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TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

PROJECT NO. 03-3040.30/TA

Great Lakes NS Remediation

Lot #: F7L200271

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: F7L200271

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:
F7L200271 (1): SU1-14-PR
F7L200271 (2): SU2-25-PR
F7L200271 (4): SU3-43-1
F7L200271 (5): SU3-52-2
F7L200271 (6): SU3-55-1
F7L200271 (7): SU3B-049 PR
F7L200271 (8): SU4-64-2
F7L200271 (9): SU4-65-1
F7L200271 (10): SU4-67-2
F7L200271 (11): SU4-76-1
F7L200271 (13): SU5-88-1
F7L200271 (14): SU5-93-1
F7L200271 (15): SU5-93-2
F7L200271 (16): SU5B-054 PR
F7L200271 (17): SU4-79-3

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

F7L200271 CLIENT ANALYSIS SUMMARY

Storage Loc: RAD

Project Manager: IV
Quote #: 77996
SDG:
Date Received: 2007-12-20

Project: 03-3040.30/TA
Great Lakes NS Remediation
Analytical Due Date: 2008-01-04

PO#:
Report to:
Report Due Date: 2008-01-07

Client: 1352406 Cabrera Services, Inc.
#SMPS in LOT: 17
Report Type: W
EDD Code: 00

SAMPLE #	CLIENT SAMPLE ID	Site ID	Client Matrix	DATE/TIME SAMPLED	WORKORDER	A
1	SU1-14-PR			2007-12-03 / 1038	KEKG2	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	SU2-25-PR			2007-12-03 / 1408	KEKHM	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	SU2-31-PR			2007-12-03 / 1345	KEKHQ	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	SU3-43-1			2007-07-30 / 1553	KEKHR	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	SU3-52-2			2007-07-30 / 910	KEKHV	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	SU3-55-1			2007-07-30 / 1248	KEKHX	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	SU3B-049 PR			2007-11-30 / 1100	KEKH1	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

F7L200271 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
8	SU4-64-2			2007-07-31 / 1140	KEKH3	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	SU4-65-1			2007-07-26 / 950	KEKH4	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	SU4-67-2			2007-07-31 / 1240	KEKH5	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	SU4-76-1			2007-07-26 / 1425	KEKH6	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	SU5-103-1			2007-07-31 / 1230	KEKH9	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	SU5-88-1			2007-07-31 / 1320	KEKJC	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	SU5-93-1			2007-07-31 / 1200	KEKJE	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

F7L200271

CLIENT ANALYSIS SUMMARY

Storage Loc: RAD

Project Manager: IV
Quote #: 77996
SDG:
Date Received: 2007-12-20

Project: 03-3040.30/TA
Great Lakes NS Remediation
Analytical Due Date: 2008-01-04

PO#:
Report to:
Report Due Date: 2008-01-07

Client: 1352406 Cabrera Services, Inc.
#SMPS in LOT: 17
Report Type: W
EDD Code: 00

SAMPLE #	CLIENT SAMPLE ID	Site ID	Client Matrix	DATE/TIME SAMPLED	WORKORDER	A
15	SU5-93-2			2007-07-31 / 1200	KEKJG	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	SU5B-054 PR			2007-11-30 / 1355	KEKJJ	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	SU4-79-3			2007-07-26 / 1305	KEKLC	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# F7L200271

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: 1
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_____			SDG No.
(xxx) xxx-xxxx FAX	☐ 2 weeks			
Project Name: Great Lakes Naval Training Center	☐ 1 week			
Site:	☐ 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:
SU1-14-PR	12/3/07	1038	Grab	Soil	1		X	
SU2-25-PR	12/3/07	1408	Grab	Soil	1		X	
SU2-31-PR	12/3/07	1345	Grab	Soil	1		X	
SU3-43-1	7/30/07	1553	Grab	Soil	1		X	
SU3-52-2	7/30/07	0810	Grab	Soil	1		X	
SU3-55-1	7/30/07	1248	Grab	Soil	1		X	
SU3B-049 PR	11/30/07	1100	Grab	Soil	1		X	
SU4-64-2	7/31/07	1140	Grab	Soil	1		X	
SU4-65-1	7/26/07	0950	Grab	Soil	1		X	
SU4-67-2	7/31/07	1240	Grab	Soil	1		X	
SU4-76-1	7/26/07	1425	Grab	Soil	1		X	
SU4-79-3	7/26/07	1305	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], K. ANDREWS	CABRERA	12/13/07, 1830	[signature]	TA	12-20-07 0930
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:

TestAmerica St. Louis

LOT# F7L200271

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: 1
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_____			SDG No.
(xxx) xxx-xxxx FAX	☐ 2 weeks			
Project Name: Great Lakes Naval Training Center	☐ 1 week			
Site:	☐ 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:
SU5-103-1	7/31/07	1230	Grab	Soil	1		X	
SU5-88-1	7/31/07	1320	Grab	Soil	1		X	
SU5-93-1	7/31/07	1200	Grab	Soil	1		X	
SU5-93-2	7/31/07	1200	Grab	Soil	1		X	
SU5B-054 PR	11/30/07	1355	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, 123	[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
THE LEADER IN ENVIRONMENTAL TESTING

Lot #(s): F7L200251, 260, 270, 271

- 1412 -

Condition Upon Receipt Form

Client: Cabrera
Quote No: 77996
COC/RFA No: 2,3,4,1
Initiated By:
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: Sheryl A Allen 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.

Location: Sample Containers
Site: GLN.TL PPV Manifolds

RWP# 003

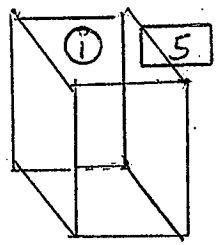
Survey # 03-3040, 30-272

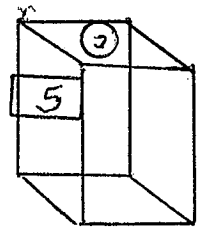
Survey Type:

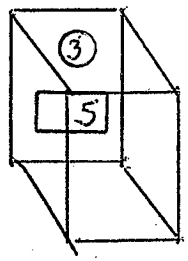
pg. 1 of 1

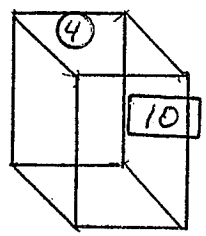
(Smear) (CPM/100 cm²)
Direct Count (CPM/Direct Frisk)
circle one

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		









Comments

Surveyed By:	Date:	Instrument	Serial #	α Eff.	β Eff.	α Bkg.	β Bkg	γ Bkg	Cal. Due
K. Gordon	12/13/07	Bicron	C854F	N/A	N/A	N/A	N/A	5	6/17/08
		2929	163827	.3649	.2385	.15	44.2	N/A	9/7/08

Key

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

Reviewed By: [signature] Date: 12/13/07

LOT# F7L200271
9 of 303
TestAmerica St. Louis

METHODS SUMMARY

F7L200271

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

F7L200271

WO #	SAMPLE#	CLIENT SAMPLE ID	SAMPLED DATE	SAMP TIME
KEKG2	001	SU1-14-PR	12/03/07	10:38
KEKHM	002	SU2-25-PR	12/03/07	14:08
KEKHQ	003	SU2-31-PR	12/03/07	13:45
KEKHR	004	SU3-43-1	07/30/07	15:53
KEKHV	005	SU3-52-2	07/30/07	09:10
KEKHX	006	SU3-55-1	07/30/07	12:48
KEKH1	007	SU3B-049 PR	11/30/07	11:00
KEKH3	008	SU4-64-2	07/31/07	11:40
KEKH4	009	SU4-65-1	07/26/07	09:50
KEKH5	010	SU4-67-2	07/31/07	12:40
KEKH6	011	SU4-76-1	07/26/07	14:25
KEKH9	012	SU5-103-1	07/31/07	12:30
KEKJC	013	SU5-88-1	07/31/07	13:20
KEKJE	014	SU5-93-1	07/31/07	12:00
KEKJG	015	SU5-93-2	07/31/07	12:00
KEKJJ	016	SU5B-054 PR	11/30/07	13:55
KEKLC	017	SU4-79-3	07/26/07	13:05

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: SU1-14-PR

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F7L200271-001
Work Order: KEKG2
Matrix: SOLID

Date Collected: 12/03/07 1038
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 # 7360294**	**Yld %**
Actinium 228	**0.80**		**0.30**	0.25	**0.35**	**12/26/07**	**12/26/07**

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: SU1-14-PR DUP

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F7L200271-001X
Work Order: KEKG2
Matrix: SOLID

Date Collected: 12/03/07 1038
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 # 7360294**	**Yld %**
Actinium 228	**0.77**		**0.24**	0.25	**0.43**	**12/26/07**	**12/26/07**

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: SU2-25-PR

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F7L200271-002
Work Order: KEKHM
Matrix: SOLID

Date Collected: 12/03/07 1408
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 # 7360294**	**Yld %**
Actinium 228	**0.98**		**0.22**	0.25	**0.28**	**12/26/07**	**12/26/07**

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: SU2-31-PR

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F7L200271-003
Work Order: KEKHQ
Matrix: SOLID

Date Collected: 12/03/07 1345
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 # 7360294**	**Yld %**
Actinium 228	**1.0**		**0.26**	0.25	**0.20**	**12/26/07**	**12/26/07**

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: SU3-43-1

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F7L200271-004
Work Order: KEKHR
Matrix: SOLID

Date Collected: 07/30/07 1553
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 # 7360294**	**Yld %**
Actinium 228	**1.48**		**0.30**	0.25	**0.41**	**12/26/07**	**12/26/07**

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: SU3-52-2

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F7L200271-005
Work Order: KEKHV
Matrix: SOLID

Date Collected: 07/30/07 0910
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 # 7360294**	**Yld %**
Actinium 228	**1.10**		**0.32**	0.25	**0.45**	**12/26/07**	**12/26/07**

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: SU3-55-1

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F7L200271-006
Work Order: KEKHX
Matrix: SOLID

Date Collected: 07/30/07 1248
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 # 7360294**	**Yld %**
Actinium 228	**1.20**		**0.24**	0.25	**0.34**	**12/26/07**	**12/26/07**

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: SU3B-049 PR

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F7L200271-007
Work Order: KEKH1
Matrix: SOLID

Date Collected: 11/30/07 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 # 7360294**	**Yld %**
Actinium 228	**4.60**		**0.51**	0.25	**0.26**	**12/26/07**	**12/26/07**

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: SU4-64-2

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F7L200271-008
Work Order: KEKH3
Matrix: SOLID

Date Collected: 07/31/07 1140
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 # 7360294**	**Yld %**
Actinium 228	**1.00**		**0.21**	0.25	**0.29**	**12/26/07**	**12/26/07**

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: SU4-65-1

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F7L200271-009
Work Order: KEKH4
Matrix: SOLID

Date Collected: 07/26/07 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 # 7360294**	**Yld %**
Actinium 228	**0.63**		**0.20**	0.25	**0.33**	**12/26/07**	**12/26/07**

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: SU4-67-2

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F7L200271-010
Work Order: KEKH5
Matrix: SOLID

Date Collected: 07/31/07 1240
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 # 7360294**	**Yld %**
Actinium 228	**1.11**		**0.28**	0.25	**0.28**	**12/26/07**	**12/26/07**

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: SU4-76-1

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F7L200271-011
Work Order: KEKH6
Matrix: SOLID

Date Collected: 07/26/07 1425
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 # 7360294**	**Yld %**
Actinium 228	**1.13**		**0.26**	0.25	**0.37**	**12/26/07**	**12/26/07**

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: SU5-103-1

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F7L200271-012
Work Order: KEKH9
Matrix: SOLID

Date Collected: 07/31/07 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 # 7360294**	**Yld %**
Actinium 228	**1.41**		**0.25**	0.25	**0.24**	**12/26/07**	**12/26/07**

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: SU5-88-1

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F7L200271-013
Work Order: KEKJC
Matrix: SOLID

Date Collected: 07/31/07 1320
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 # 7360294**	**Yld %**
Actinium 228	**0.74**		**0.24**	0.25	**0.39**	**12/26/07**	**12/26/07**

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: SU5-93-1

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F7L200271-014
Work Order: KEKJE
Matrix: SOLID

Date Collected: 07/31/07 1200
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 # 7360294**	**Yld %**
Actinium 228	**1.12**		**0.35**	0.25	**0.38**	**12/26/07**	**12/26/07**

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: SU5-93-2

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F7L200271-015
Work Order: KEKJG
Matrix: SOLID

Date Collected: 07/31/07 1200
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 # 7360294**	**Yld %**
Actinium 228	**1.11**		**0.31**	0.25	**0.41**	**12/26/07**	**12/26/07**

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: SU5B-054 PR

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F7L200271-016
Work Order: KEKJJ
Matrix: SOLID

Date Collected: 11/30/07 1355
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 # 7360294**	**Yld %**
Actinium 228	**3.04**		**0.44**	0.25	**0.30**	**12/26/07**	**12/26/07**

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: SU4-79-3

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F7L200271-017
Work Order: KEKLC
Matrix: SOLID

Date Collected: 07/26/07 1305
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 # 7360294**	**Yld %**
Actinium 228	**1.07**		**0.23**	0.25	**0.42**	**12/26/07**	**12/26/07**

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: F7L200271
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 # 7360294**		**Yld %**		**F7L260000-294B**
Actinium 228	-0.04	U	0.48	0.25	0.25		12/26/07	12/26/07

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: F7L200271
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**			**F7L260000-294C**
Americium 241	103	107	8.5	1.5		103	(85 - 118)
Cesium 137	40.0	41.5	2.6	0.5		104	(91 - 120)
Cobalt 60	62.7	63.9	3.9	0.4		102	(91 - 112)
	Batch #:	7360294		**Analysis Date:**	12/26/07		

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: F7L200271
Matrix: SOLID

Date Sampled: 12/03/07
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**			**F7L200271-001**	
Actinium 228	**0.80**	**0.30**		**0.77**	**0.24**		4	%RPD
	Batch #:	7360294	(Sample)	7360294	(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: 7360294 **Operator:** 60040

SampID	WRKNO	Aliquot	Sigma	Instrument	Detector	CountDateTime	CountDuration
F7L200271-001	KEKG21AC	345.10g	2.00	GammaVision	GV05	12 / 26 / 07 17:00	30

Analyte	Cmpnd#	Activity	TotalUnc	CountUnc	MDA	MLCC	Act/MDA
AC-228	1501	8.027E-001 pCi/g	2.996E-001	2.961E-001	3.452E-001	0.000E+000	2.33

SampID	WRKNO	Aliquot	Sigma	Instrument	Detector	CountDateTime	CountDuration
F7L200271-001X	KEKG21AD	345.10g	2.00	GammaVision	GV07	12 / 26 / 07 17:46	30

Analyte	Cmpnd#	Activity	TotalUnc	CountUnc	MDA	MLCC	Act/MDA
AC-228	1501	7.740E-001 pCi/g	2.373E-001	2.330E-001	4.261E-001	0.000E+000	1.82

SampID	WRKNO	Aliquot	Sigma	Instrument	Detector	CountDateTime	CountDuration
F7L200271-002	KEKHM1AC	394.00g	2.00	GammaVision	GV07	12 / 26 / 07 17:01	30

Analyte	Cmpnd#	Activity	TotalUnc	CountUnc	MDA	MLCC	Act/MDA
AC-228	1501	9.755E-001 pCi/g	2.162E-001	2.088E-001	2.785E-001	0.000E+000	3.50

SampID	WRKNO	Aliquot	Sigma	Instrument	Detector	CountDateTime	CountDuration
F7L200271-003	KEKHQ1AC	373.20g	2.00	GammaVision	GV01	12 / 26 / 07 17:44	30

Analyte	Cmpnd#	Activity	TotalUnc	CountUnc	MDA	MLCC	Act/MDA
AC-228	1501	9.982E-001 pCi/g	2.566E-001	2.501E-001	1.972E-001	8.280E-002	5.06

SampID	WRKNO	Aliquot	Sigma	Instrument	Detector	CountDateTime	CountDuration
F7L200271-004	KEKHR1AC	300.90g	2.00	GammaVision	GV03	12 / 26 / 07 17:45	30

Analyte	Cmpnd#	Activity	TotalUnc	CountUnc	MDA	MLCC	Act/MDA
AC-228	1501	1.485E+000 pCi/g	2.978E-001	2.853E-001	4.143E-001	1.879E-001	3.58

SampID	WRKNO	Aliquot	Sigma	Instrument	Detector	CountDateTime	CountDuration
F7L200271-005	KEKHV1AC	303.20g	2.00	GammaVision	GV04	12 / 26 / 07 17:45	30

Analyte	Cmpnd#	Activity	TotalUnc	CountUnc	MDA	MLCC	Act/MDA
AC-228	1501	1.100E+000 pCi/g	3.198E-001	3.135E-001	4.476E-001	1.929E-001	2.46

SampID	WRKNO	Aliquot	Sigma	Instrument	Detector	CountDateTime	CountDuration
F7L200271-006	KEKHX1AC	399.60g	2.00	GammaVision	GV05	12 / 26 / 07 17:45	30

Analyte	Cmpnd#	Activity	TotalUnc	CountUnc	MDA	MLCC	Act/MDA
AC-228	1501	1.198E+000 pCi/g	2.448E-001	2.349E-001	3.370E-001	0.000E+000	3.56

SampID	WRKNO	Aliquot	Sigma	Instrument	Detector	CountDateTime	CountDuration
F7L200271-007	KEKH11AC	352.50g	2.00	GammaVision	GV01	12 / 26 / 07 18:22	30

Analyte	Cmpnd#	Activity	TotalUnc	CountUnc	MDA	MLCC	Act/MDA
AC-228	1501	4.598E+000 pCi/g	5.115E-001	4.377E-001	2.595E-001	1.130E-001	17.72

SampID	WRKNO	Aliquot	Sigma	Instrument	Detector	CountDateTime	CountDuration
F7L200271-008	KEKH31AC	405.40g	2.00	GammaVision	GV03	12 / 26 / 07 18:23	30

Analyte	Cmpnd#	Activity	TotalUnc	CountUnc	MDA	MLCC	Act/MDA
AC-228	1501	1.001E+000 pCi/g	2.104E-001	2.023E-001	2.853E-001	1.284E-001	3.51

SampID	WRKNO	Aliquot	Sigma	Instrument	Detector	CountDateTime	CountDuration
F7L200271-009	KEKH41AC	407.30g	2.00	GammaVision	GV04	12 / 26 / 07 18:23	30

Analyte	Cmpnd#	Activity	TotalUnc	CountUnc	MDA	MLCC	Act/MDA
AC-228	1501	6.297E-001 pCi/g	1.985E-001	1.951E-001	3.255E-001	1.397E-001	1.93

SampID	WRKNO	Aliquot	Sigma	Instrument	Detector	CountDateTime	CountDuration
F7L200271-010	KEKH51AC	344.00g	2.00	GammaVision	GV05	12 / 26 / 07 18:24	30

Analyte	Cmpnd#	Activity	TotalUnc	CountUnc	MDA	MLCC	Act/MDA
AC-228	1501	1.113E+000 pCi/g	2.806E-001	2.732E-001	2.807E-001	0.000E+000	3.97

SampID	WRKNO	Aliquot	Sigma	Instrument	Detector	CountDateTime	CountDuration
F7L200271-011	KEKH61AC	362.30g	2.00	GammaVision	GV07	12 / 26 / 07 18:24	30

Analyte	Cmpnd#	Activity	TotalUnc	CountUnc	MDA	MLCC	Act/MDA
AC-228	1501	1.134E+000 pCi/g	2.591E-001	2.507E-001	3.707E-001	0.000E+000	3.06

SampID	WRKNO	Aliquot	Sigma	Instrument	Detector	CountDateTime	CountDuration
F7L200271-012	KEKH91AC	322.20g	2.00	GammaVision	GV01	12 / 26 / 07 19:00	30

Analyte	Cmpnd#	Activity	TotalUnc	CountUnc	MDA	MLCC	Act/MDA
AC-228	1501	1.408E+000 pCi/g	2.509E-001	2.375E-001	2.417E-001	1.025E-001	5.83

SampID	WRKNO	Aliquot	Sigma	Instrument	Detector	CountDateTime	CountDuration
F7L200271-013	KEKJC1AC	305.20g	2.00	GammaVision	GV03	12 / 26 / 07 19:00	30

Analyte	Cmpnd#	Activity		TotalUnc	CountUnc	MDA	MLCC	Act/MDA
AC-228	1501	7.363E-001	pCi/g	2.375E-001	2.337E-001	3.924E-001	1.773E-001	1.88

SampID	WRKNO	Aliquot	Sigma	Instrument	Detector	CountDateTime	CountDuration
F7L200271-014	KEKJE1AC	402.40g	2.00	GammaVision	GV04	12 / 26 / 07 19:01	30

Analyte	Cmpnd#	Activity		TotalUnc	CountUnc	MDA	MLCC	Act/MDA
AC-228	1501	1.115E+000	pCi/g	3.495E-001	3.436E-001	3.817E-001	1.676E-001	2.92

SampID	WRKNO	Aliquot	Sigma	Instrument	Detector	CountDateTime	CountDuration
F7L200271-015	KEKJG1AC	348.50g	2.00	GammaVision	GV05	12 / 26 / 07 19:01	30

Analyte	Cmpnd#	Activity		TotalUnc	CountUnc	MDA	MLCC	Act/MDA
AC-228	1501	1.113E+000	pCi/g	3.093E-001	3.025E-001	4.093E-001	0.000E+000	2.72

SampID	WRKNO	Aliquot	Sigma	Instrument	Detector	CountDateTime	CountDuration
F7L200271-016	KEKJJ1AC	332.10g	2.00	GammaVision	GV07	12 / 26 / 07 19:02	30

Analyte	Cmpnd#	Activity		TotalUnc	CountUnc	MDA	MLCC	Act/MDA
AC-228	1501	3.045E+000	pCi/g	4.419E-001	4.057E-001	2.994E-001	0.000E+000	10.17

SampID	WRKNO	Aliquot	Sigma	Instrument	Detector	CountDateTime	CountDuration
F7L200271-017	KEKLC1AC	334.60g	2.00	GammaVision	GV01	12 / 26 / 07 19:40	30

Analyte	Cmpnd#	Activity		TotalUnc	CountUnc	MDA	MLCC	Act/MDA
AC-228	1501	1.068E+000	pCi/g	2.324E-001	2.242E-001	4.157E-001	1.903E-001	2.57

SampID	WRKNO	Aliquot	Sigma	Instrument	Detector	CountDateTime	CountDuration
F7L260000-294B	KER4L1AA	372.80g	2.00	GammaVision	GV03	12 / 26 / 07 19:41	30

Analyte	Cmpnd#	Activity		TotalUnc	CountUnc	MDA	MLCC	Act/MDA
AC-228	1501	-4.314E-002	pCi/g	4.777E-001	4.777E-001	2.507E-001	1.099E-001	-0.17

SampID	WRKNO	Aliquot	Sigma	Instrument	Detector	CountDateTime	CountDuration
F7L260000-294C	KER4L1AC	351.20g	2.00	GammaVision	GV04	12 / 26 / 07 19:43	30

Analyte	Cmpnd#	Activity		TotalUnc	CountUnc	MDA	MLCC	Act/MDA
AM-241	1493	1.065E+002	pCi/g	8.467E+000	1.954E+000	1.457E+000	7.223E-001	73.09
CO-60	1515	6.393E+001	pCi/g	3.865E+000	1.311E+000	3.732E-001	1.692E-001	171.31
CS-137	1518	4.155E+001	pCi/g	2.649E+000	1.098E+000	4.909E-001	2.379E-001	84.64

Laboratory Control Sample Information

Sample ID	WRKNO	Analyte	Activity		StdAdded	Recovery
F7L260000-294C	KER4L1AC	CS-137	4.155E+001	pCi/g	4.002E+001	103.83%
		CO-60	6.393E+001	pCi/g	6.272E+001	101.93%
		AM-241	1.065E+002	pCi/g	1.031E+002	103.29%

Sample Duplicate Information

Sample ID	Dup Sample ID	Analyte	Samp Activity		Dup Activity	RPD	RER	DER	Flag
F7L200271-001	F7L200271-001X	AC-228	8.027E-001	pCi/g	7.740E-001	3.63%	5.335E-002	1.499E-001	

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Instrument Checks

TestAmerica STL

Gamma Spectroscopy Daily Check Summary

Detector: 1

Measurement Date/Time: 12/26/2007 7:43:38

	Minimum	Low	Current	High	Maximum	Result
Bkg Count Rate (CPS)	3.250	3.500	3.693	4.250	4.500	ok
Total Activity (Bq)	1841.0	1880.0	1936.5	1996.0	2035.0	ok
Peak Shift (keV)	-0.3000	-0.2000	-0.1193	0.2000	0.2500	ok
Avg FWHM Ratio	0.9000	0.9500	0.9944	1.0500	1.1000	ok
Avg FWTM Ratio	0.9000	0.9500	1.0036	1.1000	1.1500	ok

Detector: 3

Measurement Date/Time: 12/26/2007 7:44:32

	Minimum	Low	Current	High	Maximum	Result
Bkg Count Rate (CPS)	2.500	2.750	3.095	3.250	3.500	ok
Total Activity (Bq)	1835.0	1874.0	1947.2	1990.0	2029.0	ok
Peak Shift (keV)	-0.3000	-0.2500	-0.1686	0.2500	0.3000	ok
Avg FWHM Ratio	0.8500	0.9000	1.0571	1.1500	1.2500	ok
Avg FWTM Ratio	0.9000	0.9500	1.1792	1.1500	1.2500	High

Detector: 4

Measurement Date/Time: 12/26/2007 7:44:20

	Minimum	Low	Current	High	Maximum	Result
Bkg Count Rate (CPS)	1.150	1.200	1.430	1.450	1.500	ok
Total Activity (Bq)	1833.7	1872.3	1939.6	1988.2	2026.8	ok
Peak Shift (keV)	-0.5000	-0.2500	-0.1839	0.2500	0.5000	ok
Avg FWHM Ratio	0.7000	0.8000	0.9414	1.1000	1.2500	ok
Avg FWTM Ratio	0.7000	0.8000	0.9679	1.1000	1.2500	ok

Detector: 5

Measurement Date/Time: 12/26/2007 7:46:49

	Minimum	Low	Current	High	Maximum	Result
Bkg Count Rate (CPS)	1.250	1.500	1.865	2.000	2.250	ok
Total Activity (Bq)	1837.9	1876.6	1929.5	1992.7	2031.4	ok
Peak Shift (keV)	-0.2500	-0.1750	0.0844	0.1750	0.2500	ok
Avg FWHM Ratio	0.8500	0.9000	0.9794	1.1000	1.1500	ok
Avg FWTM Ratio	0.9000	0.9500	1.0020	1.1500	1.2000	ok

Gamma Spectroscopy Daily Check Summary

Detector: 6

Measurement Date/Time: 12/26/2007 7:45:40

	Minimum	Low	Current	High	Maximum	Result
Bkg Count Rate (CPS)	2.350	2.600	2.724	3.150	3.400	ok
Total Activity (Bq)	1829.3	1867.8	1888.0	1983.3	2021.8	ok
Peak Shift (keV)	-0.5000	-0.2500	-0.1428	0.2500	0.5000	ok
Avg FWHM Ratio	0.7500	0.9000	0.9913	1.1500	1.3000	ok
Avg FWTM Ratio	0.7500	0.9000	1.0441	1.1500	1.3000	ok

Detector: 7

Measurement Date/Time: 12/26/2007 7:46:09

	Minimum	Low	Current	High	Maximum	Result
Bkg Count Rate (CPS)	0.750	1.000	1.292	1.750	2.000	ok
Total Activity (Bq)	1850.0	1875.0	1913.1	1975.0	2000.0	ok
Peak Shift (keV)	-0.5000	-0.2500	-0.0172	0.2500	0.5000	ok
Avg FWHM Ratio	0.8000	0.8500	1.0381	1.1500	1.2000	ok
Avg FWTM Ratio	0.8000	0.8500	1.0748	1.2000	1.2500	ok

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

Analyst SE

Date 12/26/7

GammaVision V6.01 QA Background Report 12/26/2007 6:35:19 AM

Detector: 1 Ge 1 SN/242
Measurement Number: 1281
Data Acquired On: 12/26/2007 6:15:11 AM
Real Time: 1206.34 Sec.
Live Time: 1200.00 Sec.
Status: OK

	Minimum	Low	Actual	High	Maximum
Background (CPS):	3.25	3.50	3.69	4.25	4.50

GammaVision V6.01 QA Background Report 12/26/2007 6:35:31 AM

Detector:	3 Ge 3 SN/155
Measurement Number:	1210
Data Acquired On:	12/26/2007 6:15:19 AM
Real Time:	1208.62 Sec.
Live Time:	1200.00 Sec.
Status:	OK

	Minimum	Low	Actual	High	Maximum
Background (CPS):	2.50	2.75	3.10	3.25	3.50

GammaVision V6.01 QA Background Report 12/26/2007 6:35:33 AM

Detector: 4 Ge 4 SN/181
Measurement Number: 102
Data Acquired On: 12/26/2007 6:15:29 AM
Real Time: 1202.16 Sec.
Live Time: 1200.00 Sec.
Status: OK

	Minimum	Low	Actual	High	Maximum
Background (CPS):	1.15	1.20	1.43	1.45	1.50

GammaVision V6.01 QA Background Report 12/26/2007 6:35:45 AM

Detector:	5 Ge 5 SN/157
Measurement Number:	248
Data Acquired On:	12/26/2007 6:15:41 AM
Real Time:	1200.00 Sec.
Live Time:	1143.82 Sec.
Status:	OK

	Minimum	Low	Actual	High	Maximum
Background (CPS):	1.25	1.50	1.86	2.00	2.25

GammaVision V6.01 QA Background Report 12/26/2007 6:35:55 AM

Detector:	6 Ge 6 SN/164
Measurement Number:	176
Data Acquired On:	12/26/2007 6:15:50 AM
Real Time:	1203.80 Sec.
Live Time:	1200.00 Sec.
Status:	OK

	Minimum	Low	Actual	High	Maximum
Background (CPS):	2.35	2.60	2.72	3.15	3.40

GammaVision V6.01 QA Background Report 12/26/2007 6:36:17 AM

Detector:	7 Ge 7 SN/154
Measurement Number:	342
Data Acquired On:	12/26/2007 6:16:00 AM
Real Time:	1213.76 Sec.
Live Time:	1200.00 Sec.
Status:	OK

	Minimum	Low	Actual	High	Maximum
Background (CPS):	0.75	1.00	1.29	1.75	2.00

GammaVision V6.01 QA Background Report 12/26/2007 7:36:06 AM

Detector:	8 Ge 8 SN/174
Measurement Number:	1229
Data Acquired On:	12/26/2007 7:15:19 AM
Real Time:	1245.20 Sec.
Live Time:	1200.00 Sec.
Status:	Warning (Below Low Limit)

	Minimum	Low	Actual	High	Maximum
Background (CPS):	1.25	1.50	1.44	2.00	2.25

GammaVision Report Writer Version 2.04.0 G53W4.21 26-Dec-2007 7:43:36AM Page 1

DB Analysis ID: 32,997

Sample Description: 03-0366

Spectrum Filename: QA101260.Spc

Acquisition Information

Start Time:	26-Dec-2007 7:12:57AM		
Live Time:	1800.00	Real Time:	1821.34
Dead Time:	1.17 %		
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: 0.1856

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	3.343E+002	6.233E+002	1.73	5.96	1.245E+000
CS-137	3.505E+002	3.908E+002	2.07	6.41	2.868E+000
AM-241	9.154E+002	9.224E+002	1.01	9.33	4.521E+000

= All peaks for activity calculation had bad shape

Total Activity (25.11 to 1,999.43 keV) 1,600.31 Bq/SA

Analyzed by: _____

403605

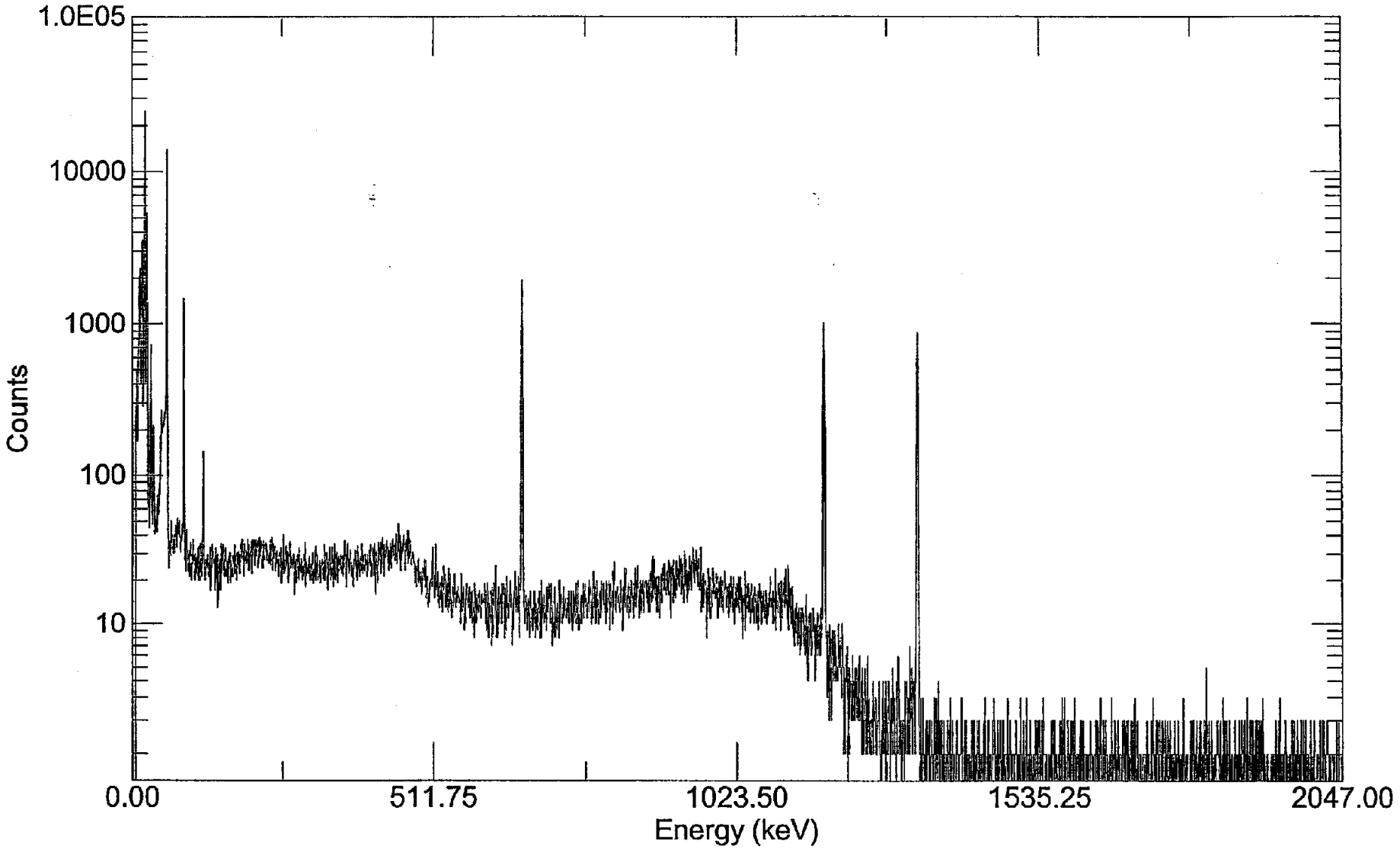
Reviewed by: _____

Supervisor

Laboratory: Test America

QA101260

03-0366



Acquired: 26-Dec-2007 7:12:57 AM
File: C:\User\spectra\QA101260.spc
Detector: #0 Ge 1 SN/242

Real Time: 1821.34 s. Live Time: 1800.00 s.
Channels: 8192

GammaVision Report Writer Version 2.04.0 G53W4.21 26-Dec-2007 7:44:29AM Page 1

DB Analysis ID: 32,999

Sample Description: 03-0368

Spectrum Filename: QA301295.Spc

Acquisition Information

Start Time:	26-Dec-2007 7:13:13AM		
Live Time:	1800.00	Real Time:	1827.76
Dead Time:	1.52 %		
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 Difference: 0.2201

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		3.378E+002	6.298E+002	1.75	5.96	2.007E+000
CS-137		3.582E+002	3.993E+002	2.04	6.21	2.940E+000
AM-241	#	9.112E+002	9.181E+002	1.00	9.33	4.742E+000

= All peaks for activity calculation had bad shape

Total Activity (25.35 to 2,000.41 keV) 1,607.20 Bq/SA

Analyzed by: _____

403605

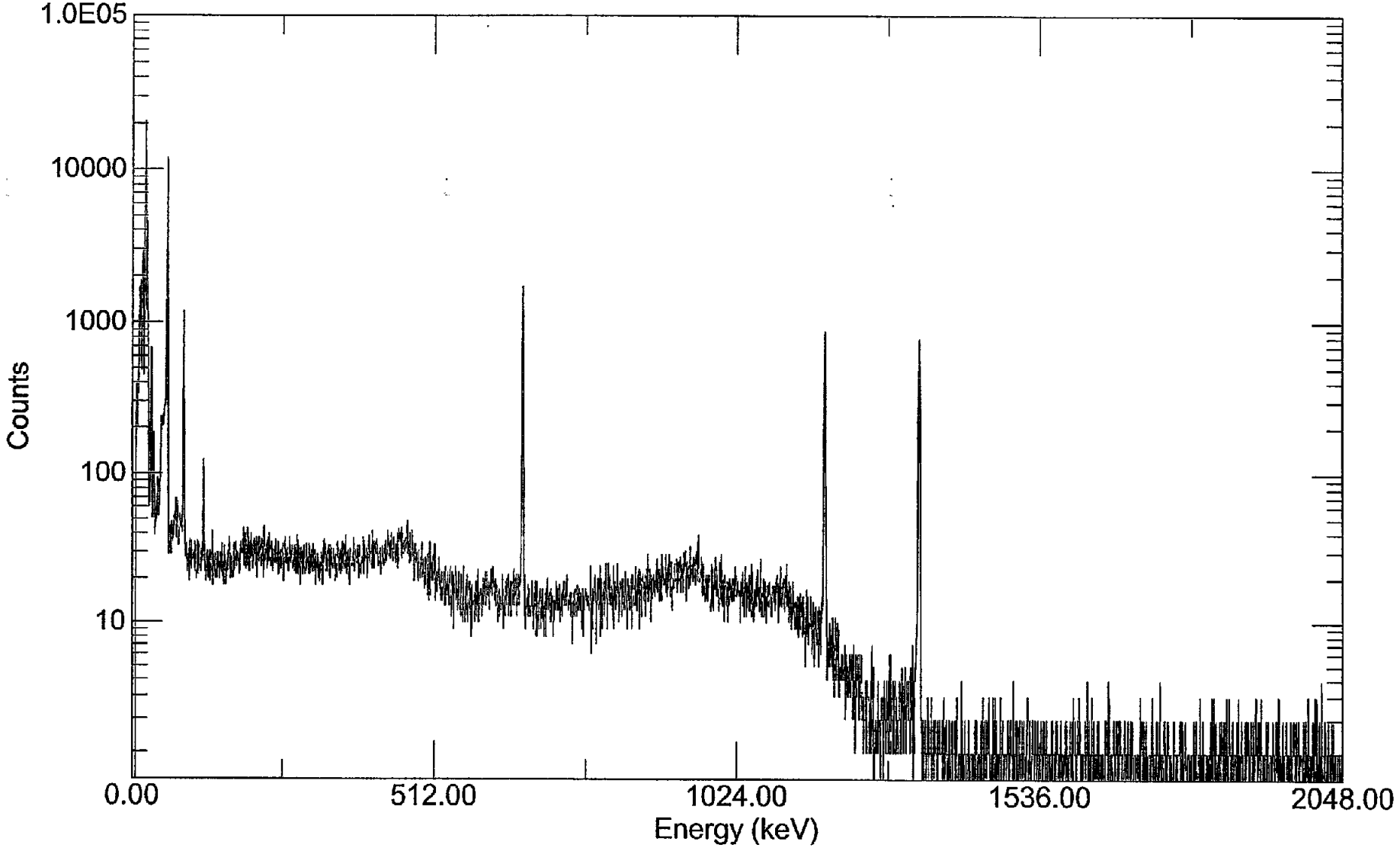
Reviewed by: _____

Supervisor

Laboratory: STL- St Louis

QA301295

03-0368



Acquired: 26-Dec-2007 7:13:13 AM
File: C:\User\spectra\QA301295.spc
Detector: #0 Ge 3 SN/155

Real Time: 1827.76 s. Live Time: 1800.00 s.
Channels: 8192

TestAmerica St. Louis

GammaVision Report Writer Version 2.04.0 G53W4.21 26-Dec-2007 7:44:16AM Page 1

DB Analysis ID: 32,998

Sample Description: 03-0371

Spectrum Filename: QA400105.Spc

Acquisition Information

Start Time:	26-Dec-2007 7:13:29AM		
Live Time:	1800.00	Real Time:	1810.98
Dead Time:	0.61 %		
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: 0.1839

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
CS-137	3.503E+002	3.906E+002	2.58	6.48	3.718E+000
AM-241	9.212E+002	9.282E+002	1.11	9.27	4.778E+000
CO-60	3.330E+002	6.208E+002	2.18	6.09	1.080E+000

= All peaks for activity calculation had bad shape

Total Activity (25.03 to 1,998.47 keV) 1,604.52 Bq/SA

Analyzed by: _____

403605

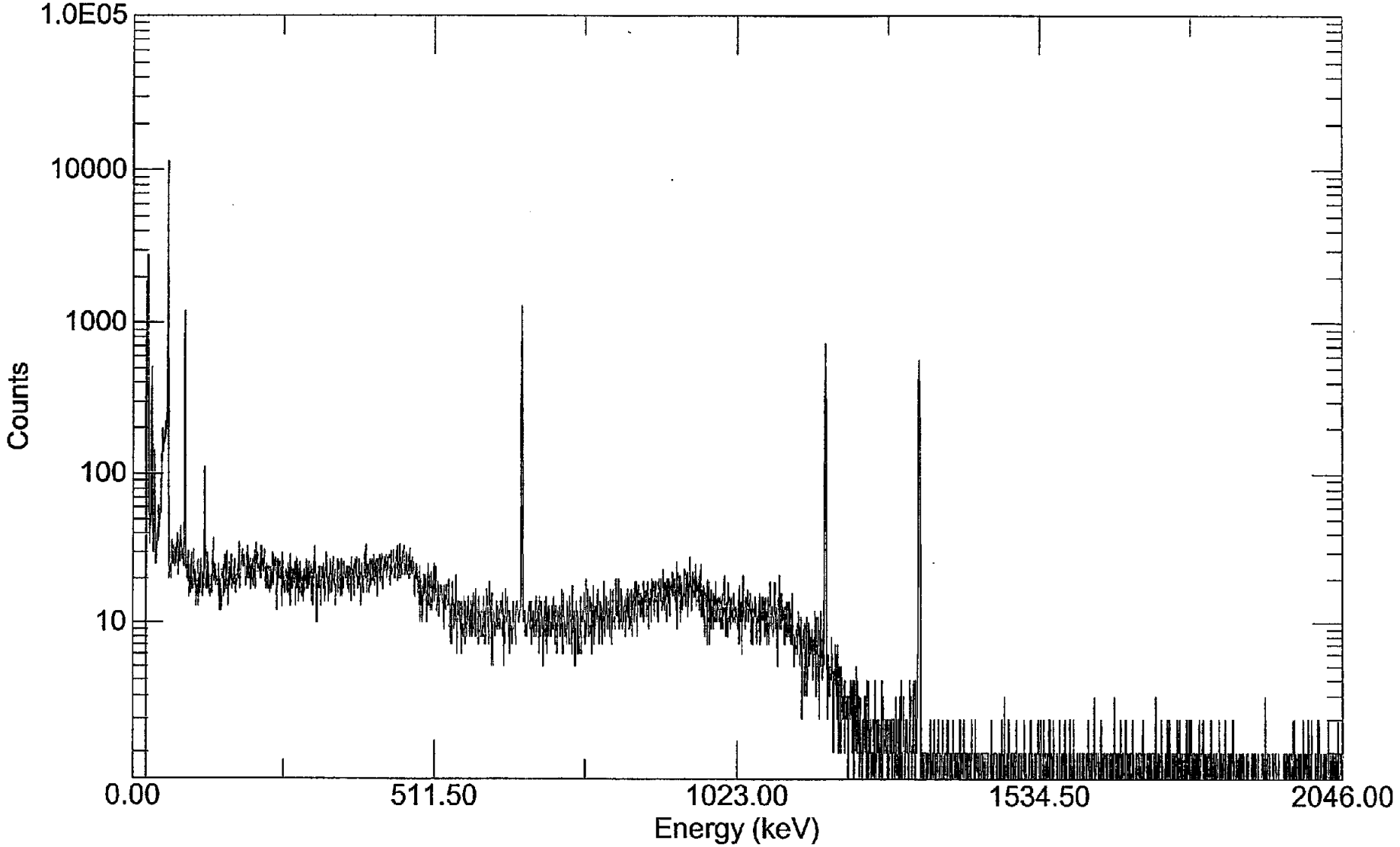
Reviewed by: _____

Supervisor

Laboratory: STL- St Louis

QA400105

03-0371



Acquired: 26-Dec-2007 7:13:29 AM
File: C:\User\spectra\QA400105.spc
Detector: #0 Ge 4 SN/181

Real Time: 1810.98 s. Live Time: 1800.00 s.
Channels: 8192

TestAmerica St. Louis

GammaVision Report Writer Version 2.04.0 G53W4.21 26-Dec-2007 7:46:47AM Page 1

DB Analysis ID: 33,002

Sample Description: 03-0370

Spectrum Filename: QA500095.Spc

Acquisition Information

Start Time:	26-Dec-2007 7:14:40AM		
Live Time:	1800.00	Real Time:	1901.16
Dead Time:	5.32 %		
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: 0.1296

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	3.303E+002	6.158E+002	2.12	6.08	1.326E+000
CS-137	3.465E+002	3.864E+002	2.42	6.53	3.127E+000
AM-241	9.203E+002	9.273E+002	1.06	9.34	4.708E+000

= All peaks for activity calculation had bad shape

Total Activity (25.25 to 2,000.57 keV) 1,597.21 Bq/SA

Analyzed by: _____

403605

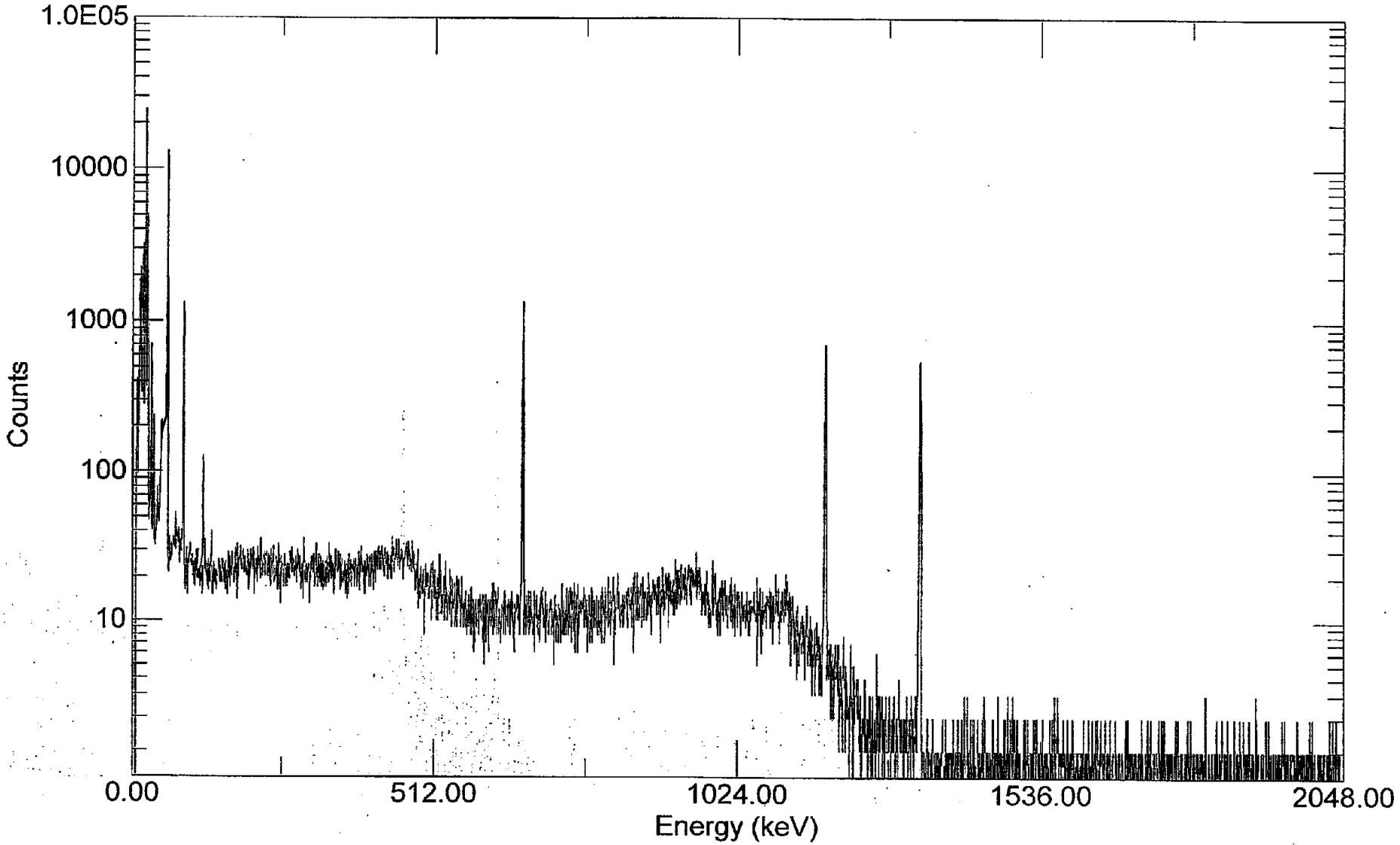
Reviewed by: _____

Supervisor

Laboratory: STL- St Louis

QA500095

03-0370



Acquired: 26-Dec-2007 7:14:40 AM
File: C:\User\spectra\QA500095.spc
Detector: #0 Ge 5 SN/157

Real Time: 1901.16 s. Live Time: 1800.00 s.
Channels: 8192

TestAmerica St. Louis

GammaVision Report Writer Version 2.04.0 G53W4.21 26-Dec-2007 7:45:37AM Page 1

DB Analysis ID: 33,000

Sample Description: 03-0369

Spectrum Filename: QA600038.Spc

Acquisition Information

Start Time:	26-Dec-2007 7:14:51AM		
Live Time:	1800.00	Real Time:	1812.32
Dead Time:	0.68 %		
Detector ID:	6		

Detector System: Ge 6 SN/164

Calibration

Description:	Ge6 airfilter 741470-336_12_13_07		
Filename:	C:\User\Calibrations\Ge 6 post 09_07_07\Ge6 _airfilter_12_13_07.Clb		
Energy Created:	13-Dec-2007 10:15:45AM	Efficiency Created:	13-Dec-2007 10:32:26AM
Zero Offset:	0.226 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 25.22 keV
Stop Channel:	8,000 for an energy of 1999.85 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: 0.1428

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	3.219E+002	6.000E+002	1.51	5.89	1.332E+000
CS-137	3.628E+002	4.045E+002	1.74	6.22	2.206E+000
AM-241	8.768E+002	8.835E+002	2.00	9.44	1.213E+001

= All peaks for activity calculation had bad shape

Total Activity (25.22 to 1,999.85 keV) 1,561.50 Bq/SA

Analyzed by: _____

403605

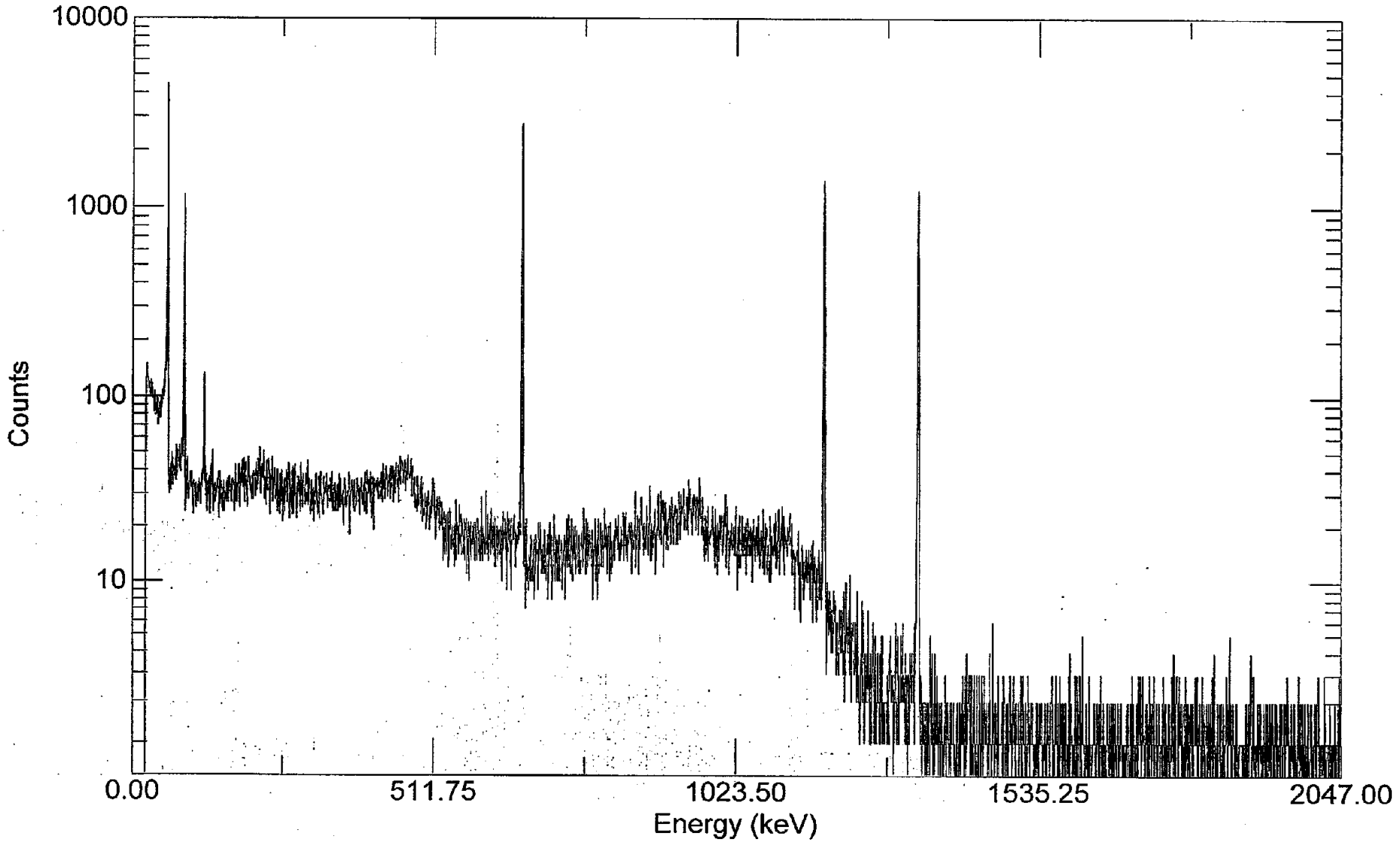
Reviewed by: _____

Supervisor

Laboratory: Test America

QA600038

03-0369



Acquired: 26-Dec-2007 7:14:51 AM
File: C:\User\spectra\QA600038.spc
Detector: #0 Ge 6 SN/164

Real Time: 1812.32 s. Live Time: 1800.00 s.
Channels: 8192

GammaVision Report Writer Version 2.04.0 G53W4.21 26-Dec-2007 7:46:07AM Page 1

DB Analysis ID: 33,001

Sample Description: 03-0372

Spectrum Filename: QA700212.Spc

Acquisition Information

Start Time:	26-Dec-2007 7:15:04AM		
Live Time:	1800.00	Real Time:	1831.58
Dead Time:	1.72 %		
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 0.0421

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	3.270E+002	6.096E+002	1.93	6.02	1.346E+000
CS-137	3.415E+002	3.808E+002	2.19	6.26	3.055E+000
AM-241	9.158E+002	9.228E+002	0.94	8.44	4.242E+000

= All peaks for activity calculation had bad shape

Total Activity (25.08 to 2,000.16 keV) 1,584.31 Bq/SA

Analyzed by: _____

403605

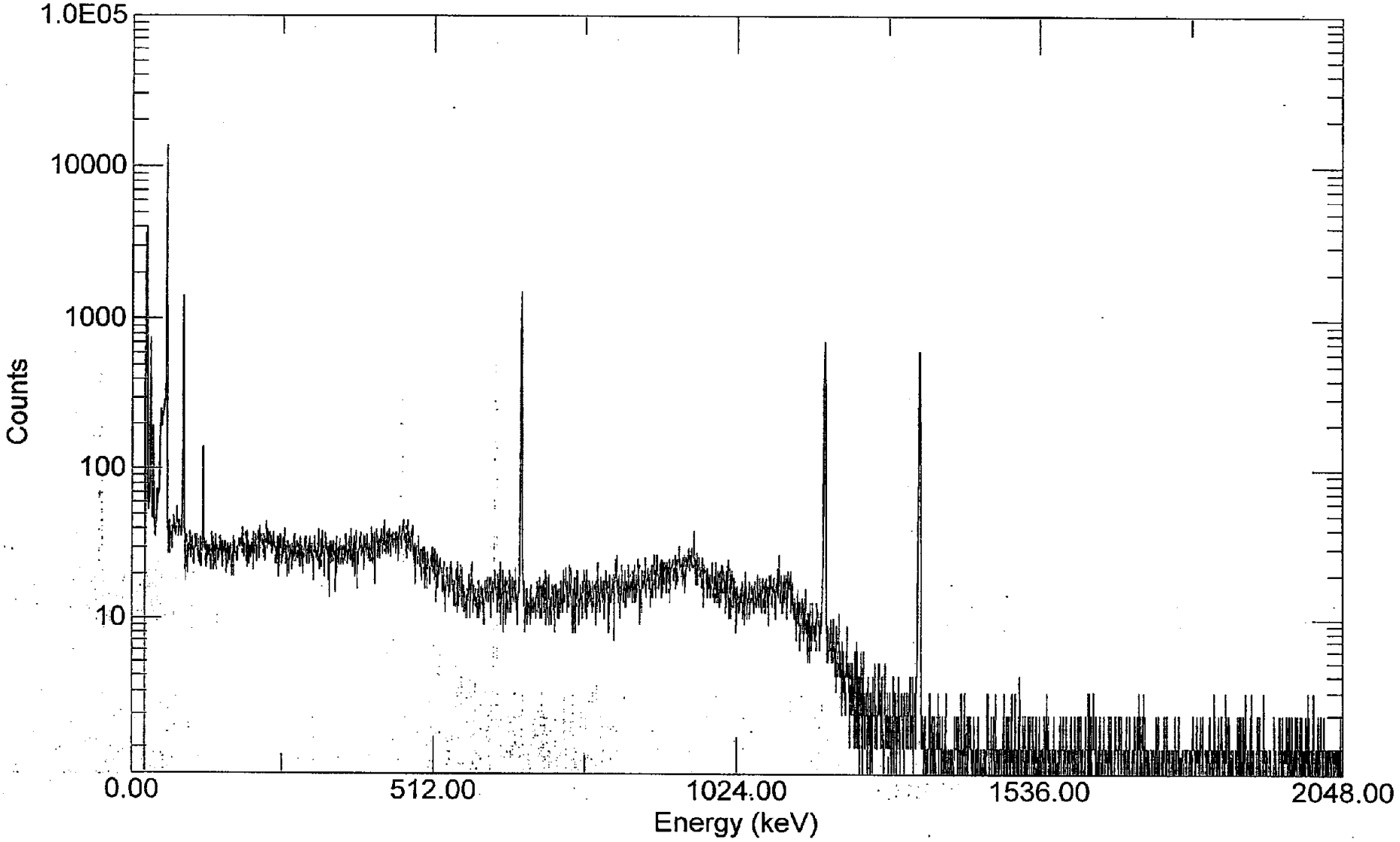
Reviewed by: _____

Supervisor

Laboratory: Test America

QA700212

03-0372



Acquired: 26-Dec-2007 7:15:04 AM
File: C:\User\spectra\QA700212.spc
Detector: #0 Ge 7 SN/154

Real Time: 1831.58 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

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.

