EU-152	1	5627.53	1406.87	40.43	-0.06	0.000	15376.43	2.076	s
K-40	1	5842.48	1460.63	50.82	-3.21	-0.002	116.76	2.115	s
BI-214	1	7048.58	1762.39	26.34	-1.92	-0.001	1577.65	2.326	s

s = Peak fails shape tests.

D = Peak area deconvoluted.

A = Derived Aveage Activity.

SUMMARY OF LIBRARY PEAK USAGE

Nuclide Name	Code	Library Used	Average Activity Becquerels	Peak Energy keV	Peak Activity Becquerels		Analysis Code	MDA Value Becquerels	Code	Comments	
PB-212	N	1	7.358E+000	238.63	7.358E+000		(P	6.059E+000G		7.0E+002	43.30
			7.358E+000	300.03	-1.206E+001	%		9.245E+001G		7.0E+002	3.28
BI-212	N	1	-7.086E-001	727.33	-7.086E-001	&	(	3.717E+001G		7.0E+002	11.82
			-7.086E-001	785.51	3.488E+001	&		4.280E+002G		7.0E+002	1.10
BE-7	N P C	1	5.774E+000	477.60	5.774E+000	%	(	3.859E+001G		5.3E+001	10.52
CO-60	T F	1	5.246E+002	1332.50	5.256E+002	@	(	2.428E+000G		1.9E+003	99.98
			5.246E+002	1173.24	5.237E+002		(	5.547E+000G		1.9E+003	99.90
CS-137	T F I	1	5.200E+002	661.66	5.200E+002		(	4.243E+000G		1.1E+004	85.21
U-235	N	1	-4.865E-001	143.79	-4.865E-001	&	(P	2.079E+001G		2.6E+011	10.96
			-4.865E-001	205.33	-3.337E+000	&		5.418E+001G		2.6E+011	5.01
			-4.865E-001	163.38	6.350E+000	%		4.362E+001G		2.6E+011	5.08
			-4.865E-001	93.35	-4.865E-001	&	E	4.479E+001X		2.6E+011	5.81
CS-134	T F I	1	4.698E-001	604.71	4.698E-001	%	(	3.448E+000G		7.5E+002	97.62
			4.698E-001	795.87	1.584E+000	%		5.746E+000G		7.5E+002	85.53
			4.698E-001	569.32	4.698E-001	&		2.395E+001G		7.5E+002	15.38
			4.698E-001	801.95	-4.174E+000	&		5.991E+001G		7.5E+002	8.69
			4.698E-001	563.24	1.256E+001	&		4.032E+001G		7.5E+002	8.35
AC-228	N	1	4.317E+000	911.07	4.317E+000	%	(P	2.161E+001G		2.1E+003	29.00
			4.317E+000	968.97	-2.025E+000	%		3.780E+001G		2.1E+003	17.46
			4.317E+000	338.32	4.113E+000	%	P	2.855E+001G		2.1E+003	12.01
			4.317E+000	93.35	2.844E+001	&	} E	4.680E+001X	A	2.1E+003	5.56
EU-154	T F I	1	3.537E-002	873.23	3.537E-002	&	(	4.600E+001G		3.1E+003	12.27
			3.537E-002	123.10	2.008E-001	%		5.825E+000G		3.1E+003	40.79
			3.537E-002	1274.54	-6.873E-001	%		7.191E+000G		3.1E+003	35.19
			3.537E-002	723.36	6.728E+000	&		2.052E+001G		3.1E+003	20.22
			3.537E-002	1004.77	-4.888E-002	&		3.441E+001G		3.1E+003	18.01
			3.537E-002	996.33	0.000E+000	&		5.866E+001G		3.1E+003	10.60
BI-214	N	1	3.021E+000	609.31	3.021E+000	%	(P	8.697E+000G		5.8E+005	46.09
			3.021E+000	1120.29	1.692E+001	%	P	3.940E+001G		5.8E+005	15.10
			3.021E+000	1764.49	-9.685E-001	%	P	1.343E+001G		5.8E+005	15.40
TH-234	N	1	-2.403E+002	63.29	-2.403E+002		(P	8.362E+001G		1.6E+012	4.82
			-2.403E+002	92.59	-1.203E+001	%	P	4.155E+001G		1.6E+012	5.58
K-40	N	1	-1.983E+000	1460.83	-1.983E+000	%	(P	2.220E+001G		4.7E+011	10.67
			1.824E+001	1408.00	-1.781E-002	%		9.845E+000G		4.9E+003	21.00
EU-152	T F	1	1.824E+001	344.29	-1.961E+000	&	(	1.276E+001G		4.9E+003	26.50
			1.824E+001	121.78	3.698E+001	*	(	8.416E+000G		4.9E+003	28.58
			1.824E+001	778.92	5.279E+000	%		3.644E+001G		4.9E+003	12.94
			1.824E+001	964.11	9.622E+000	%		4.708E+001G		4.9E+003	14.61
			1.824E+001	1112.07	0.000E+000	%		4.680E+001G		4.9E+003	13.64
RA-224	N	1	-1.796E+001	240.99	-1.796E+001	&	(	7.631E+001G		7.0E+002	4.10
PB-214	N	1	1.764E+000	351.93	1.764E+000	%	(P	9.291E+000G		5.8E+005	37.60
			1.764E+000	295.09	-1.234E-001	&	P	1.415E+001G		5.8E+005	19.30
			1.764E+000	242.00	-4.925E-001	%		4.159E+001G		5.8E+005	7.43
Pa-234	N	1	-1.730E-002	131.29	-1.730E-002	&	(	1.303E+001G		1.6E+012	18.00

