Environment Testing
TestAmerica

ANALYTICAL REPORT

Job Number: 180-95857-1

Job Description: WBF_BS_20190917_1B

For:
Environmental Standards Inc.
1140 Valley Forge Road
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Valley Forge, PA 19482-0810

Attention: Amanda Cover

Approved for release.
Jennifer L Rumble
Project Manager I
10/25/2019 2:45 PM

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10/25/2019

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Definitions/Glossary

Client: Environmental Standards Inc.
Project/Site: WBF_BS_20190917_1B

Job ID: 180-95857-1

Qualifiers

Rad

Qualifier	Qualifier Description
U	Result is less than the sample detection limit.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Job Narrative
180-95857-1

Receipt
The samples were received on 9/18/2019 9:00 AM; the samples arrived in good condition, properly preserved and on ice. The temperatures of the 3 coolers at receipt time were 1.3º C, 1.4º C and 2.9º C.

RAD
Method 901.1: Gamma Prep Batch 160-444057
Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative.

Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.

Many isotopes requested for analysis do not have any gamma emissions, or the gamma emissions they do have are very poor. Often, such analytes are reported by gamma spectrometry assuming secular equilibrium with a longer-lived parent. The client should ensure that such inference is acceptable for their sample based upon process knowledge. The following assumptions were made for this report:
Inferred from Reported to Analyte
Ac-228 Ra-228
Bi-214 Ra-226
WBF-BS-BG11-1.5/3.5-20190917 ~ WBF-BG-11 (180-95857-1), WBF-BS-BG11-6.5/8.5-20190917 ~ WBF-BG-11 (180-95857-2), WBF-BS-BG11-11.5/13.5-20190917 ~ WBF-BG-11 (180-95857-3), WBF-BS-BG11-11.5/13.5-20190917 ~ WBF-BG-11 (180-95857-3[DU]), WBF-BS-BG11-16.5/18.5-20190917 ~ WBF-BG-11 (180-95857-4), WBF-BS-BG11-0.0/0.5-20190917 ~ WBF-BG-11 (180-95857-5), WBF-BS-BG12-1.5/3.5-20190917 ~ WBF-BG-12 (180-95857-8), WBF-BS-BG12-6.5/8.5-20190917 ~ WBF-BG-12 (180-95857-9), WBF-BS-BG12-11.5/13.5-20190917 ~ WBF-BG-12 (180-95857-10), WBF-BS-BG12-16.5/18.5-20190917 ~ WBF-BG-12 (180-95857-11), WBF-BS-BG12-21.5/23.5-20190917 ~ WBF-BG-12 (180-95857-12), WBF-BS-BG12-0.0/0.5-20190917 ~ WBF-BG-12 (180-95857-13), WBF-BS-DUP03-20190917 ~ NA (180-95857-14), (LCS 160-444057/2-A) and (MB 160-444057/1-A)

Method 901.1: Gamma Prep Batch 160-443730
Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative.

Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.

Many isotopes requested for analysis do not have any gamma emissions, or the gamma emissions they do have are very poor. Often, such analytes are reported by gamma spectrometry assuming secular equilibrium with a longer-lived parent. The client should ensure that such inference is acceptable for their sample based upon process knowledge. The following assumptions were made for this report:
Inferred from Reported to Analyte
Ac-228 Ra-228
Bi-214 Ra-226
WBF-BS-FB09-20190917 ~ WBF-BG-11 (180-95857-6), WBF-BS-EB03-20190917 ~ WBF-BG-11 (180-95857-7), (LCS 160-443730/2-A), (MB 160-443730/1-A) and (180-95857-B-6-B DU)

Method Fill_Geo-21: Gamma Prep Batch 160-444057: Samples WBF-BS-BG11-6.5/8.5-20190917 ~ WBF-BG-11 (180-95857-2), WBF-BS-BG11-0.0/0.5-20190917 ~ WBF-BG-11 (180-95857-5), WBF-BS-BG12-6.5/8.5-20190917 ~ WBF-BG-12 (180-95857-9) and WBF-BS-BG12-0.0/0.5-20190917 ~ WBF-BG-12 (180-95857-13) are powdery soil which exhibits low density.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Detection Summary

Client: Environmental Standards Inc.
Project/Site: WBF_BS_20190917_1B

Job ID: 180-95857-1

Client Sample ID: WBF-BS-BG11-1.5/3.5-20190917 ~ WBF-BG-11 **Lab Sample ID: 180-95857-1**

No Detections.

Client Sample ID: WBF-BS-BG11-6.5/8.5-20190917 ~ WBF-BG-11 **Lab Sample ID: 180-95857-2**

No Detections.

Client Sample ID: WBF-BS-BG11-11.5/13.5-20190917 ~ WBF-BG-11 **Lab Sample ID: 180-95857-3**

No Detections.

Client Sample ID: WBF-BS-BG11-16.5/18.5-20190917 ~ WBF-BG-11 **Lab Sample ID: 180-95857-4**

No Detections.

Client Sample ID: WBF-BS-BG11-0.0/0.5-20190917 ~ WBF-BG-11 **Lab Sample ID: 180-95857-5**

No Detections.

Client Sample ID: WBF-BS-FB09-20190917 ~ WBF-BG-11 **Lab Sample ID: 180-95857-6**

No Detections.

Client Sample ID: WBF-BS-EB03-20190917 ~ WBF-BG-11 **Lab Sample ID: 180-95857-7**

No Detections.

Client Sample ID: WBF-BS-BG12-1.5/3.5-20190917 ~ WBF-BG-12 **Lab Sample ID: 180-95857-8**

No Detections.

Client Sample ID: WBF-BS-BG12-6.5/8.5-20190917 ~ WBF-BG-12 **Lab Sample ID: 180-95857-9**

No Detections.

Client Sample ID: WBF-BS-BG12-11.5/13.5-20190917 ~ WBF-BG-12 **Lab Sample ID: 180-95857-10**

No Detections.

Client Sample ID: WBF-BS-BG12-16.5/18.5-20190917 ~ WBF-BG-12 **Lab Sample ID: 180-95857-11**

No Detections.

Client Sample ID: WBF-BS-BG12-21.5/23.5-20190917 ~ WBF-BG-12 **Lab Sample ID: 180-95857-12**

No Detections.

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: Environmental Standards Inc.
Project/Site: WBF_BS_20190917_1B

Job ID: 180-95857-1

Client Sample ID: WBF-BS-BG12-0.0/0.5-20190917 ~ WBF-BG-12 — Lab Sample ID: 180-95857-13

No Detections.

Client Sample ID: WBF-BS-DUP03-20190917 ~ NA — Lab Sample ID: 180-95857-14

No Detections.

This Detection Summary does not include radiochemical test results.

Client Sample Results

Client: Environmental Standards Inc.
Project/Site: WBF_BS_20190917_1B

Job ID: 180-95857-1

Method: 901.1 - Radium-226 & Other Gamma Emitters (GS)

Client Sample ID: WBF-BS-BG11-1.5/3.5-20190917 ~ WBF-BG-11
Date Collected: 09/17/19 08:32
Date Received: 09/18/19 09:00

Lab Sample ID: 180-95857-1
Matrix: Solid

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226 and 228 (positive only)	2.25		0.428	0.459			pCi/g	09/24/19 13:36	10/15/19 10:05	1
Radium-226	0.988		0.211	0.235	1.00	0.178	pCi/g	09/24/19 13:36	10/15/19 10:05	1
Radium-228	1.26		0.372	0.394		0.404	pCi/g	09/24/19 13:36	10/15/19 10:05	1

Client Sample Results

Client: Environmental Standards Inc.
Project/Site: WBF_BS_20190917_1B

Job ID: 180-95857-1

Method: 901.1 - Radium-226 & Other Gamma Emitters (GS)

Client Sample ID: WBF-BS-BG11-6.5/8.5-20190917 ~ WBF-BG-11
Date Collected: 09/17/19 08:48
Date Received: 09/18/19 09:00

Lab Sample ID: 180-95857-2
Matrix: Solid

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226 and 228 (positive only)	3.43		0.494	0.554			pCi/g	09/24/19 13:36	10/15/19 10:44	1
Radium-226	1.33		0.325	0.352	1.00	0.283	pCi/g	09/24/19 13:36	10/15/19 10:44	1
Radium-228	2.10		0.372	0.428		0.159	pCi/g	09/24/19 13:36	10/15/19 10:44	1

Method: 901.1 - Radium-226 & Other Gamma Emitters (GS)

Client Sample ID: WBF-BS-BG11-11.5/13.5-20190917 ~ WBF-BG-11 **Lab Sample ID: 180-95857-3**
Date Collected: 09/17/19 09:08 **Matrix: Solid**
Date Received: 09/18/19 09:00

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226 and 228 (positive only)	2.91		0.471	0.517			pCi/g	09/24/19 13:36	10/15/19 10:42	1
Radium-226	1.26		0.279	0.309	1.00	0.278	pCi/g	09/24/19 13:36	10/15/19 10:42	1
Radium-228	1.65		0.379	0.415		0.266	pCi/g	09/24/19 13:36	10/15/19 10:42	1

Method: 901.1 - Radium-226 & Other Gamma Emitters (GS)

Client Sample ID: WBF-BS-BG11-16.5/18.5-20190917 ~ WBF-BG-11 **Lab Sample ID: 180-95857-4**
Date Collected: 09/17/19 09:28 **Matrix: Solid**
Date Received: 09/18/19 09:00

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226 and 228 (positive only)	3.09		0.408	0.468			pCi/g	09/24/19 13:36	10/15/19 10:43	1
Radium-226	1.18		0.248	0.276	1.00	0.166	pCi/g	09/24/19 13:36	10/15/19 10:43	1
Radium-228	1.91		0.324	0.378		0.238	pCi/g	09/24/19 13:36	10/15/19 10:43	1

Client Sample Results

Client: Environmental Standards Inc.
Project/Site: WBF_BS_20190917_1B

Job ID: 180-95857-1

Method: 901.1 - Radium-226 & Other Gamma Emitters (GS)

Client Sample ID: WBF-BS-BG11-0.0/0.5-20190917 ~ WBF-BG-11
Date Collected: 09/17/19 10:04
Date Received: 09/18/19 09:00

Lab Sample ID: 180-95857-5
Matrix: Solid

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226 and 228 (positive only)	2.49		0.326	0.372			pCi/g	09/24/19 13:36	10/15/19 11:04	1
Radium-226	1.24		0.204	0.241	1.00	0.140	pCi/g	09/24/19 13:36	10/15/19 11:04	1
Radium-228	1.25		0.254	0.284		0.202	pCi/g	09/24/19 13:36	10/15/19 11:04	1

Client Sample Results

Client: Environmental Standards Inc.
Project/Site: WBF_BS_20190917_1B

Job ID: 180-95857-1

Method: 901.1 - Radium-226 & Other Gamma Emitters (GS)

Client Sample ID: WBF-BS-FB09-20190917 ~ WBF-BG-11
Date Collected: 09/17/19 09:57
Date Received: 09/18/19 09:00

Lab Sample ID: 180-95857-6
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226 and 228 (positive only)	16.6	U	22.1	22.2			pCi/L	09/23/19 11:56	10/14/19 07:02	1
Radium-226	2.35	U	3.47	3.48	50.0	37.9	pCi/L	09/23/19 11:56	10/14/19 07:02	1
Radium-228	14.2	U	21.8	21.9	50.0	26.0	pCi/L	09/23/19 11:56	10/14/19 07:02	1

Method: 901.1 - Radium-226 & Other Gamma Emitters (GS)

Client Sample ID: WBF-BS-EB03-20190917 ~ WBF-BG-11 **Lab Sample ID: 180-95857-7**
Date Collected: 09/17/19 10:12 **Matrix: Water**
Date Received: 09/18/19 09:00

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226 and 228 (positive only)	15.1	U	17.7	17.7			pCi/L	09/23/19 11:56	10/14/19 09:20	1
Radium-226	10.7	U	12.4	12.5	50.0	16.7	pCi/L	09/23/19 11:56	10/14/19 09:20	1
Radium-228	4.39	U	12.6	12.6	50.0	26.8	pCi/L	09/23/19 11:56	10/14/19 09:20	1

Method: 901.1 - Radium-226 & Other Gamma Emitters (GS)

Client Sample ID: WBF-BS-BG12-1.5/3.5-20190917 ~ WBF-BG-12 **Lab Sample ID: 180-95857-8**
Date Collected: 09/17/19 13:18 **Matrix: Solid**
Date Received: 09/18/19 09:00

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226 and 228 (positive only)	3.23		0.494	0.548			pCi/g	09/24/19 13:36	10/15/19 11:17	1
Radium-226	1.38		0.293	0.326	1.00	0.191	pCi/g	09/24/19 13:36	10/15/19 11:17	1
Radium-228	1.85		0.398	0.441		0.461	pCi/g	09/24/19 13:36	10/15/19 11:17	1

Method: 901.1 - Radium-226 & Other Gamma Emitters (GS)

Client Sample ID: WBF-BS-BG12-6.5/8.5-20190917 ~ WBF-BG-12 **Lab Sample ID: 180-95857-9**
Date Collected: 09/17/19 13:30 **Matrix: Solid**
Date Received: 09/18/19 09:00

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226 and 228 (positive only)	3.44		0.605	0.654			pCi/g	09/24/19 13:36	10/15/19 11:20	1
Radium-226	1.54		0.339	0.373	1.00	0.263	pCi/g	09/24/19 13:36	10/15/19 11:20	1
Radium-228	1.90		0.501	0.537		0.582	pCi/g	09/24/19 13:36	10/15/19 11:20	1

Method: 901.1 - Radium-226 & Other Gamma Emitters (GS)

Client Sample ID: WBF-BS-BG12-11.5/13.5-20190917 ~ WBF-BG-12 **Lab Sample ID: 180-95857-10**
Date Collected: 09/17/19 13:52 **Matrix: Solid**
Date Received: 09/18/19 09:00

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226 and 228 (positive only)	3.18		0.371	0.438			pCi/g	09/24/19 13:36	10/15/19 11:57	1
Radium-226	1.39		0.237	0.277	1.00	0.173	pCi/g	09/24/19 13:36	10/15/19 11:57	1
Radium-228	1.79		0.285	0.339		0.272	pCi/g	09/24/19 13:36	10/15/19 11:57	1

Method: 901.1 - Radium-226 & Other Gamma Emitters (GS)

Client Sample ID: WBF-BS-BG12-16.5/18.5-20190917 ~ WBF-BG-12 **Lab Sample ID: 180-95857-11**
Date Collected: 09/17/19 14:06 **Matrix: Solid**
Date Received: 09/18/19 09:00

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226 and 228 (positive only)	3.00		0.428	0.480			pCi/g	09/24/19 13:36	10/15/19 11:59	1
Radium-226	1.33		0.257	0.291	1.00	0.195	pCi/g	09/24/19 13:36	10/15/19 11:59	1
Radium-228	1.67		0.342	0.382		0.240	pCi/g	09/24/19 13:36	10/15/19 11:59	1

Method: 901.1 - Radium-226 & Other Gamma Emitters (GS)

Client Sample ID: WBF-BS-BG12-21.5/23.5-20190917 ~ WBF-BG-12 **Lab Sample ID: 180-95857-12**
Date Collected: 09/17/19 14:31 **Matrix: Solid**
Date Received: 09/18/19 09:00

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226 and 228 (positive only)	2.93		0.517	0.560			pCi/g	09/24/19 13:36	10/15/19 11:55	1
Radium-226	1.20		0.300	0.325	1.00	0.239	pCi/g	09/24/19 13:36	10/15/19 11:55	1
Radium-228	1.73		0.421	0.456		0.188	pCi/g	09/24/19 13:36	10/15/19 11:55	1

Client Sample Results

Client: Environmental Standards Inc.
Project/Site: WBF_BS_20190917_1B

Job ID: 180-95857-1

Method: 901.1 - Radium-226 & Other Gamma Emitters (GS)

Client Sample ID: WBF-BS-BG12-0.0/0.5-20190917 ~ WBF-BG-12
Date Collected: 09/17/19 14:50
Date Received: 09/18/19 09:00

Lab Sample ID: 180-95857-13
Matrix: Solid

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226 and 228 (positive only)	**2.05**		0.379	0.413			pCi/g	09/24/19 13:36	10/15/19 11:56	1
Radium-226	0.528	U	0.220	0.227	1.00	0.542	pCi/g	09/24/19 13:36	10/15/19 11:56	1
Radium-228	**1.52**		0.309	0.345		0.193	pCi/g	09/24/19 13:36	10/15/19 11:56	1

Client Sample Results

Client: Environmental Standards Inc.
Project/Site: WBF_BS_20190917_1B

Job ID: 180-95857-1

Method: 901.1 - Radium-226 & Other Gamma Emitters (GS)

Client Sample ID: WBF-BS-DUP03-20190917 ~ NA
Date Collected: 09/17/19 00:00
Date Received: 09/18/19 09:00

Lab Sample ID: 180-95857-14
Matrix: Solid

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226 and 228 (positive only)	2.94		0.391	0.446			pCi/g	09/24/19 13:36	10/15/19 12:45	1
Radium-226	1.41		0.239	0.280	1.00	0.157	pCi/g	09/24/19 13:36	10/15/19 12:45	1
Radium-228	1.53		0.309	0.347		0.250	pCi/g	09/24/19 13:36	10/15/19 12:45	1

Method: 901.1 - Radium-226 & Other Gamma Emitters (GS)

Lab Sample ID: MB 160-443730/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 445993 — **Prep Batch: 443730**

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226 and 228 (positive only)	14.86	U	28.9	29.0			pCi/L	09/23/19 11:56	10/14/19 06:22	1
Radium-226	14.86	U	16.8	16.9	50.0	16.7	pCi/L	09/23/19 11:56	10/14/19 06:22	1
Radium-228	-28.03	U	23.5	23.6	50.0	38.7	pCi/L	09/23/19 11:56	10/14/19 06:22	1

Lab Sample ID: LCS 160-443730/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 445994 — **Prep Batch: 443730**

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Americium-241	136000	129700		15000		293	pCi/L	96	90 - 111
Cesium-137	44200	43780		4380		82.4	pCi/L	99	90 - 111
Cobalt-60	28000	27440		2710		46.9	pCi/L	98	89 - 110

Lab Sample ID: 180-95857-6 DU — **Client Sample ID: WBF-BS-FB09-20190917 ~ WBF-BG-11**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 447046 — **Prep Batch: 443730**

Analyte	Sample Result	Sample Qual	DU Result	DU Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	RER	RER Limit
Radium 226 and 228 (positive only)	16.6	U	28.59		24.9			pCi/L	0.26	
Radium-226	2.35	U	15.70	U	14.6	50.0	18.1	pCi/L	0.74	1
Radium-228	14.2	U	12.89	U	20.2	50.0	26.8	pCi/L	0.03	1

Lab Sample ID: MB 160-444057/1-A — **Client Sample ID: Method Blank**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 446100 — **Prep Batch: 444057**

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226 and 228 (positive only)	0.2367	U	0.117	0.119			pCi/g	09/24/19 13:36	10/15/19 10:06	1
Radium-226	0.04714	U	0.0422	0.0424	1.00	0.288	pCi/g	09/24/19 13:36	10/15/19 10:06	1
Radium-228	0.1896		0.109	0.111		0.129	pCi/g	09/24/19 13:36	10/15/19 10:06	1

Lab Sample ID: LCS 160-444057/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 446102 — **Prep Batch: 444057**

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Americium-241	96.6	98.56		10.4		1.28	pCi/g	102	87 - 116
Cesium-137	27.5	26.80		2.89		0.362	pCi/g	98	87 - 120
Cobalt-60	11.0	11.04		1.19		0.0587	pCi/g	100	87 - 115

Method: 901.1 - Radium-226 & Other Gamma Emitters (GS) (Continued)

Lab Sample ID: 180-95857-3 DU
Client Sample ID: WBF-BS-BG11-11.5/13.5-20190917 ~ WBF-BG-11
Matrix: Solid
Prep Type: Total/NA
Analysis Batch: 446103
Prep Batch: 444057

Analyte	Sample Result	Sample Qual		DU Result	DU Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit			RER	RER Limit
Radium 226 and 228 (positive only)	2.91			3.113		0.486			pCi/g			0.20	
Radium-226	1.26			1.491		0.338	1.00	0.206	pCi/g			0.36	1
Radium-228	1.65			1.622		0.349		0.147	pCi/g			0.04	1

QC Association Summary

Client: Environmental Standards Inc.
Project/Site: WBF_BS_20190917_1B

Job ID: 180-95857-1

Rad

Leach Batch: 443563

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-95857-1	WBF-BS-BG11-1.5/3.5-20190917 ~ WBF-BG-11	Total/NA	Solid	Dry and Grind	
180-95857-2	WBF-BS-BG11-6.5/8.5-20190917 ~ WBF-BG-11	Total/NA	Solid	Dry and Grind	
180-95857-3	WBF-BS-BG11-11.5/13.5-20190917 ~ WBF-BG-	Total/NA	Solid	Dry and Grind	
180-95857-4	WBF-BS-BG11-16.5/18.5-20190917 ~ WBF-BG-	Total/NA	Solid	Dry and Grind	
180-95857-5	WBF-BS-BG11-0.0/0.5-20190917 ~ WBF-BG-11	Total/NA	Solid	Dry and Grind	
180-95857-8	WBF-BS-BG12-1.5/3.5-20190917 ~ WBF-BG-12	Total/NA	Solid	Dry and Grind	
180-95857-9	WBF-BS-BG12-6.5/8.5-20190917 ~ WBF-BG-12	Total/NA	Solid	Dry and Grind	
180-95857-10	WBF-BS-BG12-11.5/13.5-20190917 ~ WBF-BG-	Total/NA	Solid	Dry and Grind	
180-95857-11	WBF-BS-BG12-16.5/18.5-20190917 ~ WBF-BG-	Total/NA	Solid	Dry and Grind	
180-95857-12	WBF-BS-BG12-21.5/23.5-20190917 ~ WBF-BG-	Total/NA	Solid	Dry and Grind	
180-95857-13	WBF-BS-BG12-0.0/0.5-20190917 ~ WBF-BG-12	Total/NA	Solid	Dry and Grind	
180-95857-14	WBF-BS-DUP03-20190917 ~ NA	Total/NA	Solid	Dry and Grind	
180-95857-3 DU	WBF-BS-BG11-11.5/13.5-20190917 ~ WBF-BG-	Total/NA	Solid	Dry and Grind	

Prep Batch: 443730

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-95857-6	WBF-BS-FB09-20190917 ~ WBF-BG-11	Total/NA	Water	Fill_Geo-21	
180-95857-7	WBF-BS-EB03-20190917 ~ WBF-BG-11	Total/NA	Water	Fill_Geo-21	
MB 160-443730/1-A	Method Blank	Total/NA	Water	Fill_Geo-21	
LCS 160-443730/2-A	Lab Control Sample	Total/NA	Water	Fill_Geo-21	
180-95857-6 DU	WBF-BS-FB09-20190917 ~ WBF-BG-11	Total/NA	Water	Fill_Geo-21	

Prep Batch: 444057

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-95857-1	WBF-BS-BG11-1.5/3.5-20190917 ~ WBF-BG-11	Total/NA	Solid	Fill_Geo-21	443563
180-95857-2	WBF-BS-BG11-6.5/8.5-20190917 ~ WBF-BG-11	Total/NA	Solid	Fill_Geo-21	443563
180-95857-3	WBF-BS-BG11-11.5/13.5-20190917 ~ WBF-BG-	Total/NA	Solid	Fill_Geo-21	443563
180-95857-4	WBF-BS-BG11-16.5/18.5-20190917 ~ WBF-BG-	Total/NA	Solid	Fill_Geo-21	443563
180-95857-5	WBF-BS-BG11-0.0/0.5-20190917 ~ WBF-BG-11	Total/NA	Solid	Fill_Geo-21	443563
180-95857-8	WBF-BS-BG12-1.5/3.5-20190917 ~ WBF-BG-12	Total/NA	Solid	Fill_Geo-21	443563
180-95857-9	WBF-BS-BG12-6.5/8.5-20190917 ~ WBF-BG-12	Total/NA	Solid	Fill_Geo-21	443563
180-95857-10	WBF-BS-BG12-11.5/13.5-20190917 ~ WBF-BG-	Total/NA	Solid	Fill_Geo-21	443563
180-95857-11	WBF-BS-BG12-16.5/18.5-20190917 ~ WBF-BG-	Total/NA	Solid	Fill_Geo-21	443563
180-95857-12	WBF-BS-BG12-21.5/23.5-20190917 ~ WBF-BG-	Total/NA	Solid	Fill_Geo-21	443563
180-95857-13	WBF-BS-BG12-0.0/0.5-20190917 ~ WBF-BG-12	Total/NA	Solid	Fill_Geo-21	443563
180-95857-14	WBF-BS-DUP03-20190917 ~ NA	Total/NA	Solid	Fill_Geo-21	443563
MB 160-444057/1-A	Method Blank	Total/NA	Solid	Fill_Geo-21	
LCS 160-444057/2-A	Lab Control Sample	Total/NA	Solid	Fill_Geo-21	
180-95857-3 DU	WBF-BS-BG11-11.5/13.5-20190917 ~ WBF-BG-	Total/NA	Solid	Fill_Geo-21	443563

Lab Chronicle

Client: Environmental Standards Inc.
Project/Site: WBF_BS_20190917_1B

Job ID: 180-95857-1

Client Sample ID: WBF-BS-BG11-1.5/3.5-20190917 ~ WBF-BG-11

Lab Sample ID: 180-95857-1

Date Collected: 09/17/19 08:32
Date Received: 09/18/19 09:00

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Leach	Dry and Grind			1.0 g	1.0 g	443563	09/20/19 15:21	DRO	TAL SL
Total/NA	Prep	Fill_Geo-21			279.3 g	1.0 g	444057	09/24/19 13:36	KRS	TAL SL
Total/NA	Analysis	901.1		1			446103	10/15/19 10:05	KLS	TAL SL
	Instrument ID:	GAMMAVISION								

Client Sample ID: WBF-BS-BG11-6.5/8.5-20190917 ~ WBF-BG-11

Lab Sample ID: 180-95857-2

Date Collected: 09/17/19 08:48
Date Received: 09/18/19 09:00

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Leach	Dry and Grind			1.0 g	1.0 g	443563	09/20/19 15:21	DRO	TAL SL
Total/NA	Prep	Fill_Geo-21			236.2 g	1.0 g	444057	09/24/19 13:36	KRS	TAL SL
Total/NA	Analysis	901.1		1			446100	10/15/19 10:44	KLS	TAL SL
	Instrument ID:	GAMMAVISION								

Client Sample ID: WBF-BS-BG11-11.5/13.5-20190917 ~ WBF-BG-11

Lab Sample ID: 180-95857-3

Date Collected: 09/17/19 09:08
Date Received: 09/18/19 09:00

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Leach	Dry and Grind			1.0 g	1.0 g	443563	09/20/19 15:21	DRO	TAL SL
Total/NA	Prep	Fill_Geo-21			280.4 g	1.0 g	444057	09/24/19 13:36	KRS	TAL SL
Total/NA	Analysis	901.1		1			446102	10/15/19 10:42	KLS	TAL SL
	Instrument ID:	GAMMAVISION								

Client Sample ID: WBF-BS-BG11-16.5/18.5-20190917 ~ WBF-BG-11

Lab Sample ID: 180-95857-4

Date Collected: 09/17/19 09:28
Date Received: 09/18/19 09:00

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Leach	Dry and Grind			1.0 g	1.0 g	443563	09/20/19 15:21	DRO	TAL SL
Total/NA	Prep	Fill_Geo-21			253.5 g	1.0 g	444057	09/24/19 13:36	KRS	TAL SL
Total/NA	Analysis	901.1		1			446103	10/15/19 10:43	KLS	TAL SL
	Instrument ID:	GAMMAVISION								

Client Sample ID: WBF-BS-BG11-0.0/0.5-20190917 ~ WBF-BG-11

Lab Sample ID: 180-95857-5

Date Collected: 09/17/19 10:04
Date Received: 09/18/19 09:00

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Leach	Dry and Grind			1.0 g	1.0 g	443563	09/20/19 15:21	DRO	TAL SL
Total/NA	Prep	Fill_Geo-21			240.5 g	1.0 g	444057	09/24/19 13:36	KRS	TAL SL
Total/NA	Analysis	901.1		1			446101	10/15/19 11:04	KLS	TAL SL
	Instrument ID:	GAMMAVISION								

Client Sample ID: WBF-BS-FB09-20190917 ~ WBF-BG-11

Lab Sample ID: 180-95857-6

Date Collected: 09/17/19 09:57
Date Received: 09/18/19 09:00

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Fill_Geo-21			1000 mL	1.0 g	443730	09/23/19 11:56	KRS	TAL SL
Total/NA	Analysis	901.1		1			445992	10/14/19 07:02	KLS	TAL SL
	Instrument ID:	GAMMAVISION								

Client Sample ID: WBF-BS-EB03-20190917 ~ WBF-BG-11

Lab Sample ID: 180-95857-7

Date Collected: 09/17/19 10:12
Date Received: 09/18/19 09:00

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Fill_Geo-21			1000 mL	1.0 g	443730	09/23/19 11:56	KRS	TAL SL
Total/NA	Analysis	901.1		1			445994	10/14/19 09:20	KLS	TAL SL
	Instrument ID:	GAMMAVISION								

Client Sample ID: WBF-BS-BG12-1.5/3.5-20190917 ~ WBF-BG-12

Lab Sample ID: 180-95857-8

Date Collected: 09/17/19 13:18
Date Received: 09/18/19 09:00

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Leach	Dry and Grind			1.0 g	1.0 g	443563	09/20/19 15:21	DRO	TAL SL
Total/NA	Prep	Fill_Geo-21			254.1 g	1.0 g	444057	09/24/19 13:36	KRS	TAL SL
Total/NA	Analysis	901.1		1			446102	10/15/19 11:17	KLS	TAL SL
	Instrument ID:	GAMMAVISION								

Client Sample ID: WBF-BS-BG12-6.5/8.5-20190917 ~ WBF-BG-12

Lab Sample ID: 180-95857-9

Date Collected: 09/17/19 13:30
Date Received: 09/18/19 09:00

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Leach	Dry and Grind			1.0 g	1.0 g	443563	09/20/19 15:21	DRO	TAL SL
Total/NA	Prep	Fill_Geo-21			228.2 g	1.0 g	444057	09/24/19 13:36	KRS	TAL SL
Total/NA	Analysis	901.1		1			446100	10/15/19 11:20	KLS	TAL SL
	Instrument ID:	GAMMAVISION								

Client Sample ID: WBF-BS-BG12-11.5/13.5-20190917 ~ WBF-BG-12 — Lab Sample ID: 180-95857-10

Date Collected: 09/17/19 13:52 **Matrix: Solid**
Date Received: 09/18/19 09:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Leach	Dry and Grind			1.0 g	1.0 g	443563	09/20/19 15:21	DRO	TAL SL
Total/NA	Prep	Fill_Geo-21			267.5 g	1.0 g	444057	09/24/19 13:36	KRS	TAL SL
Total/NA	Analysis	901.1		1			446101	10/15/19 11:57	KLS	TAL SL
	Instrument ID:	GAMMAVISION								

Client Sample ID: WBF-BS-BG12-16.5/18.5-20190917 ~ WBF-BG-12 — Lab Sample ID: 180-95857-11

Date Collected: 09/17/19 14:06 **Matrix: Solid**
Date Received: 09/18/19 09:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Leach	Dry and Grind			1.0 g	1.0 g	443563	09/20/19 15:21	DRO	TAL SL
Total/NA	Prep	Fill_Geo-21			251.5 g	1.0 g	444057	09/24/19 13:36	KRS	TAL SL
Total/NA	Analysis	901.1		1			446100	10/15/19 11:59	KLS	TAL SL
	Instrument ID:	GAMMAVISION								

Client Sample ID: WBF-BS-BG12-21.5/23.5-20190917 ~ WBF-BG-12 — Lab Sample ID: 180-95857-12

Date Collected: 09/17/19 14:31 **Matrix: Solid**
Date Received: 09/18/19 09:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Leach	Dry and Grind			1.0 g	1.0 g	443563	09/20/19 15:21	DRO	TAL SL
Total/NA	Prep	Fill_Geo-21			267.9 g	1.0 g	444057	09/24/19 13:36	KRS	TAL SL
Total/NA	Analysis	901.1		1			446102	10/15/19 11:55	KLS	TAL SL
	Instrument ID:	GAMMAVISION								

Client Sample ID: WBF-BS-BG12-0.0/0.5-20190917 ~ WBF-BG-12 — Lab Sample ID: 180-95857-13

Date Collected: 09/17/19 14:50 **Matrix: Solid**
Date Received: 09/18/19 09:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Leach	Dry and Grind			1.0 g	1.0 g	443563	09/20/19 15:21	DRO	TAL SL
Total/NA	Prep	Fill_Geo-21			213.3 g	1.0 g	444057	09/24/19 13:36	KRS	TAL SL
Total/NA	Analysis	901.1		1			446103	10/15/19 11:56	KLS	TAL SL
	Instrument ID:	GAMMAVISION								

Lab Chronicle

Client: Environmental Standards Inc.
Project/Site: WBF_BS_20190917_1B

Job ID: 180-95857-1

Client Sample ID: WBF-BS-DUP03-20190917 ~ NA

Lab Sample ID: 180-95857-14

Date Collected: 09/17/19 00:00
Date Received: 09/18/19 09:00

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Leach	Dry and Grind			1.0 g	1.0 g	443563	09/20/19 15:21	DRO	TAL SL
Total/NA	Prep	Fill_Geo-21			245.7 g	1.0 g	444057	09/24/19 13:36	KRS	TAL SL
Total/NA	Analysis	901.1		1			446101	10/15/19 12:45	KLS	TAL SL
	Instrument ID:	GAMMAVISION								

Laboratory References:

TAL SL = Eurofins TestAmerica, St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Analyst References:

Lab: TAL SL

Batch Type: Leach

DRO = David Oetter

Batch Type: Prep

KRS = Kurt Slama

Batch Type: Analysis

KLS = Kody Saulters

Accreditation/Certification Summary

Client: Environmental Standards Inc.
Project/Site: WBF_BS_20190917_1B

Job ID: 180-95857-1

Laboratory: Eurofins TestAmerica, Pittsburgh

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Arkansas DEQ	State	19-033-0	06-27-20
California	State	2891	04-30-20
Connecticut	State	PH-0688	09-30-20
Florida	NELAP	E871008	06-30-20
Georgia	State	PA 02-00416	04-30-20
Illinois	NELAP	004375	06-30-20
Kansas	NELAP	E-10350	03-31-20
Kentucky (UST)	State	162013	04-30-20
Kentucky (WW)	State	KY98043	12-31-19
Louisiana	NELAP	04041	06-30-20
Minnesota	NELAP	042-999-482	12-31-19
Nevada	State	PA00164	07-31-20
New Hampshire	NELAP	2030	04-04-20
New Hampshire	NELAP	2030	04-04-20
New Jersey	NELAP	PA005	06-30-20
New York	NELAP	11182	04-01-20
North Carolina (WW/SW)	State	434	12-31-19
North Dakota	State	R-227	04-30-20
Oregon	NELAP	PA-2151	02-06-20
Pennsylvania	NELAP	02-00416	04-30-20
Rhode Island	State	LAO00362	12-30-19
South Carolina	State	89014	04-30-20
Texas	NELAP	T104704528	03-31-20
US Fish & Wildlife	US Federal Programs	058448	07-31-20
USDA	Federal	P-Soil-01	06-26-22
USDA	US Federal Programs	P330-16-00211	06-26-22
Utah	NELAP	PA001462019-8	05-31-20
Virginia	NELAP	10043	09-15-20
West Virginia DEP	State	142	01-31-20
Wisconsin	State	998027800	08-31-20

Accreditation/Certification Summary

Client: Environmental Standards Inc.
Project/Site: WBF_BS_20190917_1B

Job ID: 180-95857-1

Laboratory: Eurofins TestAmerica, St. Louis

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
ANAB	Dept. of Defense ELAP	L2305	04-06-22
ANAB	Dept. of Energy	L2305.01	04-06-22
ANAB	ISO/IEC 17025	L2305	04-06-22
Arizona	State	AZ0813	12-08-19
California	Los Angeles County Sanitation Districts	10259	06-30-20
California	State	2886	06-30-20
Connecticut	State	PH-0241	03-31-21
Florida	NELAP	E87689	06-30-20
HI - RadChem Recognition	State	n/a	06-30-20
Illinois	NELAP	004553	11-30-19
Iowa	State	373	09-17-20
Iowa	State Program	373	12-01-20
Kansas	NELAP	E-10236	10-31-19 *
Kentucky (DW)	State	KY90125	12-31-19
Louisiana	NELAP	04080	06-30-20
Louisiana (DW)	State	LA011	12-31-19
Maryland	State	310	09-30-20
MI - RadChem Recognition	State	9005	06-30-20
Missouri	State	780	06-30-22
Nevada	State	MO000542020-1	07-31-20
New Jersey	NELAP	MO002	06-30-20
New York	NELAP	11616	04-01-20
North Dakota	State	R-207	06-30-20
NRC	NRC	24-24817-01	12-31-22
Oklahoma	State	9997	08-31-20
Pennsylvania	NELAP	68-00540	02-28-20
South Carolina	State	85002001	06-30-20
Texas	NELAP	T104704193-19-13	07-31-20
US Fish & Wildlife	US Federal Programs	058448	07-31-20
USDA	US Federal Programs	P330-17-00028	02-02-20
Utah	NELAP	MO000542019-11	07-31-20
Virginia	NELAP	10310	06-14-20
Washington	State	C592	08-30-20
Washington	State Program	C592	08-30-19 *
West Virginia DEP	State	381	10-31-19
West Virginia DEP	State Program	381	10-31-19 *

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Method Summary

Client: Environmental Standards Inc.
Project/Site: WBF_BS_20190917_1B

Job ID: 180-95857-1

Method	Method Description	Protocol	Laboratory
901.1	Radium-226 & Other Gamma Emitters (GS)	EPA	TAL SL
Dry and Grind	Preparation, Dry and Grind	None	TAL SL
Fill_Geo-21	Fill Geometry, 21-Day In-Growth	None	TAL SL

Protocol References:

EPA = US Environmental Protection Agency
None = None

Laboratory References:

TAL SL = Eurofins TestAmerica, St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Sample Summary

Client: Environmental Standards Inc.
Project/Site: WBF_BS_20190917_1B

Job ID: 180-95857-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
180-95857-1	WBF-BS-BG11-1.5/3.5-20190917 ~ WBF-BG-11	Solid	09/17/19 08:32	09/18/19 09:00	
180-95857-2	WBF-BS-BG11-6.5/8.5-20190917 ~ WBF-BG-11	Solid	09/17/19 08:48	09/18/19 09:00	
180-95857-3	WBF-BS-BG11-11.5/13.5-20190917 ~ WBF-BG-11	Solid	09/17/19 09:08	09/18/19 09:00	
180-95857-4	WBF-BS-BG11-16.5/18.5-20190917 ~ WBF-BG-11	Solid	09/17/19 09:28	09/18/19 09:00	
180-95857-5	WBF-BS-BG11-0.0/0.5-20190917 ~ WBF-BG-11	Solid	09/17/19 10:04	09/18/19 09:00	
180-95857-6	WBF-BS-FB09-20190917 ~ WBF-BG-11	Water	09/17/19 09:57	09/18/19 09:00	
180-95857-7	WBF-BS-EB03-20190917 ~ WBF-BG-11	Water	09/17/19 10:12	09/18/19 09:00	
180-95857-8	WBF-BS-BG12-1.5/3.5-20190917 ~ WBF-BG-12	Solid	09/17/19 13:18	09/18/19 09:00	
180-95857-9	WBF-BS-BG12-6.5/8.5-20190917 ~ WBF-BG-12	Solid	09/17/19 13:30	09/18/19 09:00	
180-95857-10	WBF-BS-BG12-11.5/13.5-20190917 ~ WBF-BG-12	Solid	09/17/19 13:52	09/18/19 09:00	
180-95857-11	WBF-BS-BG12-16.5/18.5-20190917 ~ WBF-BG-12	Solid	09/17/19 14:06	09/18/19 09:00	
180-95857-12	WBF-BS-BG12-21.5/23.5-20190917 ~ WBF-BG-12	Solid	09/17/19 14:31	09/18/19 09:00	
180-95857-13	WBF-BS-BG12-0.0/0.5-20190917 ~ WBF-BG-12	Solid	09/17/19 14:50	09/18/19 09:00	
180-95857-14	WBF-BS-DUP03-20190917 ~ NA	Solid	09/17/19 00:00	09/18/19 09:00	

REAGENT TRACEABILITY SUMMARY

Lab Name: Eurofins TestAmerica, St. Louis Job No.: 180-95857-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
1L Marn LCS_00006	09/18/20	Eckert & Ziegler, Lot 83924-334			(Purchased Reagent)		Americium-241	305.85 dpm/g
							Cesium-137	120.21 dpm/g
							Cobalt-60	197.61 dpm/g
1L Marn_00002	03/02/16	Eckert & Ziegler, Lot 83924-334			(Purchased Reagent)		Americium-241	5097.5 pCi/L
							Ce-139	2399.2 pCi/L
							Cesium-137	2003.5 pCi/L
							Co-57	1564.3 pCi/L
							Cobalt-60	3293.9 pCi/L
							Mn-54	3083.6 pCi/L
							Sn-113	4248.4 pCi/L
							Y-88	6929.6 pCi/L
1L Marn_00003	02/09/17	Eckert & Ziegler, Lot 90062			(Purchased Reagent)		Americium-241	5072.4 Bq
							Cd-109	72078 Bq
							Ce-139	2418 Bq
							Cesium-137	2056.4 Bq
							Co-57	1593.5 Bq
							Cobalt-60	3233.8 Bq
							Hg-203	5155.9 Bq
							Mn-54	3114.6 Bq
							Sn-113	4253.1 Bq
							Y-88	7000 Bq
Source A_00001	04/01/59	02/23/11	water, Lot 79670-334	0.9986 Source	Gamma Ampuole_00001	0.9986 g	Americium-241	9.4429 Bq
							Cd-109	132.909 Bq
							Ce-139	4.4538 Bq
							Cesium-137	3.7296 Bq
							Co-57	2.9513 Bq
							Cobalt-60	6.2002 Bq
							Hg-203	9.6996 Bq
							Sn-113	7.6266 Bq
							Y-88	12.712 Bq
.Gamma Ampuole_00001	04/07/59	Analytics, Lot 79670-334			(Purchased Reagent)		Americium-241	9442.9 Bq
							Cd-109	132909 Bq
							Ce-139	4453.8 Bq
							Cesium-137	3729.6 Bq
							Co-57	2951.3 Bq
							Cobalt-60	6200.2 Bq
							Hg-203	9699.6 Bq
							Sn-113	7626.6 Bq
							Y-88	12712 Bq
Source D_00001	04/01/59	02/23/11	water, Lot 79670-334	0.9781 g	Gamma Ampuole_00001	0.9781 g	Americium-241	9442.9 Bq
							Cd-109	132909 Bq
							Ce-139	4453.8 Bq
							Cesium-137	3729.6 Bq
							Co-57	2951.3 Bq
							Cobalt-60	6200.2 Bq

REAGENT TRACEABILITY SUMMARY

Lab Name: Eurofins TestAmerica, St. Louis Job No.: 180-95857-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Hg-203	9699.6 Bq
							Sn-113	7626.6 Bq
							Y-88	12712 Bq
.Gamma Ampuole_00001	04/07/59		Analytics, Lot 79670-334		(Purchased Reagent)		Americium-241	9442.9 Bq
							Cd-109	132909 Bq
							Ce-139	4453.8 Bq
							Cesium-137	3729.6 Bq
							Co-57	2951.3 Bq
							Cobalt-60	6200.2 Bq
							Hg-203	9699.6 Bq
							Sn-113	7626.6 Bq
							Y-88	12712 Bq
Source E_00001	04/01/59	02/23/11	water, Lot 79670-334	1.0205 g	Gamma Ampuole_00001	1.0205 g	Americium-241	9442.9 Bq
							Cd-109	132909 Bq
							Ce-139	4453.8 Bq
							Cesium-137	3729.6 Bq
							Co-57	2951.3 Bq
							Cobalt-60	6200.2 Bq
							Hg-203	9699.6 Bq
							Sn-113	7626.6 Bq
							Y-88	12712 Bq
.Gamma Ampuole_00001	04/07/59		Analytics, Lot 79670-334		(Purchased Reagent)		Americium-241	9442.9 Bq
							Cd-109	132909 Bq
							Ce-139	4453.8 Bq
							Cesium-137	3729.6 Bq
							Co-57	2951.3 Bq
							Cobalt-60	6200.2 Bq
							Hg-203	9699.6 Bq
							Sn-113	7626.6 Bq
							Y-88	12712 Bq
Source G_00001	01/01/61	01/01/11	water, Lot 83725-334	10 mL	Gamma Ampuole_00003	1.8639 g	Americium-241	1693.09 Bq
							Cd-109	24592.1 Bq
							Ce-139	816.481 Bq
							Cesium-137	681.815 Bq
							Co-57	532.386 Bq
							Cobalt-60	1120.87 Bq
							Hg-203	1766.08 Bq
							Sn-113	1445.98 Bq
							Y-88	2359.21 Bq
.Gamma Ampuole_00003	01/19/61		Analytics, Lot 83725-334		(Purchased Reagent)		Americium-241	9083.6 Bq
							Cd-109	131939 Bq
							Ce-139	4380.5 Bq
							Cesium-137	3658 Bq
							Co-57	2856.3 Bq
							Cobalt-60	6013.6 Bq
							Hg-203	9475.2 Bq
							Sn-113	7757.8 Bq

REAGENT TRACEABILITY SUMMARY

Lab Name: Eurofins TestAmerica, St. Louis Job No.: 180-95857-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Y-88	12657.4 Bq
Source H_00002	01/01/51	01/01/12	wataer, Lot 83725-334	10 mL	Gamma Ampuole_00003	2.1184 g	Americium-241	1924.27 Bq
							Cd-109	27950 Bq
							Ce-139	927.965 Bq
							Cesium-137	774.911 Bq
							Co-57	605.079 Bq
							Cobalt-60	1273.92 Bq
							Hg-203	2007.23 Bq
							Sn-113	1643.41 Bq
							Y-88	2681.34 Bq
.Gamma Ampuole_00003	01/19/61	Analytics, Lot 83725-334			(Purchased Reagent)		Americium-241	9083.6 Bq
							Cd-109	131939 Bq
							Ce-139	4380.5 Bq
							Cesium-137	3658 Bq
							Co-57	2856.3 Bq
							Cobalt-60	6013.6 Bq
							Hg-203	9475.2 Bq
							Sn-113	7757.8 Bq
							Y-88	12657.4 Bq
Tuna Can LCS_00009	09/13/20	Analytics, Lot 74139-334			(Purchased Reagent)		Americium-241	219 dpm/g
							Cesium-137	82.3 dpm/g
							Cobalt-60	136 dpm/g
Tuna Can_00003	02/09/17	Eckert & Ziegler, Lot 90099			(Purchased Reagent)		Americium-241	1164 Bq
							Cd-109	16373 Bq
							Ce-139	549 Bq
							Cesium-137	467 Bq
							Co-57	362 Bq
							Cobalt-60	735 Bq
							Hg-203	1171 Bq
							Pb-210	14936 Bq
							Sn-113	967 Bq
							Y-88	1590 Bq
Tuna Can_00006	03/01/16	Eckert & Ziegler, Lot 83814-334			(Purchased Reagent)		Americium-241	1195 Bq
							Cd-109	16353 Bq
							Ce-139	543 Bq
							Cesium-137	453 Bq
							Co-57	354 Bq
							Cobalt-60	745 Bq
							Hg-203	1175 Bq
							Pb-210	14606 Bq
							Sn-113	961 Bq
							Y-88	1568 Bq

Reagent

1L Marn_00002

Eckert & Ziegler
Analytics

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www.analyticsinc.com

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

83924-334

1.0 Liter Solid in 130G GA-MA Beaker

Customer: Test America St. Louis
P.O. No.: 2401509, Item 1
Reference Date: 01-Jan-2011 12:00 PM EST **Grams of Master Source:** 0.015372

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 1, February, 1979, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." EZA is accredited by the Health Physics Society (HPS) for the production of NIST-traceable sources, and this source was produced in accordance with the HPS accreditation requirements. Customers may report any concerns with the accreditation program to the HPS Secretariat, 1313 Dolley Madison Blvd., Ste. 402, McLean, VA 22101. Density of solid matrix 1.15 g/cc.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* γps/gram	This Source γps	Uncertainty, % Type u_A	u_B	U	Calibration Method
Am-241	59.5	1.580E+05	———	1.830E+03	0.1	1.7	3.5	4π LS
Cd-109	88.0	4.626E+02	1.697E+05	2.609E+03	0.8	2.3	4.9	HPGe
Co-57	122.1	2.718E+02	8.711E+04	1.339E+03	0.5	2.0	4.1	HPGe
Ce-139	165.9	1.376E+02	1.247E+05	1.917E+03	0.5	1.9	3.9	HPGe
Hg-203	279.2	4.661E+01	2.753E+05	4.232E+03	0.4	1.9	3.9	HPGe
Sn-113	391.7	1.151E+02	1.769E+05	2.719E+03	0.5	1.9	3.9	HPGe
Cs-137	661.7	1.098E+04	1.109E+05	1.705E+03	0.7	1.9	4.0	HPGe
Mn-54	834.9	3.121E+02	———	3.083E+03	0.1	1.7	3.3	IC
Y-88	898.0	1.066E+02	4.224E+05	6.493E+03	0.5	1.9	3.9	HPGe
Zn-65	1115.6	2.441E+02	———	3.181E+03	0.1	1.7	3.5	IC
Co-60	1173.2	1.925E+03	2.142E+05	3.293E+03	0.6	1.9	4.0	HPGe
Co-60	1332.5	1.925E+03	2.143E+05	3.294E+03	0.6	1.9	4.0	HPGe
Y-88	1836.1	1.066E+02	4.472E+05	6.874E+03	0.5	1.9	3.9	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. **Uncertainty:** U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

(Certificate continued on reverse side)

ACCREDITED SOURCE CALIBRATION LABORATORY HEALTH PHYSICS SOCIETY FOUNDED 1968

6675
ID: 1L Marn_00002
Exp 03/02/18 Prpd: JW Open 03/02/11
Mixed Gamma 1L Marn 2011

91608
ID: 1L Marn_00004
Exp:02/15/14 Prpd:JW Opn:03/
Mixed Gamma 1L Marn

MGS Certificate, Rev 2 09-28-2009

Page 1 of 2

This standard will expire one year after the reference date.