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	-2.5924E-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.

+ - 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
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

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	Peak 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				

```
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
```



```
 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
```

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:
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

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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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

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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	ID
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	1

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 *****

Nuclide Name	Code	Average Activity Bq/sample	Peak Energy keV	Peak Activity Bq/sample	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				

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				

ORTEC g v - i (3135) Env32 G53W4.21 22-NOV-2007 08:29:30 Page 5
STL- St Louis Spectrum name: Ge3 background 11_21_07.An1

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

ORTEC g v - i (3135) Env32 G53W4.21 22-NOV-2007 08:29:30 Page 6
STL- St Louis Spectrum name: Ge3 background 11_21_07.An1

R - Coincidence Corrected
H - Halflife limit exceeded
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	84.65	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 2 Sigma Counting	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.

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				

D

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

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

ORTEC g v - i (3135) Env32 G53W4.21 22-NOV-2007 09:23:11 Page 5
STL- St Louis Spectrum name: Ge4 background 11_21_07.An1

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

D

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	1
2044.52	511.11	240.	1014.	0.023	10.47	2.077	TL-208	s

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 *****

Nuclide Name	Code	Average Activity Bq/sample	Peak Energy keV	Peak Activity Bq/sample	Code	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				

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

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					

□

ORTEC g v - i (3135) Env32 G53W4.21 22-NOV-2007 07:48:45 Page 5
STL- St Louis Spectrum name: Ge5 background 11_21_07.An1

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

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 Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 2 Sigma %	Activity
PB-214	351.92	329.	125.	0.003	44.77	2.953E-01

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

□

 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
```

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 Centroid Channel	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

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	Peak Code	Peak 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				

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