				-1.730E-002	569.47	-1.730E-002	&			4.232E+001G	1.6E+012	8.20
				-1.730E-002	946.02	-1.927E+000	&			5.250E+001G	1.6E+012	13.40
				-1.730E-002	883.24	-6.103E+000	&			6.024E+001G	1.6E+012	9.60
				-1.730E-002	880.53	-2.053E+001	&			9.895E+001G	1.6E+012	6.00
PB-210		N	1	1.563E+004	46.54	1.563E+004	*	(	P	2.682E+002G	8.1E+003	4.25
EU-155	T F I		1	1.454E+002	105.31	-1.225E+000	%	(		9.229E+000G	1.8E+003	21.20
				1.454E+002	86.54	2.467E+002	?	(		1.081E+001G	1.8E+003	30.70
AM-241	T		1	1.383E+003	59.54	1.383E+003	*	(		1.789E+001G	1.6E+005	35.90
PA-234		N	1	-1.181E+002	1001.00	-1.181E+002	&	(		7.314E+002G	1.6E+012	.84
				-1.181E+002	766.41	4.033E+002	%			1.564E+003G	1.6E+012	.29
I-131	T F I		1	1.090E+000	364.48	1.090E+000	*	(		4.111E+000G	8.0E+000	81.70
				1.090E+000	284.30	-1.163E+001	&			4.915E+001G	8.0E+000	6.14
				1.090E+000	636.97	1.064E+001	%			5.045E+001G	8.0E+000	7.17
TL-208	F	N	1	1.042E+000	583.02	1.042E+000	%	(	P	4.862E+000G	7.0E+002	84.50
				1.042E+000	277.28	1.004E+001	%			4.577E+001G	7.0E+002	6.31
				1.042E+000	860.56	4.255E+000	&			4.770E+001G	7.0E+002	12.42

Analysis Codes:

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Nuclide Codes:

T = Thermal Neutron Activation

F = Fast Neutron Activation

I = Fission Product

P = Photon Reaction

N = Naturally Occurring Isotope

C = Charged Particle Reaction

M = No MDA Calculation

Peak Codes:

G = Gamma Ray

X = X-Ray

P = Positron Decay

S = Single - Escape

D = Double - Escape

K = Key Line

A = Not in Average

SUMMARY OF NUCLIDES IN SAMPLE

Nuclide		Time of Count Activity Bq/sample	Time Corrected Activity Bq/sample	Uncertainty Counts 1 Sigma %	Uncertainty Total 1 Sigma %	Minimum Detectable Activity
BE-7	<	5.774E+000		200.18	200.20	3.859E+001
K-40	<	-1.983E+000	-1.983E+000	524.48	524.49	2.220E+001
CO-60		5.246E+002	8.564E+002	0.85	2.97	2.428E+000
I-131	<	1.090E+000		113.44	113.48	4.111E+000
CS-134	<	4.698E-001	1.642E+000	218.36	218.38	3.448E+000
EU-154	<	3.537E-002	4.777E-002	38.638.91	38.638.91	4.600E+001
PB-212		7.358E+000	2.845E+001	35.92	36.05	6.059E+000
PB-214	<	1.764E+000	1.767E+000	157.79	157.82	9.291E+000
BI-212	<	-7.086E-001	-2.740E+000	1.555.43	1.555.43	3.717E+001
CS-137		5.200E+002	5.668E+002	0.99	3.07	4.243E+000
EU-152	<	1.824E+001	2.208E+001	7.61	8.14	1.276E+001
EU-155	<	1.454E+002	2.448E+002	1.84	3.83	9.229E+000
TL-208	<	1.042E+000	4.030E+000	139.44	139.47	4.862E+000
RA-224	<	-1.796E+001	-6.945E+001	127.95	127.98	7.631E+001
PB-210	#	1.563E+004	1.755E+004	1.03	4.03	2.682E+002
BI-214	<	3.021E+000	3.026E+000	86.53	86.57	8.697E+000
AC-228	<	4.317E+000	6.765E+000	150.02	150.04	2.161E+001
PA-234M	<	-1.181E+002	-1.181E+002	185.21	185.23	7.314E+002
U-235	<	-4.865E-001	-4.865E-001	3.943.10	3.943.10	2.079E+001
AM-241	#	1.383E+003	1.391E+003	0.86	3.96	1.789E+001
Pa-234	<	-1.730E-002	-1.730E-002	22.535.29	22.535.29	1.303E+001
TH-234	<	-2.403E+002	-2.403E+002	11.73	12.29	8.362E+001