Source Prepared by: _____
W. Mao, Radiochemist

QA Approved: _____ Date: 2/23/11
J. D. McCorvey, QA Manager Alternate

Reagent

1L Marn_00003

Eckert & Ziegler
Analytics

1380 Seaboard Industrial Blvd.
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Fax 404·352·2837
www.analyticsinc.com

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

90062

1.0 Liter Solid in 130G GA-MA Beaker

Customer: TestAmerica St. Louis
P.O. No.: 2455298, Item 1
Reference Date: 01-Jan-2012 12:00 PM EST **Grams of Master Source:** 0.015513

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Additional radionuclides were added gravimetrically from solutions calibrated by gamma-ray spectrometry, ionization chamber, or liquid scintillation counting. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." EZA is accredited by the Health Physics Society (HPS) for the production of NIST-traceable sources, and this source was produced in accordance with the HPS accreditation requirements. Customers may report any concerns with the accreditation program to the HPS Secretariat, 1313 Dolley Madison Blvd., Ste. 402, McLean, VA 22101.
Density of solid matrix 1.15 g/cc.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* γps/gram	This Source γps	Uncertainty*, % Type u_A	u_B	U	Calibration Method*
Am-241	59.5	1.580E+05	———	1.821E+03	0.1	1.7	3.5	4π LS
Cd-109	88.0	4.626E+02	1.677E+05	2.602E+03	0.5	2.3	4.7	HPGe
Co-57	122.1	2.718E+02	8.795E+04	1.364E+03	0.4	2.0	4.1	HPGe
Ce-139	165.9	1.376E+02	1.245E+05	1.932E+03	0.4	1.9	3.9	HPGe
Hg-203	279.2	4.661E+01	2.707E+05	4.200E+03	0.3	1.9	3.8	HPGe
Sn-113	391.7	1.151E+02	1.755E+05	2.722E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.098E+04	1.128E+05	1.750E+03	0.7	1.9	4.0	HPGe
Mn-54	834.9	3.121E+02	———	3.114E+03	0.1	1.7	3.3	IC
Y-88	898.0	1.066E+02	4.228E+05	6.559E+03	0.5	1.9	3.9	HPGe
Zn-65	1115.6	2.441E+02	———	3.134E+03	0.1	1.7	3.5	IC
Co-60	1173.2	1.925E+03	2.084E+05	3.233E+03	0.6	1.9	4.0	HPGe
Co-60	1332.5	1.925E+03	2.084E+05	3.233E+03	0.7	1.9	4.0	HPGe
Y-88	1836.1	1.066E+02	4.476E+05	6.944E+03	0.7	1.9	4.0	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. **Uncertainty:** U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

(Certificate continued on reverse side)

This standard will expire one year after the reference date.

Source Prepared by: M. Williford
M. Williford, Radiochemist

QA Approved: J. McCorvey
J.D. McCorvey, Counting Room Manager

Date: 26 Jan 12

Reagent

Gamma Ampuole_00001

Eckert & Ziegler
Analytics

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404•352•8677
Fax 404•352•2837
www.analyticsinc.com

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

79670-334

5 mL Liquid in Flame Sealed Vial

Customer: TestAmerica St. Louis
P.O. No.: 2303925, Item 1
Calibration Date: 01-Apr-2009 12:00 EST **Grams of Master Source:** 0.028371

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Analytics maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 1, February, 1979, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST."

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* γps/gram	This Source γps	Uncertainty, % Type u_A	u_B	U	Calibration Method
Am-241	59.5	157860	———	3.390E+03	0.1	0.9	1.8	4π LS
Cd-109	88.0	462.60	1.691E+05	4.798E+03	0.4	1.7	3.5	HPGe
Co-57	122.1	271.79	8.904E+04	2.526E+03	0.5	1.3	2.8	HPGe
Ce-139	165.9	137.6	1.256E+05	3.563E+03	0.4	1.1	2.3	HPGe
Hg-203	279.2	46.61	2.788E+05	7.910E+03	0.3	1.1	2.3	HPGe
Sn-113	391.7	115.1	1.725E+05	4.894E+03	0.5	1.1	2.4	HPGe
Cs-137	661.7	10983	1.120E+05	3.178E+03	0.7	1.2	2.8	HPGe
Y-88	898.0	106.6	4.205E+05	1.193E+04	0.8	1.1	2.7	HPGe
Co-60	1173.2	1925.4	2.184E+05	6.196E+03	0.7	1.1	2.6	HPGe
Co-60	1332.5	1925.4	2.185E+05	6.199E+03	0.7	1.1	2.6	HPGe
Y-88	1836.1	106.6	4.444E+05	1.261E+04	0.7	1.1	2.6	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. **Uncertainty:** U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

Comments:
5.31740 grams 4M HCl solution with approximately 30 microg/g each of Cd, Co, Ce, Hg, Sn, Cs, and Y carriers.

This standard will expire one year after the calibration date.

Source Prepared by: [signature] for
W. Mao, Radiochemist

QA Approved: [signature] Date: 5-13-09
D. M. Montgomery, QA Manager

End of Certificate

Corporate Office
24937 Avenue Tibbitts Valencia, California 91355
Laboratory
1380 Seaboard Industrial Blvd. Atlanta, Georgia, 30318

Reagent

Gamma Ampuole_00003

Eckert & Ziegler
Analytics

1380 Seaboard Industrial Blvd.
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Fax 404•352•2837
www.analyticsinc.com

CERTIFICATE OF CALIBRATION
Standard Radionuclide Source

83725-334
5 mL Liquid in Flame Sealed Vial

Customer: Test America St. Louis/Earth City, MO
P.O. No.: 2397508, Item 1
Reference Date: 01-Jan-2011 12:00 PM EST **Grams of Master Source:** 0.028066

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 1, February, 1979, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." EZA is accredited by the Health Physics Society (HPS) for the production of NIST-traceable sources, and this source was produced in accordance with the HPS accreditation requirements. Customers may report any concerns with the accreditation program to the HPS Secretariat, 1313 Dolley Madison Blvd., Ste. 402, McLean, VA 22101.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* γps/gram	This Source γps	Uncertainty, % Type u_A	u_B	U	Calibration Method
Am-241	59.5	1.580E+05	———	3.261E+03	0.1	0.9	1.8	4π LS
Cd-109	88.0	4.626E+02	1.697E+05	4.763E+03	0.8	1.7	3.8	HPGe
Co-57	122.1	2.718E+02	8.711E+04	2.445E+03	0.5	1.3	2.8	HPGe
Ce-139	165.9	1.376E+02	1.247E+05	3.500E+03	0.5	1.1	2.4	HPGe
Hg-203	279.2	4.661E+01	2.753E+05	7.727E+03	0.4	1.1	2.3	HPGe
Sn-113	391.7	1.151E+02	1.769E+05	4.965E+03	0.5	1.1	2.4	HPGe
Cs-137	661.7	1.098E+04	1.109E+05	3.113E+03	0.7	1.2	2.8	HPGe
Y-88	898.0	1.066E+02	4.224E+05	1.186E+04	0.5	1.1	2.4	HPGe
Co-60	1173.2	1.925E+03	2.142E+05	6.012E+03	0.6	1.1	2.5	HPGe
Co-60	1332.5	1.925E+03	2.143E+05	6.015E+03	0.6	1.1	2.5	HPGe
Y-88	1836.1	1.066E+02	4.472E+05	1.255E+04	0.5	1.1	2.4	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. **Uncertainty:** U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

(Certificate continued on reverse side)

Comments:
5.30203 grams 4M HCl solution with approximately 30 μg/g each of Cd, Co, Ce, Hg, Sn, Cs, and Y carriers.

This standard will expire one year after the reference date.

Source Prepared by: MITaskaeva
M. I. Taskaeva, Radiochemist

QA Approved: _____ Date: 13/JAN/11
J. D. McCorvey, QA Manager Alternate

Reagent

Source A_00001

Eckert & Ziegler
Analytics

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404•352•8677
Fax 404•352•2837
www.analyticsinc.com

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

79670-334

5 mL Liquid in Flame Sealed Vial

Customer: TestAmerica St. Louis
P.O. No.: 2303925, Item 1
Calibration Date: 01-Apr-2009 12:00 EST **Grams of Master Source:** 0.028371

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Analytics maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 1, February, 1979, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST."

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* γps/gram	This Source γps	Uncertainty, % Type u_A	u_B	U	Calibration Method
Am-241	59.5	157860	———	3.390E+03	0.1	0.9	1.8	4π LS
Cd-109	88.0	462.60	1.691E+05	4.798E+03	0.4	1.7	3.5	HPGe
Co-57	122.1	271.79	8.904E+04	2.526E+03	0.5	1.3	2.8	HPGe
Ce-139	165.9	137.6	1.256E+05	3.563E+03	0.4	1.1	2.3	HPGe
Hg-203	279.2	46.61	2.788E+05	7.910E+03	0.3	1.1	2.3	HPGe
Sn-113	391.7	115.1	1.725E+05	4.894E+03	0.5	1.1	2.4	HPGe
Cs-137	661.7	10983	1.120E+05	3.178E+03	0.7	1.2	2.8	HPGe
Y-88	898.0	106.6	4.205E+05	1.193E+04	0.8	1.1	2.7	HPGe
Co-60	1173.2	1925.4	2.184E+05	6.196E+03	0.7	1.1	2.6	HPGe
Co-60	1332.5	1925.4	2.185E+05	6.199E+03	0.7	1.1	2.6	HPGe
Y-88	1836.1	106.6	4.444E+05	1.261E+04	0.7	1.1	2.6	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. **Uncertainty:** U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

Comments:
5.31740 grams 4M HCl solution with approximately 30 microg/g each of Cd, Co, Ce, Hg, Sn, Cs, and Y carriers.

This standard will expire one year after the calibration date.

Source Prepared by: [signature] for
W. Mao, Radiochemist

QA Approved: [signature] Date: 5-13-09
D. M. Montgomery, QA Manager

End of Certificate

Corporate Office
24937 Avenue Tibbitts Valencia, California 91355
Laboratory
1380 Seaboard Industrial Blvd. Atlanta, Georgia, 30318

Reagent

Source D_00001

Eckert & Ziegler
Analytics

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404•352•8677
Fax 404•352•2837
www.analyticsinc.com

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

79670-334

5 mL Liquid in Flame Sealed Vial

Customer: TestAmerica St. Louis
P.O. No.: 2303925, Item 1
Calibration Date: 01-Apr-2009 12:00 EST **Grams of Master Source:** 0.028371

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Analytics maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 1, February, 1979, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST."

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* γps/gram	This Source γps	Uncertainty, % Type u_A	u_B	U	Calibration Method
Am-241	59.5	157860	———	3.390E+03	0.1	0.9	1.8	4π LS
Cd-109	88.0	462.60	1.691E+05	4.798E+03	0.4	1.7	3.5	HPGe
Co-57	122.1	271.79	8.904E+04	2.526E+03	0.5	1.3	2.8	HPGe
Ce-139	165.9	137.6	1.256E+05	3.563E+03	0.4	1.1	2.3	HPGe
Hg-203	279.2	46.61	2.788E+05	7.910E+03	0.3	1.1	2.3	HPGe
Sn-113	391.7	115.1	1.725E+05	4.894E+03	0.5	1.1	2.4	HPGe
Cs-137	661.7	10983	1.120E+05	3.178E+03	0.7	1.2	2.8	HPGe
Y-88	898.0	106.6	4.205E+05	1.193E+04	0.8	1.1	2.7	HPGe
Co-60	1173.2	1925.4	2.184E+05	6.196E+03	0.7	1.1	2.6	HPGe
Co-60	1332.5	1925.4	2.185E+05	6.199E+03	0.7	1.1	2.6	HPGe
Y-88	1836.1	106.6	4.444E+05	1.261E+04	0.7	1.1	2.6	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. **Uncertainty:** U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

Comments:
5.31740 grams 4M HCl solution with approximately 30 microg/g each of Cd, Co, Ce, Hg, Sn, Cs, and Y carriers.

This standard will expire one year after the calibration date.

Source Prepared by: [signature] for
W. Mao, Radiochemist

QA Approved: [signature] Date: 5-13-09
D. M. Montgomery, QA Manager

End of Certificate

Corporate Office
24937 Avenue Tibbitts Valencia, California 91355
Laboratory
1380 Seaboard Industrial Blvd. Atlanta, Georgia, 30318

Reagent

Source E_00001

Eckert & Ziegler
Analytics

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404•352•8677
Fax 404•352•2837
www.analyticsinc.com

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

79670-334

5 mL Liquid in Flame Sealed Vial

Customer: TestAmerica St. Louis
P.O. No.: 2303925, Item 1
Calibration Date: 01-Apr-2009 12:00 EST **Grams of Master Source:** 0.028371

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Analytics maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 1, February, 1979, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST."

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* γps/gram	This Source γps	Uncertainty, % Type u_A	u_B	U	Calibration Method
Am-241	59.5	157860	———	3.390E+03	0.1	0.9	1.8	4π LS
Cd-109	88.0	462.60	1.691E+05	4.798E+03	0.4	1.7	3.5	HPGe
Co-57	122.1	271.79	8.904E+04	2.526E+03	0.5	1.3	2.8	HPGe
Ce-139	165.9	137.6	1.256E+05	3.563E+03	0.4	1.1	2.3	HPGe
Hg-203	279.2	46.61	2.788E+05	7.910E+03	0.3	1.1	2.3	HPGe
Sn-113	391.7	115.1	1.725E+05	4.894E+03	0.5	1.1	2.4	HPGe
Cs-137	661.7	10983	1.120E+05	3.178E+03	0.7	1.2	2.8	HPGe
Y-88	898.0	106.6	4.205E+05	1.193E+04	0.8	1.1	2.7	HPGe
Co-60	1173.2	1925.4	2.184E+05	6.196E+03	0.7	1.1	2.6	HPGe
Co-60	1332.5	1925.4	2.185E+05	6.199E+03	0.7	1.1	2.6	HPGe
Y-88	1836.1	106.6	4.444E+05	1.261E+04	0.7	1.1	2.6	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. **Uncertainty:** U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

Comments:
5.31740 grams 4M HCl solution with approximately 30 microg/g each of Cd, Co, Ce, Hg, Sn, Cs, and Y carriers.

This standard will expire one year after the calibration date.

Source Prepared by: [signature] for
W. Mao, Radiochemist

QA Approved: [signature] Date: 5-13-09
D. M. Montgomery, QA Manager

End of Certificate

Corporate Office
24937 Avenue Tibbitts Valencia, California 91355

Laboratory
1380 Seaboard Industrial Blvd. Atlanta, Georgia, 30318

Reagent

Source G_00001

Eckert & Ziegler
Analytics

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404•352•8677
Fax 404•352•2837
www.analyticsinc.com

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

79670-334

5 mL Liquid in Flame Sealed Vial

Customer: TestAmerica St. Louis
P.O. No.: 2303925, Item 1
Calibration Date: 01-Apr-2009 12:00 EST **Grams of Master Source:** 0.028371

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Analytics maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 1, February, 1979, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST."

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* γps/gram	This Source γps	Uncertainty, % Type u_A	u_B	U	Calibration Method
Am-241	59.5	157860	———	3.390E+03	0.1	0.9	1.8	4π LS
Cd-109	88.0	462.60	1.691E+05	4.798E+03	0.4	1.7	3.5	HPGe
Co-57	122.1	271.79	8.904E+04	2.526E+03	0.5	1.3	2.8	HPGe
Ce-139	165.9	137.6	1.256E+05	3.563E+03	0.4	1.1	2.3	HPGe
Hg-203	279.2	46.61	2.788E+05	7.910E+03	0.3	1.1	2.3	HPGe
Sn-113	391.7	115.1	1.725E+05	4.894E+03	0.5	1.1	2.4	HPGe
Cs-137	661.7	10983	1.120E+05	3.178E+03	0.7	1.2	2.8	HPGe
Y-88	898.0	106.6	4.205E+05	1.193E+04	0.8	1.1	2.7	HPGe
Co-60	1173.2	1925.4	2.184E+05	6.196E+03	0.7	1.1	2.6	HPGe
Co-60	1332.5	1925.4	2.185E+05	6.199E+03	0.7	1.1	2.6	HPGe
Y-88	1836.1	106.6	4.444E+05	1.261E+04	0.7	1.1	2.6	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. **Uncertainty:** U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

Comments:
5.31740 grams 4M HCl solution with approximately 30 microg/g each of Cd, Co, Ce, Hg, Sn, Cs, and Y carriers.

This standard will expire one year after the calibration date.

Source Prepared by: [signature] for
W. Mao, Radiochemist

QA Approved: [signature] Date: 5-13-09
D. M. Montgomery, QA Manager

End of Certificate

Corporate Office
24937 Avenue Tibbitts Valencia, California 91355

Laboratory
1380 Seaboard Industrial Blvd. Atlanta, Georgia, 30318

Eckert & Ziegler
Analytics

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404•352•8677
Fax 404•352•2837
www.analyticsinc.com

CERTIFICATE OF CALIBRATION
Standard Radionuclide Source

83725-334
5 mL Liquid in Flame Sealed Vial

Customer: Test America St. Louis/Earth City, MO
P.O. No.: 2397508, Item 1
Reference Date: 01-Jan-2011 12:00 PM EST **Grams of Master Source:** 0.028066

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 1, February, 1979, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." EZA is accredited by the Health Physics Society (HPS) for the production of NIST-traceable sources, and this source was produced in accordance with the HPS accreditation requirements. Customers may report any concerns with the accreditation program to the HPS Secretariat, 1313 Dolley Madison Blvd., Ste. 402, McLean, VA 22101.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* γps/gram	This Source γps	Uncertainty, % Type u_A	u_B	U	Calibration Method
Am-241	59.5	1.580E+05	———	3.261E+03	0.1	0.9	1.8	4π LS
Cd-109	88.0	4.626E+02	1.697E+05	4.763E+03	0.8	1.7	3.8	HPGe
Co-57	122.1	2.718E+02	8.711E+04	2.445E+03	0.5	1.3	2.8	HPGe
Ce-139	165.9	1.376E+02	1.247E+05	3.500E+03	0.5	1.1	2.4	HPGe
Hg-203	279.2	4.661E+01	2.753E+05	7.727E+03	0.4	1.1	2.3	HPGe
Sn-113	391.7	1.151E+02	1.769E+05	4.965E+03	0.5	1.1	2.4	HPGe
Cs-137	661.7	1.098E+04	1.109E+05	3.113E+03	0.7	1.2	2.8	HPGe
Y-88	898.0	1.066E+02	4.224E+05	1.186E+04	0.5	1.1	2.4	HPGe
Co-60	1173.2	1.925E+03	2.142E+05	6.012E+03	0.6	1.1	2.5	HPGe
Co-60	1332.5	1.925E+03	2.143E+05	6.015E+03	0.6	1.1	2.5	HPGe
Y-88	1836.1	1.066E+02	4.472E+05	1.255E+04	0.5	1.1	2.4	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. **Uncertainty:** U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

(Certificate continued on reverse side)

Comments:
5.30203 grams 4M HCl solution with approximately 30 μg/g each of Cd, Co, Ce, Hg, Sn, Cs, and Y carriers.

This standard will expire one year after the reference date.

Source Prepared by: MITaskaeva
M. I. Taskaeva, Radiochemist

QA Approved: _____ Date: 13/JAN/11
J. D. McCorvey, QA Manager Alternate

Reagent

Source H_00002

Eckert & Ziegler
Analytics

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404•352•8677
Fax 404•352•2837
www.analyticsinc.com

CERTIFICATE OF CALIBRATION
Standard Radionuclide Source

83725-334
5 mL Liquid in Flame Sealed Vial

Customer: Test America St. Louis/Earth City, MO
P.O. No.: 2397508, Item 1
Reference Date: 01-Jan-2011 12:00 PM EST **Grams of Master Source:** 0.028066

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 1, February, 1979, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." EZA is accredited by the Health Physics Society (HPS) for the production of NIST-traceable sources, and this source was produced in accordance with the HPS accreditation requirements. Customers may report any concerns with the accreditation program to the HPS Secretariat, 1313 Dolley Madison Blvd., Ste. 402, McLean, VA 22101.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* γps/gram	This Source γps	Uncertainty, % Type u_A	u_B	U	Calibration Method
Am-241	59.5	1.580E+05	———	3.261E+03	0.1	0.9	1.8	4π LS
Cd-109	88.0	4.626E+02	1.697E+05	4.763E+03	0.8	1.7	3.8	HPGe
Co-57	122.1	2.718E+02	8.711E+04	2.445E+03	0.5	1.3	2.8	HPGe
Ce-139	165.9	1.376E+02	1.247E+05	3.500E+03	0.5	1.1	2.4	HPGe
Hg-203	279.2	4.661E+01	2.753E+05	7.727E+03	0.4	1.1	2.3	HPGe
Sn-113	391.7	1.151E+02	1.769E+05	4.965E+03	0.5	1.1	2.4	HPGe
Cs-137	661.7	1.098E+04	1.109E+05	3.113E+03	0.7	1.2	2.8	HPGe
Y-88	898.0	1.066E+02	4.224E+05	1.186E+04	0.5	1.1	2.4	HPGe
Co-60	1173.2	1.925E+03	2.142E+05	6.012E+03	0.6	1.1	2.5	HPGe
Co-60	1332.5	1.925E+03	2.143E+05	6.015E+03	0.6	1.1	2.5	HPGe
Y-88	1836.1	1.066E+02	4.472E+05	1.255E+04	0.5	1.1	2.4	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. **Uncertainty:** U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

(Certificate continued on reverse side)

Comments:
5.30203 grams 4M HCl solution with approximately 30 μg/g each of Cd, Co, Ce, Hg, Sn, Cs, and Y carriers.

This standard will expire one year after the reference date.

Source Prepared by: MITaskaeva
M. I. Taskaeva, Radiochemist

QA Approved: _____ Date: 13/JAN/11
J. D. McCorvey, QA Manager Alternate

Reagent

Tuna Can LCS_00009

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

St. Louis Radiological Standard Verification

Printed: 9/17/2019 12:40 PM

Standard ID Number: 1798543
True Value = 27.51 pCi/L or g
Date Analyzed: 9/13/2019

Radionuclide: Cs-137

	Replicates	
#1	28.54	pCi/L or g
#2	26.76	pCi/L or g
#3	26.73	pCi/L or g

Tuna can LCS-00009

Mean = 27.343333

1 sigma = 1.0364523

1.96 sigma = 2.031446

True Value minus 5% = 26.1345 (True Value - 5%)
True Value plus 5% = 28.8855 (True Value + 5%)

Accuracy:
Mean value within 5% of Certified (True) Value? Yes **(Acceptance Criteria)**

Precision:
1.96 sigma Value Within 10% of Mean Value? Yes **(Acceptance Criteria)**

Standard Reverification Acceptable? Yes

Note: Criteria for reverification of radiological standards is taken from the DoD/DOE Consolidated QSM and LANL Statements of Work

1st Reviewed By/Date: cmm 9/17/19

2nd Reviewed By/Date: CJP 9/17/19

St. Louis Radiological Standard Verification

Printed: 9/17/2019 12:43 PM

Standard ID Number: 1798543
True Value = 11.16 pCi/L or g
Date Analyzed: 9/13/2019

Radionuclide: Co-60

	Replicates	
#1	11	pCi/L or g
#2	10.57	pCi/L or g
#3	10.6	pCi/L or g

Mean = 10.723333

1 sigma = 0.2400694

1.96 sigma = 0.470536

True Value minus 5% = 10.602 (True Value - 5%)
True Value plus 5% = 11.718 (True Value + 5%)

Accuracy:
Mean value within 5% of Certified (True) Value? Yes **(Acceptance Criteria)**

Precision:
1.96 sigma Value Within 10% of Mean Value? Yes **(Acceptance Criteria)**

Standard Reverification Acceptable? Yes

Note: Criteria for reverification of radiological standards is taken from the DoD/DOE Consolidated QSM and LANL Statements of Work

1st Reviewed By/Date: umm 9/17/19

2nd Reviewed By/Date: [illegible] 9/17/19

St. Louis Radiological Standard Verification

Standard ID Number: 1798543
True Value = 96.62 pCi/L or g
Date Analyzed: 9/13/2019

Radionuclide: Am-241

	Replicates	
#1	101.7	pCi/L or g
#2	96.41	pCi/L or g
#3	95.48	pCi/L or g

Mean = 97.863333

1 sigma = 3.355031

1.96 sigma = 6.575861

True Value minus 5% = 91.789 (True Value - 5%)
True Value plus 5% = 101.451 (True Value + 5%)

Accuracy:
Mean value within 5% of Certified (True) Value? Yes **(Acceptance Criteria)**

Precision:
1.96 sigma Value Within 10% of Mean Value? Yes **(Acceptance Criteria)**

Standard Reverification Acceptable? Yes

Note: Criteria for reverification of radiological standards is taken from the DoD/DOE Consolidated QSM and LANL Statements of Work

1st Reviewed By/Date: Cmm 9/17/19

2nd Reviewed By/Date: CJP 9/17/19

eurofins Environment Testing TestAmerica

Analysis Report for Gamma Spectroscopy

Batch: 442821 **Operator:**

MQO

SampID	WRKNO	Aliquot	Sigma	Instrument	Detector	CountDateTime	CountDuration
LCS 160-442821~2-	LCS	341.90g	1.00	GammaVision	GV05	9 / 13 / 19 11:44	30

Analyte	Cmpnd#	Activity	TotalUnc	CountUnc	MDA	MLCC	Act/MDA	
AC-228	11136	4.065E-001pCi/g	3.032E-001	3.025E-001	1.192E+000	5.689E-001	0.34	0.3032
AG-108M	10982	1.185E-001pCi/g	7.877E-002	7.853E-002	3.100E-001	1.503E-001	0.38	0.0788
AG-110M	10973	2.000E-001pCi/g	9.003E-002	8.945E-002	5.914E-001	2.852E-001	0.34	0.0900
AM-241	10818	1.017E+002pCi/g	5.329E+000	7.416E-001	8.130E-001	4.000E-001	125.08	5.3292
BA-133	10469	1.514E-001pCi/g	1.488E-001	1.485E-001	4.938E-001	2.411E-001	0.31	0.1488
BA-140	10463	2.083E-001pCi/g	2.262E-001	2.259E-001	9.621E-001	4.604E-001	0.22	0.2262
BE-7	10435	1.114E+000pCi/g	1.027E+000	1.025E+000	3.407E+000	1.660E+000	0.33	1.0267
BI-207	10195	-2.863E-001pCi/g	2.010E-001	2.004E-001	5.293E-001	2.527E-001	-0.54	0.2010
BI-210M	10173	-1.581E-001pCi/g	2.131E-001	2.129E-001	4.979E-001	2.433E-001	-0.32	0.2131
BI-212	10160	9.310E-001pCi/g	1.149E+000	1.148E+000	3.868E+000	1.848E+000	0.24	1.1488
BI-214	10154	2.326E-001pCi/g	2.064E-001	2.060E-001	1.071E+000	5.232E-001	0.22	0.2064
CD-109	9254	1.444E+000pCi/g	2.033E+000	2.031E+000	6.744E+000	3.327E+000	0.21	2.0327
CD-113M	17462	8.913E+002pCi/g	1.147E+003	1.145E+003	3.822E+003	1.865E+003	0.23	1,146.6992
CE-139	9241	4.620E-002pCi/g	7.074E-002	7.060E-002	2.355E-001	1.154E-001	0.20	0.0707
CE-141	9235	-8.939E-002pCi/g	1.306E-001	1.305E-001	4.344E-001	2.135E-001	-0.21	0.1306
CE-144	9221	-3.028E-002pCi/g	5.116E-001	5.116E-001	1.716E+000	8.424E-001	-0.02	0.5116
CF-249	9215	9.341E-002pCi/g	1.575E-001	1.574E-001	5.640E-001	2.762E-001	0.17	0.1575
CF-251	13690	2.026E-002pCi/g	3.341E-001	3.341E-001	8.977E-001	4.371E-001	0.02	0.3341
CO-56	8704	-5.180E-002pCi/g	6.396E-002	6.391E-002	3.155E-001	1.504E-001	-0.16	0.0640
CO-57	13694	5.022E-002pCi/g	6.294E-002	6.288E-002	2.192E-001	1.077E-001	0.23	0.0629
CO-58	8698	1.213E-001pCi/g	1.166E-001	1.164E-001	3.887E-001	1.872E-001	0.31	0.1166
CO-60	8692	1.100E+001pCi/g	5.892E-001	2.058E-001	5.871E-002	1.856E-002	187.32	0.5892
CR-51	8604	8.324E-001pCi/g	8.498E-001	8.486E-001	2.823E+000	1.378E+000	0.29	0.8498
CS-134	8553	1.015E-001pCi/g	1.246E-001	1.244E-001	4.184E-001	2.010E-001	0.24	0.1246
CS-136	8546	-1.530E-001pCi/g	1.378E-001	1.376E-001	4.578E-001	2.217E-001	-0.33	0.1378
CS-137	8539	2.854E+001pCi/g	1.538E+000	4.012E-001	2.446E-001	1.153E-001	116.69	1.5381
EU-152	7145	3.020E-001pCi/g	2.418E-001	2.413E-001	6.436E-001	3.160E-001	0.47	0.2418
EU-154	7138	2.290E-001pCi/g	2.544E-001	2.542E-001	4.328E-001	2.123E-001	0.53	0.2544
EU-155	7131	-2.454E-001pCi/g	3.675E-001	3.673E-001	1.219E+000	6.019E-001	-0.20	0.3675
FE-59	7073	-3.237E-001pCi/g	3.238E-001	3.234E-001	7.052E-001	3.364E-001	-0.46	0.3238
GA-68	18005	-9.487E-001pCi/g	6.188E+000	6.188E+000	1.372E+001	6.538E+000	-0.07	6.1878
GD-153	6824	1.957E-001pCi/g	1.591E-001	1.586E-001	6.377E-001	3.133E-001	0.31	0.1591
HF-181	6495	-1.709E-001pCi/g	1.588E-001	1.585E-001	5.263E-001	2.574E-001	-0.32	0.1588
HG-203	6466	4.060E-002pCi/g	9.570E-002	9.567E-002	2.441E-001	1.184E-001	0.17	0.0957
I-131	6380	1.133E-001pCi/g	1.081E-001	1.079E-001	2.735E-001	1.323E-001	0.41	0.1081
IR-192	6303	-1.012E-001pCi/g	1.012E-001	1.010E-001	3.357E-001	1.641E-001	-0.30	0.1012
K-40	6148	8.569E-001pCi/g	3.415E-001	3.387E-001	9.090E-001	3.452E-001	0.94	0.3415
KR-85	6111	9.028E+000pCi/g	2.406E+001	2.405E+001	8.100E+001	3.937E+001	0.11	24.0589
LA-140	6096	7.687E-002pCi/g	2.802E-002	2.772E-002	7.164E-002	2.265E-002	1.07	0.0280
MN-54	5382	1.261E-001pCi/g	1.134E-001	1.132E-001	2.567E-001	1.210E-001	0.49	0.1134
NA-22	5201	-5.117E-003pCi/g	3.600E-002	3.600E-002	1.376E-001	5.841E-002	-0.04	0.0360
NB-94	5160	1.661E-002pCi/g	9.748E-002	9.747E-002	2.349E-001	1.110E-001	0.07	0.0975
NB-95	5154	1.187E-001pCi/g	9.088E-002	9.067E-002	3.014E-001	1.439E-001	0.39	0.0909
ND-147	5083	3.185E-001pCi/g	3.051E-001	3.045E-001	1.867E+000	8.952E-001	0.17	0.3051
NP-237	4757	-4.197E-001pCi/g	6.528E-001	6.524E-001	2.166E+000	1.070E+000	-0.19	0.6528
NP-239	4751	2.244E-001pCi/g	3.296E-001	3.293E-001	1.094E+000	5.396E-001	0.21	0.3296
PA-231	4541	1.010E+000pCi/g	4.359E+000	4.359E+000	1.455E+001	7.166E+000	0.07	4.3590
PA-233	4535	2.171E-001pCi/g	3.533E-001	3.532E-001	1.175E+000	5.785E-001	0.18	0.3533
PA-234	4528	2.721E-001pCi/g	3.471E-001	3.468E-001	1.153E+000	5.669E-001	0.24	0.3471

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PA-234M	19453	-2.323E+001pCi/g	1.952E+001	1.948E+001	6.495E+001	3.146E+001	-0.36	19.5162
PB-210	4467	7.535E+002pCi/g	4.494E+001	7.890E+000	1.440E+001	7.124E+000	52.31	44.9442
PB-212	4454	5.468E-001pCi/g	1.146E-001	1.090E-001	3.328E-001	1.605E-001	1.64	0.1146
PB-214	4448	4.716E-001pCi/g	1.908E-001	1.892E-001	8.029E-001	3.920E-001	0.59	0.1908
PM-144	19585	1.555E-002pCi/g	9.547E-002	9.547E-002	2.297E-001	1.085E-001	0.07	0.0955
PM-146	2464	5.132E-002pCi/g	8.496E-002	8.492E-002	4.790E-001	2.327E-001	0.11	0.0850
RH-106	1882	6.982E-001pCi/g	1.483E+000	1.482E+000	4.967E+000	2.426E+000	0.14	1.4829
RU-103	1828	-3.450E-002pCi/g	1.159E-001	1.159E-001	2.848E-001	1.372E-001	-0.12	0.1159
SB-124	1784	1.827E-001pCi/g	1.472E-001	1.469E-001	4.788E-001	2.337E-001	0.38	0.1472
SB-125	1777	2.430E-001pCi/g	3.275E-001	3.273E-001	9.103E-001	4.411E-001	0.27	0.3275
SC-46	1739	-1.702E-001pCi/g	1.569E-001	1.567E-001	5.215E-001	2.531E-001	-0.33	0.1569
SN-113	1570	1.532E-001pCi/g	1.719E-001	1.717E-001	5.714E-001	2.796E-001	0.27	0.1719
SN-126	17459	7.612E-001pCi/g	7.746E-001	7.736E-001	2.567E+000	1.261E+000	0.30	0.7746
TA-182	1301	7.726E-002pCi/g	1.583E-001	1.582E-001	9.973E-001	4.719E-001	0.08	0.1583
TC-99M	17412	5.631E-002pCi/g	7.110E-002	7.103E-002	2.361E-001	1.161E-001	0.24	0.0711
TH-227	1058	4.902E-001pCi/g	6.613E-001	6.606E-001	2.739E+000	1.330E+000	0.18	0.6613
TH-229	1046	5.186E-001pCi/g	1.499E+000	1.498E+000	4.004E+000	1.953E+000	0.13	1.4985
TH-234	1027	4.812E-001pCi/g	1.366E+000	1.366E+000	4.548E+000	2.244E+000	0.11	1.3664
TL-208	929	1.257E-001pCi/g	1.203E-001	1.201E-001	2.658E-001	1.265E-001	0.47	0.1203
TL-210	20861	4.217E-002pCi/g	6.801E-002	6.796E-002	3.680E-001	1.769E-001	0.11	0.0680
U-235	281	5.621E-001pCi/g	5.410E-001	5.402E-001	1.918E+000	9.431E-001	0.29	0.5410
Y-88	74	3.754E-002pCi/g	6.236E-002	6.233E-002	1.503E-001	6.088E-002	0.25	0.0624
ZN-65	31	9.256E-003pCi/g	2.828E-001	2.828E-001	9.678E-001	4.655E-001	0.01	0.2828
ZR-95	7	-1.121E-001pCi/g	1.959E-001	1.958E-001	4.656E-001	2.205E-001	-0.24	0.1959

Laboratory Control Sample Information

Sample ID	WRKNO	Analyte	Activity	StdAdded	Recovery	ZFactor
LCS 160-442821~2-A	LCS 160-442821~2-A	CS-137	2.854E-001 pCi/g	2.751E+001	103.76%	0.6435
		CO-60	1.100E+001 pCi/g	1.116E+001	98.53%	-0.2636
		AM-241	1.017E+002 pCi/g	9.662E+001	105.24%	0.9035

Sample Duplicate Information

Sample ID	Dup Sample ID	Analyte	Samp Activity	Dup Activity	RPD	RER	DER	Flag	ZFactor

Blanks Information

SampID	WRKNO	Analyte	Activity	UncTotal	ZFactor	
MB 160-442821~1-A	MB	AC-228	4.342E-002	4.965E-002	0.8746	
MB 160-442821~1-A	MB	AG-108M	1.098E-003	9.817E-004	1.1182	
MB 160-442821~1-A	MB	AG-110M	2.340E-002	1.797E-002	1.3022	
MB 160-442821~1-A	MB	AM-241	-5.731E-002	8.274E-002	-0.6926	
MB 160-442821~1-A	MB	BA-133	2.852E-002	3.243E-002	0.8794	
MB 160-442821~1-A	MB	BA-140	5.953E-002	6.662E-002	0.8937	
MB 160-442821~1-A	MB	BE-7	-2.994E-001	3.208E-001	-0.9335	
MB 160-442821~1-A	MB	BI-207	-1.018E-002	4.105E-002	-0.2481	
MB 160-442821~1-A	MB	BI-210M	-9.908E-003	3.572E-002	-0.2774	
MB 160-442821~1-A	MB	BI-212	1.756E-001	3.078E-001	0.5704	
MB 160-442821~1-A	MB	BI-214	1.393E-001	5.312E-002	2.6221	B
MB 160-442821~1-A	MB	CD-109	0.000E+000	1.699E-001	0.0000	
MB 160-442821~1-A	MB	CD-113M	2.503E+002	2.082E+002	1.2023	
MB 160-442821~1-A	MB	CE-139	-2.124E-002	2.417E-002	-0.8787	
MB 160-442821~1-A	MB	CE-141	-2.884E-002	3.258E-002	-0.8852	
MB 160-442821~1-A	MB	CE-144	1.170E-001	2.066E-001	0.5664	
MB 160-442821~1-A	MB	CF-249	1.170E-002	1.645E-002	0.7112	
MB 160-442821~1-A	MB	CF-251	1.837E-002	8.164E-002	0.2250	
MB 160-442821~1-A	MB	CO-56	-4.823E-002	4.988E-002	-0.9671	
MB 160-442821~1-A	MB	CO-57	5.510E-003	2.192E-002	0.2514	
MB 160-442821~1-A	MB	CO-58	4.697E-003	2.933E-002	0.1601	
MB 160-442821~1-A	MB	CO-60	1.531E-002	6.888E-003	2.2223	
MB 160-442821~1-A	MB	CR-51	-3.047E-001	5.786E-001	-0.5267	
MB 160-442821~1-A	MB	CS-134	3.841E-002	1.494E-002	2.5710	
MB 160-442821~1-A	MB	CS-136	1.257E-002	3.856E-003	3.2593	B
MB 160-442821~1-A	MB	CS-137	2.393E-002	2.558E-002	0.9358	
MB 160-442821~1-A	MB	EU-152	6.044E-002	2.721E-002	2.2212	
MB 160-442821~1-A	MB	EU-154	7.072E-002	5.279E-002	1.3396	
MB 160-442821~1-A	MB	EU-155	2.661E-002	4.693E-002	0.5670	
MB 160-442821~1-A	MB	FE-59	2.751E-002	5.674E-002	0.4849	
MB 160-442821~1-A	MB	GA-68	-6.817E-002	1.080E+000	-0.0631	
MB 160-442821~1-A	MB	GD-153	-4.201E-002	6.752E-002	-0.6221	
MB 160-442821~1-A	MB	HF-181	5.102E-003	8.664E-003	0.5889	
MB 160-442821~1-A	MB	HG-203	-1.206E-002	2.101E-002	-0.5742	
MB 160-442821~1-A	MB	I-131	3.155E-003	2.491E-002	0.1267	
MB 160-442821~1-A	MB	IR-192	3.111E-002	6.103E-002	0.5098	
MB 160-442821~1-A	MB	K-40	-5.436E-001	7.228E-001	-0.7520	
MB 160-442821~1-A	MB	KR-85	-4.929E+000	1.024E+001	-0.4813	
MB 160-442821~1-A	MB	LA-140	1.338E-002	1.479E-002	0.9047	
MB 160-442821~1-A	MB	MN-54	-1.909E-002	3.907E-002	-0.4885	
MB 160-442821~1-A	MB	NA-22	1.521E-002	2.411E-002	0.6309	
MB 160-442821~1-A	MB	NB-94	5.593E-002	1.577E-002	3.5459	B
MB 160-442821~1-A	MB	NB-95	7.234E-003	2.219E-002	0.3260	
MB 160-442821~1-A	MB	ND-147	-1.671E-001	2.340E-001	-0.7140	
MB 160-442821~1-A	MB	NP-237	1.084E-001	1.795E-001	0.6038	
MB 160-442821~1-A	MB	NP-239	4.730E-002	7.053E-002	0.6706	
MB 160-442821~1-A	MB	PA-231	-9.465E-001	1.811E+000	-0.5226	
MB 160-442821~1-A	MB	PA-233	0.000E+000	2.543E-002	0.0000	
MB 160-442821~1-A	MB	PA-234	1.397E-001	4.096E-002	3.4108	B
MB 160-442821~1-A	MB	PA-234M	0.000E+000	1.839E+000	0.0000	
MB 160-442821~1-A	MB	PB-210	-1.447E+000	8.300E-001	-1.7435	