```
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

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 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 %
-------------------------------------------------------------------------
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
```

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		Activity Bq/sample	Time of Count Uncertainty 2 Sigma Counting	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

D

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.

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	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

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				

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 Counting	2 Sigma	MDA Bq/sample

Page 5

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
12/23/7	7356122	KEKFE1AD	1	30min	[illegible]	[illegible]
		KEKFP1AC	3			
		KEKFT1AC	4			
		KEKFV1AC	5			
		KEKFO1AC	7			
		KEKF11AC	1			
		KEKF51AC	3			
		KEKF71AC	4			
		KEKF81AC	5			
		KEKF91AC	7			
		KEKGD1AC	1			
		KEKGF1AC	3			
		KEKGG1AC	4			
		KEQKC1AA	5			
		KEQKC1AC	7			
12/26/7	Daily	Bkg + Source	1,3-8	20+30min	QA	SE
	7337395	KC6QE1AD	1	30min	Tema can	
		KC6QL1AD	3			
		KDCLL1AA	4			
		KDCLL1AC	5			
	M070859	1L2307-1	7			
		-2	1			
		-3	3			
		-4	4			
		-5	5			
	7337395	KC6QE1AE	7			
	M070858	2L1107-6	7			

Reviewed By: SE Date: 12/26/7

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
12/26/17	7353500	KEFØW1AG	5	1.5 hrs	1L Mann	SS
	MO70859	1L7307-6	1	30 min	Tuna can	
		-7	3			
		-8	4			
12/26/17	7355392	KEGTX1AA	7	2 hrs	Solid 25mL	LW
	7346346	KDWLR1AH	1	30 min	Tuna can	
		KDWL81AH	3			
		KDWL91AH	4			
		KDOWQ1AA	1			
		KDWLR1CK	3			
		DDOWQ1AC	4			
	7353500	KEGTE1AA	5	1.5 hrs	1L Mem	
	MO70858	2L1707-3	1	30 min	Tuna can	
		-4	3			
		-7	4			
		-8	1			
		2L1807-5	4			
		-6	5			
		-8	7			
	7355392	KENWG1AA	3	2 hrs	25mL Solid	
	7360292	KEEC31AC	1	30 min	tuna can	C
		KEEC71AC	4			
		KEECD1AC	5			
		KEECDEIAC	7			
		KEEC31AD	4			
		KEEKD1C1AC	1			
		KEECDR1AC	5			

Reviewed By: _____ Date: 12/26/17

Logbook No.: 3021

TESTAMERICA
St. Louis

Gamma Counting Runlog

Date	Batch #	Sample #	Detector	Count Time	Geometry	Initials
12/26/7	7360292	KEKDX1AC	7	30 min	Tuna can	[illegible]
		KEKD41AC	1			[illegible]
		KEKD81AC	3			
		KEKEC1AC	4			
		KEKE~~B~~G1AC	5			
		KEKEM1AC	7			
		KEKEW1AC	1			[illegible]
		KEKE11AC	3			
		KEKE21AC	4			
		KEKE41AC	5			
		KEKE51AC	7			
		KER4G1AA	1			
		KER4G1AC	3			
	7337325	KDCLL1AC-PC	4			
	7360274	KEKG21AC	5			
		KEKHM1AC	7			
		KEKHQ1AC	1			
		KEKHR1AC	3			
		KEKHV1AC	4			
		KEKHX1AC	5			
		KEKG21AD	7			
		KEKH11AC	1			
		KEKH31AC	3			
		KEKH41AC	4			
		KEKH51AC	5			
		KEKH61AC	7			
		KEKH91AC	1			

Reviewed By: [signature] Date: 12/26/7

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
12/26/7	7360294	KEKJC1AC	3	30 min	tuna can	e
		KEKJE1AC	4			
		KEKJG1AC	5			
		KEKJJ1AC	7			
		KEKLC1AC	1			
		KER4L1AA	3			
		KER4L1AC	4			
	7357015	KEKAJ1AG	7	2hrs	1L Marn	
	↓	KEQK01AC	5		↓	
10/27/7	Daily	Bkg & Source	1,3-8	20+30min	QA	SE
	7340388	KDHPX1AC	1	30min	tunacan	
		KDHP31AC	3			
		KDHP41AC	4			
		KDHP61AC	5			
		KDHP71AC	7			
		KDHPX1AE	4			
		KDLDN1AA	5			
		KDLDN1AC	7			
	7340390	KDDØ41AE	1			
		KDDØ81AE	3			
		KDG5C1AE	1			
		KDDØ41AF	3			
		KDLDØ1AA	4			
	7357015	KEKAJ1CF	5	3hrs	1L Marn	
	↓	KEQKØ1AA	7	2hrs	↓	
	7340390	KDLDØ1AC	1	30min	tuna Can	

Reviewed By:_____ Date:_____

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.

CS1371 1/4/08

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Prep Report for Gamma Spectroscopy

Batch: 7360294 **Prep Analyst:** 403135

SampID	WRKNO	Aliquot	Dilution	Adjusted Aliquot	GeometryDesc
F7L200271-001	KEKG21AC	3.4510E+002 g	1.00	3.4510E+002 g	Tuna Can
F7L200271-001X	KEKG21AD	3.4510E+002 g	1.00	3.4510E+002 g	Tuna Can
F7L200271-002	KEKHM1AC	3.9400E+002 g	1.00	3.9400E+002 g	Tuna Can
F7L200271-003	KEKHQ1AC	3.7320E+002 g	1.00	3.7320E+002 g	Tuna Can
F7L200271-004	KEKHR1AC	3.0090E+002 g	1.00	3.0090E+002 g	Tuna Can
F7L200271-005	KEKHV1AC	3.0320E+002 g	1.00	3.0320E+002 g	Tuna Can
F7L200271-006	KEKHX1AC	3.9960E+002 g	1.00	3.9960E+002 g	Tuna Can
F7L200271-007	KEKH11AC	3.5250E+002 g	1.00	3.5250E+002 g	Tuna Can
F7L200271-008	KEKH31AC	4.0540E+002 g	1.00	4.0540E+002 g	Tuna Can
F7L200271-009	KEKH41AC	4.0730E+002 g	1.00	4.0730E+002 g	Tuna Can
F7L200271-010	KEKH51AC	3.4400E+002 g	1.00	3.4400E+002 g	Tuna Can
F7L200271-011	KEKH61AC	3.6230E+002 g	1.00	3.6230E+002 g	Tuna Can
F7L200271-012	KEKH91AC	3.2220E+002 g	1.00	3.2220E+002 g	Tuna Can
F7L200271-013	KEKJC1AC	3.0520E+002 g	1.00	3.0520E+002 g	Tuna Can
F7L200271-014	KEKJE1AC	4.0240E+002 g	1.00	4.0240E+002 g	Tuna Can
F7L200271-015	KEKJG1AC	3.4850E+002 g	1.00	3.4850E+002 g	Tuna Can
F7L200271-016	KEKJJ1AC	3.3210E+002 g	1.00	3.3210E+002 g	Tuna Can

SampID	WRKNO	Aliquot	Dilution	Adjusted Aliquot	GeometryDesc
F7L200271-017	KEKLC1AC	3.3460E+002 g	1.00	3.3460E+002 g	Tuna Can
F7L260000-294B	KER4L1AA	3.7280E+002 g	1.00	3.7280E+002 g	Tuna Can
F7L260000-294C	KER4L1AC	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
F7L260000-294C	GV Tuna Can	AM-241	2.289E+002 dpm/g	351.20 g	4/1/2004 12:00:00AM	1.031E+002 pCi/g
F7L260000-294C	GV Tuna Can	CO-60	1.392E+002 dpm/g	351.20 g	4/1/2004 12:00:00AM	6.272E+001 pCi/g
F7L260000-294C	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: [signature] | Review Date: 12-27-07

Analyst/Relinquished By: [signature] | Release Date: 12/26/07 | Received By: [signature] | Receipt Date: 12/26/07

DB Analysis ID: 33,063

Sample Description: 7360294_KEKG21AC_F7L200271-001

Spectrum Filename: KEKG21AC.An1

Acquisition Information

Start Time:	26-Dec-2007 5:00:29PM		
Live Time:	1800.00	Real Time:	1854.36
Dead Time:	2.93 %		
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	26-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: 0.2134

UNIDENTIFIED PEAK SUMMARY

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncertainty 1 Sigma%	FWHM keV	Suspected Nuclide	Code
298.02	74.72	173.33	118.67	0.066	23.14	0.628	PB-214	
307.57	77.10	165.00	225.00	0.125	13.22	0.633	PB-214	
348.04	87.21	89.94	80.06	0.044	20.14	0.922	PB-214	
358.79	89.90	60.00	39.00	0.022	35.25	0.836	PB-214	M
743.09	185.91	84.33	113.67	0.063	20.09	0.949	RA-226	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	184.74	46.42	84.93	34.07	0.019	32.42	0.450	s
AM-241	1	237.49	59.60	140.33	11.32	0.006	116.12	0.761	s
TH-234	1	251.15	63.01	170.17	64.83	0.036	33.56	0.731	s
EU-155	1	345.35	86.54	167.54	1.12	0.001	1637.50	0.788	
TH-234	1	371.33	93.03	119.53	149.47	0.083	14.11	1.371	s
U-235	1	372.61	93.35	138.10	-0.67	0.000	-740.51	0.795	s D
AC-228	1	372.61	93.35	138.10	35.25	0.020	5.36	0.795	s D
EU-155	1	422.41	105.79	65.47	9.79	0.005	121.16	0.808	s
EU-152	1	484.77	121.37	101.39	8.99	0.005	161.88	0.824	s
EU-154	1	493.10	123.45	110.76	0.79	0.000	1892.95	0.826	s
Pa-234	1	523.81	131.12	111.02	-5.21	-0.003	289.36	0.834	s
U-235	1	574.49	143.79	132.17	-1.27	-0.001	1342.34	0.847	s
U-235	1	652.92	163.38	90.96	0.46	0.000	545.67	0.867	s
U-235	1	820.44	205.23	63.68	3.77	0.002	303.73	0.909	s
PB-212	1	954.86	238.82	75.81	313.19	0.174	7.99	1.172	s
RA-224	1	959.97	240.09	316.15	-77.95	-0.043	34.19	0.944	
PB-214	1	966.94	241.84	63.33	72.67	0.040	25.64	0.539	s
TL-208	1	1109.77	277.52	48.37	22.25	0.012	49.02	0.980	
I-131	1	1140.15	285.11	47.56	-8.03	-0.004	126.51	0.987	s
PB-214	1	1180.62	295.22	22.58	115.42	0.064	11.62	1.105	
PB-212	1	1199.96	300.06	16.33	24.67	0.014	36.06	0.796	s
AC-228	1	1353.87	338.52	54.14	36.52	0.020	32.95	1.040	s
EU-152	1	1376.97	344.29	45.17	0.00	0.000	950.53	1.045	s
PB-214	1	1407.23	351.85	25.21	233.79	0.130	7.93	1.215	s
I-131	1	1456.77	364.23	36.99	-5.84	-0.003	153.02	1.065	s
BE-7	1	1910.43	477.59	46.47	0.00	0.000	964.05	1.173	s
CS-134	1	2250.64	562.62	20.21	1.31	0.001	492.95	1.252	s
CS-134	1	2277.45	569.32	37.03	-0.02	0.000	-32.84	1.258	s D
Pa-234	1	2278.05	569.47	25.58	-0.78	0.000	-132.02	1.258	s D
TL-208	1	2334.31	583.53	13.75	82.25	0.046	13.22	1.051	
CS-134	1	2429.65	607.36	20.20	-0.10	0.000	6643.88	1.290	s
BI-214	1	2438.21	609.50	11.23	133.77	0.074	9.15	1.193	
I-131	1	2549.01	637.19	23.11	4.62	0.003	154.32	1.319	s
CS-137	1	2646.99	661.68	28.41	7.03	0.004	57.14	1.342	s
EU-154	1	2894.20	723.48	31.30	-6.24	-0.003	133.01	1.397	s
BI-212	1	2910.61	727.58	14.42	13.93	0.008	46.93	1.400	s
PA-234M	1	3063.37	765.77	38.03	-3.46	-0.002	257.49	1.434	s
EU-152	1	3115.99	778.92	59.51	0.00	0.000	1090.99	1.445	s
BI-212	1	3140.62	785.08	26.45	3.63	0.002	206.95	1.451	s
CS-134	1	3183.78	795.87	44.31	0.00	0.000	941.40	1.460	s
CS-134	1	3207.92	801.90	28.48	-2.77	-0.002	279.46	1.465	s
TL-208	1	3443.53	860.80	26.02	6.88	0.004	111.50	1.516	s
EU-154	1	3502.56	875.56	17.25	-0.23	0.000	2558.73	1.527	s
Pa-234	1	3521.36	880.26	15.47	3.01	0.002	193.70	1.533	s
Pa-234	1	3534.39	883.52	23.22	-1.17	-0.001	587.69	1.535	s
AC-228	1	3646.30	911.50	10.80	43.87	0.024	18.44	1.559	s

Pa-234	1	3773.48	943.30	18.11	-0.84	0.000	727.36	1.588	s
EU-152	1	3859.51	964.80	27.15	10.55	0.006	76.31	1.603	s
AC-228	1	3877.17	969.22	26.47	19.62	0.011	43.41	1.607	s
EU-154	1	3986.48	996.55	27.62	-2.50	-0.001	303.81	1.630	s
PA-234M	1	4003.83	1000.89	19.20	5.54	0.003	119.66	1.633	s
EU-154	1	4020.75	1005.12	23.92	2.03	0.001	347.25	1.637	s
EU-152	1	4443.61	1110.86	23.32	-3.58	-0.002	197.99	1.723	s
BI-214	1	4461.07	1115.22	18.72	-0.29	0.000	2112.66	1.730	s
CO-60	1	4693.23	1173.28	19.90	3.46	0.002	190.22	1.772	s
EU-154	1	5085.02	1271.26	12.01	-1.04	-0.001	482.66	1.850	s
CO-60	1	5332.43	1333.14	7.94	5.04	0.003	90.81	1.894	s
EU-152	1	5631.70	1408.00	26.69	0.00	0.000	730.57	1.950	s
K-40	1	5844.70	1461.28	0.00	292.00	0.162	5.85	2.105	
BI-214	1	7059.04	1765.10	8.20	16.68	0.009	30.17	2.196	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	
EU-155	T F I	1	7.258E-001	105.31	7.258E-001	*	(		2.996E+000G		1.8E+003	21.20
			7.258E-001	86.54	6.056E-002	&			3.409E+000G	A	1.8E+003	30.70
BI-212	N	1	6.947E+000	727.33	6.947E+000	%	(		1.017E+001G		7.0E+002	11.82
			6.947E+000	785.51	2.075E+001	%			1.523E+002G		7.0E+002	1.10
AM-241	T	1	6.440E-001	59.54	6.440E-001	%	(	P	3.295E+000G		1.6E+005	35.90
PA-234M	N	1	5.066E+001	1001.00	5.066E+001	%	(		2.115E+002G		1.6E+012	.84
			5.066E+001	766.41	-7.251E+001	%			6.584E+002G		1.6E+012	.29
CS-134	T F I	1	-4.944E-003	604.71	-4.944E-003	%	(		1.221E+000G		7.5E+002	97.62
			-4.944E-003	795.87	0.000E+000	%			2.504E+000G		7.5E+002	85.53
			-4.944E-003	569.32	-4.944E-003	%			9.660E+000G		7.5E+002	15.38
			-4.944E-003	801.95	-2.033E+000	%			2.028E+001G		7.5E+002	8.69
			-4.944E-003	563.24	7.435E-001	&			1.342E+001G		7.5E+002	8.35
CO-60	T F	1	4.866E-001	1332.50	4.866E-001	%	(		1.531E+000G		1.9E+003	99.98
			4.866E-001	1173.24	3.013E-001	&			2.048E+000G		1.9E+003	99.90
TL-208	F N	1	4.752E+000	583.02	4.752E+000		(	P	1.155E+000G		7.0E+002	84.50
			4.752E+000	277.28	8.805E+000	%			1.390E+001G		7.0E+002	6.31
			4.752E+000	860.56	3.753E+000	%			1.443E+001G		7.0E+002	12.42
			-4.563E-001	883.24	-8.457E-001	%			1.813E+001G		1.6E+012	9.60
			-4.563E-001	880.53	3.457E+000	&			2.418E+001G		1.6E+012	6.00
Pa-234	N	1	-4.563E-001	131.29	-4.563E-001	%	(		4.538E+000G		1.6E+012	18.00
			-4.563E-001	569.47	-4.563E-001	%			1.533E+001G		1.6E+012	8.20
			-4.563E-001	946.02	-4.567E-001	%			1.230E+001G		1.6E+012	13.40
CS-137	T F I	1	4.492E-001	661.66	4.492E-001	%	(	P	1.760E+000G		1.1E+004	85.21
RA-224	N	1	-4.209E+001	240.99	-4.209E+001		(		4.620E+001G		7.0E+002	4.10
TH-234	N	1	3.545E+001	63.29	2.626E+001	*	(	P	2.572E+001G		1.6E+012	4.82
			3.545E+001	92.59	4.339E+001	*	(	P	1.557E+001G		1.6E+012	5.58
K-40	N	1	2.854E+002	1460.83	2.854E+002		(		7.204E+000G		4.7E+011	10.67
PB-210	N	1	2.502E+001	46.54	2.502E+001	%	(	P	3.352E+001G		8.1E+003	4.25
I-131	T F I	1	-2.287E-001	364.48	-2.287E-001	%	(		1.216E+000G		8.0E+000	81.70
			-2.287E-001	284.30	-3.337E+000	&			1.449E+001G		8.0E+000	6.14
			-2.287E-001	636.97	3.395E+000	&			1.845E+001G		8.0E+000	7.17
			1.967E+001	242.00	2.173E+001		(		1.190E+001G		5.8E+005	7.43

PB-214	N	1	1.967E+001	351.93	1.927E+001	@	(	P		2.151E+000G	5.8E+005	37.60
			1.967E+001	295.09	1.578E+001	-		P		3.398E+000G	5.8E+005	19.30
U-235	N	1	-1.873E-001	143.79	-1.873E-001	%	(	P		8.283E+000G	2.6E+011	10.96
			-1.873E-001	205.33	1.471E+000	%				1.556E+001G	2.6E+011	5.01
			-1.873E-001	163.38	1.552E-001	%		P		1.577E+001G	2.6E+011	5.08
			-1.873E-001	93.35	-1.873E-001	!			E	1.599E+001X	2.6E+011	5.81
PB-212	N	1	1.588E+001	238.63	1.588E+001		(	P		2.195E+000G	7.0E+002	43.30
			1.588E+001	300.03	2.014E+001	*				1.759E+001G	7.0E+002	3.28
BI-214	N	1	1.436E+001	609.31	1.472E+001		(	P		2.017E+000G	5.8E+005	46.09
			1.436E+001	1120.29	-1.614E-001	%				1.270E+001G	5.8E+005	15.10
			1.436E+001	1764.49	1.330E+001	?	(	P		1.280E+001G	5.8E+005	15.40
EU-154	T F I	1	-1.286E-001	873.23	-1.286E-001	%	(			1.232E+001G	3.1E+003	12.27
			-1.286E-001	123.10	3.018E-002	%				1.983E+000G	3.1E+003	40.79
			-1.286E-001	1274.54	-2.745E-001	%				4.992E+000G	3.1E+003	35.19
			-1.286E-001	723.36	-1.810E+000	%				8.349E+000G	3.1E+003	20.22
			-1.286E-001	1004.77	8.670E-001	%				1.087E+001G	3.1E+003	18.01
			-1.286E-001	996.33	-1.799E+000	%				1.956E+001G	3.1E+003	10.60
AC-228	N	1	1.025E+001	911.16	1.073E+001	?	(			4.408E+000G	2.1E+003	29.00
			1.025E+001	968.97	8.378E+000	%				1.139E+001G	2.1E+003	17.46
			1.025E+001	338.32	9.087E+000	@	(			9.205E+000G	2.1E+003	12.01
			1.025E+001	93.35	1.025E+001	+			E	1.671E+001G	A 2.1E+003	5.56
BE-7	N P C	1	0.000E+000	477.60	0.000E+000	&	(			1.342E+001G	5.3E+001	10.52
			0.000E+000	121.78	4.912E-001	%				2.712E+000G	4.9E+003	28.58
			0.000E+000	778.92	0.000E+000	%				1.864E+001G	4.9E+003	12.94
			0.000E+000	964.11	5.365E+000	%				1.372E+001G	4.9E+003	14.61
			0.000E+000	1112.07	-2.186E+000	%				1.540E+001G	4.9E+003	13.64
			0.000E+000	1408.00	0.000E+000	%				1.289E+001G	4.9E+003	21.00
EU-152	T F	1	0.000E+000	344.29	0.000E+000	%	(			3.899E+000G	4.9E+003	26.50

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	#			964.05	964.05	1.342E+001
K-40		2.854E+002	2.854E+002	5.85	6.54	7.204E+000
CO-60	#	4.866E-001	4.867E-001	90.81	90.85	1.531E+000
I-131	#	-2.287E-001	-2.328E-001	153.02	153.04	1.216E+000
EU-154	#	-1.286E-001	-1.286E-001	2,558.73	2,558.73	1.232E+001
CS-134	#	-4.944E-003	-4.945E-003	6,643.88	6,643.88	1.221E+000
CS-137	#	4.492E-001	4.492E-001	107.92	107.96	1.760E+000
EU-152	#			950.53	950.53	3.899E+000
EU-155	#	7.258E-001	7.258E-001	121.16	121.21	2.996E+000
TL-208		4.752E+000	4.753E+000	13.83	14.12	1.155E+000
BI-212	#	6.947E+000	6.949E+000	46.93	47.02	1.017E+001
BI-214		1.436E+001	1.436E+001	9.61	10.04	2.017E+000
RA-224	#	-4.209E+001	-4.209E+001	34.19	34.32	4.620E+001
TH-234	#	3.545E+001	3.545E+001	16.27	16.68	2.572E+001
PA-234M	#	5.066E+001	5.066E+001	119.66	119.69	2.115E+002
U-235	#	-1.873E-001	-1.873E-001	3,952.70	3,952.70	8.283E+000
PB-210		2.502E+001	2.502E+001	48.84	49.00	3.352E+001
PB-212		1.588E+001	1.589E+001	8.16	8.69	2.195E+000
PB-214		1.967E+001	1.967E+001	8.10	8.60	2.151E+000
AC-228	#	1.025E+001	1.025E+001	18.44	18.67	4.408E+000
Pa-234	#	-4.563E-001	-4.563E-001	289.36	289.38	4.538E+000
AM-241	#	6.440E-001	6.440E-001	150.11	150.16	3.295E+000

= All peaks for activity calculation had bad shape

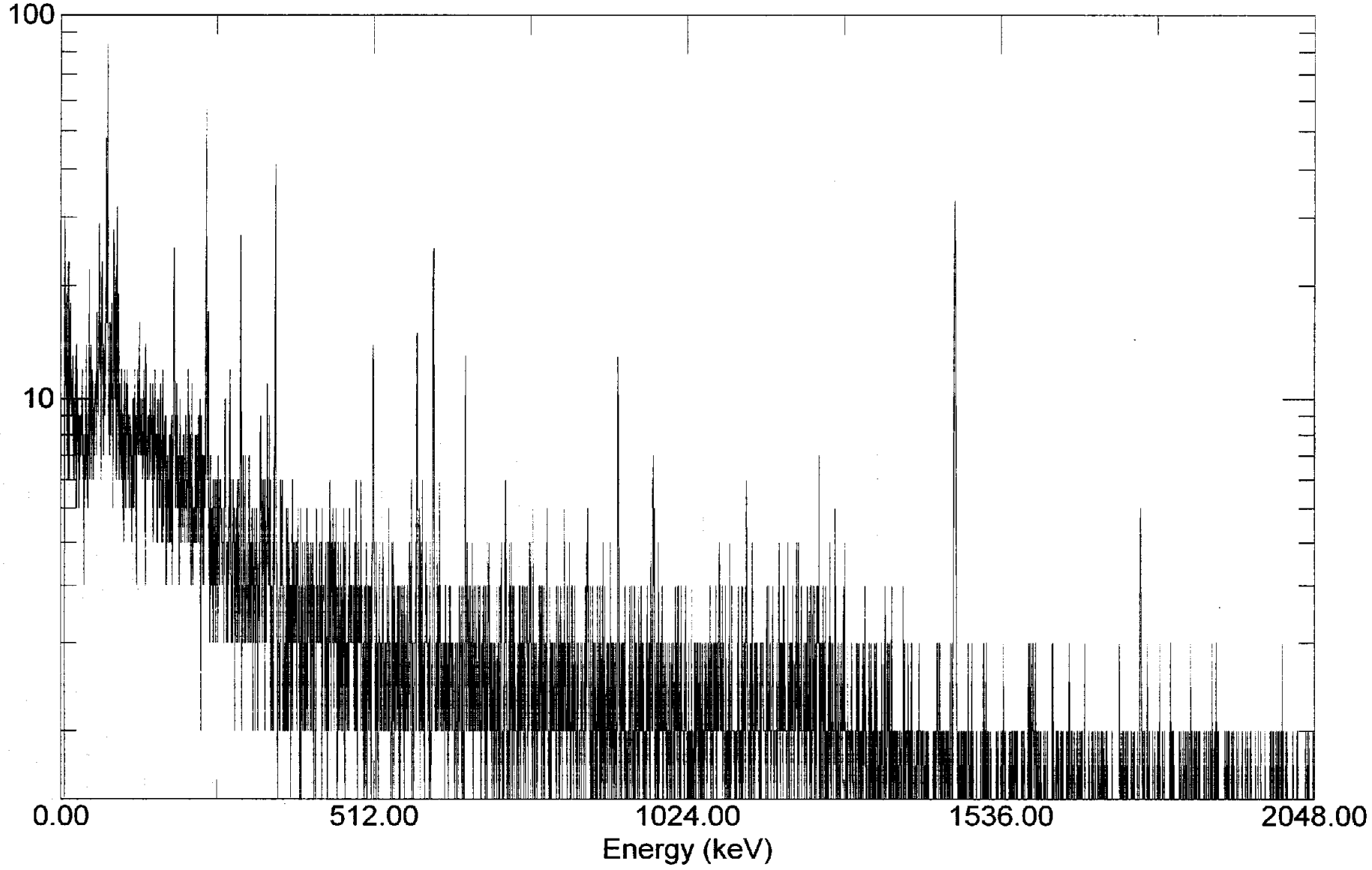
Total Activity (37.74 to 2,000.57 keV) 375.55 Bq/sample

Analyzed by: 403605

Laboratory: STL- St Louis

KEKG21AC

7360294_KEKG21AC_F7L200271-001



Acquired: 26-Dec-2007 5:00:30 PM
File: C:\User\spectra\KEKG21AC.spc
Detector: #0 Ge 5 SN/157

Real Time: 1854.36 s. Live Time: 1800.00 s.
Channels: 8192

TestAmerica St. Louis

DB Analysis ID: 33,069

Sample Description: 7360294_KEKG21AD_F7L200271-001X

Spectrum Filename: KEKG21AD.An1

Acquisition Information

Start Time:	26-Dec-2007 5:46:19PM		
Live Time:	1800.00	Real Time:	1823.94
Dead Time:	1.31 %		
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	26-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: 0.1662

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	74.65	282.67	126.33	0.070	26.99	0.668	PB-214	
307.71	77.14	198.00	210.00	0.117	13.50	1.085	PB-214	s
1313.86	328.63	25.50	39.50	0.022	29.66	0.676	LA-140	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	185.74	46.65	173.09	8.71	0.005	55.43	0.832	
AM-241	1	236.80	59.42	200.35	-0.43	0.000	4704.74	0.846	s
TH-234	1	252.61	63.37	294.44	9.67	0.005	79.03	0.850	s
EU-155	1	345.32	86.54	267.83	-2.48	-0.001	934.43	0.874	s
TH-234	1	370.29	92.78	315.01	28.67	0.016	44.35	0.881	s
AC-228	1	372.56	93.35	218.93	47.14	0.026	3.16	0.882	s D
U-235	1	372.56	93.35	276.26	0.00	0.000	2107.13	0.882	s D
EU-155	1	414.96	103.95	102.84	21.02	0.012	71.62	0.894	s
EU-152	1	488.78	122.40	124.96	17.68	0.010	92.55	0.912	s
EU-154	1	493.79	123.65	174.32	-16.77	-0.009	113.99	0.913	s
Pa-234	1	522.77	130.90	166.13	-6.27	-0.003	293.29	0.922	s
U-235	1	572.22	143.26	128.97	17.29	0.010	95.96	0.935	s
U-235	1	650.61	162.85	127.23	-10.02	-0.006	162.31	0.955	s
U-235	1	818.38	204.78	101.23	9.01	0.005	161.38	0.999	s
PB-212	1	955.87	239.15	136.04	468.96	0.261	7.54	0.893	s
RA-224	1	961.09	240.45	512.18	-91.14	-0.051	36.65	1.036	
PB-214	1	975.38	244.03	142.47	-14.91	-0.008	116.15	1.037	
TL-208	1	1109.89	277.65	86.54	11.03	0.006	123.04	1.074	s
I-131	1	1134.39	283.77	62.45	-3.72	-0.002	304.69	1.081	s
PB-214	1	1179.75	295.11	39.00	151.00	0.084	11.60	1.283	s
PB-212	1	1198.08	299.69	40.00	43.00	0.024	34.21	0.513	s
AC-228	1	1352.81	338.37	65.89	55.60	0.031	24.62	1.136	s
EU-152	1	1380.62	345.32	62.04	0.11	0.000	9864.14	1.142	s
PB-214	1	1407.41	352.02	31.88	257.12	0.143	7.97	1.300	s
I-131	1	1453.90	363.63	32.64	0.05	0.000	14759.70	1.163	s
BE-7	1	1915.32	478.97	23.86	0.41	0.000	1674.81	1.277	s
CS-134	1	2257.16	564.42	33.50	0.17	0.000	4762.65	1.363	s
CS-134	1	2276.76	569.32	38.26	-2.07	-0.001	-43.72	1.369	s D
Pa-234	1	2277.35	569.47	37.53	-0.92	-0.001	-116.55	1.369	s D
TL-208	1	2332.83	583.34	47.91	78.59	0.044	16.19	1.382	
CS-134	1	2425.56	606.52	59.70	-12.44	-0.007	92.27	1.403	s
BI-214	1	2436.84	609.34	39.08	136.64	0.076	10.51	1.408	s
I-131	1	2547.96	637.11	28.11	2.67	0.001	286.98	1.435	s
CS-137	1	2646.65	661.78	34.92	21.28	0.012	43.16	1.459	s
EU-154	1	2891.17	722.91	31.93	-3.60	-0.002	228.40	1.519	s
BI-212	1	2908.67	727.28	23.41	11.10	0.006	68.58	1.523	s
PA-234M	1	3065.29	766.43	22.97	7.28	0.004	100.16	1.561	s
EU-152	1	3096.92	774.34	12.81	-0.05	0.000	9308.02	1.573	s
BI-212	1	3143.02	785.86	32.99	-0.32	0.000	2517.17	1.579	s
CS-134	1	3181.42	795.46	26.02	5.18	0.003	145.98	1.589	s
CS-134	1	3206.52	801.74	37.87	-6.25	-0.003	144.97	1.595	s
TL-208	1	3442.22	860.66	22.68	4.98	0.003	142.54	1.650	s
EU-154	1	3490.17	872.65	32.16	-4.55	-0.003	182.31	1.662	s
Pa-234	1	3519.22	879.91	26.46	0.36	0.000	2000.22	1.669	s
Pa-234	1	3530.67	882.77	27.15	-2.69	-0.001	280.91	1.672	s
AC-228	1	3644.48	911.22	33.78	53.02	0.029	20.71	1.698	s

Pa-234	1	3779.27	944.92	34.47	3.37	0.002	252.18	1.731	s
EU-152	1	3853.49	963.47	44.54	-2.92	-0.002	328.62	1.748	s
AC-228	1	3876.30	969.17	33.82	31.40	0.017	31.70	1.752	s
EU-154	1	3984.60	996.25	21.16	-3.94	-0.002	172.74	1.778	s
PA-234M	1	4004.24	1001.16	18.51	1.81	0.001	345.10	1.782	s
EU-154	1	4020.63	1005.26	11.66	5.47	0.003	98.09	1.785	s
EU-152	1	4447.92	1112.07	73.49	0.00	0.000	1212.35	1.884	s
BI-214	1	4482.72	1120.77	23.76	27.87	0.015	31.15	1.891	s
CO-60	1	4699.03	1174.85	20.55	9.82	0.005	72.67	1.939	s
EU-154	1	5097.80	1274.54	63.68	0.00	0.000	1128.58	2.030	s
CO-60	1	5316.20	1329.14	15.83	0.40	0.000	1420.37	2.081	s
EU-152	1	5631.98	1408.09	15.69	4.67	0.003	128.55	2.147	s
K-40	1	5843.13	1460.88	0.00	390.00	0.217	5.06	1.642	s
BI-214	1	7058.89	1764.85	12.01	12.05	0.007	49.86	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	Peak Analysis Code	Peak MDA Value Becquerels	Peak Code	Comments	
AC-228	N	1	9.882E+000	911.16	9.681E+000 *	(	5.441E+000G		2.1E+003	29.00
			9.882E+000	968.97	1.004E+001 *	(	9.530E+000G		2.1E+003	17.46
			9.882E+000	338.32	1.014E+001	(	7.395E+000G		2.1E+003	12.01
			9.882E+000	93.35	9.882E+000 !	E	1.502E+001G	A	2.1E+003	5.56
EU-152	T F	1	9.492E-003	344.29	9.492E-003 %	(	3.312E+000G		4.9E+003	26.50
			9.492E-003	121.78	6.974E-001 %		2.162E+000G		4.9E+003	28.58
			9.492E-003	778.92	-1.948E-002 %		6.938E+000G		4.9E+003	12.94
			9.492E-003	964.11	-1.111E+000 %		1.287E+001G		4.9E+003	14.61
			9.492E-003	1112.07	0.000E+000 %		1.965E+001G		4.9E+003	13.64
			9.492E-003	1408.00	1.723E+000 %		7.808E+000G		4.9E+003	21.00
PB-210	N	1	5.198E+000	46.54	5.198E+000 %	(P	3.822E+001G		8.1E+003	4.25
CS-134	T F I	1	-4.738E-001	604.71	-4.738E-001 %	(	1.474E+000G		7.5E+002	97.62
			-4.738E-001	795.87	2.858E-001 &		1.460E+000G		7.5E+002	85.53
			-4.738E-001	569.32	-4.738E-001 %		7.225E+000G		7.5E+002	15.38
			-4.738E-001	801.95	-3.413E+000 %		1.715E+001G		7.5E+002	8.69
			-4.738E-001	563.24	7.193E-002 &		1.241E+001G		7.5E+002	8.35
BI-212	N	1	4.099E+000	727.33	4.099E+000 %	(	9.328E+000G		7.0E+002	11.82
			4.099E+000	785.51	-1.372E+000 &		1.250E+002G		7.0E+002	1.10
Pa-234	N	1	-3.974E-001	131.29	-3.974E-001 %	(	3.976E+000G		1.6E+012	18.00
			-3.974E-001	569.47	-3.974E-001 %		1.344E+001G		1.6E+012	8.20
			-3.974E-001	946.02	1.376E+000 %		1.227E+001G		1.6E+012	13.40
			-3.974E-001	883.24	-1.444E+000 %		1.450E+001G		1.6E+012	9.60
			-3.974E-001	880.53	3.128E-001 %		2.287E+001G		1.6E+012	6.00
RA-224	N	1	-3.599E+001	240.99	-3.599E+001	(	4.272E+001G		7.0E+002	4.10
TL-208	F N	1	3.347E+000	583.02	3.347E+000	(P	1.489E+000G		7.0E+002	84.50
			3.347E+000	277.28	3.195E+000 %		1.335E+001G		7.0E+002	6.31
			3.347E+000	860.56	2.021E+000 %		1.011E+001G		7.0E+002	12.42
CO-60	T F	1	2.939E-002	1332.50	2.939E-002 %	(	1.567E+000G		1.9E+003	99.98
			2.939E-002	1173.24	6.472E-001 &		1.571E+000G		1.9E+003	99.90
TH-234	N	1	2.934E+000	63.29	2.934E+000 *	(P	2.509E+001G		1.6E+012	4.82
			2.934E+000	92.59	6.001E+000 %	P	1.788E+001G		1.6E+012	5.58
K-40	N	1	2.929E+002	1460.83	2.929E+002	(	5.536E+000G		4.7E+011	10.67

EU-154	T F I	1	-1.895E+000	873.23	-1.895E+000	%	(		1.213E+001G		3.1E+003	12.27
			-1.895E+000	123.10	-4.641E-001	%			1.778E+000G		3.1E+003	40.79
			-1.895E+000	1274.54	0.000E+000	&			8.031E+000G		3.1E+003	35.19
			-1.895E+000	723.36	-7.727E-001	%			6.241E+000G		3.1E+003	20.22
			-1.895E+000	1004.77	1.749E+000	%			5.953E+000G		3.1E+003	18.01
			-1.895E+000	996.33	-2.123E+000	%			1.302E+001G		3.1E+003	10.60
U-235	N	1	1.844E+000	143.79	1.844E+000	*	(		5.934E+000G		2.6E+011	10.96
			1.844E+000	205.33	2.566E+000	&			1.412E+001G		2.6E+011	5.01
			1.844E+000	163.38	-2.436E+000	&			1.344E+001G		2.6E+011	5.08
			1.844E+000	93.35	0.000E+000	%	}	E	1.438E+001X		2.6E+011	5.81
AM-241	T	1	-1.839E-002	59.54	-1.839E-002	%	(		2.967E+000G		1.6E+005	35.90
PB-212	N	1	1.739E+001	238.63	1.739E+001	*	(	P	2.117E+000G		7.0E+002	43.30
			1.739E+001	300.03	2.573E+001	+			1.926E+001G		7.0E+002	3.28
I-131	T F I	1	1.573E-003	364.48	1.573E-003	%	(		8.427E-001G		8.0E+000	81.70
			1.573E-003	284.30	-1.133E+000	&			1.204E+001G		8.0E+000	6.14
			1.573E-003	636.97	1.451E+000	&			1.488E+001G		8.0E+000	7.17
PB-214	N	1	1.540E+001	351.93	1.554E+001	@	(	P	1.754E+000G		5.8E+005	37.60
			1.540E+001	295.09	1.513E+001		(		3.187E+000G		5.8E+005	19.30
			1.540E+001	242.00	-3.261E+000	%			1.276E+001G		5.8E+005	7.43
PA-234M	N	1	1.238E+001	1001.00	1.238E+001	%	(		1.561E+002G		1.6E+012	.84
			1.238E+001	766.41	1.131E+002	&			3.890E+002G		1.6E+012	.29
BE-7	N P C	1	1.185E-001	477.60	1.185E-001	%	(		7.286E+000G		5.3E+001	10.52
			1.124E+001	1120.29	1.168E+001		(		1.065E+001G		5.8E+005	15.10
			1.124E+001	1764.49	7.511E+000	%			1.176E+001G		5.8E+005	15.40
BI-214	N	1	1.124E+001	609.31	1.109E+001	*	(	P	2.585E+000G		5.8E+005	46.09
EU-155	T F I	1	1.123E+000	105.31	1.123E+000	&	(		2.669E+000G		1.8E+003	21.20
			1.123E+000	86.54	-9.706E-002	%			3.087E+000G	A	1.8E+003	30.70
CS-137	T F I	1	1.004E+000	661.66	1.004E+000	%	(	P	1.428E+000G		1.1E+004	85.21

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	#	1.573E-003	1.606E-003	14,759.70	14,759.70	8.427E-001
CS-134	#	-4.738E-001	-4.739E-001	92.27	92.32	1.474E+000
BE-7	#	1.185E-001	1.189E-001	1,674.81	1,674.81	7.286E+000
K-40		2.929E+002	2.929E+002	5.06	5.85	5.536E+000
CO-60	#	2.939E-002	2.939E-002	1,420.37	1,420.37	1.567E+000
CS-137	#	1.004E+000	1.004E+000	44.68	44.77	1.428E+000
EU-152	#	9.492E-003	9.492E-003	9,864.14	9,864.14	3.312E+000
EU-155	#	1.123E+000	1.123E+000	71.62	71.70	2.669E+000
TL-208	#	3.347E+000	3.348E+000	16.69	16.94	1.489E+000
PB-210	#	5.198E+000	5.198E+000	208.92	208.96	3.822E+001
PB-212		1.739E+001	1.740E+001	7.69	8.25	2.117E+000
RA-224	#	-3.599E+001	-3.600E+001	36.65	36.77	4.272E+001
AC-228	#	9.882E+000	9.883E+000	15.05	15.33	5.441E+000
PA-234M	#	1.238E+001	1.238E+001	345.10	345.11	1.561E+002
U-235	#	1.844E+000	1.844E+000	95.96	96.00	5.934E+000
AM-241	#	-1.839E-002	-1.839E-002	4,704.74	4,704.74	2.967E+000
EU-154	#	-1.895E+000	-1.895E+000	182.31	182.34	1.213E+001
PB-214	#	1.540E+001	1.540E+001	7.06	7.62	1.754E+000
BI-212	#	4.099E+000	4.099E+000	68.58	68.64	9.328E+000
BI-214	#	1.124E+001	1.124E+001	10.67	11.06	2.585E+000
Pa-234	#	-3.974E-001	-3.974E-001	293.29	293.31	3.976E+000
TH-234	#	2.934E+000	2.934E+000	248.68	248.70	2.509E+001

= All peaks for activity calculation had bad shape

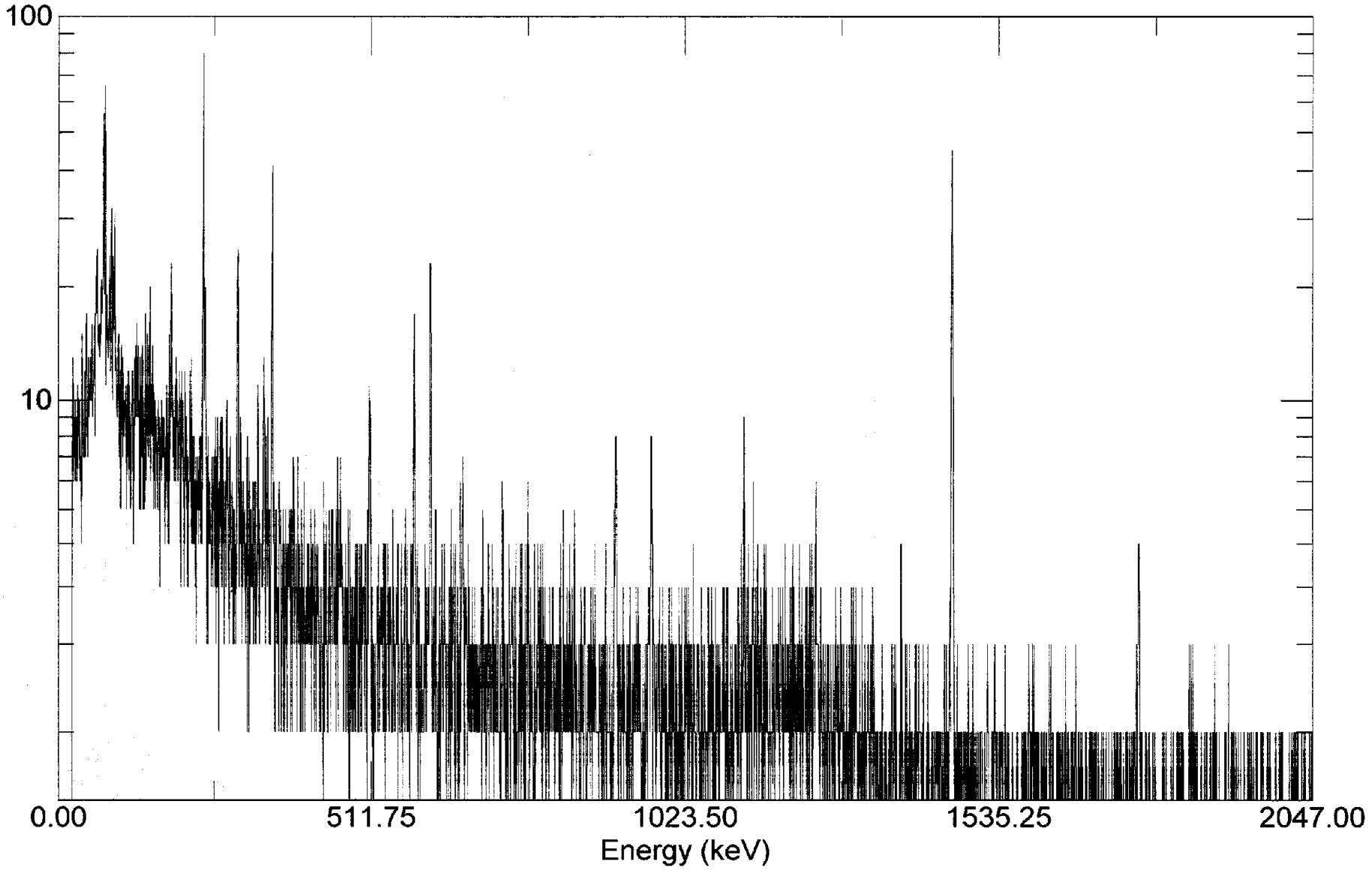
Total Activity (37.72 to 2,000.15 keV) 325.72 Bq/sample

Analyzed by: 403605

Laboratory: Test America

KEKG21AD

7360294_KEKG21AD_F7L200271-001X



Acquired: 26-Dec-2007 5:46:19 PM
File: C:\User\spectra\KEKG21AD.spc
Detector: #0 Ge 7 SN/154

Real Time: 1823.94 s. Live Time: 1800.00 s.
Channels: 8192

TestAmerica St. Louis

DB Analysis ID: 33,060

Sample Description: 7360294_KEKHM1AC_F7L200271-002

Spectrum Filename: KEKHM1AC.An1

Acquisition Information

Start Time:	26-Dec-2007 5:01:17PM		
Live Time:	1800.00	Real Time:	1820.66
Dead Time:	1.13 %		
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	26-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: 0.0875

UNIDENTIFIED PEAK SUMMARY

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncertainty 1 Sigma%	FWHM keV	Suspected Nuclide	Code
298.03	74.72	208.00	154.00	0.086	19.66	0.834	PB-214	
307.87	77.18	138.00	222.00	0.123	11.36	0.970	PB-214	s
1180.61	295.32	82.90	25.10	0.014	55.04	0.551		s
1407.41	352.02	147.35	10.65	0.006	164.03	0.856		s

s = Peak fails shape tests.

D = Peak area deconvoluted.

Test Sample Mica St Louis

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	46.55	127.60	5.04	0.003	52.73	0.832	s
AM-241	1	233.68	58.64	152.17	5.89	0.003	299.27	0.846	s
TH-234	1	252.36	63.31	199.08	26.64	0.015	42.42	0.850	s
EU-155	1	345.32	86.54	287.94	0.00	0.000	2399.73	0.874	s
TH-234	1	370.97	92.95	242.90	33.28	0.018	36.19	0.881	s
U-235	1	372.56	93.35	168.00	8.63	0.005	20.97	0.882	s D
AC-228	1	372.56	93.35	168.00	67.83	0.038	2.24	0.882	s D
EU-155	1	418.04	104.72	138.23	8.15	0.005	206.92	0.894	s
EU-154	1	491.58	123.10	218.86	1.30	0.001	1616.65	0.913	s
EU-152	1	493.75	123.64	111.78	-13.72	-0.008	112.30	0.912	s
Pa-234	1	519.45	130.07	130.55	6.04	0.003	270.51	0.922	s
U-235	1	574.18	143.74	135.99	16.24	0.009	104.52	0.935	s
U-235	1	654.37	163.79	151.73	-7.36	-0.004	239.39	0.955	s
U-235	1	822.56	205.83	108.53	-0.63	0.000	2348.54	0.999	s
PB-212	1	953.97	238.67	126.88	593.13	0.330	6.09	1.169	s
RA-224	1	960.16	240.22	521.81	-111.66	-0.062	30.44	1.036	s
PB-214	1	970.76	242.87	170.87	-16.18	-0.009	116.96	1.037	s
TL-208	1	1109.10	277.45	55.22	25.49	0.014	45.73	1.074	s
I-131	1	1138.46	284.79	66.79	0.79	0.000	1462.62	1.081	s
PB-214	1	1180.88	295.39	42.61	64.90	0.036	18.88	1.092	s
PB-212	1	1202.57	300.81	43.50	68.50	0.038	26.21	0.733	s
AC-228	1	1352.75	338.35	42.36	76.97	0.043	16.52	1.136	s
EU-152	1	1374.64	343.82	29.68	4.29	0.002	185.96	1.142	s
PB-214	1	1407.47	352.03	40.86	129.46	0.072	10.90	1.150	s
I-131	1	1461.26	365.48	42.88	-6.50	-0.004	147.85	1.163	s
BE-7	1	1909.36	477.48	25.91	1.61	0.001	454.39	1.277	s
CS-134	1	2250.34	562.72	25.34	7.61	0.004	100.33	1.363	s
CS-134	1	2276.76	569.32	74.03	0.00	0.000	632.46	1.369	s D
Pa-234	1	2277.35	569.47	61.42	0.89	0.000	103.53	1.369	s D
TL-208	1	2332.02	583.13	11.74	162.26	0.090	8.96	0.796	s
CS-134	1	2408.16	602.17	25.54	2.51	0.001	291.44	1.403	s
BI-214	1	2436.29	609.20	6.63	129.37	0.072	9.51	1.295	s
I-131	1	2548.93	637.36	32.28	-2.71	-0.002	303.10	1.435	s
CS-137	1	2647.96	662.11	40.03	3.18	0.002	231.50	1.459	s
EU-154	1	2890.12	722.65	37.03	-3.34	-0.002	263.53	1.519	s
BI-212	1	2908.96	727.35	26.53	33.67	0.019	27.66	1.523	s
PA-234M	1	3065.06	766.38	35.11	-1.07	-0.001	792.56	1.561	s
EU-152	1	3114.84	778.82	31.62	-3.61	-0.002	226.62	1.573	s
BI-212	1	3126.04	781.62	15.83	5.20	0.003	116.84	1.579	s
CS-134	1	3181.54	795.49	22.06	9.68	0.005	75.80	1.589	s
CS-134	1	3207.37	801.95	38.00	0.00	0.000	871.78	1.595	s
TL-208	1	3440.82	860.31	0.00	33.00	0.018	17.41	0.531	s
EU-154	1	3495.68	874.02	15.92	-1.74	-0.001	332.76	1.662	s
Pa-234	1	3527.07	881.87	21.74	0.28	0.000	2369.52	1.669	s
Pa-234	1	3530.57	882.74	19.20	2.57	0.001	248.63	1.672	s
AC-228	1	3644.88	911.32	17.55	78.27	0.043	13.60	1.698	

TestAmerica St Louis

Pa-234	1	3777.40	944.45	17.30	-0.15	0.000	4010.46	1.731	s
EU-152	1	3857.10	964.37	56.19	2.00	0.001	533.84	1.748	s
AC-228	1	3875.51	968.97	41.21	26.55	0.015	39.32	1.752	s
EU-154	1	3981.93	995.58	10.65	3.01	0.002	163.77	1.778	s
PA-234M	1	3997.05	999.36	13.51	-1.39	-0.001	384.45	1.782	s
EU-154	1	4014.09	1003.62	8.60	1.71	0.001	254.56	1.785	s
EU-152	1	4447.92	1112.07	2.27	0.00	0.000	212.86	1.884	s
BI-214	1	4481.11	1120.37	16.15	14.20	0.008	48.03	1.891	s
CO-60	1	4692.58	1173.24	14.98	0.00	0.000	547.42	1.939	s
EU-154	1	5097.80	1274.54	0.00	0.00	0.000	100.00	2.030	s
CO-60	1	5335.72	1334.02	18.89	-0.20	0.000	3140.56	2.081	s
EU-152	1	5632.10	1408.12	18.92	0.16	0.000	3772.48	2.147	s
K-40	1	5843.11	1460.88	0.00	201.00	0.112	7.05	1.525	s
BI-214	1	7058.62	1764.78	9.46	11.06	0.006	49.49	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 MDA Value Code	Peak Comments	
CS-134	T F I	1	9.564E-002	604.71	9.564E-002 %	(	9.999E-001G		7.5E+002	97.62
			9.564E-002	795.87	5.337E-001 %		1.357E+000G		7.5E+002	85.53
			9.564E-002	569.32	0.000E+000 &	)	8.809E+000G		7.5E+002	15.38
			9.564E-002	801.95	0.000E+000 &		1.718E+001G		7.5E+002	8.69
			9.564E-002	563.24	3.181E+000 %		1.094E+001G		7.5E+002	8.35
PA-234M	N	1	-9.505E+000	1001.00	-9.505E+000 %	(	1.360E+002G		1.6E+012	.84
			-9.505E+000	766.41	-1.655E+001 %		4.710E+002G		1.6E+012	.29
TH-234	N	1	8.085E+000	63.29	8.085E+000 *	(P	2.078E+001G		1.6E+012	4.82
			8.085E+000	92.59	6.968E+000 %	P	1.577E+001G		1.6E+012	5.58
PB-214	N	1	7.375E+000	351.93	7.824E+000	(P	1.964E+000G		5.8E+005	37.60
			7.375E+000	295.09	6.501E+000 *	(	3.319E+000G		5.8E+005	19.30
			7.375E+000	242.00	-3.538E+000 %		1.391E+001G		5.8E+005	7.43
EU-154	T F I	1	-7.248E-001	873.23	-7.248E-001 %	(	8.866E+000G		3.1E+003	12.27
			-7.248E-001	123.10	3.587E-002 &		1.983E+000G		3.1E+003	40.79
			-7.248E-001	1274.54	0.000E+000 %		1.483E+000G		3.1E+003	35.19
			-7.248E-001	723.36	-7.174E-001 %		6.676E+000G		3.1E+003	20.22
			-7.248E-001	1004.77	5.461E-001 &		5.236E+000G		3.1E+003	18.01
			-7.248E-001	996.33	1.624E+000 %		9.663E+000G		3.1E+003	10.60
TL-208	F N	1	6.911E+000	583.02	6.911E+000 *	(P	7.955E-001G		7.0E+002	84.50
			6.911E+000	277.28	7.387E+000 &		1.082E+001G		7.0E+002	6.31
			6.911E+000	860.56	1.340E+001 +		2.993E+000G		7.0E+002	12.42
BE-7	N P C	1	4.601E-001	477.60	4.601E-001 &	(	7.560E+000G		5.3E+001	10.52
RA-224	N	1	-4.410E+001	240.99	-4.410E+001	(	4.311E+001G		7.0E+002	4.10
EU-155	T F I	1	4.355E-001	105.31	4.355E-001 &	(	3.072E+000G		1.8E+003	21.20
			4.355E-001	86.54	0.000E+000 %		3.197E+000G	A	1.8E+003	30.70
			3.827E-001	569.47	3.827E-001 &		1.686E+001G		1.6E+012	8.20
			3.827E-001	946.02	-5.998E-002 %		9.016E+000G		1.6E+012	13.40
			3.827E-001	883.24	1.383E+000 %		1.242E+001G		1.6E+012	9.60
			3.827E-001	880.53	2.393E-001 %		2.095E+001G		1.6E+012	6.00
Pa-234	N	1	3.827E-001	131.29	3.827E-001 &	(	3.544E+000G		1.6E+012	18.00
EU-152	T F	1	3.605E-001	344.29	3.605E-001 &	(	2.361E+000G		4.9E+003	26.50
			3.605E-001	121.78	-5.412E-001 %		2.051E+000G		4.9E+003	28.58

				3.605E-001	778.92	-1.291E+000	%			1.035E+001G		4.9E+003	12.94
				3.605E-001	964.11	7.624E-001	%			1.432E+001G		4.9E+003	14.61
				3.605E-001	1112.07	0.000E+000	%			4.479E+000G		4.9E+003	13.64
				3.605E-001	1408.00	6.027E-002	%			8.476E+000G		4.9E+003	21.00
PB-210		N	1	3.007E+000	46.54	3.007E+000	*	(	P	3.305E+001G		8.1E+003	4.25
AM-241	T		1	2.543E-001	59.54	2.543E-001	&	(		2.601E+000G		1.6E+005	35.90
PB-212		N	1	2.200E+001	238.63	2.200E+001	*	(	P	2.047E+000G		7.0E+002	43.30
				2.200E+001	300.03	4.099E+001	+			2.001E+001G		7.0E+002	3.28
I-131	T F I		1	-1.866E-001	364.48	-1.866E-001	%	(		9.545E-001G		8.0E+000	81.70
				-1.866E-001	284.30	2.413E-001	&			1.242E+001G		8.0E+000	6.14
				-1.866E-001	636.97	-1.468E+000	%			1.584E+001G		8.0E+000	7.17
U-235		N	1	1.733E+000	143.79	1.733E+000	%	(		6.086E+000G		2.6E+011	10.96
				1.733E+000	205.33	-1.789E-001	&			1.460E+001G		2.6E+011	5.01
				1.733E+000	163.38	-1.790E+000	%			1.461E+001G		2.6E+011	5.08
				1.733E+000	93.35	1.733E+000	!		E	1.266E+001X		2.6E+011	5.81
K-40		N	1	1.510E+002	1460.83	1.510E+002		(		5.536E+000G		4.7E+011	10.67
CS-137	T F I		1	1.500E-001	661.66	1.500E-001	%	(	P	1.520E+000G		1.1E+004	85.21
CO-60	T F		1	-1.446E-002	1332.50	-1.446E-002	%	(		1.693E+000G		1.9E+003	99.98
				-1.446E-002	1173.24	0.000E+000	&			1.367E+000G		1.9E+003	99.90
AC-228		N	1	1.422E+001	911.16	1.429E+001		(		4.060E+000G		2.1E+003	29.00
				1.422E+001	968.97	8.488E+000	-			1.043E+001G		2.1E+003	17.46
				1.422E+001	338.32	1.404E+001		(		6.027E+000G		2.1E+003	12.01
				1.422E+001	93.35	1.422E+001	!		E	1.323E+001G	A	2.1E+003	5.56
BI-212		N	1	1.244E+001	727.33	1.244E+001	@	(		9.865E+000G		7.0E+002	11.82
				1.244E+001	785.51	2.203E+001	&			9.010E+001G		7.0E+002	1.10
BI-214		N	1	1.050E+001	609.31	1.050E+001	@	(	P	1.194E+000G		5.8E+005	46.09
				1.050E+001	1120.29	5.947E+000	%			8.980E+000G		5.8E+005	15.10
				1.050E+001	1764.49	6.898E+000	%			1.062E+001G		5.8E+005	15.40

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

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Nuclide Codes:

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P = Photon Reaction	N = Naturally Occurring Isotope	C = Charged Particle Reaction
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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	#	4.601E-001	4.614E-001	454.39	454.40	7.560E+000
K-40		1.510E+002	1.510E+002	7.05	7.64	5.536E+000
CO-60	#	-1.446E-002	-1.447E-002	3,140.56	3,140.56	1.693E+000
I-131	#	-1.866E-001	-1.900E-001	147.85	147.88	9.545E-001
CS-134	#	9.564E-002	9.566E-002	291.44	291.45	9.999E-001
EU-154	#	-7.248E-001	-7.248E-001	332.76	332.77	8.866E+000