= All peaks for activity calculation had bad shape

Total Activity (37.87 to 2,000.50 keV) 18,069.12 Bq/sample

Analyzed by: _____

403605

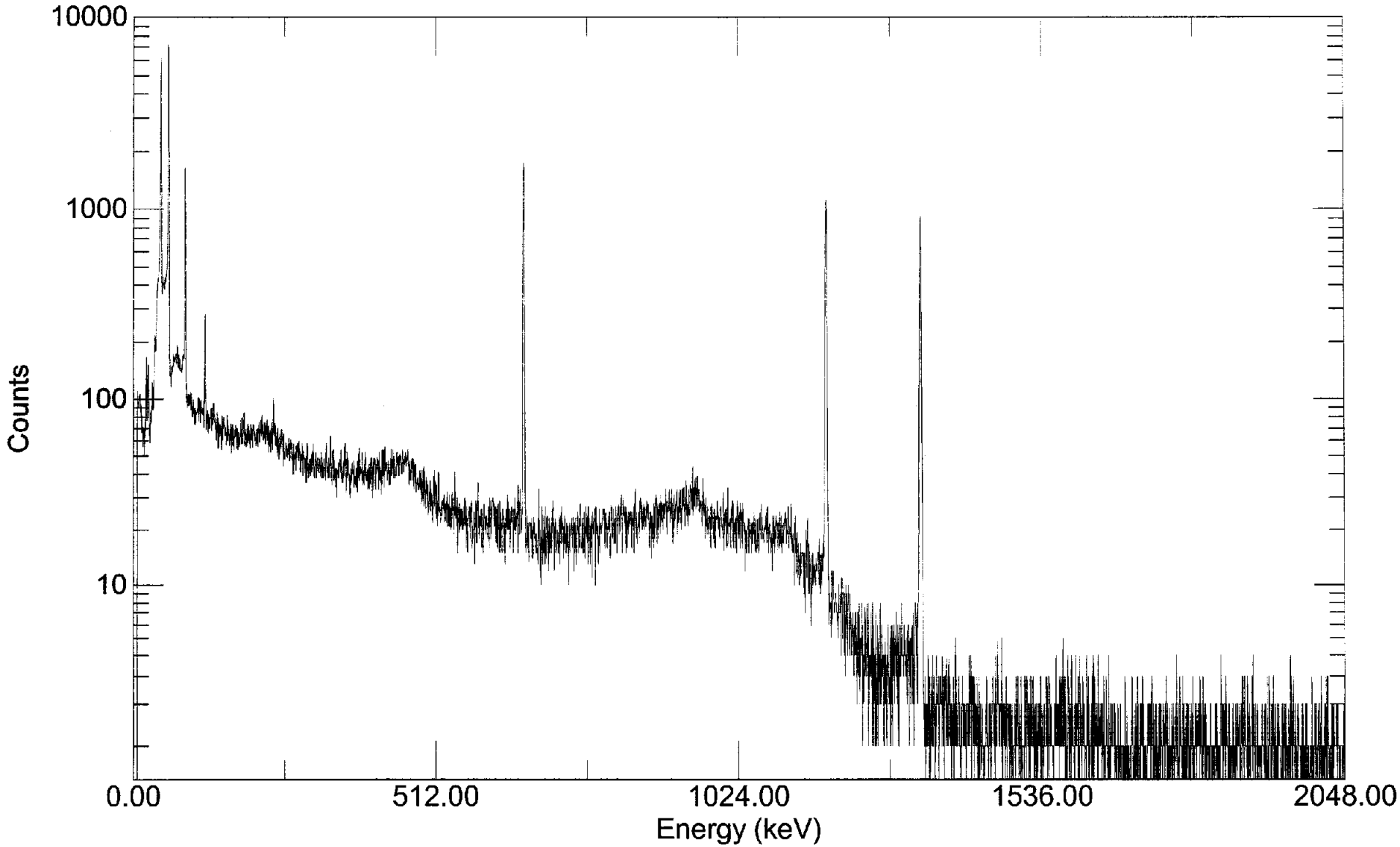
Reviewed by: _____

Supervisor

Laboratory: STL- St Louis

KEQKR1AC

7357010_KEQKR1AC_F7L230000-010C



Acquired: 23-Dec-2007 3:04:26 PM
File: C:\User\spectra\KEQKR1AC.spc
Detector: #0 Ge 3 SN/155

Real Time: 1824.48 s. Live Time: 1800.00 s.
Channels: 8192

TestAmerica St. Louis