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MB 160-442821~1-A	MB	PB-212	-4.364E-002	5.625E-002	-0.7757
MB 160-442821~1-A	MB	PB-214	-1.562E-002	5.292E-002	-0.2952
MB 160-442821~1-A	MB	PM-144	-4.228E-003	3.382E-002	-0.1250
MB 160-442821~1-A	MB	PM-146	1.686E-002	2.497E-002	0.6753
MB 160-442821~1-A	MB	RH-106	-3.312E-001	5.169E-001	-0.6409
MB 160-442821~1-A	MB	RU-103	-2.513E-002	3.575E-002	-0.7031
MB 160-442821~1-A	MB	SB-124	5.135E-002	2.113E-002	2.4307
MB 160-442821~1-A	MB	SB-125	5.517E-002	4.524E-002	1.2193
MB 160-442821~1-A	MB	SC-46	0.000E+000	7.064E-003	0.0000
MB 160-442821~1-A	MB	SN-113	3.065E-002	3.577E-002	0.8568
MB 160-442821~1-A	MB	SN-126	1.684E-001	2.381E-001	0.7074
MB 160-442821~1-A	MB	TA-182	-1.911E-001	1.577E-001	-1.2114
MB 160-442821~1-A	MB	TC-99M	1.568E-009	2.393E-002	0.0000
MB 160-442821~1-A	MB	TH-227	1.868E-001	1.347E-001	1.3870
MB 160-442821~1-A	MB	TH-229	8.086E-001	3.483E-001	2.3215
MB 160-442821~1-A	MB	TH-234	2.642E-001	3.173E-001	0.8327
MB 160-442821~1-A	MB	TL-208	1.480E-002	1.817E-002	0.8144
MB 160-442821~1-A	MB	TL-210	3.150E-002	2.108E-002	1.4946
MB 160-442821~1-A	MB	U-235	-2.885E-002	2.377E-002	-1.2138
MB 160-442821~1-A	MB	Y-88	-3.249E-002	6.078E-002	-0.5346
MB 160-442821~1-A	MB	ZN-65	0.000E+000	1.165E-002	0.0000
MB 160-442821~1-A	MB	ZR-95	3.349E-002	2.726E-002	1.2286

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Analysis Report for Gamma Spectroscopy

Batch: 442120 **Operator:**

MQO

SampID	WRKNO	Aliquot	Sigma	Instrument	Detector	CountDateTime	CountDuration
LCS 160-442120~2-	LCS	341.90g	1.00	GammaVision	GV09	9 / 14 / 19 8:40	60

Analyte	Cmpnd#	Activity	TotalUnc	CountUnc	MDA	MLCC	Act/MDA	
AC-228	11136	7.971E-001pCi/g	1.503E-001	1.447E-001	4.116E-001	1.986E-001	1.94	0.1503
AG-108M	10982	3.273E-002pCi/g	4.460E-002	4.457E-002	1.527E-001	7.503E-002	0.21	0.0446
AG-110M	10973	5.611E-002pCi/g	3.263E-002	3.250E-002	2.862E-001	1.403E-001	0.20	0.0326
AM-241	10818	9.641E+001pCi/g	5.030E+000	5.156E-001	7.152E-001	3.553E-001	134.81	5.0300
BA-133	10469	2.162E-002pCi/g	7.888E-002	7.887E-002	2.627E-001	1.297E-001	0.08	0.0789
BA-140	10463	-1.914E-001pCi/g	1.490E-001	1.486E-001	4.960E-001	2.422E-001	-0.39	0.1490
BE-7	10435	-7.246E-001pCi/g	6.106E-001	6.094E-001	2.407E+000	1.191E+000	-0.30	0.6106
BI-207	10195	5.167E-002pCi/g	2.099E-002	2.083E-002	2.146E-001	1.041E-001	0.24	0.0210
BI-210M	10173	-6.957E-002pCi/g	5.753E-002	5.738E-002	2.573E-001	1.269E-001	-0.27	0.0575
BI-212	10160	-5.523E-002pCi/g	5.526E-001	5.526E-001	1.865E+000	9.090E-001	-0.03	0.5526
BI-214	10154	3.852E-001pCi/g	9.766E-002	9.559E-002	1.944E-001	9.385E-002	1.98	0.0977
CD-109	9254	-1.750E-007pCi/g	1.700E+000	1.700E+000	5.634E+000	2.802E+000	0.00	1.7005
CD-113M	17462	-3.881E+002pCi/g	6.515E+002	6.511E+002	2.163E+003	1.067E+003	-0.18	651.5354
CE-139	9241	3.894E-002pCi/g	2.479E-002	2.452E-002	8.082E-002	3.962E-002	0.48	0.0248
CE-141	9235	-1.547E-002pCi/g	6.406E-002	6.405E-002	1.753E-001	8.643E-002	-0.09	0.0641
CE-144	9221	-3.154E-001pCi/g	4.499E-001	4.496E-001	1.487E+000	7.386E-001	-0.21	0.4499
CF-249	9215	1.781E-001pCi/g	7.734E-002	7.680E-002	1.477E-001	7.216E-002	1.21	0.0773
CF-251	13690	4.070E-002pCi/g	1.991E-001	1.991E-001	5.029E-001	2.476E-001	0.08	0.1991
CO-56	8704	4.653E-002pCi/g	2.373E-002	2.361E-002	1.308E-001	6.340E-002	0.36	0.0237
CO-57	13694	-7.288E-003pCi/g	3.710E-002	3.710E-002	1.234E-001	6.105E-002	-0.06	0.0371
CO-58	8698	-1.897E-003pCi/g	4.758E-002	4.758E-002	1.605E-001	7.834E-002	-0.01	0.0476
CO-60	8692	1.057E+001pCi/g	5.418E-001	1.102E-001	6.740E-002	3.087E-002	156.79	0.5418
CR-51	8604	-4.284E-001pCi/g	4.158E-001	4.152E-001	1.418E+000	6.993E-001	-0.30	0.4158
CS-134	8553	1.120E-001pCi/g	6.138E-002	6.111E-002	1.766E-001	8.610E-002	0.63	0.0614
CS-136	8546	5.864E-002pCi/g	5.392E-002	5.381E-002	1.583E-001	7.721E-002	0.37	0.0539
CS-137	8539	2.676E+001pCi/g	1.407E+000	2.042E-001	1.233E-001	5.972E-002	217.05	1.4070
EU-152	7145	2.923E-003pCi/g	2.591E-003	2.586E-003	3.641E-001	1.801E-001	0.01	0.0026
EU-154	7138	1.735E-001pCi/g	1.133E-001	1.130E-001	2.371E-001	1.172E-001	0.73	0.1133
EU-155	7131	-1.792E-001pCi/g	9.195E-002	9.143E-002	8.405E-001	4.176E-001	-0.21	0.0920
FE-59	7073	8.888E-002pCi/g	1.334E-001	1.333E-001	2.797E-001	1.356E-001	0.32	0.1334
GA-68	18005	1.010E+000pCi/g	2.873E+000	2.873E+000	6.059E+000	2.932E+000	0.17	2.8732
GD-153	6824	-1.271E-001pCi/g	1.790E-001	1.788E-001	5.913E-001	2.938E-001	-0.21	0.1790
HF-181	6495	2.184E-001pCi/g	6.810E-002	6.717E-002	1.316E-001	6.420E-002	1.66	0.0681
HG-203	6466	-6.342E-002pCi/g	4.983E-002	4.970E-002	1.642E-001	8.104E-002	-0.39	0.0498
I-131	6380	-7.256E-002pCi/g	6.388E-002	6.377E-002	1.531E-001	7.523E-002	-0.47	0.0639
IR-192	6303	5.827E-002pCi/g	8.760E-002	8.753E-002	2.897E-001	1.438E-001	0.20	0.0876
K-40	6148	-4.085E-001pCi/g	2.930E-001	2.922E-001	8.645E-001	4.037E-001	-0.47	0.2930
KR-85	6111	0.000E+000pCi/g	5.958E+000	5.958E+000	3.921E+001	1.929E+001	0.00	5.9582
LA-140	6096	4.473E-002pCi/g	5.970E-002	5.965E-002	6.482E-002	2.897E-002	0.69	0.0597
MN-54	5382	-7.301E-002pCi/g	4.126E-002	4.109E-002	1.409E-001	6.850E-002	-0.52	0.0413
NA-22	5201	2.624E-002pCi/g	2.169E-002	2.165E-002	7.265E-002	3.359E-002	0.36	0.0217
NB-94	5160	6.374E-002pCi/g	3.242E-002	3.225E-002	1.519E-001	7.421E-002	0.42	0.0324
NB-95	5154	1.963E-003pCi/g	3.822E-002	3.822E-002	1.295E-001	6.292E-002	0.02	0.0382
ND-147	5083	3.119E-001pCi/g	3.848E-001	3.844E-001	8.917E-001	4.351E-001	0.35	0.3848
NP-237	4757	-2.992E-001pCi/g	4.987E-001	4.984E-001	1.648E+000	8.195E-001	-0.18	0.4987
NP-239	4751	1.640E-001pCi/g	2.323E-001	2.321E-001	7.677E-001	3.814E-001	0.21	0.2323
PA-231	4541	0.000E+000pCi/g	8.169E-001	8.169E-001	8.598E+000	4.266E+000	0.00	0.8169
PA-233	4535	-1.500E-003pCi/g	1.125E-001	1.125E-001	7.025E-001	3.486E-001	0.00	0.1125
PA-234	4528	-1.929E-001pCi/g	2.743E-001	2.742E-001	9.070E-001	4.503E-001	-0.21	0.2743

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PA-234M	19453	-6.978E-002pCi/g	7.541E+000	7.541E+000	2.662E+001	1.304E+001	0.00	7.5414
PB-210	4467	7.539E+002pCi/g	4.451E+001	4.662E+000	8.529E+000	4.237E+000	88.39	44.5104
PB-212	4454	4.619E-001pCi/g	6.836E-002	6.148E-002	1.884E-001	9.237E-002	2.45	0.0684
PB-214	4448	5.844E-001pCi/g	1.236E-001	1.198E-001	2.710E-001	1.327E-001	2.16	0.1236
PM-144	19585	-6.206E-002pCi/g	4.852E-002	4.841E-002	1.603E-001	7.840E-002	-0.39	0.0485
PM-146	2464	-6.084E-002pCi/g	1.020E-001	1.019E-001	2.355E-001	1.159E-001	-0.26	0.1020
RH-106	1882	-5.583E-001pCi/g	4.539E-001	4.529E-001	1.500E+000	7.343E-001	-0.37	0.4539
RU-103	1828	1.549E-002pCi/g	6.208E-002	6.208E-002	1.443E-001	7.070E-002	0.11	0.0621
SB-124	1784	1.007E-001pCi/g	7.453E-002	7.434E-002	2.350E-001	1.160E-001	0.43	0.0745
SB-125	1777	3.494E-002pCi/g	3.557E-002	3.553E-002	4.848E-001	2.384E-001	0.07	0.0356
SC-46	1739	-8.326E-002pCi/g	6.719E-002	6.705E-002	2.219E-001	1.089E-001	-0.38	0.0672
SN-113	1570	2.746E-002pCi/g	8.897E-002	8.896E-002	2.960E-001	1.462E-001	0.09	0.0890
SN-126	17459	-9.609E-001pCi/g	2.197E+000	2.197E+000	7.250E+000	3.617E+000	-0.13	2.1975
TA-182	1301	1.103E-001pCi/g	1.129E-001	1.128E-001	6.531E-001	3.195E-001	0.17	0.1129
TC-99M	17412	0.000E+000pCi/g	2.204E-002	2.204E-002	2.009E-001	9.974E-002	0.00	0.0220
TH-227	1058	1.587E-001pCi/g	6.160E-001	6.159E-001	1.487E+000	7.316E-001	0.11	0.6160
TH-229	1046	8.150E-002pCi/g	9.665E-001	9.665E-001	2.331E+000	1.150E+000	0.03	0.9665
TH-234	1027	-6.906E-001pCi/g	9.853E-001	9.845E-001	3.256E+000	1.618E+000	-0.21	0.9853
TL-208	929	2.594E-001pCi/g	5.669E-002	5.507E-002	1.124E-001	5.442E-002	2.31	0.0567
TL-210	20861	6.163E-002pCi/g	4.864E-002	4.851E-002	1.607E-001	7.843E-002	0.38	0.0486
U-235	281	-7.046E-003pCi/g	2.801E-001	2.801E-001	1.559E+000	7.744E-001	0.00	0.2801
Y-88	74	-2.679E-002pCi/g	3.451E-002	3.447E-002	7.939E-002	3.598E-002	-0.34	0.0345
ZN-65	31	0.000E+000pCi/g	5.246E-002	5.246E-002	4.458E-001	2.180E-001	0.00	0.0525
ZR-95	7	-4.438E-002pCi/g	9.905E-002	9.902E-002	2.154E-001	1.044E-001	-0.21	0.0990

Laboratory Control Sample Information

Sample ID	WRKNO	Analyte	Activity	StdAdded	Recovery	ZFactor
LCS 160-442120~2-A	LCS 160-442120~2-A	CS-137	2.676E+001 pCi/g	2.751E+001	97.29%	-0.5032
		CO-60	1.057E+001 pCi/g	1.116E+001	94.72%	-1.0238
		AM-241	9.641E+001 pCi/g	9.662E+001	99.78%	-0.0397

Sample Duplicate Information

Sample ID	Dup Sample ID	Analyte	Samp Activity	Dup Activity	RPD	RER	DER	Flag	ZFactor

Blanks Information

SampID	WRKNO	Analyte	Activity	UncTotal	ZFactor	
MB 160-442120~1-A	MB	AC-228	5.038E-002	6.932E-002	0.7269	
MB 160-442120~1-A	MB	AG-108M	-2.019E-003	1.779E-002	-0.1135	
MB 160-442120~1-A	MB	AG-110M	1.355E-002	8.550E-003	1.5843	
MB 160-442120~1-A	MB	AM-241	8.122E-002	3.041E-002	2.6706	B
MB 160-442120~1-A	MB	BA-133	3.808E-002	3.757E-002	1.0134	
MB 160-442120~1-A	MB	BA-140	5.589E-002	6.413E-002	0.8716	
MB 160-442120~1-A	MB	BE-7	-2.362E-001	2.241E-001	-1.0541	
MB 160-442120~1-A	MB	BI-207	-3.482E-002	3.785E-002	-0.9199	
MB 160-442120~1-A	MB	BI-210M	2.544E-002	3.260E-002	0.7805	
MB 160-442120~1-A	MB	BI-212	-8.612E-002	2.928E-001	-0.2941	
MB 160-442120~1-A	MB	BI-214	5.043E-002	2.960E-002	1.7036	
MB 160-442120~1-A	MB	CD-109	0.000E+000	5.558E-002	0.0000	
MB 160-442120~1-A	MB	CD-113M	-2.718E+002	2.332E+002	-1.1655	
MB 160-442120~1-A	MB	CE-139	8.248E-003	1.261E-002	0.6540	
MB 160-442120~1-A	MB	CE-141	1.554E-002	2.028E-002	0.7666	
MB 160-442120~1-A	MB	CE-144	-8.111E-002	1.145E-001	-0.7084	
MB 160-442120~1-A	MB	CF-249	-1.188E-002	1.048E-002	-1.1341	
MB 160-442120~1-A	MB	CF-251	5.139E-002	5.501E-002	0.9341	
MB 160-442120~1-A	MB	CO-56	-2.889E-002	2.222E-002	-1.3004	
MB 160-442120~1-A	MB	CO-57	0.000E+000	3.364E-003	0.0000	
MB 160-442120~1-A	MB	CO-58	-3.584E-002	3.227E-002	-1.1107	
MB 160-442120~1-A	MB	CO-60	4.012E-002	1.616E-002	2.4828	
MB 160-442120~1-A	MB	CR-51	-1.270E-001	1.698E-001	-0.7477	
MB 160-442120~1-A	MB	CS-134	-1.612E-002	1.891E-002	-0.8523	
MB 160-442120~1-A	MB	CS-136	-3.609E-002	3.421E-002	-1.0549	
MB 160-442120~1-A	MB	CS-137	-1.037E-002	2.149E-002	-0.4826	
MB 160-442120~1-A	MB	EU-152	3.567E-002	4.750E-002	0.7510	
MB 160-442120~1-A	MB	EU-154	-2.863E-003	3.819E-003	-0.7496	
MB 160-442120~1-A	MB	EU-155	3.121E-002	5.034E-002	0.6200	
MB 160-442120~1-A	MB	FE-59	0.000E+000	1.408E-002	0.0000	
MB 160-442120~1-A	MB	GA-68	-3.205E-001	1.137E+000	-0.2819	
MB 160-442120~1-A	MB	GD-153	-8.809E-003	2.630E-002	-0.3350	
MB 160-442120~1-A	MB	HF-181	-7.435E-003	1.632E-002	-0.4555	
MB 160-442120~1-A	MB	HG-203	-3.647E-003	1.563E-002	-0.2334	
MB 160-442120~1-A	MB	I-131	1.087E-002	2.227E-002	0.4882	
MB 160-442120~1-A	MB	IR-192	1.725E-002	1.795E-002	0.9608	
MB 160-442120~1-A	MB	K-40	-3.512E-001	2.481E-001	-1.4153	
MB 160-442120~1-A	MB	KR-85	4.077E-001	7.276E+000	0.0560	
MB 160-442120~1-A	MB	LA-140	2.570E-002	3.839E-002	0.6695	
MB 160-442120~1-A	MB	MN-54	3.578E-002	1.805E-002	1.9827	
MB 160-442120~1-A	MB	NA-22	2.253E-002	1.014E-002	2.2222	
MB 160-442120~1-A	MB	NB-94	6.478E-003	2.167E-002	0.2990	
MB 160-442120~1-A	MB	NB-95	1.486E-002	1.298E-002	1.1450	
MB 160-442120~1-A	MB	ND-147	-6.652E-002	1.630E-001	-0.4081	
MB 160-442120~1-A	MB	NP-237	-6.577E-002	1.185E-001	-0.5549	
MB 160-442120~1-A	MB	NP-239	2.935E-002	4.639E-002	0.6326	
MB 160-442120~1-A	MB	PA-231	4.500E-001	7.725E-001	0.5825	
MB 160-442120~1-A	MB	PA-233	-3.527E-003	4.296E-003	-0.8211	
MB 160-442120~1-A	MB	PA-234	7.125E-002	2.403E-002	2.9648	B
MB 160-442120~1-A	MB	PA-234M	-3.788E-001	3.085E+000	-0.1228	
MB 160-442120~1-A	MB	PB-210	4.436E-001	4.168E-001	1.0644	

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MB 160-442120~1-A	MB	PB-212	2.139E-002	3.051E-002	0.7012
MB 160-442120~1-A	MB	PB-214	-8.911E-002	4.874E-002	-1.8281
MB 160-442120~1-A	MB	PM-144	-1.187E-002	2.398E-002	-0.4951
MB 160-442120~1-A	MB	PM-146	2.447E-002	2.423E-002	1.0103
MB 160-442120~1-A	MB	RH-106	1.992E-001	2.993E-001	0.6655
MB 160-442120~1-A	MB	RU-103	1.656E-002	1.646E-002	1.0059
MB 160-442120~1-A	MB	SB-124	0.000E+000	2.446E-003	0.0000
MB 160-442120~1-A	MB	SB-125	-2.440E-002	6.866E-002	-0.3554
MB 160-442120~1-A	MB	SC-46	3.218E-002	3.784E-002	0.8503
MB 160-442120~1-A	MB	SN-113	2.292E-002	3.145E-002	0.7289
MB 160-442120~1-A	MB	SN-126	-8.506E-002	1.236E-001	-0.6881
MB 160-442120~1-A	MB	TA-182	3.492E-002	3.263E-002	1.0702
MB 160-442120~1-A	MB	TC-99M	8.082E-003	1.222E-002	0.6612
MB 160-442120~1-A	MB	TH-227	9.868E-002	7.124E-002	1.3853
MB 160-442120~1-A	MB	TH-229	-1.062E-001	2.439E-001	-0.4355
MB 160-442120~1-A	MB	TH-234	3.187E-001	1.473E-001	2.1643
MB 160-442120~1-A	MB	TL-208	2.143E-002	2.075E-002	1.0326
MB 160-442120~1-A	MB	TL-210	0.000E+000	6.153E-003	0.0000
MB 160-442120~1-A	MB	U-235	0.000E+000	6.083E-002	0.0000
MB 160-442120~1-A	MB	Y-88	-8.251E-003	3.406E-002	-0.2423
MB 160-442120~1-A	MB	ZN-65	0.000E+000	1.591E-002	0.0000
MB 160-442120~1-A	MB	ZR-95	-5.364E-002	4.850E-002	-1.1060

eurofins

Environment Testing
TestAmerica

Analysis Report for Gamma Spectroscopy

Batch: 442823 **Operator:**

MQO

SampID	WRKNO	Aliquot	Sigma	Instrument	Detector	CountDateTime	CountDuration
LCS 160-442823~2-	LCS	341.90g	1.00	GammaVision	GV09	9 / 16 / 19 12:14	30

Analyte	Cmpnd#	Activity	TotalUnc	CountUnc	MDA	MLCC	Act/MDA	
AC-228	11136	6.724E-001pCi/g	2.591E-001	2.568E-001	7.430E-001	3.570E-001	0.91	0.2591
AG-108M	10982	-1.190E-001pCi/g	9.958E-002	9.939E-002	2.499E-001	1.223E-001	-0.48	0.0996
AG-110M	10973	1.853E-001pCi/g	9.373E-002	9.325E-002	2.068E-001	9.777E-002	0.90	0.0937
AM-241	10818	9.548E+001pCi/g	5.008E+000	7.231E-001	1.000E+000	4.956E-001	95.46	5.0078
BA-133	10469	-1.290E-001pCi/g	1.142E-001	1.140E-001	3.776E-001	1.854E-001	-0.34	0.1142
BA-140	10463	1.955E-001pCi/g	2.786E-001	2.784E-001	6.644E-001	3.207E-001	0.29	0.2786
BE-7	10435	-9.489E-001pCi/g	9.176E-001	9.163E-001	3.134E+000	1.542E+000	-0.30	0.9176
BI-207	10195	2.664E-001pCi/g	1.265E-001	1.258E-001	2.603E-001	1.238E-001	1.02	0.1265
BI-210M	10173	1.661E-001pCi/g	1.132E-001	1.127E-001	3.306E-001	1.619E-001	0.50	0.1132
BI-212	10160	2.393E-001pCi/g	7.710E-001	7.709E-001	2.616E+000	1.261E+000	0.09	0.7710
BI-214	10154	7.373E-001pCi/g	1.497E-001	1.447E-001	3.057E-001	1.462E-001	2.41	0.1497
CD-109	9254	0.000E+000pCi/g	2.460E+000	2.460E+000	8.144E+000	4.041E+000	0.00	2.4597
CD-113M	17462	6.783E+002pCi/g	7.899E+002	7.887E+002	2.626E+003	1.285E+003	0.26	789.9314
CE-139	9241	1.721E-002pCi/g	5.608E-002	5.606E-002	1.873E-001	9.206E-002	0.09	0.0561
CE-141	9235	1.046E-001pCi/g	1.449E-001	1.448E-001	4.799E-001	2.375E-001	0.22	0.1449
CE-144	9221	-4.470E-001pCi/g	6.207E-001	6.203E-001	2.056E+000	1.017E+000	-0.22	0.6207
CF-249	9215	1.160E-001pCi/g	1.282E-001	1.280E-001	4.248E-001	2.090E-001	0.27	0.1282
CF-251	13690	5.206E-001pCi/g	2.747E-001	2.708E-001	6.761E-001	3.304E-001	0.77	0.2747
CO-56	8704	-8.547E-002pCi/g	1.448E-002	1.380E-002	2.127E-001	1.024E-001	-0.40	0.0145
CO-57	13694	2.886E-002pCi/g	4.356E-002	4.353E-002	1.450E-001	7.119E-002	0.20	0.0436
CO-58	8698	-9.765E-002pCi/g	7.729E-002	7.712E-002	2.558E-001	1.241E-001	-0.38	0.0773
CO-60	8692	1.060E+001pCi/g	5.540E-001	1.547E-001	9.301E-002	4.084E-002	113.91	0.5540
CR-51	8604	7.292E-001pCi/g	1.114E+000	1.113E+000	3.690E+000	1.826E+000	0.20	1.1135
CS-134	8553	7.654E-002pCi/g	7.075E-002	7.064E-002	2.642E-001	1.277E-001	0.29	0.0708
CS-136	8546	6.184E-002pCi/g	7.324E-002	7.315E-002	1.602E-001	7.624E-002	0.39	0.0732
CS-137	8539	2.673E+001pCi/g	1.418E+000	2.785E-001	1.324E-001	6.235E-002	201.85	1.4182
EU-152	7145	2.260E-001pCi/g	1.711E-001	1.706E-001	5.105E-001	2.513E-001	0.44	0.1711
EU-154	7138	2.733E-001pCi/g	2.123E-001	2.119E-001	3.313E-001	1.629E-001	0.82	0.2123
EU-155	7131	-7.752E-004pCi/g	8.424E-001	8.424E-001	9.424E-001	4.659E-001	0.00	0.8424
FE-59	7073	1.249E-001pCi/g	1.787E-001	1.786E-001	3.787E-001	1.808E-001	0.33	0.1787
GA-68	18005	3.556E+000pCi/g	3.616E+000	3.610E+000	7.614E+000	3.637E+000	0.47	3.6158
GD-153	6824	-1.813E-003pCi/g	3.058E-001	3.058E-001	1.015E+000	5.038E-001	0.00	0.3058
HF-181	6495	-5.114E-002pCi/g	3.197E-002	3.186E-002	4.147E-001	2.041E-001	-0.12	0.0320
HG-203	6466	0.000E+000pCi/g	4.588E-002	4.588E-002	2.137E-001	1.047E-001	0.00	0.0459
I-131	6380	-2.889E-002pCi/g	8.399E-002	8.398E-002	2.043E-001	9.955E-002	-0.14	0.0840
IR-192	6303	2.376E-002pCi/g	2.199E-002	2.194E-002	4.211E-001	2.083E-001	0.06	0.0220
K-40	6148	6.048E-001pCi/g	4.192E-001	4.181E-001	9.646E-001	4.251E-001	0.63	0.4192
KR-85	6111	1.568E+001pCi/g	1.702E+001	1.700E+001	5.656E+001	2.765E+001	0.28	17.0214
LA-140	6096	3.176E-002pCi/g	2.687E-002	2.682E-002	1.433E-001	6.478E-002	0.22	0.0269
MN-54	5382	8.473E-002pCi/g	7.587E-002	7.575E-002	1.653E-001	7.874E-002	0.51	0.0759
NA-22	5201	2.692E-002pCi/g	3.216E-002	3.213E-002	1.111E-001	5.008E-002	0.24	0.0322
NB-94	5160	5.878E-002pCi/g	6.815E-002	6.808E-002	2.277E-001	1.103E-001	0.26	0.0682
NB-95	5154	-4.254E-002pCi/g	6.355E-002	6.351E-002	2.136E-001	1.031E-001	-0.20	0.0636
ND-147	5083	6.142E-001pCi/g	5.324E-001	5.312E-001	1.235E+000	5.958E-001	0.50	0.5324
NP-237	4757	0.000E+000pCi/g	7.137E-001	7.137E-001	2.363E+000	1.173E+000	0.00	0.7137
NP-239	4751	2.218E-001pCi/g	2.468E-001	2.465E-001	8.166E-001	4.034E-001	0.27	0.2468
PA-231	4541	1.832E-007pCi/g	3.612E+000	3.612E+000	1.203E+001	5.951E+000	0.00	3.6123
PA-233	4535	-2.068E-001pCi/g	1.061E-001	1.055E-001	1.003E+000	4.961E-001	-0.21	0.1061
PA-234	4528	1.581E-001pCi/g	1.386E-001	1.383E-001	1.273E+000	6.304E-001	0.12	0.1386

MQO

PA-234M	19453	1.368E+001pCi/g	1.117E+001	1.115E+001	3.699E+001	1.796E+001	0.37	11.1677
PB-210	4467	7.468E+002pCi/g	4.435E+001	6.596E+000	1.224E+001	6.066E+000	61.01	44.3456
PB-212	4454	1.469E-001pCi/g	1.416E-001	1.412E-001	4.680E-001	2.303E-001	0.31	0.1416
PB-214	4448	3.138E-001pCi/g	1.033E-001	1.020E-001	3.489E-001	1.689E-001	0.90	0.1033
PM-144	19585	-7.643E-002pCi/g	6.127E-002	6.114E-002	2.031E-001	9.808E-002	-0.38	0.0613
PM-146	2464	-1.680E-001pCi/g	1.637E-001	1.635E-001	5.415E-001	2.669E-001	-0.31	0.1637
RA-226	1950	-6.088E-001pCi/g	1.720E+000	1.719E+000	4.352E+000	2.135E+000	-0.14	1.7203
RH-106	1882	-1.486E-002pCi/g	1.004E+000	1.004E+000	3.371E+000	1.654E+000	0.00	1.0040
RU-103	1828	-7.203E-002pCi/g	8.998E-002	8.990E-002	2.091E-001	1.016E-001	-0.34	0.0900
SB-124	1784	6.042E-002pCi/g	5.935E-002	5.926E-002	1.535E-001	6.235E-002	0.39	0.0594
SB-125	1777	6.502E-002pCi/g	8.889E-002	8.883E-002	6.829E-001	3.334E-001	0.10	0.0889
SC-46	1739	9.829E-002pCi/g	7.906E-002	7.890E-002	2.619E-001	1.268E-001	0.38	0.0791
SN-113	1570	1.196E-001pCi/g	1.325E-001	1.324E-001	4.393E-001	2.161E-001	0.27	0.1325
SN-126	17459	-1.363E+000pCi/g	3.097E+000	3.097E+000	1.023E+001	5.098E+000	-0.13	3.0975
TA-182	1301	9.317E-002pCi/g	1.172E-001	1.171E-001	4.631E-001	2.120E-001	0.20	0.1172
TC-99M	17412	9.948E-003pCi/g	8.246E-002	8.246E-002	2.742E-001	1.358E-001	0.04	0.0825
TH-227	1058	4.056E-001pCi/g	8.725E-001	8.721E-001	2.114E+000	1.033E+000	0.19	0.8725
TH-229	1046	2.328E-001pCi/g	1.336E+000	1.336E+000	3.238E+000	1.587E+000	0.07	1.3360
TH-234	1027	1.014E+000pCi/g	1.182E+000	1.181E+000	3.911E+000	1.935E+000	0.26	1.1823
TL-208	929	9.316E-002pCi/g	9.328E-002	9.316E-002	2.088E-001	1.009E-001	0.45	0.0933
TL-210	20861	-6.981E-002pCi/g	6.709E-002	6.697E-002	2.234E-001	1.079E-001	-0.31	0.0671
U-235	281	2.461E-001pCi/g	6.522E-001	6.520E-001	2.165E+000	1.072E+000	0.11	0.6522
Y-88	74	1.431E-002pCi/g	3.545E-002	3.544E-002	7.939E-002	3.227E-002	0.18	0.0355
ZN-65	31	2.116E-001pCi/g	1.817E-001	1.814E-001	6.031E-001	2.918E-001	0.35	0.1817
ZR-95	7	9.079E-002pCi/g	6.198E-002	6.180E-002	3.173E-001	1.520E-001	0.29	0.0620

Laboratory Control Sample Information

Sample ID	WRKNO	Analyte	Activity	StdAdded	Recovery	ZFactor
LCS 160-442823~2-A	LCS 160-442823~2-A	CS-137	2.673E+001 pCi/g	2.750E+001	97.19%	-0.5172
		CO-60	1.060E+001 pCi/g	1.115E+001	95.04%	-0.9417
		AM-241	9.548E+001 pCi/g	9.662E+001	98.82%	-0.2149

Sample Duplicate Information

Sample ID	Dup Sample ID	Analyte	Samp Activity	Dup Activity	RPD	RER	DER	Flag	ZFactor

Blanks Information

SampID	WRKNO	Analyte	Activity	UncTotal	ZFactor	
MB 160-442823~1-A	MB	AC-228	-2.670E-001	1.221E-001	-2.1868	
MB 160-442823~1-A	MB	AG-108M	8.076E-003	2.308E-002	0.3499	
MB 160-442823~1-A	MB	AG-110M	2.302E-002	2.088E-002	1.1024	
MB 160-442823~1-A	MB	AM-241	-9.497E-003	4.616E-002	-0.2058	
MB 160-442823~1-A	MB	BA-133	2.048E-002	2.342E-002	0.8744	
MB 160-442823~1-A	MB	BA-140	-5.370E-002	1.253E-001	-0.4285	
MB 160-442823~1-A	MB	BE-7	4.138E-001	1.266E-001	3.2697	B
MB 160-442823~1-A	MB	BI-207	-3.668E-003	2.589E-002	-0.1417	
MB 160-442823~1-A	MB	BI-210M	-1.420E-002	3.524E-002	-0.4029	
MB 160-442823~1-A	MB	BI-212	-4.888E-002	4.215E-001	-0.1160	
MB 160-442823~1-A	MB	BI-214	-3.981E-002	6.986E-002	-0.5698	
MB 160-442823~1-A	MB	CD-109	1.223E-001	5.078E-001	0.2408	
MB 160-442823~1-A	MB	CD-113M	2.431E+002	2.488E+002	0.9773	
MB 160-442823~1-A	MB	CE-139	9.176E-003	1.152E-002	0.7962	
MB 160-442823~1-A	MB	CE-141	1.703E-002	1.988E-002	0.8563	
MB 160-442823~1-A	MB	CE-144	0.000E+000	3.266E-002	0.0000	
MB 160-442823~1-A	MB	CF-249	1.966E-002	3.165E-002	0.6213	
MB 160-442823~1-A	MB	CF-251	4.419E-002	7.716E-002	0.5727	
MB 160-442823~1-A	MB	CO-56	4.158E-002	1.830E-002	2.2722	
MB 160-442823~1-A	MB	CO-57	8.727E-003	1.124E-002	0.7767	
MB 160-442823~1-A	MB	CO-58	2.064E-002	2.951E-002	0.6997	
MB 160-442823~1-A	MB	CO-60	-6.800E-004	1.850E-003	-0.3677	
MB 160-442823~1-A	MB	CR-51	-5.597E-002	2.692E-001	-0.2079	
MB 160-442823~1-A	MB	CS-134	5.739E-002	2.362E-002	2.4301	
MB 160-442823~1-A	MB	CS-136	4.922E-003	1.775E-002	0.2773	
MB 160-442823~1-A	MB	CS-137	-1.613E-002	3.318E-002	-0.4862	
MB 160-442823~1-A	MB	EU-152	2.338E-001	7.497E-002	3.1193	B
MB 160-442823~1-A	MB	EU-154	-2.806E-002	3.302E-002	-0.8499	
MB 160-442823~1-A	MB	EU-155	2.834E-002	4.016E-002	0.7056	
MB 160-442823~1-A	MB	FE-59	7.038E-002	3.167E-002	2.2222	
MB 160-442823~1-A	MB	GA-68	2.782E-001	1.396E+000	0.1993	
MB 160-442823~1-A	MB	GD-153	-3.444E-002	4.289E-002	-0.8028	
MB 160-442823~1-A	MB	HF-181	-9.881E-003	1.492E-002	-0.6621	
MB 160-442823~1-A	MB	HG-203	1.554E-003	1.954E-002	0.0796	
MB 160-442823~1-A	MB	I-131	-3.610E-002	4.098E-002	-0.8810	
MB 160-442823~1-A	MB	IR-192	-4.305E-003	2.237E-002	-0.1924	
MB 160-442823~1-A	MB	K-40	-3.196E-001	3.711E-001	-0.8614	
MB 160-442823~1-A	MB	KR-85	-3.262E-001	9.021E+000	-0.0362	
MB 160-442823~1-A	MB	LA-140	5.449E-002	2.532E-002	2.1521	
MB 160-442823~1-A	MB	MN-54	2.105E-002	3.117E-002	0.6753	
MB 160-442823~1-A	MB	NA-22	4.506E-002	2.028E-002	2.2222	
MB 160-442823~1-A	MB	NB-94	-3.259E-002	3.136E-002	-1.0392	
MB 160-442823~1-A	MB	NB-95	3.923E-003	2.587E-002	0.1516	
MB 160-442823~1-A	MB	ND-147	-9.977E-002	2.329E-001	-0.4284	
MB 160-442823~1-A	MB	NP-237	5.696E-002	1.302E-001	0.4375	
MB 160-442823~1-A	MB	NP-239	1.829E-002	6.185E-002	0.2957	
MB 160-442823~1-A	MB	PA-231	5.165E-001	7.402E-001	0.6977	
MB 160-442823~1-A	MB	PA-233	5.654E-002	9.581E-002	0.5902	
MB 160-442823~1-A	MB	PA-234	5.529E-002	7.081E-002	0.7808	
MB 160-442823~1-A	MB	PA-234M	-3.788E-001	4.634E+000	-0.0817	
MB 160-442823~1-A	MB	PB-210	-5.436E-001	5.026E-001	-1.0817	

			MQO		
MB 160-442823~1-A	MB	PB-212	2.182E-002	5.574E-002	0.3915
MB 160-442823~1-A	MB	PB-214	-1.606E-002	2.120E-002	-0.7576
MB 160-442823~1-A	MB	PM-144	2.009E-002	2.556E-002	0.7861
MB 160-442823~1-A	MB	PM-146	0.000E+000	1.429E-002	0.0000
MB 160-442823~1-A	MB	RA-226	-8.911E-001	5.769E-001	-1.5448
MB 160-442823~1-A	MB	RH-106	-3.984E-001	5.691E-001	-0.7001
MB 160-442823~1-A	MB	RU-103	-1.800E-002	3.639E-002	-0.4947
MB 160-442823~1-A	MB	SB-124	-1.501E-002	3.062E-002	-0.4903
MB 160-442823~1-A	MB	SB-125	7.401E-002	1.104E-001	0.6704
MB 160-442823~1-A	MB	SC-46	0.000E+000	6.658E-003	0.0000
MB 160-442823~1-A	MB	SN-113	2.050E-002	3.589E-002	0.5713
MB 160-442823~1-A	MB	SN-126	-1.522E-001	2.089E-001	-0.7283
MB 160-442823~1-A	MB	TA-182	-2.146E-001	2.532E-001	-0.8474
MB 160-442823~1-A	MB	TC-99M	1.200E-002	8.068E-003	1.4873
MB 160-442823~1-A	MB	TH-227	5.859E-002	4.199E-002	1.3951
MB 160-442823~1-A	MB	TH-229	2.743E-001	2.554E-001	1.0741
MB 160-442823~1-A	MB	TH-234	4.142E-001	2.246E-001	1.8439
MB 160-442823~1-A	MB	TL-208	1.547E-002	2.050E-002	0.7547
MB 160-442823~1-A	MB	TL-210	2.520E-002	2.582E-002	0.9760
MB 160-442823~1-A	MB	U-235	-7.543E-003	1.229E-001	-0.0613
MB 160-442823~1-A	MB	Y-88	-2.074E-003	4.228E-002	-0.0491
MB 160-442823~1-A	MB	ZN-65	0.000E+000	3.183E-002	0.0000
MB 160-442823~1-A	MB	ZR-95	0.000E+000	1.068E-002	0.0000

Reagent

Tuna Can_00003

Eckert & Ziegler
Analytics

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404·352·8677
Fax 404·352·2837
www.analyticsinc.com

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

90099

1.0 Liter Sand in 1 Liter Wide Mouth HDPE Silgan Jar

Customer: TestAmerica St. Louis / Earth City, MO
P.O. No.: 2454150, Item 1
Reference Date: 01-Jan-2012 12:00 PM EST **Grams of Master Source:** 0.017180

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Additional radionuclides were added gravimetrically from solutions calibrated by gamma-ray spectrometry, ionization chamber, or liquid scintillation counting. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." EZA is accredited by the Health Physics Society (HPS) for the production of NIST-traceable sources, and this source was produced in accordance with the HPS accreditation requirements. Customers may report any concerns with the accreditation program to the HPS Secretariat, 1313 Dolley Madison Blvd., Ste. 402, McLean, VA 22101.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* γps/gram	This Source γps	Uncertainty* , % Type u_A	u_B	U	Calibration Method*
Pb-210	46.5	8.109E+03	———	3.094E+03	0.1	2.1	4.1	4π LS
Am-241	59.5	1.580E+05	———	2.037E+03	0.1	1.7	3.5	4π LS
Cd-109	88.0	4.626E+02	1.677E+05	2.881E+03	0.5	2.3	4.7	HPGe
Co-57	122.1	2.718E+02	8.795E+04	1.511E+03	0.4	2.0	4.1	HPGe
Ce-139	165.9	1.376E+02	1.245E+05	2.139E+03	0.4	1.9	3.9	HPGe
Hg-203	279.2	4.661E+01	2.707E+05	4.651E+03	0.3	1.9	3.8	HPGe
Sn-113	391.7	1.151E+02	1.755E+05	3.015E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.098E+04	1.128E+05	1.938E+03	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.228E+05	7.264E+03	0.5	1.9	3.9	HPGe
Co-60	1173.2	1.925E+03	2.084E+05	3.580E+03	0.6	1.9	4.0	HPGe
Co-60	1332.5	1.925E+03	2.084E+05	3.581E+03	0.7	1.9	4.0	HPGe
Y-88	1836.1	1.066E+02	4.476E+05	7.690E+03	0.7	1.9	4.0	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. **Uncertainty:** U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

(Certificate continued on reverse side)

Comments:
1550 grams of sand. Homogenous down to 10 grams aliquot.
This standard will expire one year after the reference date.

Source Prepared by: _____
Z. Dimitrova, Radiochemist

QA Approved: _____ Date: 30 JAN 12
J.D. McCorvey, Counting Room Manager

Reagent

Tuna Can_00006

Eckert & Ziegler
Analytics

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404·352·8677
Fax 404·352·2837
www.analyticsinc.com

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

83814-334

1.0 Liter Sand in 1 Liter Wide Mouth HDPE Silgan Jar

Customer: Test America St. Louis
P.O. No.: 2395112, Item 1
Reference Date: 01-Jan-2011 12:00 PM EST **Grams of Master Source:** 0.016927

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 1, February, 1979, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." EZA is accredited by the Health Physics Society (HPS) for the production of NIST-traceable sources, and this source was produced in accordance with the HPS accreditation requirements. Customers may report any concerns with the accreditation program to the HPS Secretariat, 1313 Dolley Madison Blvd., Ste. 402, McLean, VA 22101.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* γps/gram	This Source γps	Uncertainty, % Type u_A	u_B	U	Calibration Method
Pb-210	46.5	8.120E+03	———	3.021E+03	0.1	2.1	4.1	4π LS
Am-241	59.5	1.580E+05	———	2.090E+03	0.1	1.7	3.5	4π LS
Cd-109	88.0	4.626E+02	1.697E+05	2.873E+03	0.8	2.3	4.9	HPGe
Co-57	122.1	2.718E+02	8.711E+04	1.475E+03	0.5	2.0	4.1	HPGe
Ce-139	165.9	1.376E+02	1.247E+05	2.111E+03	0.5	1.9	3.9	HPGe
Hg-203	279.2	4.661E+01	2.753E+05	4.660E+03	0.4	1.9	3.9	HPGe
Sn-113	391.7	1.151E+02	1.769E+05	2.994E+03	0.5	1.9	3.9	HPGe
Cs-137	661.7	1.098E+04	1.109E+05	1.877E+03	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.224E+05	7.150E+03	0.5	1.9	3.9	HPGe
Co-60	1173.2	1.925E+03	2.142E+05	3.626E+03	0.6	1.9	4.0	HPGe
Co-60	1332.5	1.925E+03	2.143E+05	3.627E+03	0.6	1.9	4.0	HPGe
Y-88	1836.1	1.066E+02	4.472E+05	7.570E+03	0.5	1.9	3.9	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. **Uncertainty:** U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

(Certificate continued on reverse side)

Corporate Office
Laboratory

Comments:
1550 grams of sand. Homogeneous down to 10 gram aliquot.
This standard will expire one year after the reference date.