EU-155	#	4.355E-001	4.356E-001	206.92	206.95	3.072E+000
PB-214	#	7.375E+000	7.375E+000	10.96	11.33	1.964E+000
BI-212	#	1.244E+001	1.244E+001	27.66	27.81	9.865E+000
BI-214	#	1.050E+001	1.050E+001	9.66	10.09	1.194E+000
TH-234	#	8.085E+000	8.085E+000	75.46	75.55	2.078E+001
PA-234M	#	-9.505E+000	-9.505E+000	384.45	384.46	1.360E+002
CS-137	#	1.500E-001	1.500E-001	285.75	285.76	1.520E+000
EU-152	#	3.605E-001	3.605E-001	185.96	185.99	2.361E+000
TL-208		6.911E+000	6.912E+000	9.09	9.54	7.955E-001
PB-210	#	3.007E+000	3.007E+000	305.15	305.17	3.305E+001
PB-212	#	2.200E+001	2.200E+001	6.19	6.87	2.047E+000
RA-224	#	-4.410E+001	-4.411E+001	30.44	30.59	4.311E+001
AC-228	#	1.422E+001	1.422E+001	10.70	11.08	4.060E+000
Pa-234	#	3.827E-001	3.827E-001	270.51	270.52	3.544E+000
U-235	#	1.733E+000	1.733E+000	104.52	104.56	6.086E+000
AM-241	#	2.543E-001	2.543E-001	299.27	299.29	2.601E+000

= All peaks for activity calculation had bad shape

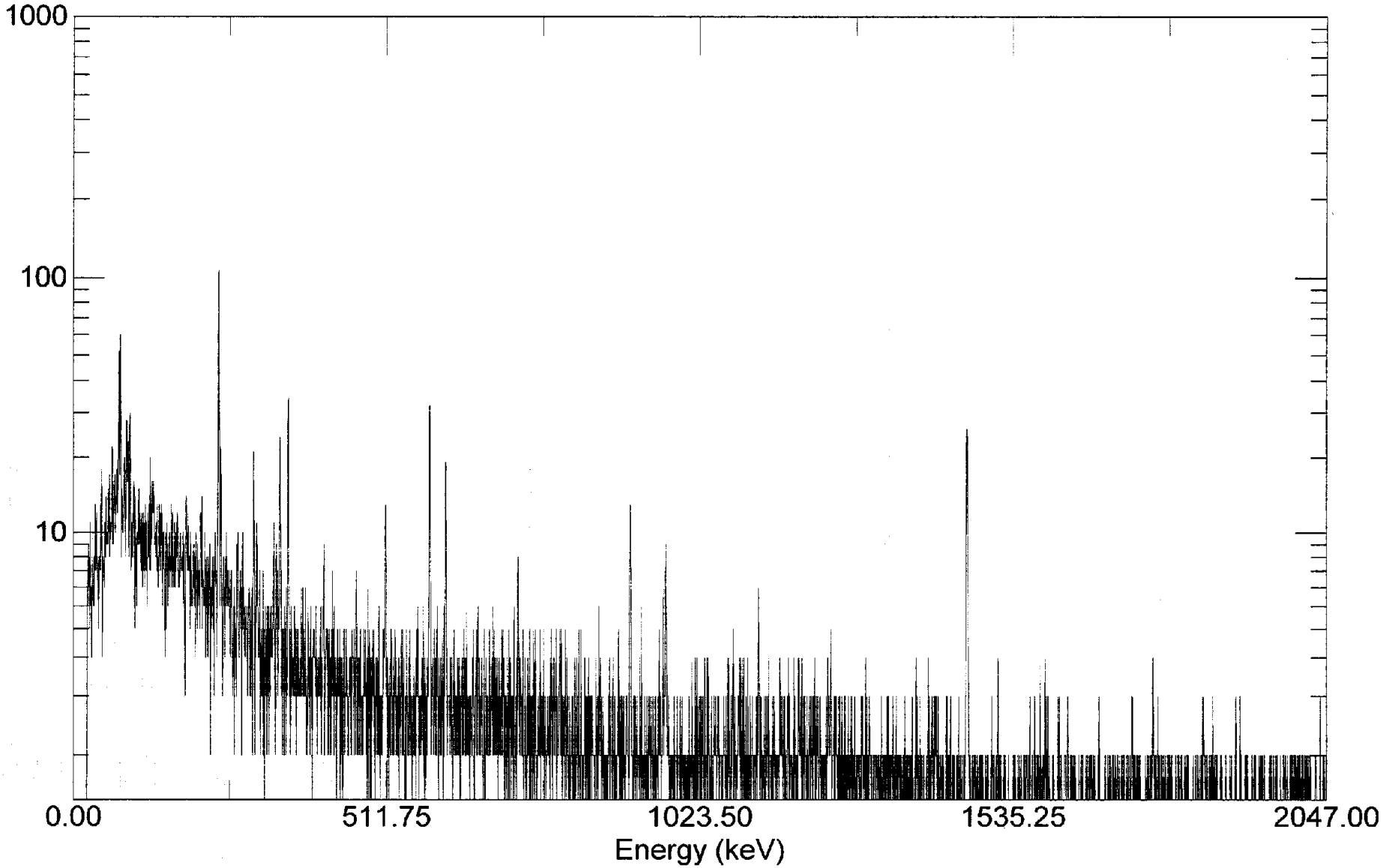
Total Activity (37.72 to 2,000.15 keV) 190.38 Bq/sample

Analyzed by: 403605

Laboratory: Test America

KEKHM1AC

7360294_KEKHM1AC_F7L200271-002



Acquired: 26-Dec-2007 5:01:17 PM
File: C:\User\spectra\KEKHM1AC.spc
Detector: #0 Ge 7 SN/154

Real Time: 1820.66 s. Live Time: 1800.00 s.
Channels: 8192

TestAmerica St. Louis

DB Analysis ID: 33,066

Sample Description: 7360294_KEKHQ1AC_F7L200271-003

Spectrum Filename: KEKHQ1AC.An1

Acquisition Information

Start Time:	26-Dec-2007 5:44:40PM		
Live Time:	1800.00	Real Time:	1810.48
Dead Time:	0.58 %		
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	26-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 0.1743

UNIDENTIFIED PEAK SUMMARY

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncertainty 1 Sigma%	FWHM keV	Suspected Nuclide	Code
298.24	74.77	229.50	174.50	0.097	18.61	0.658	PB-214	
307.76	77.16	141.17	187.83	0.104	12.91	0.846	PB-214	
742.25	185.78	104.50	104.50	0.058	22.24	0.513	U-235	s
1179.83	295.17	142.46	13.54	0.008	127.64	1.035		s
1406.29	351.79	229.48	19.52	0.011	112.06	1.058		

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	184.89	46.44	142.79	43.21	0.024	32.68	0.535	s
AM-241	1	235.51	59.09	166.89	17.83	0.010	105.15	0.824	s
TH-234	1	252.19	63.26	286.80	-5.84	-0.003	74.18	0.828	s
EU-155	1	345.31	86.54	218.97	-1.21	-0.001	1739.03	0.849	s
TH-234	1	370.40	92.82	228.97	68.82	0.038	18.29	0.855	s
AC-228	1	372.54	93.35	157.67	57.34	0.032	3.01	1.176	s D
U-235	1	372.54	93.35	137.37	1.02	0.001	185.72	0.855	s D
EU-155	1	420.63	105.37	159.64	5.92	0.003	304.64	0.866	s
EU-152	1	488.27	122.28	103.85	8.47	0.005	173.60	0.881	s
EU-154	1	493.55	123.60	156.28	-12.53	-0.007	143.94	0.882	s
Pa-234	1	520.42	130.32	152.98	-19.03	-0.011	94.75	0.890	
U-235	1	574.18	143.76	116.30	1.88	0.001	270.07	0.901	s
U-235	1	652.61	163.37	125.22	-9.10	-0.005	258.54	0.919	s
U-235	1	826.73	206.90	90.26	-0.71	0.000	933.65	0.957	s
PB-212	1	953.62	238.62	110.92	506.08	0.281	6.27	0.929	
RA-224	1	958.65	239.88	462.11	-111.31	-0.062	28.91	0.989	s
PB-214	1	965.00	241.47	105.61	38.39	0.021	34.30	0.990	s
TL-208	1	1109.76	277.66	45.89	26.70	0.015	40.77	1.021	s
I-131	1	1135.83	284.17	53.38	3.20	0.002	328.15	1.028	s
PB-214	1	1179.56	295.11	65.06	93.59	0.052	14.25	1.037	s
PB-212	1	1199.57	300.11	44.00	63.00	0.035	26.00	0.747	s
AC-228	1	1352.13	338.25	33.41	100.59	0.056	14.19	1.444	s
EU-152	1	1377.96	344.70	47.68	5.33	0.003	188.11	1.081	s
PB-214	1	1406.16	351.76	42.35	199.49	0.111	7.80	1.088	
I-131	1	1456.92	364.44	43.16	3.39	0.002	279.78	1.099	s
BE-7	1	1915.68	479.13	35.62	5.64	0.003	155.58	1.198	s
CS-134	1	2242.41	560.81	19.74	1.70	0.001	377.74	1.273	s
CS-134	1	2276.47	569.32	36.61	0.31	0.000	798.09	1.278	s D
Pa-234	1	2277.07	569.47	30.00	-3.44	-0.002	-133.44	1.278	s D
TL-208	1	2331.17	582.99	40.31	92.84	0.052	12.61	1.290	s
CS-134	1	2418.04	604.71	326.60	1.86	0.001	1377.61	1.309	s
BI-214	1	2435.96	609.19	56.42	142.18	0.079	10.14	1.313	s
I-131	1	2548.03	637.20	25.29	1.66	0.001	434.87	1.337	s
CS-137	1	2646.82	661.90	24.57	3.38	0.002	214.36	1.358	s
EU-154	1	2882.93	720.92	23.72	-1.27	-0.001	548.33	1.411	
BI-212	1	2910.10	727.71	32.16	6.69	0.004	126.04	1.414	s
PA-234M	1	3064.67	766.35	36.26	-4.59	-0.003	191.43	1.447	s
EU-152	1	3113.23	778.49	22.83	0.00	0.000	50827.73	1.458	s
BI-212	1	3142.16	785.72	26.68	9.76	0.005	81.37	1.463	s
CS-134	1	3182.04	795.69	26.14	5.12	0.003	148.06	1.472	s
CS-134	1	3207.86	802.14	40.00	-6.66	-0.004	139.84	1.477	s
TL-208	1	3438.97	859.91	6.17	42.83	0.024	21.78	0.403	s
EU-154	1	3492.25	873.23	41.93	0.00	0.000	915.71	1.537	s
Pa-234	1	3520.49	880.29	27.16	-0.31	0.000	2395.61	1.543	s
Pa-234	1	3535.35	884.00	28.70	-3.23	-0.002	241.05	1.546	s

AC-228	1	3643.82	911.12	9.31	85.69	0.048	11.86	1.173	s
Pa-234	1	3783.35	945.99	23.32	-3.13	-0.002	225.58	1.598	s
EU-152	1	3856.89	964.37	42.08	12.52	0.007	78.55	1.613	s
AC-228	1	3870.47	967.77	13.58	75.42	0.042	15.17	1.000	s
EU-154	1	3984.21	996.20	23.54	3.39	0.002	209.41	1.640	s
PA-234M	1	4000.56	1000.29	29.46	0.50	0.000	1542.02	1.643	s
EU-154	1	4020.08	1005.16	32.83	1.62	0.001	505.18	1.647	s
EU-152	1	4445.20	1111.42	28.13	-1.47	-0.001	517.27	1.735	s
BI-214	1	4480.54	1120.26	37.94	11.47	0.006	52.47	1.741	s
CO-60	1	4692.40	1173.21	21.36	2.40	0.001	279.39	1.784	s
EU-154	1	5089.99	1272.58	13.93	4.15	0.002	136.46	1.866	s
CO-60	1	5326.58	1331.72	22.15	1.42	0.001	476.59	1.912	s
EU-152	1	5628.77	1407.24	16.78	2.75	0.002	218.82	1.972	s
K-40	1	5842.62	1460.69	12.54	330.46	0.184	5.40	1.914	
BI-214	1	7058.21	1764.49	12.08	21.30	0.012	24.43	2.246	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	8.708E-002	1332.50	8.708E-002	%	(	1.512E+000G		1.9E+003	99.98
			8.708E-002	1173.24	1.344E-001	%		1.355E+000G		1.9E+003	99.90
AM-241	T	1	8.621E-001	59.54	8.621E-001	&	(	3.041E+000G		1.6E+005	35.90
TH-234	N	1	7.940E+000	63.29	-1.985E+000	*	(P	2.776E+001G		1.6E+012	4.82
			7.940E+000	92.59	1.651E+001		(P	1.757E+001G		1.6E+012	5.58
CS-134	T F I	1	6.667E-002	604.71	6.667E-002	%	(	3.119E+000G		7.5E+002	97.62
			6.667E-002	795.87	2.540E-001	%		1.317E+000G		7.5E+002	85.53
			6.667E-002	569.32	6.667E-002	%		6.745E+000G		7.5E+002	15.38
			6.667E-002	801.95	-3.269E+000	%		1.580E+001G		7.5E+002	8.69
			6.667E-002	563.24	6.776E-001	&		9.339E+000G		7.5E+002	8.35
RA-224	N	1	-4.888E+001	240.99	-4.888E+001		(	4.518E+001G		7.0E+002	4.10
			4.684E-001	964.11	4.160E+000	%		1.095E+001G		4.9E+003	14.61
			4.684E-001	1112.07	-5.782E-001	%		1.080E+001G		4.9E+003	18.64
			4.684E-001	1408.00	8.390E-001	%		6.642E+000G		4.9E+003	21.00
EU-152	T F	1	4.684E-001	344.29	4.684E-001	&	(	3.064E+000G		4.9E+003	26.50
			4.684E-001	121.78	3.899E-001	%		2.311E+000G		4.9E+003	28.58
			4.684E-001	778.92	8.710E-004	%		8.071E+000G		4.9E+003	12.94
TL-208	F N	1	3.751E+000	583.02	3.751E+000	?	(P	1.305E+000G		7.0E+002	84.50
			3.751E+000	277.28	8.405E+000	&		1.079E+001G		7.0E+002	6.31
			3.751E+000	860.56	1.546E+001	+		5.154E+000G		7.0E+002	12.42
EU-155	T F I	1	3.661E-001	105.31	3.661E-001	%	(	3.809E+000G		1.8E+003	21.20
			3.661E-001	86.54	-5.367E-002	%		3.192E+000G		1.8E+003	30.70
PA-234	N	1	2.976E+000	1001.00	2.976E+000	&	(	1.667E+002G		1.6E+012	.84
			2.976E+000	766.41	-6.452E+001	%		4.328E+002G		1.6E+012	.29
PB-210	N	1	2.729E+001	46.54	2.729E+001	%	(P	3.688E+001G		8.1E+003	4.25
U-235	N	1	2.345E-001	143.79	2.345E-001	%	(P	6.599E+000G		2.6E+011	10.96
			2.345E-001	205.33	-2.312E-001	&	P	1.521E+001G		2.6E+011	5.01
			2.345E-001	163.38	-2.571E+000	&	P	1.549E+001G		2.6E+011	5.08
			2.345E-001	93.35	2.345E-001	%	E	1.319E+001X		2.6E+011	5.81
BI-212	N	1	2.255E+000	727.33	2.255E+000	%	(	9.828E+000G		7.0E+002	11.82
			2.255E+000	785.51	3.734E+001	%		1.024E+002G		7.0E+002	1.10
PB-212	N	1	2.090E+001	238.63	2.090E+001		(P	2.139E+000G		7.0E+002	43.30
			2.090E+001	300.03	4.040E+001	+		2.156E+001G		7.0E+002	3.28
K-40	N	1	2.039E+002	1460.83	2.039E+002		(P	1.186E+001G		4.7E+011	10.67
BE-7	N P C	1	1.585E+000	477.60	1.585E+000	%	(	8.584E+000G		5.3E+001	10.52
CS-137	T F I	1	1.481E-001	661.66	1.481E-001	&	(	1.130E+000G		1.1E+004	85.21
Pa-234	N	1	-1.408E+000	131.29	-1.408E+000	&	(	4.467E+000G		1.6E+012	18.00
			-1.408E+000	569.47	-1.408E+000	%		1.156E+001G		1.6E+012	8.20
			-1.408E+000	946.02	-1.118E+000	%		9.011E+000G		1.6E+012	13.40
			-1.408E+000	883.24	-1.536E+000	%		1.316E+001G		1.6E+012	9.60
			-1.408E+000	880.53	-2.342E-001	%		2.049E+001G		1.6E+012	6.00
AC-228	N	1	1.378E+001	911.07	1.378E+001		(P	2.722E+000G		2.1E+003	29.00
			1.378E+001	968.97	2.104E+001	+	P	5.547E+000G		2.1E+003	17.46
			1.378E+001	338.32	1.924E+001	+	P	5.671E+000G		2.1E+003	12.01

TestAmerica St. Louis

			1.378E+001	93.35	1.378E+001	+		E	1.472E+001X	A 2.1E+003	5.56
PB-214	N	1	1.255E+001	351.93	1.255E+001	(	P		2.078E+000G	5.8E+005	37.60
			1.255E+001	295.09	1.008E+001	-	P		4.339E+000G	5.8E+005	19.30
			1.255E+001	242.00	9.328E+000	%	P		1.230E+001G	5.8E+005	7.43
BI-214	N	1	1.080E+001	609.31	1.086E+001	(	P		2.882E+000G	5.8E+005	46.09
			1.080E+001	1120.29	4.100E+000	%	P		1.123E+001G	5.8E+005	15.10
			1.080E+001	1764.49	1.062E+001	?	(P		9.429E+000G	5.8E+005	15.40
I-131	T F I	1	1.006E-001	364.48	1.006E-001	&	(		9.900E-001G	8.0E+000	81.70
			1.006E-001	284.30	1.053E+000	%			1.211E+001G	8.0E+000	6.14
			1.006E-001	636.97	8.423E-001	&			1.325E+001G	8.0E+000	7.17
EU-154	T F I	1	0.000E+000	873.23	0.000E+000	%	(		1.214E+001G	3.1E+003	12.27
			0.000E+000	123.10	-4.045E-001	%			1.969E+000G	3.1E+003	40.79
			0.000E+000	1274.54	6.992E-001	&			3.390E+000G	3.1E+003	35.19
			0.000E+000	723.36	-2.500E-001	&			4.990E+000G	3.1E+003	20.22
			0.000E+000	1004.77	4.505E-001	%			8.160E+000G	3.1E+003	18.01
			0.000E+000	996.33	1.590E+000	%			1.186E+001G	3.1E+003	10.60

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	<	1.585E+000	1.590E+000	155.58	155.61	8.584E+000
K-40		2.039E+002	2.039E+002	5.60	6.32	1.186E+001
CO-60	<	8.708E-002	8.708E-002	476.59	476.60	1.512E+000
I-131	<	1.006E-001	1.027E-001	279.78	279.80	9.900E-001
CS-134	<	6.667E-002	6.668E-002	1,377.61	1,377.61	3.119E+000
EU-154	<			915.71	915.71	1.214E+001
CS-137	<	1.481E-001	1.481E-001	214.36	214.38	1.130E+000
EU-152	<	4.684E-001	4.684E-001	188.11	188.13	3.064E+000
EU-155	<	3.661E-001	3.661E-001	304.64	304.66	3.809E+000
TL-208	#	3.751E+000	3.751E+000	13.82	14.11	1.305E+000
BI-212	<	2.255E+000	2.256E+000	126.04	126.08	9.828E+000
BI-214	<	1.080E+001	1.080E+001	10.97	11.35	2.882E+000
AC-228		1.378E+001	1.378E+001	12.53	12.85	2.722E+000
TH-234	<	7.940E+000	7.940E+000	31.71	31.93	2.776E+001
PA-234M	<	2.976E+000	2.976E+000	1,542.02	1,542.02	1.667E+002
U-235	<	2.345E-001	2.345E-001	807.16	807.17	6.599E+000
AM-241	<	8.621E-001	8.621E-001	105.15	105.22	3.041E+000
RA-224	<	-4.888E+001	-4.889E+001	28.91	29.06	4.518E+001
PB-210		2.729E+001	2.729E+001	54.95	55.09	3.688E+001
PB-212		2.090E+001	2.091E+001	6.56	7.21	2.139E+000
PB-214	<	1.255E+001	1.255E+001	8.27	8.75	2.078E+000
Pa-234	<	-1.408E+000	-1.408E+000	94.75	94.80	4.467E+000

= All peaks for activity calculation had bad shape

Total Activity (37.71 to 1,999.84 keV) 242.37 Bq/sample

Analyzed by: _____

403605

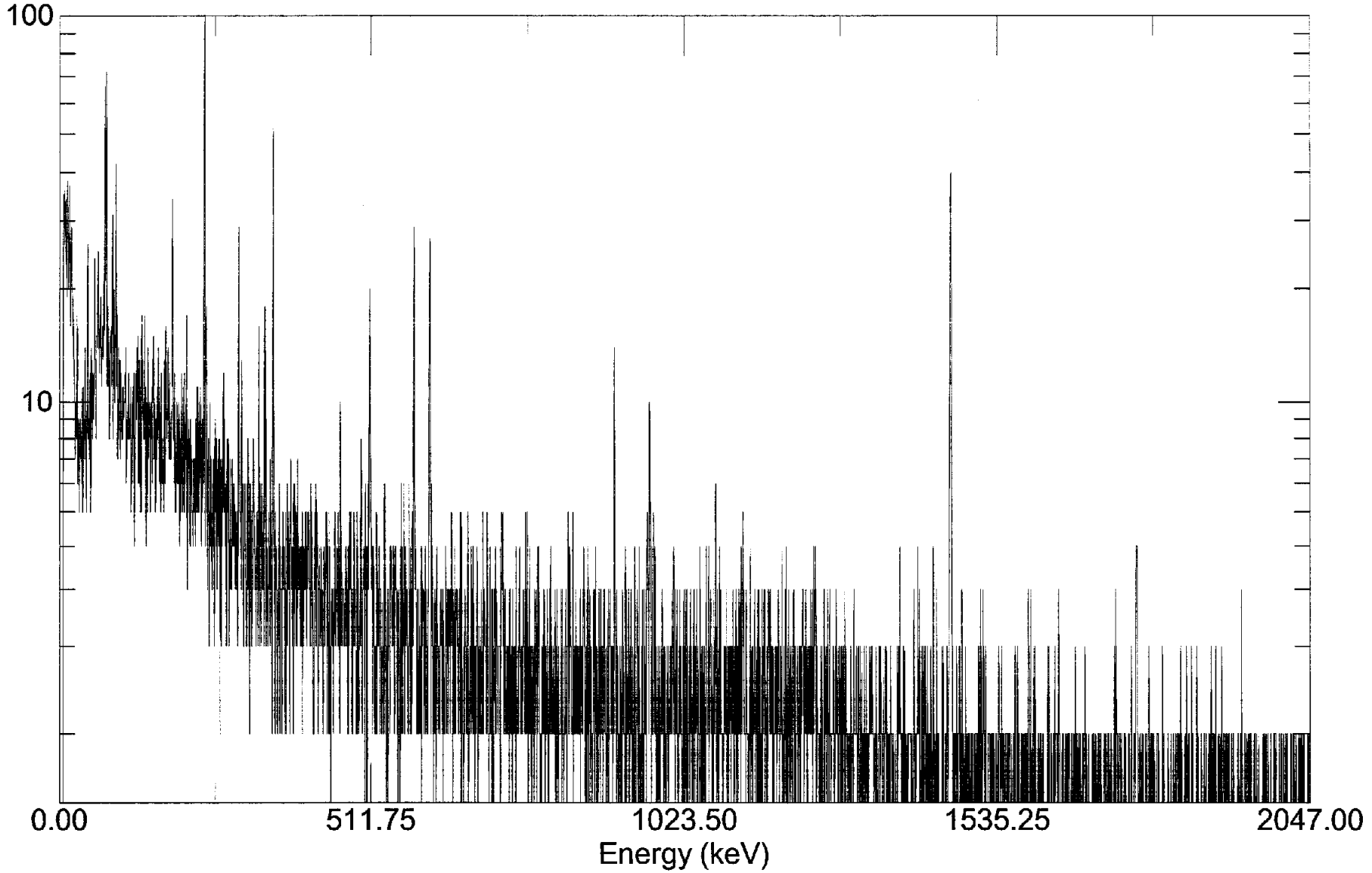
Reviewed by: _____

Supervisor

Laboratory: Test America

KEKHQ1AC

7360294_KEKHQ1AC_F7L200271-003



Acquired: 26-Dec-2007 5:44:41 PM
File: C:\User\spectra\KEKHQ1AC.spc
Detector: #0 Ge 1 SN/242

Real Time: 1810.48 s. Live Time: 1800.00 s.
Channels: 8192

TestAmerica St. Louis

DB Analysis ID: 33,068

Sample Description: 7360294_KEKHR1AC_F7L200271-004

Spectrum Filename: KEKHR1AC.An1

Acquisition Information

Start Time:	26-Dec-2007 5:45:05PM		
Live Time:	1800.00	Real Time:	1815.40
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	26-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 0.2471

UNIDENTIFIED PEAK SUMMARY

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncertainty 1 Sigma%	FWHM keV	Suspected Nuclide	Code
251.91	63.32	206.48	9.52	0.005	215.82	0.629		s
297.57	74.73	264.00	169.00	0.094	18.34	0.714	PB-214	
306.93	77.06	300.00	267.00	0.148	13.59	1.100	BI-207	s
335.05	84.09	165.68	92.32	0.051	22.30	0.616	TA-182	s
347.17	87.11	277.68	21.32	0.012	112.61	1.165		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	184.33	46.45	194.86	112.14	0.062	24.34	0.897	s
AM-241	1	238.74	60.03	244.13	23.76	0.013	95.25	0.878	s
TH-234	1	251.52	63.23	280.75	27.97	0.016	45.13	0.882	s
EU-155	1	347.07	87.09	311.47	105.01	0.058	25.69	0.906	s
TH-234	1	368.29	92.39	351.37	-28.86	-0.016	950.41	0.912	s
U-235	1	372.14	93.35	219.18	-3.20	-0.002	-447.97	0.913	s D
AC-228	1	372.14	93.35	161.47	132.15	0.073	13.62	0.913	s D
EU-155	1	428.03	107.31	118.56	20.58	0.011	78.00	0.925	s
EU-152	1	481.97	120.78	115.42	-0.41	0.000	3678.24	0.942	s
EU-154	1	490.08	122.80	163.79	-12.08	-0.007	152.57	0.943	s
Pa-234	1	517.76	129.72	120.11	0.72	0.000	2141.69	0.952	s
U-235	1	571.95	143.25	162.22	-5.88	-0.003	481.87	0.964	s
U-235	1	651.62	163.15	152.52	-7.02	-0.004	251.47	0.984	s
U-235	1	829.40	207.56	107.26	-1.44	-0.001	1018.10	1.027	s
PB-212	1	953.82	238.63	137.36	508.64	0.283	5.22	1.060	D
RA-224	1	963.24	240.99	248.64	65.36	0.036	36.29	1.062	D
PB-214	1	967.29	242.00	123.83	78.17	0.043	23.09	1.063	D
TL-208	1	1108.32	277.23	39.67	41.33	0.023	31.87	1.071	
I-131	1	1135.59	284.04	79.33	0.60	0.000	2107.80	1.105	s
PB-214	1	1180.31	295.21	67.32	178.68	0.099	11.70	0.859	s
PB-212	1	1199.48	300.00	101.38	15.92	0.009	92.87	1.121	s
AC-228	1	1352.31	338.18	63.25	103.76	0.058	14.26	1.158	s
EU-152	1	1375.56	343.98	66.11	-8.30	-0.005	142.80	1.164	s
PB-214	1	1407.62	351.99	52.70	274.30	0.152	8.18	1.259	s
I-131	1	1458.15	364.62	51.73	2.61	0.001	394.81	1.184	s
BE-7	1	1913.57	478.40	50.83	-4.26	-0.002	241.54	1.292	s
CS-134	1	2237.62	559.37	12.51	2.13	0.001	244.64	1.372	s
CS-134	1	2277.45	569.32	46.48	0.00	0.000	824.62	1.378	s D
Pa-234	1	2278.04	569.47	47.20	0.13	0.000	106.71	1.378	s D
TL-208	1	2331.58	582.85	30.46	221.54	0.123	8.94	1.389	
CS-134	1	2419.07	604.71	434.35	2.00	0.001	1473.58	1.410	s
BI-214	1	2436.99	609.19	31.78	138.67	0.077	9.60	1.415	
I-131	1	2545.03	636.19	41.43	-4.06	-0.002	229.50	1.440	s
CS-137	1	2647.22	661.73	11.33	70.67	0.039	17.11	0.791	s
EU-154	1	2895.82	723.86	58.75	-1.39	-0.001	785.47	1.518	s
BI-212	1	2907.81	726.85	36.52	21.73	0.012	44.80	1.521	s
PA-234M	1	3079.63	769.80	37.64	-2.36	-0.001	373.64	1.556	s
EU-152	1	3109.23	777.20	28.56	-4.97	-0.003	158.51	1.567	s
BI-212	1	3136.85	784.10	34.01	-3.36	-0.002	251.36	1.572	s
CS-134	1	3191.32	797.71	22.32	2.14	0.001	319.57	1.582	s
CS-134	1	3209.74	802.32	30.03	3.40	0.002	234.28	1.587	s
TL-208	1	3439.59	859.77	24.17	12.27	0.007	63.45	1.638	s
EU-154	1	3491.15	872.66	20.19	1.07	0.001	604.05	1.649	s
Pa-234	1	3519.76	879.81	24.22	2.48	0.001	287.31	1.655	s
Pa-234	1	3532.90	883.10	26.84	2.05	0.001	364.20	1.657	s

AC-228	1	3643.63	910.78	32.40	103.19	0.057	12.22	1.681	s
Pa-234	1	3782.44	945.48	31.93	-2.76	-0.002	295.47	1.710	s
EU-152	1	3859.28	964.69	93.40	-0.18	0.000	7781.92	1.726	s
AC-228	1	3875.77	968.81	44.54	55.99	0.031	21.51	1.730	s
EU-154	1	3985.85	996.33	53.26	0.00	0.000	1032.10	1.753	s
PA-234M	1	4006.07	1001.38	35.57	0.26	0.000	3272.60	1.756	s
EU-154	1	4013.53	1003.25	20.45	7.30	0.004	95.09	1.760	s
EU-152	1	4446.50	1111.50	27.07	4.97	0.003	154.63	1.847	s
BI-214	1	4478.67	1119.55	31.58	35.07	0.019	26.52	1.854	s
CO-60	1	4688.91	1172.12	18.66	2.58	0.001	244.48	1.896	s
EU-154	1	5097.66	1274.34	22.37	0.22	0.000	2998.86	1.975	s
CO-60	1	5326.86	1331.66	19.90	-0.08	0.000	7516.35	2.019	s
EU-152	1	5623.86	1405.95	14.76	-1.38	-0.001	402.67	2.076	s
K-40	1	5840.65	1460.18	11.21	381.79	0.212	5.04	1.946	
BI-214	1	7054.34	1763.83	12.93	19.32	0.011	30.18	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
TH-234	N	1	8.710E+000	63.29	8.710E+000 %	(P	2.516E+001G		1.6E+012 4.82
			8.710E+000	92.59	-6.394E+000 %	P	1.996E+001G		1.6E+012 5.58
TL-208	F N	1	8.642E+000	583.02	8.642E+000	(P	1.109E+000G		7.0E+002 84.50
			8.642E+000	277.28	1.229E+001 +		9.531E+000G		7.0E+002 6.31
			8.642E+000	860.56	4.334E+000 &		9.049E+000G		7.0E+002 12.42
I-131	T F I	1	7.375E-002	364.48	7.375E-002 %	(	1.024E+000G		8.0E+000 81.70
			7.375E-002	284.30	1.864E-001 %		1.376E+001G		8.0E+000 6.14
			7.375E-002	636.97	-1.994E+000 &		1.605E+001G		8.0E+000 7.17
BI-212	N	1	7.131E+000	727.33	7.131E+000 %	(	1.013E+001G		7.0E+002 11.82
			7.131E+000	785.51	-1.254E+001 &		1.115E+002G		7.0E+002 1.10
CS-134	T F I	1	6.947E-002	604.71	6.947E-002 %	(	3.463E+000G		7.5E+002 97.62
			6.947E-002	795.87	1.037E-001 %		1.198E+000G		7.5E+002 85.53
			6.947E-002	569.32	0.000E+000 &		7.261E+000G		7.5E+002 15.38
			6.947E-002	801.95	1.630E+000 %		1.354E+001G		7.5E+002 8.69
			6.947E-002	563.24	8.196E-001 %		7.385E+000G		7.5E+002 8.35
EU-152	T F	1	-6.926E-001	344.29	-6.926E-001 %	(	3.387E+000G		4.9E+003 26.50
			-6.926E-001	121.78	-1.765E-002 %		2.253E+000G		4.9E+003 28.58
			-6.926E-001	778.92	-1.567E+000 &		8.703E+000G		4.9E+003 12.94
			-6.926E-001	964.11	-5.740E-002 %		1.560E+001G		4.9E+003 14.61
			-6.926E-001	1112.07	1.935E+000 %		1.049E+001G		4.9E+003 13.64
			-6.926E-001	1408.00	-4.202E-001 %		6.275E+000G		4.9E+003 21.00
U-235	N	1	-6.812E-001	143.79	-6.812E-001 &	(P	7.192E+000G		2.6E+011 10.96
			-6.812E-001	205.33	-4.380E-001 &		1.547E+001G		2.6E+011 5.01
			-6.812E-001	163.38	-1.850E+000 &		1.587E+001G		2.6E+011 5.08
			-6.812E-001	93.35	-6.812E-001 !	E	1.524E+001X		2.6E+011 5.81
PB-210	N	1	6.497E+001	46.54	6.497E+001 *	(P	3.926E+001G		8.1E+003 4.25
CO-60	T F	1	-5.139E-003	1332.50	-5.139E-003 %	(	1.437E+000G		1.9E+003 99.98
			-5.139E-003	1173.24	1.431E-001 %		1.265E+000G		1.9E+003 99.90
			4.982E-002	880.53	1.847E+000 %		1.907E+001G		1.6E+012 6.00
Pa-234	N	1	4.982E-002	131.29	4.982E-002 %	(	3.697E+000G		1.6E+012 18.00
			4.982E-002	569.47	4.982E-002 &		1.372E+001G		1.6E+012 8.20
			4.982E-002	946.02	-9.698E-001 %		1.020E+001G		1.6E+012 13.40
			4.982E-002	883.24	9.548E-001 %		1.251E+001G		1.6E+012 9.60
			3.852E-001	723.36	-2.652E-001 %		7.342E+000G		3.1E+003 20.22
			3.852E-001	1004.77	1.994E+000 %		6.497E+000G		3.1E+003 18.01
			3.852E-001	996.33	0.000E+000 %		1.693E+001G		3.1E+003 10.60
EU-154	T F I	1	3.852E-001	873.23	3.852E-001 %	(	8.547E+000G		3.1E+003 12.27
			3.852E-001	123.10	-3.620E-001 %		1.868E+000G		3.1E+003 40.79
			3.852E-001	1274.54	3.750E-002 %		4.151E+000G		3.1E+003 35.19
EU-155	T F I	1	3.034E+000	105.31	1.178E+000 %	(	3.060E+000G		1.8E+003 21.20
			3.034E+000	86.54	4.315E+000	(	3.491E+000G		1.8E+003 30.70
CS-137	T F I	1	3.001E+000	661.66	3.001E+000	(	7.814E-001G		1.1E+004 85.21
RA-224	N	1	2.700E+001	240.99	2.700E+001	(	3.147E+001G		7.0E+002 4.10
K-40	N	1	2.359E+002	1460.83	2.359E+002	(P	1.131E+001G		4.7E+011 10.67

PB-212	N	1	1.976E+001	238.63	1.976E+001		(	P	2.227E+000G		7.0E+002	43.30
			1.976E+001	300.03	9.663E+000	%			3.012E+001G		7.0E+002	3.28
			1.711E+001	242.00	1.787E+001		(		1.248E+001G		5.8E+005	7.43
PB-214	N	1	1.711E+001	351.93	1.640E+001	*	(	P	2.185E+000G		5.8E+005	37.60
			1.711E+001	295.09	1.820E+001	@	(	P	4.170E+000G		5.8E+005	19.30
AC-228	N	1	1.653E+001	911.07	1.628E+001	*	(	P	4.612E+000G		2.1E+003	29.00
			1.653E+001	968.97	1.535E+001		(		9.272E+000G		2.1E+003	17.46
			1.653E+001	338.32	1.885E+001	*	(	P	7.224E+000G		2.1E+003	12.01
			1.653E+001	93.35	2.935E+001	!		} E	1.592E+001X	A	2.1E+003	5.56
PA-234	N	1	1.513E+000	1001.00	1.513E+000	%	(		1.788E+002G		1.6E+012	.84
			1.513E+000	766.41	-3.233E+001	%			4.290E+002G		1.6E+012	.29
BE-7	N P C	1	-1.150E+000	477.60	-1.150E+000	%	(		9.698E+000G		5.3E+001	10.52
BI-214	N	1	1.057E+001	609.31	1.025E+001		(	P	2.141E+000G		5.8E+005	46.09
			1.057E+001	1120.29	1.240E+001		(	P	1.022E+001G		5.8E+005	15.10
			1.057E+001	1764.49	9.741E+000	?	(	P	9.816E+000G		5.8E+005	15.40
AM-241 T		1	1.050E+000	59.54	1.050E+000	%	(		3.338E+000G		1.6E+005	35.90

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	<	-1.150E+000	-1.154E+000	241.54	241.55	9.698E+000
K-40		2.359E+002	2.359E+002	5.19	5.96	1.131E+001
CO-60	<	-5.139E-003	-5.139E-003	7,516.35	7,516.35	1.437E+000
I-131	<	7.375E-002	7.529E-002	394.81	394.83	1.024E+000
CS-134	<	6.947E-002	6.949E-002	1,473.58	1,473.59	3.463E+000
CS-137		3.001E+000	3.001E+000	17.11	17.36	7.814E-001
EU-152	<	-6.926E-001	-6.926E-001	142.80	142.83	3.387E+000
EU-155	<	3.034E+000	3.034E+000	25.69	25.91	3.060E+000
TL-208		8.642E+000	8.644E+000	9.26	9.70	1.109E+000
BI-212	<	7.131E+000	7.132E+000	44.80	44.89	1.013E+001
BI-214	<	1.057E+001	1.057E+001	10.08	10.48	2.141E+000
AC-228	<	1.653E+001	1.653E+001	9.61	10.03	4.612E+000
TH-234	<	8.710E+000	8.710E+000	84.96	85.04	2.516E+001
PA-234M	<	1.513E+000	1.513E+000	3,272.60	3,272.60	1.788E+002
U-235	<	-6.812E-001	-6.812E-001	657.60	657.61	7.192E+000
EU-154	<	3.852E-001	3.852E-001	604.05	604.06	8.547E+000
RA-224		2.700E+001	2.701E+001	36.29	36.41	3.147E+001
PB-210	#	6.497E+001	6.497E+001	29.01	29.27	3.926E+001
PB-212		1.976E+001	1.976E+001	5.43	6.20	2.227E+000
PB-214		1.711E+001	1.711E+001	8.45	8.92	2.185E+000
Pa-234	<	4.982E-002	4.982E-002	2,141.69	2,141.69	3.697E+000
AM-241	<	1.050E+000	1.050E+000	95.25	95.33	3.338E+000

= All peaks for activity calculation had bad shape

Total Activity (37.87 to 2,000.50 keV) 376.34 Bq/sample

Analyzed by: _____

403605

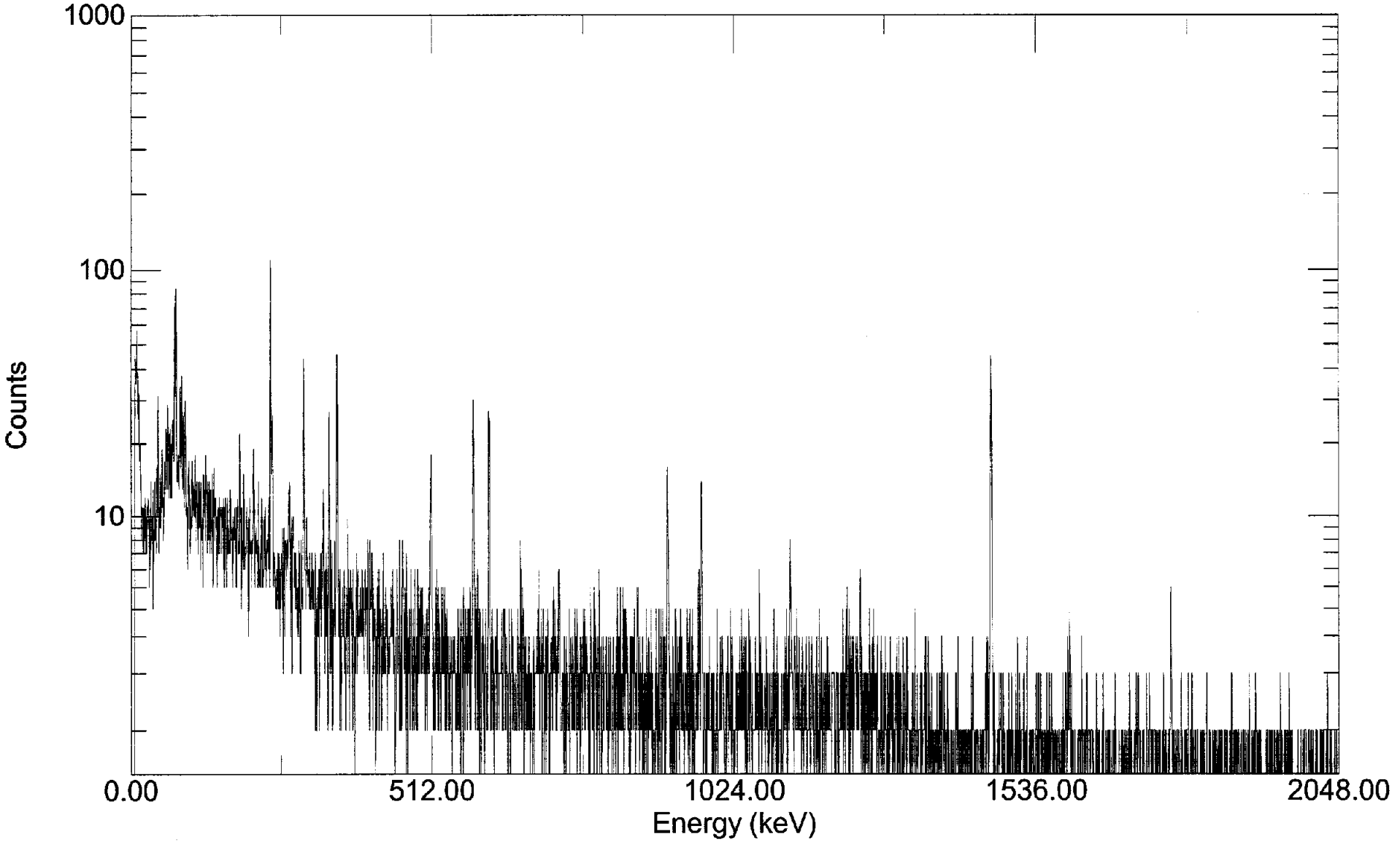
Reviewed by: _____

Supervisor

Laboratory: STL- St Louis

KEKHR1AC

7360294_KEKHR1AC_F7L200271-004



Acquired: 26-Dec-2007 5:45:05 PM
File: C:\User\spectra\KEKHR1AC.spc
Detector: #0 Ge 3 SN/155

Real Time: 1815.40 s. Live Time: 1800.00 s.
Channels: 8192

TestAmerica St. Louis

DB Analysis ID: 33,067

Sample Description: 7360294_KEKHV1AC_F7L200271-005

Spectrum Filename: KEKHV1AC.An1

Acquisition Information

Start Time:	26-Dec-2007 5:45:28PM		
Live Time:	1800.00	Real Time:	1804.30
Dead Time:	0.24 %		
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	26-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 0.2300

UNIDENTIFIED PEAK SUMMARY

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncertainty 1 Sigma%	FWHM keV	Suspected Nuclide	Code
299.08	74.82	178.67	127.33	0.071	21.97	0.747	PB-214	
308.18	77.09	176.00	168.00	0.093	16.98	0.780	PB-214	
348.77	87.25	91.75	73.25	0.041	21.87	0.713	PB-214	

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	186.02	46.54	121.37	6.04	0.003	56.24	0.819	s
AM-241	1	237.73	59.47	131.02	-5.87	-0.003	278.94	0.830	s
TH-234	1	253.86	63.51	188.56	17.70	0.010	57.70	0.834	s
EU-155	1	340.47	85.17	150.53	-15.04	-0.008	118.22	0.854	
TH-234	1	371.66	92.97	178.58	26.53	0.015	37.48	0.859	s
U-235	1	373.18	93.35	150.45	7.31	0.004	28.54	0.860	s D
AC-228	1	373.18	93.35	203.51	0.00	0.000	1794.44	0.860	s D
EU-155	1	421.69	105.48	62.33	56.67	0.031	30.34	0.900	s
EU-152	1	487.26	121.88	103.52	-6.15	-0.003	237.38	0.885	s
EU-154	1	492.40	123.17	94.84	2.33	0.001	593.70	0.886	s
Pa-234	1	525.18	131.36	131.65	7.13	0.004	230.75	0.894	
U-235	1	574.83	143.78	87.04	13.80	0.008	99.34	0.904	
U-235	1	653.68	163.50	60.99	22.06	0.012	54.40	0.922	s
U-235	1	818.91	204.82	46.25	2.00	0.001	485.38	0.958	s
PB-212	1	953.49	238.47	58.29	236.71	0.132	8.22	1.180	
RA-224	1	959.43	239.95	360.38	-88.67	-0.049	32.08	0.988	
PB-214	1	966.35	241.68	45.33	81.67	0.045	19.28	0.990	s
TL-208	1	1107.47	276.97	48.39	8.95	0.005	114.85	1.019	s
I-131	1	1136.79	284.30	75.99	0.00	0.000	1232.78	1.025	s
PB-214	1	1179.24	294.91	42.04	93.96	0.052	16.88	1.091	
PB-212	1	1196.73	299.29	30.41	10.80	0.006	78.39	1.039	s
AC-228	1	1351.65	338.02	32.90	48.27	0.027	22.13	1.071	s
EU-152	1	1376.96	344.35	33.15	-1.97	-0.001	419.96	1.076	s
PB-214	1	1406.29	351.68	13.24	158.76	0.088	8.48	1.083	
I-131	1	1456.07	364.13	24.12	-1.16	-0.001	606.79	1.092	s
BE-7	1	1903.95	476.09	18.98	3.07	0.002	208.84	1.185	s
CS-134	1	2253.65	563.50	28.61	-0.93	-0.001	820.55	1.254	s
CS-134	1	2276.94	569.32	21.94	-0.30	0.000	-118.66	1.259	s D
Pa-234	1	2277.54	569.47	20.92	1.06	0.001	140.16	1.259	s D
TL-208	1	2333.08	583.35	7.68	119.32	0.066	10.32	0.874	s
CS-134	1	2418.53	604.71	242.69	-1.83	-0.001	1208.60	1.286	s
BI-214	1	2435.26	608.89	9.25	128.75	0.072	9.26	1.200	
I-131	1	2560.69	640.24	10.48	0.28	0.000	1628.02	1.312	s
CS-137	1	2643.72	660.99	20.10	1.34	0.001	481.82	1.331	s
EU-154	1	2900.00	725.04	41.66	-8.21	-0.005	116.48	1.378	s
BI-212	1	2907.62	726.94	16.36	21.28	0.012	34.53	1.381	s
PA-234M	1	3064.04	766.02	29.97	-0.43	0.000	1787.57	1.411	s
EU-152	1	3115.64	778.92	15.32	0.00	0.000	553.62	1.420	s
BI-212	1	3141.43	785.36	17.03	3.20	0.002	190.93	1.425	s
CS-134	1	3177.99	794.50	13.37	12.02	0.007	51.80	1.433	s
CS-134	1	3207.74	801.93	17.99	3.47	0.002	181.15	1.437	s
TL-208	1	3441.49	860.34	21.88	10.38	0.006	70.90	1.481	s
EU-154	1	3492.38	873.05	10.05	3.78	0.002	129.29	1.490	s
Pa-234	1	3522.31	880.53	10.56	0.00	0.000	459.47	1.495	s
Pa-234	1	3542.31	885.53	15.67	0.93	0.001	609.34	1.497	s

AC-228	1	3643.32	910.76	13.18	47.95	0.027	17.98	1.518	s
Pa-234	1	3781.87	945.38	20.67	-3.17	-0.002	210.61	1.543	s
EU-152	1	3858.95	964.63	33.49	1.05	0.001	783.80	1.556	s
AC-228	1	3874.84	968.60	26.46	9.16	0.005	86.05	1.559	s
EU-154	1	3985.54	996.26	16.29	-2.38	-0.001	248.69	1.579	s
PA-234M	1	4006.54	1001.50	12.02	1.48	0.001	340.74	1.582	s
EU-154	1	4015.58	1003.76	15.70	-2.95	-0.002	198.48	1.585	s
EU-152	1	4453.49	1113.15	13.20	4.28	0.002	129.40	1.659	s
BI-214	1	4481.29	1120.09	26.95	11.06	0.006	49.44	1.665	s
CO-60	1	4694.91	1173.44	14.75	6.10	0.003	97.87	1.701	s
EU-154	1	5099.57	1274.50	10.88	2.94	0.002	168.92	1.768	s
CO-60	1	5323.52	1330.43	11.75	-1.27	-0.001	391.93	1.806	s
EU-152	1	5634.21	1408.00	0.00	0.00	0.000	100.00	1.854	s
K-40	1	5843.89	1460.35	2.83	212.17	0.118	6.82	0.733	s
BI-214	1	7058.31	1763.49	4.88	16.19	0.009	31.47	2.066	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-134	T F I	1	-9.818E-002	604.71	-9.818E-002 %	(	4.048E+000	G	7.5E+002 97.62
			-9.818E-002	795.87	9.316E-001 %		1.531E+000	G	7.5E+002 85.53
			-9.818E-002	569.32	-9.818E-002 %		7.944E+000	G	7.5E+002 15.38
			-9.818E-002	801.95	2.662E+000 %		1.725E+001	G	7.5E+002 8.69
			-9.818E-002	563.24	-5.490E-001 %		1.633E+001	G	7.5E+002 8.35
CS-137	T F I	1	8.902E-002	661.66	8.902E-002 &	(	1.571E+000	G	1.1E+004 85.21
TH-234	N	1	7.658E+000	63.29	7.658E+000 %	(P	2.885E+001	G	1.6E+012 4.82
			7.658E+000	92.59	7.954E+000 %	P	1.948E+001	G	1.6E+012 5.58
TL-208	F N	1	7.179E+000	583.02	7.179E+000 @	(P	9.403E-001	G	7.0E+002 84.50
			7.179E+000	277.28	3.686E+000 %		1.446E+001	G	7.0E+002 6.31
			7.179E+000	860.56	5.912E+000 %		1.396E+001	G	7.0E+002 12.42
Pa-234	N	1	6.446E-001	131.29	6.446E-001 %	(	5.082E+000	G	1.6E+012 18.00
			6.446E-001	569.47	6.446E-001 %		1.459E+001	G	1.6E+012 8.20
			6.446E-001	946.02	-1.809E+000 %		1.365E+001	G	1.6E+012 13.40
			6.446E-001	883.24	7.021E-001 &		1.593E+001	G	1.6E+012 9.60
			6.446E-001	880.53	0.000E+000 &		2.145E+001	G	1.6E+012 6.00
PB-210	N	1	5.001E+000	46.54	5.001E+000 %	(P	4.479E+001	G	8.1E+003 4.25
RA-224	N	1	-4.980E+001	240.99	-4.980E+001	(	5.120E+001	G	7.0E+002 4.10
I-131	T F I	1	-4.721E-002	364.48	-4.721E-002 %	(	1.043E+000	G	8.0E+000 81.70
			-4.721E-002	284.30	0.000E+000 &		1.875E+001	G	8.0E+000 6.14
			-4.721E-002	636.97	2.167E-001 %		1.362E+001	G	8.0E+000 7.17
EU-155	T F I	1	4.332E+000	105.31	4.332E+000 *	(	3.019E+000	G	1.8E+003 21.20
			4.332E+000	86.54	-8.422E-001 %		3.354E+000	G	1.8E+003 30.70
AM-241	T	1	-3.603E-001	59.54	-3.603E-001 %	(	3.441E+000	G	1.6E+005 35.90
EU-152	T F	1	-2.346E-001	344.29	-2.346E-001 %	(	3.523E+000	G	4.9E+003 26.50
			-2.346E-001	121.78	-3.468E-001 &		2.826E+000	G	4.9E+003 28.58
			-2.346E-001	778.92	0.000E+000 &		1.054E+001	G	4.9E+003 12.94
			-2.346E-001	964.11	5.602E-001 %		1.580E+001	G	4.9E+003 14.61
			-2.346E-001	1112.07	2.747E+000 &		1.261E+001	G	4.9E+003 13.64
			-2.346E-001	1408.00	0.000E+000 %		3.755E+000	G	4.9E+003 21.00
EU-154	T F I	1	2.207E+000	873.23	2.207E+000 &	(	1.021E+001	G	3.1E+003 12.27
			2.207E+000	123.10	9.229E-002 %		1.902E+000	G	3.1E+003 40.79
			2.207E+000	1274.54	8.213E-001 %		5.047E+000	G	3.1E+003 35.19
			2.207E+000	723.36	-2.485E+000 %		9.920E+000	G	3.1E+003 20.22
			2.207E+000	1004.77	-1.320E+000 %		9.462E+000	G	3.1E+003 18.01
			2.207E+000	996.33	-1.792E+000 %		1.622E+001	G	3.1E+003 10.60
K-40	N	1	2.198E+002	1460.83	2.198E+002	(P	1.093E+001	G	4.7E+011 10.67
U-235	N	1	2.100E+000	143.79	2.100E+000 %	(	7.029E+000	G	2.6E+011 10.96
			2.100E+000	205.33	8.118E-001 %		1.394E+001	G	2.6E+011 5.01
			2.100E+000	163.38	7.645E+000 &		1.355E+001	G	2.6E+011 5.08
			2.100E+000	93.35	2.100E+000 %	E	1.720E+001	X	2.6E+011 5.81
			1.452E+001	1120.29	6.455E+000 %	P	1.570E+001	G	5.8E+005 15.10
			1.452E+001	1764.49	1.380E+001 ?	(	1.108E+001	G	5.8E+005 15.40
BI-214	N	1	1.452E+001	609.31	1.476E+001	(P	1.935E+000	G	5.8E+005 46.09

			1.421E+001	766.41	-9.496E+000	%			6.165E+002G		1.6E+012	.29
PA-234	N	1	1.421E+001	1001.00	1.421E+001	%	(		1.808E+002G		1.6E+012	.84
PB-214	N	1	1.353E+001	351.93	1.362E+001		(	P	1.687E+000G		5.8E+005	37.60
			1.353E+001	295.09	1.337E+001		(	P	4.685E+000G		5.8E+005	19.30
			1.353E+001	242.00	2.540E+001	*			1.060E+001G		5.8E+005	7.43
CO-60	T F	1	-1.296E-001	1332.50	-1.296E-001	%	(		1.907E+000G		1.9E+003	99.98
			-1.296E-001	1173.24	5.588E-001	%			1.889E+000G		1.9E+003	99.90
PB-212	N	1	1.249E+001	238.63	1.249E+001		(	P	2.020E+000G		7.0E+002	43.30
			1.249E+001	300.03	9.175E+000	%			2.415E+001G		7.0E+002	3.28
BE-7	N P C	1	1.242E+000	477.60	1.242E+000	&	(		9.319E+000G		5.3E+001	10.52
AC-228	N	1	1.234E+001	911.07	1.227E+001		(		5.021E+000G		2.1E+003	29.00
			1.234E+001	968.97	4.094E+000	%			1.193E+001G		2.1E+003	17.46
			1.234E+001	338.32	1.250E+001	*	(		7.624E+000G		2.1E+003	12.01
			1.234E+001	93.35	0.000E+000	%	}	E	1.797E+001X	A	2.1E+003	5.56
BI-212	N	1	1.106E+001	727.33	1.106E+001		(		1.121E+001G		7.0E+002	11.82
			1.106E+001	785.51	1.906E+001	%			1.308E+002G		7.0E+002	1.10

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	<	1.242E+000	1.246E+000	208.84	208.86	9.319E+000
K-40		2.198E+002	2.198E+002	6.91	7.51	1.093E+001
CO-60	<	-1.296E-001	-1.296E-001	391.93	391.94	1.907E+000
I-131	<	-4.721E-002	-4.820E-002	606.79	606.80	1.043E+000
CS-134	<	-9.818E-002	-9.820E-002	1,208.60	1,208.60	4.048E+000
EU-154	<	2.207E+000	2.207E+000	129.29	129.33	1.021E+001
EU-155	#	4.332E+000	4.332E+000	30.34	30.53	3.019E+000
CS-137	<	8.902E-002	8.902E-002	481.82	481.83	1.571E+000
EU-152	<	-2.346E-001	-2.346E-001	419.96	419.97	3.523E+000
TL-208	#	7.179E+000	7.180E+000	10.51	10.90	9.403E-001
RA-224	<	-4.980E+001	-4.981E+001	32.08	32.22	5.120E+001
PB-210	<	5.001E+000	5.001E+000	250.16	250.19	4.479E+001
PB-212		1.249E+001	1.249E+001	8.55	9.05	2.020E+000
AC-228	<	1.234E+001	1.234E+001	14.25	14.54	5.021E+000
Pa-234	<	6.446E-001	6.446E-001	230.75	230.77	5.082E+000
U-235	<	2.100E+000	2.100E+000	99.34	99.38	7.029E+000
AM-241	<	-3.603E-001	-3.603E-001	278.94	278.96	3.441E+000
PB-214		1.353E+001	1.353E+001	8.76	9.22	1.687E+000
BI-212	<	1.106E+001	1.107E+001	34.53	34.65	1.121E+001
BI-214		1.452E+001	1.452E+001	9.64	10.06	1.935E+000
TH-234	<	7.658E+000	7.658E+000	109.95	110.01	2.885E+001
PA-234M	<	1.421E+001	1.421E+001	340.74	340.75	1.808E+002

= All peaks for activity calculation had bad shape

Total Activity (37.53 to 1,998.47 keV) 271.85 Bq/sample

Analyzed by: _____

403605

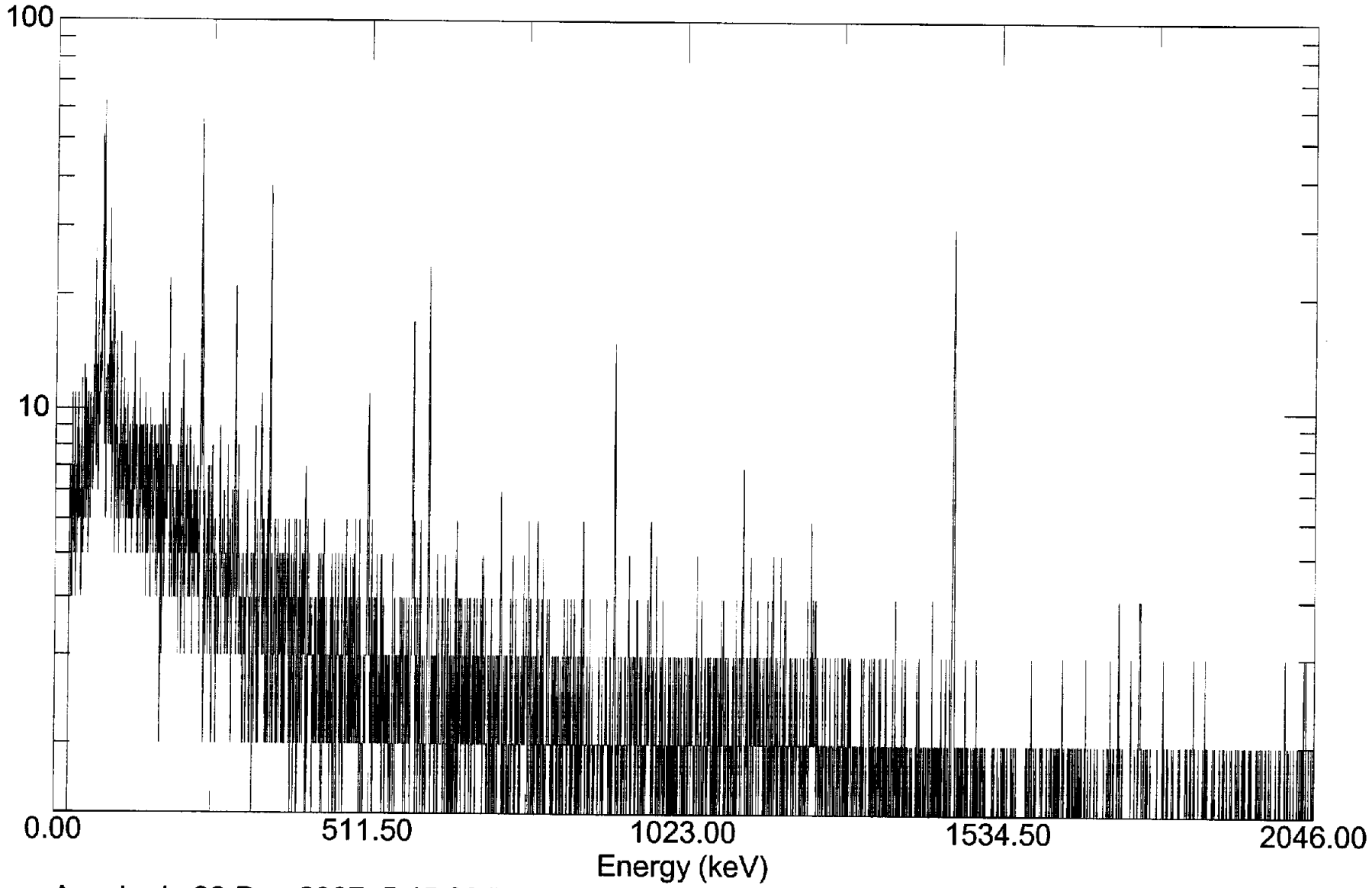
Reviewed by: _____

Supervisor

Laboratory: STL- St Louis

KEKHV1AC

7360294_KEKHV1AC_F7L200271-005



Acquired: 26-Dec-2007 5:45:28 PM
File: C:\User\spectra\KEKHV1AC.spc
Detector: #0 Ge 4 SN/181

Real Time: 1804.30 s. Live Time: 1800.00 s.
Channels: 8192

TestAmerica St. Louis

DB Analysis ID: 33,070

Sample Description: 7360294_KEKHX1AC_F7L200271-006

Spectrum Filename: KEKHX1AC.An1

Acquisition Information

Start Time:	26-Dec-2007 5:45:48PM		
Live Time:	1800.00	Real Time:	1854.50
Dead Time:	2.94 %		
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	26-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: 0.2148

UNIDENTIFIED PEAK SUMMARY

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncertainty 1 Sigma%	FWHM keV	Suspected Nuclide	Code
297.38	74.56	213.00	165.00	0.092	19.33	0.819	PB-214	s
307.19	77.01	209.00	254.00	0.141	13.20	0.816	PB-214	
346.96	86.94	90.16	89.84	0.050	18.30	0.692	TB-160	s
1180.57	295.21	127.71	44.29	0.025	39.08	0.671	PB-214	s
1354.00	338.55	105.09	27.91	0.016	55.28	0.550		s
1407.32	351.87	152.74	49.26	0.027	38.24	1.123	PB-214	s
3645.83	911.38	65.44	31.56	0.018	40.38	0.408		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	184.21	46.29	98.26	42.74	0.024	32.66	0.594	s
AM-241	1	238.45	59.84	150.69	16.28	0.009	90.48	0.761	s
TH-234	1	252.29	63.29	175.85	26.58	0.015	46.83	0.764	s
EU-155	1	345.35	86.54	197.98	-7.84	-0.004	256.37	0.788	s
TH-234	1	370.72	92.88	221.82	27.38	0.015	42.13	0.795	s
U-235	1	372.61	93.35	163.76	-0.67	0.000	-760.92	0.795	s D
AC-228	1	372.61	93.35	163.76	60.92	0.034	2.85	0.795	s D
EU-155	1	423.34	106.02	122.66	0.12	0.000	13351.63	0.808	s
EU-152	1	483.90	121.15	128.27	-18.82	-0.010	88.17	0.824	s
EU-154	1	495.91	124.15	100.79	20.12	0.011	74.00	0.826	s
Pa-234	1	521.34	130.51	107.68	-8.84	-0.005	169.45	0.834	
U-235	1	574.49	143.79	139.45	-1.27	-0.001	1379.34	0.847	s
U-235	1	651.30	162.98	77.26	1.86	0.001	322.46	0.867	s
U-235	1	819.41	204.98	96.40	-13.74	-0.008	104.61	0.909	s
PB-212	1	954.41	238.70	51.15	415.85	0.231	5.65	0.961	
RA-224	1	960.21	240.15	369.90	-100.98	-0.056	28.72	0.944	s
PB-214	1	966.89	241.82	59.23	33.92	0.019	36.40	0.945	s
TL-208	1	1109.67	277.50	56.44	11.94	0.007	93.57	0.980	s
I-131	1	1134.60	283.73	28.85	13.61	0.008	62.05	0.987	s
PB-214	1	1180.51	295.20	54.07	80.12	0.045	16.48	0.998	s
PB-212	1	1202.12	300.60	47.67	41.33	0.023	39.29	0.404	s
AC-228	1	1353.67	338.46	37.16	78.32	0.044	15.77	1.040	s
EU-152	1	1376.06	344.06	33.00	10.98	0.006	79.90	1.045	s
PB-214	1	1407.98	352.04	51.42	112.54	0.063	12.31	1.053	s
I-131	1	1454.22	363.59	32.60	0.03	0.000	24501.49	1.065	s
BE-7	1	1910.20	477.54	28.62	0.33	0.000	2285.35	1.173	s
CS-134	1	2249.73	562.39	25.00	3.17	0.002	230.22	1.252	s
CS-134	1	2277.45	569.32	22.26	-0.25	0.000	-38.07	1.258	s D
Pa-234	1	2278.05	569.47	23.72	-1.33	-0.001	-131.13	1.258	s D
TL-208	1	2333.71	583.38	20.25	143.75	0.080	10.82	0.982	
CS-134	1	2419.46	604.81	26.44	-1.52	-0.001	485.52	1.290	s
BI-214	1	2438.39	609.55	26.93	71.49	0.040	13.92	1.294	
I-131	1	2548.36	637.03	31.01	-3.27	-0.002	247.20	1.319	s
CS-137	1	2648.71	662.12	28.74	19.21	0.011	32.96	1.342	s
EU-154	1	2901.25	725.24	34.42	-3.74	-0.002	227.87	1.397	s
BI-212	1	2911.57	727.82	27.96	22.26	0.012	39.72	1.400	s
PA-234M	1	3065.61	766.33	20.48	-1.79	-0.001	365.46	1.434	s
EU-152	1	3116.46	779.04	17.01	-1.79	-0.001	334.49	1.445	s
BI-212	1	3143.76	785.86	12.82	6.06	0.003	92.85	1.451	s
CS-134	1	3180.97	795.16	20.42	8.53	0.005	82.39	1.460	s
CS-134	1	3206.97	801.66	18.51	3.19	0.002	198.60	1.465	s
TL-208	1	3440.86	860.14	4.00	39.00	0.022	19.70	0.458	s
EU-154	1	3491.10	872.69	23.86	-0.90	-0.001	774.71	1.527	s
Pa-234	1	3527.21	881.72	17.96	-0.05	0.000	11097.00	1.533	s
Pa-234	1	3532.54	883.06	18.45	-0.41	0.000	1476.03	1.535	s
AC-228	1	3645.89	911.39	14.36	65.44	0.036	14.83	1.559	s

Pa-234	1	3781.70	945.35	19.31	-1.43	-0.001	443.96	1.588	s
EU-152	1	3847.73	961.86	16.59	-3.34	-0.002	180.72	1.603	s
AC-228	1	3878.16	969.47	17.98	45.25	0.025	19.92	1.607	s
PA-234M	1	3994.57	998.57	13.80	-4.49	-0.002	126.19	1.633	s
EU-154	1	4002.66	1000.60	11.22	0.74	0.000	647.04	1.630	s
EU-154	1	4025.17	1006.22	15.36	-3.80	-0.002	154.60	1.637	s
EU-152	1	4448.48	1112.07	28.20	0.00	0.000	751.03	1.723	s
BI-214	1	4483.35	1120.80	15.60	17.31	0.010	40.24	1.730	s
CO-60	1	4694.45	1173.59	21.99	1.53	0.001	440.17	1.772	s
EU-154	1	5097.45	1274.37	9.44	1.81	0.001	251.49	1.850	s
CO-60	1	5329.86	1332.50	17.18	0.00	0.000	586.26	1.894	s
EU-152	1	5630.59	1407.72	9.86	-0.16	0.000	2836.01	1.950	s
K-40	1	5844.66	1461.27	11.33	147.21	0.082	8.85	1.988	
BI-214	1	7060.46	1765.45	4.91	10.79	0.006	34.27	2.196	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	Peak Analysis Code	Peak MDA Value Becquerels	MDA Code	Comments	
PB-214	N	1	9.878E+000	351.93	9.273E+000	(P	2.977E+000G		5.8E+005	37.60
			9.878E+000	295.09	1.096E+001	(P	5.056E+000G		5.8E+005	19.30
			9.878E+000	242.00	1.014E+001 *	(	1.153E+001G		5.8E+005	7.43
AM-241	T	1	9.264E-001	59.54	9.264E-001 *	(P	3.409E+000G		1.6E+005	35.90
EU-155	T F I	1	8.698E-003	105.31	8.698E-003 &	(	4.027E+000G		1.8E+003	21.20
			8.698E-003	86.54	-4.239E-001 %		3.693E+000G	A	1.8E+003	30.70
			8.306E+000	277.28	4.724E+000 &		1.492E+001G		7.0E+002	6.31
			8.306E+000	860.56	2.126E+001 +		6.557E+000G		7.0E+002	12.42
TL-208	F N	1	8.306E+000	583.02	8.306E+000	(P	1.368E+000G		7.0E+002	84.50
BI-214	N	1	7.868E+000	609.31	7.868E+000	(P	2.959E+000G		5.8E+005	46.09
			7.868E+000	1120.29	9.610E+000 %		1.172E+001G		5.8E+005	15.10
			7.868E+000	1764.49	8.606E+000 %	P	1.039E+001G		5.8E+005	15.40
CS-134	T F I	1	-7.841E-002	604.71	-7.841E-002 %	(	1.377E+000G		7.5E+002	97.62
			-7.841E-002	795.87	6.330E-001 %		1.764E+000G		7.5E+002	85.53
			-7.841E-002	569.32	-7.841E-002 %		7.679E+000G		7.5E+002	15.38
			-7.841E-002	801.95	2.348E+000 %		1.674E+001G		7.5E+002	8.69
			-7.841E-002	563.24	1.797E+000 %		1.476E+001G		7.5E+002	8.35
Pa-234	N	1	-7.739E-001	131.29	-7.739E-001 %	(	4.472E+000G		1.6E+012	18.00
			-7.739E-001	569.47	-7.739E-001 %		1.482E+001G		1.6E+012	8.20
			-7.739E-001	946.02	-7.777E-001 %		1.265E+001G		1.6E+012	13.40
			-7.739E-001	883.24	-2.981E-001 %		1.637E+001G		1.6E+012	9.60
			-7.739E-001	880.53	-6.214E-002 %		2.582E+001G		1.6E+012	6.00
RA-224	N	1	-5.452E+001	240.99	-5.452E+001 *	(	4.986E+001G		7.0E+002	4.10
EU-154	T F I	1	-5.026E-001	873.23	-5.026E-001 &	(	1.422E+001G		3.1E+003	12.27
			-5.026E-001	123.10	7.710E-001 %		1.896E+000G		3.1E+003	40.79
			-5.026E-001	1274.54	4.787E-001 %		4.507E+000G		3.1E+003	35.19
			-5.026E-001	723.36	-1.085E+000 %		8.718E+000G		3.1E+003	20.22
			-5.026E-001	1004.77	-1.620E+000 %		8.941E+000G		3.1E+003	18.01
			-5.026E-001	996.33	5.354E-001 %		1.318E+001G		3.1E+003	10.60
PA-234M	N	1	-4.105E+001	1001.00	-4.105E+001 %	(	1.831E+002G		1.6E+012	.84
			-4.105E+001	766.41	-3.746E+001 %		4.983E+002G		1.6E+012	.29
PB-210	N	1	3.138E+001	46.54	3.138E+001 %	(P	3.591E+001G		8.1E+003	4.25

PB-212		N	1	2.109E+001	238.63	2.109E+001		(	P	1.828E+000G		7.0E+002	43.30
				2.109E+001	300.03	3.376E+001	+			2.849E+001G		7.0E+002	3.28
				-1.873E-001	205.33	-5.359E+000	%			1.891E+001G		2.6E+011	5.01
				-1.873E-001	163.38	6.205E-001	%		P	1.460E+001G		2.6E+011	5.08
				-1.873E-001	93.35	-1.873E-001	!		E	1.735E+001X		2.6E+011	5.81
U-235		N	1	-1.873E-001	143.79	-1.873E-001	%	(	P	8.497E+000G		2.6E+011	10.96
AC-228		N	1	1.771E+001	911.16	1.600E+001		(		4.982E+000G		2.1E+003	29.00
				1.771E+001	968.97	1.932E+001		(		9.595E+000G		2.1E+003	17.46
				1.771E+001	338.32	1.949E+001		(		7.742E+000G		2.1E+003	12.01
				1.771E+001	93.35	1.771E+001	!		E	1.812E+001G	A	2.1E+003	5.56
K-40		N	1	1.439E+002	1460.83	1.439E+002		(		1.798E+001G		4.7E+011	10.67
BE-7		N P C	1	1.292E-001	477.60	1.292E-001	%	(		1.076E+001G		5.3E+001	10.52
I-131	T F I		1	1.291E-003	364.48	1.291E-003	%	(		1.148E+000G		8.0E+000	81.70
				1.291E-003	284.30	5.658E+000	%			1.153E+001G		8.0E+000	6.14
				1.291E-003	636.97	-2.402E+000	&			2.106E+001G		8.0E+000	7.17
				1.258E+000	121.78	-1.028E+000	%			3.032E+000G		4.9E+003	28.58
				1.258E+000	778.92	-8.625E-001	%			1.057E+001G		4.9E+003	12.94
				1.258E+000	964.11	-1.700E+000	%			1.103E+001G		4.9E+003	14.61
				1.258E+000	1112.07	0.000E+000	%			1.677E+001G		4.9E+003	13.64
				1.258E+000	1408.00	-7.568E-002	%			8.349E+000G		4.9E+003	21.00
EU-152	T F		1	1.258E+000	344.29	1.258E+000	*	(		3.378E+000G		4.9E+003	26.50
CS-137	T F I		1	1.227E+000	661.66	1.227E+000	%	(	P	1.768E+000G		1.1E+004	85.21
BI-212		N	1	1.110E+001	727.33	1.110E+001		(		1.364E+001G		7.0E+002	11.82
				1.110E+001	785.51	3.463E+001	&			1.107E+002G		7.0E+002	1.10
TH-234		N	1	1.077E+001	63.29	1.077E+001	*	(	P	2.613E+001G		1.6E+012	4.82
				1.077E+001	92.59	7.949E+000	%		P	2.093E+001G		1.6E+012	5.58
CO-60	T F		1	0.000E+000	1332.50	0.000E+000	%	(		2.128E+000G		1.9E+003	99.98
				0.000E+000	1173.24	1.335E-001	&			2.140E+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	#	1.292E-001	1.296E-001	2.285.35	2.285.35	1.076E+001
K-40	#	1.439E+002	1.439E+002	8.85	9.33	1.798E+001
CO-60	#			586.26	586.26	2.128E+000
I-131	#	1.291E-003	1.318E-003	24.501.49	24.501.49	1.148E+000
EU-154	#	-5.026E-001	-5.026E-001	774.71	774.72	1.422E+001
PB-210	#	3.138E+001	3.138E+001	45.85	46.02	3.591E+001
PB-212		2.109E+001	2.109E+001	5.74	6.47	1.828E+000
PB-214	#	9.878E+000	9.878E+000	12.88	13.20	2.977E+000
AC-228	#	1.771E+001	1.771E+001	9.81	10.22	4.982E+000
Pa-234	#	-7.739E-001	-7.739E-001	169.45	169.48	4.472E+000
AM-241	#	9.264E-001	9.264E-001	108.88	108.95	3.409E+000
CS-134	#	-7.841E-002	-7.843E-002	485.52	485.53	1.377E+000
CS-137	#	1.227E+000	1.227E+000	43.68	43.78	1.768E+000
EU-152	#	1.258E+000	1.258E+000	79.90	79.95	3.378E+000
EU-155	#	8.698E-003	8.699E-003	13.351.63	13.351.63	4.027E+000
TL-208		8.306E+000	8.308E+000	11.10	11.47	1.368E+000
BI-212	#	1.110E+001	1.110E+001	39.72	39.82	1.364E+001
BI-214	#	7.868E+000	7.868E+000	15.23	15.51	2.959E+000
RA-224	#	-5.452E+001	-5.453E+001	28.72	28.87	4.986E+001
TH-234	#	1.077E+001	1.077E+001	71.79	71.89	2.613E+001
PA-234M	#	-4.105E+001	-4.105E+001	126.19	126.22	1.831E+002
U-235	#	-1.873E-001	-1.873E-001	4.061.65	4.061.65	8.497E+000

= All peaks for activity calculation had bad shape

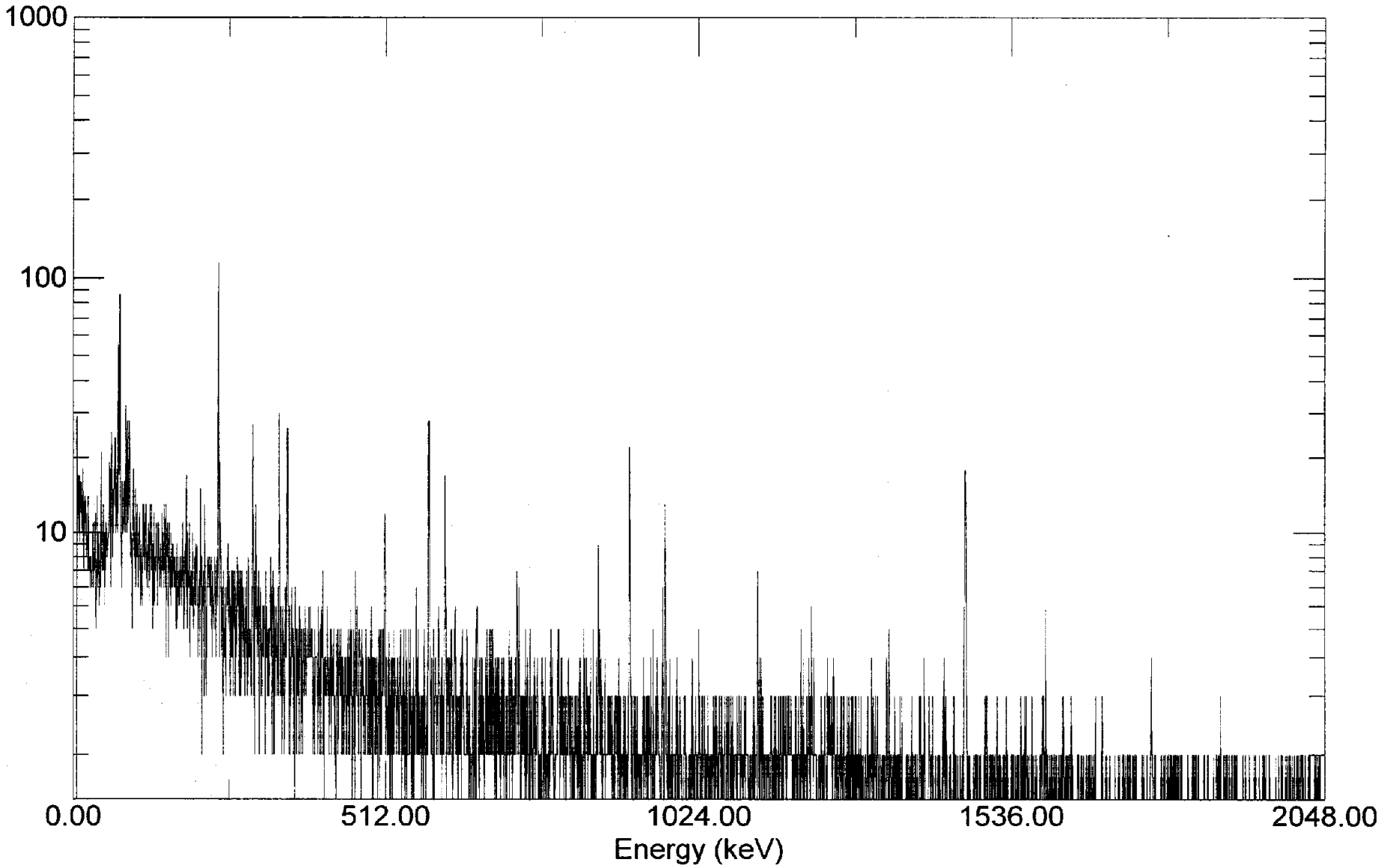
Total Activity (37.74 to 2,000.57 keV) 29.40 Bq/sample

Analyzed by: 403605

Laboratory: STL- St Louis

KEKHX1AC

7360294_KEKHX1AC_F7L200271-006



Acquired: 26-Dec-2007 5:45:48 PM
File: C:\User\spectra\KEKHX1AC.spc
Detector: #0 Ge 5 SN/157

Real Time: 1854.50 s. Live Time: 1800.00 s.
Channels: 8192

DB Analysis ID: 33,071

Sample Description: 7360294_KEKH11AC_F7L200271-007

Spectrum Filename: KEKH11AC.An1

Acquisition Information

Start Time:	26-Dec-2007 6:22:22PM		
Live Time:	1800.00	Real Time:	1811.68
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	26-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 0.1150

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
298.32	74.80	480.00	437.00	0.243	10.73	0.804	PB-214	
307.53	77.10	291.50	686.50	0.381	5.66	0.825	PB-214	
335.12	83.99	319.15	104.85	0.058	26.00	0.707	TA-182	
347.98	87.21	257.89	318.11	0.177	9.08	0.939	PB-214	s
358.81	89.92	218.33	139.67	0.078	19.24	0.790	PB-214	M
514.82	128.92	142.11	160.89	0.089	13.11	0.764	AC-228	
595.52	149.10	81.33	40.67	0.023	37.33	0.733	TE-131	
835.40	209.07	159.00	193.00	0.107	14.92	1.003	AC-228	s
1851.02	462.96	53.17	149.83	0.083	14.31	1.247	AC-228	
2042.11	510.73	84.00	318.00	0.177	9.89	1.285	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	184.92	46.44	202.79	52.21	0.029	32.79	0.696	
AM-241	1	238.11	59.74	428.76	0.06	0.000	45355.14	0.824	s
TH-234	1	251.26	63.03	488.40	119.60	0.066	29.89	0.923	s
EU-155	1	345.31	86.54	606.24	-21.69	-0.012	161.96	0.849	s
TH-234	1	369.50	92.59	417.01	56.99	0.032	26.97	0.855	D
AC-228	1	372.54	93.35	417.20	135.43	0.075	21.25	0.855	D
U-235	1	372.54	93.35	384.08	4.03	0.002	81.41	0.855	s D
EU-155	1	420.17	105.26	315.26	67.12	0.037	39.35	0.866	s
EU-152	1	485.65	121.63	307.77	22.23	0.012	113.59	0.881	s
EU-154	1	491.80	123.17	373.57	-31.44	-0.017	88.75	0.882	s
Pa-234	1	519.92	130.20	413.19	-54.18	-0.030	54.76	0.890	s
U-235	1	573.49	143.59	345.72	7.45	0.004	235.53	0.901	s
U-235	1	652.11	163.24	303.74	0.72	0.000	664.12	0.919	s
U-235	1	814.54	203.85	193.16	15.55	0.009	113.02	0.957	s
PB-212	1	953.66	238.63	139.92	1449.33	0.805	2.81	0.987	D
RA-224	1	963.07	240.99	229.97	158.03	0.088	15.73	0.989	D
PB-214	1	967.12	242.00	234.36	82.64	0.046	26.02	0.990	D
TL-208	1	1106.84	276.93	126.67	76.33	0.042	32.20	0.686	s
I-131	1	1138.26	284.78	138.56	7.44	0.004	226.59	1.028	s
PB-214	1	1178.86	294.93	114.21	189.79	0.105	13.02	1.534	s
PB-212	1	1198.36	299.81	69.67	129.33	0.072	16.48	0.784	s
AC-228	1	1351.80	338.16	70.08	309.92	0.172	7.55	1.118	
EU-152	1	1380.06	345.23	77.58	16.80	0.009	78.04	1.081	s
PB-214	1	1406.39	351.81	53.99	344.01	0.191	6.26	1.074	
I-131	1	1458.17	364.76	89.41	2.75	0.002	490.62	1.099	s
BE-7	1	1908.56	477.35	66.19	-0.98	-0.001	1173.34	1.198	s
CS-134	1	2249.07	562.47	53.25	16.60	0.009	66.83	1.273	s
CS-134	1	2276.47	569.32	53.69	-1.72	-0.001	-3.59	1.278	s D
Pa-234	1	2277.07	569.47	51.69	-9.80	-0.005	-219.65	1.278	s D
TL-208	1	2331.42	583.06	51.08	479.92	0.267	5.38	1.099	
CS-134	1	2402.83	600.91	-18.85	-10.47	-0.006	9.56	1.309	s
BI-214	1	2436.37	609.29	46.29	249.71	0.139	8.08	1.381	
I-131	1	2545.92	636.68	57.10	-3.47	-0.002	312.94	1.337	s
CS-137	1	2645.86	661.66	92.31	0.00	0.000	1358.77	1.358	s
EU-154	1	2899.53	725.07	105.13	-23.00	-0.013	66.41	1.411	s
BI-212	1	2909.10	727.46	28.00	136.00	0.076	12.22	0.735	s
PA-234M	1	3065.10	766.46	65.57	4.25	0.002	273.77	1.447	s
EU-152	1	3113.80	778.63	64.43	-5.35	-0.003	216.73	1.458	s
BI-212	1	3141.15	785.47	17.50	74.50	0.041	18.70	1.205	s
CS-134	1	3177.21	794.48	41.37	61.71	0.034	19.48	1.472	s
CS-134	1	3206.47	801.79	52.72	-4.19	-0.002	250.01	1.477	s
TL-208	1	3441.78	860.61	41.49	41.45	0.023	26.91	1.527	s
EU-154	1	3493.76	873.61	33.61	1.60	0.001	518.11	1.537	s
Pa-234	1	3520.47	880.28	28.57	1.67	0.001	458.50	1.543	s
Pa-234	1	3530.17	882.71	28.05	0.62	0.000	1208.97	1.546	s

AC-228	1	3643.66	911.08	15.47	374.53	0.208	5.57	0.921	s
Pa-234	1	3784.10	946.18	50.84	-6.97	-0.004	149.64	1.598	s
AC-228	1	3873.09	968.42	36.58	299.42	0.166	8.19	1.293	
EU-152	1	3874.20	968.70	79.21	36.39	0.020	38.35	1.613	
EU-154	1	3976.77	994.34	22.17	-0.48	0.000	1406.55	1.640	s
PA-234M	1	4002.85	1000.86	31.32	9.58	0.005	88.74	1.643	s
EU-154	1	4020.93	1005.38	41.20	3.59	0.002	258.52	1.647	s
EU-152	1	4447.80	1112.07	27.41	0.00	0.000	740.36	1.735	s
BI-214	1	4478.94	1119.86	5.75	83.25	0.046	10.60	0.844	s
CO-60	1	4689.17	1172.40	35.04	-1.70	-0.001	498.49	1.784	s
EU-154	1	5097.83	1274.54	10.93	0.00	0.000	467.50	1.866	s
CO-60	1	5312.81	1328.27	8.82	2.37	0.001	189.07	1.912	s
EU-152	1	5631.33	1407.88	22.59	5.87	0.003	121.65	1.972	s
K-40	1	5841.92	1460.52	12.54	443.46	0.246	4.68	1.930	
BI-214	1	7058.16	1764.48	15.82	25.49	0.014	23.88	2.246	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	
U-235	N	1	9.283E-001	143.79	9.283E-001	%	(	P	1.113E+001G		2.6E+011	10.96
			9.283E-001	205.33	5.035E+000	%		P	2.185E+001G		2.6E+011	5.01
			9.283E-001	163.38	2.046E-001	&		P	2.370E+001G		2.6E+011	5.08
			9.283E-001	93.35	9.283E-001	%		E	2.164E+001X		2.6E+011	5.81
I-131	T F I	1	8.159E-002	364.48	8.159E-002	&	(		1.390E+000G		8.0E+000	81.70
			8.159E-002	284.30	2.453E+000	&			1.896E+001G		8.0E+000	6.14
			8.159E-002	636.97	-1.757E+000	%			1.922E+001G		8.0E+000	7.17
RA-224	N	1	6.940E+001	240.99	6.940E+001		(		3.222E+001G		7.0E+002	4.10
			5.996E+001	93.35	3.256E+001	-		E	2.016E+001X	A	2.1E+003	5.56
AC-228	N	1	5.996E+001	911.07	6.024E+001		(	P	3.384E+000G		2.1E+003	29.00
			5.996E+001	968.97	8.352E+001	+		P	8.618E+000G		2.1E+003	17.46
			5.996E+001	338.32	5.928E+001		(	P	7.980E+000G		2.1E+003	12.01
PB-212	N	1	5.986E+001	238.63	5.986E+001		(	P	2.389E+000G		7.0E+002	43.30
			5.986E+001	300.03	8.294E+001	+			2.668E+001G		7.0E+002	3.28
EU-154	T F I	1	5.909E-001	873.23	5.909E-001	%	(		1.097E+001G		3.1E+003	12.27
			5.909E-001	123.10	-1.015E+000	%			2.996E+000G		3.1E+003	40.79
			5.909E-001	1274.54	0.000E+000	&			3.055E+000G		3.1E+003	35.19
			5.909E-001	723.36	-4.517E+000	%			9.918E+000G		3.1E+003	26.22
			5.909E-001	1004.77	9.951E-001	%			9.050E+000G		3.1E+003	18.01
			5.909E-001	996.33	-2.230E-001	%			1.155E+001G		3.1E+003	10.60
PA-234	N	1	5.702E+001	1001.00	5.702E+001	%	(		1.714E+002G		1.6E+012	.84
			5.702E+001	766.41	5.978E+001	&			5.688E+002G		1.6E+012	.29
			5.248E+000	1112.07	0.000E+000	%			1.067E+001G		4.9E+003	13.64
			5.248E+000	1408.00	1.790E+000	%			7.574E+000G		4.9E+003	21.00
EU-152	T F	1	5.248E+000	344.29	1.476E+000	&	(		3.842E+000G		4.9E+003	26.50
			5.248E+000	121.78	1.023E+000	&			3.888E+000G		4.9E+003	28.58
			5.248E+000	778.92	-1.727E+000	&			1.296E+001G		4.9E+003	12.94
			5.248E+000	964.11	1.209E+001	?	(		1.468E+001G		4.9E+003	14.61
BI-212	N	1	4.587E+001	727.33	4.587E+001		(		9.231E+000G		7.0E+002	11.82
			4.587E+001	785.51	2.849E+002	*			8.491E+001G		7.0E+002	1.10
EU-155	T F I	1	4.151E+000	105.31	4.151E+000	*	(		5.285E+000G		1.8E+003	21.20
			4.151E+000	86.54	-9.661E-001	&			5.231E+000G		1.8E+003	30.70
TH-234	N	1	4.067E+001	63.29	4.067E+001	@	(	P	3.594E+001G		1.6E+012	4.82
			4.067E+001	92.59	1.367E+001	%		P	2.348E+001G		1.6E+012	5.58
Pa-234	N	1	-4.011E+000	131.29	-4.011E+000	*	(		7.212E+000G		1.6E+012	18.00
			-4.011E+000	569.47	-4.011E+000	%			1.483E+001G		1.6E+012	8.20
			-4.011E+000	946.02	-2.489E+000	%			1.284E+001G		1.6E+012	13.40
			-4.011E+000	883.24	2.962E-001	%			1.302E+001G		1.6E+012	9.60
			-4.011E+000	880.53	1.270E+000	&			2.096E+001G		1.6E+012	6.00
CS-134	T F I	1	-3.755E-001	604.71	-3.755E-001		(		2.645E-001G		7.5E+002	97.62
			-3.755E-001	795.87	3.063E+000	+			1.622E+000G		7.5E+002	85.53
			-3.755E-001	569.32	-3.755E-001	%			8.043E+000G		7.5E+002	15.38
			-3.755E-001	801.95	-2.057E+000	%			1.795E+001G		7.5E+002	8.69
			-3.755E-001	563.24	6.623E+000	&			1.465E+001G		7.5E+002	8.35

PB-210		N	1	3.298E+001	46.54	3.298E+001	%	(	P	4.363E+001G	8.1E+003	4.25
AM-241	T		1	3.121E-003	59.54	3.121E-003	%	(		4.795E+000G	1.6E+005	35.90
BE-7		N P C	1	-2.768E-001	477.60	-2.768E-001	%	(		1.143E+001G	5.3E+001	10.52
K-40		N	1	2.737E+002	1460.83	2.737E+002		(	P	1.186E+001G	4.7E+011	10.67
PB-214		N	1	2.110E+001	351.93	2.164E+001		(	P	2.324E+000G	5.8E+005	37.60
				2.110E+001	295.09	2.044E+001		(	P	5.654E+000G	5.8E+005	19.30
				2.110E+001	242.00	2.008E+001		(	P	1.799E+001G	5.8E+005	7.43
TL-208	F	N	1	1.939E+001	583.02	1.939E+001		(	P	1.455E+000G	7.0E+002	84.50
				1.939E+001	277.28	2.403E+001	+			1.737E+001G	7.0E+002	6.31
				1.939E+001	860.56	1.496E+001	-			1.181E+001G	7.0E+002	12.42
BI-214		N	1	1.908E+001	609.31	1.908E+001		(	P	2.630E+000G	5.8E+005	46.09
				1.908E+001	1120.29	2.977E+001	+		P	4.965E+000G	5.8E+005	15.10
				1.908E+001	1764.49	1.271E+001	-		P	1.060E+001G	5.8E+005	15.40
CO-60	T F		1	1.452E-001	1332.50	1.452E-001	%	(		1.016E+000G	1.9E+003	99.98
				1.452E-001	1173.24	-9.499E-002	%			1.693E+000G	1.9E+003	99.90
CS-137	T F I		1	0.000E+000	661.66	0.000E+000	%	(		2.080E+000G	1.1E+004	85.21

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	<	-2.768E-001	-2.778E-001	1,173.34	1,173.34	1.143E+001
K-40		2.737E+002	2.737E+002	4.82	5.64	1.186E+001
CO-60	<	1.452E-001	1.452E-001	189.07	189.09	1.016E+000
I-131	<	8.159E-002	8.348E-002	490.62	490.63	1.390E+000
CS-134	<	-3.755E-001	-3.756E-001	9.56	9.98	2.645E-001
EU-154	<	5.909E-001	5.910E-001	518.11	518.12	1.097E+001
PB-210		3.298E+001	3.298E+001	51.30	51.44	4.363E+001
PB-212		5.986E+001	5.988E+001	2.85	4.13	2.389E+000
PB-214		2.110E+001	2.110E+001	6.47	7.08	2.324E+000
BI-212		4.587E+001	4.589E+001	12.22	12.56	9.231E+000
Pa-234	<	-4.011E+000	-4.011E+000	54.76	54.85	7.212E+000
TH-234	#	4.067E+001	4.067E+001	39.11	39.29	3.594E+001
CS-137	<			1,358.77	1,358.77	2.080E+000
EU-152	<	5.248E+000	5.248E+000	38.35	38.46	3.842E+000
EU-155	<	4.151E+000	4.151E+000	39.35	39.50	5.285E+000
TL-208		1.939E+001	1.939E+001	5.48	6.20	1.455E+000
RA-224		6.940E+001	6.941E+001	15.73	16.01	3.222E+001
BI-214		1.908E+001	1.908E+001	8.46	8.94	2.630E+000
AC-228		5.996E+001	5.996E+001	4.76	5.56	3.384E+000
PA-234M	<	5.702E+001	5.702E+001	88.74	88.79	1.714E+002
U-235	<	9.283E-001	9.283E-001	353.83	353.84	1.113E+001
AM-241	<	3.121E-003	3.121E-003	45,355.14	45,355.14	4.795E+000

= All peaks for activity calculation had bad shape

Total Activity (37.71 to 1,999.84 keV) 609.00 Bq/sample

Analyzed by: _____

403605

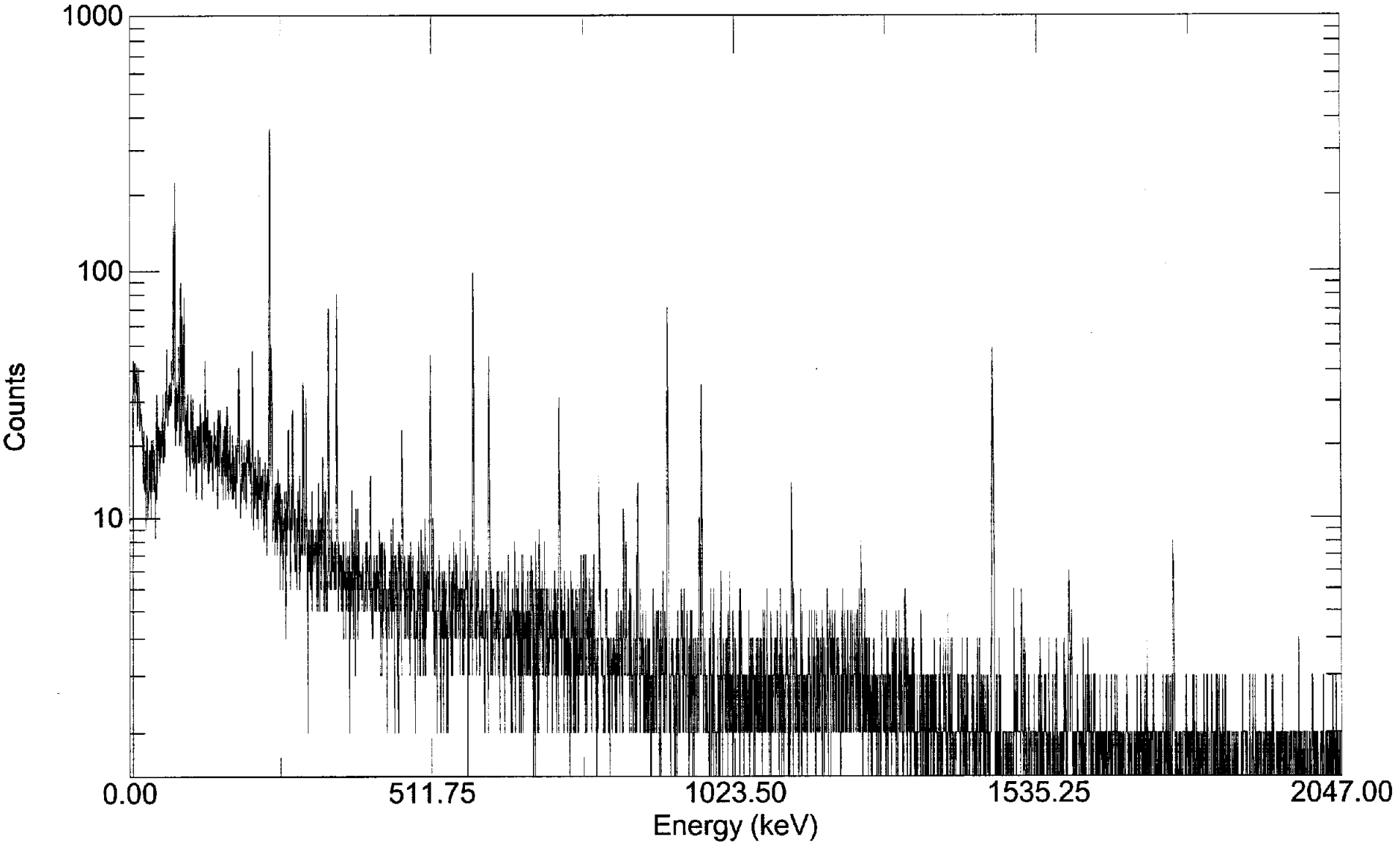
Reviewed by: _____

Supervisor

Laboratory: Test America

KEKH11AC

7360294_KEKH11AC_F7L200271-007



Acquired: 26-Dec-2007 6:22:22 PM
File: C:\User\spectra\KEKH11AC.spc
Detector: #0 Ge 1 SN/242

Real Time: 1811.68 s. Live Time: 1800.00 s.
Channels: 8192

TestAmerica St. Louis

DB Analysis ID: 33,072

Sample Description: 7360294_KEKH31AC_F7L200271-008

Spectrum Filename: KEKH31AC.An1

Acquisition Information

Start Time:	26-Dec-2007 6:23:08PM		
Live Time:	1800.00	Real Time:	1816.04
Dead Time:	0.88 %		
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	26-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 0.3225

UNIDENTIFIED PEAK SUMMARY

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncertainty 1 Sigma%	FWHM keV	Suspected Nuclide	Code
297.95	74.82	314.67	146.33	0.081	24.64	0.860	PB-214	
306.94	77.07	261.33	216.67	0.120	15.82	1.009	PB-214	
347.19	87.12	120.00	102.00	0.057	18.13	1.140	PB-214	s
1081.58	270.55	69.33	83.67	0.046	25.45	0.412	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	184.87	46.58	176.94	15.81	0.009	49.97	0.864	s
AM-241	1	242.51	60.98	213.42	-4.88	-0.003	425.69	0.878	s
TH-234	1	252.46	63.46	268.94	7.73	0.004	70.40	0.882	s
EU-155	1	335.69	84.25	171.59	34.57	0.019	56.23	0.906	s
TH-234	1	370.87	93.03	217.83	123.17	0.068	21.96	0.999	s
U-235	1	372.14	93.35	231.29	-4.58	-0.003	-363.89	0.913	s D
AC-228	1	372.14	93.35	231.29	67.64	0.038	2.24	0.913	s D
EU-155	1	415.50	104.18	154.57	0.21	0.000	8380.21	0.925	s
EU-152	1	485.97	121.78	200.53	-19.60	-0.011	104.64	0.942	s
EU-154	1	490.68	122.96	139.22	29.13	0.016	60.21	0.943	s
Pa-234	1	522.23	130.83	172.38	-0.82	0.000	2261.17	0.952	s
U-235	1	573.41	143.62	172.78	-8.41	-0.005	297.58	0.964	s
U-235	1	652.17	163.29	161.56	12.80	0.007	143.17	0.984	s
U-235	1	825.53	206.59	118.93	3.31	0.002	469.16	1.027	s
PB-212	1	954.26	238.74	156.08	632.92	0.352	5.81	1.113	s
RA-224	1	960.34	240.26	615.11	-114.96	-0.064	31.91	1.062	s
PB-214	1	973.95	243.66	150.47	-5.04	-0.003	346.79	1.063	s
TL-208	1	1107.91	277.12	48.00	81.00	0.045	22.12	0.765	s
I-131	1	1136.64	284.30	96.16	0.00	0.000	1386.76	1.105	s
PB-214	1	1179.78	295.08	88.31	45.46	0.025	29.87	1.116	s
PB-212	1	1200.79	300.33	72.33	75.67	0.042	30.19	0.884	s
AC-228	1	1352.63	338.26	99.57	98.57	0.055	17.07	1.158	s
EU-152	1	1377.92	344.57	53.08	5.93	0.003	178.49	1.164	s
PB-214	1	1406.45	351.70	72.73	97.92	0.054	14.28	1.171	s
I-131	1	1458.13	364.61	48.55	2.75	0.002	362.91	1.184	s
BE-7	1	1908.69	477.18	51.54	-8.69	-0.005	121.69	1.292	s
CS-134	1	2258.21	564.51	46.11	-9.54	-0.005	105.76	1.372	s
CS-134	1	2277.45	569.32	46.15	-1.89	-0.001	-43.70	1.378	s D
Pa-234	1	2278.04	569.47	46.05	-0.14	0.000	-127.80	1.378	s D
TL-208	1	2333.01	583.20	29.29	203.71	0.113	8.80	1.187	
CS-134	1	2425.95	606.43	73.60	-11.46	-0.006	109.96	1.410	
BI-214	1	2437.62	609.35	50.74	104.99	0.058	12.62	1.415	s
I-131	1	2550.13	637.46	30.50	6.07	0.003	134.93	1.440	s
CS-137	1	2647.42	661.78	37.25	5.75	0.003	155.69	1.462	s
EU-154	1	2899.92	724.88	75.51	-14.55	-0.008	88.45	1.518	s
BI-212	1	2908.78	727.09	32.01	44.13	0.025	23.56	1.521	s
PA-234M	1	3065.39	766.24	38.71	-3.28	-0.002	273.97	1.556	s
EU-152	1	3116.13	778.92	18.15	0.00	0.000	602.44	1.567	s
BI-212	1	3143.19	785.68	22.47	5.63	0.003	126.22	1.572	s
CS-134	1	3180.58	795.03	22.77	16.27	0.009	48.32	1.582	s
CS-134	1	3208.17	801.92	27.88	2.35	0.001	325.02	1.587	s
TL-208	1	3439.42	859.73	5.33	46.67	0.026	19.22	0.576	s
EU-154	1	3492.50	873.00	18.55	0.59	0.000	1041.13	1.649	s
Pa-234	1	3522.93	880.60	20.96	-1.30	-0.001	506.27	1.655	s
Pa-234	1	3534.22	883.43	22.27	-1.88	-0.001	362.19	1.657	s

AC-228	1	3643.99	910.87	27.45	86.10	0.048	13.35	1.681	s
Pa-234	1	3782.84	945.58	26.03	0.15	0.000	4717.70	1.710	s
EU-152	1	3855.55	963.75	65.26	-3.55	-0.002	326.46	1.726	s
AC-228	1	3875.33	968.70	39.38	56.25	0.031	20.66	1.730	s
EU-154	1	3986.69	996.54	29.14	-1.79	-0.001	432.83	1.753	s
PA-234M	1	4004.14	1000.90	24.76	3.89	0.002	187.86	1.756	s
EU-154	1	4022.22	1005.42	27.73	-1.41	-0.001	536.35	1.760	s
EU-152	1	4453.83	1113.34	29.90	-6.20	-0.003	130.95	1.847	s
BI-214	1	4480.76	1120.07	25.44	13.74	0.008	50.50	1.854	s
CO-60	1	4692.73	1173.08	18.10	4.47	0.002	142.63	1.896	s
EU-154	1	5098.47	1274.54	30.78	0.00	0.000	784.66	1.975	s
CO-60	1	5322.57	1330.59	13.33	2.70	0.002	200.54	2.019	s
EU-152	1	5632.07	1408.00	-8.57	0.00	0.000	100.00	2.076	s
K-40	1	5840.52	1460.14	11.21	230.79	0.128	6.43	2.022	
BI-214	1	7053.90	1763.72	12.23	13.72	0.008	37.22	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	
U-235	N	1	-9.744E-001	143.79	-9.744E-001	%	(P	7.412E+000	G	2.6E+011	10.96
			-9.744E-001	205.33	1.004E+000	%		1.624E+001	G	2.6E+011	5.01
			-9.744E-001	163.38	3.371E+000	&		1.631E+001	G	2.6E+011	5.08
			-9.744E-001	93.35	-9.744E-001	!	E	1.564E+001	X	2.6E+011	5.81
PB-210	N	1	9.162E+000	46.54	9.162E+000	*	(P	3.748E+001	G	8.1E+003	4.25
TL-208	F N	1	7.947E+000	583.02	7.947E+000		(P	1.090E+000	G	7.0E+002	84.50
			7.947E+000	277.28	2.408E+001	*		1.040E+001	G	7.0E+002	6.31
			7.947E+000	860.56	1.648E+001	+		4.759E+000	G	7.0E+002	12.42
			7.785E-002	636.97	2.979E+000	%		1.396E+001	G	8.0E+000	7.17
I-131	T F I	1	7.785E-002	364.48	7.785E-002	&	(	9.946E-001	G	8.0E+000	81.70
			7.785E-002	284.30	0.000E+000	%		1.507E+001	G	8.0E+000	6.14
BI-214	N	1	7.758E+000	609.31	7.758E+000	@	(P	2.653E+000	G	5.8E+005	46.09
			7.758E+000	1120.29	4.858E+000	%	P	9.271E+000	G	5.8E+005	15.10
			7.758E+000	1764.49	6.918E+000	%	P	9.585E+000	G	5.8E+005	15.40
			-5.652E-002	946.02	5.377E-002	%		9.298E+000	G	1.6E+012	13.40
			-5.652E-002	883.24	-8.762E-001	%		1.151E+001	G	1.6E+012	9.60
			-5.652E-002	880.53	-9.656E-001	%		1.788E+001	G	1.6E+012	6.00
Pa-234	N	1	-5.652E-002	131.29	-5.652E-002	%	(	4.392E+000	G	1.6E+012	18.00
			-5.652E-002	569.47	-5.652E-002	%		1.356E+001	G	1.6E+012	8.20
PB-214	N	1	5.440E+000	351.93	5.856E+000	*	(P	2.539E+000	G	5.8E+005	37.60
			5.440E+000	295.09	4.630E+000	@	(P	4.736E+000	G	5.8E+005	19.30
			5.440E+000	242.00	-1.153E+000	%		1.369E+001	G	5.8E+005	7.43
EU-152	T F	1	4.949E-001	344.29	4.949E-001	%	(	3.059E+000	G	4.9E+003	26.50
			4.949E-001	121.78	-8.369E-001	%		2.933E+000	G	4.9E+003	28.58
			4.949E-001	778.92	0.000E+000	%		7.110E+000	G	4.9E+003	12.94
			4.949E-001	964.11	-1.159E+000	&		1.318E+001	G	4.9E+003	14.61
			4.949E-001	1112.07	-2.415E+000	%		1.097E+001	G	4.9E+003	13.64
			4.949E-001	1408.00	0.000E+000	&		2.244E+000	G	4.9E+003	21.00
RA-224	N	1	-4.749E+001	240.99	-4.749E+001		(	4.886E+001	G	7.0E+002	4.10
CS-134	T F I	1	-3.974E-001	604.71	-3.974E-001	%	(	1.481E+000	G	7.5E+002	97.62
			-3.974E-001	795.87	7.881E-001	%		1.208E+000	G	7.5E+002	85.53
			-3.974E-001	569.32	-3.974E-001	&		7.237E+000	G	7.5E+002	15.38
			-3.974E-001	801.95	1.124E+000	%		1.310E+001	G	7.5E+002	8.69
			-3.974E-001	563.24	-3.670E+000	&		1.322E+001	G	7.5E+002	8.35
PB-212	N	1	2.459E+001	238.63	2.459E+001	@	(P	2.367E+000	G	7.0E+002	43.30
			2.459E+001	300.03	4.592E+001	*		2.570E+001	G	7.0E+002	3.28
CS-137	T F I	1	2.444E-001	661.66	2.444E-001	&	(	1.323E+000	G	1.1E+004	85.21
BE-7	N P C	1	-2.345E+000	477.60	-2.345E+000	%	(	9.760E+000	G	5.3E+001	10.52
PA-234	N	1	2.280E+001	1001.00	2.280E+001	%	(	1.518E+002	G	1.6E+012	.84
			2.280E+001	766.41	-4.495E+001	%		4.346E+002	G	1.6E+012	.29
AM-241	T	1	-2.157E-001	59.54	-2.157E-001	%	(	3.129E+000	G	1.6E+005	35.90
			2.131E-001	123.10	8.727E-001	%		1.729E+000	G	3.1E+003	40.79
			2.131E-001	1274.54	0.000E+000	%		4.791E+000	G	3.1E+003	35.19
			2.131E-001	723.36	-2.779E+000	%		8.255E+000	G	3.1E+003	20.22

				2.131E-001	1004.77	-3.840E-001	%			7.443E+000G		3.1E+003	18.01
				2.131E-001	996.33	-8.259E-001	&			1.285E+001G		3.1E+003	10.60
EU-154	T F I		1	2.131E-001	873.23	2.131E-001	%	(		8.234E+000G		3.1E+003	12.27
CO-60	T F		1	1.652E-001	1332.50	1.652E-001	%	(		1.206E+000G		1.9E+003	99.98
				1.652E-001	1173.24	2.476E-001	%			1.248E+000G		1.9E+003	99.90
TH-234		N	1	1.576E+001	63.29	2.408E+000	%	(	P	2.464E+001G		1.6E+012	4.82
				1.576E+001	92.59	2.729E+001		(	P	1.584E+001G		1.6E+012	5.58
AC-228		N	1	1.502E+001	911.07	1.358E+001	*	(	P	4.279E+000G		2.1E+003	29.00
				1.502E+001	968.97	1.543E+001		(		8.763E+000G		2.1E+003	17.46
				1.502E+001	338.32	1.790E+001	*	(	P	8.938E+000G		2.1E+003	12.01
				1.502E+001	93.35	1.502E+001	!		E	1.634E+001X	A	2.1E+003	5.56
BI-212		N	1	1.448E+001	727.33	1.448E+001	*	(		9.541E+000G		7.0E+002	11.82
				1.448E+001	785.51	2.102E+001	%			9.252E+001G		7.0E+002	1.10
K-40		N	1	1.426E+002	1460.83	1.426E+002		(	P	1.131E+001G		4.7E+011	10.67
EU-155	T F I		1	1.201E-002	105.31	1.201E-002	&	(		3.471E+000G		1.8E+003	21.20
				1.201E-002	86.54	1.420E+000	%			2.620E+000G		1.8E+003	30.70

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	<	-3.974E-001	-3.975E-001	109.96	109.99	1.481E+000
CS-137	<	2.444E-001	2.444E-001	155.69	155.72	1.323E+000
EU-155	<	1.201E-002	1.202E-002	8,380.21	8,380.21	3.471E+000
PB-214	<	5.440E+000	5.440E+000	15.63	15.89	2.539E+000
BI-212	<	1.448E+001	1.449E+001	23.56	23.74	9.541E+000
BI-214	<	7.758E+000	7.758E+000	13.45	13.76	2.653E+000
TH-234	<	1.576E+001	1.576E+001	26.63	26.88	2.464E+001
PA-234M	<	2.280E+001	2.280E+001	187.86	187.88	1.518E+002
BE-7	<	-2.345E+000	-2.353E+000	121.69	121.73	9.760E+000
K-40		1.426E+002	1.426E+002	6.74	7.35	1.131E+001
CO-60	<	1.652E-001	1.652E-001	200.54	200.56	1.206E+000
I-131	<	7.785E-002	7.966E-002	362.91	362.93	9.946E-001
EU-152	<	4.949E-001	4.949E-001	178.49	178.51	3.059E+000
EU-154	<	2.131E-001	2.131E-001	1,041.13	1,041.14	8.234E+000
TL-208		7.947E+000	7.949E+000	9.14	9.59	1.090E+000
RA-224	<	-4.749E+001	-4.750E+001	31.91	32.04	4.886E+001
PB-210	<	9.162E+000	9.162E+000	117.99	118.05	3.748E+001
PB-212	#	2.459E+001	2.459E+001	6.00	6.70	2.367E+000
AC-228	<	1.502E+001	1.502E+001	10.10	10.50	4.279E+000
Pa-234	<	-5.652E-002	-5.652E-002	2,261.17	2,261.17	4.392E+000
U-235	<	-9.744E-001	-9.744E-001	373.45	373.46	7.412E+000
AM-241	<	-2.157E-001	-2.157E-001	425.69	425.71	3.129E+000

= All peaks for activity calculation had bad shape

Total Activity (37.87 to 2,000.50 keV) 175.11 Bq/sample

Analyzed by: _____

403605

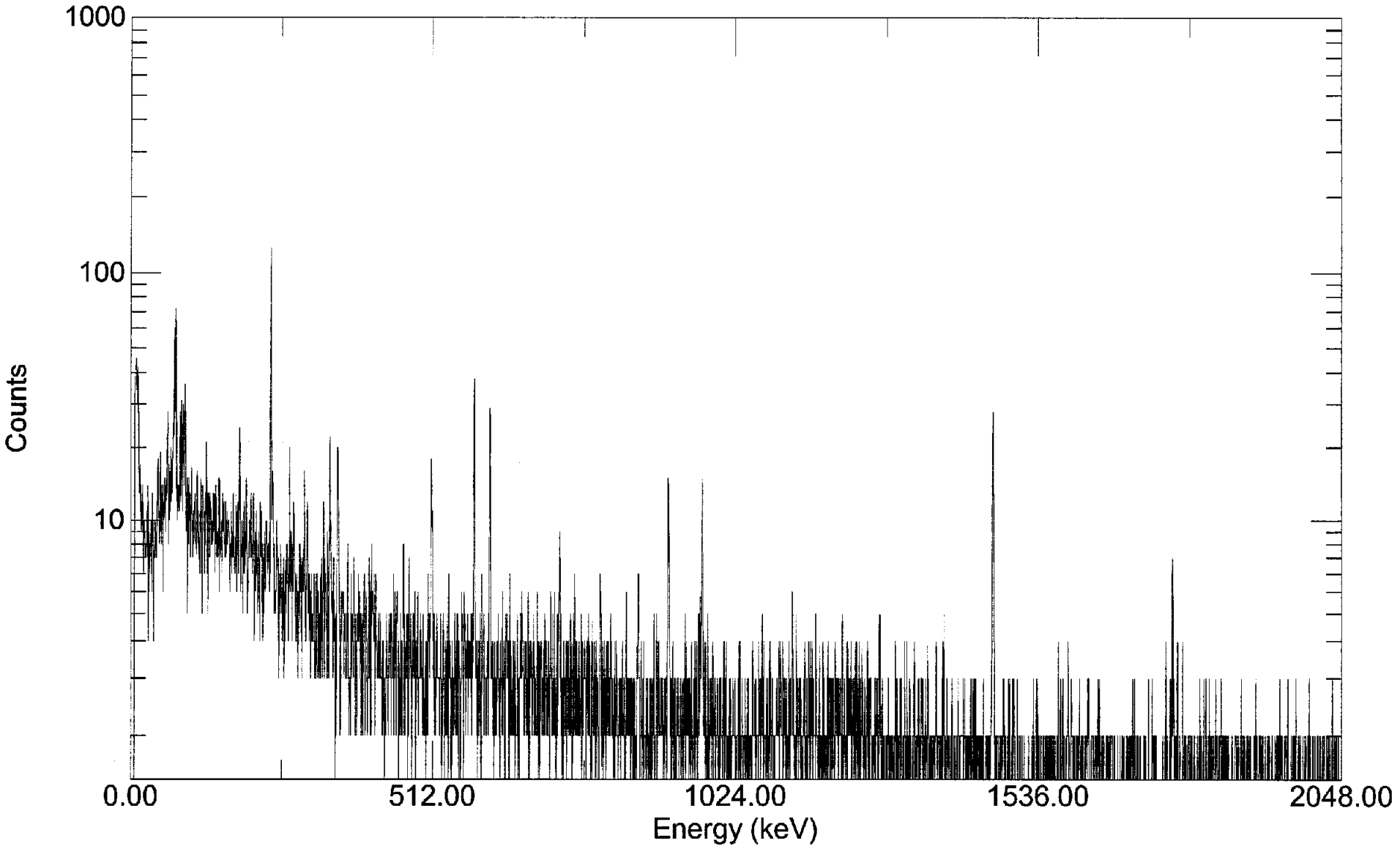
Reviewed by: _____

Supervisor

Laboratory: STL- St Louis

KEKH31AC

7360294_KEKH31AC_F7L200271-008



Acquired: 26-Dec-2007 6:23:08 PM
File: C:\User\spectra\KEKH31AC.spc
Detector: #0 Ge 3 SN/155

Real Time: 1816.04 s. Live Time: 1800.00 s.
Channels: 8192

TestAmerica St. Louis

DB Analysis ID: 33,073

Sample Description: 7360294_KEKH41AC_F7L200271-009

Spectrum Filename: KEKH41AC.An1

Acquisition Information

Start Time:	26-Dec-2007 6:23:38PM		
Live Time:	1800.00	Real Time:	1804.10
Dead Time:	0.23 %		
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	26-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 0.2099

UNIDENTIFIED PEAK SUMMARY

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncertainty 1 Sigma%	FWHM keV	Suspected Nuclide	Code
298.51	74.68	122.50	102.50	0.057	22.49	0.831	PB-214	
308.51	77.18	100.00	138.00	0.077	16.01	0.945	PB-214	
350.25	87.62	178.96	55.04	0.031	36.92	0.907	PB-214	s
835.34	208.92	32.47	45.53	0.025	23.08	0.517	AC-228	s
1406.01	351.61	104.66	29.34	0.016	52.66	1.052		

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	185.73	46.47	72.71	8.89	0.005	38.90	0.819	s
AM-241	1	232.42	58.15	74.95	-1.27	-0.001	964.46	0.830	s
TH-234	1	253.52	63.42	85.36	50.64	0.028	26.87	0.900	s
EU-155	1	348.77	87.25	100.88	72.63	0.040	22.81	0.854	s
TH-234	1	371.57	92.95	112.06	92.94	0.052	19.63	1.254	s
AC-228	1	373.18	93.35	303.02	0.00	0.000	1714.64	0.860	s D
U-235	1	373.18	93.35	117.14	6.14	0.003	26.76	0.860	s D
EU-155	1	419.64	104.97	64.06	11.99	0.007	98.69	0.871	s
EU-152	1	487.15	121.85	58.92	10.38	0.006	109.07	0.885	s
EU-154	1	493.89	123.54	89.22	-7.80	-0.004	175.02	0.886	s
Pa-234	1	522.18	130.61	96.31	-14.74	-0.008	97.68	0.894	s
U-235	1	572.46	143.19	52.44	11.59	0.006	93.13	0.904	s
U-235	1	652.48	163.20	40.33	5.35	0.003	173.33	0.922	s
U-235	1	824.06	206.10	53.67	-8.28	-0.005	129.92	0.958	s
PB-212	1	953.65	238.51	86.29	253.71	0.141	10.51	1.166	
RA-224	1	958.50	239.72	278.84	-76.06	-0.042	33.10	0.988	s
PB-214	1	966.66	241.76	73.89	15.82	0.009	80.84	0.989	s
TL-208	1	1108.55	277.24	12.83	27.17	0.015	29.34	1.028	
I-131	1	1137.73	284.53	34.65	-0.22	0.000	3706.82	1.025	s
PB-214	1	1180.04	295.11	43.13	44.19	0.025	23.60	1.034	s
PB-212	1	1200.29	300.18	38.44	2.58	0.001	345.53	1.039	s
AC-228	1	1351.61	338.01	23.09	40.59	0.023	22.95	1.071	s
EU-152	1	1376.49	344.23	24.36	-1.67	-0.001	424.92	1.076	s
PB-214	1	1406.36	351.70	27.01	85.92	0.048	12.73	1.082	
I-131	1	1459.52	364.99	20.70	3.84	0.002	175.33	1.092	s
BE-7	1	1907.00	476.85	21.76	0.31	0.000	2150.29	1.185	s
CS-134	1	2253.98	563.58	18.62	3.01	0.002	211.11	1.254	s
CS-134	1	2276.94	569.32	14.15	-0.55	0.000	-40.00	1.259	s D
Pa-234	1	2277.54	569.47	12.12	-2.20	-0.001	-130.26	1.259	s D
TL-208	1	2330.28	582.65	8.52	72.48	0.040	13.46	1.756	s
CS-134	1	2420.27	605.14	26.03	-3.29	-0.002	225.94	1.286	s
BI-214	1	2436.24	609.13	9.25	78.75	0.044	12.14	0.771	s
I-131	1	2547.63	636.97	37.01	0.00	0.000	860.40	1.312	s
CS-137	1	2645.35	661.40	18.20	12.16	0.007	57.29	1.331	s
EU-154	1	2888.57	722.18	18.39	0.01	0.000	50745.58	1.378	s
BI-212	1	2909.74	727.47	16.90	9.47	0.005	69.43	1.381	s
PA-234M	1	3067.54	766.90	20.61	-1.33	-0.001	491.13	1.411	s
EU-152	1	3119.54	779.89	13.31	-1.27	-0.001	416.72	1.420	s
BI-212	1	3141.12	785.29	12.56	6.55	0.004	85.91	1.425	s
CS-134	1	3182.17	795.54	17.14	-0.61	0.000	973.01	1.433	s
CS-134	1	3207.81	801.95	9.04	0.00	0.000	425.15	1.437	s
TL-208	1	3443.83	860.92	19.99	6.66	0.004	102.51	1.481	s
EU-154	1	3495.24	873.77	14.45	-0.11	0.000	5064.89	1.490	s
Pa-234	1	3524.63	881.11	11.97	-0.30	0.000	1660.85	1.495	s
Pa-234	1	3533.16	883.24	0.00	0.00	0.000	100.00	1.497	s

AC-228	1	3644.55	911.07	12.48	33.00	0.018	23.07	1.518	s
Pa-234	1	3784.44	946.02	49.55	0.00	0.000	995.48	1.543	s
EU-152	1	3862.63	965.55	44.73	-1.23	-0.001	776.16	1.556	s
AC-228	1	3876.09	968.92	18.74	23.53	0.013	33.20	1.559	s
EU-154	1	3985.62	996.28	16.92	-3.71	-0.002	165.08	1.579	s
PA-234M	1	4002.58	1000.51	9.35	4.50	0.002	107.06	1.582	s
EU-154	1	4025.70	1006.29	7.38	2.21	0.001	186.12	1.585	s
EU-152	1	4450.41	1112.38	11.36	-2.15	-0.001	231.76	1.659	s
BI-214	1	4479.57	1119.66	4.65	23.35	0.013	18.90	0.337	s
CO-60	1	4693.22	1173.02	12.78	0.96	0.001	535.58	1.701	s
EU-154	1	5110.28	1277.18	10.41	-1.18	-0.001	396.51	1.768	s
CO-60	1	5331.84	1332.50	0.00	0.00	0.000	100.00	1.806	s
EU-152	1	5634.21	1408.00	37.19	0.00	0.000	862.43	1.854	s
K-40	1	5844.21	1460.43	2.83	121.17	0.067	8.98	0.607	s
BI-214	1	7058.88	1763.63	4.84	8.19	0.005	51.64	2.066	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	
AC-228	N	1	9.488E+000	911.07	8.442E+000		(		4.905E+000G		2.1E+003	29.00
			9.488E+000	968.97	1.052E+001	?	(		1.023E+001G		2.1E+003	17.46
			9.488E+000	338.32	1.051E+001	@	(		6.500E+000G		2.1E+003	12.01
			9.488E+000	93.35	0.000E+000	%	}	E	1.596E+001X	A	2.1E+003	5.56
BI-214	N	1	9.026E+000	609.31	9.026E+000		(	P	1.935E+000G		5.8E+005	46.09
			9.026E+000	1120.29	1.363E+001	+		P	7.441E+000G		5.8E+005	15.10
			9.026E+000	1764.49	6.977E+000	%			1.105E+001G		5.8E+005	15.40
CS-137	T F I	1	8.095E-001	661.66	8.095E-001	%	(		1.503E+000G		1.1E+004	85.21
AM-241	T	1	-7.827E-002	59.54	-7.827E-002	%	(		2.643E+000G		1.6E+005	35.90
PB-210	N	1	7.367E+000	46.54	7.367E+000	*	(	P	3.517E+001G		8.1E+003	4.25
PB-214	N	1	7.002E+000	351.93	7.368E+000		(	P	2.309E+000G		5.8E+005	37.60
			7.002E+000	295.09	6.289E+000		(	P	4.740E+000G		5.8E+005	19.30
			7.002E+000	242.00	4.920E+000	%			1.330E+001G		5.8E+005	7.43
EU-154	T F I	1	-6.207E-002	873.23	-6.207E-002	%	(		1.192E+001G		3.1E+003	12.27
			-6.207E-002	123.10	-3.083E-001	&			1.848E+000G		3.1E+003	40.79
			-6.207E-002	1274.54	-3.303E-001	%			4.954E+000G		3.1E+003	35.19
			-6.207E-002	723.36	3.617E-003	&			6.866E+000G		3.1E+003	20.22
			-6.207E-002	1004.77	9.891E-001	%			6.867E+000G		3.1E+003	18.01
			-6.207E-002	996.33	-2.799E+000	%			1.649E+001G		3.1E+003	10.60
BI-212	N	1	4.926E+000	727.33	4.926E+000	%	(		1.137E+001G		7.0E+002	11.82
			4.926E+000	785.51	3.904E+001	&			1.146E+002G		7.0E+002	1.10
TL-208	F N	1	4.361E+000	583.02	4.361E+000		(	P	9.813E-001G		7.0E+002	84.50
			4.361E+000	277.28	1.119E+001	+			7.989E+000G		7.0E+002	6.31
			4.361E+000	860.56	3.795E+000	%			1.341E+001G		7.0E+002	12.42
PA-234	N	1	4.312E+001	1001.00	4.312E+001	%	(		1.626E+002G		1.6E+012	.84
			4.312E+001	766.41	-2.901E+001	%			5.213E+002G		1.6E+012	.29
RA-224	N	1	-4.271E+001	240.99	-4.271E+001		(		4.522E+001G		7.0E+002	4.10
EU-155	T F I	1	2.780E+000	105.31	9.168E-001	%	(		3.058E+000G		1.8E+003	21.20
			2.780E+000	86.54	4.067E+000	*	(		2.773E+000G		1.8E+003	30.70
TH-234	N	1	2.510E+001	63.29	2.191E+001	*	(	P	1.980E+001G		1.6E+012	4.82
			2.510E+001	92.59	2.786E+001	*	(	P	1.560E+001G		1.6E+012	5.58
			-1.992E-001	964.11	-6.532E-001	%			1.804E+001G		4.9E+003	14.61
			-1.992E-001	1112.07	-1.381E+000	%			1.182E+001G		4.9E+003	13.64
			-1.992E-001	1408.00	0.000E+000	%			1.586E+001G		4.9E+003	21.00
EU-152	T F	1	-1.992E-001	344.29	-1.992E-001	%	(		3.066E+000G		4.9E+003	26.50
			-1.992E-001	121.78	5.854E-001	&			2.170E+000G		4.9E+003	28.58
			-1.992E-001	778.92	-6.375E-001	%			9.917E+000G		4.9E+003	12.94
CS-134	T F I	1	-1.770E-001	604.71	-1.770E-001	%	(		1.424E+000G		7.5E+002	97.62
			-1.770E-001	795.87	-4.705E-002	%			1.705E+000G		7.5E+002	85.53
			-1.770E-001	569.32	-1.770E-001	%			6.552E+000G		7.5E+002	15.38
			-1.770E-001	801.95	0.000E+000	%			1.284E+001G		7.5E+002	8.69
			-1.770E-001	563.24	1.775E+000	%			1.348E+001G		7.5E+002	8.35
U-235	N	1	1.764E+000	143.79	1.764E+000	%	(		5.549E+000G		2.6E+011	10.96
			1.764E+000	205.33	-3.355E+000	&			1.494E+001G		2.6E+011	5.01

Test America St Louis

				1.764E+000	163.38	1.854E+000	%		1.119E+001G	2.6E+011	5.08