Source Prepared by: _____
Z. Dimitrova, Radiochemist

QA Approved: _____ Date: 2/11/11
J. D. McCorvey, QA Manager Alternate

GAMMA SPECTROSCOPY

Method 901.1
Ra-226

Radium-226 & Other Gamma Emitters (GS) by Method 901.1

Prep Batch: 443730

Fill Geometry, 21-Day In-Growth

Gamma Spectroscopy Analysis Detail Report
Prep Batch: 443730

Lab Id: MB 160-443730/1-A | Analyzed: 10/14/19 06:22 | Ts: 120 | Sigma: 2
Client ID: | Detector: GV16 | Decay Corrected: | Ingrowth:

Analyte	MB Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Radium 226 and 228 (positive only)	14.86	28.9	29.0	U	pCi/L		38.7	445993
Radium-226	14.86	16.8	16.9	U	pCi/L	50.0	16.7	445993
Radium-228	-28.03	23.5	23.6	U	pCi/L	50.0	38.7	445993

Lab Id: LCS 160-443730/2-A | Analyzed: 10/14/19 06:23 | Ts: 120 | Sigma: 2
Client ID: | Detector: GV17 | Decay Corrected: No | Ingrowth:

Analyte	LCS Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Americium-241	129700	419	15000		pCi/L		293	445994
Cesium-137	43780	223	4380		pCi/L		82.4	445994
Cobalt-60	27440	147	2710		pCi/L		46.9	445994

Lab Id: 180-95857-6 | Analyzed: 10/14/19 07:02 | Ts: 120 | Sigma: 2
Client ID: WBF-BS-FB09-20190917 ~ WBF-BG-11 | Detector: GV14 | Decay Corrected: | Ingrowth:

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Radium 226 and 228 (positive only)	16.6	22.1	22.2	U	pCi/L		37.9	445992
Radium-226	2.35	3.47	3.48	U	pCi/L	50.0	37.9	445992
Radium-228	14.2	21.8	21.9	U	pCi/L	50.0	26.0	445992

Lab Id: 180-95857-6 DU | Analyzed: 10/21/19 08:49 | Ts: 120 | Sigma: 2
Client ID: WBF-BS-FB09-20190917 ~ WBF-BG-11 | Detector: GV17 | Decay Corrected: | Ingrowth:

Analyte	DU Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Radium 226 and 228 (positive only)	28.59	24.9	24.9		pCi/L		26.8	447046
Radium-226	15.70	14.6	14.6	U	pCi/L	50.0	18.1	447046
Radium-228	12.89	20.2	20.2	U	pCi/L	50.0	26.8	447046

Lab Id: 180-95857-7 | Analyzed: 10/14/19 09:20 | Ts: 120 | Sigma: 2
Client ID: WBF-BS-EB03-20190917 ~ WBF-BG-11 | Detector: GV17 | Decay Corrected: | Ingrowth:

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Radium 226 and 228 (positive only)	15.1	17.7	17.7	U	pCi/L		26.8	445994

Gamma Spectroscopy Analysis Detail Report
Prep Batch: 443730

Lab Id:	180-95857-7	Analyzed:	10/14/19 09:20	Ts:	120	Sigma:	2
Client ID:	WBF-BS-EB03-20190917 ~ WBF-BG-11	Detector:	GV17	Decay Corrected:	No	Ingrowth:	

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Radium-226	10.7	12.4	12.5	U	pCi/L	50.0	16.7	445994
Radium-228	4.39	12.6	12.6	U	pCi/L	50.0	26.8	445994

Quality Control Summary

Method Blank ID:	Analyte	Parent Result	Spike Added	MB Result	Qualifier	Unit	% Rec	% Rec Limits	RPD	RER	DER	RER Limit	Z Factor
MB 160-443730/1-A	Radium 226 and 228 (positive only)			14.86	U	pCi/L							
MB 160-443730/1-A	Radium-226			14.86	U	pCi/L							1.7574
MB 160-443730/1-A	Radium-228			-28.03	U	pCi/L							-2.3715
Lab Control Sample ID:	**Analyte**	**Parent Result**	**Spike Added**	**LCS Result**	**Qualifier**	**Unit**	**% Rec**	**% Rec Limits**	**RPD**	**RER**	**DER**	**RER Limit**	**Z Factor**
LCS 160-443730/2-A	Americium-241		136000	129700		pCi/L	96	90 - 111					-.7754
LCS 160-443730/2-A	Cesium-137		44200	43780		pCi/L	99	90 - 111					-.1917
LCS 160-443730/2-A	Cobalt-60		28000	27440		pCi/L	98	89 - 110					-.4154
Duplicate ID:	**Analyte**	**Parent Result**	**Spike Added**	**DU Result**	**Qualifier**	**Unit**	**% Rec**	**% Rec Limits**	**RPD**	**RER**	**DER**	**RER Limit**	**Z Factor**
180-95857-6	Radium 226 and 228 (positive only)	16.6		28.59		pCi/L			53	0.26	0.72		
180-95857-6	Radium-226	2.35		15.70	U	pCi/L			148	0.74	1.77	1	1.7738
180-95857-6	Radium-228	14.2		12.89	U	pCi/L			10	0.03	0.09	1	.0902

Glossary:

Ts = Count Duration, Sample

GAMMA SPECTROSCOPY BATCH WORKSHEET

Lab Name: Eurofins TestAmerica, St. Loui Job No.: 180-95857-1

SDG No.:

Batch Number: 443730 Batch Start Date: 09/23/19 11:56 Batch Analyst: Slama, Kurt R

Batch Method: Fill_Geo-21 Batch End Date: 09/23/19 12:03

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	IngDecDate1	IngDecDate3	Geometry	1L Marn LCS 00006	
MB 160-443730/1		Fill_Geo-21, 901.1		1000 mL	09/23/19 12:03	10/14/19 12:03	1L Marn		
LCS 160-443730/2		Fill_Geo-21, 901.1		1000 mL	09/23/19 12:03	10/14/19 12:03	1L Marn	# mL	
180-95857-B-6	WBF-BS-FB09-2019 0917 ~ WBF-BG-11	Fill_Geo-21, 901.1	T	1000 mL	09/23/19 12:03	10/14/19 12:03	1L Marn		
180-95857-B-6 DU	WBF-BS-FB09-2019 0917 ~ WBF-BG-11	Fill_Geo-21, 901.1	T	1000 mL	09/23/19 12:03	10/14/19 12:03	1L Marn		
180-95857-B-7	WBF-BS-EB03-2019 0917 ~ WBF-BG-11	Fill_Geo-21, 901.1	T	1000 mL	09/23/19 12:03	10/14/19 12:03	1L Marn		

Batch Notes	
SOP Number	ST-RC-0025

Basis	Basis Description
T	Total/NA

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

Test America St. Louis Spectrum ID: 16_Gamma_20191786

Sample Description: 443730_Gamma_MB 160-443730~1-A
Detector: Detector #16
Batch ID: 443730
Work Order Number: Gamma
Lot Number: MB 160-443730~1-A

Decay to Time: 10/14/2019 06:22 Live Time: 7200 sec
Acquisition Time: 10/14/2019 06:22:47 Real Time: 7212 sec
Analysis Time: 10/14/2019 08:23 Dead Time: 0.16 %
Analysis Quantity: 1.000E+00 Sample

Efficiency Cal File: 16_Liquid_Marinelli 1L.Clb
Efficiency Cal Desc: 16_1Lmarn_90062_032712
Efficiency Cal Date: 4/2/2012 18:09
Energy Cal Date: 2/28/2012 09:35
Library: Client_Long_Rev15.lib
Bkgd Correction File: 16_2019-10-06_1926.PBC

Nuclide	Activity Bq/Sample	1-Sigma Counting Uncert %	1-Sigma Counting Uncert Bq/Sample	1-Sigma Total Uncert Bq/Sample	Minimum Detectable Activity Bq/Sample
BE-7	6.829E-01	136.3	9.307E-01	9.314E-01	3.142E+00
NA-22	-1.493E-01	112.6	1.680E-01	1.682E-01	3.468E-01
K-40	-1.926E-01	763.3	1.470E+00	1.470E+00	4.115E+00
Sc-46	-1.558E-01	89.9	1.400E-01	1.402E-01	4.684E-01
CR-51	-9.377E-01	140.0	1.313E+00	1.314E+00	4.388E+00
MN-54	-3.707E-02	311.0	1.153E-01	1.153E-01	2.946E-01
FE-59	3.145E-02	95.3	2.998E-02	3.002E-02	5.646E-01
Co-56	-1.236E-01	125.3	1.549E-01	1.551E-01	3.437E-01
CO-57	-6.737E-01	156.3	1.053E+00	1.053E+00	3.507E+00
CO-58	-1.647E-01	81.3	1.340E-01	1.342E-01	4.466E-01
CO-60	-2.632E-02	522.6	1.375E-01	1.376E-01	3.155E-01
ZN-65	2.565E-01	105.1	2.697E-01	2.699E-01	9.114E-01
NB-94	-1.328E-01	112.8	1.498E-01	1.500E-01	5.026E-01
ZR-95	7.694E-02	266.3	2.049E-01	2.050E-01	4.811E-01
NB-95	0.000E+00	1.#INF	7.616E-02	7.616E-02	2.955E-01
RU-103	-6.025E-03	1648.7	9.934E-02	9.934E-02	2.427E-01
RH-106	1.320E+00	132.5	1.749E+00	1.750E+00	5.845E+00
AG-108M	8.109E-02	116.5	9.450E-02	9.458E-02	2.259E-01
AG-110M	3.771E-01	35.6	1.342E-01	1.355E-01	5.882E-01
SN-113	-9.288E-02	171.2	1.590E-01	1.590E-01	5.364E-01
SB-124	1.041E-03	79.0	8.223E-04	8.239E-04	6.932E-01
SB-125	2.323E-01	90.0	2.091E-01	2.094E-01	7.845E-01
I-131	9.087E-03	239.0	2.172E-02	2.172E-02	2.672E-01
Gd-153	-3.293E-02	1174.0	3.866E-01	3.866E-01	1.293E+00
Ga-68	-4.803E+00	146.7	7.047E+00	7.052E+00	1.552E+01
Tc-99m	-1.344E-02	1072.5	1.442E-01	1.442E-01	4.831E-01
BA-133	1.698E-01	94.0	1.596E-01	1.598E-01	4.247E-01
CS-134	3.901E-02	325.8	1.271E-01	1.271E-01	4.360E-01
CS-137	5.039E-02	211.6	1.067E-01	1.067E-01	3.667E-01
CE-139	-9.853E-02	88.6	8.727E-02	8.772E-02	3.088E-01
Ba-140	2.433E-01	114.7	2.791E-01	2.794E-01	9.704E-01
La-140	9.648E-02	171.3	1.652E-01	1.653E-01	2.875E-01
CE-141	4.920E-02	261.9	1.288E-01	1.289E-01	4.355E-01

CE-144	-6.414E-01	150.6	9.663E-01	9.669E-01	3.219E+00
PM-144	-1.980E-01	97.2	1.926E-01	1.928E-01	5.230E-01
EU-152	-2.683E-01	59.3	1.592E-01	1.598E-01	1.790E+00
EU-154	1.606E-01	93.6	1.504E-01	1.506E-01	4.682E-01
EU-155	-1.491E-02	2426.0	3.618E-01	3.618E-01	1.853E+00
HF-181	-1.436E-01	95.7	1.374E-01	1.376E-01	4.593E-01
Ta-182	-6.556E-01	75.8	4.968E-01	4.978E-01	1.652E+00
Hg-203	-1.121E-01	72.5	8.129E-02	8.155E-02	3.019E-01
TL-208	-1.156E-01	59.8	6.908E-02	6.932E-02	3.501E-01
PM-146	-1.004E-01	137.8	1.383E-01	1.384E-01	3.660E-01
Y-88	-2.446E-01	110.6	2.704E-01	2.708E-01	5.248E-01
Cd-113m	-1.664E+03	86.9	1.446E+03	1.450E+03	4.812E+03
Cd-109	-1.756E+00	174.8	3.071E+00	3.072E+00	1.022E+01
Cf-251	-3.493E-01	127.2	4.444E-01	4.454E-01	1.136E+00
Cf-249	8.599E-02	157.6	1.355E-01	1.356E-01	4.580E-01
Sn-126	6.004E-01	131.2	7.877E-01	7.884E-01	2.631E+00
PB-210	1.848E+00	99.3	1.835E+00	1.843E+00	5.165E+00
PB-212	-2.213E-01	110.6	2.447E-01	2.451E-01	8.299E-01
PB-214	-3.791E-01	65.9	2.500E-01	2.508E-01	8.548E-01
BI-207	9.012E-02	102.1	9.200E-02	9.211E-02	3.739E-01
BI-212	-1.933E-01	808.3	1.562E+00	1.562E+00	5.390E+00
U-235	-1.125E+00	71.9	8.092E-01	8.113E-01	3.340E+00
BI-214	5.496E-01	56.7	3.116E-01	3.128E-01	6.177E-01
BI-210M	-2.327E-01	88.3	2.056E-01	2.060E-01	6.065E-01
AC-228	-1.037E+00	41.9	4.344E-01	4.373E-01	1.432E+00
TH-227	-5.022E-02	2318.8	1.165E+00	1.165E+00	2.905E+00
TH-229	2.819E+00	48.8	1.376E+00	1.393E+00	3.434E+00
TH-234	2.516E+00	41.5	1.045E+00	1.055E+00	3.228E+00
PA-231	3.028E+00	158.5	4.801E+00	4.804E+00	1.605E+01
PA-233	0.000E+00	1.#INF	5.187E-02	5.187E-02	1.346E+00
PA-234	-8.096E-02	143.5	1.162E-01	1.162E-01	1.952E+00
PA-234M	-1.387E+01	117.3	1.627E+01	1.628E+01	5.279E+01
AM-241	-2.658E-01	76.2	2.026E-01	2.031E-01	7.915E-01
Np-237	-5.075E-01	182.6	9.269E-01	9.274E-01	3.085E+00
Ir-192	0.000E+00	1.#INF	2.611E-02	2.611E-02	5.618E-01
Cs-136	1.199E-02	401.3	4.813E-02	4.814E-02	5.132E-01
Np-239	2.292E-01	139.9	3.208E-01	3.211E-01	1.073E+00
Nd-147	-2.947E-01	241.6	7.121E-01	7.123E-01	1.724E+00
TL-210	2.945E-02	263.8	7.768E-02	7.770E-02	3.863E-01
Kr-85	-2.662E+01	143.4	3.818E+01	3.821E+01	1.278E+02
Total	1.569E+01				

Analyst: Caleb Quinn

Sample description
443730_Gamma_MB 160-443730~1-A

Spectrum Filename: C:\User\SPC\Det16\16_Gamma_20191786.An1

Acquisition information
Start time: 10/14/2019 6:22:47 AM
Live time: 7200
Real time: 7212
Dead time: 0.16 %
Detector ID: 16

Detector system
Ge16 SN/11012217

Calibration
Filename: 16_Liquid_Marinelli 1L.Clb
16_1Lmarn_90062_032712

Energy Calibration
Created: 2/28/2012 9:35:31 AM
Zero offset: 0.050 keV
Gain: 0.250 keV/channel
Quadratic: -2.285E-08 keV/channel^2

Efficiency Calibration
Created: 4/2/2012 6:09:24 PM
Knee Energy: 165.85 keV
Above the Knee: Quadratic Uncertainty = 2.42 %
Log(Eff): -2.314705E+00 + (2.848008E-01*Log(E)) +
(-8.114986E-02*Log(E)^2)
Below the Knee: Quadratic Uncertainty = 0.26 %
Log(Eff): -1.260350E+01 + (4.382261E+00*Log(E)) +
(-4.889120E-01*Log(E)^2)

Library Files
Main analysis library: Client_Long_Rev15.lib
Library Match Width: 0.500
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G800W064
Start channel: 100 (25.06keV)
Stop channel: 8000 (1999.64keV)
Peak rejection level: 1000.000%
Peak search sensitivity: 3
Sample Size: 1.0000E+00 +/- 0.000E+00%
Activity scaling factor: 1.0000E+00/(1.0000E+00* 1.0000E+00) =
1.0000E+00
Detection limit method: Reg. Guide 4.16 Method

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Random error: 4.0000000E+00
Systematic error: 4.0000000E+00
Fraction Limit: 0.000%
Background width: 3
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:	YES	10/14/2019 6:22:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	16_2019-10-06_1926.PBC 10/6/2019 7:26:53 PM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 15 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 0.2606

***** 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
46.39	29.	99.34	0.91	5.045E-02	46.54	4.250	PBC<MDA	PB210
63.30	52.	55.98	1.25	5.853E-02	63.29	3.810	PBC<MDA	TH234
64.28	25.	131.20	0.98	5.882E-02	64.28	9.700	PBC<MDA	Sn126
92.76	50.	61.34	1.35	6.175E-02	92.59	5.584	PBC<MDA	TH234
					93.35	5.561	PBC<MDA	AC228
106.13	22.	139.95	1.01	6.081E-02	106.13	22.700	PBC<MDA	Np239
120.92	14.	64.68	0.34	5.891E-02	121.78	28.580	1.157E-01	EU152
123.09	26.	93.62	1.03	5.858E-02	123.10	40.790	PBC<MDA	EU154
145.44	9.	261.91	1.05	5.475E-02	145.44	48.200	PBC<MDA	CE141
162.66	21.	114.72	1.07	5.153E-02	162.66	6.220	PBC<MDA	Ba140
163.38	17.	144.08	1.07	5.140E-02	163.38	5.080	PBC<MDA	U235
185.64	70.	33.45	1.29	4.777E-02	185.72	54.000	PBC<MDA	U235
193.51	42.	48.82	1.09	4.666E-02	193.51	4.400	PBC<MDA	TH229
210.85	12.	181.43	1.11	4.441E-02	210.85	2.990	PBC<MDA	TH229
227.00	12.	184.00	1.13	4.251E-02	227.00	6.300	PBC<MDA	Cf251
238.66	32.	72.83	0.57	4.126E-02	238.63	43.300	PBC<MDA	PB212
242.00	10.	284.02	1.14	4.091E-02	242.00	7.430	PBC<MDA	PB214
244.54	9.	325.56	1.14	4.064E-02	244.69	7.580	PBC<MDA	EU152
277.28	18.	99.21	1.17	3.761E-02	277.28	6.310	PBC<MDA	TL208
284.30	8.	270.42	1.18	3.703E-02	284.30	6.140	PBC<MDA	I131
296.00	14.	263.80	1.19	3.609E-02	296.00	79.000	PBC<MDA	TL210
302.65	22.	158.53	1.19	3.558E-02	302.65	2.880	PBC<MDA	PA231

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
					302.85	18.330	4.760E-01	BA133
302.85	13.	266.31	1.19	3.557E-02	302.65	2.880	PBC<MDA	PA231
					302.85	18.330	2.874E-01	BA133
328.76	5.	587.81	1.22	3.372E-02	328.76	20.300	PBC<MDA	La140
351.93	-33.	65.95	1.24	3.223E-02	351.93	37.600	PBC<MDA	PB214
356.00	19.	93.97	1.24	3.199E-02	356.00	62.050	PBC<MDA	BA133
383.84	10.	220.55	1.27	3.040E-02	383.84	8.940	PBC<MDA	BA133
387.95	12.	157.57	1.27	3.018E-02	387.95	66.000	PBC<MDA	Cf249
433.94	15.	116.53	1.31	2.793E-02	433.94	90.480	PBC<MDA	AG108M
477.60	14.	136.28	1.35	2.610E-02	477.60	10.520	PBC<MDA	BE7
487.02	11.	172.03	1.36	2.573E-02	487.02	45.500	PBC<MDA	La140
511.39	58.	56.16	2.09	2.484E-02	511.86	20.000	1.635E+00	RH106
					513.98	0.430	7.626E+01	Kr85
537.26	3.	545.19	1.40	2.396E-02	537.26	24.390	PBC<MDA	Ba140
569.70	13.	121.68	1.43	2.294E-02	569.32	15.380	5.203E-01	CS134
					569.47	8.200	9.760E-01	PA234
					569.70	97.740	PBC<MDA	BI207
600.50	14.	170.07	1.46	2.206E-02	600.50	17.860	PBC<MDA	SB125
609.35	31.	56.89	1.52	2.181E-02	609.31	46.090	PBC<MDA	BI214
621.92	20.	132.48	1.48	2.148E-02	621.92	9.930	PBC<MDA	RH106
635.89	13.	90.04	1.49	2.112E-02	635.89	11.310	PBC<MDA	SB125
661.66	6.	211.64	1.51	2.049E-02	661.66	85.210	PBC<MDA	CS137
723.36	4.	400.67	1.57	1.912E-02	722.79	10.810	PBC<MDA	SB124
					722.94	90.840	3.289E-02	AG108M
					723.36	20.220	1.478E-01	EU154
757.24	6.	266.34	1.60	1.845E-02	756.73	54.460	PBC<MDA	ZR95
763.94	27.	35.58	1.60	1.831E-02	763.94	22.280	PBC<MDA	AG110M
795.87	4.	325.85	1.63	1.772E-02	795.87	85.530	PBC<MDA	CS134
871.10	2.	698.81	1.69	1.648E-02	871.10	99.890	PBC<MDA	NB94
873.23	3.	410.77	1.70	1.645E-02	873.23	12.270	PBC<MDA	EU154
884.68	17.	86.35	1.71	1.627E-02	884.68	72.680	PBC<MDA	AG110M
937.49	11.	104.38	1.75	1.551E-02	937.49	34.360	PBC<MDA	AG110M
946.02	5.	244.95	1.76	1.540E-02	946.02	13.400	PBC<MDA	PA234
968.97	15.	85.95	1.78	1.510E-02	968.97	17.460	PBC<MDA	AC228
996.33	6.	208.67	1.80	1.475E-02	996.33	10.600	PBC<MDA	EU154
1001.00	-12.	117.27	1.81	1.469E-02	1001.00	0.837	PBC<MDA	PA234M
1048.07	2.	401.27	1.84	1.414E-02	1048.07	80.000	PBC<MDA	Cs136
1063.66	8.	163.96	1.86	1.396E-02	1063.66	74.500	PBC<MDA	BI207
1115.55	13.	105.12	1.90	1.341E-02	1115.55	50.600	PBC<MDA	ZN65
1120.29	14.	98.05	1.91	1.336E-02	1120.29	15.100	PBC<MDA	BI214
					1120.55	99.987	PBC<MDA	Sc46
1275.20	2.	369.68	2.03	1.195E-02	1274.53	99.940	PBC<MDA	NA22
					1274.54	35.190	6.607E-02	EU154
1291.60	9.	95.32	2.05	1.181E-02	1291.60	43.200	PBC<MDA	FE59
1332.50	-2.	522.55	2.08	1.149E-02	1332.50	99.980	PBC<MDA	CO60
1384.30	10.	107.24	2.12	1.111E-02	1384.30	24.290	PBC<MDA	AG110M
1408.00	18.	40.45	2.14	1.094E-02	1408.00	21.005	1.088E+00	EU152
1461.03	-2.	763.31	2.19	1.059E-02	1460.83	10.670	PBC<MDA	K40

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1596.21	5.	171.28	2.29	9.770E-03	1596.21	95.400	PBC<MDA	La140
1690.98	11.	90.22	2.37	9.267E-03	1690.98	47.790	PBC<MDA	SB124
1771.35	8.	80.83	2.43	8.877E-03	1771.35	15.480	PBC<MDA	Co56

********** 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	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide
483.21	120.92	80.	16.	2.686E+02	83.94	1.028	- c
742.02	185.64	82.	136.	2.844E+03	15.63	1.293	- s
2044.66	511.39	295.	58.	2.352E+03	56.16	2.094	-

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

This section based on library: Client_Long_Rev15.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 1 Sigma %	FWHM keV
PB-210	185.28	46.39	274.	29.	0.004	99.34	0.913
TH-227	200.26	50.14	563.	-26.	-0.004	128.89	0.963s
AM-241	237.83	59.54	603.	-39.	-0.005	76.20	0.971s
TH-234	252.87	63.30	246.	52.	0.007	55.98	1.249s
Sn-126	256.79	64.28	511.	25.	0.003	131.20	0.976s
BA-133	323.60	80.99	279.	-37.	-0.005	80.26	0.991s
Np-237	345.59	86.49	1445.	-30.	-0.004	182.65	0.996
EU-155	345.80	86.54	1415.	-30.	-0.004	180.79	0.996
Sn-126	347.39	86.94	1386.	-30.	-0.004	178.86	0.997
Sn-126	349.91	87.57	1356.	-30.	-0.004	176.84	0.997
Cd-109	351.79	88.04	1326.	-30.	-0.004	174.84	0.998
Nd-147	364.02	91.10	1297.	-30.	-0.004	172.42	1.001s
TH-234	370.67	92.76	276.	50.	0.007	61.34	1.348s
AC-228	373.02	93.35	1318.	-60.	-0.008	55.56	1.003s
Np-239	397.61	99.50	1282.	-30.	-0.004	170.11	1.008s
Gd-153	412.40	103.20	1312.	-10.	-0.001	503.86	1.012
Np-239	414.40	103.70	1322.	0.	0.000	1000.00	1.012
Np-239	424.11	106.13	484.	22.	0.003	139.95	1.014s
EU-152	486.69	121.78	303.	-29.	-0.004	86.17	1.029
CO-57	487.81	122.06	300.	-32.	-0.004	79.63	1.029
EU-154	491.96	123.10	279.	26.	0.004	93.62	1.030s
PA-234	524.73	131.29	930.	-29.	-0.004	149.51	1.038s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
HF-181	531.64	133.02	919.	-29.	-0.004	148.42	1.039s
CE-144	533.70	133.54	948.	-29.	-0.004	150.65	1.040s
HF-181	544.74	136.30	977.	-29.	-0.004	152.54	1.042s
CO-57	545.43	136.47	1027.	-29.	-0.004	156.28	1.042
U-235	574.67	143.79	934.	-49.	-0.007	71.90	1.049s
CE-141	581.29	145.44	295.	9.	0.001	261.91	1.050s
Ba-140	650.14	162.66	276.	21.	0.003	114.72	1.066s
U-235	653.01	163.38	304.	17.	0.002	144.08	1.067s
CE-139	662.90	165.85	353.	-29.	-0.004	88.57	1.069s
Cf-251	705.88	176.60	198.	-21.	-0.003	127.24	1.079s
U-235	742.34	185.72	394.	-92.	-0.013	31.39	1.087s
TH-229	773.49	193.51	106.	42.	0.006	48.82	1.094s
U-235	820.76	205.33	185.	-23.	-0.003	129.24	1.105
TH-229	842.82	210.85	132.	12.	0.002	181.43	1.110
Cf-251	907.40	227.00	128.	12.	0.002	184.00	1.125s
TH-227	943.27	235.97	534.	-26.	-0.004	126.62	1.133s
PB-212	953.91	238.63	498.	-28.	-0.004	110.57	1.136s
PB-214	967.37	242.00	386.	10.	0.001	284.02	1.139s
EU-152	978.14	244.69	451.	9.	0.001	325.56	1.141
Cd-113m	1054.15	263.70	280.	-28.	-0.004	86.92	1.158s
BI-210M	1062.67	265.83	307.	-32.	-0.004	88.35	1.160s
TL-208	1108.46	277.28	141.	18.	0.002	99.21	1.171s
Hg-203	1116.13	279.20	186.	-25.	-0.003	72.51	1.173s
I-131	1136.52	284.30	120.	8.	0.001	270.42	1.177s
TL-210	1183.31	296.00	638.	14.	0.002	263.80	1.188s
PA-231	1209.90	302.65	616.	22.	0.003	158.53	1.194s
BA-133	1210.70	302.85	639.	13.	0.002	266.31	1.194s
Ba-140	1218.69	304.85	652.	0.	0.000	1000.00	1.196
BI-210M	1218.88	304.90	652.	0.	0.000	1000.00	1.196
Ir-192	1233.05	308.44	652.	0.	0.000	1000.00	1.199
PA-233	1247.34	312.01	652.	0.	0.000	1000.00	1.202s
Ir-192	1265.24	316.49	652.	0.	0.000	1000.00	1.206s
CR-51	1279.62	320.08	508.	-23.	-0.003	140.00	1.210s
La-140	1314.31	328.76	401.	5.	0.001	587.81	1.217s
Cf-249	1333.02	333.44	491.	-24.	-0.003	134.10	1.222s
AC-228	1352.54	338.32	498.	-28.	-0.004	131.38	1.226s
Cs-136	1361.54	340.57	518.	-24.	-0.003	136.94	1.228
EU-152	1376.40	344.29	547.	-17.	-0.002	59.34	1.231s
PB-214	1406.97	351.93	238.	-33.	-0.005	65.95	1.238
BA-133	1423.24	356.00	155.	19.	0.003	93.97	1.242s
I-131	1457.16	364.48	100.	-5.	-0.001	394.12	1.250s
BA-133	1534.57	383.84	227.	10.	0.001	220.55	1.267s
Cf-249	1551.01	387.95	183.	12.	0.002	157.57	1.271s
SN-113	1565.96	391.69	235.	-13.	-0.002	171.16	1.274s
SB-125	1710.67	427.88	91.	-8.	-0.001	245.96	1.307s
AG-108M	1734.91	433.94	68.	15.	0.002	116.53	1.312s
PM-146	1814.67	453.88	88.	-13.	-0.002	137.80	1.330s
SB-125	1852.61	463.37	155.	-14.	-0.002	125.57	1.338s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BE-7	1909.51	477.60	162.	14.	0.002	136.28	1.351s
HF-181	1927.12	482.00	202.	-22.	-0.003	95.71	1.355s
La-140	1947.21	487.02	176.	11.	0.002	172.03	1.359s
RH-106	2046.57	511.86	450.	-35.	-0.005	86.31	2.631s
Kr-85	2055.03	513.98	418.	-20.	-0.003	143.42	1.383s
Nd-147	2123.10	531.00	61.	-7.	-0.001	241.61	1.398s
Ba-140	2148.14	537.26	67.	3.	0.000	545.19	1.404
CS-134	2252.03	563.24	66.	-3.	0.000	498.10	1.427s
CS-134	2276.36	569.32	100.	-24.	-0.003	62.58	1.432
PA-234	2276.96	569.47	127.	-6.	-0.001	286.80	1.432
BI-207	2277.89	569.70	121.	13.	0.002	121.68	1.432
TL-208	2331.16	583.02	95.	-28.	-0.004	66.66	1.444
SB-125	2401.07	600.50	288.	14.	0.002	170.07	1.460s
SB-124	2409.99	602.73	509.	-25.	-0.003	129.76	1.462s
CS-134	2417.91	604.71	484.	-25.	-0.003	126.48	1.463s
BI-214	2436.47	609.35	81.	31.	0.004	56.89	1.517s
RU-103	2440.26	610.30	459.	-25.	-0.003	122.86	1.468s
AG-108M	2456.19	614.28	434.	-25.	-0.003	119.28	1.472s
PM-144	2471.31	618.06	415.	-25.	-0.003	116.38	1.475s
RH-106	2486.73	621.92	349.	20.	0.003	132.48	1.479s
SB-125	2542.62	635.89	62.	13.	0.002	90.04	1.491s
I-131	2546.96	636.97	82.	-5.	-0.001	244.47	1.492s
AG-110M	2630.10	657.76	88.	-6.	-0.001	224.85	1.510s
CS-137	2645.69	661.66	87.	6.	0.001	211.64	1.513s
PM-144	2785.22	696.54	230.	-28.	-0.004	97.24	1.544
NB-94	2809.57	702.63	204.	-18.	-0.003	112.82	1.549s
SB-124	2890.19	722.79	113.	-20.	-0.003	76.98	1.567s
AG-108M	2890.80	722.94	122.	-7.	-0.001	212.58	1.567s
EU-154	2892.49	723.36	134.	4.	0.001	400.67	1.567s
BI-212	2907.73	727.17	130.	-2.	0.000	808.29	1.570s
PM-146	2941.93	735.72	80.	-23.	-0.003	116.80	1.578s
PM-146	2987.69	747.16	47.	-8.	-0.001	192.44	1.588s
ZR-95	3025.97	756.73	47.	6.	0.001	266.34	1.596s
AG-110M	3054.82	763.94	33.	27.	0.004	35.58	1.602s
NB-95	3062.21	765.79	60.	0.	0.000	1000.00	1.604s
PA-234M	3064.70	766.41	141.	-27.	-0.004	38.26	1.605s
EU-152	3114.73	778.92	75.	-22.	-0.003	84.28	1.615s
BI-212	3140.74	785.42	59.	-10.	-0.001	111.35	1.621s
CS-134	3182.54	795.87	93.	4.	0.001	325.85	1.630s
TL-210	3197.46	799.60	97.	0.	0.000	1000.00	1.633s
CS-134	3206.86	801.95	108.	-10.	-0.001	155.17	1.635s
CO-58	3242.16	810.78	130.	-21.	-0.003	81.34	1.643s
La-140	3262.14	815.77	151.	-20.	-0.003	87.88	1.647s
MN-54	3338.46	834.85	52.	-5.	-0.001	311.04	1.663s
Co-56	3386.15	846.77	70.	-15.	-0.002	125.31	1.674s
NB-94	3483.47	871.10	40.	2.	0.000	698.81	1.695s
EU-154	3492.00	873.23	54.	3.	0.000	410.77	1.696
PA-234	3521.21	880.53	117.	-20.	-0.003	81.22	1.703s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
PA-234	3532.05	883.24	137.	-3.	0.000	616.39	1.705s
AG-110M	3537.82	884.68	103.	17.	0.002	86.35	1.706s
Sc-46	3556.21	889.28	124.	-18.	-0.003	89.86	1.710s
Y-88	3591.26	898.04	56.	-8.	-0.001	143.91	1.718s
AC-228	3643.38	911.07	92.	-34.	-0.005	41.88	1.729s
AG-110M	3749.09	937.49	25.	11.	0.002	104.38	1.751s
PA-234	3783.21	946.02	30.	5.	0.001	244.95	1.759s
EU-152	3855.58	964.11	74.	-14.	-0.002	93.84	1.774s
AC-228	3875.02	968.97	71.	15.	0.002	85.95	1.778s
EU-154	3984.48	996.33	71.	6.	0.001	208.67	1.801
PA-234M	4003.15	1001.00	89.	-12.	-0.002	117.27	1.805s
EU-154	4018.27	1004.77	94.	-10.	-0.001	142.92	1.808s
Co-56	4150.56	1037.84	50.	-19.	-0.003	77.03	1.836s
Cs-136	4191.49	1048.07	43.	2.	0.000	401.27	1.845s
RH-106	4200.65	1050.36	65.	-9.	-0.001	126.77	1.847s
BI-207	4253.86	1063.66	29.	8.	0.001	163.96	1.858s
Ga-68	4308.84	1077.40	32.	-9.	-0.001	146.71	1.870s
FE-59	4396.27	1099.25	37.	-7.	-0.001	192.95	1.888s
ZN-65	4461.46	1115.55	80.	13.	0.002	105.12	1.901s
BI-214	4480.43	1120.29	79.	14.	0.002	98.05	1.906s
Sc-46	4481.49	1120.55	93.	0.	0.000	1000.00	1.906s
Ta-182	4484.49	1121.30	128.	-22.	-0.003	75.78	1.906s
CO-60	4692.30	1173.24	40.	-7.	-0.001	224.92	1.950s
Ta-182	4755.57	1189.05	51.	-20.	-0.003	86.67	1.963s
Ta-182	4885.06	1221.41	40.	-18.	-0.002	86.93	1.990s
NA-22	5097.62	1274.53	34.	-13.	-0.002	112.57	2.034
EU-154	5097.66	1274.54	26.	2.	0.000	369.68	2.034s
FE-59	5165.91	1291.60	12.	9.	0.001	95.32	2.048s
TL-210	5251.57	1313.00	45.	-17.	-0.002	94.21	2.066s
CO-60	5329.61	1332.50	25.	-2.	0.000	522.55	2.081s
AG-110M	5536.89	1384.30	18.	10.	0.001	107.24	2.124s
EU-152	5631.75	1408.00	6.	18.	0.002	40.45	2.143
K-40	5843.19	1460.83	44.	-2.	0.000	763.31	2.186s
La-140	6385.02	1596.21	13.	5.	0.001	171.28	2.294s
SB-124	6764.37	1690.98	13.	11.	0.001	90.22	2.369s
BI-214	7058.61	1764.49	62.	-29.	-0.004	32.06	2.427s
Co-56	7086.08	1771.35	19.	8.	0.001	80.83	2.433s
Y-88	7345.12	1836.06	40.	-15.	-0.002	110.55	2.483s

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	6.8293E-01				5.31E+01	
			477.60	6.829E-01	&(	3.142E+00	1.36E+02 1.05E+01 G
NA-22	C	-1.4928E-01				9.50E+02	
			1274.53	-1.493E-01	?(P	3.468E-01	1.13E+02 9.99E+01 G
K-40	N	-1.9264E-01				4.66E+11	
			1460.83	-1.926E-01	?(P	4.115E+00	7.63E+02 1.07E+01 G
Sc-46	F	-1.5575E-01				8.38E+01	
			889.28	-1.558E-01	&(	4.684E-01	8.99E+01 1.00E+02 G
			1120.55	0.000E+00	+	4.956E-01	1.00E+03 1.00E+02 G
CR-51	F	-9.3768E-01				2.77E+01	
			320.08	-9.377E-01	?(	4.388E+00	1.40E+02 9.94E+00 G
MN-54	C	-3.7067E-02				3.12E+02	
			834.85	-3.707E-02	?(P	2.946E-01	3.11E+02 1.00E+02 G
FE-59	F	3.1450E-02				4.45E+01	
			1099.25	-1.328E-01	?(	5.646E-01	1.93E+02 5.65E+01 G
			1291.60	2.463E-01	?(P	5.125E-01	9.53E+01 4.32E+01 G
Co-56	C	-1.2364E-01				7.73E+01	
			846.77	-1.236E-01	?(	3.437E-01	1.25E+02 9.99E+01 G
			1238.28	-1.716E-02	%	5.127E-01	1.37E+03 6.61E+01 G
			1037.84	-1.318E+00	+ P	2.462E+00	7.70E+01 1.41E+01 G
			1771.35	8.554E-01	?	2.336E+00	8.08E+01 1.55E+01 A
CO-57	C	-6.7369E-01				2.72E+02	
			122.06	-8.724E-02	}	2.306E-01	7.96E+01 8.56E+01 G
			136.47	-6.737E-01	?(	3.507E+00	1.56E+02 1.07E+01 G
CO-58	C	-1.6468E-01				7.09E+01	
			810.78	-1.647E-01	?(	4.466E-01	8.13E+01 9.95E+01 G
CO-60	F	-2.6322E-02				1.93E+03	
			1332.50	-2.632E-02	?(P	3.155E-01	5.23E+02 1.00E+02 G
			1173.24	-7.219E-02	+	3.472E-01	2.25E+02 9.99E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
ZN-65	F	2.5653E-01					2.44E+02	
			1115.55	2.565E-01	?(	9.114E-01	1.05E+02	5.06E+01 G
NB-94	I	-1.3278E-01					7.41E+06	
			702.63	-1.328E-01	?(	5.026E-01	1.13E+02	9.79E+01 G
			871.10	1.688E-02	+	2.716E-01	6.99E+02	9.99E+01 G
ZR-95	I	7.6940E-02					6.40E+01	
			756.73	7.694E-02	?(P	4.811E-01	2.66E+02	5.45E+01 G
			724.20	2.300E-02	%	9.234E-01	1.16E+03	4.42E+01 G
RU-103	I	-6.0253E-03					3.93E+01	
			497.05	-6.025E-03	%(	2.427E-01	1.65E+03	9.09E+01 G
			610.30	-2.772E+00	&	1.137E+01	1.23E+02	5.75E+00 GA
RH-106	I	1.3203E+00					3.74E+02	
			621.92	1.320E+00	?(P	5.845E+00	1.32E+02	9.93E+00 G
			1050.36	-5.889E+00	+	2.548E+01	1.27E+02	1.56E+00 G
			511.86	-9.910E-01	+	2.840E+00	8.63E+01	2.00E+01 GA
AG-108M	C	8.1092E-02					1.53E+05	
			433.94	8.109E-02	*(P	2.259E-01	1.17E+02	9.05E+01 G
			722.94	-5.969E-02	&	4.335E-01	2.13E+02	9.08E+01 G
			614.28	-1.787E-01	+	7.118E-01	1.19E+02	8.98E+01 G
AG-110M	F	3.7713E-01					2.50E+02	
			884.68	2.036E-01	?(	5.882E-01	8.63E+01	7.27E+01 G
			657.76	-4.279E-02	&	3.311E-01	2.25E+02	9.46E+01 G
			937.49	2.866E-01	&(	6.777E-01	1.04E+02	3.44E+01 G
			1384.30	5.148E-01	?(	1.157E+00	1.07E+02	2.43E+01 G
			763.94	9.328E-01	&(P	9.981E-01	3.56E+01	2.23E+01 G
SN-113	F	-9.2877E-02					1.15E+02	
			391.69	-9.288E-02	?(	5.364E-01	1.71E+02	6.40E+01 G
SB-124	F	1.0406E-03					6.02E+01	
			602.73	-1.600E-01	?(	6.932E-01	1.30E+02	9.83E+01 G
			1690.98	3.321E-01	&(P	6.202E-01	9.02E+01	4.78E+01 G
			722.79	-1.369E+00	&	3.507E+00	7.70E+01	1.08E+01 G
SB-125	I	2.3226E-01					1.01E+03	
			427.88	-1.331E-01	?(	7.845E-01	2.46E+02	2.96E+01 G
			600.50	5.061E-01	(P	2.885E+00	1.70E+02	1.79E+01 G
			635.89	7.559E-01	?(	2.291E+00	9.00E+01	1.13E+01 G
			463.37	-7.081E-01	& P	3.023E+00	1.26E+02	1.05E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
I-131	I	9.0870E-03					8.02E+00	
			364.48	-2.709E-02	?(	2.672E-01	3.94E+02	8.17E+01 G
			284.30	4.905E-01	?(	3.296E+00	2.70E+02	6.14E+00 G
			636.97	-4.916E-01	&	4.148E+00	2.44E+02	7.17E+00 G
Gd-153	F	-3.2931E-02					2.42E+02	
			97.50	-3.293E-02	&(	1.293E+00	1.17E+03	3.00E+01 G
			103.20	-1.062E-01	+	1.788E+00	5.04E+02	2.18E+01 G
Ga-68	C	-4.8033E+00					4.71E-02	
			1077.40	-4.803E+00	?(	1.552E+01	1.47E+02	3.30E+00 G
Tc-99m	I	-1.3443E-02					2.51E-01	
			140.51	-1.344E-02	%(	4.831E-01	1.07E+03	8.93E+01 G
BA-133	F	1.6981E-01					3.85E+03	
			356.00	1.351E-01	(	4.247E-01	9.40E+01	6.20E+01 G
			302.85	2.874E-01	(	2.566E+00	2.66E+02	1.83E+01 G
			383.84	5.021E-01	P	3.727E+00	2.21E+02	8.94E+00 GA
			80.99	-2.458E-01	+ P	5.332E-01	8.03E+01	3.41E+01 GA
CS-134	I	3.9009E-02					7.54E+02	
			795.87	3.901E-02	?(P	4.360E-01	3.26E+02	8.55E+01 G
			604.71	-1.616E-01	+	6.826E-01	1.26E+02	9.76E+01 G
			569.32	-9.392E-01	+	1.937E+00	6.26E+01	1.54E+01 G
			801.95	-8.771E-01	+	4.633E+00	1.55E+02	8.69E+00 G
			563.24	-2.465E-01	+ P	2.925E+00	4.98E+02	8.35E+00 G
CS-137	I	5.0392E-02					1.10E+04	
			661.66	5.039E-02	&(	3.667E-01	2.12E+02	8.52E+01 G
CE-139	F	-9.8529E-02					1.38E+02	
			165.85	-9.853E-02	(P	3.088E-01	8.86E+01	7.99E+01 G
Ba-140	I	2.4328E-01					1.28E+01	
			537.26	7.312E-02	?(P	9.704E-01	5.45E+02	2.44E+01 G
			162.66	9.105E-01	&(P	3.472E+00	1.15E+02	6.22E+00 G
			304.85	0.000E+00	-	1.113E+01	1.00E+03	4.29E+00 G
La-140	I	9.6478E-02					1.28E+01	
			1596.21	7.948E-02	?(	2.875E-01	1.71E+02	9.54E+01 G
			487.02	1.314E-01	&(	7.656E-01	1.72E+02	4.55E+01 G
			328.76	9.807E-02	*(	1.949E+00	5.88E+02	2.03E+01 G
			815.77	-7.007E-01	+	2.057E+00	8.79E+01	2.33E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CE-141	I	4.9196E-02					3.25E+01	
			145.44	4.920E-02	?(	4.355E-01	2.62E+02	4.82E+01 G
CE-144	I	-6.4141E-01					2.85E+02	
			133.54	-6.414E-01	?(	3.219E+00	1.51E+02	1.11E+01 G
PM-144	C	-1.9805E-01					3.63E+02	
			696.54	-1.980E-01	?(P	5.230E-01	9.72E+01	9.90E+01 G
			618.06	-1.631E-01	+	6.339E-01	1.16E+02	9.91E+01 G
EU-152	F	-2.6828E-01					4.94E+03	
			121.78	-2.419E-01	}	6.933E-01	8.62E+01	2.86E+01 G
			344.29	-2.683E-01	&(P	1.790E+00	5.93E+01	2.65E+01 G
			1112.07	-1.137E-03	%	3.609E+00	9.08E+04	1.36E+01 G
			778.92	-1.337E+00	+	2.558E+00	8.43E+01	1.29E+01 G
			964.11	-8.469E-01	+	2.676E+00	9.38E+01	1.46E+01 G
			244.69	4.180E-01	+	4.583E+00	3.26E+02	7.58E+00 G
			1408.00	1.088E+00	+	8.537E-01	4.04E+01	2.10E+01 GA
EU-154	I	1.6062E-01					3.14E+03	
			123.10	1.500E-01	?(	4.682E-01	9.36E+01	4.08E+01 G
			1274.54	6.607E-02	?(	8.795E-01	3.70E+02	3.52E+01 G
			723.36	1.478E-01	&(	2.034E+00	4.01E+02	2.02E+01 G
			873.23	1.792E-01	(P	2.552E+00	4.11E+02	1.23E+01 G
			1004.77	-5.178E-01	&	2.520E+00	1.43E+02	1.80E+01 G
			996.33	5.182E-01	(	3.733E+00	2.09E+02	1.06E+01 G
EU-155	I	-1.4914E-02					1.81E+03	
			105.31	-1.491E-02	%(P	1.853E+00	2.43E+03	2.12E+01 G
			86.54	-2.166E-01	&	1.303E+00	1.81E+02	3.07E+01 G
HF-181	F	-1.4360E-01					4.24E+01	
			482.00	-1.436E-01	?(	4.593E-01	9.57E+01	8.05E+01 G
			133.02	-1.640E-01	+	8.108E-01	1.48E+02	4.33E+01 G
			345.83	2.156E-07	%	3.201E+00	4.40E+08	1.51E+01 G
			136.30	-1.229E+00	+	6.247E+00	1.53E+02	5.85E+00 G
Ta-182	F	-6.5560E-01					1.14E+02	
			1121.30	-6.556E-01	?(	1.652E+00	7.58E+01	3.49E+01 G
			1221.41	-7.329E-01	+	1.330E+00	8.69E+01	2.70E+01 G
			1189.05	-1.351E+00	&	2.431E+00	8.67E+01	1.62E+01 G
Hg-203	F	-1.1212E-01					4.66E+01	
			279.20	-1.121E-01	?(P	3.019E-01	7.25E+01	8.15E+01 G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TL-208   N  -1.1559E-01                                     6.98E+02
                         583.02-2.012E-01 &(P 3.501E-01 6.67E+01 8.45E+01 G
                         277.28 1.030E+00 &(P 3.401E+00 9.92E+01 6.31E+00 G
                         860.56 4.317E-02 % P 2.070E+00 2.07E+03 1.24E+01 G