				1.764E+000	93.35	1.764E+000	!	E	1.527E+001X	2.6E+011	5.81
I-131	T F I		1	1.564E-001	364.48	1.564E-001	% (		9.747E-001G	8.0E+000	81.70
				1.564E-001	284.30	-9.732E-002	&		1.304E+001G	8.0E+000	6.14
				1.564E-001	636.97	0.000E+000	%		2.378E+001G	8.0E+000	7.17
PB-212		N	1	1.338E+001	238.63	1.338E+001	(P		2.426E+000G	7.0E+002	43.30
				1.338E+001	300.03	2.193E+000	&		2.686E+001G	7.0E+002	3.28
Pa-234		N	1	-1.333E+000	131.29	-1.333E+000	% (		4.382E+000G	1.6E+012	18.00
				-1.333E+000	569.47	-1.333E+000	&		1.150E+001G	1.6E+012	8.20
				-1.333E+000	946.02	0.000E+000	%		2.028E+001G	1.6E+012	13.40
				-1.333E+000	883.24	0.000E+000	%		5.551E+000G	1.6E+012	9.60
				-1.333E+000	880.53	-3.563E-001	%		2.264E+001G	1.6E+012	6.00
K-40		N	1	1.255E+002	1460.83	1.255E+002	(P		1.093E+001G	4.7E+011	10.67
BE-7		N P C	1	1.247E-001	477.60	1.247E-001	% (		9.900E+000G	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	8.814E-002	%		1.775E+000G	1.9E+003	99.90

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

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

? = 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

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	<	1.247E-001	1.251E-001	2.150.29	2.150.29	9.900E+000
K-40		1.255E+002	1.255E+002	9.19	9.65	1.093E+001
CO-60	<			100.00	100.04	7.522E-001
I-131	<	1.564E-001	1.600E-001	175.33	175.35	9.747E-001
CS-134	<	-1.770E-001	-1.771E-001	225.94	225.96	1.424E+000
EU-154	<	-6.207E-002	-6.208E-002	5.064.89	5.064.89	1.192E+001
RA-224	<	-4.271E+001	-4.273E+001	33.10	33.23	4.522E+001
PB-210	<	7.367E+000	7.368E+000	129.95	130.01	3.517E+001
PB-212		1.338E+001	1.339E+001	10.89	11.29	2.426E+000
PB-214	<	7.002E+000	7.002E+000	13.51	13.81	2.309E+000
CS-137	<	8.095E-001	8.095E-001	57.29	57.36	1.503E+000
EU-152	<	-1.992E-001	-1.992E-001	424.92	424.93	3.066E+000
EU-155	<	2.780E+000	2.781E+000	22.81	23.05	3.058E+000
TL-208		4.361E+000	4.362E+000	13.87	14.17	9.813E-001
BI-212	<	4.926E+000	4.927E+000	69.43	69.50	1.137E+001
BI-214		9.026E+000	9.026E+000	12.95	13.27	1.935E+000
AC-228	<	9.488E+000	9.489E+000	15.50	15.76	4.905E+000
TH-234	#	2.510E+001	2.510E+001	21.58	21.89	1.980E+001
PA-234M	<	4.312E+001	4.312E+001	107.06	107.09	1.626E+002
U-235	<	1.764E+000	1.764E+000	93.13	93.18	5.549E+000
Pa-234	<	-1.333E+000	-1.333E+000	97.68	97.73	4.382E+000
AM-241	<	-7.827E-002	-7.827E-002	964.46	964.47	2.643E+000

= All peaks for activity calculation had bad shape

Total Activity (37.53 to 1,998.47 keV) 177.41 Bq/sample

Analyzed by: _____

403605

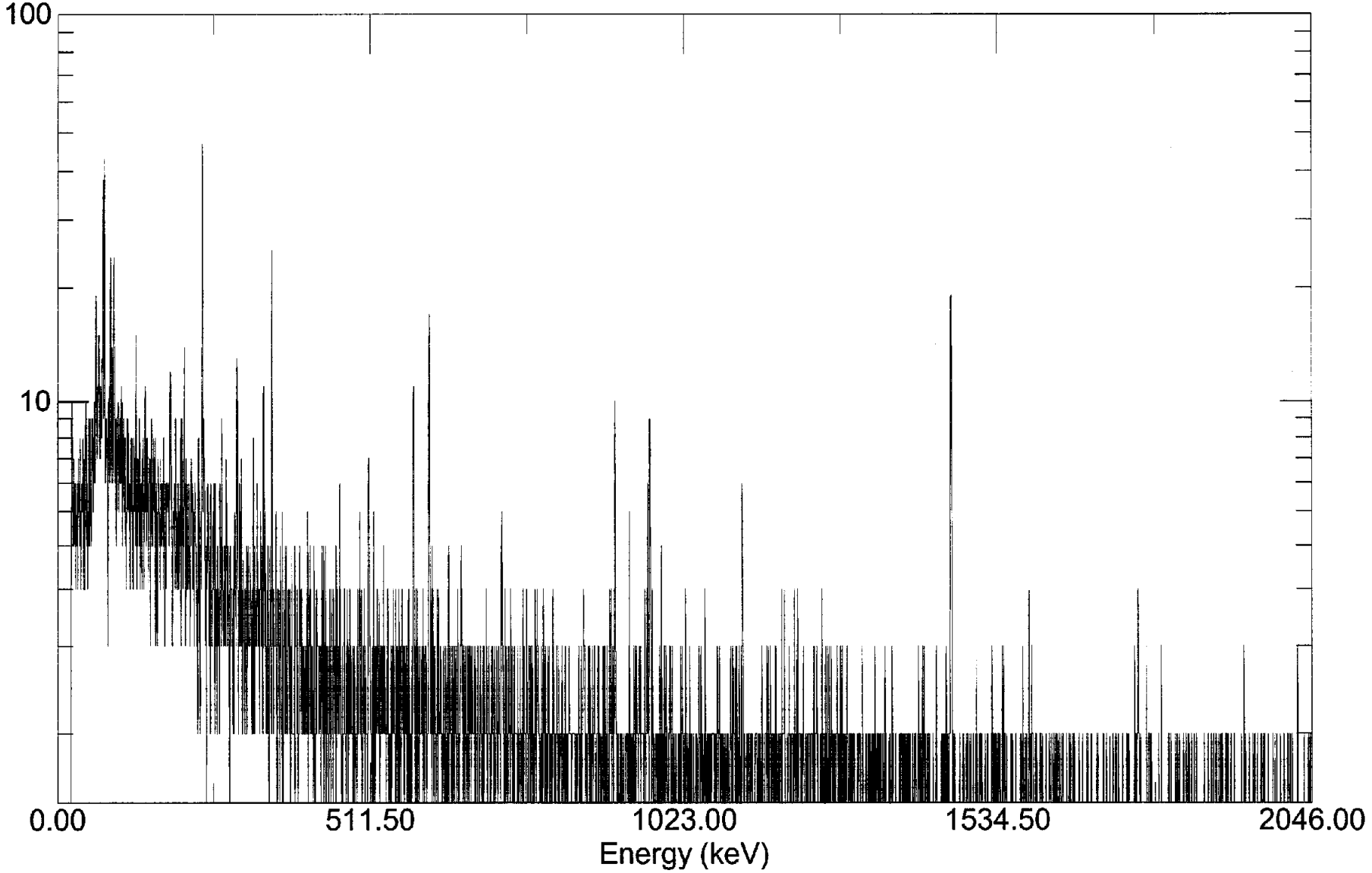
Reviewed by: _____

Supervisor

Laboratory: STL- St Louis

KEKH41AC

7360294_KEKH41AC_F7L200271-009



Acquired: 26-Dec-2007 6:23:38 PM
File: C:\User\spectra\KEKH41AC.spc
Detector: #0 Ge 4 SN/181

Real Time: 1804.10 s. Live Time: 1800.00 s.
Channels: 8192

TestAmerica St. Louis

DB Analysis ID: 33,075

Sample Description: 7360294_KEKH51AC_F7L200271-010

Spectrum Filename: KEKH51AC.An1

Acquisition Information

Start Time:	26-Dec-2007 6:24:04PM		
Live Time:	1800.00	Real Time:	1855.46
Dead Time:	2.99 %		
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	26-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: 0.1965

UNIDENTIFIED PEAK SUMMARY

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncertainty 1 Sigma%	FWHM keV	Suspected Nuclide	Code
297.23	74.52	184.33	131.67	0.073	20.75	0.703	PB-214	s
307.38	77.06	154.00	264.00	0.147	10.21	0.754	PB-214	
516.60	129.32	116.70	81.30	0.045	21.82	0.635	AC-228	s
742.55	185.77	66.67	85.33	0.047	21.28	0.836	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	185.13	46.52	119.47	18.69	0.010	43.12	0.749	s
AM-241	1	235.16	59.01	156.84	12.27	0.007	115.25	0.761	s
TH-234	1	252.75	63.41	142.50	61.50	0.034	29.65	0.540	s
EU-155	1	347.50	87.08	158.16	76.76	0.043	25.83	0.788	s
TH-234	1	369.56	92.59	150.02	43.98	0.024	26.81	0.795	D
U-235	1	372.61	93.35	151.30	11.67	0.006	16.16	0.795	s D
AC-228	1	372.61	93.35	-17.49	48.72	0.027	3.57	0.795	D
EU-155	1	419.13	104.97	124.37	12.34	0.007	130.93	0.808	s
EU-152	1	483.09	120.95	84.39	-6.60	-0.004	200.54	0.824	s
EU-154	1	499.50	125.05	72.95	7.35	0.004	168.54	0.826	s
Pa-234	1	523.99	131.17	179.42	1.20	0.001	1582.17	0.834	s
U-235	1	575.15	143.95	72.31	22.07	0.012	52.21	0.847	s
U-235	1	653.23	163.46	102.57	11.96	0.007	105.07	0.867	s
U-235	1	821.77	205.57	76.16	8.19	0.005	154.68	0.909	s
PB-212	1	954.20	238.65	94.81	309.19	0.172	8.53	0.699	s
RA-224	1	959.62	240.01	412.91	-113.02	-0.063	27.11	0.944	
PB-214	1	967.00	241.85	61.33	99.67	0.055	18.08	0.727	s
TL-208	1	1108.70	277.25	46.69	25.55	0.014	42.68	0.980	s
I-131	1	1143.03	285.83	53.80	-0.27	0.000	3837.45	0.987	s
PB-214	1	1181.41	295.42	48.58	139.42	0.077	13.44	0.992	s
PB-212	1	1201.65	300.48	19.83	44.17	0.025	24.82	1.009	s
AC-228	1	1353.66	338.46	29.33	69.67	0.039	19.11	0.619	s
EU-152	1	1375.50	343.92	50.51	-3.84	-0.002	266.93	1.045	s
PB-214	1	1408.13	352.07	42.54	227.46	0.126	9.06	1.117	s
I-131	1	1457.72	364.46	38.17	0.73	0.000	1198.55	1.065	s
BE-7	1	1910.23	477.54	30.35	-1.63	-0.001	485.65	1.173	s
CS-134	1	2246.17	561.50	21.16	-3.48	-0.002	194.46	1.252	s
CS-134	1	2277.45	569.32	34.39	0.00	0.000	0.00	1.258	s D
Pa-234	1	2278.05	569.47	33.28	0.18	0.000	166.18	1.258	s D
TL-208	1	2334.16	583.49	13.08	116.92	0.065	10.92	0.978	
CS-134	1	2419.04	604.71	74.54	0.00	0.000	1220.97	1.290	s
BI-214	1	2438.85	609.66	9.90	139.10	0.077	8.65	0.621	s
I-131	1	2545.26	636.26	20.94	-0.31	0.000	2081.23	1.319	s
CS-137	1	2648.53	662.07	33.39	5.79	0.003	67.63	1.342	s
EU-154	1	2893.71	723.36	116.79	0.00	0.000	1528.33	1.397	s
BI-212	1	2908.97	727.17	21.88	17.96	0.010	43.74	1.400	
PA-234M	1	3062.75	765.61	34.08	-2.68	-0.001	314.54	1.434	s
EU-152	1	3114.41	778.53	20.23	3.49	0.002	190.11	1.445	s
BI-212	1	3147.29	786.74	22.66	11.20	0.006	67.13	1.451	s
CS-134	1	3185.20	796.22	28.63	-2.44	-0.001	317.00	1.460	s
CS-134	1	3211.43	802.78	18.40	3.53	0.002	179.77	1.465	s
TL-208	1	3444.00	860.92	0.00	38.00	0.021	16.22	0.500	s
EU-154	1	3497.52	874.30	21.75	0.46	0.000	1452.76	1.527	s
Pa-234	1	3517.84	879.38	11.21	-1.32	-0.001	368.74	1.535	s
Pa-234	1	3523.06	880.68	17.26	2.18	0.001	277.76	1.533	s
AC-228	1	3645.50	911.30	6.52	52.54	0.029	15.41	1.559	s

Pa-234	1	3786.84	946.64	24.69	-0.26	0.000	2731.75	1.588	s
EU-152	1	3855.19	963.72	35.63	-3.59	-0.002	241.01	1.603	s
AC-228	1	3877.89	969.40	0.00	62.00	0.034	12.70	0.646	s
EU-154	1	3986.46	996.55	21.28	5.73	0.003	121.29	1.630	s
PA-234M	1	4000.03	999.94	29.50	-2.25	-0.001	348.40	1.633	s
EU-154	1	4017.45	1004.30	19.36	2.75	0.002	233.83	1.637	s
EU-152	1	4452.64	1113.11	22.50	-2.65	-0.001	260.66	1.723	s
BI-214	1	4481.66	1120.37	28.60	10.23	0.006	80.30	1.730	s
CO-60	1	4688.05	1171.98	24.34	3.13	0.002	230.06	1.772	s
EU-154	1	5098.13	1274.54	27.41	0.00	0.000	740.47	1.850	s
CO-60	1	5329.85	1332.50	21.74	-3.23	-0.002	211.68	1.894	s
EU-152	1	5627.68	1407.00	12.39	-1.82	-0.001	283.44	1.950	s
K-40	1	5844.38	1461.20	0.00	322.00	0.179	5.57	1.526	s
BI-214	1	7058.58	1764.98	5.29	19.42	0.011	24.95	2.196	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	
EU-155	T F I	1	9.148E-001	105.31	9.148E-001 %	(	4.053E+000G		1.8E+003	21.20
			9.148E-001	86.54	4.152E+000 &		3.316E+000G	A	1.8E+003	30.70
BI-212	N	1	8.955E+000	727.33	8.955E+000 %	(	1.222E+001G		7.0E+002	11.82
			8.955E+000	785.51	6.395E+001 %		1.421E+002G		7.0E+002	1.10
AM-241	T	1	6.983E-001	59.54	6.983E-001 &	(P	3.475E+000G		1.6E+005	35.90
TL-208	F N	1	6.755E+000	583.02	6.755E+000	(P	1.130E+000G		7.0E+002	84.50
			6.755E+000	277.28	1.011E+001 &		1.367E+001G		7.0E+002	6.31
			6.755E+000	860.56	2.071E+001 +		4.017E+000G		7.0E+002	12.42
BE-7	N P C	1	-6.326E-001	477.60	-6.326E-001 %	(	1.104E+001G		5.3E+001	10.52
RA-224	N	1	-6.103E+001	240.99	-6.103E+001	(	5.259E+001G		7.0E+002	4.10
			-4.395E-001	778.92	1.681E+000 &		1.141E+001G		4.9E+003	12.94
			-4.395E-001	964.11	-1.825E+000 %		1.552E+001G		4.9E+003	14.61
			-4.395E-001	1112.07	-1.618E+000 %		1.516E+001G		4.9E+003	13.64
			-4.395E-001	1408.00	-8.759E-001 %		9.200E+000G		4.9E+003	21.00
EU-152	T F	1	-4.395E-001	344.29	-4.395E-001 %	(	4.105E+000G		4.9E+003	26.50
			-4.395E-001	121.78	-3.608E-001 &		2.487E+000G		4.9E+003	28.58
CS-137	T F I	1	3.698E-001	661.66	3.698E-001 %	(P	1.893E+000G		1.1E+004	85.21
U-235	N	1	3.248E+000	143.79	3.248E+000 *	(P	6.230E+000G		2.6E+011	10.96
			3.248E+000	205.33	3.195E+000 %		1.692E+001G		2.6E+011	5.01
			3.248E+000	163.38	4.000E+000 &	P	1.669E+001G		2.6E+011	5.08
			3.248E+000	93.35	3.248E+000 !	E	1.670E+001X		2.6E+011	5.81
K-40	N	1	3.147E+002	1460.83	3.147E+002	(	7.204E+000G		4.7E+011	10.67
CO-60	T F	1	-3.120E-001	1332.50	-3.120E-001 %	(	2.361E+000G		1.9E+003	99.98
			-3.120E-001	1173.24	2.726E-001 %		2.239E+000G		1.9E+003	99.90
I-131	T F I	1	2.869E-002	364.48	2.869E-002 %	(	1.234E+000G		8.0E+000	81.70
			2.869E-002	284.30	-1.125E-001 %		1.534E+001G		8.0E+000	6.14
			2.869E-002	636.97	-2.293E-001 %		1.766E+001G		8.0E+000	7.17
EU-154	T F I	1	2.548E-001	873.23	2.548E-001 %	(	1.365E+001G		3.1E+003	12.27
			2.548E-001	123.10	2.814E-001 %		1.629E+000G		3.1E+003	40.79
			2.548E-001	1274.54	0.000E+000 %		7.175E+000G		3.1E+003	35.19
			2.548E-001	723.36	0.000E+000 %		1.540E+001G		3.1E+003	20.22
			2.548E-001	1004.77	1.174E+000 %		9.896E+000G		3.1E+003	18.01

			2.548E-001	996.33	4.122E+000	%			1.741E+001G		3.1E+003	10.60
TH-234	N	1	2.491E+001	63.29	2.491E+001		(	P	2.363E+001G		1.6E+012	4.82
			2.491E+001	92.59	1.277E+001	%		P	1.735E+001G		1.6E+012	5.58
PA-234M	N	1	-2.054E+001	1001.00	-2.054E+001	%	(		2.562E+002G		1.6E+012	.84
			-2.054E+001	766.41	-5.602E+001	%			6.263E+002G		1.6E+012	.29
PB-214	N	1	1.885E+001	351.93	1.874E+001		(	P	2.728E+000G		5.8E+005	37.60
			1.885E+001	295.09	1.906E+001	*	(	P	4.812E+000G		5.8E+005	19.30
			1.885E+001	242.00	2.980E+001	*			1.172E+001G		5.8E+005	7.43
PB-212	N	1	1.568E+001	238.63	1.568E+001		(	P	2.439E+000G		7.0E+002	43.30
			1.568E+001	300.03	3.607E+001	+			1.916E+001G		7.0E+002	3.28
BI-214	N	1	1.535E+001	609.31	1.531E+001	@	(	P	1.911E+000G		5.8E+005	46.09
			1.535E+001	1120.29	5.678E+000	%			1.534E+001G		5.8E+005	15.10
			1.535E+001	1764.49	1.549E+001	?	(	P	1.071E+001G		5.8E+005	15.40
AC-228	N	1	1.416E+001	911.16	1.285E+001	?	(		3.572E+000G		2.1E+003	29.00
			1.416E+001	968.97	2.647E+001	+			3.147E+000G		2.1E+003	17.46
			1.416E+001	338.32	1.733E+001		(		6.954E+000G		2.1E+003	12.01
			1.416E+001	93.35	1.416E+001	-		E	2.142E+000G	A	2.1E+003	5.56
PB-210	N	1	1.372E+001	46.54	1.372E+001	*	(	P	3.939E+001G		8.1E+003	4.25
			1.050E-001	880.53	2.508E+000	%			2.537E+001G		1.6E+012	6.00
Pa-234	N	1	1.050E-001	131.29	1.050E-001	&	(		5.704E+000G		1.6E+012	18.00
			1.050E-001	569.47	1.050E-001	%			1.726E+001G		1.6E+012	8.20
			1.050E-001	946.02	-1.407E-001	%			1.411E+001G		1.6E+012	13.40
			1.050E-001	883.24	-9.519E-001	&			1.319E+001G		1.6E+012	9.60
CS-134	T F !	1	0.000E+000	604.71	0.000E+000	&	(		2.217E+000G		7.5E+002	97.62
			0.000E+000	795.87	-1.810E-001	%			2.052E+000G		7.5E+002	85.53
			0.000E+000	569.32	0.000E+000	%			9.340E+000G		7.5E+002	15.38
			0.000E+000	801.95	2.598E+000	&			1.669E+001G		7.5E+002	8.69
			0.000E+000	563.24	-1.975E+000	%			1.370E+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	#	-6.326E-001	-6.348E-001	485.65	485.66	1.104E+001
K-40		3.147E+002	3.147E+002	5.57	6.30	7.204E+000
CO-60	#	-3.120E-001	-3.120E-001	211.68	211.70	2.361E+000
I-131	#	2.869E-002	2.936E-002	1,198.55	1,198.55	1.234E+000
CS-134	#			1,220.97	1,220.98	2.217E+000
EU-154	#	2.548E-001	2.549E-001	1,452.76	1,452.77	1.365E+001
CS-137	#	3.698E-001	3.698E-001	140.63	140.66	1.893E+000
EU-152	#	-4.395E-001	-4.396E-001	266.93	266.95	4.105E+000
EU-155	#	9.148E-001	9.149E-001	130.93	130.98	4.053E+000
TL-208		6.755E+000	6.757E+000	11.27	11.63	1.130E+000
BI-212	#	8.955E+000	8.957E+000	43.74	43.84	1.222E+001
BI-214	#	1.535E+001	1.535E+001	9.07	9.52	1.911E+000
RA-224	#	-6.103E+001	-6.104E+001	27.11	27.27	5.259E+001
AC-228		1.416E+001	1.416E+001	12.27	12.61	3.572E+000
TH-234		2.491E+001	2.491E+001	36.48	36.67	2.363E+001
PA-234M	#	-2.054E+001	-2.054E+001	348.40	348.41	2.562E+002
U-235	#	3.248E+000	3.248E+000	58.07	58.14	6.230E+000
PB-210	#	1.372E+001	1.372E+001	82.96	83.06	3.939E+001
PB-212		1.568E+001	1.568E+001	8.72	9.22	2.439E+000
PB-214	#	1.885E+001	1.885E+001	8.27	8.75	2.728E+000
Pa-234	#	1.050E-001	1.050E-001	1,582.17	1,582.17	5.704E+000
AM-241	#	6.983E-001	6.983E-001	146.35	146.40	3.475E+000

= All peaks for activity calculation had bad shape

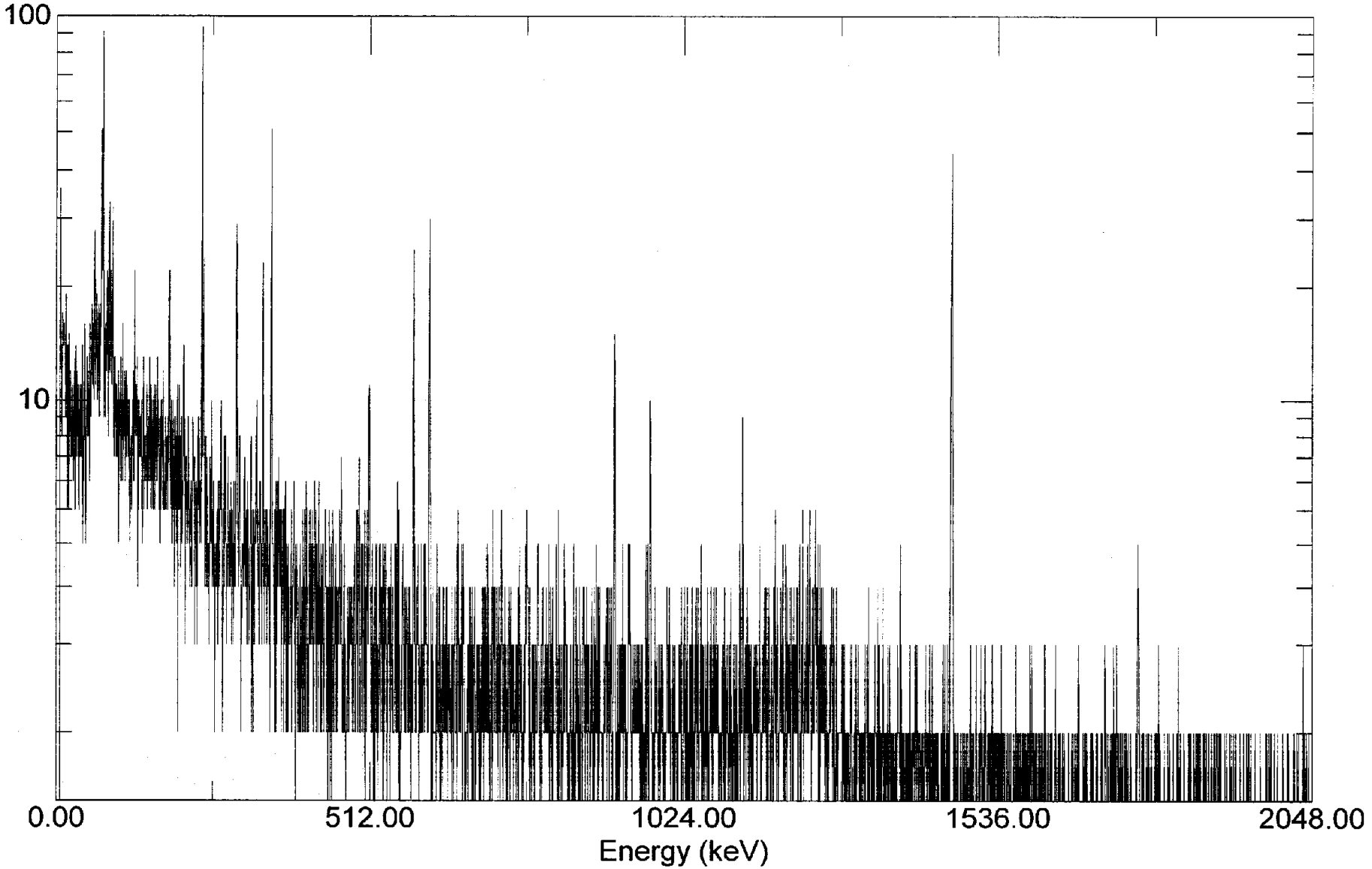
Total Activity (37.74 to 2,000.57 keV) 410.46 Bq/sample

Analyzed by: 403605

Laboratory: STL- St Louis

KEKH51AC

7360294_KEKH51AC_F7L200271-010



Acquired: 26-Dec-2007 6:24:04 PM
File: C:\User\spectra\KEKH51AC.spc
Detector: #0 Ge 5 SN/157

Real Time: 1855.46 s. Live Time: 1800.00 s.
Channels: 8192

TestAmerica St. Louis

DB Analysis ID: 33,074

Sample Description: 7360294_KEKH61AC_F7L200271-011

Spectrum Filename: KEKH61AC.An1

Acquisition Information

Start Time:	26-Dec-2007 6:24:35PM		
Live Time:	1800.00	Real Time:	1824.84
Dead Time:	1.36 %		
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	26-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: 0.0345

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	220.00	164.00	0.091	16.71	0.909	PB-214	
307.66	77.13	333.33	271.67	0.151	14.23	1.187	PB-212	s
348.48	87.33	194.67	132.33	0.074	17.26	0.969	PB-214	s
359.92	90.19	93.34	44.66	0.025	34.06	0.333	PB-214	s
371.45	93.07	312.00	0.00	0.000	2498.00	1.124		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	185.83	46.68	177.85	16.66	0.009	45.78	0.832	s
AM-241	1	237.27	59.54	271.44	-1.20	-0.001	1942.78	0.846	s
TH-234	1	252.40	63.32	283.22	29.25	0.016	47.96	0.850	s
EU-155	1	335.62	84.12	185.49	30.49	0.017	65.72	0.874	s
TH-234	1	370.14	92.74	312.41	53.04	0.029	31.48	0.881	s
U-235	1	372.56	93.35	209.52	15.59	0.009	12.89	0.882	s D
AC-228	1	372.56	93.35	209.52	72.49	0.040	2.32	0.882	s D
EU-155	1	419.93	105.19	177.74	44.46	0.025	44.98	0.894	s
EU-152	1	485.77	121.65	143.77	9.88	0.005	174.51	0.912	s
EU-154	1	486.58	121.85	104.83	13.87	0.008	107.78	0.913	
Pa-234	1	527.22	132.01	196.46	-10.44	-0.006	192.40	0.922	s
U-235	1	574.06	143.71	163.01	29.33	0.016	64.26	0.935	s
U-235	1	652.83	163.40	118.68	19.75	0.011	81.19	0.955	
U-235	1	825.76	206.63	112.46	-0.23	0.000	6535.47	0.999	s
PB-212	1	953.80	238.63	124.01	448.99	0.249	5.72	1.034	D
RA-224	1	963.22	240.99	171.00	52.00	0.029	38.18	1.036	D
PB-214	1	967.26	242.00	90.40	84.60	0.047	19.26	1.037	D
TL-208	1	1107.21	276.98	58.00	92.00	0.051	22.55	0.548	s
I-131	1	1135.80	284.12	69.37	-7.71	-0.004	157.01	1.081	s
PB-214	1	1181.37	295.51	52.00	197.00	0.109	10.85	0.873	s
PB-212	1	1201.82	300.63	64.55	31.01	0.017	40.80	1.097	
AC-228	1	1352.98	338.41	75.51	76.49	0.042	19.72	1.136	s
EU-152	1	1387.56	347.05	41.87	-1.56	-0.001	590.90	1.142	s
PB-214	1	1407.19	351.96	26.22	350.78	0.195	6.40	1.108	s
I-131	1	1454.63	363.82	69.27	-11.35	-0.006	107.84	1.163	s
BE-7	1	1907.37	476.99	41.05	0.53	0.000	1708.90	1.277	s
CS-134	1	2257.77	564.58	32.68	-0.36	0.000	2240.64	1.363	s
CS-134	1	2276.76	569.32	34.60	-1.43	-0.001	-50.12	1.369	s D
Pa-234	1	2277.35	569.47	33.48	-1.54	-0.001	-127.22	1.369	s D
TL-208	1	2331.97	583.12	13.41	194.59	0.108	8.32	1.502	s
CS-134	1	2424.67	606.29	82.35	-8.59	-0.005	153.19	1.403	s
BI-214	1	2436.55	609.26	25.63	233.37	0.130	8.94	1.684	s
I-131	1	2547.69	637.05	31.19	-3.01	-0.002	268.31	1.435	s
CS-137	1	2641.84	660.58	37.53	-7.37	-0.004	135.08	1.459	s
EU-154	1	2893.33	723.45	45.58	-7.28	-0.004	136.34	1.519	s
BI-212	1	2907.72	727.05	25.30	22.72	0.013	37.69	1.523	s
PA-234M	1	3066.47	766.73	38.84	0.35	0.000	2523.12	1.561	s
EU-152	1	3113.77	778.55	25.99	-4.04	-0.002	185.08	1.573	s
BI-212	1	3141.75	785.55	25.05	6.29	0.003	119.41	1.579	s
CS-134	1	3179.88	795.08	23.37	5.92	0.003	122.64	1.589	s
CS-134	1	3208.88	802.33	26.86	-0.78	0.000	951.98	1.595	s
TL-208	1	3435.84	859.06	20.71	12.20	0.007	60.01	1.650	s
EU-154	1	3491.60	873.00	25.39	0.10	0.000	7205.52	1.662	s
Pa-234	1	3516.54	879.24	18.65	-4.61	-0.003	140.46	1.669	s
Pa-234	1	3530.69	882.78	10.48	4.10	0.002	122.24	1.672	s
AC-228	1	3646.24	911.66	27.64	83.70	0.047	14.08	1.698	s

Pa-234	1	3784.90	946.32	33.26	3.45	0.002	242.40	1.731	s
EU-152	1	3856.05	964.11	289.61	0.00	0.000	2406.70	1.748	s
AC-228	1	3876.75	969.29	38.65	49.74	0.028	22.66	1.752	s
EU-154	1	3996.42	999.20	30.62	-4.28	-0.002	189.03	1.778	s
PA-234M	1	4005.27	1001.42	28.25	6.06	0.003	130.57	1.782	s
EU-154	1	4018.99	1004.85	24.65	2.49	0.001	289.18	1.785	s
EU-152	1	4442.04	1110.60	33.63	-5.63	-0.003	151.54	1.884	s
BI-214	1	4481.24	1120.40	3.17	52.83	0.029	15.38	0.729	s
CO-60	1	4692.58	1173.24	30.02	0.00	0.000	774.81	1.939	s
EU-154	1	5096.93	1274.33	19.29	0.09	0.000	6636.16	2.030	s
CO-60	1	5330.01	1332.60	18.94	-3.78	-0.002	170.77	2.081	s
EU-152	1	5639.80	1410.05	21.21	-0.59	0.000	1115.85	2.147	s
K-40	1	5843.00	1460.85	0.00	300.00	0.167	5.77	1.728	
BI-214	1	7059.02	1764.88	6.59	21.42	0.012	27.46	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	
PB-210	N	1	9.945E+000	46.54	9.945E+000	%	(P	3.872E+001	G	8.1E+003	4.25
TH-234	N	1	8.877E+000	63.29	8.877E+000	*	(P	2.462E+001	G	1.6E+012	4.82
			8.877E+000	92.59	1.110E+001	%	P	1.781E+001	G	1.6E+012	5.58
BI-212	N	1	8.390E+000	727.33	8.390E+000	*	(	9.657E+000	G	7.0E+002	11.82
			8.390E+000	785.51	2.667E+001	&		1.104E+002	G	7.0E+002	1.10
TL-208	F N	1	8.288E+000	583.02	8.288E+000	@	(P	8.422E-001	G	7.0E+002	84.50
			8.288E+000	277.28	2.666E+001	+		1.107E+001	G	7.0E+002	6.31
			8.288E+000	860.56	4.955E+000	%		9.712E+000	G	7.0E+002	12.42
			-6.612E-001	569.47	-6.612E-001	&		1.276E+001	G	1.6E+012	8.20
			-6.612E-001	946.02	1.408E+000	%		1.207E+001	G	1.6E+012	13.40
			-6.612E-001	883.24	2.200E+000	%		9.560E+000	G	1.6E+012	9.60
			-6.612E-001	880.53	-3.951E+000	%		1.957E+001	G	1.6E+012	6.00
Pa-234	N	1	-6.612E-001	131.29	-6.612E-001	%	(	4.309E+000	G	1.6E+012	18.00
AM-241	T	1	-5.187E-002	59.54	-5.187E-002	%	(	3.434E+000	G	1.6E+005	35.90
PA-234M	N	1	4.154E+001	1001.00	4.154E+001	%	(	1.884E+002	G	1.6E+012	.84
			4.154E+001	766.41	5.439E+000	%		4.932E+002	G	1.6E+012	.29
EU-154	T F I	1	4.120E-002	873.23	4.120E-002	%	(	1.090E+001	G	3.1E+003	12.27
			4.120E-002	123.10	3.839E-001	%		1.395E+000	G	3.1E+003	40.79
			4.120E-002	1274.54	1.886E-002	%		4.665E+000	G	3.1E+003	35.19
			4.120E-002	723.36	-1.564E+000	&		7.343E+000	G	3.1E+003	20.22
			4.120E-002	1004.77	7.957E-001	%		8.264E+000	G	3.1E+003	18.01
			4.120E-002	996.33	-2.310E+000	%		1.537E+001	G	3.1E+003	10.60
CS-137	T F I	1	-3.481E-001	661.66	-3.481E-001	%	(P	1.475E+000	G	1.1E+004	85.21
CS-134	T F I	1	-3.272E-001	604.71	-3.272E-001	%	(	1.713E+000	G	7.5E+002	97.62
			-3.272E-001	795.87	3.263E-001	%		1.392E+000	G	7.5E+002	85.53
			-3.272E-001	569.32	-3.272E-001	&		6.901E+000	G	7.5E+002	15.38
			-3.272E-001	801.95	-4.237E-001	%		1.468E+001	G	7.5E+002	8.69
			-3.272E-001	563.24	-1.513E-001	%		1.227E+001	G	7.5E+002	8.35
			-3.261E-001	284.30	-2.347E+000	%		1.264E+001	G	8.0E+000	6.14
			-3.261E-001	636.97	-1.635E+000	%		1.559E+001	G	8.0E+000	7.17
I-131	T F I	1	-3.261E-001	364.48	-3.261E-001	&	(	1.192E+000	G	8.0E+000	81.70
U-235	N	1	3.129E+000	143.79	3.129E+000	%	(	6.635E+000	G	2.6E+011	10.96

				3.129E+000	205.33	-6.539E-002	%			1.485E+001G		2.6E+011	5.01
				3.129E+000	163.38	4.801E+000	%			1.300E+001G		2.6E+011	5.08
				3.129E+000	93.35	3.129E+000	!		E	1.408E+001X		2.6E+011	5.81
CO-60	T F		1	-2.786E-001	1332.50	-2.786E-001	%	(		1.695E+000G		1.9E+003	99.98
				-2.786E-001	1173.24	0.000E+000	%			1.861E+000G		1.9E+003	99.90
EU-155	T F I		1	2.375E+000	105.31	2.375E+000	*	(		3.464E+000G		1.8E+003	21.20
				2.375E+000	86.54	1.192E+000	&			2.587E+000G	A	1.8E+003	30.70
K-40		N	1	2.253E+002	1460.83	2.253E+002		(		5.536E+000G		4.7E+011	10.67
RA-224		N	1	2.054E+001	240.99	2.054E+001		(		2.514E+001G		7.0E+002	4.10
PB-214		N	1	2.045E+001	351.93	2.120E+001	*	(	P	1.606E+000G		5.8E+005	37.60
				2.045E+001	295.09	1.973E+001	*	(		3.638E+000G		5.8E+005	19.30
				2.045E+001	242.00	1.850E+001		(		1.028E+001G		5.8E+005	7.43
BI-214		N	1	1.973E+001	609.31	1.895E+001	*	(	P	2.135E+000G		5.8E+005	46.09
				1.973E+001	1120.29	2.213E+001		(		4.608E+000G		5.8E+005	15.10
				1.973E+001	1764.49	1.336E+001	-			9.149E+000G		5.8E+005	15.40
PB-212		N	1	1.665E+001	238.63	1.665E+001		(	P	2.025E+000G		7.0E+002	43.30
				1.665E+001	300.03	1.856E+001	%			2.402E+001G		7.0E+002	3.28
BE-7		N P C	1	1.522E-001	477.60	1.522E-001	%	(		9.316E+000G		5.3E+001	10.52
AC-228		N	1	1.520E+001	911.16	1.529E+001	*	(		4.968E+000G		2.1E+003	29.00
				1.520E+001	968.97	1.590E+001		(		1.013E+001G		2.1E+003	17.46
				1.520E+001	338.32	1.395E+001		(		7.882E+000G		2.1E+003	12.01
				1.520E+001	93.35	1.520E+001	!		E	1.471E+001G	A	2.1E+003	5.56
EU-152	T F		1	-1.313E-001	344.29	-1.313E-001	%	(		2.761E+000G		4.9E+003	26.50
				-1.313E-001	121.78	3.899E-001	%			2.311E+000G		4.9E+003	28.58
				-1.313E-001	778.92	-1.447E+000	%			9.471E+000G		4.9E+003	12.94
				-1.313E-001	964.11	0.000E+000	%			3.121E+001G		4.9E+003	14.61
				-1.313E-001	1112.07	-2.595E+000	%			1.370E+001G		4.9E+003	13.64
				-1.313E-001	1408.00	-2.168E-001	%			8.915E+000G		4.9E+003	21.00

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
CS-134	#	-3.272E-001	-3.273E-001	153.19	153.22	1.713E+000
EU-154	#	4.120E-002	4.120E-002	7,205.52	7,205.52	1.090E+001
EU-155	#	2.375E+000	2.375E+000	44.98	45.11	3.464E+000
PB-214		2.045E+001	2.045E+001	6.46	7.07	1.606E+000
BI-212	#	8.390E+000	8.392E+000	37.69	37.80	9.657E+000
BI-214		1.973E+001	1.973E+001	8.91	9.37	2.135E+000
TH-234	#	8.877E+000	8.877E+000	81.98	82.07	2.462E+001
PA-234M	#	4.154E+001	4.154E+001	130.57	130.60	1.884E+002
BE-7	#	1.522E-001	1.527E-001	1,708.90	1,708.90	9.316E+000
K-40		2.253E+002	2.253E+002	5.77	6.47	5.536E+000
CO-60	#	-2.786E-001	-2.786E-001	170.77	170.79	1.695E+000
I-131	#	-3.261E-001	-3.338E-001	107.84	107.88	1.192E+000
CS-137	#	-3.481E-001	-3.481E-001	148.72	148.75	1.475E+000
EU-152	#	-1.313E-001	-1.313E-001	590.90	590.91	2.761E+000
TL-208	#	8.288E+000	8.290E+000	8.42	8.90	8.422E-001
PB-210	#	9.945E+000	9.946E+000	112.04	112.10	3.872E+001
PB-212		1.665E+001	1.666E+001	5.84	6.56	2.025E+000
RA-224		2.054E+001	2.054E+001	38.18	38.29	2.514E+001
AC-228	#	1.520E+001	1.520E+001	11.06	11.43	4.968E+000
Pa-234	#	-6.612E-001	-6.612E-001	192.40	192.42	4.309E+000
U-235	#	3.129E+000	3.129E+000	64.26	64.33	6.635E+000
AM-241	#	-5.187E-002	-5.187E-002	1,942.78	1,942.78	3.434E+000

= All peaks for activity calculation had bad shape

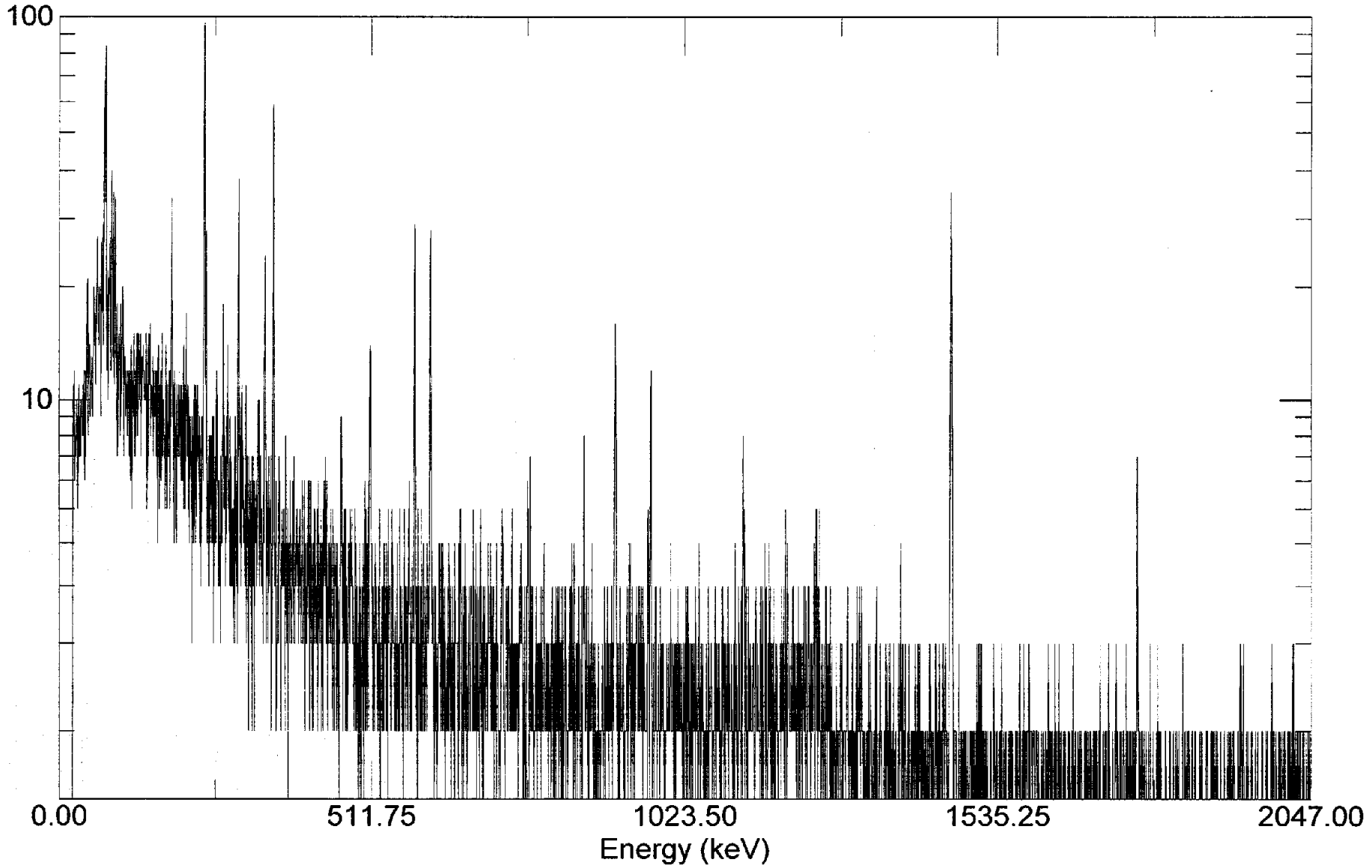
Total Activity (37.72 to 2,000.15 keV) 310.99 Bq/sample

Analyzed by: 403605

Laboratory: Test America

KEKH61AC

7360294_KEKH61AC_F7L200271-011



Acquired: 26-Dec-2007 6:24:36 PM
File: C:\User\spectra\KEKH61AC.spc
Detector: #0 Ge 7 SN/154

Real Time: 1824.84 s. Live Time: 1800.00 s.
Channels: 8192

TestAmerica St. Louis

DB Analysis ID: 33,076

Sample Description: 7360294_KEKH91AC_F7L200271-012

Spectrum Filename: KEKH91AC.An1

Acquisition Information

Start Time:	26-Dec-2007 7:00:24PM		
Live Time:	1800.00	Real Time:	1810.82
Dead Time:	0.60 %		
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	26-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 0.1482

UNIDENTIFIED PEAK SUMMARY

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncertainty 1 Sigma%	FWHM keV	Suspected Nuclide	Code
252.59	63.36	253.90	58.10	0.032	40.94	0.626		s
298.52	74.85	150.00	182.00	0.101	13.26	0.836	PB-214	
307.66	77.13	216.00	273.00	0.152	11.95	0.860	PB-214	
347.81	87.17	255.71	38.29	0.021	61.24	1.186		s
741.38	185.56	108.00	151.00	0.084	17.41	0.614	U-235	s
835.54	209.10	91.83	104.17	0.058	16.29	0.781	AC-228	s
2435.97	609.19	190.11	50.89	0.028	40.80	1.225		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	185.68	46.63	170.44	37.89	0.021	27.75	0.813	
AM-241	1	236.57	59.36	178.39	14.51	0.008	132.77	0.824	s
TH-234	1	251.84	63.17	239.50	28.00	0.016	33.41	0.828	s
EU-155	1	347.46	87.08	257.61	97.05	0.054	25.50	0.849	s
TH-234	1	370.30	92.79	297.34	31.51	0.018	29.25	0.855	s
U-235	1	372.54	93.35	214.17	-5.44	-0.003	-513.31	0.855	s D
AC-228	1	372.54	93.35	148.83	69.81	0.039	2.03	1.312	s D
EU-155	1	415.04	103.97	113.93	12.76	0.007	121.60	0.866	s
EU-152	1	483.98	121.21	110.76	11.14	0.006	136.91	0.881	s
EU-154	1	489.62	122.62	150.92	-8.86	-0.005	198.95	0.882	s
Pa-234	1	522.41	130.82	177.09	-0.62	0.000	3022.47	0.890	s
U-235	1	575.39	144.06	178.02	-10.05	-0.006	298.77	0.901	s
U-235	1	656.27	164.28	129.54	0.15	0.000	511.19	0.919	s
U-235	1	812.21	203.27	50.18	16.47	0.009	57.54	0.957	s
PB-212	1	952.84	238.43	129.25	340.75	0.189	8.06	0.946	
RA-224	1	959.32	240.05	479.62	-112.96	-0.063	28.99	0.989	
PB-214	1	967.18	242.01	92.52	89.48	0.050	22.05	0.660	s
TL-208	1	1109.38	277.56	88.36	8.44	0.005	161.30	1.021	s
I-131	1	1142.73	285.90	43.77	0.90	0.000	1049.13	1.028	s
PB-214	1	1179.60	295.12	59.04	156.96	0.087	12.14	0.877	
PB-212	1	1202.08	300.74	40.00	59.00	0.033	25.83	0.604	s
AC-228	1	1352.19	338.26	34.91	82.09	0.046	16.54	1.071	
EU-152	1	1377.01	344.47	52.57	-0.91	-0.001	1137.52	1.081	s
PB-214	1	1406.27	351.78	66.99	262.01	0.146	9.17	1.022	
I-131	1	1459.52	365.09	56.39	-4.44	-0.002	243.78	1.099	s
BE-7	1	1909.54	477.60	36.71	0.00	0.000	856.87	1.198	s
CS-134	1	2248.31	562.28	28.91	-5.03	-0.003	157.53	1.273	s
CS-134	1	2276.47	569.32	32.87	-3.01	-0.002	-47.46	1.278	s D
Pa-234	1	2277.07	569.47	28.89	-0.11	0.000	-139.43	1.278	s D
TL-208	1	2331.72	583.13	34.75	129.25	0.072	12.48	1.376	
CS-134	1	2425.00	606.45	78.30	-18.33	-0.010	72.17	1.309	s
BI-214	1	2436.00	609.20	41.46	180.92	0.101	8.25	1.313	s
I-131	1	2543.31	636.03	28.50	0.32	0.000	2347.97	1.337	s
CS-137	1	2646.99	661.94	45.79	11.13	0.006	91.02	1.358	s
EU-154	1	2895.37	724.03	45.79	-5.68	-0.003	173.75	1.411	s
BI-212	1	2906.22	726.74	6.50	29.50	0.016	23.99	0.526	s
PA-234M	1	3064.92	766.41	59.19	0.00	0.000	1088.01	1.447	s
EU-152	1	3114.20	778.73	26.72	-1.44	-0.001	514.39	1.458	s
BI-212	1	3143.25	785.99	27.14	5.67	0.003	136.47	1.463	
CS-134	1	3178.13	794.71	21.38	9.11	0.005	79.06	1.472	s
CS-134	1	3212.68	803.35	25.74	-0.16	0.000	4558.51	1.477	s
TL-208	1	3440.28	860.24	3.00	29.00	0.016	22.08	0.734	s
EU-154	1	3488.32	872.25	25.69	-2.50	-0.001	293.97	1.537	s
Pa-234	1	3521.46	880.53	32.62	0.00	0.000	807.69	1.543	s
Pa-234	1	3533.50	883.54	22.35	-2.01	-0.001	339.95	1.546	s

AC-228	1	3645.62	911.57	10.64	103.36	0.057	11.25	1.151	s
Pa-234	1	3782.54	945.79	33.62	-3.22	-0.002	260.43	1.598	s
EU-152	1	3855.22	963.96	36.37	10.41	0.006	87.60	1.613	s
AC-228	1	3874.93	968.88	6.25	63.75	0.035	13.27	0.738	s
EU-154	1	3980.93	995.38	29.37	-0.47	0.000	1625.96	1.640	s
PA-234M	1	4003.60	1001.05	33.29	5.19	0.003	163.36	1.643	s
EU-154	1	4018.52	1004.77	14.95	0.00	0.000	546.78	1.647	s
EU-152	1	4447.80	1112.07	27.41	0.00	0.000	740.36	1.735	s
BI-214	1	4479.86	1120.09	37.96	42.12	0.023	22.14	1.741	s
CO-60	1	4690.20	1172.66	43.48	-3.41	-0.002	278.74	1.784	s
EU-154	1	5092.40	1273.19	16.92	0.12	0.000	5023.98	1.866	s
CO-60	1	5329.72	1332.50	62.18	0.00	0.000	1115.21	1.912	s
EU-152	1	5637.33	1409.38	11.40	4.07	0.002	127.50	1.972	s
K-40	1	5842.06	1460.55	12.54	480.46	0.267	4.50	1.846	
BI-214	1	7058.22	1764.49	13.10	22.56	0.013	24.23	2.246	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
Bi-212	N	1	9.950E+000	727.33	9.950E+000	(	4.921E+000G		7.0E+002 11.82
			9.950E+000	785.51	2.170E+001 %		1.032E+002G		7.0E+002 1.10
TH-234	N	1	9.521E+000	63.29	9.521E+000 %	(P	2.544E+001G		1.6E+012 4.82
			9.521E+000	92.59	7.558E+000 %	P	1.993E+001G		1.6E+012 5.58
EU-154	T F I	1	-9.215E-001	873.23	-9.215E-001 %	(	9.717E+000G		3.1E+003 12.27
			-9.215E-001	123.10	-2.861E-001 %		1.936E+000G		3.1E+003 40.79
			-9.215E-001	1274.54	1.956E-002 %		3.689E+000G		3.1E+003 35.19
			-9.215E-001	723.36	-1.115E+000 %		6.727E+000G		3.1E+003 20.22
			-9.215E-001	1004.77	0.000E+000 %		5.750E+000G		3.1E+003 18.01
			-9.215E-001	996.33	-2.217E-001 &		1.310E+001G		3.1E+003 10.60
			-7.949E-002	1408.00	1.239E+000 %		5.620E+000G		4.9E+003 21.00
EU-152	T F	1	-7.949E-002	344.29	-7.949E-002 %	(	3.205E+000G		4.9E+003 26.50
			-7.949E-002	121.78	5.128E-001 &		2.382E+000G		4.9E+003 28.58
			-7.949E-002	778.92	-4.655E-001 %		8.661E+000G		4.9E+003 12.94
			-7.949E-002	964.11	3.459E+000 %		1.024E+001G		4.9E+003 14.61
			-7.949E-002	1112.07	0.000E+000 %		1.067E+001G		4.9E+003 13.64
AM-241	T	1	7.016E-001	59.54	7.016E-001 %	(	3.140E+000G		1.6E+005 35.90
CS-134	T F I	1	-6.576E-001	604.71	-6.576E-001 &	(	1.577E+000G		7.5E+002 97.62
			-6.576E-001	795.87	4.522E-001 %		1.204E+000G		7.5E+002 85.53
			-6.576E-001	569.32	-6.576E-001 %		6.422E+000G		7.5E+002 15.38
			-6.576E-001	801.95	-7.741E-002 &		1.294E+001G		7.5E+002 8.69
			-6.576E-001	563.24	-2.007E+000 %		1.108E+001G		7.5E+002 8.35
TL-208	F N	1	5.221E+000	583.02	5.221E+000	(P	1.219E+000G		7.0E+002 84.50
			5.221E+000	277.28	2.656E+000 %		1.464E+001G		7.0E+002 6.31
			5.221E+000	860.56	1.047E+001 +		3.891E+000G		7.0E+002 12.42
RA-224	N	1	-4.960E+001	240.99	-4.960E+001	(	4.600E+001G		7.0E+002 4.10
CS-137	T F I	1	4.877E-001	661.66	4.877E-001 %	(	1.500E+000G		1.1E+004 85.21
Pa-234	N	1	-4.613E-002	131.29	-4.613E-002 %	(	4.791E+000G		1.6E+012 18.00
			-4.613E-002	569.47	-4.613E-002 %		1.136E+001G		1.6E+012 8.20
			-4.613E-002	946.02	-1.152E+000 %		1.063E+001G		1.6E+012 13.40
			-4.613E-002	883.24	-9.558E-001 %		1.176E+001G		1.6E+012 9.60
			-4.613E-002	880.53	0.000E+000 %		2.226E+001G		1.6E+012 6.00
PA-234	N	1	3.088E+001	1001.00	3.088E+001 %	(	1.762E+002G		1.6E+012 .84
			3.088E+001	766.41	0.000E+000 %		5.423E+002G		1.6E+012 .29
K-40	N	1	2.965E+002	1460.83	2.965E+002	(P	1.186E+001G		4.7E+011 10.67
EU-155	T F I	1	2.879E+000	105.31	7.889E-001 &	(	3.244E+000G		1.8E+003 21.20
			2.879E+000	86.54	4.323E+000 *	(	3.452E+000G		1.8E+003 30.70
PB-210	N	1	2.393E+001	46.54	2.393E+001 %	(P	4.014E+001G		8.1E+003 4.25
AC-228	N	1	1.678E+001	911.07	1.662E+001 @	(P	2.881E+000G		2.1E+003 29.00
			1.678E+001	968.97	1.778E+001	(P	4.006E+000G		2.1E+003 17.46
			1.678E+001	338.32	1.570E+001	(P	5.785E+000G		2.1E+003 12.01
			1.678E+001	93.35	1.678E+001 +	E	1.432E+001X	A	2.1E+003 5.56
PB-214	N	1	1.662E+001	351.93	1.648E+001	(P	2.569E+000G		5.8E+005 37.60
			1.662E+001	295.09	1.690E+001	(P	4.147E+000G		5.8E+005 19.30

				1.662E+001	242.00	2.174E+001	*	P	1.155E+001G	5.8E+005	7.43
BI-214		N	1	1.413E+001	609.31	1.382E+001	@ (	P	2.500E+000G	5.8E+005	46.09
				1.413E+001	1120.29	1.506E+001	@ (	P	1.124E+001G	5.8E+005	15.10
				1.413E+001	1764.49	1.125E+001	-	P	9.762E+000G	5.8E+005	15.40
PB-212		N	1	1.407E+001	238.63	1.407E+001	(	P	2.300E+000G	7.0E+002	43.30
				1.407E+001	300.03	3.783E+001	+		2.064E+001G	7.0E+002	3.28
I-131	T F I		1	-1.319E-001	364.48	-1.319E-001	% (		1.120E+000G	8.0E+000	81.70
				-1.319E-001	284.30	2.953E-001	&		1.105E+001G	8.0E+000	6.14
				-1.319E-001	636.97	1.634E-001	%		1.398E+001G	8.0E+000	7.17
U-235		N	1	-1.252E+000	143.79	-1.252E+000	% (	P	8.084E+000G	2.6E+011	10.96
				-1.252E+000	205.33	5.334E+000	%	P	1.157E+001G	2.6E+011	5.01
				-1.252E+000	163.38	4.283E-002	&	P	1.574E+001G	2.6E+011	5.08
				-1.252E+000	93.35	-1.252E+000	!	E	1.632E+001X	2.6E+011	5.81
BE-7		N P C	1	0.000E+000	477.60	0.000E+000	& (		8.704E+000G	5.3E+001	10.52
CO-60	T F		1	0.000E+000	1332.50	0.000E+000	% (		2.422E+000G	1.9E+003	99.98
				0.000E+000	1173.24	-1.906E-001	%		1.869E+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	<	-1.319E-001	-1.353E-001	243.78	243.80	1.120E+000
CS-134	<	-6.576E-001	-6.577E-001	72.17	72.23	1.577E+000
EU-154	<	-9.215E-001	-9.215E-001	293.97	293.98	9.717E+000
PB-212		1.407E+001	1.408E+001	8.61	9.11	2.300E+000
PB-214		1.662E+001	1.662E+001	8.02	8.52	2.569E+000
BI-212		9.950E+000	9.953E+000	23.99	24.17	4.921E+000
BI-214	<	1.413E+001	1.413E+001	8.78	9.24	2.500E+000
AC-228		1.678E+001	1.678E+001	8.43	8.91	2.881E+000
BE-7	<			856.87	856.88	8.704E+000
K-40		2.965E+002	2.965E+002	4.62	5.47	1.186E+001
CO-60	<			1.115.21	1.115.22	2.422E+000
CS-137	<	4.877E-001	4.877E-001	91.02	91.06	1.500E+000
EU-152	<	-7.949E-002	-7.950E-002	1.137.52	1.137.53	3.205E+000
EU-155	<	2.879E+000	2.879E+000	25.50	25.72	3.244E+000
TL-208		5.221E+000	5.223E+000	13.34	13.65	1.219E+000
RA-224	<	-4.960E+001	-4.962E+001	28.99	29.14	4.600E+001
PB-210	#	2.393E+001	2.393E+001	49.33	49.48	4.014E+001
Pa-234	<	-4.613E-002	-4.613E-002	3.022.47	3.022.47	4.791E+000
TH-234	<	9.521E+000	9.521E+000	77.44	77.52	2.544E+001
PA-234M	<	3.088E+001	3.088E+001	163.36	163.39	1.762E+002
U-235	<	-1.252E+000	-1.252E+000	410.06	410.07	8.084E+000
AM-241	<	7.016E-001	7.016E-001	132.77	132.83	3.140E+000

= All peaks for activity calculation had bad shape

Total Activity (37.71 to 1,999.84 keV) 359.16 Bq/sample

Analyzed by: _____

403605

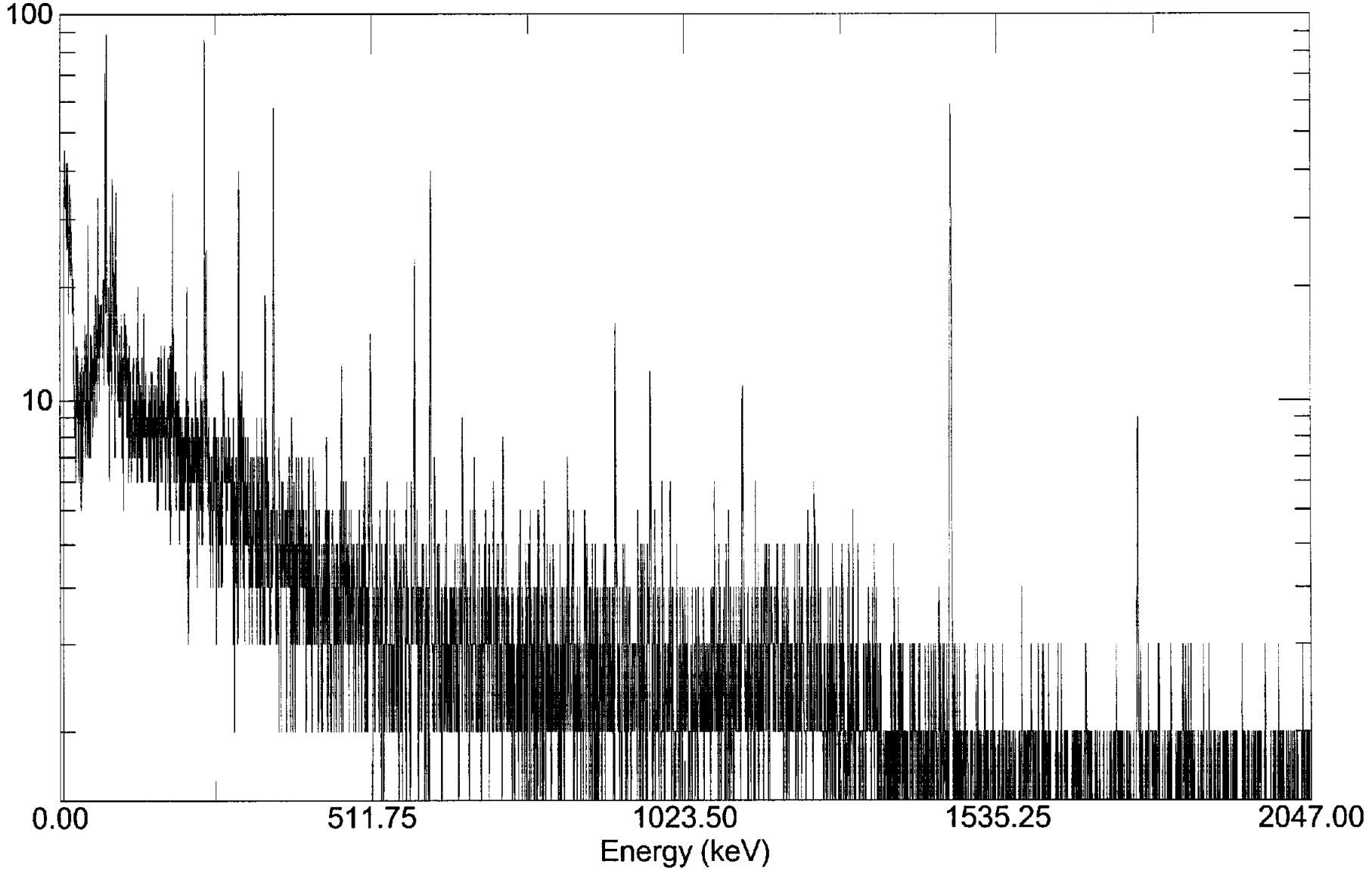
Reviewed by: _____

Supervisor

Laboratory: Test America

KEKH91AC

7360294_KEKH91AC_F7L200271-012



Acquired: 26-Dec-2007 7:00:24 PM
File: C:\User\spectra\KEKH91AC.spc
Detector: #0 Ge 1 SN/242

Real Time: 1810.82 s. Live Time: 1800.00 s.
Channels: 8192

DB Analysis ID: 33,078

Sample Description: 7360294_KEKJC1AC_F7L200271-013

Spectrum Filename: KEKJC1AC.An1

Acquisition Information

Start Time:	26-Dec-2007 7:00:50PM		
Live Time:	1800.00	Real Time:	1816.18
Dead Time:	0.89 %		
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	26-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 1.0000

UNIDENTIFIED PEAK SUMMARY

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncertainty 1 Sigma%	FWHM keV	Suspected Nuclide	Code
297.27	74.65	256.00	196.00	0.109	17.19	0.948	BI-207	
307.29	77.16	262.83	235.17	0.131	15.51	0.932	PB-214	
347.06	87.09	222.34	30.66	0.017	71.12	0.864		s
371.16	93.10	302.00	0.00	0.000	2457.64	0.912		s
1179.85	295.09	130.94	41.06	0.023	42.39	0.658		sD
1406.57	351.73	243.16	36.84	0.020	62.09	1.503		s
2436.46	609.06	124.63	69.37	0.039	25.73	1.300	BI-214	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	185.49	46.74	133.95	17.80	0.010	41.33	0.864	s
AM-241	1	235.29	59.17	211.28	-3.60	-0.002	573.53	0.878	s
TH-234	1	252.36	63.44	256.92	17.47	0.010	53.38	0.882	s
EU-155	1	347.78	87.27	258.80	69.84	0.039	34.70	0.906	s
TH-234	1	370.37	92.91	277.58	54.13	0.030	30.07	0.912	s
AC-228	1	372.14	93.35	207.70	37.44	0.021	3.52	0.913	s D
U-235	1	372.14	93.35	207.70	-3.14	-0.002	-448.95	0.913	s D
EU-155	1	418.56	104.94	136.34	26.00	0.014	66.46	0.925	
EU-154	1	482.52	120.92	72.58	4.59	0.003	266.44	0.943	
EU-152	1	486.67	121.95	122.32	15.12	0.008	106.58	0.942	
Pa-234	1	522.30	130.85	147.68	5.98	0.003	290.15	0.952	s
U-235	1	572.49	143.39	157.81	-5.77	-0.003	489.67	0.964	s
U-235	1	651.84	163.20	149.80	-13.93	-0.008	127.15	0.984	
U-235	1	820.50	205.33	120.95	1.46	0.001	1069.74	1.027	
PB-212	1	955.17	238.97	129.25	451.75	0.251	7.15	1.000	s