PM-146   C  -1.0035E-01                                     2.02E+03
                         453.88-1.004E-01 ?(P 3.660E-01 1.38E+02 6.50E+01 G
                         747.16-1.681E-01 +   7.572E-01 1.92E+02 3.40E+01 G
                         735.72-7.606E-01 + P 1.455E+00 1.17E+02 2.25E+01 G

Y-88     F  -2.4463E-01                                     1.07E+02
                        1836.06-2.446E-01 ?(  5.248E-01 1.11E+02 9.92E+01 G
                         898.04-7.086E-02 & P 3.457E-01 1.44E+02 9.37E+01 G

Cd-113m    -1.6636E+03                                     5.33E+03
                         263.70-1.664E+03 ?(  4.812E+03 8.69E+01 6.00E-03   K

Cd-109   F  -1.7562E+00                                     4.53E+02
                          88.04-1.756E+00 &(  1.022E+01 1.75E+02 3.79E+00 G

Cf-251   T  -3.4928E-01                                     3.28E+05
                         176.60-3.493E-01  (  1.136E+00 1.27E+02 1.70E+01 G
                         227.00 6.050E-01 ?   2.878E+00 1.84E+02 6.30E+00 GA

Cf-249   T   8.5988E-02                                     1.28E+05
                         387.95 8.599E-02  (  4.580E-01 1.58E+02 6.60E+01 G
                         333.44-6.336E-01 +   2.839E+00 1.34E+02 1.55E+01 G

Sn-126       6.0041E-01                                     3.65E+07
                          87.57-1.774E-01 -   1.044E+00 1.77E+02 3.75E+01 GA
                          64.28 6.004E-01 ?(  2.631E+00 1.31E+02 9.70E+00 G
                          86.94-7.355E-01 +   4.379E+00 1.79E+02 9.04E+00 GA

PB-210   N   1.8478E+00                                     8.14E+03
                          46.54 1.848E+00  (P 5.165E+00 9.93E+01 4.25E+00 G

PB-212   N  -2.2130E-01                                     6.98E+02
                         238.63-2.213E-01 ?(P 8.299E-01 1.11E+02 4.33E+01 G
                         300.03-4.613E-02 % P 1.441E+01 9.28E+03 3.28E+00 GA

PB-214   N  -3.7908E-01                                     5.84E+05
                         351.93-3.791E-01  (P 8.548E-01 6.59E+01 3.76E+01 G
                         295.09-3.549E-02 % P 2.400E+00 2.03E+03 1.93E+01 G
                         242.00 4.549E-01 + P 4.306E+00 2.84E+02 7.43E+00 GA
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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

BI-207   C   9.0121E-02                                     1.18E+04
                         1063.66 1.009E-01 ?(P 3.739E-01 1.64E+02 7.45E+01 G
                          569.70 8.191E-02 ?(P 3.340E-01 1.22E+02 9.77E+01 G

BI-212   N  -1.9327E-01                                     6.98E+02
                          727.17-1.933E-01 ?(  5.390E+00 8.08E+02 7.55E+00 G
                          785.42-5.978E+00 + P 2.330E+01 1.11E+02 1.28E+00 GA

U-235    N  -1.1254E+00                                     2.57E+11
                          143.79-1.125E+00 ?(P 3.340E+00 7.19E+01 1.10E+01 G
                          205.33-1.390E+00 & P 4.059E+00 1.29E+02 5.01E+00 G
                          163.38 9.289E-01 + P 4.463E+00 1.44E+02 5.08E+00 G
                          185.72-4.969E-01 + P 5.127E-01 3.14E+01 5.40E+01 GA

BI-214   N   5.4965E-01                                     5.84E+05
                          609.31 4.245E-01 *(P 6.177E-01 5.69E+01 4.61E+01 G
                         1120.29 9.315E-01 ?(P 3.047E+00 9.81E+01 1.51E+01 G
                         1764.49-2.909E+00 - P 3.981E+00 3.21E+01 1.54E+01 G

BI-210M  T  -2.3271E-01                                     1.10E+09
                          265.83-2.327E-01 ?(P 6.065E-01 8.83E+01 5.00E+01 G
                          304.90 0.000E+00 +   1.705E+00 1.00E+03 2.80E+01 G

AC-228   N  -1.0372E+00                                     2.10E+03
                          911.07-1.037E+00 ?(P 1.432E+00 4.19E+01 2.90E+01 G
                          968.97 7.775E-01 + P 2.215E+00 8.60E+01 1.75E+01 G
                          338.32-9.805E-01 + P 3.730E+00 1.31E+02 1.20E+01 G
                           93.35-2.426E+00 & P 6.955E+00 5.56E+01 5.56E+00 XA

TH-227   N  -5.0223E-02                                     7.95E+03
                          256.24-5.022E-02 &(  2.905E+00 2.32E+03 7.00E+00 G
                          235.97-7.101E-01 +   3.001E+00 1.27E+02 1.23E+01 G
                           50.14-8.655E-01 +   3.723E+00 1.29E+02 8.00E+00 G

TH-229   N   2.8189E+00                                     2.68E+06
                          193.51 2.819E+00 &(  3.434E+00 4.88E+01 4.40E+00 G
                          210.85 1.255E+00 -   5.884E+00 1.81E+02 2.99E+00 G

TH-234   N   2.5160E+00                                     1.63E+12
                           92.59 2.014E+00 *(P 3.228E+00 6.13E+01 5.58E+00 G
                           63.29 3.252E+00  (P 4.719E+00 5.60E+01 3.81E+00 G

PA-231   N   3.0285E+00                                     1.20E+07
                          302.65 3.028E+00  (  1.605E+01 1.59E+02 2.88E+00 G
                          300.07-4.297E-01 % P 1.924E+01 1.34E+03 2.46E+00 G
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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

PA-234   N  -8.0956E-02                                     1.63E+12
                         131.29-3.918E-01 ?(  1.952E+00 1.50E+02 1.80E+01 G
                         946.02 3.365E-01 *(  1.900E+00 2.45E+02 1.34E+01 G
                         569.47-4.152E-01 +   4.081E+00 2.87E+02 8.20E+00 G
                         883.24-2.396E-01 +   5.083E+00 6.16E+02 9.60E+00 G
                         880.53-2.783E+00 +   7.538E+00 8.12E+01 6.00E+00 GA

PA-234M  N  -1.3873E+01                                     1.63E+12
                        1001.00-1.387E+01 ?(P 5.279E+01 1.17E+02 8.37E-01 G
                         766.41-7.074E+01 + P 1.502E+02 3.83E+01 2.94E-01 G

AM-241   T  -2.6584E-01                                     1.58E+05
                          59.54-2.658E-01  (P 7.915E-01 7.62E+01 3.59E+01 G

Np-237   F  -5.0750E-01                                     2.14E+06
                          86.49-5.075E-01 &(  3.085E+00 1.83E+02 1.31E+01 G

Cs-136   F   1.1995E-02                                     1.30E+01
                         818.50-1.336E-03 &(  5.132E-01 1.12E+04 1.00E+02 G
                        1048.07 2.866E-02  (  4.071E-01 4.01E+02 8.00E+01 G
                         340.57-2.136E-01 +   9.775E-01 1.37E+02 4.69E+01 G

Np-239   T   2.2922E-01                                     2.36E+00
                         103.70 0.000E+00 &   1.652E+00 1.00E+03 2.40E+01 X
                         106.13 2.292E-01 ?(  1.073E+00 1.40E+02 2.27E+01 G
                          99.50-4.572E-01 +   2.589E+00 1.70E+02 1.50E+01 X

Nd-147      -2.9472E-01                                     1.11E+01
                         531.00-2.947E-01 &(  1.724E+00 2.42E+02 1.30E+01 G
                          91.10-2.360E-01 &   1.355E+00 1.72E+02 2.83E+01 G

TL-210   N   2.9446E-02                                     5.84E+05
                         799.60 0.000E+00 &(  3.863E-01 1.00E+03 9.90E+01 G
                         296.00 6.633E-02 ?(  5.868E-01 2.64E+02 7.90E+01 G
                        1313.00-9.849E-01 &   1.937E+00 9.42E+01 2.10E+01 GA

Kr-85    I  -2.6620E+01                                     3.92E+03
                         513.98-2.662E+01 ?(  1.278E+02 1.43E+02 4.30E-01 G
   ( - 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.
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$ - 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

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********** 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 1 Sigma %	Activity	
TH-227	50.14	563.	-26.	-0.004	128.89	-8.655E-01	
AM-241	59.54	603.	-39.	-0.005	76.20	-2.658E-01	P
Sn-126	64.28	511.	25.	0.003	131.20	6.004E-01	
BA-133	80.99	279.	-37.	-0.005	80.26	-2.458E-01	P
Np-237	86.49	1445.	-30.	-0.004	182.65	-5.075E-01	
EU-155	86.54	1415.	-30.	-0.004	180.79	-2.166E-01	
Sn-126	86.94	1386.	-30.	-0.004	178.86	-7.355E-01	
Sn-126	87.57	1356.	-30.	-0.004	176.84	-1.774E-01	
Cd-109	88.04	1326.	-30.	-0.004	174.84	-1.756E+00	
Nd-147	91.10	1297.	-30.	-0.004	172.42	-2.360E-01	
AC-228	93.35	1318.	-60.	-0.008	55.56	-2.426E+00	P
Np-239	99.50	1282.	-30.	-0.004	170.11	-4.572E-01	
Gd-153	103.20	1312.	-10.	-0.001	503.86	-1.062E-01	
Np-239	106.13	484.	22.	0.003	139.95	2.292E-01	
CO-57	122.06	300.	-32.	-0.004	79.63	-8.724E-02	
PA-234	131.29	930.	-29.	-0.004	149.51	-3.918E-01	
HF-181	133.02	919.	-29.	-0.004	148.42	-1.640E-01	
CE-144	133.54	948.	-29.	-0.004	150.65	-6.414E-01	
HF-181	136.30	977.	-29.	-0.004	152.54	-1.229E+00	
CO-57	136.47	1027.	-29.	-0.004	156.28	-6.737E-01	
U-235	143.79	934.	-49.	-0.007	71.90	-1.125E+00	P
CE-141	145.44	295.	9.	0.001	261.91	4.920E-02	
Ba-140	162.66	276.	21.	0.003	114.72	9.105E-01	P
U-235	163.38	304.	17.	0.002	144.08	9.289E-01	P
CE-139	165.85	353.	-29.	-0.004	88.57	-9.853E-02	P

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Cf-251	176.60	198.	-21.	-0.003	127.24	-3.493E-01	
U-235	185.72	394.	-92.	-0.013	31.39	-4.969E-01	P
TH-229	193.51	106.	42.	0.006	48.82	2.819E+00	
U-235	205.33	185.	-23.	-0.003	129.24	-1.390E+00	P
TH-229	210.85	132.	12.	0.002	181.43	1.255E+00	
Cf-251	227.00	128.	12.	0.002	184.00	6.050E-01	
TH-227	235.97	534.	-26.	-0.004	126.62	-7.101E-01	
PB-212	238.63	498.	-28.	-0.004	110.57	-2.213E-01	P
PB-214	242.00	386.	10.	0.001	284.02	4.549E-01	P
Cd-113m	263.70	280.	-28.	-0.004	86.92	-1.664E+03	
BI-210M	265.83	307.	-32.	-0.004	88.35	-2.327E-01	P
TL-208	277.28	141.	18.	0.002	99.21	1.030E+00	P
Hg-203	279.20	186.	-25.	-0.003	72.51	-1.121E-01	P
I-131	284.30	120.	8.	0.001	270.42	4.905E-01	
TL-210	296.00	638.	14.	0.002	263.80	6.633E-02	
PA-231	302.65	616.	22.	0.003	158.53	3.028E+00	
BA-133	302.85	639.	13.	0.002	266.31	2.874E-01	
CR-51	320.08	508.	-23.	-0.003	140.00	-9.377E-01	
La-140	328.76	401.	5.	0.001	587.81	9.807E-02	
Cf-249	333.44	491.	-24.	-0.003	134.10	-6.336E-01	
AC-228	338.32	498.	-28.	-0.004	131.38	-9.805E-01	P
Cs-136	340.57	518.	-24.	-0.003	136.94	-2.136E-01	
PB-214	351.93	238.	-33.	-0.005	65.95	-3.791E-01	P
BA-133	356.00	155.	19.	0.003	93.97	1.351E-01	
I-131	364.48	100.	-5.	-0.001	394.12	-2.709E-02	
BA-133	383.84	227.	10.	0.001	220.55	5.021E-01	P
Cf-249	387.95	183.	12.	0.002	157.57	8.599E-02	
SN-113	391.69	235.	-13.	-0.002	171.16	-9.288E-02	
SB-125	427.88	91.	-8.	-0.001	245.96	-1.331E-01	
AG-108M	433.94	68.	15.	0.002	116.53	8.109E-02	P
PM-146	453.88	88.	-13.	-0.002	137.80	-1.004E-01	P
SB-125	463.37	155.	-14.	-0.002	125.57	-7.081E-01	P
BE-7	477.60	162.	14.	0.002	136.28	6.829E-01	
HF-181	482.00	202.	-22.	-0.003	95.71	-1.436E-01	
La-140	487.02	176.	11.	0.002	172.03	1.314E-01	
RH-106	511.86	450.	-35.	-0.005	86.31	-9.910E-01	
Kr-85	513.98	418.	-20.	-0.003	143.42	-2.662E+01	
Nd-147	531.00	61.	-7.	-0.001	241.61	-2.947E-01	
Ba-140	537.26	67.	3.	0.000	545.19	7.312E-02	P
CS-134	563.24	66.	-3.	0.000	498.10	-2.465E-01	P
CS-134	569.32	100.	-24.	-0.003	62.58	-9.392E-01	
PA-234	569.47	127.	-6.	-0.001	286.80	-4.152E-01	
BI-207	569.70	121.	13.	0.002	121.68	8.191E-02	P
TL-208	583.02	95.	-28.	-0.004	66.66	-2.012E-01	P
SB-125	600.50	288.	14.	0.002	170.07	5.061E-01	P
SB-124	602.73	509.	-25.	-0.003	129.76	-1.600E-01	
CS-134	604.71	484.	-25.	-0.003	126.48	-1.616E-01	
RU-103	610.30	459.	-25.	-0.003	122.86	-2.772E+00	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
AG-108M	614.28	434.	-25.	-0.003	119.28	-1.787E-01		
PM-144	618.06	415.	-25.	-0.003	116.38	-1.631E-01		
RH-106	621.92	349.	20.	0.003	132.48	1.320E+00		P
SB-125	635.89	62.	13.	0.002	90.04	7.559E-01		
I-131	636.97	82.	-5.	-0.001	244.47	-4.916E-01		
AG-110M	657.76	88.	-6.	-0.001	224.85	-4.279E-02		
CS-137	661.66	87.	6.	0.001	211.64	5.039E-02		
PM-144	696.54	230.	-28.	-0.004	97.24	-1.980E-01		P
NB-94	702.63	204.	-18.	-0.003	112.82	-1.328E-01		
SB-124	722.79	113.	-20.	-0.003	76.98	-1.369E+00		
AG-108M	722.94	122.	-7.	-0.001	212.58	-5.969E-02		
BI-212	727.17	130.	-2.	0.000	808.29	-1.933E-01		
PM-146	735.72	80.	-23.	-0.003	116.80	-7.606E-01		P
PM-146	747.16	47.	-8.	-0.001	192.44	-1.681E-01		
AG-110M	763.94	33.	27.	0.004	35.58	9.328E-01		P
PA-234M	766.41	141.	-27.	-0.004	38.26	-7.074E+01		P
BI-212	785.42	59.	-10.	-0.001	111.35	-5.978E+00		P
CS-134	795.87	93.	4.	0.001	325.85	3.901E-02		P
CS-134	801.95	108.	-10.	-0.001	155.17	-8.771E-01		
CO-58	810.78	130.	-21.	-0.003	81.34	-1.647E-01		
La-140	815.77	151.	-20.	-0.003	87.88	-7.007E-01		
MN-54	834.85	52.	-5.	-0.001	311.04	-3.707E-02		P
Co-56	846.77	70.	-15.	-0.002	125.31	-1.236E-01		
NB-94	871.10	40.	2.	0.000	698.81	1.688E-02		
PA-234	880.53	117.	-20.	-0.003	81.22	-2.783E+00		
PA-234	883.24	137.	-3.	0.000	616.39	-2.396E-01		
AG-110M	884.68	103.	17.	0.002	86.35	2.036E-01		
Sc-46	889.28	124.	-18.	-0.003	89.86	-1.558E-01		
Y-88	898.04	56.	-8.	-0.001	143.91	-7.086E-02		P
AC-228	911.07	92.	-34.	-0.005	41.88	-1.037E+00		P
AG-110M	937.49	25.	11.	0.002	104.38	2.866E-01		
PA-234	946.02	30.	5.	0.001	244.95	3.365E-01		
AC-228	968.97	71.	15.	0.002	85.95	7.775E-01		P
PA-234M	1001.00	89.	-12.	-0.002	117.27	-1.387E+01		P
Co-56	1037.84	50.	-19.	-0.003	77.03	-1.318E+00		P
Cs-136	1048.07	43.	2.	0.000	401.27	2.866E-02		
RH-106	1050.36	65.	-9.	-0.001	126.77	-5.889E+00		
BI-207	1063.66	29.	8.	0.001	163.96	1.009E-01		P
Ga-68	1077.40	32.	-9.	-0.001	146.71	-4.803E+00		
FE-59	1099.25	37.	-7.	-0.001	192.95	-1.328E-01		
Ta-182	1121.30	128.	-22.	-0.003	75.78	-6.556E-01		
CO-60	1173.24	40.	-7.	-0.001	224.92	-7.219E-02		
Ta-182	1189.05	51.	-20.	-0.003	86.67	-1.351E+00		
Ta-182	1221.41	40.	-18.	-0.002	86.93	-7.329E-01		
NA-22	1274.53	34.	-13.	-0.002	112.57	-1.493E-01		P
FE-59	1291.60	12.	9.	0.001	95.32	2.463E-01		P
TL-210	1313.00	45.	-17.	-0.002	94.21	-9.849E-01		
CO-60	1332.50	25.	-2.	0.000	522.55	-2.632E-02		P

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
AG-110M	1384.30	18.	10.	0.001	107.24	5.148E-01		
K-40	1460.83	44.	-2.	0.000	763.31	-1.926E-01		P
La-140	1596.21	13.	5.	0.001	171.28	7.948E-02		
SB-124	1690.98	13.	11.	0.001	90.22	3.321E-01		P
Co-56	1771.35	19.	8.	0.001	80.83	8.554E-01		
Y-88	1836.06	40.	-15.	-0.002	110.55	-2.446E-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	Time Corrected Activity Bq/Sample	Uncertainty Counting 1 Sigma	MDA Bq/Sample
BE-7	#A	6.8292E-01	6.8293E-01	1.363E+02%	3.14E+00
NA-22	#A	-1.4928E-01	-1.4928E-01	1.126E+02%	3.47E-01
K-40	#A	-1.9264E-01	-1.9264E-01	7.633E+02%	4.12E+00
Sc-46	#A	-1.5575E-01	-1.5575E-01	8.986E+01%	4.68E-01
CR-51	#A	-9.3767E-01	-9.3768E-01	1.400E+02%	4.39E+00
MN-54	#A	-3.7067E-02	-3.7067E-02	3.110E+02%	2.95E-01
FE-59	#A	3.1450E-02	3.1450E-02	9.532E+01%	5.65E-01
Co-56	#A	-1.2364E-01	-1.2364E-01	1.253E+02%	3.44E-01
CO-57	#A	-6.7369E-01	-6.7369E-01	1.563E+02%	3.51E+00
CO-58	#A	-1.6468E-01	-1.6468E-01	8.134E+01%	4.47E-01
CO-60	#A	-2.6322E-02	-2.6322E-02	5.226E+02%	3.15E-01
ZN-65	#A	2.5653E-01	2.5653E-01	1.051E+02%	9.11E-01
NB-94	#A	-1.3278E-01	-1.3278E-01	1.128E+02%	5.03E-01
ZR-95	#A	7.6940E-02	7.6940E-02	2.663E+02%	4.81E-01
NB-95	#A	0.0000E+00	0.0000E+00	1.000E+03%	2.96E-01
RU-103	#A	-6.0252E-03	-6.0253E-03	1.649E+03%	2.43E-01
RH-106	#A	1.3203E+00	1.3203E+00	1.325E+02%	5.84E+00
AG-108M	#A	8.1092E-02	8.1092E-02	1.165E+02%	2.26E-01
AG-110M	#A	3.7712E-01	3.7713E-01	3.558E+01%	5.88E-01
SN-113	#A	-9.2877E-02	-9.2877E-02	1.712E+02%	5.36E-01
SB-124	#A	1.0406E-03	1.0406E-03	7.902E+01%	6.93E-01
SB-125	#A	2.3226E-01	2.3226E-01	9.004E+01%	7.85E-01
I-131	#A	9.0866E-03	9.0870E-03	2.390E+02%	2.67E-01
Gd-153	#A	-3.2931E-02	-3.2931E-02	1.174E+03%	1.29E+00
Ga-68	#A	-4.7650E+00	-4.8033E+00	1.467E+02%	1.55E+01
Tc-99m	#A	-1.3423E-02	-1.3443E-02	1.072E+03%	4.83E-01
BA-133	#A	1.6981E-01	1.6981E-01	9.397E+01%	4.25E-01
CS-134	#A	3.9009E-02	3.9009E-02	3.258E+02%	4.36E-01
CS-137	#A	5.0392E-02	5.0392E-02	2.116E+02%	3.67E-01
CE-139	#A	-9.8528E-02	-9.8529E-02	8.857E+01%	3.09E-01
Ba-140	#A	2.4327E-01	2.4328E-01	1.147E+02%	9.70E-01
La-140	#A	9.6475E-02	9.6478E-02	1.713E+02%	2.88E-01
CE-141	#A	4.9196E-02	4.9196E-02	2.619E+02%	4.36E-01
CE-144	#A	-6.4141E-01	-6.4141E-01	1.506E+02%	3.22E+00

PM-144	#A	-1.9805E-01	-1.9805E-01	9.724E+01%	5.23E-01
EU-152	A	-2.6828E-01	-2.6828E-01	5.934E+01%	1.79E+00
EU-154	A	1.6062E-01	1.6062E-01	9.362E+01%	4.68E-01
EU-155	#A	-1.4914E-02	-1.4914E-02	2.426E+03%	1.85E+00
HF-181	#A	-1.4360E-01	-1.4360E-01	9.571E+01%	4.59E-01
Ta-182	#A	-6.5559E-01	-6.5560E-01	7.578E+01%	1.65E+00
Hg-203	#A	-1.1212E-01	-1.1212E-01	7.251E+01%	3.02E-01
TL-208	#A	-1.1559E-01	-1.1559E-01	5.976E+01%	3.50E-01
PM-146	#A	-1.0035E-01	-1.0035E-01	1.378E+02%	3.66E-01
Y-88	#A	-2.4463E-01	-2.4463E-01	1.106E+02%	5.25E-01
Cd-113m	#A	-1.6636E+03	-1.6636E+03	8.692E+01%	4.81E+03
Cd-109	#A	-1.7562E+00	-1.7562E+00	1.748E+02%	1.02E+01
Cf-251	#A	-3.4928E-01	-3.4928E-01	1.272E+02%	1.14E+00
Cf-249	#A	8.5988E-02	8.5988E-02	1.576E+02%	4.58E-01
Sn-126	#A	6.0041E-01	6.0041E-01	1.312E+02%	2.63E+00
PB-210	A	1.8478E+00	1.8478E+00	9.934E+01%	5.17E+00
PB-212	#A	-2.2130E-01	-2.2130E-01	1.106E+02%	8.30E-01
PB-214	#A	-3.7908E-01	-3.7908E-01	6.595E+01%	8.55E-01
BI-207	#A	9.0121E-02	9.0121E-02	1.021E+02%	3.74E-01
BI-212	#A	-1.9327E-01	-1.9327E-01	8.083E+02%	5.39E+00
U-235	#A	-1.1254E+00	-1.1254E+00	7.190E+01%	3.34E+00
BI-214	#A	5.4965E-01	5.4965E-01	5.668E+01%	6.18E-01
BI-210M	#A	-2.3271E-01	-2.3271E-01	8.835E+01%	6.07E-01
AC-228	#A	-1.0372E+00	-1.0372E+00	4.188E+01%	1.43E+00
TH-227	#A	-5.0223E-02	-5.0223E-02	2.319E+03%	2.91E+00
TH-229	#A	2.8189E+00	2.8189E+00	4.882E+01%	3.43E+00
TH-234	A	2.5160E+00	2.5160E+00	4.152E+01%	3.23E+00
PA-231	#A	3.0285E+00	3.0285E+00	1.585E+02%	1.60E+01
PA-233	#A	0.0000E+00	0.0000E+00	1.000E+03%	1.35E+00
PA-234	#A	-8.0956E-02	-8.0956E-02	1.435E+02%	1.95E+00
PA-234M	#A	-1.3873E+01	-1.3873E+01	1.173E+02%	5.28E+01
AM-241	#A	-2.6584E-01	-2.6584E-01	7.620E+01%	7.92E-01
Np-237	#A	-5.0750E-01	-5.0750E-01	1.826E+02%	3.09E+00
Ir-192	#A	0.0000E+00	0.0000E+00	7.071E+02%	5.62E-01
Cs-136	#A	1.1994E-02	1.1995E-02	4.013E+02%	5.13E-01
Np-239	#A	2.2918E-01	2.2922E-01	1.399E+02%	1.07E+00
Nd-147	#A	-2.9471E-01	-2.9472E-01	2.416E+02%	1.72E+00
TL-210	#A	2.9446E-02	2.9446E-02	2.638E+02%	3.86E-01
Kr-85	#A	-2.6620E+01	-2.6620E+01	1.434E+02%	1.28E+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

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-----------------------------   S U M M A R Y   -----------------------------
Total Activity (   25.1 to  1999.6 keV)     3.066E+00  Bq/Sample
Total Decayed Activity (   25.1 to  1999.6 keV) 3.0656102E+00  Bq/Sample
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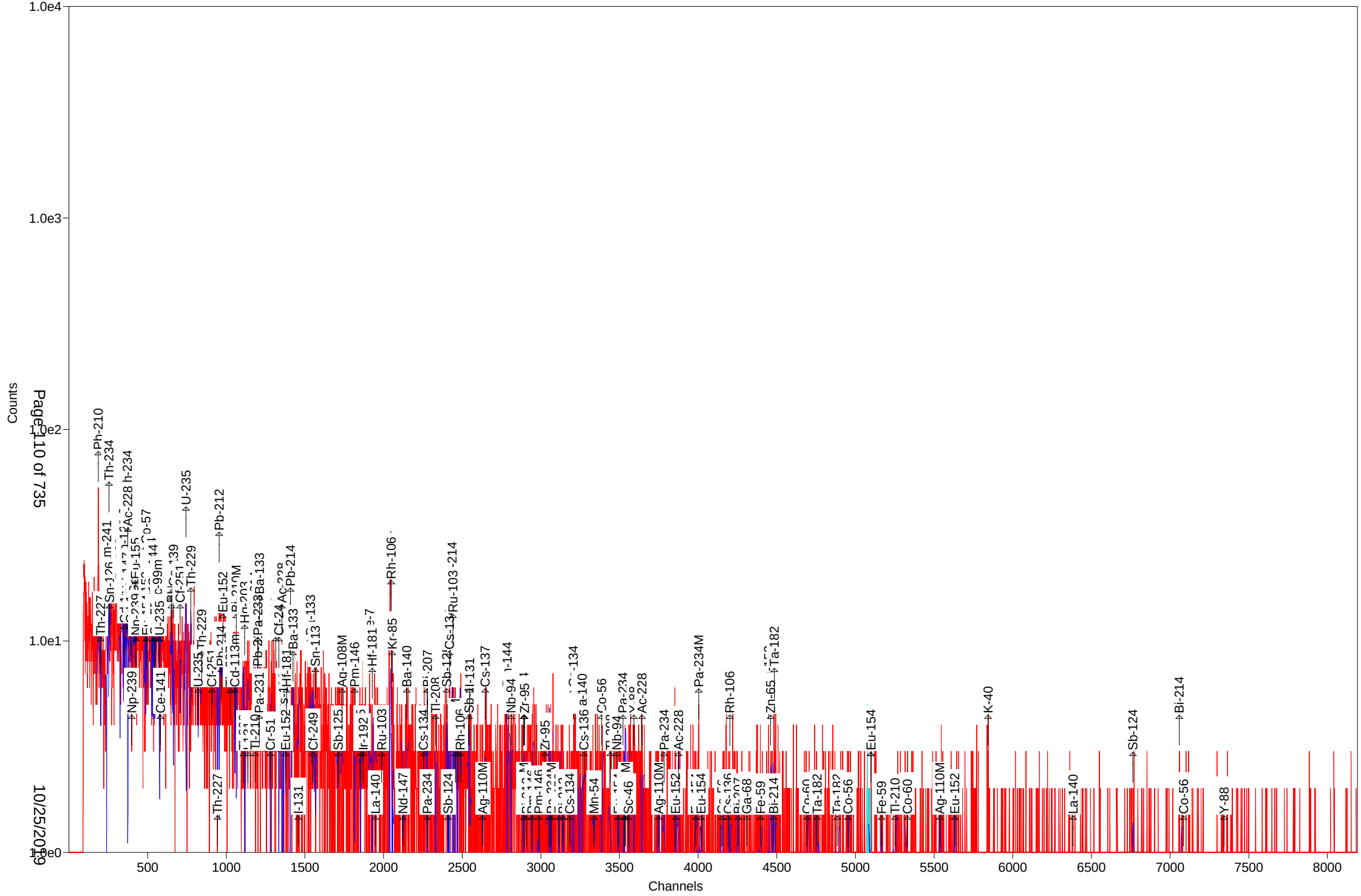
443730_Gamma_MB 160-443730~1-A. 16_Gamma_20191786.spc.



Test America St. Louis Spectrum ID: 17_Gamma_20191948

Sample Description: 443730_Gamma_LCS 160-443730~2-A
Detector: Detector #17
Batch ID: 443730
Work Order Number: Gamma
Lot Number: LCS 160-443730~2-A

Decay to Time: 10/14/2019 06:23 Live Time: 7200 sec
Acquisition Time: 10/14/2019 06:23:49 Real Time: 7354 sec
Analysis Time: 10/14/2019 08:26 Dead Time: 2.10 %
Analysis Quantity: 1.000E+00 Sample

Efficiency Cal File: 17_Liquid_Marinelli 1L.Clb
Efficiency Cal Desc: 17_1L marn_90062_030512
Efficiency Cal Date: 3/7/2012 11:47
Energy Cal Date: 2/29/2012 10:33
Library: Client_Long_Rev15.lib
Bkgd Correction File: 17_2019-10-06_1931.PBC

Nuclide	Activity Bq/Sample	1-Sigma Counting Uncert %	1-Sigma Counting Uncert Bq/Sample	1-Sigma Total Uncert Bq/Sample	Minimum Detectable Activity Bq/Sample
BE-7	-1.133E+01	92.2	1.045E+01	1.046E+01	3.448E+01
NA-22	9.008E-01	65.0	5.854E-01	5.871E-01	1.931E+00
K-40	-2.041E+00	287.5	5.866E+00	5.867E+00	1.235E+01
Sc-46	-5.181E-01	369.3	1.913E+00	1.913E+00	6.326E+00
CR-51	-7.959E+00	103.2	8.213E+00	8.224E+00	2.711E+01
MN-54	4.351E+00	24.7	1.076E+00	1.097E+00	2.391E+00
FE-59	-3.236E+00	59.4	1.921E+00	1.928E+00	6.685E+00
Co-56	3.878E-01	345.9	1.341E+00	1.341E+00	2.969E+00
CO-57	2.069E+00	20.1	4.157E-01	4.311E-01	1.319E+00
CO-58	-1.438E+00	85.4	1.229E+00	1.231E+00	4.056E+00
CO-60	1.015E+03	0.3	2.727E+00	5.018E+01	1.737E+00
ZN-65	1.756E+00	178.5	3.135E+00	3.136E+00	1.037E+01
NB-94	-1.112E+00	90.3	1.004E+00	1.005E+00	2.303E+00
ZR-95	1.587E+00	88.6	1.406E+00	1.408E+00	4.379E+00
NB-95	0.000E+00	1.#INF	5.770E-01	5.770E-01	2.850E+00
RU-103	-1.444E-01	864.2	1.248E+00	1.248E+00	2.700E+00
RH-106	1.515E+01	125.4	1.901E+01	1.902E+01	4.893E+01
AG-108M	4.905E-01	231.8	1.137E+00	1.137E+00	2.845E+00
AG-110M	1.818E+00	87.6	1.592E+00	1.594E+00	8.224E+00
SN-113	1.531E+00	112.6	1.723E+00	1.725E+00	5.688E+00
SB-124	-1.084E+00	137.8	1.494E+00	1.495E+00	4.934E+00
SB-125	6.420E+00	59.0	3.786E+00	3.799E+00	7.384E+00
I-131	2.810E+00	51.4	1.445E+00	1.452E+00	3.426E+00
Gd-153	1.737E+00	77.7	1.349E+00	1.354E+00	5.009E+00
Ga-68	-3.021E+01	294.5	8.895E+01	8.896E+01	1.900E+02
Tc-99m	-6.570E-01	126.4	8.306E-01	8.314E-01	2.742E+00
BA-133	-1.460E+00	105.3	1.537E+00	1.539E+00	5.074E+00
CS-134	1.981E+00	39.4	7.814E-01	7.875E-01	4.084E+00
CS-137	1.620E+03	0.3	4.133E+00	8.109E+01	3.048E+00
CE-139	1.356E-01	550.3	7.463E-01	7.464E-01	2.468E+00
Ba-140	4.151E+00	92.9	3.857E+00	3.863E+00	9.218E+00
La-140	2.728E-01	115.7	3.158E-01	3.161E-01	1.350E+00
CE-141	1.006E+00	133.2	1.340E+00	1.341E+00	4.426E+00

CE-144	-4.221E+00	127.0	5.359E+00	5.364E+00	1.769E+01
PM-144	4.042E-01	133.5	5.395E-01	5.398E-01	2.275E+00
EU-152	5.738E+00	81.5	4.679E+00	4.690E+00	5.742E+00
EU-154	4.967E+00	50.1	2.489E+00	2.503E+00	4.138E+00
EU-155	2.516E+00	67.2	1.691E+00	1.697E+00	4.690E+00
HF-181	1.851E-01	64.2	1.189E-01	1.192E-01	4.563E+00
Ta-182	2.856E+00	132.3	3.779E+00	3.781E+00	7.418E+00
Hg-203	1.506E+00	57.4	8.645E-01	8.688E-01	2.107E+00
TL-208	6.429E-01	255.0	1.639E+00	1.639E+00	2.652E+00
PM-146	3.185E+00	43.2	1.376E+00	1.386E+00	3.427E+00
Y-88	1.879E-02	3285.3	6.173E-01	6.173E-01	1.241E+00
Cd-113m	1.271E+04	90.2	1.146E+04	1.149E+04	3.784E+04
Cd-109	3.656E+02	4.8	1.771E+01	2.741E+01	5.618E+01
Cf-251	-3.473E+00	104.5	3.628E+00	3.640E+00	9.528E+00
Cf-249	-7.560E-01	114.5	8.655E-01	8.664E-01	5.601E+00
Sn-126	-4.804E+00	99.3	4.771E+00	4.778E+00	1.575E+01
PB-210	4.889E+02	12.3	6.016E+01	7.462E+01	1.974E+02
PB-212	1.418E+00	206.1	2.924E+00	2.925E+00	9.649E+00
PB-214	-2.887E+00	85.6	2.472E+00	2.476E+00	8.626E+00
BI-207	1.381E-01	1026.2	1.417E+00	1.417E+00	4.707E+00
BI-212	-8.723E+00	140.4	1.224E+01	1.225E+01	4.051E+01
U-235	2.228E+00	102.2	2.276E+00	2.279E+00	2.012E+01
BI-214	-3.003E+00	39.5	1.187E+00	1.196E+00	1.060E+01
BI-210M	1.515E+00	94.3	1.428E+00	1.431E+00	4.713E+00
AC-228	-1.083E+00	497.6	5.388E+00	5.389E+00	1.192E+01
TH-227	-2.476E+00	442.5	1.096E+01	1.096E+01	2.754E+01
TH-229	1.981E+00	183.4	3.634E+00	3.637E+00	4.209E+01
TH-234	1.225E+00	1023.2	1.254E+01	1.254E+01	4.141E+01
PA-231	0.000E+00	1.#INF	1.571E+01	1.571E+01	1.473E+02
PA-233	1.239E-02	17954.7	2.225E+00	2.225E+00	7.364E+00
PA-234	-1.138E+00	315.2	3.588E+00	3.588E+00	1.186E+01
PA-234M	3.160E+01	109.8	3.471E+01	3.474E+01	5.352E+02
AM-241	4.801E+03	0.2	7.758E+00	2.773E+02	1.085E+01
Np-237	-3.451E+00	159.6	5.508E+00	5.511E+00	1.818E+01
Ir-192	1.303E+00	83.3	1.085E+00	1.088E+00	3.076E+00
Cs-136	-1.451E+00	87.7	1.273E+00	1.275E+00	4.201E+00
Np-239	-2.039E+00	114.9	2.343E+00	2.347E+00	7.737E+00
Nd-147	1.412E+01	47.9	6.769E+00	6.815E+00	1.547E+01
TL-210	1.319E+00	74.4	9.809E-01	9.837E-01	3.237E+00
Kr-85	0.000E+00	1.#INF	1.011E+02	1.011E+02	8.429E+02
Total	2.113E+04				

Analyst: Caleb Quinn

Sample description
443730_Gamma_LCS 160-443730~2-A

Spectrum Filename: C:\User\SPC\Det17\17_Gamma_20191948.An1

Acquisition information
Start time: 10/14/2019 6:23:49 AM
Live time: 7200
Real time: 7354
Dead time: 2.10 %
Detector ID: 17

Detector system
Ge17 SN/11080671

Calibration
Filename: 17_Liquid_Marinelli 1L.Clb
17_1L marn_90062_030512

Energy Calibration
Created: 2/29/2012 10:33:23 AM
Zero offset: 0.108 keV
Gain: 0.250 keV/channel
Quadratic: -2.584E-08 keV/channel^2

Efficiency Calibration
Created: 3/7/2012 11:47:27 AM
Knee Energy: 165.85 keV
Above the Knee: Quadratic Uncertainty = 2.09 %
Log(Eff): -2.094103E+00 + (1.788156E-01*Log(E)) +
(-7.283143E-02*Log(E)^2)
Below the Knee: Quadratic Uncertainty = 0.66 %
Log(Eff): -1.201018E+01 + (4.016685E+00*Log(E)) +
(-4.439774E-01*Log(E)^2)

Library Files
Main analysis library: Client_Long_Rev15.lib
Library Match Width: 0.500
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G800W064
Start channel: 100 (25.12keV)
Stop channel: 8000 (1999.54keV)
Peak rejection level: 1000.000%
Peak search sensitivity: 3
Sample Size: 1.0000E+00 +/- 0.000E+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: 4.0000000E+00
Systematic error: 4.0000000E+00
Fraction Limit: 0.000%
Background width: 3
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:	YES	10/14/2019 6:23:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	17_2019-10-06_1931.PBC 10/6/2019 7:31:18 PM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 41 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 0.1970

***** 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
26.49	5329.	5.12	0.82	2.691E-02				
32.16	18486.	1.86	1.30	3.279E-02				
36.53	3880.	7.11	1.15	3.668E-02				
43.27	528.	53.36	0.82	4.162E-02				
46.54	6523.	12.31	0.77	4.360E-02	46.54	4.250	4.889E+02	PB210
49.60	18873.	3.29	1.67	4.524E-02	50.14	8.000	7.200E+02	TH227
59.59	611565.	0.16	1.16	4.930E-02	59.54	35.900	4.801E+03	AM241
80.99	171.	104.20	0.81	5.325E-02	80.99	34.060	PBC<MDA	BA133
86.62	298.	45.58	0.81	5.355E-02	86.49	13.100	PBC<MDA	Np237
					86.54	30.700	2.516E+00	EU155
87.07	174.	89.82	0.81	5.356E-02	86.94	9.040	PBC<MDA	Sn126
88.07	7890.	2.81	1.20	5.359E-02	87.57	37.500	5.454E+01	Sn126
					88.04	3.790	5.395E+02	Cd109
91.23	175.	153.68	0.82	5.364E-02	91.10	28.300	PBC<MDA	Nd147
93.35	176.	154.02	0.82	5.364E-02	93.35	5.561	PBC<MDA	AC228
97.50	173.	101.24	0.82	5.357E-02	97.50	30.000	PBC<MDA	Gd153
103.20	173.	117.81	0.83	5.334E-02	103.20	21.800	PBC<MDA	Gd153
103.70	173.	118.23	0.83	5.331E-02	103.70	24.000	PBC<MDA	Np239
105.66	204.	67.21	0.59	5.322E-02	105.31	21.200	PBC<MDA	EU155
121.78	184.	100.74	0.85	5.183E-02	121.78	28.580	PBC<MDA	EU152
					122.06	85.600	5.769E-01	CO57
122.64	1100.	15.65	1.58	5.173E-02	122.06	85.600	3.444E+00	CO57

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
					123.10	40.790	7.242E+00	EU154
135.67	95.	243.43	0.86	5.010E-02	136.47	10.680	PBC<MDA	CO57
136.30	186.	124.99	0.86	5.012E-02				
145.44	171.	133.18	0.87	4.891E-02	145.44	48.200	PBC<MDA	CE141
163.91	159.	65.81	0.37	4.630E-02	163.38	5.080	PBC<MDA	U235
165.85	36.	550.28	0.89	4.583E-02	165.85	79.900	PBC<MDA	CE139
185.72	432.	47.54	0.91	4.295E-02	185.72	54.000	PBC<MDA	U235
199.23	75.	120.42	0.54	4.122E-02				
205.33	62.	333.27	0.92	4.048E-02	205.33	5.010	PBC<MDA	U235
210.85	107.	194.20	0.93	3.985E-02	210.85	2.990	PBC<MDA	TH229
230.25	222.	50.63	0.95	3.777E-02				
231.97	255.	46.08	0.95	3.760E-02				
238.63	163.	206.14	0.95	3.695E-02	238.63	43.300	PBC<MDA	PB212
244.69	41.	470.93	0.96	3.638E-02	244.69	7.580	PBC<MDA	EU152
263.70	191.	90.21	0.98	3.471E-02	263.70	0.006	PBC<MDA	Cd113m
265.83	188.	94.28	0.98	3.453E-02	265.83	50.000	PBC<MDA	BI210M
277.28	31.	552.98	0.99	3.362E-02	277.28	6.310	PBC<MDA	TL208
278.92	296.	57.40	0.56	3.347E-02	279.20	81.460	PBC<MDA	Hg203
284.30	373.	51.42	1.00	3.308E-02	284.30	6.140	PBC<MDA	I131
308.44	164.	134.25	1.02	3.137E-02	308.44	31.750	PBC<MDA	Ir192
316.49	182.	98.77	1.03	3.085E-02	316.49	87.040	PBC<MDA	Ir192
328.76	75.	241.79	1.04	3.008E-02	328.76	20.300	PBC<MDA	La140
333.44	78.	233.29	1.04	2.980E-02	333.44	15.510	PBC<MDA	Cf249
344.39	508.	29.31	0.65	2.916E-02	344.29	26.500	9.138E+00	EU152
345.83	184.	114.23	1.05	2.908E-02	345.83	15.070	PBC<MDA	HF181
358.37	205.	54.33	0.53	2.839E-02				
364.48	181.	94.48	1.07	2.806E-02	364.48	81.700	PBC<MDA	I131
368.67	306.	41.76	0.50	2.784E-02				
391.69	188.	112.58	1.09	2.671E-02	391.69	64.000	PBC<MDA	SN113
393.36	65.	107.48	0.45	2.663E-02				
409.64	291.	44.20	0.42	2.589E-02				
423.08	98.	71.91	0.48	2.531E-02				
427.71	239.	69.40	1.12	2.512E-02	427.88	29.600	PBC<MDA	SB125
433.94	79.	231.79	1.13	2.487E-02	433.94	90.480	PBC<MDA	AG108M
447.35	136.	60.15	0.54	2.434E-02				
453.52	359.	43.22	0.94	2.409E-02	453.88	65.000	PBC<MDA	PM146
463.37	214.	95.36	1.16	2.373E-02	463.37	10.470	PBC<MDA	SB125
511.45	298.	57.90	2.45	2.209E-02	511.86	20.000	PBC<MDA	RH106
516.38	146.	57.52	0.75	2.195E-02				
530.41	284.	47.94	0.28	2.150E-02	531.00	13.000	PBC<MDA	Nd147
537.26	155.	92.93	1.22	2.132E-02	537.26	24.390	PBC<MDA	Ba140
542.37	93.	75.67	1.06	2.117E-02				
563.24	248.	53.36	1.25	2.058E-02	563.24	8.350	PBC<MDA	CS134
573.32	91.	78.97	0.40	2.031E-02				
583.02	32.	423.23	1.26	2.006E-02	583.02	84.500	PBC<MDA	TL208
609.64	156.	54.53	0.49	1.940E-02	609.31	46.090	PBC<MDA	BI214
					610.30	5.750	1.944E+01	RU103
618.06	150.	133.46	1.30	1.920E-02	618.06	99.100	PBC<MDA	PM144