RA-224	1	960.27	240.24	466.05	-77.56	-0.043	40.97	1.062	s
PB-214	1	960.43	240.28	256.86	-42.61	-0.024	55.35	1.063	s
TL-208	1	1107.02	276.90	73.01	3.37	0.002	362.22	1.098	
I-131	1	1129.33	282.47	41.72	1.11	0.001	828.67	1.105	s
PB-214	1	1179.83	295.09	74.99	74.95	0.042	18.83	1.116	s D
PB-212	1	1199.08	299.90	84.31	21.27	0.012	64.78	1.121	s
AC-228	1	1352.37	338.19	76.12	45.60	0.025	29.30	1.158	
EU-152	1	1375.42	343.95	54.04	3.56	0.002	297.06	1.164	s
PB-214	1	1406.77	351.78	75.75	169.96	0.094	9.86	1.171	s
I-131	1	1460.35	365.17	57.59	7.34	0.004	150.83	1.184	s
BE-7	1	1912.58	478.15	28.82	1.49	0.001	514.51	1.292	s
CS-134	1	2252.08	562.98	19.45	4.78	0.003	138.22	1.372	s
CS-134	1	2277.45	569.32	23.24	-2.09	-0.001	-46.72	1.378	s D
Pa-234	1	2278.04	569.47	28.15	1.04	0.001	114.62	1.378	s D
TL-208	1	2331.38	582.80	24.96	136.04	0.076	11.14	1.235	s
CS-134	1	2421.04	605.20	84.33	-12.70	-0.007	106.05	1.410	s
BI-214	1	2436.97	609.18	52.04	108.57	0.060	12.42	1.415	s
I-131	1	2550.20	637.48	33.80	-4.07	-0.002	208.06	1.440	s
CS-137	1	2646.70	661.60	34.17	11.32	0.006	78.82	1.462	s
EU-154	1	2893.82	723.36	122.07	0.00	0.000	1562.51	1.518	s
BI-212	1	2909.51	727.28	33.76	14.65	0.008	61.88	1.521	s
PA-234M	1	3065.71	766.32	31.06	3.05	0.002	264.43	1.556	s
EU-152	1	3116.03	778.89	22.53	1.76	0.001	388.61	1.567	s
BI-212	1	3142.76	785.58	24.59	5.43	0.003	135.98	1.572	s
CS-134	1	3178.77	794.58	23.75	7.22	0.004	102.49	1.582	s
CS-134	1	3211.59	802.78	38.13	-0.18	0.000	4758.36	1.587	s
TL-208	1	3440.38	859.97	28.41	6.04	0.003	131.21	1.638	s
EU-154	1	3488.87	872.09	31.61	-4.37	-0.002	187.98	1.649	s
Pa-234	1	3506.50	876.50	20.00	-0.96	-0.001	668.25	1.655	s
Pa-234	1	3535.77	883.81	20.65	-1.32	-0.001	493.45	1.657	s

AC-228	1	3643.65	910.78	29.65	56.64	0.031	18.13	1.681	s
Pa-234	1	3784.61	946.02	17.54	0.00	0.000	592.35	1.710	s
EU-152	1	3855.85	963.83	36.39	5.52	0.003	160.37	1.726	s
AC-228	1	3873.45	968.23	21.10	26.64	0.015	31.15	1.730	s
EU-154	1	3980.43	994.98	21.68	-0.14	0.000	4823.65	1.753	s
PA-234M	1	4014.26	1003.43	20.10	-0.08	0.000	7583.31	1.756	s
EU-154	1	4016.05	1003.88	22.26	1.65	0.001	411.69	1.760	s
EU-152	1	4449.96	1112.37	21.95	-2.39	-0.001	285.07	1.847	s
BI-214	1	4477.78	1119.33	27.89	14.15	0.008	51.26	1.854	s
CO-60	1	4691.37	1172.74	33.21	-4.13	-0.002	203.27	1.896	s
EU-154	1	5099.14	1274.71	31.56	-2.97	-0.002	273.63	1.975	s
CO-60	1	5331.30	1332.77	14.68	-0.64	0.000	860.65	2.019	s
EU-152	1	5632.07	1408.00	-8.57	0.00	0.000	100.00	2.076	s
K-40	1	5840.66	1460.18	34.22	312.23	0.173	5.94	2.115	
BI-214	1	7055.56	1764.14	9.44	9.43	0.005	43.21	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	
AC-228	N	1	8.314E+000	911.07	8.935E+000	(P	4.430E+000G		2.1E+003	29.00
			8.314E+000	968.97	7.305E+000 ?	(	6.613E+000G		2.1E+003	17.46
			8.314E+000	338.32	8.282E+000	(P	7.877E+000G		2.1E+003	12.01
			8.314E+000	93.35	8.314E+000 +	E	1.552E+001X	A	2.1E+003	5.56
BI-214	N	1	8.022E+000	609.31	8.022E+000	(P	2.684E+000G		5.8E+005	46.09
			8.022E+000	1120.29	5.003E+000 %	P	9.662E+000G		5.8E+005	15.10
			8.022E+000	1764.49	4.754E+000 %	P	8.588E+000G		5.8E+005	15.40
U-235	N	1	-6.684E-001	143.79	-6.684E-001 &	(P	7.098E+000G		2.6E+011	10.96
			-6.684E-001	205.33	4.425E-001 %		1.637E+001G		2.6E+011	5.01
			-6.684E-001	163.38	-3.667E+000 &		1.573E+001G		2.6E+011	5.08
			-6.684E-001	93.35	-6.684E-001 !	E	1.485E+001X		2.6E+011	5.81
			5.441E+000	92.59	1.199E+001 %	P	1.780E+001G		1.6E+012	5.58
TH-234	N	1	5.441E+000	63.29	5.441E+000 *	(P	2.410E+001G		1.6E+012	4.82
TL-208 F	N	1	5.307E+000	583.02	5.307E+000 *	(P	1.014E+000G		7.0E+002	84.50
			5.307E+000	277.28	1.003E+000 %		1.264E+001G		7.0E+002	6.31
			5.307E+000	860.56	2.134E+000 %		9.731E+000G		7.0E+002	12.42
PA-234	N	1	-4.905E-001	1001.00	-4.905E-001 %	(	1.383E+002G		1.6E+012	.84
			-4.905E-001	766.41	4.185E+001 &		3.932E+002G		1.6E+012	.29
CS-137 T F I		1	4.810E-001	661.66	4.810E-001 %	(	1.272E+000G		1.1E+004	85.21
			4.807E+000	785.51	2.027E+001 %		9.632E+001G		7.0E+002	1.10
BI-212	N	1	4.807E+000	727.33	4.807E+000 %	(	9.775E+000G		7.0E+002	11.82
CS-134 T F I		1	-4.405E-001	604.71	-4.405E-001 %	(	1.579E+000G		7.5E+002	97.62
			-4.405E-001	795.87	3.496E-001 %		1.231E+000G		7.5E+002	85.53
			-4.405E-001	569.32	-4.405E-001 &		5.302E+000G		7.5E+002	15.38
			-4.405E-001	801.95	-8.809E-002 &		1.509E+001G		7.5E+002	8.69
			-4.405E-001	563.24	1.840E+000 &		8.950E+000G		7.5E+002	8.35
Pa-234	N	1	4.113E-001	131.29	4.113E-001 %	(	4.079E+000G		1.6E+012	18.00
			4.113E-001	569.47	4.113E-001 &		1.084E+001G		1.6E+012	8.20
			4.113E-001	946.02	0.000E+000 %		7.803E+000G		1.6E+012	13.40
			4.113E-001	883.24	-6.163E-001 %		1.113E+001G		1.6E+012	9.60
			4.113E-001	880.53	-7.121E-001 %		1.751E+001G		1.6E+012	6.00
BE-7	N P C	1	4.034E-001	477.60	4.034E-001 %	(	7.483E+000G		5.3E+001	10.52
CO-60 T F		1	-3.892E-002	1332.50	-3.892E-002 %	(	1.258E+000G		1.9E+003	99.98
			-3.892E-002	1173.24	-2.289E-001 %		1.637E+000G		1.9E+003	99.90
RA-224	N	1	-3.204E+001	240.99	-3.204E+001 &	(	4.268E+001G		7.0E+002	4.10
			2.968E-001	1112.07	-9.289E-001 %		9.553E+000G		4.9E+003	13.64
			2.968E-001	1408.00	0.000E+000 %		2.244E+000G		4.9E+003	21.00
EU-152 T F		1	2.968E-001	344.29	2.968E-001 &	(	3.084E+000G		4.9E+003	26.50
			2.968E-001	121.78	6.457E-001 %		2.316E+000G		4.9E+003	28.58
			2.968E-001	778.92	5.549E-001 %		7.824E+000G		4.9E+003	12.94
			2.968E-001	964.11	1.802E+000 %		1.007E+001G		4.9E+003	14.61
EU-155 T F I		1	2.306E+000	105.31	1.488E+000 %	(	3.270E+000G		1.8E+003	21.20
			2.306E+000	86.54	2.870E+000	(	3.192E+000G		1.8E+003	30.70
I-131 T F I		1	2.075E-001	364.48	2.075E-001 *	(	1.076E+000G		8.0E+000	81.70

			2.075E-001	284.30	3.454E-001	%		1.021E+001G	8.0E+000	6.14
			2.075E-001	636.97	-1.997E+000	&		1.463E+001G	8.0E+000	7.17
K-40	N	1	1.929E+002	1460.83	1.929E+002	(	P	1.852E+001G	4.7E+011	10.67
PB-212	N	1	1.755E+001	238.63	1.755E+001	* (	P	2.163E+000G	7.0E+002	43.30
			1.755E+001	300.03	1.291E+001	%		2.761E+001G	7.0E+002	3.28
AM-241 T		1	-1.591E-001	59.54	-1.591E-001	& (		3.114E+000G	1.6E+005	35.90
EU-154 T F I		1	-1.581E+000	873.23	-1.581E+000	% (		1.045E+001G	3.1E+003	12.27
			-1.581E+000	123.10	1.376E-001	&		1.271E+000G	3.1E+003	40.79
			-1.581E+000	1274.54	-4.983E-001	%		4.846E+000G	3.1E+003	35.19
			-1.581E+000	723.36	0.000E+000	&		1.035E+001G	3.1E+003	20.22
			-1.581E+000	1004.77	4.508E-001	&		6.746E+000G	3.1E+003	18.01
			-1.581E+000	996.33	-6.306E-002	%		1.126E+001G	3.1E+003	10.60
PB-210	N	1	1.031E+001	46.54	1.031E+001	% (	P	3.282E+001G	8.1E+003	4.25
PB-214	N	1	1.016E+001	351.93	1.016E+001	(	P	2.588E+000G	5.8E+005	37.60
			1.016E+001	295.09	7.634E+000	-	P E	4.386E+000G	5.8E+005	19.30
			1.016E+001	242.00	-9.742E+000	%		1.770E+001G	5.8E+005	7.43

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	<	4.034E-001	4.049E-001	514.51	514.52	7.483E+000
K-40	<	1.929E+002	1.929E+002	6.16	6.82	1.852E+001
CO-60	<	-3.892E-002	-3.892E-002	860.65	860.65	1.258E+000
I-131	<	2.075E-001	2.128E-001	150.83	150.85	1.076E+000
CS-134	<	-4.405E-001	-4.407E-001	106.05	106.09	1.579E+000
EU-154	<	-1.581E+000	-1.581E+000	187.98	188.01	1.045E+001
CS-137	<	4.810E-001	4.810E-001	78.82	78.87	1.272E+000
EU-152	<	2.968E-001	2.968E-001	297.06	297.08	3.084E+000
EU-155	<	2.306E+000	2.306E+000	34.70	34.86	3.270E+000
TL-208	#	5.307E+000	5.309E+000	11.79	12.14	1.014E+000
RA-224	<	-3.204E+001	-3.205E+001	40.97	41.08	4.268E+001
BI-214	<	8.022E+000	8.022E+000	13.21	13.52	2.684E+000
AC-228	<	8.314E+000	8.315E+000	15.87	16.13	4.430E+000
PA-234M	<	-4.905E-001	-4.905E-001	7,583.31	7,583.31	1.383E+002
U-235	<	-6.684E-001	-6.684E-001	671.66	671.67	7.098E+000
PB-210	<	1.031E+001	1.031E+001	91.30	91.39	3.282E+001
PB-212	#	1.755E+001	1.755E+001	7.48	8.05	2.163E+000
PB-214	<	1.016E+001	1.016E+001	10.40	10.79	2.588E+000
BI-212	<	4.807E+000	4.808E+000	61.88	61.95	9.775E+000
Pa-234	<	4.113E-001	4.113E-001	290.15	290.16	4.079E+000
TH-234	<	5.441E+000	5.441E+000	128.81	128.86	2.410E+001
AM-241	<	-1.591E-001	-1.591E-001	573.53	573.54	3.114E+000

= All peaks for activity calculation had bad shape

Total Activity (37.87 to 2,000.50 keV) 22.86 Bq/sample

Analyzed by: _____

403605

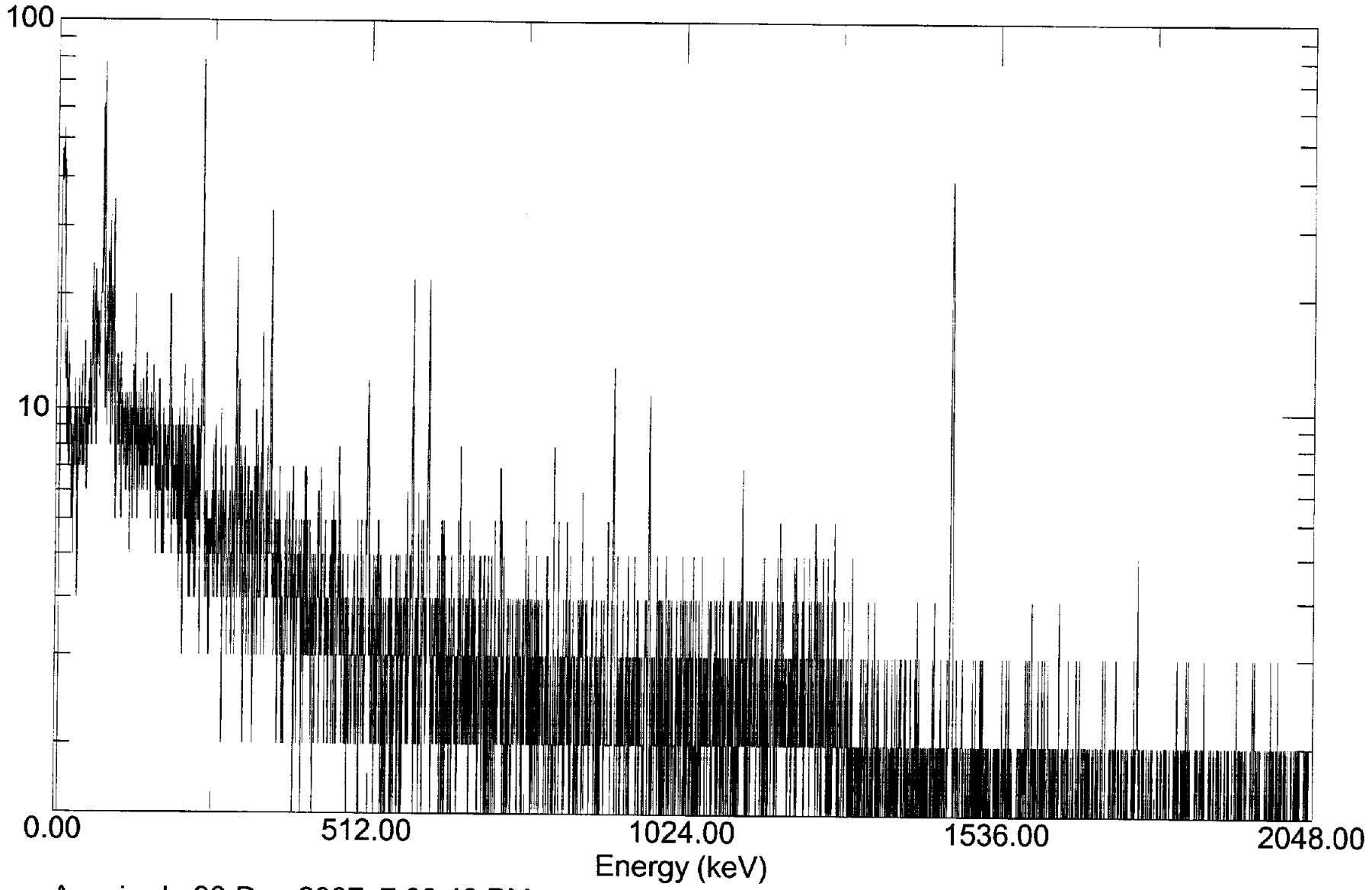
Reviewed by: _____

Supervisor

Laboratory: STL- St Louis

KEKJC1AC

7360294_KEKJC1AC_F7L200271-013



Acquired: 26-Dec-2007 7:00:49 PM
File: C:\User\spectra\KEKJC1AC.spc
Detector: #0 Ge 3 SN/155

Real Time: 1816.18 s. Live Time: 1800.00 s.
Channels: 8192

TestAmerica St. Louis

DB Analysis ID: 33,077

Sample Description: 7360294_KEKJE1AC_F7L200271-014

Spectrum Filename: KEKJE1AC.An1

Acquisition Information

Start Time:	26-Dec-2007 7:01:15PM		
Live Time:	1800.00	Real Time:	1804.08
Dead Time:	0.23 %		
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	26-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 0.1616

UNIDENTIFIED PEAK SUMMARY

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncertainty 1 Sigma%	FWHM keV	Suspected Nuclide	Code
297.97	74.54	144.00	117.00	0.065	21.71	0.635	PB-214	s
308.50	77.17	116.00	159.00	0.088	14.16	0.672	PB-214	
349.30	87.38	95.00	66.00	0.037	24.24	0.703	PB-214	
743.58	185.98	31.17	77.83	0.043	16.56	0.403	RA-226	s
1351.68	338.03	78.28	59.72	0.033	24.63	0.589	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	185.16	46.33	107.14	4.66	0.003	55.26	0.819	s
AM-241	1	239.28	59.86	145.83	-8.07	-0.004	214.55	0.830	s
TH-234	1	252.20	63.09	161.82	4.97	0.003	84.20	0.834	s
EU-155	1	345.96	86.54	187.04	0.00	0.000	1934.14	0.854	
TH-234	1	370.14	92.59	206.01	-22.84	-0.013	1566.97	0.859	s
AC-228	1	373.18	93.35	109.09	55.31	0.031	4.62	0.860	s D
U-235	1	373.18	93.35	109.09	5.85	0.003	37.96	0.860	s D
EU-155	1	423.55	105.95	98.41	25.30	0.014	58.91	0.871	s
EU-152	1	486.42	121.67	79.28	8.18	0.005	157.93	0.885	s
EU-154	1	491.45	122.93	83.15	-5.10	-0.003	256.80	0.886	s
Pa-234	1	525.50	131.44	145.23	-14.00	-0.008	124.64	0.894	s
U-235	1	576.25	144.14	100.89	11.04	0.006	132.11	0.904	s
U-235	1	653.31	163.41	66.30	2.69	0.001	432.03	0.922	s
U-235	1	822.66	205.75	63.25	8.91	0.005	130.58	0.958	s
PB-212	1	953.56	238.49	47.29	283.71	0.158	6.89	0.841	
RA-224	1	958.88	239.82	355.11	-99.15	-0.055	28.69	0.988	
PB-214	1	967.01	241.85	45.33	58.67	0.033	25.99	0.637	s
TL-208	1	1107.65	277.01	19.50	27.50	0.015	34.35	0.360	s
I-131	1	1138.24	284.66	54.87	-4.17	-0.002	256.10	1.025	s
PB-214	1	1180.36	295.19	38.21	105.79	0.059	15.69	0.995	s
PB-212	1	1198.65	299.77	43.38	24.01	0.013	43.84	1.039	
AC-228	1	1351.78	338.05	42.39	42.28	0.023	26.66	1.071	s
EU-152	1	1374.81	343.81	36.13	-4.18	-0.002	209.29	1.076	s
PB-214	1	1406.72	351.79	18.58	128.42	0.071	10.35	1.104	
I-131	1	1446.66	361.77	19.24	-0.10	0.000	6414.07	1.092	s
BE-7	1	1914.73	478.79	26.95	-1.06	-0.001	700.84	1.185	s
CS-134	1	2252.60	563.24	26.34	0.00	0.000	725.85	1.254	s
CS-134	1	2276.94	569.32	32.30	0.00	0.000	0.00	1.259	s D
Pa-234	1	2277.54	569.47	30.59	-2.08	-0.001	-157.83	1.259	s D
TL-208	1	2329.57	582.48	7.18	100.82	0.056	11.20	1.293	s
CS-134	1	2418.53	604.71	164.48	0.00	0.000	1813.75	1.286	s
BI-214	1	2435.74	609.01	10.25	100.75	0.056	11.00	1.280	
I-131	1	2542.76	635.76	22.47	-2.85	-0.002	242.89	1.312	s
CS-137	1	2645.54	661.44	25.42	6.24	0.003	121.10	1.331	s
EU-154	1	2898.80	724.73	30.74	-4.18	-0.002	193.78	1.378	s
BI-212	1	2908.33	727.12	16.57	7.93	0.004	80.78	1.381	s
PA-234M	1	3062.05	765.53	19.77	0.05	0.000	12060.91	1.411	s
EU-152	1	3115.27	778.83	21.28	0.42	0.000	1562.34	1.420	s
BI-212	1	3145.00	786.26	23.60	-0.01	0.000	76146.75	1.425	s
CS-134	1	3179.10	794.78	18.11	1.18	0.001	517.27	1.433	s
CS-134	1	3210.86	802.71	9.62	4.40	0.002	110.61	1.437	s
TL-208	1	3432.99	858.21	14.94	1.09	0.001	509.37	1.481	s
EU-154	1	3489.39	872.30	15.31	0.33	0.000	1679.09	1.490	s
Pa-234	1	3528.53	882.08	19.82	-3.15	-0.002	207.42	1.495	s
Pa-234	1	3536.50	884.08	13.12	3.30	0.002	164.76	1.497	s

AC-228	1	3643.17	910.73	17.51	64.91	0.036	15.40	1.518	
Pa-234	1	3783.16	945.70	16.76	1.91	0.001	310.88	1.543	s
EU-152	1	3857.77	964.34	27.38	5.12	0.003	151.28	1.556	s
AC-228	1	3874.43	968.50	25.66	20.02	0.011	42.19	1.559	s
EU-154	1	3982.90	995.60	17.87	-2.36	-0.001	261.39	1.579	s
PA-234M	1	4007.06	1001.63	21.07	-1.09	-0.001	602.99	1.582	s
EU-154	1	4019.86	1004.83	16.90	3.57	0.002	171.03	1.585	s
EU-152	1	4456.80	1113.97	15.77	-3.15	-0.002	187.02	1.659	s
BI-214	1	4481.41	1120.12	4.65	32.35	0.018	16.44	0.581	s
CO-60	1	4689.19	1172.02	19.96	-1.02	-0.001	628.21	1.701	s
EU-154	1	5096.45	1273.72	14.34	1.78	0.001	310.48	1.768	s
CO-60	1	5333.91	1333.02	5.89	-1.19	-0.001	302.51	1.806	s
EU-152	1	5634.21	1408.00	18.59	0.00	0.000	609.83	1.854	s
K-40	1	5844.37	1460.47	2.83	156.17	0.087	7.93	1.581	
BI-214	1	7057.53	1763.29	4.73	16.39	0.009	31.01	2.066	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	
TL-208	F N	1	6.066E+000	583.02	6.066E+000	*	(P	9.146E-001G		7.0E+002	84.50
			6.066E+000	277.28	1.132E+001	+		9.588E+000G		7.0E+002	6.31
			6.066E+000	860.56	6.224E-001	%		1.181E+001G		7.0E+002	12.42
RA-224	N	1	-5.568E+001	240.99	-5.568E+001		(	5.084E+001G		7.0E+002	4.10
			-4.982E-001	121.78	4.610E-001	%		2.492E+000G		4.9E+003	28.58
			-4.982E-001	778.92	2.111E-001	%		1.218E+001G		4.9E+003	12.94
			-4.982E-001	964.11	2.723E+000	%		1.443E+001G		4.9E+003	14.61
			-4.982E-001	1112.07	-2.021E+000	%		1.362E+001G		4.9E+003	13.64
			-4.982E-001	1408.00	0.000E+000	%		1.162E+001G		4.9E+003	21.00
EU-152	T F	1	-4.982E-001	344.29	-4.982E-001	%	(	3.664E+000G		4.9E+003	26.50
AM-241	T	1	-4.954E-001	59.54	-4.954E-001	%	(	3.621E+000G		1.6E+005	35.90
BE-7	N P C	1	-4.284E-001	477.60	-4.284E-001	%	(	1.090E+001G		5.3E+001	10.52
CS-137	T F I	1	4.152E-001	661.66	4.152E-001	%	(	1.744E+000G		1.1E+004	85.21
BI-212	N	1	4.125E+000	727.33	4.125E+000	%	(	1.127E+001G		7.0E+002	11.82
			4.125E+000	785.51	-5.379E-002	%		1.511E+002G		7.0E+002	1.10
I-131	T F I	1	-3.947E-003	364.48	-3.947E-003	%	(	9.436E-001G		8.0E+000	81.70
			-3.947E-003	284.30	-1.803E+000	%		1.611E+001G		8.0E+000	6.14
			-3.947E-003	636.97	-2.179E+000	%		1.899E+001G		8.0E+000	7.17
PB-210	N	1	3.859E+000	46.54	3.859E+000	*	(P	4.222E+001G		8.1E+003	4.25
TH-234	N	1	2.150E+000	63.29	2.150E+000	%	(P	2.682E+001G		1.6E+012	4.82
			2.150E+000	92.59	-6.849E+000	%	P	2.087E+001G		1.6E+012	5.58
EU-154	T F I	1	1.934E-001	873.23	1.934E-001	%	(	1.222E+001G		3.1E+003	12.27
			1.934E-001	123.10	-2.016E-001	%		1.787E+000G		3.1E+003	40.79
			1.934E-001	1274.54	4.961E-001	%		5.682E+000G		3.1E+003	35.19
			1.934E-001	723.36	-1.265E+000	%		8.636E+000G		3.1E+003	20.22
			1.934E-001	1004.77	1.597E+000	%		9.769E+000G		3.1E+003	18.01
			1.934E-001	996.33	-1.780E+000	%		1.689E+001G		3.1E+003	10.60
EU-155	T F I	1	1.934E+000	105.31	1.934E+000	%	(	3.741E+000G		1.8E+003	21.20
			1.934E+000	86.54	0.000E+000	&		3.721E+000G		1.8E+003	30.70
			1.681E+000	205.33	3.612E+000	%		1.612E+001G		2.6E+011	5.01
			1.681E+000	163.38	9.328E-001	%		1.409E+001G		2.6E+011	5.08
			1.681E+000	93.35	1.681E+000	!	E	1.476E+001X		2.6E+011	5.81
U-235	N	1	1.681E+000	143.79	1.681E+000	%	(	7.536E+000G		2.6E+011	10.96
AC-228	N	1	1.660E+001	911.07	1.660E+001		(	5.682E+000G		2.1E+003	29.00
			1.660E+001	968.97	8.953E+000	%		1.177E+001G		2.1E+003	17.46
			1.660E+001	338.32	1.095E+001	-		8.558E+000G		2.1E+003	12.01
			1.660E+001	93.35	1.660E+001	!	E	1.543E+001X	A	2.1E+003	5.56
K-40	N	1	1.618E+002	1460.83	1.618E+002		(P	1.093E+001G		4.7E+011	10.67
PB-212	N	1	1.496E+001	238.63	1.496E+001		(P	1.833E+000G		7.0E+002	43.30
			1.496E+001	300.03	2.041E+001	%		2.839E+001G		7.0E+002	3.28
Pa-234	N	1	-1.266E+000	131.29	-1.266E+000	&	(	5.325E+000G		1.6E+012	18.00
			-1.266E+000	569.47	-1.266E+000	%		1.730E+001G		1.6E+012	8.20
			-1.266E+000	946.02	1.094E+000	&		1.244E+001G		1.6E+012	13.40
			-1.266E+000	883.24	2.485E+000	&		1.476E+001G		1.6E+012	9.60

				-1.266E+000	880.53	-3.790E+000	%		2.819E+001G	1.6E+012	6.00
CO-60	T F		1	-1.215E-001	1332.50	-1.215E-001	%	(	1.431E+000G	1.9E+003	99.98
				-1.215E-001	1173.24	-9.336E-002	%		2.157E+000G	1.9E+003	99.90
BI-214		N	1	1.215E+001	609.31	1.155E+001		(P	2.021E+000G	5.8E+005	46.09
				1.215E+001	1120.29	1.888E+001	+	P	7.441E+000G	5.8E+005	15.10
				1.215E+001	1764.49	1.397E+001	?	(	1.095E+001G	5.8E+005	15.40
				1.101E+001	295.09	1.505E+001	+	P	4.485E+000G	5.8E+005	19.30
				1.101E+001	242.00	1.824E+001	+		1.060E+001G	5.8E+005	7.43
PB-214		N	1	1.101E+001	351.93	1.101E+001		(P	1.955E+000G	5.8E+005	37.60
PA-234		N	1	-1.045E+001	1001.00	-1.045E+001	%	(	2.310E+002G	1.6E+012	.84
				-1.045E+001	766.41	1.140E+000	&		5.118E+002G	1.6E+012	.29
CS-134	T F I		1	0.000E+000	604.71	0.000E+000	%	(	3.359E+000G	7.5E+002	97.62
				0.000E+000	795.87	9.162E-002	%		1.747E+000G	7.5E+002	85.53
				0.000E+000	569.32	0.000E+000	%		9.452E+000G	7.5E+002	15.38
				0.000E+000	801.95	3.374E+000	&		1.318E+001G	7.5E+002	8.69
				0.000E+000	563.24	0.000E+000	%		1.573E+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	<	-4.284E-001	-4.301E-001	700.84	700.85	1.090E+001
K-40		1.618E+002	1.618E+002	8.07	8.59	1.093E+001
CO-60	<	-1.215E-001	-1.215E-001	302.51	302.53	1.431E+000
I-131	<	-3.947E-003	-4.048E-003	6,414.07	6,414.07	9.436E-001
EU-154	<	1.934E-001	1.934E-001	1,679.09	1,679.09	1.222E+001
CS-134	<			1,813.75	1,813.76	3.359E+000
CS-137	<	4.152E-001	4.152E-001	121.10	121.13	1.744E+000
EU-152	<	-4.982E-001	-4.982E-001	209.29	209.31	3.664E+000
EU-155	<	1.934E+000	1.934E+000	58.91	59.00	3.741E+000
TL-208	#	6.066E+000	6.067E+000	11.44	11.80	9.146E-001
BI-212	<	4.125E+000	4.127E+000	80.78	80.83	1.127E+001
BI-214		1.215E+001	1.215E+001	11.58	11.93	2.021E+000
AC-228	<	1.660E+001	1.661E+001	15.40	15.67	5.682E+000
Pa-234	<	-1.266E+000	-1.266E+000	124.64	124.67	5.325E+000
AM-241	<	-4.954E-001	-4.954E-001	214.55	214.58	3.621E+000
RA-224	<	-5.568E+001	-5.570E+001	28.69	28.85	5.084E+001
PB-210	<	3.859E+000	3.859E+000	302.22	302.25	4.222E+001
PB-212		1.496E+001	1.497E+001	7.11	7.71	1.833E+000
PB-214		1.101E+001	1.101E+001	10.77	11.15	1.955E+000
TH-234	<	2.150E+000	2.150E+000	355.75	355.77	2.682E+001
PA-234M	<	-1.045E+001	-1.045E+001	602.99	602.99	2.310E+002
U-235	<	1.681E+000	1.681E+000	132.11	132.14	7.536E+000

= All peaks for activity calculation had bad shape

Total Activity (37.53 to 1,998.47 keV) 205.99 Bq/sample

Analyzed by: _____

403605

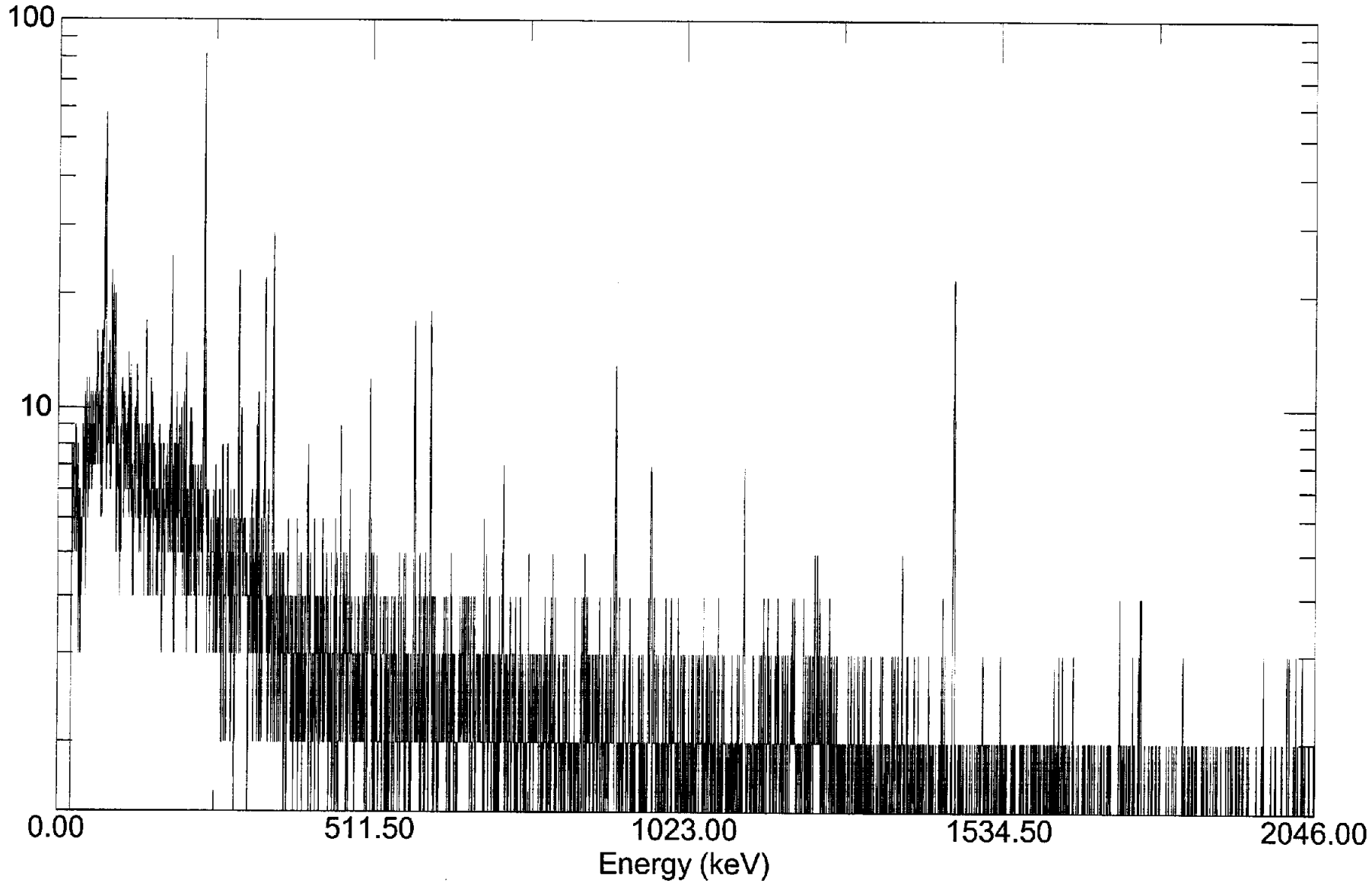
Reviewed by: _____

Supervisor

Laboratory: STL- St Louis

KEKJE1AC

7360294_KEKJE1AC_F7L200271-014



Acquired: 26-Dec-2007 7:01:15 PM
File: C:\User\spectra\KEKJE1AC.spc
Detector: #0 Ge 4 SN/181

Real Time: 1804.08 s. Live Time: 1800.00 s.
Channels: 8192

TestAmerica St. Louis

DB Analysis ID: 33,080

Sample Description: 7360294_KEKJG1AC_F7L200271-015

Spectrum Filename: KEKJG1AC.An1

Acquisition Information

Start Time:	26-Dec-2007 7:01:46PM		
Live Time:	1800.00	Real Time:	1853.04
Dead Time:	2.86 %		
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	26-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: 0.1487

UNIDENTIFIED PEAK SUMMARY

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncertainty 1 Sigma%	FWHM keV	Suspected Nuclide	Code
184.64	46.40	104.54	6.46	0.004	227.34	0.821		
298.28	74.78	209.67	129.33	0.072	23.62	0.546	PB-214	s
307.60	77.11	142.50	238.50	0.133	11.38	0.782	PB-214	
347.38	87.05	162.48	29.52	0.016	63.77	1.400		s
358.31	89.78	68.33	59.67	0.033	26.07	1.192	PB-214	sM
614.02	153.66	42.00	34.00	0.019	38.80	0.646	XE-138	
1352.42	338.15	88.06	30.94	0.017	46.50	0.706		s
2044.41	511.08	26.67	101.33	0.056	17.26	0.778	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	185.03	46.49	128.76	17.95	0.010	45.63	0.749	
AM-241	1	238.82	59.93	161.06	4.73	0.003	223.54	0.761	s
TH-234	1	251.74	63.16	188.33	66.67	0.037	35.13	0.704	s
EU-155	1	347.88	87.17	134.66	80.14	0.045	23.33	0.788	s
TH-234	1	369.76	92.64	134.86	115.14	0.064	16.97	0.892	s
AC-228	1	372.61	93.35	153.29	49.38	0.027	3.95	0.795	s D
U-235	1	372.61	93.35	153.29	9.08	0.005	23.04	0.795	s D
EU-155	1	421.46	105.55	113.76	20.73	0.012	76.02	0.808	
EU-152	1	485.33	121.51	115.25	-0.64	0.000	2391.76	0.824	s
EU-154	1	499.00	124.92	74.92	6.66	0.004	187.70	0.826	s
Pa-234	1	526.78	131.87	104.35	-3.87	-0.002	376.68	0.834	s
U-235	1	573.75	143.60	93.73	17.17	0.010	72.37	0.847	s
U-235	1	653.82	163.60	95.17	8.71	0.005	131.09	0.867	s
U-235	1	822.47	205.74	62.00	8.21	0.005	140.05	0.909	s
PB-212	1	954.30	238.68	91.15	289.85	0.161	8.95	0.885	
RA-224	1	960.16	240.14	364.86	-93.28	-0.052	30.75	0.944	
PB-214	1	966.95	241.84	41.17	87.83	0.049	16.82	1.247	s
TL-208	1	1108.18	277.12	12.00	32.00	0.018	25.77	0.253	s
I-131	1	1135.98	284.07	60.53	-6.64	-0.004	170.24	0.987	s
PB-214	1	1180.98	295.31	37.08	140.92	0.078	12.27	0.482	s
PB-212	1	1199.29	299.89	18.67	37.33	0.021	26.73	0.714	s
AC-228	1	1353.53	338.43	42.22	53.39	0.030	21.99	1.040	s
EU-152	1	1376.97	344.29	49.13	0.00	0.000	991.21	1.045	s
PB-214	1	1407.48	351.91	30.21	187.79	0.104	9.60	1.014	s
I-131	1	1458.00	364.54	40.88	-2.99	-0.002	307.53	1.065	s
BE-7	1	1906.82	476.69	16.14	5.38	0.003	113.96	1.173	s
CS-134	1	2261.06	565.22	25.07	0.27	0.000	2645.07	1.252	s
CS-134	1	2277.45	569.32	22.41	0.06	0.000	547.14	1.258	s D
Pa-234	1	2278.05	569.47	19.87	-0.58	0.000	-127.69	1.258	s D
TL-208	1	2331.72	582.89	3.75	101.25	0.056	9.76	0.571	s
CS-134	1	2422.02	605.45	33.14	0.38	0.000	2128.29	1.290	s
BI-214	1	2438.61	609.60	14.06	145.94	0.081	8.95	1.228	s
I-131	1	2548.36	637.03	17.64	1.03	0.001	584.43	1.319	s
CS-137	1	2646.25	661.50	34.69	-7.50	-0.004	610.80	1.342	s
EU-154	1	2891.12	722.71	40.71	-6.34	-0.004	147.76	1.397	s
BI-212	1	2910.26	727.49	32.57	10.11	0.006	85.83	1.400	s
PA-234M	1	3060.01	764.93	21.38	1.88	0.001	355.33	1.434	s
EU-152	1	3116.47	779.04	15.92	1.24	0.001	463.08	1.445	s
BI-212	1	3140.59	785.07	29.30	-2.46	-0.001	318.21	1.451	s
CS-134	1	3180.01	794.92	16.56	9.59	0.005	68.12	1.460	s
CS-134	1	3203.64	800.83	16.71	-0.44	0.000	1323.26	1.465	s
TL-208	1	3440.02	859.93	16.48	4.53	0.003	135.14	1.516	s
EU-154	1	3493.24	873.23	15.03	0.00	0.000	548.31	1.527	s
Pa-234	1	3523.25	880.73	21.06	-3.80	-0.002	178.41	1.533	s
Pa-234	1	3534.17	883.46	22.47	-1.55	-0.001	440.61	1.535	s
AC-228	1	3645.72	911.35	16.39	60.52	0.034	15.96	1.559	

Pa-234	1	3784.38	946.02	46.19	0.00	0.000	961.19	1.588	s
EU-152	1	3848.86	962.14	25.91	0.21	0.000	3466.54	1.603	s
AC-228	1	3879.58	969.82	25.03	11.14	0.006	70.20	1.607	s
EU-154	1	3984.79	996.13	16.48	0.94	0.001	616.61	1.630	s
PA-234M	1	4007.12	1001.71	20.51	-1.50	-0.001	433.45	1.633	s
EU-154	1	4018.03	1004.44	18.44	2.21	0.001	282.46	1.637	s
EU-152	1	4448.32	1112.04	23.01	-2.37	-0.001	293.70	1.723	s
BI-214	1	4481.97	1120.45	24.56	22.07	0.012	38.24	1.730	
CO-60	1	4693.52	1173.35	25.36	4.11	0.002	180.11	1.772	s
EU-154	1	5089.91	1272.49	16.37	-0.06	0.000	9938.92	1.850	s
CO-60	1	5331.40	1332.89	17.18	3.54	0.002	174.02	1.894	s
EU-152	1	5638.97	1409.82	14.86	0.09	0.000	5899.38	1.950	s
K-40	1	5844.17	1461.15	0.00	304.00	0.169	5.74	1.793	
BI-214	1	7059.21	1765.14	11.48	12.47	0.007	40.48	2.196	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	
TL-208	F N	1	5.850E+000	583.02	5.850E+000	@ (P	6.780E-001G		7.0E+002	84.50
			5.850E+000	277.28	1.266E+001	+	7.459E+000G		7.0E+002	6.31
			5.850E+000	860.56	2.470E+000	&	1.179E+001G		7.0E+002	12.42
BI-212	N	1	5.038E+000	727.33	5.038E+000	% (	1.461E+001G		7.0E+002	11.82
			5.038E+000	785.51	-1.402E+001	&	1.595E+002G		7.0E+002	1.10
RA-224	N	1	-5.037E+001	240.99	-5.037E+001	(	4.952E+001G		7.0E+002	4.10
CS-137	T F I	1	-4.789E-001	661.66	-4.789E-001	% (P	1.926E+000G		1.1E+004	85.21
CO-60	T F	1	3.418E-001	1332.50	3.418E-001	% (	2.128E+000G		1.9E+003	99.98
			3.418E-001	1173.24	3.582E-001	%	2.281E+000G		1.9E+003	99.90
Pa-234	N	1	-3.390E-001	131.29	-3.390E-001	% (	4.406E+000G		1.6E+012	18.00
			-3.390E-001	569.47	-3.390E-001	&	1.370E+001G		1.6E+012	8.20
			-3.390E-001	946.02	0.000E+000	%	1.876E+001G		1.6E+012	13.40
			-3.390E-001	883.24	-1.115E+000	%	1.786E+001G		1.6E+012	9.60
			-3.390E-001	880.53	-4.366E+000	%	2.770E+001G		1.6E+012	6.00
TH-234	N	1	3.045E+001	63.29	2.701E+001	% (P	2.700E+001G		1.6E+012	4.82
			3.045E+001	92.59	3.342E+001	* (P	1.649E+001G		1.6E+012	5.58
K-40	N	1	2.972E+002	1460.83	2.972E+002	(	7.204E+000G		4.7E+011	10.67
AM-241	T	1	2.693E-001	59.54	2.693E-001	% (P	3.519E+000G		1.6E+005	35.90
U-235	N	1	2.527E+000	143.79	2.527E+000	* (P	7.038E+000G		2.6E+011	10.96
			2.527E+000	205.33	3.203E+000	%	1.537E+001G		2.6E+011	5.01
			2.527E+000	163.38	2.913E+000	& P	1.611E+001G		2.6E+011	5.08
			2.527E+000	93.35	2.527E+000	&	1.681E+001X	E	2.6E+011	5.81
BE-7	N P C	1	2.096E+000	477.60	2.096E+000	& (	8.339E+000G		5.3E+001	10.52
CS-134	T F I	1	1.980E-002	604.71	1.980E-002	% (	1.525E+000G		7.5E+002	97.62
			1.980E-002	795.87	7.122E-001	%	1.609E+000G		7.5E+002	85.53
			1.980E-002	569.32	1.980E-002	&	7.703E+000G		7.5E+002	15.38
			1.980E-002	801.95	-3.234E-001	%	1.600E+001G		7.5E+002	8.69
			1.980E-002	563.24	1.523E-001	%	1.478E+001G		7.5E+002	8.35
PB-214	N	1	1.676E+001	351.93	1.547E+001	* (P	2.334E+000G		5.8E+005	37.60
			1.676E+001	295.09	1.927E+001	(P	4.251E+000G		5.8E+005	19.30
			1.676E+001	242.00	2.626E+001	+	9.750E+000G		5.8E+005	7.43
BI-214	N	1	1.606E+001	609.31	1.606E+001	(P	2.221E+000G		5.8E+005	46.09

				1.606E+001	1120.29	1.225E+001	-			1.433E+001G		5.8E+005	15.10
				1.606E+001	1764.49	9.942E+000	%		P	1.475E+001G		5.8E+005	15.40
EU-155	T F I		1	1.536E+000	105.31	1.536E+000	%	(		3.885E+000G		1.8E+003	21.20
				1.536E+000	86.54	4.335E+000	*			3.071E+000G	A	1.8E+003	30.70
PB-212		N	1	1.470E+001	238.63	1.470E+001		(	P	2.394E+000G		7.0E+002	43.30
				1.470E+001	300.03	3.049E+001	+			1.866E+001G		7.0E+002	3.28
AC-228		N	1	1.436E+001	911.16	1.480E+001		(		5.277E+000G		2.1E+003	29.00
				1.436E+001	968.97	4.758E+000	&			1.111E+001G		2.1E+003	17.46
				1.436E+001	338.32	1.328E+001	@	(		8.208E+000G		2.1E+003	12.01
				1.436E+001	93.35	1.436E+001	&		E	1.756E+001G	A	2.1E+003	5.56
PA-234M		N	1	-1.376E+001	1001.00	-1.376E+001	%	(		2.177E+002G		1.6E+012	.84
				-1.376E+001	766.41	3.937E+001	%			5.078E+002G		1.6E+012	.29
PB-210		N	1	1.318E+001	46.54	1.318E+001	%	(	P	4.082E+001G		8.1E+003	4.25
				-1.172E-001	636.97	7.578E-001	&			1.638E+001G		8.0E+000	7.17
I-131	T F I		1	-1.172E-001	364.48	-1.172E-001	%	(		1.273E+000G		8.0E+000	81.70
				-1.172E-001	284.30	-2.760E+000	%			1.620E+001G		8.0E+000	6.14
				0.000E+000	123.10	2.554E-001	&			1.649E+000G		3.1E+003	40.79
				0.000E+000	1274.54	-1.525E-002	%			5.707E+000G		3.1E+003	35.19
				0.000E+000	723.36	-1.839E+000	%			9.411E+000G		3.1E+003	20.22
				0.000E+000	1004.77	9.437E-001	%			9.686E+000G		3.1E+003	18.01
				0.000E+000	996.33	6.794E-001	%			1.556E+001G		3.1E+003	10.60
EU-152	T F		1	0.000E+000	344.29	0.000E+000	%	(		4.053E+000G		4.9E+003	26.50
				0.000E+000	121.78	-3.473E-002	&			2.882E+000G		4.9E+003	28.58
				0.000E+000	778.92	5.988E-001	%			1.027E+001G		4.9E+003	12.94
				0.000E+000	964.11	1.058E-001	%			1.344E+001G		4.9E+003	14.61
				0.000E+000	1112.07	-1.447E+000	%			1.531E+001G		4.9E+003	13.64
				0.000E+000	1408.00	4.457E-002	%			9.955E+000G		4.9E+003	21.00
EU-154	T F I		1	0.000E+000	873.23	0.000E+000	%	(		1.160E+001G		3.1E+003	12.27

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
CS-134	#	1.980E-002	1.981E-002	2,128.29	2,128.29	1.525E+000
CS-137	#	-4.789E-001	-4.789E-001	1,119.93	1,119.94	1.926E+000
EU-155	#	1.536E+000	1.537E+000	76.02	76.09	3.885E+000
BE-7	#	2.096E+000	2.104E+000	113.96	113.99	8.339E+000
K-40		2.972E+002	2.972E+002	5.74	6.44	7.204E+000
CO-60	#	3.418E-001	3.419E-001	174.02	174.04	2.128E+000
I-131	#	-1.172E-001	-1.202E-001	307.53	307.54	1.273E+000
EU-152	#			991.21	991.22	4.053E+000
EU-154	#			548.31	548.31	1.160E+001
TL-208		5.850E+000	5.852E+000	10.12	10.52	6.780E-001
PB-210	#	1.318E+001	1.318E+001	89.52	89.60	4.082E+001
PB-212		1.470E+001	1.470E+001	9.16	9.63	2.394E+000
PB-214		1.676E+001	1.676E+001	7.96	8.46	2.334E+000
RA-224	#	-5.037E+001	-5.038E+001	30.75	30.90	4.952E+001
AC-228	#	1.436E+001	1.436E+001	13.59	13.89	5.277E+000
Pa-234	#	-3.390E-001	-3.390E-001	376.68	376.69	4.406E+000
U-235	#	2.527E+000	2.527E+000	82.81	82.86	7.038E+000
AM-241	#	2.693E-001	2.693E-001	379.95	379.97	3.519E+000
BI-212	#	5.038E+000	5.040E+000	85.83	85.88	1.461E+001
BI-214	#	1.606E+001	1.606E+001	9.37	9.80	2.221E+000
TH-234	#	3.045E+001	3.045E+001	20.34	20.68	2.700E+001
PA-234M	#	-1.376E+001	-1.376E+001	433.45	433.46	2.177E+002

= All peaks for activity calculation had bad shape

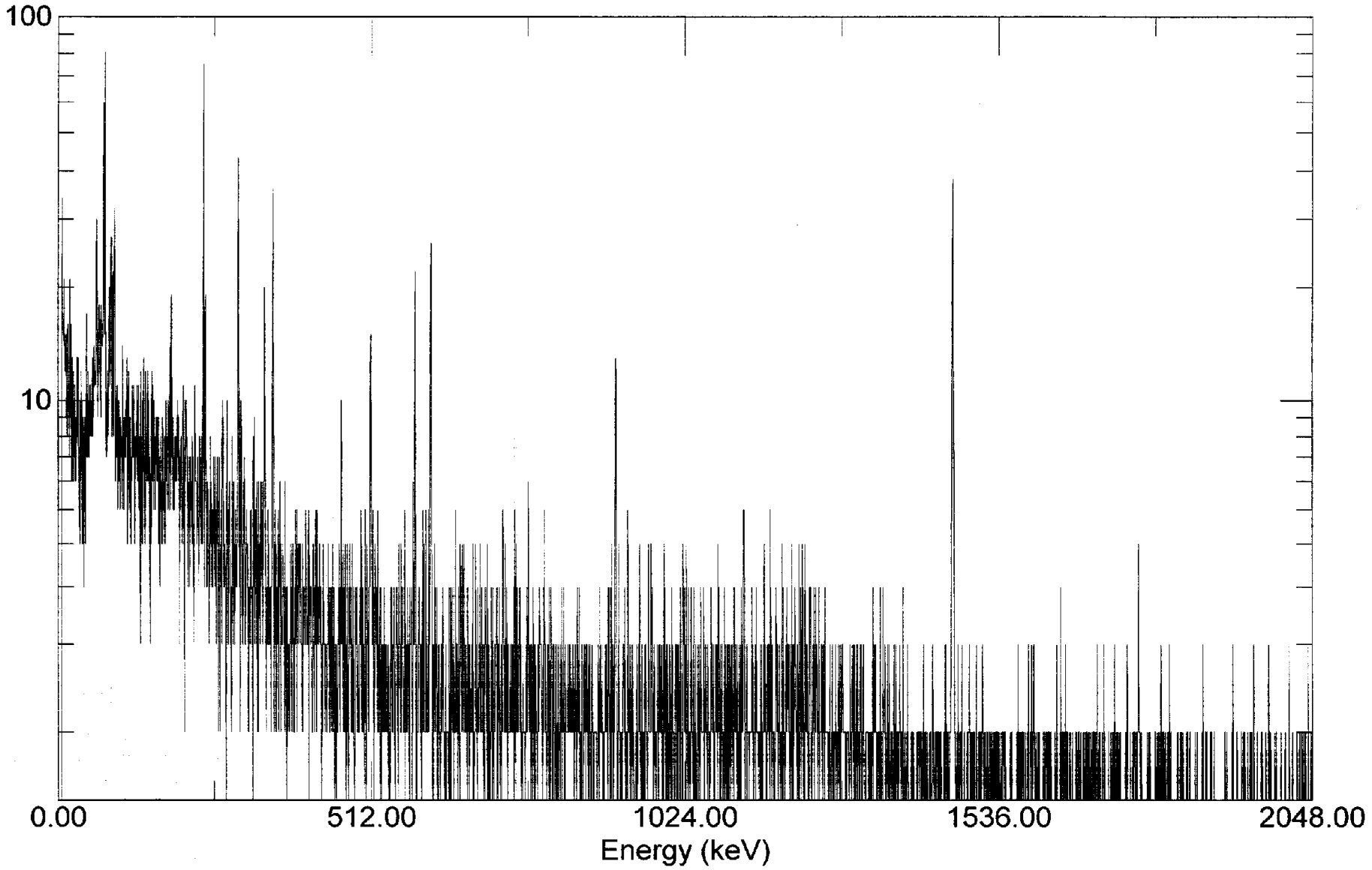
Total Activity (37.74 to 2,000.57 keV) 380.97 Bq/sample

Analyzed by: 403605

Laboratory: STL- St Louis

KEKJG1AC

7360294_KEKJG1AC_F7L200271-015



Acquired: 26-Dec-2007 7:01:46 PM
File: C:\User\spectra\KEKJG1AC.spc
Detector: #0 Ge 5 SN/157

Real Time: 1853.04 s. Live Time: 1800.00 s.
Channels: 8192

TestAmerica St. Louis

DB Analysis ID: 33,081

Sample Description: 7360294_KEKJJ1AC_F7L200271-016

Spectrum Filename: KEKJJ1AC.An1

Acquisition Information

Start Time:	26-Dec-2007 7:02:17PM		
Live Time:	1800.00	Real Time:	1820.48
Dead Time:	1.12 %		
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	26-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: 0.2265

UNIDENTIFIED PEAK SUMMARY

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncertainty 1 Sigma%	FWHM keV	Suspected Nuclide	Code
298.46	74.83	544.00	222.00	0.123	21.64	0.862	PB-214	
307.40	77.06	516.00	430.00	0.239	11.61	0.931	PB-214	
348.38	87.31	216.68	194.32	0.108	12.89	0.690	PB-214	
359.21	90.01	160.00	107.00	0.059	19.31	0.534	PB-214	sM
833.84	208.65	122.04	124.96	0.069	15.37	0.978	LU-177	s
932.80	233.38	53.17	39.83	0.022	34.65	0.697	XE-133M	s
1311.93	328.15	48.00	70.00	0.039	22.41	0.896	AC-228	

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	184.70	46.39	138.44	50.56	0.028	28.59	0.913	
AM-241	1	237.27	59.54	419.10	-3.60	-0.002	805.52	0.846	
TH-234	1	252.45	63.33	431.54	33.98	0.019	54.09	0.850	s
EU-155	1	345.32	86.54	444.16	-8.69	-0.005	344.69	0.874	s
TH-234	1	371.52	93.09	459.72	110.17	0.061	22.91	0.881	s
U-235	1	372.56	93.35	355.01	0.00	0.000	0.00	0.882	s D
AC-228	1	372.56	93.35	252.00	178.45	0.099	1.40	1.236	s D
EU-155	1	420.20	105.26	278.35	33.34	0.019	72.87	0.894	s
EU-152	1	486.28	121.78	245.40	2.59	0.001	858.21	0.912	s
EU-154	1	488.74	122.39	214.17	-24.02	-0.013	88.54	0.913	s
Pa-234	1	531.47	133.07	211.67	-24.46	-0.014	86.50	0.922	s
U-235	1	574.34	143.79	274.09	0.00	0.000	2341.31	0.935	s
U-235	1	659.76	165.14	186.69	-0.93	-0.001	2083.09	0.955	s
U-235	1	819.33	205.02	197.05	-8.59	-0.005	233.55	0.999	s
PB-212	1	953.80	238.63	154.47	858.53	0.477	3.92	1.034	D
RA-224	1	963.22	240.99	237.89	73.11	0.041	32.05	1.036	D
PB-214	1	967.26	242.00	136.92	87.08	0.048	21.82	1.037	D
TL-208	1	1108.02	277.18	142.38	19.01	0.011	91.66	1.074	s
I-131	1	1135.33	284.01	98.81	8.36	0.005	171.65	1.081	s
PB-214	1	1180.60	295.32	63.33	203.67	0.113	10.74	1.378	s
PB-212	1	1201.98	300.67	69.33	104.67	0.058	20.81	0.989	s
AC-228	1	1353.49	338.54	48.00	212.00	0.118	10.03	1.530	s
EU-152	1	1384.63	346.32	54.94	5.21	0.003	206.05	1.142	s
PB-214	1	1407.43	352.02	32.22	339.78	0.189	6.39	1.295	s
I-131	1	1464.23	366.22	58.36	4.23	0.002	259.95	1.163	s
BE-7	1	1910.21	477.70	51.20	-4.77	-0.003	217.16	1.277	s
CS-134	1	2251.36	562.97	55.98	10.90	0.006	101.66	1.363	s
CS-134	1	2276.76	569.32	49.33	-1.37	-0.001	-43.88	1.369	s D
Pa-234	1	2277.35	569.47	50.80	-3.61	-0.002	-134.04	1.369	s D
TL-208	1	2332.29	583.20	33.24	319.76	0.178	7.23	1.501	
CS-134	1	2412.90	603.35	62.28	-8.26	-0.005	139.54	1.403	s
BI-214	1	2436.84	609.34	8.97	277.03	0.154	6.53	0.960	s
I-131	1	2549.00	637.37	42.99	-4.78	-0.003	199.24	1.435	s
CS-137	1	2647.12	661.90	59.96	-5.99	-0.003	211.84	1.459	s
EU-154	1	2893.01	723.37	76.23	-11.60	-0.006	110.40	1.519	s
BI-212	1	2908.62	727.27	31.38	52.94	0.029	20.32	1.523	s
PA-234M	1	3062.50	765.74	62.13	-4.67	-0.003	243.28	1.561	s
EU-152	1	3117.21	779.41	23.09	7.04	0.004	103.67	1.573	s
BI-212	1	3143.71	786.04	29.48	6.26	0.003	129.05	1.579	s
CS-134	1	3179.43	794.97	45.28	20.27	0.011	51.95	1.589	s
CS-134	1	3207.37	801.95	45.61	0.00	0.000	955.12	1.595	s
TL-208	1	3441.66	860.52	4.17	63.83	0.035	14.47	0.760	s
EU-154	1	3488.73	872.29	27.45	4.70	0.003	164.38	1.662	s
Pa-234	1	3520.15	880.14	27.61	5.81	0.003	134.50	1.669	s
Pa-234	1	3527.27	881.92	27.12	-2.20	-0.001	341.24	1.672	s
AC-228	1	3645.14	911.39	14.00	202.00	0.112	8.77	1.541	

Pa-234	1	3782.36	945.69	32.77	3.69	0.002	225.78	1.731	s
EU-152	1	3853.66	963.51	77.26	-4.43	-0.002	284.83	1.748	s
AC-228	1	3873.97	968.59	22.00	145.00	0.081	12.50	0.743	s
EU-154	1	3984.93	996.33	36.78	0.00	0.000	857.64	1.778	s
PA-234M	1	4001.02	1000.35	27.62	3.08	0.002	247.92	1.782	s
EU-154	1	4025.75	1006.53	28.34	-1.20	-0.001	635.58	1.785	s
EU-152	1	4441.72	1110.52	19.64	8.11	0.005	84.86	1.884	s
BI-214	1	4482.15	1120.63	0.00	106.00	0.059	9.71	1.475	
CO-60	1	4692.66	1173.26	39.76	-1.96	-0.001	459.47	1.939	s
EU-154	1	5099.08	1274.86	33.40	-4.37	-0.002	192.90	2.030	s
CO-60	1	5354.50	1338.72	5.40	-0.59	0.000	575.75	2.081	s
EU-152	1	5631.04	1407.86	9.11	5.62	0.003	86.88	2.147	s
K-40	1	5842.74	1460.78	0.00	389.00	0.216	5.07	1.990	
BI-214	1	7059.96	1765.11	7.34	21.30	0.012	28.15	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	
EU-152	T F	1	4.374E-001	344.29	4.374E-001 %	(	3.130E+000G		4.9E+003	26.50
			4.374E-001	121.78	1.021E-001 &		2.987E+000G		4.9E+003	28.58
			4.374E-001	778.92	2.519E+000 %		8.984E+000G		4.9E+003	12.94
			4.374E-001	964.11	-1.684E+000 %		1.662E+001G		4.9E+003	14.61
			4.374E-001	1112.07	3.737E+000 &		1.076E+001G		4.9E+003	13.64
			4.374E-001	1408.00	2.073E+000 %		6.187E+000G		4.9E+003	21.00
CO-60	T F	1	-4.322E-002	1332.50	-4.322E-002 %	(	9.984E-001G		1.9E+003	99.98
			-4.322E-002	1173.24	-1.295E-001 %		2.115E+000G		1.9E+003	99.90
AC-228	N	1	3.741E+001	911.16	3.689E+001	(	3.679E+000G		2.1E+003	29.00
			3.741E+001	968.97	4.635E+001 +		7.854E+000G		2.1E+003	17.46
			3.741E+001	338.32	3.867E+001 *	(	6.384E+000G		2.1E+003	12.01
			3.741E+001	93.35	3.741E+001 +	E	1.608E+001G	A	2.1E+003	5.56
PB-212	N	1	3.184E+001	238.63	3.184E+001	(P	2.249E+000G		7.0E+002	43.30
			3.184E+001	300.03	6.263E+001 +		2.484E+001G		7.0E+002	3.28
CS-134	T F I	1	-3.145E-001	604.71	-3.145E-001 %	(	1.503E+000G		7.5E+002	97.62
			-3.145E-001	795.87	1.118E+000 %		1.879E+000G		7.5E+002	85.53
			-3.145E-001	569.32	-3.145E-001 &		8.120E+000G		7.5E+002	15.38
			-3.145E-001	801.95	0.000E+000 &		1.868E+001G		7.5E+002	8.69
			-3.145E-001	563.24	4.558E+000 %		1.571E+001G		7.5E+002	8.35
PB-210	N	1	3.019E+001	46.54	3.019E+001 %	(P	3.436E+001G		8.1E+003	4.25
K-40	N	1	2.922E+002	1460.83	2.922E+002	(	5.536E+000G		4.7E+011	10.67
RA-224	N	1	2.887E+001	240.99	2.887E+001	(	2.946E+001G		7.0E+002	4.10
CS-137	T F I	1	-2.830E-001	661.66	-2.830E-001 &	(P	1.831E+000G		1.1E+004	85.21
BI-214	N	1	2.249E+001	609.31	2.249E+001 *	(P	1.353E+000G		5.8E+005	46.09
			2.249E+001	1120.29	4.440E+001 +		3.087E+000G		5.8E+005	15.10
			2.249E+001	1764.49	1.328E+001 -		9.561E+000G		5.8E+005	15.40
PA-234M	N	1	2.112E+001	1001.00	2.112E+001 &	(	1.865E+002G		1.6E+012	.84
			2.112E+001	766.41	-7.250E+001 &		6.126E+002G		1.6E+012	.29
PB-214	N	1	2.032E+001	351.93	2.053E+001 *	(P	1.762E+000G		5.8E+005	37.60
			2.032E+001	295.09	2.040E+001 *	(	3.986E+000G		5.8E+005	19.30
			2.032E+001	242.00	1.905E+001	(	1.252E+001G		5.8E+005	7.43
			1.955E+001	785.51	2.653E+001 %		1.188E+002G		7.0E+002	1.10

Bl-212	N	1	1.955E+001	727.33	1.955E+001	@	(	1.064E+001G		7.0E+002	11.82
			1.955E+000	1004.77	-3.827E-001	%		8.798E+000G		3.1E+003	18.01
			1.955E+000	996.33	0.000E+000	%		1.670E+001G		3.1E+003	10.60
EU-154 T F I		1	1.955E+000	873.23	1.955E+000	%	(	1.129E+001G		3.1E+003	12.27
			1.955E+000	123.10	-6.648E-001	%		1.962E+000G		3.1E+003	40.79
			1.955E+000	1274.54	-8.803E-001	&		5.966E+000G		3.1E+003	35.19
			1.955E+000	723.36	-2.493E+000	%		9.326E+000G		3.1E+003	20.22
EU-155 T F I		1	1.781E+000	105.31	1.781E+000	%	(	4.298E+000G		1.8E+003	21.20
			1.781E+000	86.54	-3.397E-001	%		3.945E+000G	A	1.8E+003	30.70
TH-234	N	1	1.716E+001	63.29	1.031E+001	%	(P	3.020E+001G		1.6E+012	4.82
			1.716E+001	92.59	2.306E+001	*	(P	2.148E+001G		1.6E+012	5.58
AM-241 T		1	-1.556E-001	59.54	-1.556E-001	&	(	4.239E+000G		1.6E+005	35.90
Pa-234	N	1	-1.550E+000	131.29	-1.550E+000	%	(	4.466E+000G		1.6E+012	18.00
			-1.550E+000	569.47	-1.550E+000	&		1.544E+001G		1.6E+012	8.20
			-1.550E+000	946.02	1.504E+000	&		1.199E+001G		1.6E+012	13.40
			-1.550E+000	883.24	-1.183E+000	%		1.449E+001G		1.6E+012	9.60
			-1.550E+000	880.53	4.979E+000	%		2.331E+001G		1.6E+012	6.00
BE-7	N P C	1	-1.364E+000	477.60	-1.364E+000	%	(	1.031E+001G		5.3E+001	10.52
TL-208 F	N	1	1.362E+001	583.02	1.362E+001		(P	1.260E+000G		7.0E+002	84.50
			1.362E+001	277.28	5.509E+000	%		1.690E+001G		7.0E+002	6.31
			1.362E+001	860.56	2.592E+001	+		4.963E+000G		7.0E+002	12.42
I-131 T F I		1	1.215E-001	364.48	1.215E-001	%	(	1.101E+000G		8.0E+000	81.70
			1.215E-001	284.30	2.546E+000	%		1.493E+001G		8.0E+000	6.14
			1.215E-001	636.97	-2.594E+000	%		1.805E+001G		8.0E+000	7.17
U-235	N	1	0.000E+000	143.79	0.000E+000	&	(	8.518E+000G		2.6E+011	10.96
			0.000E+000	205.33	-2.447E+000	%		1.940E+001G		2.6E+011	5.01
			0.000E+000	163.38	-2.258E-001	&		1.614E+001G		2.6E+011	5.08
			0.000E+000	93.35	0.000E+000	!		E 1.816E+001X		2.6E+011	5.81

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	#	-1.364E+000	-1.369E+000	217.16	217.18	1.031E+001
K-40		2.922E+002	2.922E+002	5.07	5.85	5.536E+000
CO-60	#	-4.322E-002	-4.323E-002	575.75	575.76	9.984E-001
I-131	#	1.215E-001	1.247E-001	259.95	259.96	1.101E+000
CS-134	#	-3.145E-001	-3.146E-001	139.54	139.57	1.503E+000
CS-137	#	-2.830E-001	-2.830E-001	238.16	238.18	1.831E+000
EU-152	#	4.374E-001	4.375E-001	206.05	206.07	3.130E+000
EU-155	#	1.781E+000	1.781E+000	72.87	72.94	4.298E+000
TL-208		1.362E+001	1.362E+001	7.29	7.84	1.260E+000
BI-214		2.249E+001	2.249E+001	6.58	7.19	1.353E+000
RA-224		2.887E+001	2.888E+001	32.05	32.18	2.946E+001
AC-228		3.741E+001	3.741E+001	6.66	7.26	3.679E+000
TH-234	#	1.716E+001	1.716E+001	28.73	28.96	3.020E+001
PA-234M	#	2.112E+001	2.112E+001	247.92	247.93	1.865E+002
U-235	#			2,341.31	2,341.31	8.518E+000
EU-154	#	1.955E+000	1.955E+000	164.38	164.40	1.129E+001
PB-210		3.019E+001	3.019E+001	42.22	42.40	3.436E+001
PB-212		3.184E+001	3.185E+001	3.96	4.96	2.249E+000
PB-214		2.032E+001	2.032E+001	6.44	7.06	1.762E+000
BI-212	#	1.955E+001	1.956E+001	20.32	20.53	1.064E+001
Pa-234	#	-1.550E+000	-1.550E+000	86.50	86.55	4.466E+000
AM-241	#	-1.556E-001	-1.556E-001	805.52	805.53	4.239E+000

= All peaks for activity calculation had bad shape

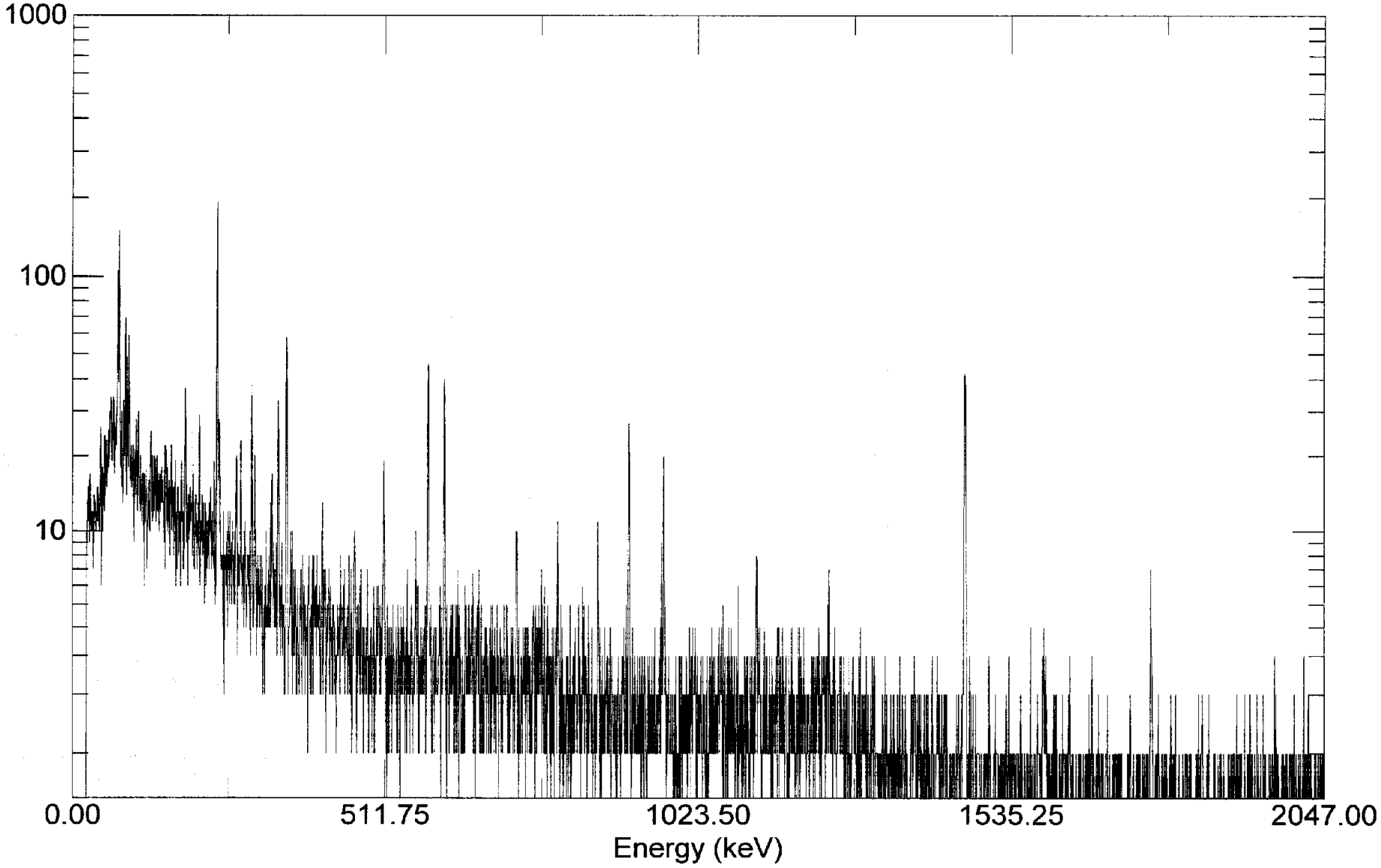
Total Activity (37.72 to 2,000.15 keV) 446.74 Bq/sample

Analyzed by: 403605

Laboratory: Test America

KEKJJ1AC

7360294_KEKJJ1AC_F7L200271-016



Acquired: 26-Dec-2007 7:02:16 PM
File: C:\User\spectra\KEKJJ1AC.spc
Detector: #0 Ge 7 SN/154

Real Time: 1820.48 s. Live Time: 1800.00 s.
Channels: 8192

TestAmerica St. Louis

DB Analysis ID: 33,082

Sample Description: 7360294_KEKLC1AC_F7L200271-017

Spectrum Filename: KEKLC1AC.An1

Acquisition Information

Start Time:	26-Dec-2007 7:40:07PM		
Live Time:	1800.00	Real Time:	1810.60
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	26-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 0.2280

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
298.27	74.78	294.67	233.33	0.130	15.82	0.747	PB-214	
307.52	77.09	161.33	275.67	0.153	9.82	0.886	PB-214	
347.24	87.03	254.67	30.33	0.017	76.60	1.212		s
358.85	89.93	119.18	54.82	0.030	31.23	0.842	PB-214	
370.68	92.89	380.00	0.00	0.000	2756.81	1.397		s
743.08	185.99	108.50	127.50	0.071	19.46	1.292	RA-226	s
1351.41	338.07	124.73	3.27	0.002	486.71	0.925		
3874.58	968.80	48.52	53.48	0.030	22.94	0.712	AC-228	s

s = Peak fails shape tests.

D = Peak area deconvoluted.

Test Sample Louis

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	46.54	131.46	61.54	0.034	24.13	0.829	s
AM-241	1	238.91	59.94	215.32	-4.40	-0.002	474.02	0.824	s
TH-234	1	252.77	63.41	304.29	15.84	0.009	45.96	0.828	
EU-155	1	347.53	87.10	260.30	86.67	0.048	28.43	0.849	s
TH-234	1	369.81	92.67	307.05	68.00	0.038	21.20	0.855	s
U-235	1	372.54	93.35	176.33	-2.25	-0.001	-4372.57	0.855	s D
AC-228	1	372.54	93.35	176.33	54.99	0.031	2.52	0.855	s D
EU-155	1	421.03	105.47	154.81	23.52	0.013	77.60	0.866	s
EU-152	1	488.77	122.41	173.98	-4.95	-0.003	379.86	0.881	
EU-154	1	495.45	124.08	175.82	-0.27	0.000	6860.56	0.882	s
Pa-234	1	525.76	131.66	196.25	-3.64	-0.002	546.08	0.890	s
U-235	1	572.59	143.36	174.96	-4.16	-0.002	4441.43	0.901	s
U-235	1	653.25	163.53	160.04	5.29	0.003	217.16	0.919	s
U-235	1	820.83	205.43	104.97	8.26	0.005	141.30	0.957	s
PB-212	1	953.66	238.63	70.47	376.53	0.209	5.57	0.987	D
RA-224	1	963.07	240.99	137.01	53.99	0.030	33.54	0.989	D
PB-214	1	967.12	242.00	98.54	78.46	0.044	19.17	0.990	D
TL-208	1	1108.24	277.28	93.41	13.21	0.007	107.10	1.021	s
I-131	1	1135.07	283.98	63.20	9.73	0.005	119.93	1.028	s
PB-214	1	1179.58	295.11	54.54	164.46	0.091	10.73	1.121	s
PB-212	1	1200.40	300.32	45.33	37.67	0.021	37.91	1.089	
AC-228	1	1351.58	338.11	51.63	94.14	0.052	14.01	1.076	
EU-152	1	1368.25	342.28	57.81	0.09	0.000	11473.75	1.081	
PB-214	1	1405.97	351.71	55.32	275.68	0.153	7.92	0.790	s
I-131	1	1454.80	363.91	55.28	-3.29	-0.002	324.57	1.099	s
BE-7	1	1908.26	477.28	35.27	-2.55	-0.001	334.79	1.198	s
CS-134	1	2253.64	563.61	53.38	-5.71	-0.003	185.74	1.273	s
CS-134	1	2276.47	569.32	36.49	-1.92	-0.001	-42.06	1.278	s D
Pa-234	1	2277.07	569.47	36.16	-0.66	0.000	-147.33	1.278	s D
TL-208	1	2331.43	583.06	20.42	139.58	0.078	9.62	1.140	
CS-134	1	2425.30	606.52	62.86	-11.66	-0.006	100.51	1.309	s
BI-214	1	2435.80	609.15	25.29	261.71	0.145	7.14	0.969	s
I-131	1	2534.92	633.93	23.71	0.29	0.000	2388.84	1.337	s
CS-137	1	2646.71	661.87	54.37	-6.97	-0.004	154.35	1.358	s
EU-154	1	2901.49	725.56	45.35	-5.67	-0.003	173.14	1.411	s
BI-212	1	2908.86	727.40	36.73	18.26	0.010	52.44	1.414	s
PA-234M	1	3062.51	765.81	35.60	1.48	0.001	576.20	1.447	s
EU-152	1	3119.05	779.94	27.59	-0.33	0.000	2228.91	1.458	s
BI-212	1	3141.32	785.51	62.34	0.00	0.000	1116.60	1.463	s
CS-134	1	3178.91	794.91	22.16	16.77	0.009	46.62	1.472	s
CS-134	1	3209.36	802.52	29.86	-0.90	0.000	866.73	1.477	s
TL-208	1	3439.97	860.16	0.00	37.00	0.021	16.44	0.625	s
EU-154	1	3491.64	873.08	27.01	1.49	0.001	498.67	1.537	s
Pa-234	1	3519.02	879.92	26.10	-1.11	-0.001	655.16	1.543	s
Pa-234	1	3545.68	886.59	16.53	-0.28	0.000	2062.88	1.546	s

AC-228	1	3643.71	911.09	39.49	74.82	0.042	15.33	1.569	
Pa-234	1	3784.25	946.22	28.13	2.10	0.001	362.98	1.598	s
EU-152	1	3863.10	965.93	82.17	-3.72	-0.002	348.49	1.613	s
AC-228	1	3875.16	968.94	26.50	42.65	0.024	20.94	1.617	s
EU-154	1	3985.15	996.43	37.27	-3.41	-0.002	258.78	1.640	s
PA-234M	1	3999.63	1000.05	28.24	-5.34	-0.003	147.13	1.643	s
EU-154	1	4018.52	1004.77	36.08	0.00	0.000	849.44	1.647	s
EU-152	1	4447.58	1112.02	40.99	-6.05	-0.003	155.03	1.735	s
BI-214	1	4480.47	1120.24	37.49	29.54	0.016	28.16	1.741	s
CO-60	1	4698.67	1174.78	31.25	-1.56	-0.001	514.58	1.784	s
EU-154	1	5097.76	1274.53	27.14	3.41	0.002	222.93	1.866	s
CO-60	1	5319.85	1330.03	16.12	0.19	0.000	2984.85	1.912	s
EU-152	1	5630.58	1407.70	19.50	-1.63	-0.001	390.35	1.972	s
K-40	1	5842.67	1460.70	12.54	581.46	0.323	4.10	2.093	
BI-214	1	7056.46	1764.05	10.14	36.69	0.020	17.40	2.246	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	
			-9.766E-002	284.30	3.205E+000	%			1.310E+001G		8.0E+000	6.14
			-9.766E-002	636.97	1.465E-001	%			1.287E+001G		8.0E+000	7.17
I-131	T F I	1	-9.766E-002	364.48	-9.766E-002	%	(		1.110E+000G		8.0E+000	81.70
EU-152	T F	1	8.233E-003	344.29	8.233E-003	&	(		3.349E+000G		4.9E+003	26.50
			8.233E-003	121.78	-2.276E-001	&			2.954E+000G		4.9E+003	28.58
			8.233E-003	778.92	-1.080E-001	%			8.787E+000G		4.9E+003	12.94
			8.233E-003	964.11	-1.236E+000	&			1.494E+001G		4.9E+003	14.61
			8.233E-003	1112.07	-2.382E+000	%			1.281E+001G		4.9E+003	13.64
			8.233E-003	1408.00	-4.976E-001	%			7.095E+000G		4.9E+003	21.00
BE-7	N P C	1	-7.183E-001	477.60	-7.183E-001	%	(		8.547E+000G		5.3E+001	10.52
BI-212	N	1	6.160E+000	727.33	6.160E+000	%	(		1.044E+001G		7.0E+002	11.82
			6.160E+000	785.51	0.000E+000	&			1.511E+002G		7.0E+002	1.10
TL-208	F N	1	5.639E+000	583.02	5.639E+000		(	P	9.601E-001G		7.0E+002	84.50
			5.639E+000	277.28	4.158E+000	&			1.503E+001G		7.0E+002	6.31
			5.639E+000	860.56	1.335E+001	+			2.660E+000G		7.0E+002	12.42
EU-154	T F I	1	5.514E-001	873.23	5.514E-001	%	(		9.938E+000G		3.1E+003	12.27
			5.514E-001	123.10	-8.831E-003	&			2.083E+000G		3.1E+003	40.79
			5.514E-001	1274.54	5.746E-001	&			4.551E+000G		3.1E+003	35.19
			5.514E-001	723.36	-1.114E+000	%			6.696E+000G		3.1E+003	20.22
			5.514E-001	1004.77	0.000E+000	%			8.517E+000G		3.1E+003	18.01
			5.514E-001	996.33	-1.599E+000	%			1.460E+001G		3.1E+003	10.60
U-235	N	1	-5.182E-001	143.79	-5.182E-001	&	(	P	8.017E+000G		2.6E+011	10.96
			-5.182E-001	205.33	2.675E+000	&		P	1.634E+001G		2.6E+011	5.01
			-5.182E-001	163.38	1.493E+000	%		P	1.741E+001G		2.6E+011	5.08
			-5.182E-001	93.35	-5.182E-001	!		E	1.486E+001X		2.6E+011	5.81
CS-134	T F I	1	-4.185E-001	604.71	-4.185E-001	%	(		1.423E+000G		7.5E+002	97.62
			-4.185E-001	795.87	8.321E-001	%			1.223E+000G		7.5E+002	85.53
			-4.185E-001	569.32	-4.185E-001	%			6.735E+000G		7.5E+002	15.38
			-4.185E-001	801.95	-4.411E-001	%			1.384E+001G		7.5E+002	8.69
			-4.185E-001	563.24	-2.278E+000	%			1.466E+001G		7.5E+002	8.35
PB-210	N	1	3.887E+001	46.54	3.887E+001	*	(	P	3.546E+001G		8.1E+003	4.25
K-40	N	1	3.588E+002	1460.83	3.588E+002		(	P	1.186E+001G		4.7E+011	10.67
			-3.182E+001	766.41	2.081E+001	%			4.292E+002G		1.6E+012	.29
PA-234	N	1	-3.182E+001	1001.00	-3.182E+001	%	(		1.636E+002G		1.6E+012	.84
CS-137	T F I	1	-3.052E-001	661.66	-3.052E-001	%	(		1.624E+000G		1.1E+004	85.21
EU-155	T F I	1	2.878E+000	105.31	1.455E+000	%	(		3.753E+000G		1.8E+003	21.20
			2.878E+000	86.54	3.861E+000	*	(		3.469E+000G		1.8E+003	30.70
Pa-234	N	1	-2.698E-001	131.29	-2.698E-001	*	(		5.033E+000G		1.6E+012	18.00
			-2.698E-001	569.47	-2.698E-001	%			1.258E+001G		1.6E+012	8.20
			-2.698E-001	946.02	7.522E-001	%			9.802E+000G		1.6E+012	13.40
			-2.698E-001	883.24	-1.331E-001	&			1.030E+001G		1.6E+012	9.60
			-2.698E-001	880.53	-8.460E-001	%			2.013E+001G		1.6E+012	6.00
RA-224	N	1	2.371E+001	240.99	2.371E+001		(		2.514E+001G		7.0E+002	4.10
AM-241	T	1	-2.127E-001	59.54	-2.127E-001	%	(		3.437E+000G		1.6E+005	35.90

			1.957E+001	1120.29	1.056E+001	-		P		1.117E+001G		5.8E+005	15.10
			1.957E+001	1764.49	1.830E+001	?	(	P		8.750E+000G		5.8E+005	15.40
BI-214	N	1	1.957E+001	609.31	2.000E+001		(	P		1.998E+000G		5.8E+005	46.09
PB-214	N	1	1.765E+001	351.93	1.734E+001		(	P		2.351E+000G		5.8E+005	37.60
			1.765E+001	295.09	1.771E+001	@	(	P		3.997E+000G		5.8E+005	19.30
			1.765E+001	242.00	1.907E+001		(	P		1.190E+001G		5.8E+005	7.43
PB-212	N	1	1.555E+001	238.63	1.555E+001		(	P		1.728E+000G		7.0E+002	43.30
			1.555E+001	300.03	2.415E+001	+				2.186E+001G		7.0E+002	3.28
AC-228	N	1	1.322E+001	911.07	1.203E+001		(	P		5.146E+000G		2.1E+003	29.00
			1.322E+001	968.97	1.190E+001		(	P		7.448E+000G		2.1E+003	17.46
			1.322E+001	338.32	1.801E+001		(	P		6.923E+000G		2.1E+003	12.01
			1.322E+001	93.35	1.322E+001	+			E	1.553E+001X	A	2.1E+003	5.56
CO-60	T F	1	1.171E-002	1332.50	1.171E-002	%	(			1.315E+000G		1.9E+003	99.98
			1.171E-002	1173.24	-8.693E-002	&				1.607E+000G		1.9E+003	99.90
TH-234	N	1	1.125E+001	63.29	5.386E+000	%	(	P		2.856E+001G		1.6E+012	4.82
			1.125E+001	92.59	1.631E+001	*	(	P		2.024E+001G		1.6E+012	5.58

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	<	-4.185E-001	-4.186E-001	100.51	100.55	1.423E+000
EU-154	<	5.514E-001	5.514E-001	498.67	498.68	9.938E+000
EU-155	<	2.878E+000	2.878E+000	28.43	28.63	3.753E+000
BE-7	<	-7.183E-001	-7.213E-001	334.79	334.80	8.547E+000
K-40		3.588E+002	3.588E+002	4.19	5.11	1.186E+001
CO-60	<	1.171E-002	1.171E-002	2,984.85	2,984.85	1.315E+000
I-131	<	-9.766E-002	-1.004E-001	324.57	324.59	1.110E+000
CS-137	<	-3.052E-001	-3.052E-001	154.35	154.38	1.624E+000
EU-152	<	8.233E-003	8.233E-003	11,473.75	11,473.75	3.349E+000
TL-208		5.639E+000	5.641E+000	10.23	10.63	9.601E-001
RA-224		2.371E+001	2.372E+001	33.54	33.67	2.514E+001
PB-210	#	3.887E+001	3.887E+001	35.67	35.89	3.546E+001
PB-212		1.555E+001	1.556E+001	5.91	6.62	1.728E+000
AC-228	<	1.322E+001	1.322E+001	10.50	10.88	5.146E+000
Pa-234	<	-2.698E-001	-2.698E-001	546.08	546.09	5.033E+000
U-235	<	-5.182E-001	-5.182E-001	8,437.72	8,437.72	8.017E+000
AM-241	<	-2.127E-001	-2.127E-001	474.02	474.03	3.437E+000
PB-214		1.765E+001	1.765E+001	8.26	8.75	2.351E+000
BI-212	<	6.160E+000	6.162E+000	52.44	52.52	1.044E+001
BI-214		1.957E+001	1.957E+001	7.45	7.99	1.998E+000
TH-234	<	1.125E+001	1.125E+001	36.96	37.14	2.856E+001
PA-234M	<	-3.182E+001	-3.182E+001	147.13	147.16	1.636E+002

= All peaks for activity calculation had bad shape

Total Activity (37.71 to 1,999.84 keV) 479.83 Bq/sample

Analyzed by: _____

403605

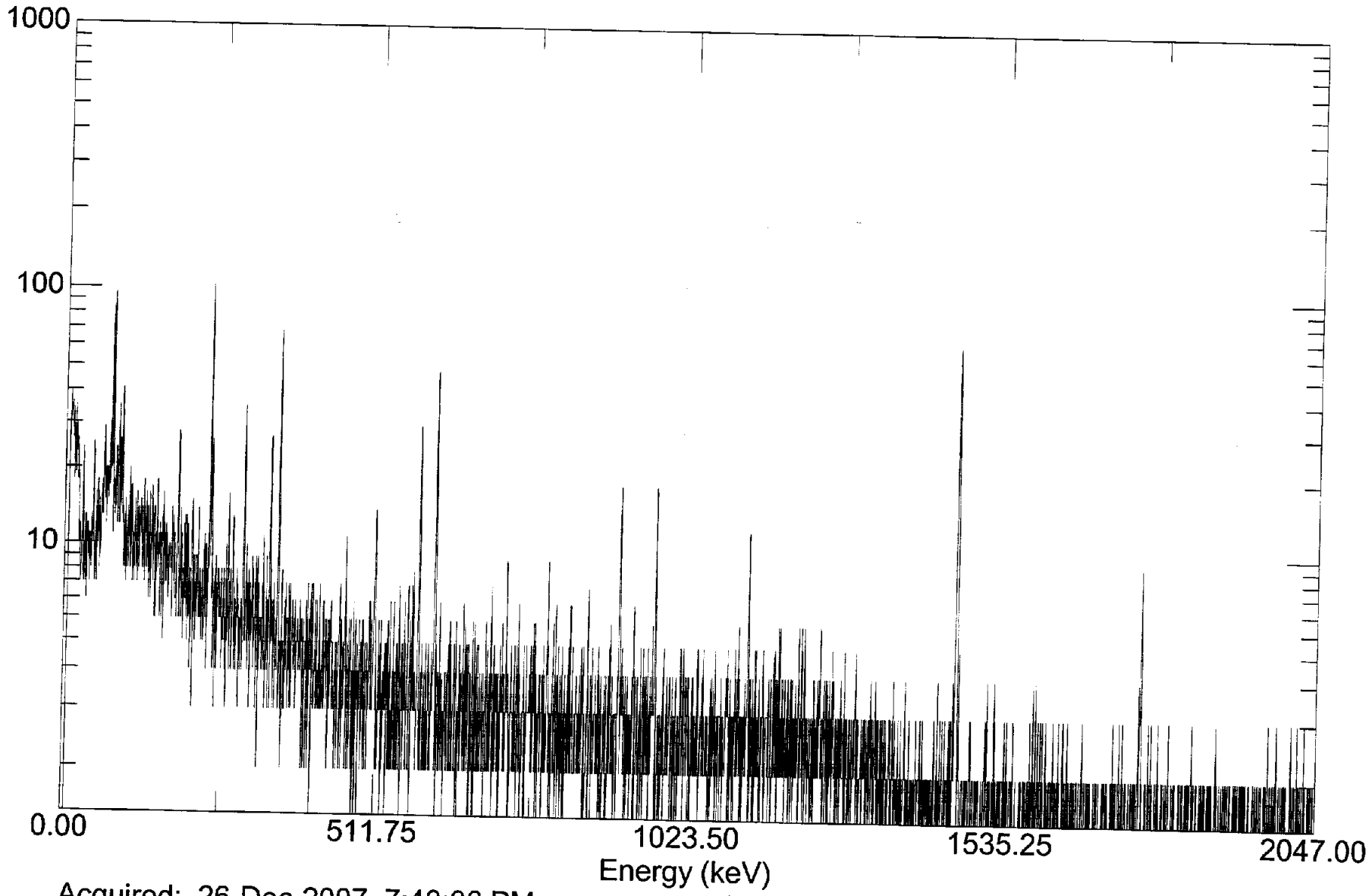
Reviewed by: _____

Supervisor

Laboratory: Test America

KEKLC1AC

7360294_KEKLC1AC_F7L200271-017



Acquired: 26-Dec-2007 7:40:06 PM
File: C:\User\spectra\KEKLC1AC.spc
Detector: #0 Ge 1 SN/242

Real Time: 1810.60 s. Live Time: 1800.00 s.
Channels: 8192

TestAmerica St. Louis

DB Analysis ID: 33,083

Sample Description: 7360294_KER4L1AA_F7L260000-294B

Spectrum Filename: KER4L1AA.An1

Acquisition Information

Start Time:	26-Dec-2007 7:41:19PM		
Live Time:	1800.00	Real Time:	1813.62
Dead Time:	0.75 %		
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	26-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 0.0000

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	185.23	46.67	52.85	-1.04	-0.001	44.50	0.864	s
AM-241	1	240.23	60.41	41.73	-4.06	-0.002	230.53	0.878	s
TH-234	1	250.58	62.99	62.89	-13.66	-0.008	84.76	0.882	s
EU-155	1	346.02	86.83	49.52	-4.66	-0.003	218.65	0.906	s
TH-234	1	369.15	92.60	56.70	-9.15	-0.005	51.94	0.912	s
U-235	1	372.14	93.35	30.06	19.37	0.011	42.15	0.913	s D
AC-228	1	372.14	93.35	48.37	-2.68	-0.001	-329.41	0.913	s D
EU-155	1	420.04	105.31	37.66	0.00	0.000	867.86	0.925	s
EU-152	1	483.64	121.20	26.34	-1.51	-0.001	488.66	0.942	s
EU-154	1	490.46	122.90	25.09	8.28	0.005	92.31	0.943	
Pa-234	1	527.53	132.16	27.68	-3.66	-0.002	209.87	0.952	
U-235	1	573.64	143.68	25.22	1.94	0.001	173.44	0.964	s
U-235	1	652.16	163.29	18.61	9.11	0.005	74.70	0.984	s
U-235	1	821.32	205.54	26.09	0.44	0.000	1651.13	1.027	s
PB-212	1	952.48	238.30	52.06	-10.56	-0.006	83.76	1.060	s
PB-214	1	960.44	240.29	26.45	-4.18	-0.002	180.89	1.063	s
RA-224	1	962.88	240.90	40.92	-5.53	-0.003	169.01	1.062	s
TL-208	1	1110.20	277.69	16.04	4.90	0.003	124.23	1.098	s
I-131	1	1140.97	285.38	20.40	-0.14	0.000	4532.72	1.105	s
PB-214	1	1177.27	294.45	25.36	-3.32	-0.002	992.17	1.116	s
PB-212	1	1201.23	300.44	23.44	1.10	0.001	632.47	1.121	s
AC-228	1	1354.59	338.75	25.67	6.68	0.004	84.68	1.158	s
EU-152	1	1376.77	344.29	21.84	0.00	0.000	660.96	1.164	s
PB-214	1	1407.68	352.01	36.05	-4.31	-0.002	156.33	1.171	s
I-131	1	1460.87	365.30	20.57	-3.55	-0.002	188.28	1.184	s
BE-7	1	1910.51	477.63	21.54	-0.04	0.000	16756.89	1.292	s
CS-134	1	2254.26	563.53	20.34	-4.42	-0.002	151.85	1.372	s
CS-134	1	2277.45	569.32	34.00	0.00	0.000	0.00	1.378	s D
Pa-234	1	2278.04	569.47	29.18	-0.64	0.000	-52.82	1.378	s D
TL-208	1	2331.96	582.94	23.13	-1.86	-0.001	98.96	1.390	s
CS-134	1	2419.07	604.71	15.83	0.00	0.000	562.75	1.410	s
BI-214	1	2438.95	609.68	28.65	-4.45	-0.002	271.99	1.415	s
I-131	1	2550.28	637.50	11.25	0.57	0.000	843.57	1.440	s
CS-137	1	2646.96	661.66	8.24	0.00	0.000	405.90	1.462	s
EU-154	1	2894.36	723.49	13.71	0.88	0.000	607.81	1.518	s
BI-212	1	2908.31	726.98	15.70	-0.64	0.000	889.00	1.521	s
PA-234M	1	3066.95	766.63	12.52	0.82	0.000	622.34	1.556	s
EU-152	1	3110.58	777.53	8.65	-2.30	-0.001	192.67	1.567	s
BI-212	1	3142.18	785.43	8.76	-1.94	-0.001	227.38	1.572	s
CS-134	1	3183.93	795.87	0.00	0.00	0.000	100.00	1.582	s
CS-134	1	3210.02	802.39	5.09	6.53	0.004	62.62	1.587	s
TL-208	1	3454.64	863.53	7.82	0.11	0.000	3734.78	1.638	s
EU-154	1	3492.16	872.91	14.38	5.54	0.003	105.65	1.649	s
Pa-234	1	3523.29	880.69	9.14	2.95	0.002	156.25	1.655	s
Pa-234	1	3533.48	883.24	22.45	0.00	0.000	670.02	1.657	s

AC-228	1	3638.95	909.61	17.00	-3.77	-0.002	350.91	1.681	s
Pa-234	1	3784.01	945.87	5.36	1.45	0.001	240.44	1.710	s
EU-152	1	3847.69	961.79	9.56	-0.06	0.000	7435.41	1.726	s
AC-228	1	3875.64	968.78	14.55	-2.78	-0.002	203.42	1.730	s
EU-154	1	3989.49	997.24	7.96	5.47	0.003	84.57	1.753	s
PA-234M	1	3998.05	999.38	15.33	-4.31	-0.002	137.09	1.756	s
EU-154	1	4019.63	1004.77	0.00	0.00	0.000	100.00	1.760	s
EU-152	1	4462.70	1115.56	8.66	-0.14	0.000	2931.44	1.847	s
BI-214	1	4481.62	1120.29	1.94	-1.94	-0.001	100.00	1.854	s
CO-60	1	4694.73	1173.58	17.31	-0.09	0.000	6280.24	1.896	s
EU-154	1	5098.47	1274.54	34.43	0.00	0.000	829.83	1.975	s
CO-60	1	5330.21	1332.50	0.00	0.00	0.000	100.00	2.019	s
EU-152	1	5632.07	1408.00	0.00	0.00	0.000	100.00	2.076	s
K-40	1	5838.66	1459.68	18.69	-3.08	-0.002	59.13	2.115	s
BI-214	1	7052.33	1763.33	12.14	-2.20	-0.001	2739.83	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	Peak Analysis Code	Peak MDA Value Becquerels	Peak Code	Peak Comments	
			-7.251E-002	860.56	3.753E-002 %		5.560E+000G		7.0E+002	12.42
TL-208	F N	1	-7.251E-002	583.02	-7.251E-002 %	(P	9.800E-001G		7.0E+002	84.50
			-7.251E-002	277.28	1.455E+000 %		6.355E+000G		7.0E+002	6.31
PB-210	N	1	-6.019E-001	46.54	-6.019E-001 %	(P	2.120E+001G		8.1E+003	4.25
			-5.950E-001	968.97	-7.611E-001 %		5.618E+000G		2.1E+003	17.46
			-5.950E-001	338.32	1.213E+000 %	P	4.781E+000G		2.1E+003	12.01
			-5.950E-001	93.35	-5.950E-001 &	E	7.799E+000X	A	2.1E+003	5.56
AC-228	N	1	-5.950E-001	911.07	-5.950E-001 %	(P	3.458E+000G		2.1E+003	29.00
TH-234	N	1	-4.252E+000	63.29	-4.252E+000 %	(P	1.235E+001G		1.6E+012	4.82
			-4.252E+000	92.59	-2.028E+000 %	P	8.376E+000G		1.6E+012	5.58
PB-212	N	1	-4.103E-001	238.63	-4.103E-001 %	(P	1.411E+000G		7.0E+002	43.30
			-4.103E-001	300.03	6.646E-001 %		1.534E+001G		7.0E+002	3.28
BI-214	N	1	-3.291E-001	609.31	-3.291E-001 &	(P	2.044E+000G		5.8E+005	46.09
			-3.291E-001	1120.29	-6.861E-001 %	P	3.254E+000G		5.8E+005	15.10
			-3.291E-001	1764.49	-1.109E+000 %	P	9.556E+000G		5.8E+005	15.40
PB-214	N	1	-2.576E-001	351.93	-2.576E-001 *	(P	1.835E+000G		5.8E+005	37.60
			-2.576E-001	295.09	-3.379E-001 %	P	2.666E+000G		5.8E+005	19.30
			-2.576E-001	242.00	-9.549E-001 &		6.099E+000G		5.8E+005	7.43
PA-234	N	1	-2.528E+001	1001.00	-2.528E+001 %	(	1.228E+002G		1.6E+012	.84
			-2.528E+001	766.41	1.120E+001 %		2.632E+002G		1.6E+012	.29
Pa-234	N	1	-2.517E-001	131.29	-2.517E-001 %	(	1.872E+000G		1.6E+012	18.00
			-2.517E-001	569.47	-2.517E-001 %		1.101E+001G		1.6E+012	8.20
			-2.517E-001	946.02	5.094E-001 %		4.739E+000G		1.6E+012	13.40
			-2.517E-001	883.24	0.000E+000 %		1.155E+001G		1.6E+012	9.60
			-2.517E-001	880.53	2.193E+000 %		1.249E+001G		1.6E+012	6.00
RA-224	N	1	-2.285E+000	240.99	-2.285E+000 %	(	1.343E+001G		7.0E+002	4.10
			2.251E-001	163.38	2.400E+000 %		6.008E+000G		2.6E+011	5.08
			2.251E-001	93.35	4.116E+000 &	) E	7.465E+000X		2.6E+011	5.81
U-235	N	1	2.251E-001	143.79	2.251E-001 &	(P	3.026E+000G		2.6E+011	10.96
			2.251E-001	205.33	1.333E-001 &		8.045E+000G		2.6E+011	5.01
BI-212	N	1	-2.090E-001	727.33	-2.090E-001 %	(	6.949E+000G		7.0E+002	11.82
			-2.090E-001	785.51	-7.235E+000 %		6.155E+001G		7.0E+002	1.10
EU-154	T F I	1	2.003E+000	873.23	2.003E+000 %	(	7.366E+000G		3.1E+003	12.27
			2.003E+000	123.10	2.482E-001 %		7.806E-001G		3.1E+003	40.79
			2.003E+000	1274.54	0.000E+000 %		5.041E+000G		3.1E+003	35.19
			2.003E+000	723.36	1.672E-001 %		3.815E+000G		3.1E+003	20.22
			2.003E+000	1004.77	0.000E+000 %		2.013E+000G		3.1E+003	18.01
			2.003E+000	996.33	2.523E+000 %		7.315E+000G		3.1E+003	10.60
K-40	N	1	-1.905E+000	1460.83	-1.905E+000 %	(P	1.412E+001G		4.7E+011	10.67
AM-241	T	1	-1.794E-001	59.54	-1.794E-001 %	(	1.450E+000G		1.6E+005	35.90
BE-7	N P C	1	-1.058E-002	477.60	-1.058E-002 %	(	6.569E+000G		5.3E+001	10.52
I-131	T F I	1	-1.004E-001	364.48	-1.004E-001 %	(	6.741E-001G		8.0E+000	81.70
			-1.004E-001	284.30	-4.394E-002 %		7.395E+000G		8.0E+000	6.14
			-1.004E-001	636.97	2.795E-001 %		9.001E+000G		8.0E+000	7.17

CO-60 T F	1	0.000E+000	1332.50	0.000E+000	% (	4.508E-001G	1.9E+003	99.98
		0.000E+000	1173.24	-5.196E-003	%	1.224E+000G	1.9E+003	99.90
CS-134 T F I	1	0.000E+000	604.71	0.000E+000	% (	7.373E-001G	7.5E+002	97.62
		0.000E+000	778.92	-7.243E-001	%	5.174E+000G	4.9E+003	12.94
		0.000E+000	964.11	-1.924E-002	%	5.591E+000G	4.9E+003	14.61
		0.000E+000	1112.07	-5.547E-002	%	6.391E+000G	4.9E+003	13.64
		0.000E+000	1408.00	0.000E+000	%	2.244E+000G	4.9E+003	21.00
		0.000E+000	795.87	0.000E+000	%	3.570E-001G	7.5E+002	85.53
		0.000E+000	569.32	0.000E+000	%	6.293E+000G	7.5E+002	15.38
		0.000E+000	801.95	3.130E+000	%	6.341E+000G	7.5E+002	8.69
		0.000E+000	563.24	-1.702E+000	%	9.130E+000G	7.5E+002	8.35
CS-137 T F I	1	0.000E+000	661.66	0.000E+000	% (	6.831E-001G	1.1E+004	85.21
EU-152 T F	1	0.000E+000	344.29	0.000E+000	% (	2.043E+000G	4.9E+003	26.50
		0.000E+000	121.78	-6.431E-002	%	1.137E+000G	4.9E+003	28.58
EU-155 T F I	1	0.000E+000	105.31	0.000E+000	% (	1.792E+000G	1.8E+003	21.20
		0.000E+000	86.54	-1.914E-001	&	1.459E+000G	1.8E+003	30.70

Analysis Codes:

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* = 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

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

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

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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	<	-1.058E-002	-1.062E-002	16.756.89	16.756.89	6.569E+000
K-40	<	-1.905E+000	-1.905E+000	274.06	274.08	1.412E+001
CO-60	<			100.00	100.04	4.508E-001
I-131	<	-1.004E-001	-1.032E-001	188.28	188.30	6.741E-001
CS-134	<			562.75	562.75	7.373E-001
EU-154	<	2.003E+000	2.004E+000	105.65	105.69	7.366E+000
RA-224	<	-2.285E+000	-2.285E+000	169.01	169.03	1.343E+001
PB-210	<	-6.019E-001	-6.019E-001	966.66	966.66	2.120E+001
PB-212	<	-4.103E-001	-4.105E-001	248.29	248.31	1.411E+000
PB-214	<	-2.576E-001	-2.576E-001	490.33	490.34	1.835E+000
Pa-234	<	-2.517E-001	-2.517E-001	209.87	209.89	1.872E+000
AM-241	<	-1.794E-001	-1.794E-001	230.53	230.56	1.450E+000
CS-137	<			405.90	405.91	6.831E-001
EU-152	<			660.96	660.97	2.043E+000
EU-155	<			867.86	867.87	1.792E+000
TL-208	<	-7.251E-002	-7.253E-002	522.68	522.69	9.800E-001
BI-212	<	-2.090E-001	-2.090E-001	889.00	889.01	6.949E+000
BI-214	<	-3.291E-001	-3.291E-001	696.11	696.11	2.044E+000
AC-228	<	-5.950E-001	-5.950E-001	553.66	553.67	3.458E+000
TH-234	<	-4.252E+000	-4.252E+000	238.01	238.04	1.235E+001
PA-234M	<	-2.528E+001	-2.528E+001	137.09	137.12	1.228E+002
U-235	<	2.251E-001	2.251E-001	364.83	364.84	3.026E+000

= All peaks for activity calculation had bad shape

Total Activity (37.87 to 2,000.50 keV) 0.00 Bq/sample

Analyzed by: _____

403605

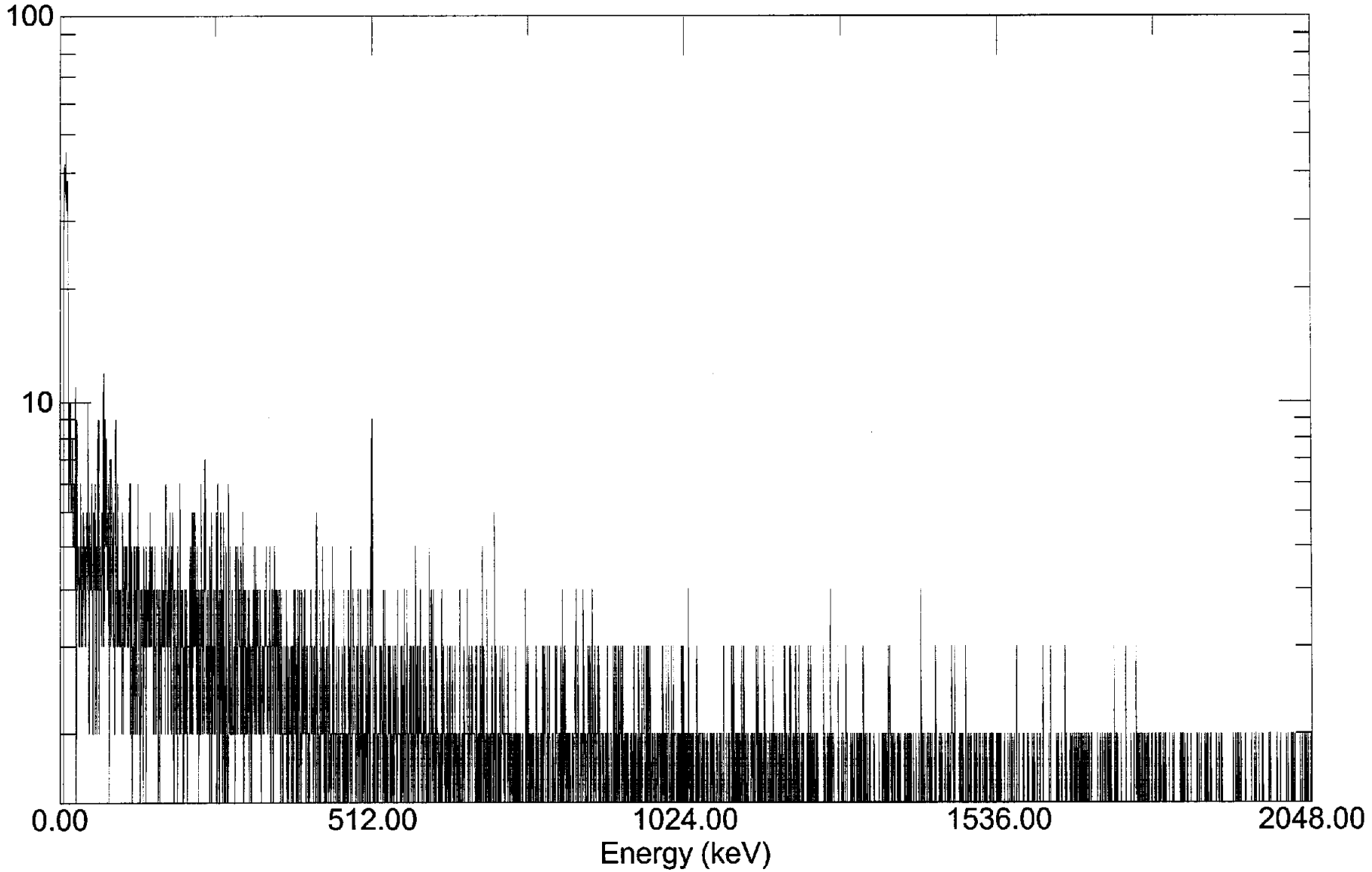
Reviewed by: _____

Supervisor

Laboratory: STL- St Louis

KER4L1AA

7360294_KER4L1AA_F7L260000-294B



Acquired: 26-Dec-2007 7:41:19 PM
File: C:\User\spectra\KER4L1AA.spc
Detector: #0 Ge 3 SN/155

Real Time: 1813.62 s. Live Time: 1800.00 s.
Channels: 8192

TestAmerica St. Louis

DB Analysis ID: 33,084

Sample Description: 7360294_KER4L1AC_F7L260000-294C

Spectrum Filename: KER4L1AC.An1

Acquisition Information

Start Time:	26-Dec-2007 7:43:24PM		
Live Time:	1800.00	Real Time:	1810.74
Dead Time:	0.59 %		
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-Mav-2007 1:28:13PM	Efficiency Created:	15-Mav-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	01-Apr-2004 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 0.2174

UNIDENTIFIED PEAK SUMMARY

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncertainty 1 Sigma%	FWHM keV	Suspected Nuclide	Code
146.17	36.58	1501.67	316.33	0.176	24.63	1.172	XE-133M	s
289.34	72.38	849.00	123.00	0.068	38.53	0.483	W-187	sM
351.98	88.05	1622.45	5729.55	3.183	1.65	0.818	PB-214	M
488.14	122.10	1335.00	0.00	0.000	10937.50	0.841		M
1540.27	385.18	386.33	123.67	0.069	33.67	0.700		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	185.65	46.45	5288.31	18511.69	10.284	1.11	0.788	s
AM-241	1	237.78	59.49	4253.33	22409.67	12.450	0.92	0.792	
TH-234	1	253.56	63.44	1768.37	-9.89	-0.005	964.92	0.834	s
EU-155	1	345.58	86.45	3361.74	-327.63	-0.182	25.63	0.854	s
TH-234	1	371.14	92.84	1324.48	18.77	0.010	120.05	0.859	s
AC-228	1	373.18	93.35	1120.58	-2.39	-0.001	-864.50	0.860	s D
U-235	1	373.18	93.35	1120.58	1.61	0.001	430.02	0.860	s D
EU-155	1	420.79	105.26	1223.45	0.31	0.000	15764.28	0.871	s
EU-152	1	488.12	122.09	1166.66	776.24	0.431	7.18	0.885	
EU-154	1	500.12	125.10	982.03	-19.86	-0.011	224.28	0.886	s
Pa-234	1	524.48	131.19	1180.12	12.17	0.007	400.20	0.894	s
U-235	1	575.04	143.83	1034.41	3.04	0.002	1496.45	0.904	s
U-235	1	653.20	163.38	1056.07	3.92	0.002	1172.70	0.922	s
U-235	1	829.36	207.43	635.93	17.07	0.009	210.36	0.958	
PB-212	1	953.16	238.38	946.46	77.50	0.043	51.02	0.986	
RA-224	1	965.28	241.42	998.04	-19.00	-0.011	236.31	0.988	s
PB-214	1	969.89	242.57	929.31	-1.66	-0.001	2602.40	0.989	s
TL-208	1	1106.53	276.73	683.27	-6.59	-0.004	562.69	1.019	
I-131	1	1143.98	286.10	547.31	37.14	0.021	90.57	1.025	s
PB-214	1	1171.10	292.88	467.83	3.63	0.002	426.52	1.034	s
PB-212	1	1190.51	297.73	472.83	-13.43	-0.007	230.64	1.039	
AC-228	1	1352.69	338.28	760.83	-24.70	-0.014	159.24	1.071	s
EU-152	1	1376.86	344.32	728.51	-25.08	-0.014	153.51	1.076	s
PB-214	1	1406.63	351.76	679.55	35.03	0.019	92.54	1.082	s
I-131	1	1460.99	365.36	662.95	6.95	0.004	525.43	1.092	s
BE-7	1	1916.33	479.18	633.44	-35.43	-0.020	101.87	1.185	s
CS-134	1	2249.41	562.44	385.31	-23.92	-0.013	117.84	1.254	s
CS-134	1	2276.94	569.32	472.23	-0.01	0.000	-129.66	1.259	s D
Pa-234	1	2277.54	569.47	386.87	1.81	0.001	243.08	1.259	s D
TL-208	1	2332.38	583.18	167.18	69.82	0.039	35.40	0.422	s
CS-134	1	2425.39	606.42	290.83	-0.05	0.000	53417.99	1.286	s
BI-214	1	2434.97	608.82	178.08	66.92	0.037	37.56	1.012	
I-131	1	2545.31	636.40	347.01	26.34	0.015	101.90	1.312	s
CS-137	1	2644.84	661.27	334.33	7441.67	4.134	1.32	1.294	
EU-154	1	2891.73	722.97	395.26	-23.94	-0.013	119.21	1.378	s
BI-212	1	2911.82	727.99	363.36	5.86	0.003	462.18	1.381	s
PA-234M	1	3063.05	765.78	338.32	38.39	0.021	69.66	1.411	s
EU-152	1	3116.55	779.15	366.62	-8.06	-0.004	337.69	1.420	s
BI-212	1	3133.74	783.44	251.74	38.61	0.021	60.31	1.425	s
CS-134	1	3182.11	795.53	437.31	-26.37	-0.015	113.84	1.433	s
CS-134	1	3207.57	801.89	385.88	22.38	0.012	125.93	1.437	s
TL-208	1	3443.04	860.72	492.62	20.60	0.011	153.95	1.481	
EU-154	1	3482.76	870.65	379.62	-23.53	-0.013	118.90	1.490	s
Pa-234	1	3526.84	881.66	539.68	-14.40	-0.008	229.68	1.495	s
Pa-234	1	3534.28	883.52	586.14	1.98	0.001	1731.33	1.497	s

AC-228	1	3642.12	910.46	569.58	-2.81	-0.002	1202.80	1.518	s
Pa-234	1	3785.04	946.17	758.64	0.35	0.000	11155.29	1.543	s
EU-152	1	3851.65	962.81	492.59	33.92	0.019	94.10	1.556	s
AC-228	1	3877.32	969.22	478.87	32.30	0.018	97.40	1.559	s
EU-154	1	3982.82	995.58	435.48	-11.71	-0.007	253.67	1.579	s
PA-234M	1	4011.86	1002.83	438.48	-9.02	-0.005	329.97	1.582	s
EU-154	1	4031.46	1007.73	347.33	13.40	0.007	198.53	1.585	s
EU-152	1	4446.23	1111.33	446.24	-8.86	-0.005	338.82	1.659	s
BI-214	1	4482.74	1120.45	372.88	-4.29	-0.002	7607.92	1.665	s
CO-60	1	4692.58	1172.86	132.00	5574.00	3.097	1.44	1.624	
EU-154	1	5100.51	1274.74	60.32	-6.01	-0.003	187.39	1.768	s
CO-60	1	5330.10	1332.07	32.00	4954.00	2.752	1.46	1.620	
EU-152	1	5631.54	1407.34	17.82	2.56	0.001	241.34	1.854	s
K-40	1	5844.96	1460.62	17.63	6.30	0.003	68.18	1.887	s
BI-214	1	7060.82	1764.12	8.86	3.60	0.002	128.31	2.066	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	
PA-234	N	1	-8.645E+001	1001.00	-8.645E+001	&	(	9.611E+002G		1.6E+012	.84
			-8.645E+001	766.41	8.386E+002	%		1.932E+003G		1.6E+012	.29
BI-214	N	1	7.670E+000	609.31	7.670E+000	%	(P	7.438E+000G		5.8E+005	46.09
			7.670E+000	1120.29	-2.502E+000	%	P	5.408E+001G		5.8E+005	15.10
			7.670E+000	1764.49	3.068E+000	%		1.413E+001G		5.8E+005	15.40
AC-228	N	1	-7.187E-001	911.07	-7.187E-001	%	(	2.914E+001G		2.1E+003	29.00
			-7.187E-001	968.97	1.445E+001	%		4.681E+001G		2.1E+003	17.46
			-7.187E-001	338.32	-6.395E+000	%		3.399E+001G		2.1E+003	12.01
			-7.187E-001	93.35	-7.187E-001	%	E	4.765E+001X	A	2.1E+003	5.56
K-40	N	1	6.524E+000	1460.83	6.524E+000	%	(P	2.308E+001G		4.7E+011	10.67
CO-60	T F	1	5.083E+002	1332.50	5.056E+002		(	2.967E+000G		1.9E+003	99.98
			5.083E+002	1173.24	5.110E+002		(	5.156E+000G		1.9E+003	99.90
CS-137	T F I	1	4.953E+002	661.66	4.953E+002		(	5.851E+000G		1.1E+004	85.21
U-235	N	1	4.629E-001	143.79	4.629E-001	&	(	2.322E+001G		2.6E+011	10.96
			4.629E-001	205.33	6.918E+000	%		4.873E+001G		2.6E+011	5.01
			4.629E-001	163.38	1.359E+000	%		5.341E+001G		2.6E+011	5.08
			4.629E-001	93.35	4.629E-001	%	E	4.560E+001X		2.6E+011	5.81
TH-234	N	1	-4.277E+000	63.29	-4.277E+000	%	(P	8.594E+001G		1.6E+012	4.82
			-4.277E+000	92.59	5.627E+000	&	P	5.166E+001G		1.6E+012	5.58
TL-208	F N	1	4.200E+000	583.02	4.200E+000	@	(P	3.788E+000G		7.0E+002	84.50
			4.200E+000	277.28	-2.711E+000	%		5.127E+001G		7.0E+002	6.31
			4.200E+000	860.56	1.174E+001	%		6.047E+001G		7.0E+002	12.42
PB-212	N	1	4.088E+000	238.63	4.088E+000	%	(P	7.705E+000G		7.0E+002	43.30
			4.088E+000	300.03	-1.141E+001	%		8.843E+001G		7.0E+002	3.28
BI-212	N	1	3.045E+000	727.33	3.045E+000	&	(	4.760E+001G		7.0E+002	11.82
			3.045E+000	785.51	2.301E+002	&		4.569E+002G		7.0E+002	1.10
PB-214	N	1	3.004E+000	351.93	3.004E+000	%	(P	1.065E+001G		5.8E+005	37.60
			3.004E+000	295.09	5.162E-001	%	P	1.473E+001G		5.8E+005	19.30
			3.004E+000	242.00	-5.154E-001	%		4.502E+001G		5.8E+005	7.43
I-131	T F I	1	2.832E-001	364.48	2.832E-001	%	(	5.001E+000G		8.0E+000	81.70
			2.832E-001	284.30	1.607E+001	&		4.834E+001G		8.0E+000	6.14
			2.832E-001	636.97	2.016E+001	&		6.853E+001G		8.0E+000	7.17
CS-134	T F I	1	-2.427E-003	604.71	-2.427E-003	%	(	4.418E+000G		7.5E+002	97.62
			-2.427E-003	795.87	-2.044E+000	%		7.763E+000G		7.5E+002	85.53
			-2.427E-003	569.32	-2.427E-003	&		3.366E+001G		7.5E+002	15.38
			-2.427E-003	801.95	1.718E+001	&		7.236E+001G		7.5E+002	8.69
			-2.427E-003	563.24	-1.413E+001	%		5.564E+001G		7.5E+002	8.35
EU-155	T F I	1	2.399E-002	105.31	2.399E-002	%	(	1.267E+001G		1.8E+003	21.20
			2.399E-002	86.54	-1.835E+001	+		1.528E+001G		1.8E+003	30.70
EU-152	T F	1	2.127E+001	344.29	-2.991E+000	%	(	1.532E+001G		4.9E+003	26.50
			2.127E+001	121.78	4.377E+001		(	9.127E+000G		4.9E+003	28.58
			2.127E+001	778.92	-4.057E+000	%		4.626E+001G		4.9E+003	12.94
			2.127E+001	964.11	1.806E+001	%		5.650E+001G		4.9E+003	14.61
			2.127E+001	1112.07	-5.687E+000	%		6.491E+001G		4.9E+003	13.64

			2.127E+001	1408.00	1.305E+000	%		1.140E+001G	4.9E+003	21.00
PB-210	N	1	1.534E+004	46.54	1.534E+004	@	(P	2.831E+002G	8.1E+003	4.25
BE-7	N P C	1	-1.435E+001	477.60	-1.435E+001	%	(	4.860E+001G	5.3E+001	10.52
AM-241	T	1	1.376E+003	59.54	1.376E+003		(	1.883E+001G	1.6E+005	35.90
EU-154	T F I	1	-1.374E+001	873.23	-1.374E+001	%	(	5.458E+001G	3.1E+003	12.27
			-1.374E+001	123.10	-7.853E-001	%		5.881E+000G	3.1E+003	40.79
			-1.374E+001	1274.54	-1.676E+000	%		1.086E+001G	3.1E+003	35.19
			-1.374E+001	723.36	-7.243E+000	%		2.885E+001G	3.1E+003	20.22
			-1.374E+001	1004.77	5.988E+000	&		4.001E+001G	3.1E+003	18.01
			-1.374E+001	996.33	-8.829E+000	%		7.535E+001G	3.1E+003	10.60
Pa-234	N	1	1.101E+000	131.29	1.101E+000	&	(	1.473E+001G	1.6E+012	18.00
			1.101E+000	569.47	1.101E+000	&		5.732E+001G	1.6E+012	8.20
			1.101E+000	946.02	1.995E-001	%		7.486E+001G	1.6E+012	13.40
			1.101E+000	883.24	1.491E+000	%		8.701E+001G	1.6E+012	9.60
			1.101E+000	880.53	-1.731E+001	%		1.334E+002G	1.6E+012	6.00
RA-224	N	1	-1.067E+001	240.99	-1.067E+001	%	(	8.420E+001G	7.0E+002	4.10

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	<	-1.435E+001		101.87	101.91	4.860E+001
K-40	<	6.524E+000	6.524E+000	98.83	98.87	2.308E+001
CO-60		5.083E+002	8.307E+002	1.03	3.02	2.967E+000
I-131	<	2.832E-001		525.43	525.43	5.001E+000
CS-134	<	-2.427E-003	-8.505E-003	53,417.99	53,417.99	4.418E+000
CS-137		4.953E+002	5.399E+002	1.32	3.19	5.851E+000
EU-152	<	2.127E+001	2.575E+001	7.18	7.74	1.532E+001
EU-155	<	2.399E-002	4.043E-002	15,764.28	15,764.28	1.267E+001
TL-208	#	4.200E+000	1.629E+001	36.50	36.62	3.788E+000
RA-224	<	-1.067E+001	-4.138E+001	236.31	236.32	8.420E+001
PB-210	#	1.534E+004	1.723E+004	1.11	4.05	2.831E+002
BI-214		7.670E+000	7.682E+000	40.51	40.61	7.438E+000
AC-228	<	-7.187E-001	-1.128E+000	1,202.80	1,202.81	2.914E+001
PA-234M	<	-8.645E+001	-8.645E+001	329.97	329.98	9.611E+002
U-235	<	4.629E-001	4.629E-001	1,496.45	1,496.46	2.322E+001
AM-241		1.376E+003	1.384E+003	0.92	3.97	1.883E+001
EU-154	<	-1.374E+001	-1.856E+001	118.90	118.93	5.458E+001
PB-212		4.088E+000	1.586E+001	57.14	57.22	7.705E+000
PB-214	<	3.004E+000	3.009E+000	106.39	106.43	1.065E+001
BI-212	<	3.045E+000	1.181E+001	462.18	462.19	4.760E+001
Pa-234	<	1.101E+000	1.101E+000	400.20	400.21	1.473E+001
TH-234	<	-4.277E+000	-4.277E+000	2,529.12	2,529.12	8.594E+001

= All peaks for activity calculation had bad shape

Total Activity (37.53 to 1,998.47 keV) 17,723.38 Bq/sample

Analyzed by: _____

403605

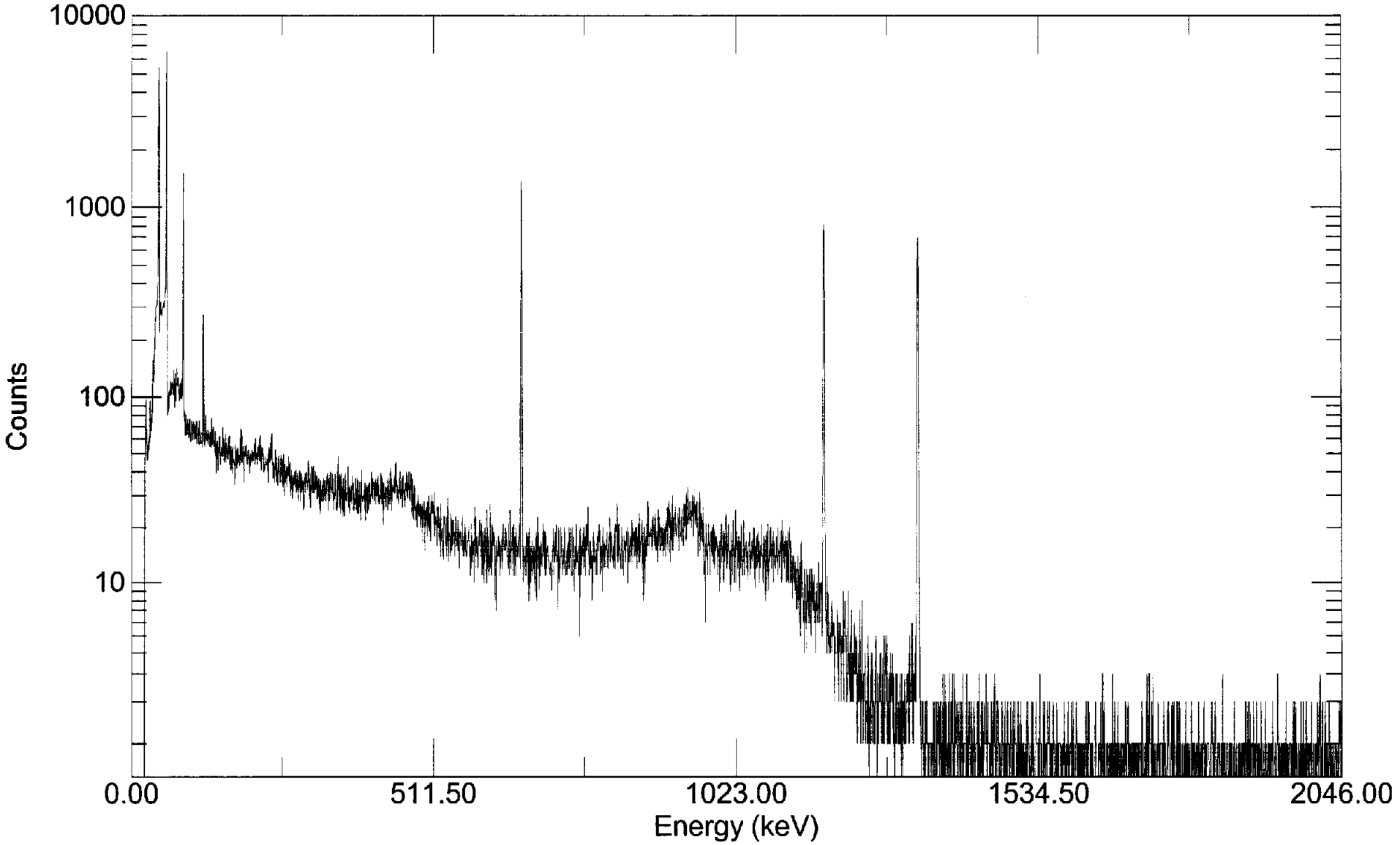
Reviewed by: _____

Supervisor

Laboratory: STL- St Louis

KER4L1AC

7360294_KER4L1AC_F7L260000-294C



Acquired: 26-Dec-2007 7:43:24 PM
File: C:\User\spectra\KER4L1AC.spc
Detector: #0 Ge 4 SN/181

Real Time: 1810.74 s. Live Time: 1800.00 s.
Channels: 8192

TestAmerica St. Louis