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
620.85	148.	136.93	1.30	1.911E-02	621.92	9.930	PBC<MDA	RH106
657.76	142.	431.38	1.33	1.831E-02	657.76	94.640	PBC<MDA	AG110M
661.71	181112.	0.26	1.60	1.823E-02	661.66	85.210	1.620E+03	CS137
683.66	75.	65.31	0.37	1.777E-02				
723.41	139.	78.49	1.39	1.701E-02	722.79	10.810	PBC<MDA	SB124
					722.94	90.840	1.247E+00	AG108M
					723.36	20.220	5.603E+00	EU154
724.20	48.	226.90	1.39	1.700E-02	724.20	44.150	PBC<MDA	ZR95
756.73	139.	88.59	1.41	1.642E-02	756.73	54.460	PBC<MDA	ZR95
763.94	97.	102.50	1.42	1.630E-02	763.94	22.280	PBC<MDA	AG110M
766.41	92.	109.81	1.42	1.626E-02	765.79	99.790	PBC<MDA	NB95
					766.41	0.294	PBC<MDA	PA234M
778.92	118.	107.52	1.43	1.605E-02	778.92	12.940	PBC<MDA	EU152
799.58	148.	74.38	1.45	1.572E-02	799.60	98.960	PBC<MDA	TL210
801.95	149.	82.22	1.45	1.568E-02	801.95	8.690	PBC<MDA	CS134
815.77	60.	210.53	1.47	1.547E-02	815.77	23.280	PBC<MDA	La140
826.45	176.	52.94	0.76	1.531E-02				
835.09	476.	24.73	1.65	1.519E-02	834.85	99.980	4.351E+00	MN54
846.77	42.	345.86	1.49	1.502E-02	846.77	99.935	PBC<MDA	Co56
860.56	34.	316.39	1.50	1.482E-02	860.56	12.420	PBC<MDA	TL208
862.63	83.	81.74	0.29	1.479E-02				
877.73	92.	61.22	0.54	1.459E-02				
884.68	29.	655.31	1.52	1.450E-02	884.68	72.680	PBC<MDA	AG110M
937.49	188.	87.57	1.57	1.383E-02	937.49	34.360	PBC<MDA	AG110M
965.82	79.	61.01	0.50	1.349E-02				
996.33	182.	76.60	1.62	1.315E-02	996.33	10.600	PBC<MDA	EU154
1009.62	89.	80.02	1.63	1.301E-02				
1011.33	109.	69.69	1.63	1.299E-02				
1034.57	84.	70.47	0.47	1.275E-02				
1050.36	60.	210.17	1.66	1.259E-02	1050.36	1.560	PBC<MDA	RH106
1055.54	67.	78.10	0.74	1.254E-02				
1063.17	127.	52.17	0.48	1.246E-02	1063.66	74.500	PBC<MDA	BI207
1099.94	182.	45.72	0.75	1.211E-02	1099.25	56.500	PBC<MDA	FE59
1112.07	167.	81.54	1.71	1.200E-02	1112.07	13.644	PBC<MDA	EU152
1117.23	173.	56.43	0.72	1.195E-02	1115.55	50.600	3.975E+00	ZN65
1173.34	83561.	0.38	1.95	1.147E-02	1173.24	99.900	1.013E+03	CO60
1189.05	69.	132.31	1.77	1.134E-02	1189.05	16.200	PBC<MDA	Ta182
1222.44	31.	247.79	1.80	1.108E-02	1221.41	27.000	PBC<MDA	Ta182
1274.38	134.	50.13	2.15	1.068E-02	1274.53	99.940	PBC<MDA	NA22
					1274.54	35.190	1.080E+01	EU154
1274.59	69.	64.99	1.84	1.068E-02	1274.53	99.940	PBC<MDA	NA22
					1274.54	35.190	2.558E+00	EU154
1291.17	63.	50.41	1.85	1.056E-02	1291.60	43.200	PBC<MDA	FE59
1293.14	36.	52.91	0.68	1.055E-02				
1318.07	144.	26.65	0.77	1.038E-02				
1332.62	75284.	0.38	2.02	1.028E-02	1332.50	99.980	1.017E+03	CO60
1408.00	39.	109.79	1.94	9.796E-03	1408.00	21.005	PBC<MDA	EU152
1460.83	-15.	287.47	1.98	9.483E-03	1460.83	10.670	PBC<MDA	K40

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1621.96	20.	43.69	0.69	8.640E-03				
1690.98	10.	375.50	2.16	8.321E-03	1690.98	47.790	PBC<MDA	SB124
1803.60	13.	57.05	0.49	7.848E-03				

********** 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	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide	
105.49	26.49	25918.	5329.	1.980E+05	5.12	0.823	-	
128.14	32.16	25888.	18486.	5.637E+05	1.86	1.301	-	s
145.62	36.53	24052.	3880.	1.058E+05	7.11	1.153	-	s
172.54	43.27	33796.	528.	1.269E+04	53.36	0.824	-	s
197.88	49.60	115646.	18873.	4.172E+05	3.29	1.672	-	s
654.91	163.91	4605.	159.	3.427E+03	65.81	0.373	-	s
796.12	199.23	4041.	75.	1.820E+03	120.42	0.537	-	sc
920.18	230.24	6205.	222.	5.877E+03	50.63	0.947	-	sD
927.02	231.95	6771.	255.	6.778E+03	46.08	0.948	-	sD
1376.56	344.39	6202.	508.	1.744E+04	29.31	0.646	-	s
1432.47	358.37	4299.	205.	7.216E+03	54.33	0.530	-	s
1473.68	368.67	5048.	306.	1.098E+04	41.76	0.505	-	s
1572.39	393.36	2408.	65.	2.441E+03	107.48	0.450	-	sc
1637.52	409.64	5144.	291.	1.125E+04	44.20	0.416	-	s
1691.27	423.08	2434.	98.	3.871E+03	71.91	0.480	-	sc
1788.35	447.35	3048.	136.	5.609E+03	60.15	0.538	-	s
2062.76	516.38	4206.	121.	5.516E+03	76.31	1.205	-	sc
2168.35	542.37	1944.	93.	4.393E+03	75.67	1.064	-	sc
2291.97	573.32	2274.	116.	5.703E+03	58.95	1.256	-	sD
2733.48	683.66	996.	75.	4.220E+03	65.31	0.373	-	s
3304.68	826.45	2320.	176.	1.149E+04	52.94	0.762	-	s
3449.43	862.63	1695.	83.	5.610E+03	81.74	0.289	-	sc
3509.87	877.73	1320.	92.	6.306E+03	61.22	0.539	-	sM
3862.30	965.82	1122.	79.	5.854E+03	61.01	0.495	-	sM
4037.55	1009.57	2492.	89.	6.842E+03	80.02	1.627	-	sc
4044.36	1011.27	2812.	109.	8.363E+03	69.69	1.628	-	sc
4137.36	1034.57	1352.	84.	6.550E+03	70.47	0.467	-	sc
4221.26	1055.54	2126.	136.	1.088E+04	48.55	1.665	-	sD
4251.80	1063.17	1509.	127.	1.021E+04	52.17	0.480	-	s
4398.93	1099.94	2023.	182.	1.503E+04	45.72	0.748	-	sM
4469.30	1117.23	2972.	127.	1.062E+04	61.38	1.715	-	sc
5170.35	1293.14	373.	57.	5.434E+03	49.44	1.854	-	sD
5272.43	1318.07	374.	82.	7.927E+03	35.02	1.875	-	sD
6488.23	1621.96	24.	20.	2.257E+03	43.69	0.689	-	sM
7215.44	1803.60	21.	13.	1.656E+03	57.05	0.495	-	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: Client_Long_Rev15.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 1 Sigma %	FWHM keV
PB-210	185.63	46.54	318893.	6523.	0.906	12.31	0.775s
TH-227	200.03	50.14	322711.	-532.	-0.074	151.08	0.778s
AM-241	237.80	59.59	87644.	611565.	84.940	0.16	1.159s
TH-234	252.59	63.29	12074.	-258.	-0.036	310.87	0.791
Sn-126	256.56	64.28	14150.	-170.	-0.024	99.32	0.792s
BA-133	323.36	80.99	11184.	171.	0.024	104.20	0.807s
Np-237	345.35	86.49	38607.	-174.	-0.024	159.62	0.813s
EU-155	345.56	86.54	37717.	298.	0.041	45.58	0.813D
Sn-126	347.15	86.94	37476.	174.	0.024	89.82	0.813D
Sn-126	349.67	87.57	35739.	175.	0.024	96.73	0.814D
Cd-109	351.55	88.04	30886.	5347.	0.743	4.85	0.814A
Nd-147	363.79	91.10	36175.	175.	0.024	153.68	0.817s
AC-228	372.78	93.35	36526.	176.	0.024	154.02	0.819s
Gd-153	389.37	97.50	15325.	173.	0.024	101.24	0.823
Np-239	397.37	99.50	17505.	-133.	-0.019	140.51	0.825s
Gd-153	412.16	103.20	20656.	173.	0.024	117.81	0.828s
Np-239	414.16	103.70	20829.	173.	0.024	118.23	0.829s
EU-155	422.00	105.66	6590.	204.	0.028	67.21	0.588s
Np-239	423.88	106.13	20130.	-175.	-0.024	114.93	0.831s
EU-152	486.45	121.78	17117.	184.	0.026	100.74	0.846s
CO-57	487.57	122.06	8060.	644.	0.089	20.10	0.846D
EU-154	491.73	123.10	18015.	185.	0.026	102.80	0.847s
PA-234	524.49	131.29	27799.	-75.	-0.010	315.20	0.855s
HF-181	531.41	133.02	23004.	-187.	-0.026	115.11	0.856s
CE-144	533.46	133.54	23233.	-170.	-0.024	126.96	0.857s
HF-181	544.50	136.30	27041.	186.	0.026	124.99	0.859s
CO-57	545.20	136.47	26854.	95.	0.013	243.43	0.859s
Tc-99m	561.34	140.51	27642.	-186.	-0.026	126.42	0.863s
U-235	574.43	143.79	27837.	-100.	-0.014	190.78	0.866s
CE-141	581.05	145.44	25797.	171.	0.024	133.18	0.868
Ba-140	649.90	162.66	21255.	-115.	-0.016	180.05	0.884s
U-235	652.78	163.38	16841.	180.	0.025	102.18	0.885s
CE-139	662.67	165.85	19343.	36.	0.005	550.28	0.887
Cf-251	705.64	176.60	12120.	-188.	-0.026	104.47	0.897s
U-235	742.10	185.72	13163.	432.	0.060	47.54	0.905s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
TH-229	773.25	193.51	14253.	-68.	-0.009	311.14	0.913s
U-235	820.52	205.33	13337.	62.	0.009	333.27	0.924s
TH-229	842.58	210.85	13586.	107.	0.015	194.20	0.929s
Cf-251	907.16	227.00	57928.	-202.	-0.028	168.78	0.944s
TH-227	943.03	235.97	57726.	-204.	-0.028	167.01	0.952s
PB-212	953.67	238.63	56617.	163.	0.023	206.14	0.955s
EU-152	977.91	244.69	12016.	41.	0.006	470.93	0.960
TH-227	1024.08	256.24	10961.	-44.	-0.006	442.54	0.971s
Cd-113m	1053.91	263.70	14681.	191.	0.026	90.21	0.978s
BI-210M	1062.44	265.83	15662.	188.	0.026	94.28	0.979s
TL-208	1108.23	277.28	14520.	31.	0.004	552.98	0.990s
Hg-203	1114.76	278.92	7773.	296.	0.041	57.40	0.560s
I-131	1136.28	284.30	10389.	373.	0.052	51.42	0.996s
PB-214	1179.43	295.09	42394.	-205.	-0.028	93.67	1.006s
TL-210	1183.07	296.00	42515.	-185.	-0.026	157.86	1.007s
PB-212	1199.19	300.03	42703.	-188.	-0.026	101.84	1.011s
PA-231	1199.35	300.07	42885.	-186.	-0.026	157.97	1.011s
PA-233	1199.79	300.18	43071.	-31.	-0.004	937.82	1.011s
PA-231	1209.66	302.65	43102.	0.	0.000	1000.00	1.013s
BA-133	1210.47	302.85	42802.	-186.	-0.026	157.62	1.013s
Ir-192	1232.82	308.44	24156.	164.	0.023	134.25	1.019
Ir-192	1265.01	316.49	16138.	182.	0.025	98.77	1.026s
CR-51	1279.38	320.08	16106.	-174.	-0.024	103.19	1.029s
La-140	1314.07	328.76	9291.	75.	0.010	241.79	1.037s
Cf-249	1332.79	333.44	9357.	78.	0.011	233.29	1.041s
AC-228	1352.30	338.32	23157.	-184.	-0.026	117.17	1.046s
Cs-136	1361.30	340.57	22973.	-184.	-0.026	116.48	1.048s
EU-152	1376.16	344.29	22789.	-68.	-0.009	315.40	1.051s
HF-181	1382.33	345.83	21990.	184.	0.026	114.23	1.053
PB-214	1406.74	351.93	20572.	-225.	-0.031	85.61	1.058
BA-133	1423.00	356.00	19077.	-186.	-0.026	105.25	1.062s
I-131	1456.93	364.48	14478.	181.	0.025	94.48	1.070s
BA-133	1534.34	383.84	23352.	-189.	-0.026	114.75	1.087
Cf-249	1550.77	387.95	23410.	-189.	-0.026	114.49	1.091s
SN-113	1565.73	391.69	22399.	188.	0.026	112.58	1.094s
SB-125	1709.79	427.71	7094.	239.	0.033	69.40	1.117
AG-108M	1734.69	433.94	9670.	79.	0.011	231.79	1.132
PM-146	1813.00	453.52	6775.	359.	0.050	43.22	0.938
SB-125	1852.38	463.37	20724.	214.	0.030	95.36	1.158
BE-7	1909.29	477.59	16793.	-199.	-0.028	92.19	1.171s
HF-181	1926.89	482.00	16993.	-201.	-0.028	91.83	1.175s
La-140	1946.98	487.02	7977.	-41.	-0.006	448.22	1.180s
RU-103	1987.11	497.05	7220.	-21.	-0.003	864.17	1.188s
RH-106	2046.35	511.86	14767.	298.	0.041	57.90	2.452s
Kr-85	2054.81	513.98	15065.	0.	0.000	1000.00	1.203s
Nd-147	2120.52	530.41	4386.	284.	0.039	47.94	0.285s
Ba-140	2147.92	537.26	5397.	155.	0.022	92.93	1.224s
CS-134	2251.82	563.24	4504.	248.	0.034	53.36	1.247

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
CS-134	2276.15	569.32	6990.	-152.	-0.021	78.40	1.252
PA-234	2276.75	569.47	6909.	-55.	-0.008	214.61	1.253
BI-207	2277.67	569.70	6964.	0.	0.000	1000.00	1.253
TL-208	2330.95	583.02	4745.	32.	0.004	423.23	1.264s
SB-125	2400.86	600.50	21470.	-156.	-0.022	36.45	1.280s
SB-124	2409.78	602.73	21314.	-150.	-0.021	137.78	1.282s
CS-134	2417.70	604.71	21025.	-150.	-0.021	136.66	1.284s
BI-214	2436.10	609.31	21307.	-193.	-0.027	39.52	1.287s
RU-103	2440.05	610.30	21415.	-151.	-0.021	137.40	1.288s
AG-108M	2455.98	614.28	21566.	-151.	-0.021	137.51	1.292s
PM-144	2471.11	618.06	19856.	150.	0.021	133.46	1.295s
RH-106	2486.52	621.92	20407.	148.	0.021	136.93	1.299s
SB-125	2542.41	635.89	5210.	-150.	-0.021	68.73	1.311
I-131	2546.75	636.97	5792.	-89.	-0.012	120.84	1.312s
AG-110M	2629.90	657.76	188562.	142.	0.020	431.38	1.330s
CS-137	2645.68	661.71	5265.	181112.	25.154	0.26	1.596s
NB-94	2809.38	702.63	3605.	-136.	-0.019	90.31	1.368s
SB-124	2890.01	722.79	5990.	-60.	-0.008	183.89	1.386
AG-108M	2890.61	722.94	5930.	0.	0.000	1000.00	1.386
EU-154	2892.30	723.36	5863.	139.	0.019	78.49	1.386
ZR-95	2895.66	724.20	5882.	48.	0.007	226.90	1.387
BI-212	2907.54	727.17	6316.	-80.	-0.011	140.35	1.390s
PM-146	2987.51	747.16	3718.	-58.	-0.008	143.99	1.407s
ZR-95	3025.79	756.73	3591.	139.	0.019	88.59	1.415s
AG-110M	3054.64	763.94	4930.	97.	0.014	102.50	1.421s
NB-95	3062.03	765.79	5027.	0.	0.000	1000.00	1.423
PA-234M	3064.52	766.41	5042.	92.	0.013	109.81	1.423
EU-152	3114.56	778.92	3813.	118.	0.016	107.52	1.434s
BI-212	3140.56	785.42	3909.	-67.	-0.009	191.82	1.440s
CS-134	3182.36	795.87	7154.	-109.	-0.015	66.31	1.448s
TL-210	3197.29	799.60	5963.	148.	0.021	74.38	1.451
CS-134	3206.69	801.95	7453.	149.	0.021	82.22	1.454
CO-58	3241.99	810.78	9277.	-160.	-0.022	85.42	1.461s
La-140	3261.97	815.77	8077.	60.	0.008	210.53	1.465
Cs-136	3272.90	818.50	9913.	-161.	-0.022	87.71	1.467s
MN-54	3339.25	835.09	3083.	476.	0.066	24.73	1.652
Co-56	3385.99	846.77	4659.	42.	0.006	345.86	1.491s
TL-208	3441.18	860.56	5656.	34.	0.005	316.39	1.503s
NB-94	3483.32	871.10	5255.	-113.	-0.016	136.81	1.512s
EU-154	3491.85	873.23	19319.	-179.	-0.025	110.19	1.514
PA-234	3521.06	880.53	19326.	-180.	-0.025	109.77	1.520s
PA-234	3531.90	883.24	19506.	-180.	-0.025	110.11	1.522
AG-110M	3537.67	884.68	17763.	29.	0.004	655.31	1.523
Sc-46	3556.06	889.28	19737.	-54.	-0.007	369.32	1.527s
Y-88	3591.11	898.04	5411.	-48.	-0.007	304.83	1.534
AC-228	3643.24	911.07	5628.	-32.	-0.004	497.63	1.545s
AG-110M	3748.95	937.49	5959.	188.	0.026	87.57	1.567s
PA-234	3783.07	946.02	6720.	-208.	-0.029	83.99	1.574s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
AC-228	3874.90	968.97	6648.	-192.	-0.027	60.63	1.593s
EU-154	3984.36	996.33	9668.	182.	0.025	76.60	1.616
PA-234M	4003.04	1001.00	8118.	-40.	-0.006	359.77	1.620s
EU-154	4018.15	1004.77	14124.	-19.	-0.003	870.22	1.623
Co-56	4150.45	1037.84	5718.	-28.	-0.004	375.68	1.650s
Cs-136	4191.39	1048.07	8251.	-175.	-0.024	73.70	1.658s
RH-106	4200.55	1050.36	8038.	60.	0.008	210.17	1.661s
Ga-68	4308.74	1077.40	4475.	-50.	-0.007	294.48	1.683s
FE-59	4396.18	1099.25	4918.	-160.	-0.022	59.37	1.700s
EU-152	4447.49	1112.07	9164.	167.	0.023	81.54	1.711s
ZN-65	4461.38	1115.55	9301.	77.	0.011	178.49	1.713s
CO-60	4692.66	1173.34	2642.	83561.	11.606	0.38	1.947
Ta-182	4755.52	1189.05	1710.	69.	0.010	132.31	1.772
Ta-182	4885.02	1221.41	1136.	31.	0.004	247.79	1.798s
Co-56	4952.53	1238.28	1040.	-39.	-0.005	188.64	1.812s
NA-22	5097.60	1274.53	978.	69.	0.010	64.99	1.840A
EU-154	5097.64	1274.54	556.	134.	0.019	50.13	2.150A
FE-59	5165.90	1291.60	475.	63.	0.009	50.41	1.853D
TL-210	5251.56	1313.00	1054.	-71.	-0.010	65.77	1.870s
CO-60	5330.07	1332.62	729.	75284.	10.456	0.38	2.021
AG-110M	5536.92	1384.30	293.	-6.	-0.001	615.97	1.926
EU-152	5631.79	1408.00	341.	39.	0.005	109.79	1.944
K-40	5843.25	1460.83	351.	-15.	-0.002	287.47	1.985
La-140	6385.15	1596.21	284.	-32.	-0.004	133.32	2.087s
SB-124	6764.55	1690.98	240.	10.	0.001	375.50	2.157s
BI-214	7058.84	1764.49	375.	-22.	-0.003	197.13	2.211
Co-56	7086.31	1771.35	473.	-51.	-0.007	61.74	2.216s

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	-1.1334E+01				5.31E+01	
			477.60	-1.133E+01	?(	3.448E+01 9.22E+01 1.05E+01	G
NA-22	C	9.0080E-01				9.50E+02	Derived Ave Activity
			1274.53	9.008E-01	}(	1.931E+00 6.50E+01 9.99E+01	G
K-40	N	-2.0406E+00				4.66E+11	
			1460.83	-2.041E+00	(P	1.235E+01 2.87E+02 1.07E+01	G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

Sc-46    F  -5.1806E-01                                     8.38E+01
                          889.28-5.181E-01 &(  6.326E+00 3.69E+02 1.00E+02 G
                         1120.55-3.986E-02 } P 5.290E+00 2.77E+03 1.00E+02 G

CR-51    F  -7.9590E+00                                     2.77E+01
                          320.08-7.959E+00 &(  2.711E+01 1.03E+02 9.94E+00 G

MN-54    C   4.3505E+00                                     3.12E+02
                          834.85 4.351E+00  (  2.391E+00 2.47E+01 1.00E+02 G

FE-59    F  -3.2360E+00                                     4.45E+01
                         1099.25-3.236E+00 ?(P 6.685E+00 5.94E+01 5.65E+01 G
                         1291.60 1.922E+00 +   3.174E+00 5.04E+01 4.32E+01 G

Co-56    C   3.8784E-01                                     7.73E+01
                          846.77 3.878E-01 ?(P 2.969E+00 3.46E+02 9.99E+01 G
                         1238.28-7.487E-01 +   2.937E+00 1.89E+02 6.61E+01 G
                         1037.84-2.203E+00 +   2.745E+01 3.76E+02 1.41E+01 G
                         1771.35-5.751E+00 +   1.170E+01 6.17E+01 1.55E+01  A

CO-57    C   2.0688E+00                                     2.72E+02
                          122.06 2.018E+00  (  1.319E+00 2.01E+01 8.56E+01 G
                          136.47 2.474E+00 &(  1.989E+01 2.43E+02 1.07E+01 G

CO-58    C  -1.4384E+00                                     7.09E+01
                          810.78-1.438E+00 ?(  4.056E+00 8.54E+01 9.95E+01 G

CO-60    F   1.0153E+03                                     1.93E+03
                         1332.50 1.017E+03  (P 1.737E+00 3.77E-01 1.00E+02 G
                         1173.24 1.013E+03  (P 2.937E+00 3.82E-01 9.99E+01 G

ZN-65    F   1.7562E+00                                     2.44E+02
                         1115.55 1.756E+00 ?(  1.037E+01 1.78E+02 5.06E+01 G

NB-94    I  -1.1115E+00                                     7.41E+06
                          702.63-1.112E+00 &(  2.303E+00 9.03E+01 9.79E+01 G
                          871.10-1.067E+00 +   3.226E+00 1.37E+02 9.99E+01 G

ZR-95    I   1.5866E+00                                     6.40E+01
                          756.73 2.154E+00 &(P 4.379E+00 8.86E+01 5.45E+01 G
                          724.20 8.866E-01 &(  6.665E+00 2.27E+02 4.42E+01 G

RU-103   I  -1.4436E-01                                     3.93E+01
                          497.05-1.444E-01 ?(P 2.700E+00 8.64E+02 9.09E+01 G
                          610.30-1.880E+01 +   8.532E+01 1.37E+02 5.75E+00 GA
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Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
RH-106	I	1.5154E+01					3.74E+02	
			621.92	1.082E+01	&(	4.893E+01	1.37E+02	9.93E+00 G
			1050.36	4.275E+01	&(	2.974E+02	2.10E+02	1.56E+00 G
			511.86	9.378E+00	&	1.789E+01	5.79E+01	2.00E+01 GA
AG-108M	C	4.9051E-01					1.53E+05	
			433.94	4.905E-01	&(P	2.845E+00	2.32E+02	9.05E+01 G
			722.94	0.000E+00	-	3.248E+00	1.00E+03	9.08E+01 G
			614.28	-1.213E+00	+	5.506E+00	1.38E+02	8.98E+01 G
AG-110M	F	1.8175E+00					2.50E+02	
			884.68	3.793E-01	&(	8.224E+00	6.55E+02	7.27E+01 G
			657.76	1.141E+00	&(P	1.624E+01	4.31E+02	9.46E+01 G
			937.49	5.486E+00	(	1.060E+01	8.76E+01	3.44E+01 G
			1384.30	-3.642E-01	+	4.746E+00	6.16E+02	2.43E+01 G
			763.94	3.724E+00	&(P	1.262E+01	1.02E+02	2.23E+01 G
SN-113	F	1.5306E+00					1.15E+02	
			391.69	1.531E+00	&(	5.688E+00	1.13E+02	6.40E+01 G
SB-124	F	-1.0845E+00					6.02E+01	
			602.73	-1.084E+00	&(	4.934E+00	1.38E+02	9.83E+01 G
			1690.98	3.493E-01	+	2.616E+00	3.75E+02	4.78E+01 G
			722.79	-4.504E+00	+	2.743E+01	1.84E+02	1.08E+01 G
SB-125	I	6.4197E+00					1.01E+03	
			427.88	4.459E+00	(P	7.384E+00	6.94E+01	2.96E+01 G
			600.50	-6.192E+00	- P	2.717E+01	3.64E+01	1.79E+01 G
			635.89	-9.778E+00	-	2.216E+01	6.87E+01	1.13E+01 G
			463.37	1.196E+01	(	3.765E+01	9.54E+01	1.05E+01 G
I-131	I	2.8100E+00					8.02E+00	
			364.48	1.099E+00	&(	3.426E+00	9.45E+01	8.17E+01 G
			284.30	2.558E+01	*(P	3.279E+01	5.14E+01	6.14E+00 G
			636.97	-9.265E+00	&	3.703E+01	1.21E+02	7.17E+00 G
Gd-153	F	1.7371E+00					2.42E+02	
			97.50	1.499E+00	?(	5.009E+00	1.01E+02	3.00E+01 G
			103.20	2.065E+00	(	8.032E+00	1.18E+02	2.18E+01 G
Ga-68	C	-3.0205E+01					4.71E-02	
			1077.40	-3.021E+01	?(	1.900E+02	2.94E+02	3.30E+00 G
Tc-99m	I	-6.5701E-01					2.51E-01	
			140.51	-6.570E-01	*(	2.742E+00	1.26E+02	8.93E+01 G

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Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
BA-133	F	-1.4603E+00					3.85E+03	
			356.00	-1.460E+00	&(	5.074E+00	1.05E+02	6.20E+01 G
			302.85	-4.435E+00	&	2.307E+01	1.58E+02	1.83E+01 G
			383.84	-1.082E+01	&	4.100E+01	1.15E+02	8.94E+00 GA
			80.99	1.312E+00	+	3.795E+00	1.04E+02	3.41E+01 GA
CS-134	I	1.9808E+00					7.54E+02	
			795.87	-1.126E+00	?(P	4.084E+00	6.63E+01	8.55E+01 G
			604.71	-1.096E+00	&	4.945E+00	1.37E+02	9.76E+01 G
			569.32	-6.705E+00	+	1.735E+01	7.84E+01	1.54E+01 G
			801.95	1.521E+01	(	4.127E+01	8.22E+01	8.69E+00 G
			563.24	2.004E+01	(	2.549E+01	5.34E+01	8.35E+00 G
CS-137	I	1.6197E+03					1.10E+04	
			661.66	1.620E+03	(	3.048E+00	2.55E-01	8.52E+01 G
CE-139	F	1.3563E-01					1.38E+02	
			165.85	1.356E-01	?(	2.468E+00	5.50E+02	7.99E+01 G
Ba-140	I	4.1505E+00					1.28E+01	
			537.26	4.151E+00	?(P	9.218E+00	9.29E+01	2.44E+01 G
			162.66	-5.509E+00	&	3.277E+01	1.80E+02	6.22E+00 G
			304.85	-6.250E-06	%	9.922E+01	4.80E+08	4.29E+00 G
La-140	I	2.7284E-01					1.28E+01	
			1596.21	-5.331E-01	&(P	1.350E+00	1.33E+02	9.54E+01 G
			487.02	-5.479E-01	+ P	5.584E+00	4.48E+02	4.55E+01 G
			328.76	1.698E+00	&(	1.028E+01	2.42E+02	2.03E+01 G
			815.77	2.332E+00	&(	1.625E+01	2.11E+02	2.33E+01 G
CE-141	I	1.0065E+00					3.25E+01	
			145.44	1.006E+00	(	4.426E+00	1.33E+02	4.82E+01 G
CE-144	I	-4.2211E+00					2.85E+02	
			133.54	-4.221E+00	?(	1.769E+01	1.27E+02	1.11E+01 G
PM-144	C	4.0421E-01					3.63E+02	
			696.54	-2.843E-01	%(P	2.275E+00	1.73E+03	9.90E+01 G
			618.06	1.092E+00	?(	4.813E+00	1.33E+02	9.91E+01 G
EU-152	F	5.7382E+00					4.94E+03	
			121.78	1.727E+00	?(	5.742E+00	1.01E+02	2.86E+01 G
			344.29	-1.217E+00	-	1.269E+01	3.15E+02	2.65E+01 G
			1112.07	1.415E+01	*(	3.807E+01	8.15E+01	1.36E+01 G
			778.92	7.869E+00	(	1.942E+01	1.08E+02	1.29E+01 G
			964.11	-2.111E-01	%	2.952E+01	4.22E+03	1.46E+01 G
			244.69	2.087E+00	&(P	2.586E+01	4.71E+02	7.58E+00 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
			1408.00	2.610E+00		5.994E+00	1.10E+02	2.10E+01 GA
EU-154	I	4.9665E+00					3.14E+03	
			123.10	1.220E+00	?(P	4.138E+00	1.03E+02	4.08E+01 G
			1274.54	4.967E+00	}	4.159E+00	5.01E+01	3.52E+01 G
			723.36	5.603E+00	?(	1.452E+01	7.85E+01	2.02E+01 G
			873.23	-1.382E+01	+	5.026E+01	1.10E+02	1.23E+01 G
			1004.77	-1.141E+00	-	3.286E+01	8.70E+02	1.80E+01 G
			996.33	1.817E+01	(	4.592E+01	7.66E+01	1.06E+01 G
EU-155	I	2.5160E+00					1.81E+03	
			105.31	2.516E+00	(P	4.690E+00	6.72E+01	2.12E+01 G
			86.54	2.516E+00	}	7.669E+00	4.56E+01	3.07E+01 G
HF-181	F	1.8515E-01					4.24E+01	
			482.00	-1.500E+00	(P	4.563E+00	9.18E+01	8.05E+01 G
			133.02	-1.185E+00	&	4.504E+00	1.15E+02	4.33E+01 G
			345.83	5.831E+00	&(	2.199E+01	1.14E+02	1.51E+01 G
			136.30	8.829E+00	&(	3.643E+01	1.25E+02	5.85E+00 G
Ta-182	F	2.8562E+00					1.14E+02	
			1121.30	0.000E+00	}	1.495E+01	7.04E+03	3.49E+01 G
			1221.41	1.439E+00	&(	7.418E+00	2.48E+02	2.70E+01 G
			1189.05	5.218E+00	(	1.478E+01	1.32E+02	1.62E+01 G
Hg-203	F	1.5062E+00					4.66E+01	
			279.20	1.506E+00	(	2.107E+00	5.74E+01	8.15E+01 G
TL-208	N	6.4286E-01					6.98E+02	
			583.02	2.613E-01	(P	2.652E+00	4.23E+02	8.45E+01 G
			277.28	2.019E+00	?(	3.694E+01	5.53E+02	6.31E+00 G
			860.56	2.540E+00	?(	2.664E+01	3.16E+02	1.24E+01 G
PM-146	C	3.1846E+00					2.02E+03	
			453.88	3.185E+00	(	3.427E+00	4.32E+01	6.50E+01 G
			747.16	-1.433E+00	& P	7.065E+00	1.44E+02	3.40E+01 G
			735.72	6.214E-02	% P	1.051E+01	7.34E+03	2.25E+01 G
Y-88	F	1.8789E-02					1.07E+02	
			1836.06	1.879E-02	%(P	1.241E+00	3.29E+03	9.92E+01 G
			898.04	-4.922E-01	+ P	3.576E+00	3.05E+02	9.37E+01 G
Cd-113m		1.2708E+04					5.33E+03	
			263.70	1.271E+04	&(	3.784E+04	9.02E+01	6.00E-03 K
Cd-109	F	3.6558E+02					4.53E+02	
							Derived Ave Activity	
			88.04	3.656E+02	}(	5.618E+01	4.85E+00	3.79E+00 G

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Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Cf-251	T	-3.4730E+00					3.28E+05	
			176.60	-3.473E+00	?(	9.528E+00	1.04E+02	1.70E+01 G
			227.00	-1.168E+01	&	6.505E+01	1.69E+02	6.30E+00 GA
Cf-249	T	-7.5597E-01					1.28E+05	
			387.95	-1.482E+00	?(	5.601E+00	1.14E+02	6.60E+01 G
			333.44	2.334E+00	&(	1.363E+01	2.33E+02	1.55E+01 G
Sn-126		-4.8035E+00					3.65E+07	
			87.57	1.206E+00	}	6.108E+00	9.67E+01	3.75E+01 GA
			64.28	-4.804E+00	?(	1.575E+01	9.93E+01	9.70E+00 G
			86.94	5.002E+00	}	2.595E+01	8.98E+01	9.04E+00 GA
PB-210	N	4.8893E+02					8.14E+03	
			46.54	4.889E+02	?(P	1.974E+02	1.23E+01	4.25E+00 G
PB-212	N	1.4184E+00					6.98E+02	
			238.63	1.418E+00	?(P	9.649E+00	2.06E+02	4.33E+01 G
			300.03	-2.498E+01	+ P	1.280E+02	1.02E+02	3.28E+00 GA
PB-214	N	-2.8870E+00					5.84E+05	
			351.93	-2.887E+00	?(P	8.626E+00	8.56E+01	3.76E+01 G
			295.09	-4.566E+00	+ P	2.144E+01	9.37E+01	1.93E+01 G
			242.00	3.583E-01	&	5.680E+01	4.80E+03	7.43E+00 GA
BI-207	C	1.3807E-01					1.18E+04	
			1063.66	1.381E-01	%(P	4.707E+00	1.03E+03	7.45E+01 G
			569.70	0.000E+00	-	2.726E+00	1.00E+03	9.77E+01 G
BI-212	N	-8.7229E+00					6.98E+02	
			727.17	-8.723E+00	&(	4.051E+01	1.40E+02	7.55E+00 G
			785.42	-4.537E+01	+	2.001E+02	1.92E+02	1.28E+00 GA
U-235	N	2.2279E+00					2.57E+11	
			143.79	-2.574E+00	(P	2.012E+01	1.91E+02	1.10E+01 G
			205.33	4.226E+00	&(P	3.704E+01	3.33E+02	5.01E+00 G
			163.38	1.062E+01	&(P	3.581E+01	1.02E+02	5.08E+00 G
			185.72	2.585E+00	*	3.218E+00	4.75E+01	5.40E+01 GA
BI-214	N	-3.0029E+00					5.84E+05	
			609.31	-3.003E+00	?(P	1.060E+01	3.95E+01	4.61E+01 G
			1120.29	-2.639E-01	} P	3.502E+01	2.77E+03	1.51E+01 G
			1764.49	-2.467E+00	+ P	1.047E+01	1.97E+02	1.54E+01 G
BI-210M	T	1.5146E+00					1.10E+09	
			265.83	1.515E+00	&(P	4.713E+00	9.43E+01	5.00E+01 G
			304.90	9.577E-07	%	1.520E+01	4.80E+08	2.80E+01 G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

AC-228   N  -1.0828E+00                                     2.10E+03
                         911.07-1.083E+00 ?(  1.192E+01 4.98E+02 2.90E+01 G
                         968.97-1.132E+01 +   2.262E+01 6.06E+01 1.75E+01 G
                         338.32-7.212E+00 &   2.790E+01 1.17E+02 1.20E+01 G
                          93.35 8.181E+00 *   4.159E+01 1.54E+02 5.56E+00 XA

TH-227   N  -2.4762E+00                                     7.95E+03
                         256.24-2.476E+00 ?(P 2.754E+01 4.43E+02 7.00E+00 G
                         235.97-6.180E+00 &   3.406E+01 1.67E+02 1.23E+01 G
                          50.14-2.030E+01 +   1.011E+02 1.51E+02 8.00E+00 G

TH-229   N   1.9814E+00                                     2.68E+06
                         193.51-5.144E+00 ?(  4.209E+01 3.11E+02 4.40E+00 G
                         210.85 1.247E+01 &(P 6.364E+01 1.94E+02 2.99E+00 G

TH-234   N   1.2252E+00                                     1.63E+12
                          92.59 1.225E+00 %(P 4.141E+01 1.02E+03 5.58E+00 G
                          63.29-1.869E+01 & P 3.724E+01 3.11E+02 3.81E+00 G

PA-233   C   1.2390E-02                                     7.82E+08
                         312.01 1.239E-02 %(  7.364E+00 1.80E+04 3.60E+01 G
                         300.18-2.196E+00 +   6.803E+01 9.38E+02 6.20E+00 G

PA-234   N  -1.1383E+00                                     1.63E+12
                         131.29-1.138E+00 ?(  1.186E+01 3.15E+02 1.80E+01 G
                         946.02-1.569E+01 +   2.905E+01 8.40E+01 1.34E+01 G
                         569.47-4.553E+00 +   3.236E+01 2.15E+02 8.20E+00 G
                         883.24-1.792E+01 +   6.514E+01 1.10E+02 9.60E+00 G
                         880.53-2.856E+01 +   1.035E+02 1.10E+02 6.00E+00 GA

PA-234M  N   3.1605E+01                                     1.63E+12
                        1001.00-5.107E+01 &(P 5.352E+02 3.60E+02 8.37E-01 G
                         766.41 2.670E+02 &(P 9.694E+02 1.10E+02 2.94E-01 G

AM-241   T   4.8007E+03                                     1.58E+05
                          59.54 4.801E+03 *(  1.085E+01 1.62E-01 3.59E+01 G

Np-237   F  -3.4506E+00                                     2.14E+06
                          86.49-3.451E+00 ?(  1.818E+01 1.60E+02 1.31E+01 G

Ir-192   F   1.3025E+00                                     7.40E+01
                         316.49 9.435E-01 &(  3.076E+00 9.88E+01 8.70E+01 G
                         468.06-1.866E-01 %   7.698E+00 1.25E+03 5.18E+01 G
                         308.44 2.287E+00 ?(  1.014E+01 1.34E+02 3.18E+01 G
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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

Cs-136   F  -1.4509E+00                                      1.30E+01
                          818.50-1.451E+00 ?(  4.201E+00 8.77E+01 1.00E+02 G
                         1048.07-2.412E+00 +   5.865E+00 7.37E+01 8.00E+01 G
                          340.57-1.859E+00 +   7.147E+00 1.16E+02 4.69E+01 G

Np-239   T  -2.0390E+00                                      2.36E+00
                          103.70 1.902E+00     7.423E+00 1.18E+02 2.40E+01 X
                          106.13-2.039E+00  (  7.737E+00 1.15E+02 2.27E+01 G
                           99.50-2.338E+00 &   1.085E+01 1.41E+02 1.50E+01 X

Nd-147       1.4120E+01                                      1.11E+01
                          531.00 1.412E+01  (  1.547E+01 4.79E+01 1.30E+01 G
                           91.10 1.603E+00 &   8.134E+00 1.54E+02 2.83E+01 G

TL-210   N   1.3189E+00                                      5.84E+05
                          799.60 1.319E+00 &(  3.237E+00 7.44E+01 9.90E+01 G
                          296.00-1.009E+00 &   5.256E+00 1.58E+02 7.90E+01 G
                         1313.00-4.509E+00 +   9.783E+00 6.58E+01 2.10E+01 GA
   ( - 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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********** 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 1 Sigma %	Activity	
TH-227	50.14	322711.	-532.	-0.074	151.08	-2.030E+01	
TH-234	63.29	12074.	-258.	-0.036	310.87	-1.869E+01	P
BA-133	80.99	11184.	171.	0.024	104.20	1.312E+00	
Np-237	86.49	38607.	-174.	-0.024	159.62	-3.451E+00	
AC-228	93.35	36526.	176.	0.024	154.02	8.181E+00	
Gd-153	97.50	15325.	173.	0.024	101.24	1.499E+00	
Np-239	99.50	17505.	-133.	-0.019	140.51	-2.338E+00	
Gd-153	103.20	20656.	173.	0.024	117.81	2.065E+00	
Np-239	103.70	20829.	173.	0.024	118.23	1.902E+00	
Np-239	106.13	20130.	-175.	-0.024	114.93	-2.039E+00	
EU-152	121.78	17117.	184.	0.026	100.74	1.727E+00	
PA-234	131.29	27799.	-75.	-0.010	315.20	-1.138E+00	
HF-181	133.02	23004.	-187.	-0.026	115.11	-1.185E+00	
CE-144	133.54	23233.	-170.	-0.024	126.96	-4.221E+00	
HF-181	136.30	27041.	186.	0.026	124.99	8.829E+00	
Tc-99m	140.51	27642.	-186.	-0.026	126.42	-6.570E-01	
U-235	143.79	27837.	-100.	-0.014	190.78	-2.574E+00	P
CE-141	145.44	25797.	171.	0.024	133.18	1.006E+00	
Ba-140	162.66	21255.	-115.	-0.016	180.05	-5.509E+00	
U-235	163.38	16841.	180.	0.025	102.18	1.062E+01	P
CE-139	165.85	19343.	36.	0.005	550.28	1.356E-01	
Cf-251	176.60	12120.	-188.	-0.026	104.47	-3.473E+00	
U-235	185.72	13163.	432.	0.060	47.54	2.585E+00	
TH-229	193.51	14253.	-68.	-0.009	311.14	-5.144E+00	
U-235	205.33	13337.	62.	0.009	333.27	4.226E+00	P
TH-229	210.85	13586.	107.	0.015	194.20	1.247E+01	P
Cf-251	227.00	57928.	-202.	-0.028	168.78	-1.168E+01	
TH-227	235.97	57726.	-204.	-0.028	167.01	-6.180E+00	
PB-212	238.63	56617.	163.	0.023	206.14	1.418E+00	P
EU-152	244.69	12016.	41.	0.006	470.93	2.087E+00	P
TH-227	256.24	10961.	-44.	-0.006	442.54	-2.476E+00	P
Cd-113m	263.70	14681.	191.	0.026	90.21	1.271E+04	
BI-210M	265.83	15662.	188.	0.026	94.28	1.515E+00	P
TL-208	277.28	14520.	31.	0.004	552.98	2.019E+00	
I-131	284.30	10389.	373.	0.052	51.42	2.558E+01	P
PB-214	295.09	42394.	-205.	-0.028	93.67	-4.566E+00	P
PB-212	300.03	42703.	-188.	-0.026	101.84	-2.498E+01	P
PA-231	300.07	42885.	-186.	-0.026	157.97	-3.280E+01	
PA-233	300.18	43071.	-31.	-0.004	937.82	-2.196E+00	
BA-133	302.85	42802.	-186.	-0.026	157.62	-4.435E+00	
Ir-192	308.44	24156.	164.	0.023	134.25	2.287E+00	
Ir-192	316.49	16138.	182.	0.025	98.77	9.435E-01	
CR-51	320.08	16106.	-174.	-0.024	103.19	-7.959E+00	
La-140	328.76	9291.	75.	0.010	241.79	1.698E+00	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
Cf-249	333.44	9357.	78.	0.011	233.29	2.334E+00		
AC-228	338.32	23157.	-184.	-0.026	117.17	-7.212E+00		
Cs-136	340.57	22973.	-184.	-0.026	116.48	-1.859E+00		
EU-152	344.29	22789.	-68.	-0.009	315.40	-1.217E+00		
HF-181	345.83	21990.	184.	0.026	114.23	5.831E+00		
PB-214	351.93	20572.	-225.	-0.031	85.61	-2.887E+00		P
BA-133	356.00	19077.	-186.	-0.026	105.25	-1.460E+00		
I-131	364.48	14478.	181.	0.025	94.48	1.099E+00		
BA-133	383.84	23352.	-189.	-0.026	114.75	-1.082E+01		
Cf-249	387.95	23410.	-189.	-0.026	114.49	-1.482E+00		
SN-113	391.69	22399.	188.	0.026	112.58	1.531E+00		
AG-108M	433.94	9670.	79.	0.011	231.79	4.905E-01		P
BE-7	477.59	16793.	-199.	-0.028	92.19	-1.133E+01		
HF-181	482.00	16993.	-201.	-0.028	91.83	-1.500E+00		P
La-140	487.02	7977.	-41.	-0.006	448.22	-5.479E-01		P
RU-103	497.05	7220.	-21.	-0.003	864.17	-1.444E-01		P
Ba-140	537.26	5397.	155.	0.022	92.93	4.151E+00		P
PA-234	569.47	6909.	-55.	-0.008	214.61	-4.553E+00		
TL-208	583.02	4745.	32.	0.004	423.23	2.613E-01		P
SB-124	602.73	21314.	-150.	-0.021	137.78	-1.084E+00		
BI-214	609.31	21307.	-193.	-0.027	39.52	-3.003E+00		P
RU-103	610.30	21415.	-151.	-0.021	137.40	-1.880E+01		
AG-108M	614.28	21566.	-151.	-0.021	137.51	-1.213E+00		
PM-144	618.06	19856.	150.	0.021	133.46	1.092E+00		
I-131	636.97	5792.	-89.	-0.012	120.84	-9.265E+00		
AG-110M	657.76	188562.	142.	0.020	431.38	1.141E+00		P
NB-94	702.63	3605.	-136.	-0.019	90.31	-1.112E+00		
SB-124	722.79	5990.	-60.	-0.008	183.89	-4.504E+00		
ZR-95	724.20	5882.	48.	0.007	226.90	8.866E-01		
BI-212	727.17	6316.	-80.	-0.011	140.35	-8.723E+00		
ZR-95	756.73	3591.	139.	0.019	88.59	2.154E+00		P
AG-110M	763.94	4930.	97.	0.014	102.50	3.724E+00		P
PA-234M	766.41	5042.	92.	0.013	109.81	2.670E+02		P
EU-152	778.92	3813.	118.	0.016	107.52	7.869E+00		
BI-212	785.42	3909.	-67.	-0.009	191.82	-4.537E+01		
CO-58	810.78	9277.	-160.	-0.022	85.42	-1.438E+00		
La-140	815.77	8077.	60.	0.008	210.53	2.332E+00		
Cs-136	818.50	9913.	-161.	-0.022	87.71	-1.451E+00		
Co-56	846.77	4659.	42.	0.006	345.86	3.878E-01		P
TL-208	860.56	5656.	34.	0.005	316.39	2.540E+00		
NB-94	871.10	5255.	-113.	-0.016	136.81	-1.067E+00		
PA-234	880.53	19326.	-180.	-0.025	109.77	-2.856E+01		
PA-234	883.24	19506.	-180.	-0.025	110.11	-1.792E+01		
AG-110M	884.68	17763.	29.	0.004	655.31	3.793E-01		
Sc-46	889.28	19737.	-54.	-0.007	369.32	-5.181E-01		
Y-88	898.04	5411.	-48.	-0.007	304.83	-4.922E-01		P
AC-228	911.07	5628.	-32.	-0.004	497.63	-1.083E+00		
AG-110M	937.49	5959.	188.	0.026	87.57	5.486E+00		

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
PA-234	946.02	6720.	-208.	-0.029	83.99	-1.569E+01		
AC-228	968.97	6648.	-192.	-0.027	60.63	-1.132E+01		
PA-234M	1001.00	8118.	-40.	-0.006	359.77	-5.107E+01		P
Co-56	1037.84	5718.	-28.	-0.004	375.68	-2.203E+00		
Cs-136	1048.07	8251.	-175.	-0.024	73.70	-2.412E+00		
Ga-68	1077.40	4475.	-50.	-0.007	294.48	-3.021E+01		
EU-152	1112.07	9164.	167.	0.023	81.54	1.415E+01		
Co-56	1238.28	1040.	-39.	-0.005	188.64	-7.487E-01		
AG-110M	1384.30	293.	-6.	-0.001	615.97	-3.642E-01		
EU-152	1408.00	341.	39.	0.005	109.79	2.610E+00		
K-40	1460.83	351.	-15.	-0.002	287.47	-2.041E+00		P
La-140	1596.21	284.	-32.	-0.004	133.32	-5.331E-01		P
SB-124	1690.98	240.	10.	0.001	375.50	3.493E-01		
BI-214	1764.49	375.	-22.	-0.003	197.13	-2.467E+00		P
Co-56	1771.35	473.	-51.	-0.007	61.74	-5.751E+00		

P - Peakbackground subtraction

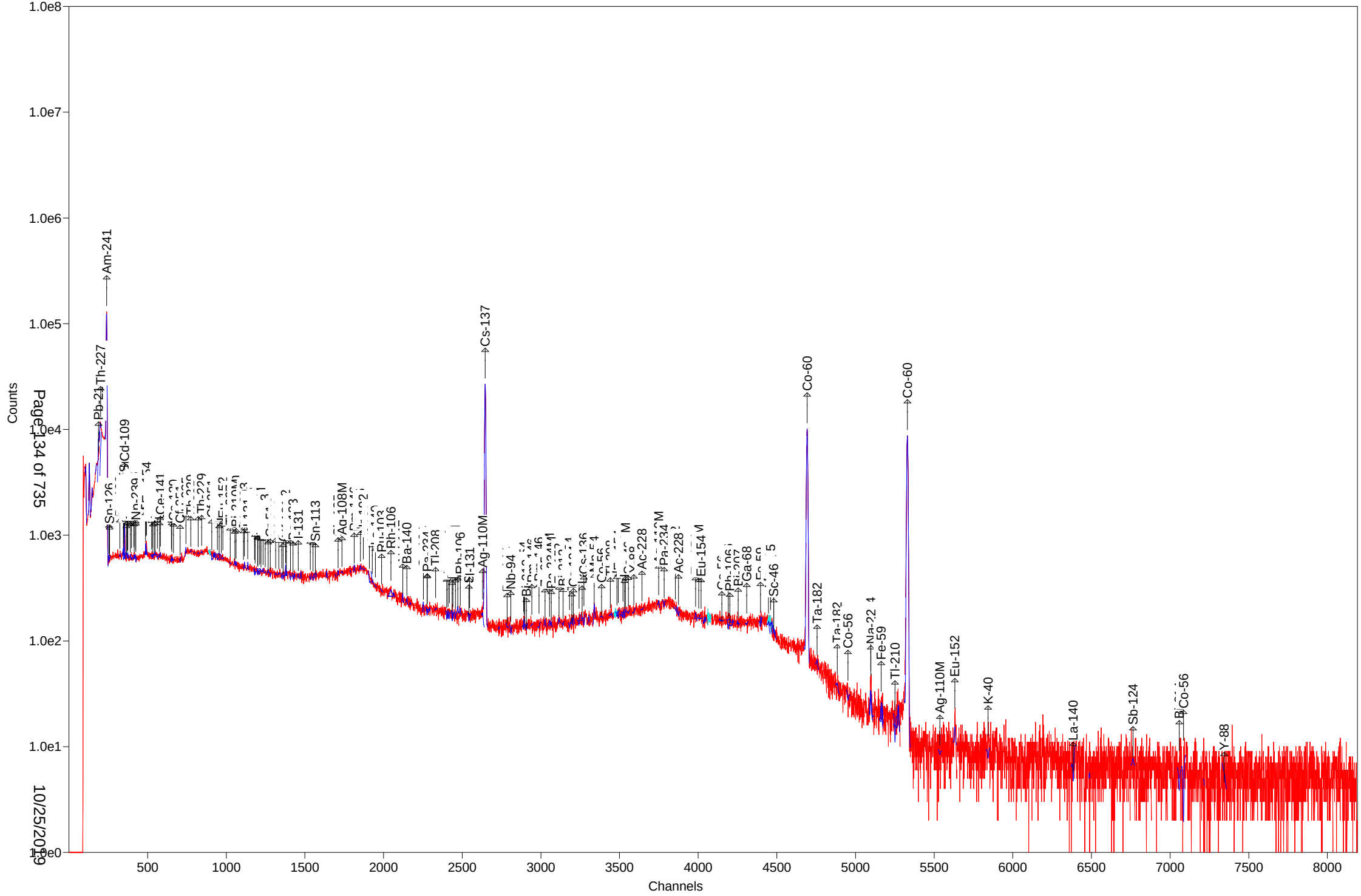
***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity Bq/Sample	Time Corrected Activity Bq/Sample	Uncertainty Counting 1 Sigma	MDA Bq/Sample
BE-7	#A	-1.1334E+01	-1.1334E+01	9.219E+01%	3.45E+01
NA-22	#A	9.0080E-01	9.0080E-01	6.499E+01%	1.93E+00
K-40	#A	-2.0406E+00	-2.0406E+00	2.875E+02%	1.24E+01
Sc-46	#A	-5.1805E-01	-5.1806E-01	3.693E+02%	6.33E+00
CR-51	#A	-7.9588E+00	-7.9590E+00	1.032E+02%	2.71E+01
MN-54		4.3505E+00	4.3505E+00	2.473E+01%	2.39E+00
FE-59	A	-3.2360E+00	-3.2360E+00	5.937E+01%	6.68E+00
Co-56	#A	3.8783E-01	3.8784E-01	3.459E+02%	2.97E+00
CO-57	#	2.0688E+00	2.0688E+00	2.010E+01%	1.32E+00
CO-58	#A	-1.4384E+00	-1.4384E+00	8.542E+01%	4.06E+00
CO-60		1.0153E+03	1.0153E+03	2.686E-01%	1.74E+00
ZN-65	#A	1.7562E+00	1.7562E+00	1.785E+02%	1.04E+01
NB-94	#A	-1.1115E+00	-1.1115E+00	9.031E+01%	2.30E+00
ZR-95	#A	1.5866E+00	1.5866E+00	8.859E+01%	4.38E+00
NB-95	#A	0.0000E+00	0.0000E+00	1.000E+03%	2.85E+00
RU-103	#A	-1.4436E-01	-1.4436E-01	8.642E+02%	2.70E+00
RH-106	#A	1.5154E+01	1.5154E+01	1.254E+02%	4.89E+01
AG-108M	#A	4.9051E-01	4.9051E-01	2.318E+02%	2.85E+00
AG-110M	#A	1.8175E+00	1.8175E+00	8.757E+01%	8.22E+00
SN-113	#A	1.5306E+00	1.5306E+00	1.126E+02%	5.69E+00
SB-124	#A	-1.0845E+00	-1.0845E+00	1.378E+02%	4.93E+00
SB-125	A	6.4197E+00	6.4197E+00	5.897E+01%	7.38E+00
I-131	#A	2.8099E+00	2.8100E+00	5.142E+01%	3.43E+00
Gd-153	#A	1.7371E+00	1.7371E+00	7.767E+01%	5.01E+00
Ga-68	#A	-2.9954E+01	-3.0205E+01	2.945E+02%	1.90E+02

Tc-99m	#A	-6.5598E-01	-6.5701E-01	1.264E+02%	2.74E+00
BA-133	#A	-1.4603E+00	-1.4603E+00	1.053E+02%	5.07E+00
CS-134	A	1.9808E+00	1.9808E+00	3.945E+01%	4.08E+00
CS-137	#	1.6197E+03	1.6197E+03	2.552E-01%	3.05E+00
CE-139	#A	1.3563E-01	1.3563E-01	5.503E+02%	2.47E+00
Ba-140	#A	4.1504E+00	4.1505E+00	9.293E+01%	9.22E+00
La-140	#A	2.7283E-01	2.7284E-01	1.157E+02%	1.35E+00
CE-141	#A	1.0065E+00	1.0065E+00	1.332E+02%	4.43E+00
CE-144	#A	-4.2211E+00	-4.2211E+00	1.270E+02%	1.77E+01
PM-144	#A	4.0421E-01	4.0421E-01	1.335E+02%	2.27E+00
EU-152	#A	5.7382E+00	5.7382E+00	8.154E+01%	5.74E+00
EU-154	C	4.9665E+00	4.9665E+00	5.011E+01%	4.14E+00
EU-155	A	2.5160E+00	2.5160E+00	6.721E+01%	4.69E+00
HF-181	#A	1.8514E-01	1.8515E-01	6.421E+01%	4.56E+00
Ta-182	A	2.8561E+00	2.8562E+00	1.323E+02%	7.42E+00
Hg-203	A	1.5062E+00	1.5062E+00	5.740E+01%	2.11E+00
TL-208	#A	6.4286E-01	6.4286E-01	2.550E+02%	2.65E+00
PM-146	A	3.1846E+00	3.1846E+00	4.322E+01%	3.43E+00
Y-88	A	1.8789E-02	1.8789E-02	3.285E+03%	1.24E+00
Cd-113m	#A	1.2708E+04	1.2708E+04	9.021E+01%	3.78E+04
Cd-109	#	3.6558E+02	3.6558E+02	4.846E+00%	5.62E+01
Cf-251	#A	-3.4730E+00	-3.4730E+00	1.045E+02%	9.53E+00
Cf-249	#A	-7.5597E-01	-7.5597E-01	1.145E+02%	5.60E+00
Sn-126	#A	-4.8035E+00	-4.8035E+00	9.932E+01%	1.58E+01
PB-210	#	4.8893E+02	4.8893E+02	1.231E+01%	1.97E+02
PB-212	#A	1.4184E+00	1.4184E+00	2.061E+02%	9.65E+00
PB-214	#A	-2.8870E+00	-2.8870E+00	8.561E+01%	8.63E+00
BI-207	#A	1.3807E-01	1.3807E-01	1.026E+03%	4.71E+00
BI-212	#A	-8.7229E+00	-8.7229E+00	1.404E+02%	4.05E+01
U-235	#A	2.2279E+00	2.2279E+00	1.022E+02%	2.01E+01
BI-214	#A	-3.0029E+00	-3.0029E+00	3.952E+01%	1.06E+01
BI-210M	#A	1.5146E+00	1.5146E+00	9.428E+01%	4.71E+00
AC-228	#A	-1.0828E+00	-1.0828E+00	4.976E+02%	1.19E+01
TH-227	#A	-2.4762E+00	-2.4762E+00	4.425E+02%	2.75E+01
TH-229	#A	1.9814E+00	1.9814E+00	1.834E+02%	4.21E+01
TH-234	#A	1.2252E+00	1.2252E+00	1.023E+03%	4.14E+01
PA-231	#A	0.0000E+00	0.0000E+00	1.000E+03%	1.47E+02
PA-233	#A	1.2390E-02	1.2390E-02	1.795E+04%	7.36E+00
PA-234	#A	-1.1383E+00	-1.1383E+00	3.152E+02%	1.19E+01
PA-234M	#A	3.1605E+01	3.1605E+01	1.098E+02%	5.35E+02
AM-241	#	4.8007E+03	4.8007E+03	1.616E-01%	1.09E+01
Np-237	#A	-3.4506E+00	-3.4506E+00	1.596E+02%	1.82E+01
Ir-192	#A	1.3025E+00	1.3025E+00	8.334E+01%	3.08E+00
Cs-136	#A	-1.4509E+00	-1.4509E+00	8.771E+01%	4.20E+00
Np-239	#A	-2.0386E+00	-2.0390E+00	1.149E+02%	7.74E+00
Nd-147	A	1.4120E+01	1.4120E+01	4.794E+01%	1.55E+01
TL-210	#A	1.3189E+00	1.3189E+00	7.438E+01%	3.24E+00
Kr-85	#A	0.0000E+00	0.0000E+00	1.000E+03%	8.43E+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 (   25.1 to  1999.5 keV)     7.835E+03  Bq/Sample
Total Decayed Activity (   25.1 to  1999.5 keV) 7.8354487E+03  Bq/Sample
```

443730_Gamma_LCS 160-443730~2-A. 17_Gamma_20191948.spc.



Test America St. Louis Spectrum ID: 14_Gamma_20192176

Sample Description: 443730_Gamma_180-95857-B-6-A
Detector: Detector #14
Batch ID: 443730
Work Order Number: Gamma
Lot Number: 180-95857-B-6-A

Decay to Time: 10/14/2019 07:02 Live Time: 7200 sec
Acquisition Time: 10/14/2019 07:02:52 Real Time: 7203 sec
Analysis Time: 10/14/2019 09:03 Dead Time: 0.04 %
Analysis Quantity: 1.000E+00 Sample

Efficiency Cal File: 14_Liquid_Marinelli 1L.Clb
Efficiency Cal Desc: 14_1LMarinelli_90062_030612
Efficiency Cal Date: 3/14/2012 16:58
Energy Cal Date: 2/28/2012 10:48
Library: Client_Long_Rev15.lib
Bkgd Correction File: 14_2019-10-06_1924.PBC

Nuclide	Activity Bq/Sample	1-Sigma Counting Uncert %	1-Sigma Counting Uncert Bq/Sample	1-Sigma Total Uncert Bq/Sample	Minimum Detectable Activity Bq/Sample
BE-7	-1.829E-01	453.1	8.289E-01	8.289E-01	2.892E+00
NA-22	-2.333E-01	57.7	1.347E-01	1.352E-01	4.387E-01
K-40	3.124E-01	469.6	1.467E+00	1.467E+00	4.195E+00
Sc-46	-3.513E-02	389.7	1.369E-01	1.369E-01	4.784E-01
CR-51	6.984E-01	114.0	7.959E-01	7.968E-01	2.068E+00
MN-54	-2.207E-03	5394.3	1.191E-01	1.191E-01	2.961E-01
FE-59	4.323E-01	47.5	2.056E-01	2.066E-01	4.437E-01
Co-56	9.860E-02	107.2	1.057E-01	1.058E-01	3.371E-01
CO-57	6.174E-02	104.0	6.421E-02	6.430E-02	2.154E-01
CO-58	9.860E-02	91.6	9.030E-02	9.043E-02	3.070E-01
CO-60	-2.754E-02	502.5	1.384E-01	1.384E-01	3.169E-01
ZN-65	1.982E-02	1340.6	2.657E-01	2.657E-01	9.499E-01
NB-94	5.353E-02	183.3	9.814E-02	9.817E-02	2.449E-01
ZR-95	-3.171E-03	121.5	3.854E-03	3.857E-03	5.443E-01
NB-95	-1.972E-01	76.5	1.508E-01	1.511E-01	5.021E-01
RU-103	2.781E-03	4346.5	1.209E-01	1.209E-01	3.095E-01
RH-106	-1.288E+00	155.4	2.002E+00	2.003E+00	6.743E+00
AG-108M	1.248E-01	40.9	5.100E-02	5.139E-02	1.531E-01
AG-110M	1.904E-01	86.4	1.644E-01	1.647E-01	5.581E-01
SN-113	7.531E-02	187.9	1.415E-01	1.416E-01	4.814E-01
SB-124	1.893E-01	81.6	1.544E-01	1.547E-01	5.711E-01
SB-125	3.256E-01	107.8	3.511E-01	3.515E-01	8.349E-01
I-131	9.624E-02	100.7	9.689E-02	9.702E-02	2.518E-01
Gd-153	-4.167E-02	169.9	7.080E-02	7.085E-02	7.729E-01
Ga-68	7.494E-01	857.3	6.425E+00	6.425E+00	1.556E+01
Tc-99m	8.187E-02	107.0	8.762E-02	8.774E-02	2.932E-01
BA-133	1.237E-01	108.6	1.343E-01	1.344E-01	4.533E-01
CS-134	1.244E-01	85.4	1.062E-01	1.064E-01	3.773E-01
CS-137	3.659E-03	3354.1	1.227E-01	1.227E-01	4.336E-01
CE-139	6.807E-02	126.4	8.601E-02	8.623E-02	2.893E-01
Ba-140	5.462E-01	63.7	3.478E-01	3.489E-01	8.416E-01
La-140	-8.431E-02	77.2	6.511E-02	6.526E-02	4.616E-01
CE-141	1.145E-01	135.2	1.548E-01	1.549E-01	5.198E-01

CE-144	0.000E+00	1.#INF	4.246E-01	4.246E-01	2.390E+00
PM-144	1.683E-01	50.9	8.569E-02	8.610E-02	1.981E-01
EU-152	2.525E-01	83.6	2.111E-01	2.116E-01	8.244E-01
EU-154	2.975E-01	110.9	3.300E-01	3.304E-01	4.853E-01
EU-155	0.000E+00	1.#INF	1.864E-01	1.864E-01	1.104E+00
HF-181	-1.114E-01	110.5	1.230E-01	1.232E-01	4.162E-01
Ta-182	2.504E-01	104.4	2.615E-01	2.618E-01	9.065E-01
Hg-203	7.879E-02	100.9	7.954E-02	7.966E-02	2.683E-01
TL-208	1.114E-01	158.9	1.770E-01	1.771E-01	2.995E-01
PM-146	-2.680E-02	70.1	1.878E-02	1.882E-02	4.142E-01
Y-88	-3.822E-03	185.8	7.099E-03	7.103E-03	4.546E-01
Cd-113m	1.678E+02	642.6	1.078E+03	1.078E+03	3.743E+03
Cd-109	0.000E+00	1.#INF	2.512E+00	2.512E+00	8.479E+00
Cf-251	-2.010E-01	225.2	4.528E-01	4.532E-01	1.230E+00
Cf-249	0.000E+00	1.#INF	6.981E-02	6.981E-02	5.132E-01
Sn-126	6.373E-01	108.6	6.921E-01	6.930E-01	2.317E+00
PB-210	-5.902E-01	345.1	2.036E+00	2.037E+00	6.032E+00
PB-212	1.923E-01	108.3	2.082E-01	2.086E-01	6.841E-01
PB-214	-2.927E-01	83.5	2.445E-01	2.449E-01	8.524E-01
BI-207	-3.087E-01	87.9	2.714E-01	2.718E-01	6.031E-01
BI-212	2.554E-07	544856081.3	1.391E+00	1.391E+00	4.947E+00
U-235	5.061E-01	121.7	6.157E-01	6.163E-01	2.190E+00
BI-214	8.685E-02	73.9	6.418E-02	6.433E-02	1.403E+00
BI-210M	-1.714E-02	875.3	1.500E-01	1.500E-01	5.178E-01
AC-228	5.266E-01	76.7	4.041E-01	4.049E-01	9.622E-01
TH-227	3.894E-01	122.1	4.753E-01	4.759E-01	3.105E+00
TH-229	-6.378E-01	287.9	1.836E+00	1.837E+00	4.723E+00
TH-234	1.573E+00	80.2	1.261E+00	1.264E+00	3.427E+00
PA-231	0.000E+00	1.#INF	7.121E-01	7.121E-01	1.738E+01
PA-233	-2.411E-01	142.0	3.422E-01	3.425E-01	1.397E+00
PA-234	1.569E-01	102.4	1.606E-01	1.608E-01	1.429E+00
PA-234M	-2.983E+01	49.5	1.477E+01	1.484E+01	8.012E+01
AM-241	1.543E-01	112.7	1.739E-01	1.741E-01	4.942E-01
Np-237	-4.434E-01	173.6	7.697E-01	7.701E-01	2.574E+00
Ir-192	6.872E-02	165.6	1.138E-01	1.139E-01	3.093E-01
Cs-136	7.961E-02	72.9	5.800E-02	5.817E-02	3.813E-01
Np-239	-1.613E-01	186.2	3.002E-01	3.004E-01	1.012E+00
Nd-147	6.635E-01	105.1	6.973E-01	6.983E-01	1.753E+00
TL-210	1.124E-01	96.9	1.089E-01	1.091E-01	3.696E-01
Kr-85	2.114E+01	165.7	3.503E+01	3.505E+01	1.185E+02
Total	1.998E+02				

Analyst: Caleb Quinn

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Sample description
443730_Gamma_180-95857-B-6-A

Spectrum Filename: C:\User\SPC\Det14\14_Gamma_20192176.An1

Acquisition information
Start time: 10/14/2019 7:02:52 AM
Live time: 7200
Real time: 7203
Dead time: 0.04 %
Detector ID: 14

Detector system
Ge14 SN/11080670

Calibration
Filename: 14_Liquid_Marinelli 1L.Clb
14_1LMarinelli_90062_030612

Energy Calibration
Created: 2/28/2012 10:48:23 AM
Zero offset: 0.130 keV
Gain: 0.250 keV/channel
Quadratic: -2.050E-08 keV/channel^2

Efficiency Calibration
Created: 3/14/2012 4:58:47 PM
Knee Energy: 165.85 keV
Above the Knee: Quadratic Uncertainty = 1.64 %
Log(Eff): -1.428037E+00 + (-4.136370E-02*Log(E)) + (-5.958012E-02*Log(E)^2)
Below the Knee: Quadratic Uncertainty = 0.07 %
Log(Eff): -1.383299E+01 + (4.786779E+00*Log(E)) + (-5.293738E-01*Log(E)^2)

Library Files
Main analysis library: Client_Long_Rev15.lib
Library Match Width: 0.500
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G800W064
Start channel: 100 (25.14keV)
Stop channel: 8000 (1999.51keV)
Peak rejection level: 1000.000%
Peak search sensitivity: 3
Sample Size: 1.0000E+00 +/- 0.000E+00%
Activity scaling factor: 1.0000E+00/(1.0000E+00* 1.0000E+00) = 1.0000E+00
Detection limit method: Reg. Guide 4.16 Method

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Random error: 4.0000000E+00
Systematic error: 4.0000000E+00
Fraction Limit: 0.000%
Background width: 3
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:	YES	10/14/2019 7:02:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	14_2019-10-06_1924.PBC 10/6/2019 7:24:09 PM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 9 cutoff: 5.00E+01 %
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
46.47	-7.	345.06	0.75	3.849E-02	46.54	4.250	PBC<MDA	PB210
50.14	16.	122.08	0.75	4.049E-02	50.14	8.000	PBC<MDA	TH227
59.54	18.	112.71	0.76	4.451E-02	59.54	35.900	PBC<MDA	AM241
63.31	21.	108.80	0.47	4.570E-02	63.29	3.810	PBC<MDA	TH234
64.35	20.	108.60	0.77	4.596E-02	64.28	9.700	PBC<MDA	Sn126
80.99	15.	135.80	0.78	4.877E-02	80.99	34.060	PBC<MDA	BA133
87.56	14.	102.28	0.79	4.913E-02	87.57	37.500	PBC<MDA	Sn126
92.43	31.	80.16	1.27	4.919E-02	92.59	5.584	PBC<MDA	TH234
103.20	7.	359.17	0.81	4.884E-02	103.20	21.800	PBC<MDA	Gd153
122.06	18.	103.99	0.83	4.714E-02	121.78	28.580	PBC<MDA	EU152
					122.06	85.600	6.174E-02	CO57
123.10	7.	290.47	0.83	4.702E-02	123.10	40.790	PBC<MDA	EU154
140.51	21.	107.02	0.85	4.472E-02	140.51	89.300	PBC<MDA	Tc99m
143.66	9.	249.80	0.85	4.425E-02	143.79	10.960	PBC<MDA	U235
145.44	17.	135.20	0.85	4.401E-02	145.44	48.200	PBC<MDA	CE141
162.66	27.	70.31	0.87	4.140E-02	162.66	6.220	PBC<MDA	Ba140
163.38	12.	165.28	0.87	4.129E-02	163.38	5.080	PBC<MDA	U235
165.85	16.	126.37	0.87	4.093E-02	165.85	79.900	PBC<MDA	CE139
185.42	76.	24.48	0.80	3.804E-02	185.72	54.000	PBC<MDA	U235
205.44	9.	208.52	0.91	3.553E-02	205.33	5.010	PBC<MDA	U235
235.97	13.	134.36	0.94	3.230E-02	235.97	12.300	PBC<MDA	TH227
238.63	19.	108.27	0.94	3.205E-02	238.63	43.300	PBC<MDA	PB212

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
242.00	13.	160.63	0.95	3.174E-02	242.00	7.430	PBC<MDA	PB214
244.69	5.	481.44	0.95	3.150E-02	244.69	7.580	PBC<MDA	EU152
263.70	2.	642.57	0.97	2.989E-02	263.70	0.006	PBC<MDA	Cd113m
277.45	8.	175.89	0.98	2.884E-02	277.28	6.310	PBC<MDA	TL208
279.20	13.	100.94	0.99	2.870E-02	279.20	81.460	PBC<MDA	Hg203
308.44	15.	165.64	1.01	2.672E-02	308.44	31.750	PBC<MDA	Ir192
320.08	13.	113.97	1.03	2.601E-02	320.08	9.940	PBC<MDA	CR51
338.32	16.	118.61	1.04	2.498E-02	338.32	12.010	PBC<MDA	AC228
340.57	9.	207.32	1.05	2.485E-02	340.57	46.900	PBC<MDA	Cs136
344.29	14.	121.51	1.05	2.466E-02	344.29	26.500	PBC<MDA	EU152
351.93	-19.	83.51	1.06	2.426E-02	351.93	37.600	PBC<MDA	PB214
356.00	13.	108.58	1.06	2.405E-02	356.00	62.050	PBC<MDA	BA133
364.48	13.	100.67	1.07	2.364E-02	364.48	81.700	PBC<MDA	I131
391.69	8.	187.91	1.09	2.240E-02	391.69	64.000	PBC<MDA	SN113
433.94	21.	40.86	1.13	2.072E-02	433.94	90.480	1.567E-01	AG108M
463.37	8.	162.45	1.16	1.970E-02	463.37	10.470	PBC<MDA	SB125
511.86	126.	14.97	2.46	1.823E-02	511.86	20.000	4.791E+00	RH106
513.98	12.	165.71	1.21	1.817E-02	513.98	0.430	PBC<MDA	Kr85
531.00	11.	105.10	1.23	1.771E-02	531.00	13.000	PBC<MDA	Nd147
537.26	10.	106.19	1.23	1.755E-02	537.26	24.390	PBC<MDA	Ba140
582.78	3.	375.86	1.27	1.645E-02	583.02	84.500	PBC<MDA	TL208
600.50	13.	137.29	1.29	1.606E-02	600.50	17.860	PBC<MDA	SB125
602.73	13.	142.39	1.29	1.601E-02	602.73	98.260	PBC<MDA	SB124
604.71	13.	147.31	1.29	1.597E-02	604.71	97.620	PBC<MDA	CS134
609.31	-16.	135.65	1.30	1.587E-02	609.31	46.090	PBC<MDA	BI214
610.30	4.	581.74	1.30	1.585E-02	610.30	5.750	PBC<MDA	RU103
618.06	-3.	807.15	1.30	1.569E-02	618.06	99.100	PBC<MDA	PM144
635.89	8.	107.82	1.32	1.534E-02	635.89	11.310	PBC<MDA	SB125
696.54	17.	50.92	1.37	1.424E-02	696.54	99.000	PBC<MDA	PM144
702.63	5.	183.34	1.38	1.414E-02	702.63	97.900	PBC<MDA	NB94
722.79	9.	81.56	1.40	1.381E-02	722.79	10.810	PBC<MDA	SB124
					722.94	90.840	9.876E-02	AG108M
					723.36	20.220	4.439E-01	EU154
722.94	8.	99.66	1.40	1.381E-02	722.79	10.810	7.825E-01	SB124
					722.94	90.840	9.313E-02	AG108M
					723.36	20.220	4.186E-01	EU154
723.36	8.	110.92	1.40	1.380E-02	722.79	10.810	PBC<MDA	SB124
					722.94	90.840	9.316E-02	AG108M
					723.36	20.220	4.187E-01	EU154
724.20	6.	161.19	1.40	1.379E-02	724.20	44.150	PBC<MDA	ZR95
735.72	8.	97.25	1.41	1.361E-02	735.72	22.500	PBC<MDA	PM146
747.16	3.	351.72	1.42	1.344E-02	747.16	34.000	PBC<MDA	PM146
766.41	10.	125.33	1.43	1.315E-02	765.79	99.790	PBC<MDA	NB95
					766.41	0.294	PBC<MDA	PA234M
778.92	4.	241.24	1.44	1.298E-02	778.92	12.940	PBC<MDA	EU152
785.42	9.	90.82	1.45	1.289E-02	785.42	1.280	PBC<MDA	BI212
795.87	10.	86.39	1.46	1.275E-02	795.87	85.530	PBC<MDA	CS134
799.60	10.	96.93	1.46	1.270E-02	799.60	98.960	PBC<MDA	TL210

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
810.78	9.	91.59	1.47	1.255E-02	810.78	99.460	PBC<MDA	CO58
815.77	7.	105.84	1.48	1.249E-02	815.77	23.280	PBC<MDA	La140
846.77	1.	913.44	1.50	1.210E-02	846.77	99.935	PBC<MDA	Co56
860.56	5.	234.65	1.51	1.193E-02	860.56	12.420	PBC<MDA	TL208
880.53	17.	43.87	1.53	1.171E-02	880.53	6.000	PBC<MDA	PA234
883.24	8.	120.92	1.53	1.167E-02	883.24	9.600	PBC<MDA	PA234
884.68	8.	131.34	1.53	1.166E-02	884.68	72.680	PBC<MDA	AG110M
898.04	4.	225.99	1.54	1.151E-02	898.04	93.700	PBC<MDA	Y88
911.07	11.	90.08	1.55	1.137E-02	911.07	29.000	PBC<MDA	AC228
968.97	7.	175.51	1.60	1.079E-02	968.97	17.460	PBC<MDA	AC228
1004.77	10.	118.91	1.63	1.045E-02	1004.77	18.010	PBC<MDA	EU154
1037.84	7.	107.17	1.65	1.016E-02	1037.84	14.130	PBC<MDA	Co56
1048.07	9.	72.86	1.66	1.008E-02	1048.07	80.000	PBC<MDA	Cs136
1077.40	1.	857.32	1.69	9.838E-03	1077.40	3.300	PBC<MDA	Ga68
1099.25	17.	47.55	1.70	9.666E-03	1099.25	56.500	PBC<MDA	FE59
1112.07	10.	83.60	1.71	9.569E-03	1112.07	13.644	PBC<MDA	EU152
1121.30	6.	104.45	1.72	9.500E-03	1120.55	99.987	PBC<MDA	Sc46
					1121.30	34.900	2.504E-01	Ta182
1291.60	5.	152.17	1.84	8.380E-03	1291.60	43.200	PBC<MDA	FE59
1313.00	13.	27.74	1.86	8.258E-03	1313.00	21.000	1.041E+00	TL210
1384.30	5.	112.17	1.91	7.874E-03	1384.30	24.290	PBC<MDA	AG110M
1408.00	9.	86.01	1.92	7.754E-03	1408.00	21.005	PBC<MDA	EU152
1460.83	2.	469.57	1.96	7.499E-03	1460.83	10.670	PBC<MDA	K40
1764.49	9.	73.90	2.14	6.302E-03	1764.49	15.400	PBC<MDA	BI214

No unknown peaks passed sensitivity test.

This section based on library: Client_Long_Rev15.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 1 Sigma %	FWHM keV
PB-210	185.58	46.54	215.	-7.	-0.001	345.06	0.750s
TH-227	199.98	50.14	129.	16.	0.002	122.08	0.751s
AM-241	237.55	59.54	135.	18.	0.002	112.71	0.761s
TH-234	252.55	63.29	247.	-36.	-0.005	60.38	0.765s
Sn-126	256.52	64.28	237.	20.	0.003	108.60	0.766s
BA-133	323.33	80.99	136.	15.	0.002	135.80	0.784s
Np-237	345.33	86.49	625.	-21.	-0.003	173.60	0.789s
EU-155	345.54	86.54	604.	-21.	-0.003	170.72	0.790s
Sn-126	347.13	86.94	584.	-5.	-0.001	711.74	0.790s
Sn-126	349.65	87.57	558.	14.	0.002	102.28	0.791D
Cd-109	351.53	88.04	567.	0.	0.000	1000.00	0.791A
Nd-147	363.77	91.10	723.	-24.	-0.003	157.31	0.794s
TH-234	369.08	92.43	195.	31.	0.004	80.16	1.267s
AC-228	372.76	93.35	732.	-25.	-0.004	152.07	0.797s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Gd-153	389.36	97.50	289.	-14.	-0.002	169.89	0.801s
Np-239	397.36	99.50	266.	-9.	-0.001	258.28	0.803
Gd-153	412.15	103.20	283.	7.	0.001	359.17	0.807s
Np-239	414.15	103.70	290.	0.	0.000	1000.00	0.807s
EU-155	420.60	105.31	290.	0.	0.000	1000.00	0.809s
Np-239	423.87	106.13	272.	-13.	-0.002	186.16	0.810s
EU-152	486.45	121.78	275.	-22.	-0.003	108.53	0.826s
CO-57	487.58	122.06	165.	18.	0.002	103.99	0.826s
EU-154	491.73	123.10	190.	7.	0.001	290.47	0.828s
PA-234	524.50	131.29	313.	-15.	-0.002	165.25	0.836s
HF-181	531.42	133.02	329.	0.	0.000	1000.00	0.838s
CE-144	533.47	133.54	329.	0.	0.000	1000.00	0.838
HF-181	544.52	136.30	329.	0.	0.000	1000.00	0.841s
CO-57	545.21	136.47	329.	0.	0.000	1000.00	0.841s
Tc-99m	561.35	140.51	242.	21.	0.003	107.02	0.845s
U-235	574.45	143.79	250.	9.	0.001	249.80	0.849s
CE-141	581.07	145.44	271.	17.	0.002	135.20	0.850s
Ba-140	649.93	162.66	168.	27.	0.004	70.31	0.868s
U-235	652.81	163.38	199.	12.	0.002	165.28	0.869
CE-139	662.70	165.85	197.	16.	0.002	126.37	0.871s
Cf-251	705.68	176.60	147.	-10.	-0.001	225.25	0.882
U-235	740.94	185.42	129.	18.	0.003	114.67	0.796s
TH-229	773.30	193.51	127.	-7.	-0.001	287.86	0.899s
U-235	820.58	205.33	117.	9.	0.001	208.52	0.912s
TH-229	842.65	210.85	135.	-22.	-0.003	100.32	0.917s
Cf-251	907.23	227.00	97.	-10.	-0.001	183.83	0.933
TH-227	943.11	235.97	155.	13.	0.002	134.36	0.942s
PB-212	953.75	238.63	198.	19.	0.003	108.27	0.945s
PB-214	967.21	242.00	218.	13.	0.002	160.63	0.948s
EU-152	977.99	244.69	287.	5.	0.001	481.44	0.951s
Cd-113m	1054.01	263.70	96.	2.	0.000	642.57	0.970s
BI-210M	1062.53	265.83	128.	-2.	0.000	875.28	0.972s
TL-208	1108.33	277.28	95.	8.	0.001	175.89	0.983s
Hg-203	1115.99	279.20	83.	13.	0.002	100.94	0.985s
I-131	1136.39	284.30	88.	-6.	-0.001	295.33	0.990s
PB-214	1179.54	295.09	396.	-42.	-0.006	54.54	1.001s
TL-210	1183.18	296.00	388.	-17.	-0.002	161.83	1.002
PB-212	1199.30	300.03	407.	-10.	-0.001	226.34	1.006s
PA-231	1199.46	300.07	415.	0.	0.000	1000.00	1.006s
PA-233	1199.90	300.18	415.	0.	0.000	1000.00	1.006s
PA-231	1209.78	302.65	415.	0.	0.000	1000.00	1.008s
BA-133	1210.59	302.85	415.	0.	0.000	1000.00	1.009s
Ba-140	1218.57	304.85	415.	0.	0.000	1000.00	1.011s
BI-210M	1218.76	304.90	415.	0.	0.000	1000.00	1.011s
Ir-192	1232.94	308.44	316.	15.	0.002	165.64	1.014s
PA-233	1247.22	312.01	400.	-17.	-0.002	141.95	1.018s
CR-51	1279.51	320.08	59.	13.	0.002	113.97	1.026s
La-140	1314.21	328.76	92.	-15.	-0.002	124.89	1.034s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Cf-249	1332.92	333.44	70.	-10.	-0.001	164.71	1.039s
AC-228	1352.44	338.32	168.	16.	0.002	118.61	1.043s
Cs-136	1361.44	340.57	184.	9.	0.001	207.32	1.045s
EU-152	1376.30	344.29	140.	14.	0.002	121.51	1.049s
HF-181	1382.47	345.83	230.	-17.	-0.002	127.53	1.050s
PB-214	1406.88	351.93	131.	-19.	-0.003	83.51	1.056s
BA-133	1423.15	356.00	97.	13.	0.002	108.58	1.060
I-131	1457.08	364.48	48.	13.	0.002	100.67	1.069s
BA-133	1534.50	383.84	117.	-9.	-0.001	173.21	1.087s
Cf-249	1550.94	387.95	126.	0.	0.000	1000.00	1.091
SN-113	1565.90	391.69	102.	8.	0.001	187.91	1.095s
SB-125	1710.63	427.88	55.	-3.	0.000	466.07	1.129s
AG-108M	1734.87	433.94	15.	21.	0.003	40.86	1.135s
PM-146	1814.64	453.88	60.	-16.	-0.002	100.87	1.154
SB-125	1852.59	463.37	90.	8.	0.001	162.45	1.163s
Ir-192	1871.36	468.06	115.	-16.	-0.002	99.77	1.167s
BE-7	1909.50	477.60	72.	-3.	0.000	453.11	1.176
HF-181	1927.10	482.00	87.	-12.	-0.002	110.48	1.180s
La-140	1947.19	487.02	84.	-19.	-0.003	97.82	1.185s
RH-106	2046.57	511.86	100.	126.	0.017	14.97	2.458s
Kr-85	2055.03	513.98	188.	12.	0.002	165.71	1.210s
Nd-147	2123.11	531.00	32.	11.	0.002	105.10	1.225s
Ba-140	2148.15	537.26	25.	10.	0.001	106.19	1.231s
CS-134	2252.06	563.24	47.	-9.	-0.001	120.80	1.255s
CS-134	2276.40	569.32	48.	-7.	-0.001	144.98	1.260s
PA-234	2276.99	569.47	61.	-4.	-0.001	269.93	1.261s
BI-207	2277.92	569.70	72.	-4.	-0.001	270.50	1.261s
TL-208	2331.20	583.02	34.	3.	0.000	375.86	1.273s
SB-125	2401.12	600.50	164.	13.	0.002	137.29	1.289s
SB-124	2410.04	602.73	177.	13.	0.002	142.39	1.291
CS-134	2417.96	604.71	190.	13.	0.002	147.31	1.292s
BI-214	2436.36	609.31	233.	-16.	-0.002	135.65	1.296s
RU-103	2440.31	610.30	217.	4.	0.000	581.74	1.297s
AG-108M	2456.25	614.28	221.	0.	0.000	1000.00	1.301s
PM-144	2471.37	618.06	224.	-3.	0.000	807.15	1.304s
RH-106	2486.79	621.92	242.	-14.	-0.002	155.42	1.308s
SB-125	2542.69	635.89	30.	8.	0.001	107.82	1.320s
I-131	2547.03	636.97	53.	-9.	-0.001	123.20	1.321s
AG-110M	2630.18	657.76	58.	-7.	-0.001	311.19	1.339
PM-144	2785.32	696.54	14.	17.	0.002	50.92	1.374s
NB-94	2809.67	702.63	22.	5.	0.001	183.34	1.379s
SB-124	2890.31	722.79	22.	9.	0.001	81.56	1.396s
AG-108M	2890.91	722.94	31.	8.	0.001	99.66	1.397s
EU-154	2892.60	723.36	39.	8.	0.001	110.92	1.397s
ZR-95	2895.96	724.20	48.	6.	0.001	161.19	1.398
PM-146	2942.05	735.72	13.	8.	0.001	97.25	1.408s
PM-146	2987.81	747.16	26.	3.	0.000	351.72	1.417s
ZR-95	3026.09	756.73	30.	-6.	-0.001	181.90	1.426s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
AG-110M	3054.96	763.94	53.	-15.	-0.002	72.03	1.432s
NB-95	3062.34	765.79	92.	-19.	-0.003	76.47	1.433s
PA-234M	3064.83	766.41	72.	10.	0.001	125.33	1.434s
EU-152	3114.87	778.92	17.	4.	0.001	241.24	1.444s
BI-212	3140.88	785.42	13.	9.	0.001	90.82	1.450s
CS-134	3182.68	795.87	33.	10.	0.001	86.39	1.459s
TL-210	3197.61	799.60	43.	10.	0.001	96.93	1.462s
CS-134	3207.01	801.95	63.	-2.	0.000	622.69	1.464s
CO-58	3242.31	810.77	28.	9.	0.001	91.59	1.471s
La-140	3262.30	815.77	26.	7.	0.001	105.84	1.475s
Co-56	3386.32	846.77	33.	1.	0.000	913.44	1.501s
TL-208	3441.51	860.56	24.	5.	0.001	234.65	1.513
NB-94	3483.65	871.10	51.	-16.	-0.002	68.40	1.522s
EU-154	3492.19	873.23	82.	-15.	-0.002	88.41	1.523s
PA-234	3521.39	880.53	20.	17.	0.002	43.87	1.529
PA-234	3532.24	883.24	38.	8.	0.001	120.92	1.531s
AG-110M	3538.01	884.68	45.	8.	0.001	131.34	1.533s
Sc-46	3556.40	889.28	64.	-3.	0.000	389.66	1.536s
Y-88	3591.45	898.04	16.	4.	0.001	225.99	1.543s
AC-228	3643.58	911.07	19.	11.	0.002	90.08	1.554
AG-110M	3749.30	937.49	34.	-7.	-0.001	125.86	1.576s
EU-152	3855.80	964.11	63.	-14.	-0.002	86.27	1.597s
AC-228	3875.25	968.97	68.	7.	0.001	175.51	1.601s
EU-154	3984.71	996.33	87.	-16.	-0.002	86.21	1.622s
PA-234M	4003.39	1001.00	106.	-19.	-0.003	49.50	1.626s
EU-154	4018.51	1004.77	63.	10.	0.001	118.91	1.629s
Co-56	4150.81	1037.84	11.	7.	0.001	107.17	1.655s
Cs-136	4191.74	1048.07	17.	9.	0.001	72.86	1.663s
BI-207	4254.12	1063.66	40.	-16.	-0.002	87.93	1.675s
Ga-68	4309.10	1077.40	15.	1.	0.000	857.32	1.685s
FE-59	4396.54	1099.25	10.	17.	0.002	47.55	1.702s
EU-152	4447.85	1112.07	32.	10.	0.001	83.60	1.712s
Sc-46	4481.77	1120.55	52.	-9.	-0.001	115.59	1.718s
Ta-182	4484.77	1121.30	16.	6.	0.001	104.45	1.719s
CO-60	4692.60	1173.24	25.	-10.	-0.001	114.38	1.757s
Ta-182	4755.88	1189.05	20.	-9.	-0.001	114.22	1.769s
Ta-182	4885.38	1221.41	16.	-3.	0.000	308.52	1.792s
Co-56	4952.89	1238.28	23.	-5.	-0.001	212.33	1.805s
NA-22	5097.96	1274.53	27.	-14.	-0.002	57.73	1.831s
FE-59	5166.25	1291.60	11.	5.	0.001	152.17	1.843s
TL-210	5251.92	1313.00	0.	13.	0.002	27.74	1.858s
CO-60	5329.96	1332.50	12.	-2.	0.000	502.47	1.871s
AG-110M	5537.26	1384.30	7.	5.	0.001	112.17	1.907s
EU-152	5632.13	1408.00	11.	9.	0.001	86.01	1.923s
K-40	5843.58	1460.83	21.	2.	0.000	469.57	1.958s
La-140	6385.44	1596.21	17.	-9.	-0.001	112.49	2.044s
SB-124	6764.81	1690.98	11.	-6.	-0.001	130.84	2.102s
BI-214	7059.07	1764.49	14.	9.	0.001	73.90	2.145s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Co-56	7086.53	1771.35	23.	0.	0.000	1000.00	2.149s
Y-88	7345.59	1836.06	13.	-2.	0.000	294.88	2.185s

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	-1.8293E-01				5.31E+01	
			477.60	-1.829E-01	?(	2.892E+00 4.53E+02 1.05E+01	G
NA-22	C	-2.3332E-01				9.50E+02	
			1274.53	-2.333E-01	?(	4.387E-01 5.77E+01 9.99E+01	G
K-40	N	3.1244E-01				4.66E+11	
			1460.83	3.124E-01	?(P	4.195E+00 4.70E+02 1.07E+01	G
Sc-46	F	-3.5127E-02				8.38E+01	
			889.28	-3.513E-02	?(	4.784E-01 3.90E+02 1.00E+02	G
			1120.55	-1.374E-01	+ P	5.326E-01 1.16E+02 1.00E+02	G
CR-51	F	6.9837E-01				2.77E+01	
			320.08	6.984E-01	(	2.068E+00 1.14E+02 9.94E+00	G
MN-54	C	-2.2073E-03				3.12E+02	
			834.85	-2.207E-03	%(P	2.961E-01 5.39E+03 1.00E+02	G
FE-59	F	4.3232E-01				4.45E+01	
			1099.25	4.323E-01	&(	4.437E-01 4.75E+01 5.65E+01	G
			1291.60	1.978E-01	- P	6.927E-01 1.52E+02 4.32E+01	G
Co-56	C	9.8602E-02				7.73E+01	
			846.77	1.532E-02	?(	3.371E-01 9.13E+02 9.99E+01	G
			1238.28	-1.270E-01	+ P	6.084E-01 2.12E+02 6.61E+01	G
			1037.84	6.877E-01	&(P	1.749E+00 1.07E+02 1.41E+01	G
			1771.35	0.000E+00	-	3.581E+00 1.00E+03 1.55E+01	A
CO-57	C	6.1742E-02				2.72E+02	
			122.06	6.174E-02	*(	2.154E-01 1.04E+02 8.56E+01	G
			136.47	0.000E+00	-	2.504E+00 1.00E+03 1.07E+01	G
CO-58	C	9.8598E-02				7.09E+01	
			810.78	9.860E-02	?(	3.070E-01 9.16E+01 9.95E+01	G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CO-60	F	-2.7543E-02					1.93E+03	
			1332.50	-2.754E-02	?(P	3.169E-01	5.02E+02	1.00E+02 G
			1173.24	-1.523E-01	+	3.962E-01	1.14E+02	9.99E+01 G
ZN-65	F	1.9818E-02					2.44E+02	
			1115.55	1.982E-02	%(	9.499E-01	1.34E+03	5.06E+01 G
NB-94	I	5.3528E-02					7.41E+06	
			702.63	5.353E-02	?(	2.449E-01	1.83E+02	9.79E+01 G
			871.10	-1.868E-01	+	4.236E-01	6.84E+01	9.99E+01 G
ZR-95	I	-3.1714E-03					6.40E+01	
			756.73	-1.215E-01	?(	5.443E-01	1.82E+02	5.45E+01 G
			724.20	1.428E-01	?(	7.965E-01	1.61E+02	4.42E+01 G
NB-95	I	-1.9715E-01					6.40E+01	
			765.79	-1.972E-01	&(	5.021E-01	7.65E+01	9.98E+01 G
RU-103	I	2.7807E-03					3.93E+01	
			497.05	2.781E-03	%(P	3.095E-01	4.35E+03	9.09E+01 G
			610.30	5.484E-01	?	1.088E+01	5.82E+02	5.75E+00 GA
RH-106	I	-1.2880E+00					3.74E+02	
			621.92	-1.288E+00	&(	6.743E+00	1.55E+02	9.93E+00 G
			1050.36	-4.426E-01	%	2.442E+01	1.52E+03	1.56E+00 G
			511.86	4.791E+00	? P	1.880E+00	1.50E+01	2.00E+01 GA
AG-108M	C	1.2483E-01					1.53E+05	
			433.94	1.567E-01	(P	1.531E-01	4.09E+01	9.05E+01 G
			722.94	9.313E-02	?(	3.169E-01	9.97E+01	9.08E+01 G
			614.28	0.000E+00	-	7.056E-01	1.00E+03	8.98E+01 G
AG-110M	F	1.9038E-01					2.50E+02	
			884.68	1.235E-01	?(	5.581E-01	1.31E+02	7.27E+01 G
			657.76	-6.997E-02	& P	3.761E-01	3.11E+02	9.46E+01 G
			937.49	-2.552E-01	& P	1.089E+00	1.26E+02	3.44E+01 G
			1384.30	3.904E-01	?(P	1.066E+00	1.12E+02	2.43E+01 G
			763.94	-7.247E-01	+	1.736E+00	7.20E+01	2.23E+01 G
SN-113	F	7.5312E-02					1.15E+02	
			391.69	7.531E-02	(P	4.814E-01	1.88E+02	6.40E+01 G
SB-124	F	1.8929E-01					6.02E+01	
			602.73	1.188E-01	(	5.711E-01	1.42E+02	9.83E+01 G
			1690.98	-2.807E-01	+	8.155E-01	1.31E+02	4.78E+01 G
			722.79	8.298E-01	?(	2.286E+00	8.16E+01	1.08E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	I	3.2562E-01					1.01E+03	
			427.88	-6.720E-02	(	8.349E-01	4.66E+02	2.96E+01 G
			600.50	6.507E-01	?(	3.016E+00	1.37E+02	1.79E+01 G
			635.89	6.139E-01	?(	2.272E+00	1.08E+02	1.13E+01 G
			463.37	5.702E-01	?(P	3.151E+00	1.62E+02	1.05E+01 G
I-131	I	9.6244E-02					8.02E+00	
			364.48	9.624E-02	?(	2.518E-01	1.01E+02	8.17E+01 G
			284.30	-4.808E-01	+	3.720E+00	2.95E+02	6.14E+00 G
			636.97	-1.100E+00	+	4.637E+00	1.23E+02	7.17E+00 G
Gd-153	F	-4.1675E-02					2.42E+02	
			97.50	-1.351E-01	?(	7.729E-01	1.70E+02	3.00E+01 G
			103.20	8.696E-02	?(	1.058E+00	3.59E+02	2.18E+01 G
Ga-68	C	7.4938E-01					4.71E-02	
			1077.40	7.494E-01	&(	1.556E+01	8.57E+02	3.30E+00 G
Tc-99m	I	8.1865E-02					2.51E-01	
			140.51	8.187E-02	&(	2.932E-01	1.07E+02	8.93E+01 G
BA-133	F	1.2367E-01					3.85E+03	
			356.00	1.237E-01	?(	4.533E-01	1.09E+02	6.20E+01 G
			302.85	0.000E+00	-	2.731E+00	1.00E+03	1.83E+01 G
			383.84	-6.149E-01	&	3.629E+00	1.73E+02	8.94E+00 GA
			80.99	1.236E-01	* P	4.774E-01	1.36E+02	3.41E+01 GA
CS-134	I	1.2436E-01					7.54E+02	
			795.87	1.292E-01	?(	3.773E-01	8.64E+01	8.55E+01 G
			604.71	1.201E-01	?(	5.970E-01	1.47E+02	9.76E+01 G
			569.32	-3.771E-01	+	1.885E+00	1.45E+02	1.54E+01 G
			801.95	-2.288E-01	+	5.002E+00	6.23E+02	8.69E+00 G
			563.24	-8.748E-01	+ P	3.406E+00	1.21E+02	8.35E+00 G
CS-137	I	3.6592E-03					1.10E+04	
			661.66	3.659E-03	&(	4.336E-01	3.35E+03	8.52E+01 G
CE-139	F	6.8067E-02					1.38E+02	
			165.85	6.807E-02	&(	2.893E-01	1.26E+02	7.99E+01 G
Ba-140	I	5.4616E-01					1.28E+01	
			537.26	3.127E-01	?(P	8.416E-01	1.06E+02	2.44E+01 G
			162.66	1.462E+00	(	3.404E+00	7.03E+01	6.22E+00 G
			304.85	0.000E+00	&	1.173E+01	1.00E+03	4.29E+00 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
La-140	I	-8.4306E-02					1.28E+01	
			1596.21	-1.895E-01	?(	4.616E-01	1.12E+02	9.54E+01 G
			487.02	-3.039E-01	+	7.314E-01	9.78E+01	4.55E+01 G
			328.76	-3.934E-01	+	1.269E+00	1.25E+02	2.03E+01 G
			815.77	3.467E-01	?(	1.262E+00	1.06E+02	2.33E+01 G
CE-141	I	1.1450E-01					3.25E+01	
			145.44	1.145E-01	(	5.198E-01	1.35E+02	4.82E+01 G
PM-144	C	1.6828E-01					3.63E+02	
			696.54	1.683E-01	*(P	1.981E-01	5.09E+01	9.90E+01 G
			618.06	-2.437E-02	- P	6.467E-01	8.07E+02	9.91E+01 G
EU-152	F	2.5252E-01					4.94E+03	
			121.78	-2.272E-01	*(	8.244E-01	1.09E+02	2.86E+01 G
			344.29	3.002E-01	&(	1.230E+00	1.22E+02	2.65E+01 G
			1112.07	1.097E+00	?(	3.093E+00	8.36E+01	1.36E+01 G
			778.92	3.016E-01	?(P	1.830E+00	2.41E+02	1.29E+01 G
			964.11	-1.200E+00	+	3.477E+00	8.63E+01	1.46E+01 G
			244.69	2.907E-01	&(	4.750E+00	4.81E+02	7.58E+00 G
			1408.00	7.959E-01	?	1.529E+00	8.60E+01	2.10E+01 GA
EU-154	I	2.9748E-01					3.14E+03	
			123.10	4.908E-02	&(	4.853E-01	2.90E+02	4.08E+01 G
			1274.54	-1.994E-02	%	1.513E+00	2.12E+03	3.52E+01 G
			723.36	4.187E-01	&(	1.589E+00	1.11E+02	2.02E+01 G
			873.23	-1.453E+00	+	4.309E+00	8.84E+01	1.23E+01 G
			1004.77	7.240E-01	(	2.932E+00	1.19E+02	1.80E+01 G
			996.33	-1.986E+00	+	5.736E+00	8.62E+01	1.06E+01 G
HF-181	F	-1.1135E-01					4.24E+01	
			482.00	-1.114E-01	?(	4.162E-01	1.10E+02	8.05E+01 G
			133.02	0.000E+00	&	6.112E-01	1.00E+03	4.33E+01 G
			345.83	-6.423E-01	+	2.752E+00	1.28E+02	1.51E+01 G
			136.30	0.000E+00	+	4.568E+00	1.00E+03	5.85E+00 G
Ta-182	F	2.5041E-01					1.14E+02	
			1121.30	2.504E-01	?(	9.065E-01	1.04E+02	3.49E+01 G
			1221.41	-1.752E-01	-	1.247E+00	3.09E+02	2.70E+01 G
			1189.05	-8.554E-01	+	2.238E+00	1.14E+02	1.62E+01 G
Hg-203	F	7.8794E-02					4.66E+01	
			279.20	7.879E-02	?(	2.683E-01	1.01E+02	8.15E+01 G
TL-208	N	1.1138E-01					6.98E+02	
			583.02	2.798E-02	?(P	2.995E-01	3.76E+02	8.45E+01 G
			277.28	6.105E-01	?(	3.673E+00	1.76E+02	6.31E+00 G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          860.56 4.252E-01  (P 2.413E+00 2.35E+02 1.24E+01 G

PM-146   C  -2.6800E-02                                     2.02E+03
                          453.88-1.658E-01 ?(  4.142E-01 1.01E+02 6.50E+01 G
                          747.16 9.121E-02 +   8.048E-01 3.52E+02 3.40E+01 G
                          735.72 3.748E-01 &(P 8.913E-01 9.73E+01 2.25E+01 G

Y-88     F  -3.8218E-03                                     1.07E+02
                         1836.06-5.340E-02 ?(P 4.546E-01 2.95E+02 9.92E+01 G
                          898.04 4.866E-02 ?(P 2.766E-01 2.26E+02 9.37E+01 G

Cd-113m      1.6781E+02                                     5.33E+03
                          263.70 1.678E+02 *(  3.743E+03 6.43E+02 6.00E-03   K

Cf-251   T  -2.0104E-01                                     3.28E+05
                          176.60-2.010E-01  (  1.230E+00 2.25E+02 1.70E+01 G
                          227.00-6.423E-01 +   3.225E+00 1.84E+02 6.30E+00 GA

Sn-126       6.3730E-01                                     3.65E+07
                           87.57 1.073E-01 }   8.506E-01 1.02E+02 3.75E+01 GA
                           64.28 6.373E-01 ?(  2.317E+00 1.09E+02 9.70E+00 G
                           86.94-1.505E-01 -   3.607E+00 7.12E+02 9.04E+00 GA

PB-210   N  -5.9016E-01                                     8.14E+03
                           46.54-5.902E-01 @(P 6.032E+00 3.45E+02 4.25E+00 G

PB-212   N   1.9229E-01                                     6.98E+02
                          238.63 1.923E-01 ?(P 6.841E-01 1.08E+02 4.33E+01 G
                          300.03-1.601E+00 + P 1.502E+01 2.26E+02 3.28E+00 GA

PB-214   N  -2.9272E-01                                     5.84E+05
                          351.93-2.927E-01 @(P 8.524E-01 8.35E+01 3.76E+01 G
                          295.09-1.106E+00 & P 2.489E+00 5.45E+01 1.93E+01 G
                          242.00 7.764E-01 ?   4.208E+00 1.61E+02 7.43E+00 GA

BI-207   C  -3.0871E-01                                     1.18E+04
                         1063.66-3.087E-01 ?(  6.031E-01 8.79E+01 7.45E+01 G
                          569.70-3.817E-02 +   3.580E-01 2.70E+02 9.77E+01 G

BI-212   N   2.5535E-07                                     6.98E+02
                          727.17 2.554E-07 %(  4.947E+00 5.45E+08 7.55E+00 G
                          785.42 7.352E+00 ?   1.643E+01 9.08E+01 1.28E+00 GA

U-235    N   5.0611E-01                                     2.57E+11
                          143.79 2.606E-01 ?(P 2.190E+00 2.50E+02 1.10E+01 G
                          205.33 7.283E-01 ?(  4.139E+00 2.09E+02 5.01E+00 G
                          163.38 8.167E-01  (P 4.529E+00 1.65E+02 5.08E+00 G
                          185.72 1.244E-01   P 3.761E-01 1.15E+02 5.40E+01 GA
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Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
BI-214	N	8.6853E-02					5.84E+05	
			609.31	-3.049E-01	*(P	1.403E+00	1.36E+02	4.61E+01 G
			1120.29	8.814E-02	% P	3.187E+00	1.04E+03	1.51E+01 G
			1764.49	1.259E+00	?(P	2.901E+00	7.39E+01	1.54E+01 G
BI-210M	T	-1.7136E-02					1.10E+09	
			265.83	-1.714E-02	?(	5.178E-01	8.75E+02	5.00E+01 G
			304.90	0.000E+00	&	1.797E+00	1.00E+03	2.80E+01 G
AC-228	N	5.2665E-01					2.10E+03	
			911.07	4.553E-01	(	9.622E-01	9.01E+01	2.90E+01 G
			968.97	5.040E-01	?(	3.044E+00	1.76E+02	1.75E+01 G
			338.32	7.318E-01	*(	2.921E+00	1.19E+02	1.20E+01 G
			93.35	-1.289E+00	+	6.540E+00	1.52E+02	5.56E+00 XA
TH-227	N	3.8937E-01					7.95E+03	
			256.24	-8.674E-02	&(	3.105E+00	1.29E+03	7.00E+00 G
			235.97	4.674E-01	&(	2.121E+00	1.34E+02	1.23E+01 G
			50.14	6.860E-01	?(	2.386E+00	1.22E+02	8.00E+00 G
TH-229	N	-6.3785E-01					2.68E+06	
			193.51	-6.378E-01	?(P	4.723E+00	2.88E+02	4.40E+00 G
			210.85	-2.893E+00	+ P	7.566E+00	1.00E+02	2.99E+00 G
TH-234	N	1.5726E+00					1.63E+12	
			92.59	1.573E+00	*(P	3.427E+00	8.02E+01	5.58E+00 G
			63.29	-2.909E+00	+ P	6.061E+00	6.04E+01	3.81E+00 G
PA-233	C	-2.4109E-01					7.82E+08	
			312.01	-2.411E-01	?(P	1.397E+00	1.42E+02	3.60E+01 G
			300.18	0.000E+00	+	8.024E+00	1.00E+03	6.20E+00 G
PA-234	N	1.5686E-01					1.63E+12	
			131.29	-2.572E-01	?(	1.429E+00	1.65E+02	1.80E+01 G
			946.02	6.276E-02	%	2.374E+00	1.54E+03	1.34E+01 G
			569.47	-4.211E-01	+	3.958E+00	2.70E+02	8.20E+00 G
			883.24	9.333E-01	&(	3.882E+00	1.21E+02	9.60E+00 G
			880.53	3.434E+00	?	4.692E+00	4.39E+01	6.00E+00 GA
PA-234M	N	-2.9833E+01					1.63E+12	
			1001.00	-2.983E+01	?(P	8.012E+01	4.95E+01	8.37E-01 G
			766.41	3.582E+01	& P	1.519E+02	1.25E+02	2.94E-01 G
AM-241	T	1.5429E-01					1.58E+05	
			59.54	1.543E-01	?(	4.942E-01	1.13E+02	3.59E+01 G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

Np-237   F  -4.4338E-01                                     2.14E+06
                          86.49-4.434E-01 &(  2.574E+00 1.74E+02 1.31E+01 G

Ir-192   F   6.8720E-02                                     7.40E+01
                         316.49 2.028E-03 %(  3.093E-01 4.39E+03 8.70E+01 G
                         468.06-2.157E-01 &   7.233E-01 9.98E+01 5.18E+01 G
                         308.44 2.515E-01 ?(  1.401E+00 1.66E+02 3.18E+01 G

Cs-136   F   7.9609E-02                                     1.30E+01
                         818.50 4.275E-03 %(  3.813E-01 2.50E+03 1.00E+02 G
                        1048.07 1.551E-01 ?(  3.777E-01 7.29E+01 8.00E+01 G
                         340.57 1.115E-01 ?(  7.847E-01 2.07E+02 4.69E+01 G

Np-239   T  -1.6127E-01                                     2.36E+00
                         103.70 0.000E+00 +   9.851E-01 1.00E+03 2.40E+01 X
                         106.13-1.613E-01  (  1.012E+00 1.86E+02 2.27E+01 G
                          99.50-1.721E-01 &   1.504E+00 2.58E+02 1.50E+01 X

Nd-147       6.6347E-01                                     1.11E+01
                         531.00 6.635E-01 &(  1.753E+00 1.05E+02 1.30E+01 G
                          91.10-2.433E-01 &   1.278E+00 1.57E+02 2.83E+01 G

TL-210   N   1.1239E-01                                     5.84E+05
                         799.60 1.124E-01 ?(  3.696E-01 9.69E+01 9.90E+01 G
                         296.00-1.112E-01 &   6.038E-01 1.62E+02 7.90E+01 G
                        1313.00 1.041E+00 &   5.903E-01 2.77E+01 2.10E+01 GA

Kr-85    I   2.1141E+01                                     3.92E+03
                         513.98 2.114E+01 ?(  1.185E+02 1.66E+02 4.30E-01 G
   ( - 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 1 Sigma %	Activity	
PB-210	46.54	215.	-7.	-0.001	345.06	-5.902E-01	P
TH-227	50.14	129.	16.	0.002	122.08	6.860E-01	
AM-241	59.54	135.	18.	0.002	112.71	1.543E-01	
BA-133	80.99	136.	15.	0.002	135.80	1.236E-01	P
Np-237	86.49	625.	-21.	-0.003	173.60	-4.434E-01	
EU-155	86.54	604.	-21.	-0.003	170.72	-1.893E-01	
Nd-147	91.10	723.	-24.	-0.003	157.31	-2.433E-01	
AC-228	93.35	732.	-25.	-0.004	152.07	-1.289E+00	
Gd-153	97.50	289.	-14.	-0.002	169.89	-1.351E-01	
Np-239	99.50	266.	-9.	-0.001	258.28	-1.721E-01	
Gd-153	103.20	283.	7.	0.001	359.17	8.696E-02	
Np-239	106.13	272.	-13.	-0.002	186.16	-1.613E-01	
EU-152	121.78	275.	-22.	-0.003	108.53	-2.272E-01	
CO-57	122.06	165.	18.	0.002	103.99	6.174E-02	
EU-154	123.10	190.	7.	0.001	290.47	4.908E-02	
PA-234	131.29	313.	-15.	-0.002	165.25	-2.572E-01	
Tc-99m	140.51	242.	21.	0.003	107.02	8.187E-02	
CE-141	145.44	271.	17.	0.002	135.20	1.145E-01	
Ba-140	162.66	168.	27.	0.004	70.31	1.462E+00	
CE-139	165.85	197.	16.	0.002	126.37	6.807E-02	
Cf-251	176.60	147.	-10.	-0.001	225.25	-2.010E-01	
TH-229	193.51	127.	-7.	-0.001	287.86	-6.378E-01	P
TH-229	210.85	135.	-22.	-0.003	100.32	-2.893E+00	P
Cf-251	227.00	97.	-10.	-0.001	183.83	-6.423E-01	
TH-227	235.97	155.	13.	0.002	134.36	4.674E-01	
PB-212	238.63	198.	19.	0.003	108.27	1.923E-01	P
PB-214	242.00	218.	13.	0.002	160.63	7.764E-01	
EU-152	244.69	287.	5.	0.001	481.44	2.907E-01	
Cd-113m	263.70	96.	2.	0.000	642.57	1.678E+02	
BI-210M	265.83	128.	-2.	0.000	875.28	-1.714E-02	
Hg-203	279.20	83.	13.	0.002	100.94	7.879E-02	
I-131	284.30	88.	-6.	-0.001	295.33	-4.808E-01	
PB-214	295.09	396.	-42.	-0.006	54.54	-1.106E+00	P

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
TL-210	296.00	388.	-17.	-0.002	161.83	-1.112E-01	
PB-212	300.03	407.	-10.	-0.001	226.34	-1.601E+00	P
Ir-192	308.44	316.	15.	0.002	165.64	2.515E-01	
PA-233	312.01	400.	-17.	-0.002	141.95	-2.411E-01	P
CR-51	320.08	59.	13.	0.002	113.97	6.984E-01	
La-140	328.76	92.	-15.	-0.002	124.89	-3.934E-01	
Cf-249	333.44	70.	-10.	-0.001	164.71	-3.429E-01	
AC-228	338.32	168.	16.	0.002	118.61	7.318E-01	
Cs-136	340.57	184.	9.	0.001	207.32	1.115E-01	
EU-152	344.29	140.	14.	0.002	121.51	3.002E-01	
HF-181	345.83	230.	-17.	-0.002	127.53	-6.423E-01	
PB-214	351.93	131.	-19.	-0.003	83.51	-2.927E-01	P
BA-133	356.00	97.	13.	0.002	108.58	1.237E-01	
I-131	364.48	48.	13.	0.002	100.67	9.624E-02	
BA-133	383.84	117.	-9.	-0.001	173.21	-6.149E-01	
SN-113	391.69	102.	8.	0.001	187.91	7.531E-02	P
SB-125	427.88	55.	-3.	0.000	466.07	-6.720E-02	
AG-108M	433.94	15.	21.	0.003	40.86	1.567E-01	P
PM-146	453.88	60.	-16.	-0.002	100.87	-1.658E-01	
SB-125	463.37	90.	8.	0.001	162.45	5.702E-01	P
Ir-192	468.06	115.	-16.	-0.002	99.77	-2.157E-01	
BE-7	477.60	72.	-3.	0.000	453.11	-1.829E-01	
HF-181	482.00	87.	-12.	-0.002	110.48	-1.114E-01	
La-140	487.02	84.	-19.	-0.003	97.82	-3.039E-01	
RH-106	511.86	100.	126.	0.017	14.97	4.791E+00	P
Kr-85	513.98	188.	12.	0.002	165.71	2.114E+01	
Nd-147	531.00	32.	11.	0.002	105.10	6.635E-01	
Ba-140	537.26	25.	10.	0.001	106.19	3.127E-01	P
CS-134	563.24	47.	-9.	-0.001	120.80	-8.748E-01	P
CS-134	569.32	48.	-7.	-0.001	144.98	-3.771E-01	
PA-234	569.47	61.	-4.	-0.001	269.93	-4.211E-01	
BI-207	569.70	72.	-4.	-0.001	270.50	-3.817E-02	
SB-125	600.50	164.	13.	0.002	137.29	6.507E-01	
SB-124	602.73	177.	13.	0.002	142.39	1.188E-01	
CS-134	604.71	190.	13.	0.002	147.31	1.201E-01	
BI-214	609.31	233.	-16.	-0.002	135.65	-3.049E-01	P
RU-103	610.30	217.	4.	0.000	581.74	5.484E-01	
PM-144	618.06	224.	-3.	0.000	807.15	-2.437E-02	P
RH-106	621.92	242.	-14.	-0.002	155.42	-1.288E+00	
SB-125	635.89	30.	8.	0.001	107.82	6.139E-01	
I-131	636.97	53.	-9.	-0.001	123.20	-1.100E+00	
AG-110M	657.76	58.	-7.	-0.001	311.19	-6.997E-02	P
PM-144	696.54	14.	17.	0.002	50.92	1.683E-01	P
NB-94	702.63	22.	5.	0.001	183.34	5.353E-02	
SB-124	722.79	22.	9.	0.001	81.56	8.298E-01	
AG-108M	722.94	31.	8.	0.001	99.66	9.313E-02	
EU-154	723.36	39.	8.	0.001	110.92	4.187E-01	
ZR-95	724.20	48.	6.	0.001	161.19	1.428E-01	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
PM-146	735.72	13.	8.	0.001	97.25	3.748E-01	P
PM-146	747.16	26.	3.	0.000	351.72	9.121E-02	
ZR-95	756.73	30.	-6.	-0.001	181.90	-1.215E-01	
AG-110M	763.94	53.	-15.	-0.002	72.03	-7.247E-01	
NB-95	765.79	92.	-19.	-0.003	76.47	-1.972E-01	
PA-234M	766.41	72.	10.	0.001	125.33	3.582E+01	P
EU-152	778.92	17.	4.	0.001	241.24	3.016E-01	P
BI-212	785.42	13.	9.	0.001	90.82	7.352E+00	
CS-134	795.87	33.	10.	0.001	86.39	1.292E-01	
TL-210	799.60	43.	10.	0.001	96.93	1.124E-01	
CS-134	801.95	63.	-2.	0.000	622.69	-2.288E-01	
CO-58	810.77	28.	9.	0.001	91.59	9.860E-02	
La-140	815.77	26.	7.	0.001	105.84	3.467E-01	
Co-56	846.77	33.	1.	0.000	913.44	1.532E-02	
NB-94	871.10	51.	-16.	-0.002	68.40	-1.868E-01	
EU-154	873.23	82.	-15.	-0.002	88.41	-1.453E+00	
PA-234	880.53	20.	17.	0.002	43.87	3.434E+00	
PA-234	883.24	38.	8.	0.001	120.92	9.333E-01	
AG-110M	884.68	45.	8.	0.001	131.34	1.235E-01	
Sc-46	889.28	64.	-3.	0.000	389.66	-3.513E-02	
Y-88	898.04	16.	4.	0.001	225.99	4.866E-02	P
AC-228	911.07	19.	11.	0.002	90.08	4.553E-01	
AG-110M	937.49	34.	-7.	-0.001	125.86	-2.552E-01	P
EU-152	964.11	63.	-14.	-0.002	86.27	-1.200E+00	
AC-228	968.97	68.	7.	0.001	175.51	5.040E-01	
EU-154	996.33	87.	-16.	-0.002	86.21	-1.986E+00	
PA-234M	1001.00	106.	-19.	-0.003	49.50	-2.983E+01	P
EU-154	1004.77	63.	10.	0.001	118.91	7.240E-01	
Co-56	1037.84	11.	7.	0.001	107.17	6.877E-01	P
Cs-136	1048.07	17.	9.	0.001	72.86	1.551E-01	
BI-207	1063.66	40.	-16.	-0.002	87.93	-3.087E-01	
Ga-68	1077.40	15.	1.	0.000	857.32	7.494E-01	
FE-59	1099.25	10.	17.	0.002	47.55	4.323E-01	
EU-152	1112.07	32.	10.	0.001	83.60	1.097E+00	
Sc-46	1120.55	52.	-9.	-0.001	115.59	-1.374E-01	P
Ta-182	1121.30	16.	6.	0.001	104.45	2.504E-01	
CO-60	1173.24	25.	-10.	-0.001	114.38	-1.523E-01	
Ta-182	1189.05	20.	-9.	-0.001	114.22	-8.554E-01	
Ta-182	1221.41	16.	-3.	0.000	308.52	-1.752E-01	
Co-56	1238.28	23.	-5.	-0.001	212.33	-1.270E-01	P
NA-22	1274.53	27.	-14.	-0.002	57.73	-2.333E-01	
FE-59	1291.60	11.	5.	0.001	152.17	1.978E-01	P
TL-210	1313.00	0.	13.	0.002	27.74	1.041E+00	
CO-60	1332.50	12.	-2.	0.000	502.47	-2.754E-02	P
AG-110M	1384.30	7.	5.	0.001	112.17	3.904E-01	P
EU-152	1408.00	11.	9.	0.001	86.01	7.959E-01	
K-40	1460.83	21.	2.	0.000	469.57	3.124E-01	P
La-140	1596.21	17.	-9.	-0.001	112.49	-1.895E-01	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
SB-124	1690.98	11.	-6.	-0.001	130.84	-2.807E-01		
BI-214	1764.49	14.	9.	0.001	73.90	1.259E+00		P
Y-88	1836.06	13.	-2.	0.000	294.88	-5.340E-02		P

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	Time Corrected Activity Bq/Sample	Uncertainty Counting 1 Sigma	MDA Bq/Sample
BE-7	#A	-1.8293E-01	-1.8293E-01	4.531E+02%	2.89E+00
NA-22	#A	-2.3332E-01	-2.3332E-01	5.773E+01%	4.39E-01
K-40	#A	3.1244E-01	3.1244E-01	4.696E+02%	4.19E+00
Sc-46	#A	-3.5127E-02	-3.5127E-02	3.897E+02%	4.78E-01
CR-51	#A	6.9836E-01	6.9837E-01	1.140E+02%	2.07E+00
MN-54	#A	-2.2073E-03	-2.2073E-03	5.394E+03%	2.96E-01
FE-59	#A	4.3232E-01	4.3232E-01	4.755E+01%	4.44E-01
Co-56	#A	9.8602E-02	9.8602E-02	1.072E+02%	3.37E-01
CO-57	#A	6.1742E-02	6.1742E-02	1.040E+02%	2.15E-01
CO-58	#A	9.8597E-02	9.8598E-02	9.159E+01%	3.07E-01
CO-60	#A	-2.7543E-02	-2.7543E-02	5.025E+02%	3.17E-01
ZN-65	#A	1.9818E-02	1.9818E-02	1.341E+03%	9.50E-01
NB-94	#A	5.3528E-02	5.3528E-02	1.833E+02%	2.45E-01
ZR-95	#A	-3.1714E-03	-3.1714E-03	1.215E+02%	5.44E-01
NB-95	#A	-1.9715E-01	-1.9715E-01	7.647E+01%	5.02E-01
RU-103	#A	2.7806E-03	2.7807E-03	4.346E+03%	3.09E-01
RH-106	#A	-1.2880E+00	-1.2880E+00	1.554E+02%	6.74E+00
AG-108M	#A	1.2483E-01	1.2483E-01	4.086E+01%	1.53E-01
AG-110M	#A	1.9038E-01	1.9038E-01	8.636E+01%	5.58E-01
SN-113	#A	7.5311E-02	7.5312E-02	1.879E+02%	4.81E-01
SB-124	#A	1.8928E-01	1.8929E-01	8.156E+01%	5.71E-01
SB-125	#A	3.2562E-01	3.2562E-01	1.078E+02%	8.35E-01
I-131	#A	9.6239E-02	9.6244E-02	1.007E+02%	2.52E-01
Gd-153	#A	-4.1675E-02	-4.1675E-02	1.699E+02%	7.73E-01
Ga-68	#A	7.4276E-01	7.4938E-01	8.573E+02%	1.56E+01
Tc-99m	#A	8.1729E-02	8.1865E-02	1.070E+02%	2.93E-01
BA-133	#A	1.2367E-01	1.2367E-01	1.086E+02%	4.53E-01
CS-134	#A	1.2436E-01	1.2436E-01	8.539E+01%	3.77E-01
CS-137	#A	3.6592E-03	3.6592E-03	3.354E+03%	4.34E-01
CE-139	#A	6.8067E-02	6.8067E-02	1.264E+02%	2.89E-01
Ba-140	#A	5.4614E-01	5.4616E-01	6.368E+01%	8.42E-01
La-140	#A	-8.4303E-02	-8.4306E-02	7.723E+01%	4.62E-01
CE-141	#A	1.1450E-01	1.1450E-01	1.352E+02%	5.20E-01
CE-144	#A	0.0000E+00	0.0000E+00	1.000E+03%	2.39E+00
PM-144	#A	1.6828E-01	1.6828E-01	5.092E+01%	1.98E-01
EU-152	#A	2.5252E-01	2.5252E-01	8.360E+01%	8.24E-01
EU-154	#A	2.9748E-01	2.9748E-01	1.109E+02%	4.85E-01

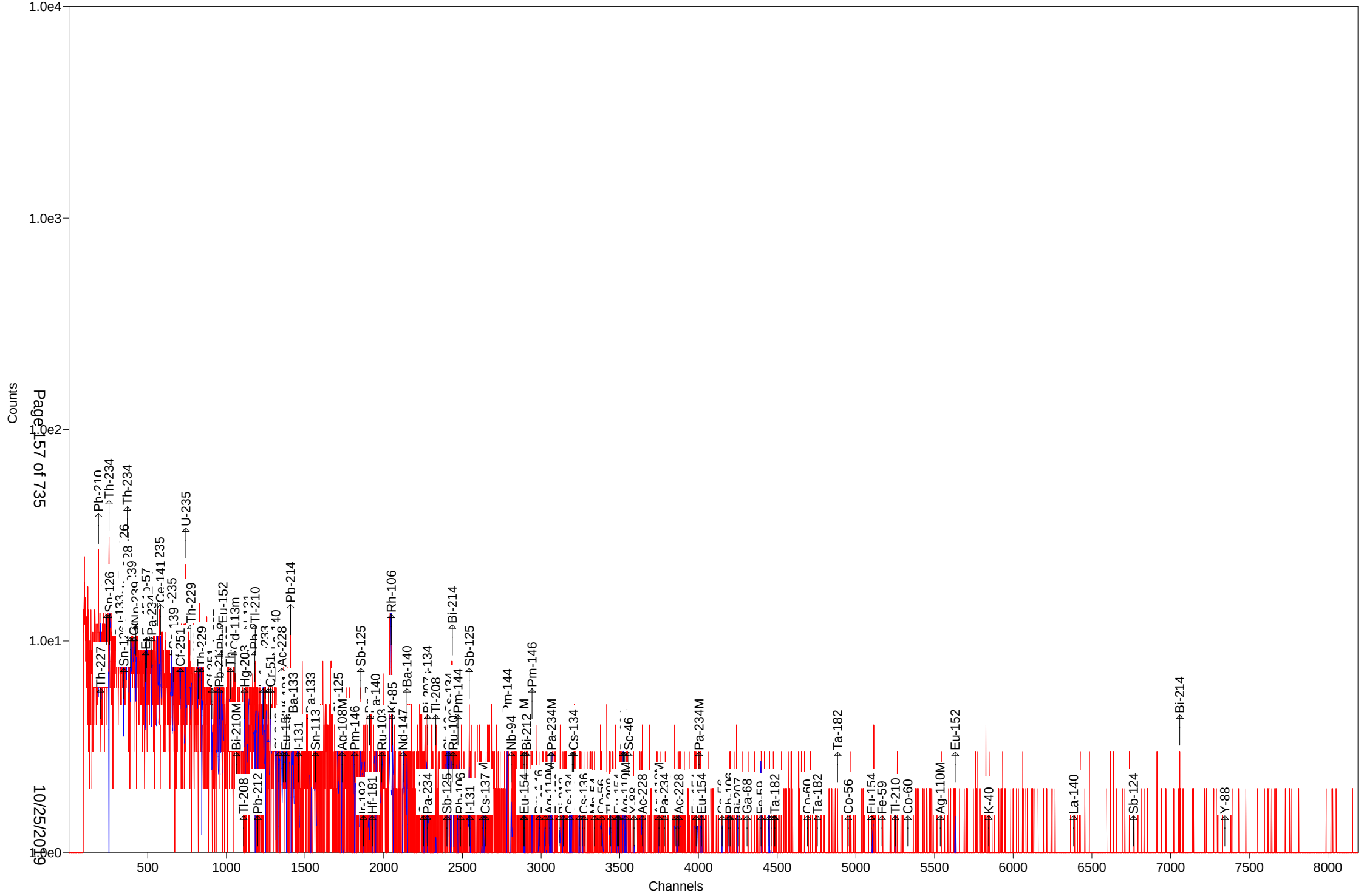
EU-155 #A	0.0000E+00	0.0000E+00	1.000E+03%		1.10E+00
HF-181 #A	-1.1135E-01	-1.1135E-01	1.105E+02%		4.16E-01
Ta-182 #A	2.5041E-01	2.5041E-01	1.044E+02%		9.07E-01
Hg-203 #A	7.8793E-02	7.8794E-02	1.009E+02%		2.68E-01
TL-208 A	1.1138E-01	1.1138E-01	1.589E+02%		2.99E-01
PM-146 #A	-2.6800E-02	-2.6800E-02	7.006E+01%		4.14E-01
Y-88 #A	-3.8218E-03	-3.8218E-03	1.858E+02%		4.55E-01
Cd-113m#A	1.6781E+02	1.6781E+02	6.426E+02%		3.74E+03
Cd-109 #A	0.0000E+00	0.0000E+00	1.000E+03%		8.48E+00
Cf-251 #A	-2.0104E-01	-2.0104E-01	2.252E+02%		1.23E+00
Cf-249 #A	0.0000E+00	0.0000E+00	1.000E+03%		5.13E-01
Sn-126 #A	6.3730E-01	6.3730E-01	1.086E+02%		2.32E+00
PB-210 #A	-5.9016E-01	-5.9016E-01	3.451E+02%		6.03E+00
PB-212 #A	1.9229E-01	1.9229E-01	1.083E+02%		6.84E-01
PB-214 #A	-2.9272E-01	-2.9272E-01	8.351E+01%		8.52E-01
BI-207 #A	-3.0871E-01	-3.0871E-01	8.793E+01%		6.03E-01
BI-212 #A	2.5535E-07	2.5535E-07	5.449E+08%		4.95E+00
U-235 A	5.0611E-01	5.0611E-01	1.217E+02%		2.19E+00
BI-214 #A	8.6853E-02	8.6853E-02	7.390E+01%		1.40E+00
BI-210M#A	-1.7136E-02	-1.7136E-02	8.753E+02%		5.18E-01
AC-228 #A	5.2665E-01	5.2665E-01	7.673E+01%		9.62E-01
TH-227 #A	3.8937E-01	3.8937E-01	1.221E+02%		3.11E+00
TH-229 #A	-6.3785E-01	-6.3785E-01	2.879E+02%		4.72E+00
TH-234 #A	1.5726E+00	1.5726E+00	8.016E+01%		3.43E+00
PA-231 #A	0.0000E+00	0.0000E+00	7.071E+02%		1.74E+01
PA-233 #A	-2.4109E-01	-2.4109E-01	1.420E+02%		1.40E+00
PA-234 #A	1.5686E-01	1.5686E-01	1.024E+02%		1.43E+00
PA-234M#A	-2.9833E+01	-2.9833E+01	4.950E+01%		8.01E+01
AM-241 #A	1.5429E-01	1.5429E-01	1.127E+02%		4.94E-01
Np-237 #A	-4.4338E-01	-4.4338E-01	1.736E+02%		2.57E+00
Ir-192 #A	6.8720E-02	6.8720E-02	1.656E+02%		3.09E-01
Cs-136 #A	7.9606E-02	7.9609E-02	7.286E+01%		3.81E-01
Np-239 #A	-1.6124E-01	-1.6127E-01	1.862E+02%		1.01E+00
Nd-147 #A	6.6345E-01	6.6347E-01	1.051E+02%		1.75E+00
TL-210 #A	1.1239E-01	1.1239E-01	9.693E+01%		3.70E-01
Kr-85 #A	2.1141E+01	2.1141E+01	1.657E+02%		1.18E+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 (25.1 to 1999.5 keV) 0.000E+00 Bq/Sample
Total Decayed Activity (25.1 to 1999.5 keV) 0.0000000E+00 Bq/Sample

443730_Gamma_180-95857-B-6-A. 14_Gamma_20192176.spc.



Test America St. Louis Spectrum ID: 17_Gamma_20191999

Sample Description: 443730_Gamma_180-95857-B-6-B DU
Detector: Detector #17
Batch ID: 443730
Work Order Number: Gamma
Lot Number: 180-95857-B-6-B DU

Decay to Time: 10/21/2019 08:49 Live Time: 7200 sec
Acquisition Time: 10/21/2019 08:49:29 Real Time: 7214 sec
Analysis Time: 10/21/2019 10:50 Dead Time: 0.20 %
Analysis Quantity: 1.000E+00 Sample

Efficiency Cal File: 17_Liquid_Marinelli 1L.Clb
Efficiency Cal Desc: 17_1L marn_90062_030512
Efficiency Cal Date: 3/7/2012 11:47
Energy Cal Date: 2/29/2012 10:33
Library: Client_Long_Rev15.lib
Bkgd Correction File: 17_2019-10-06_1931.PBC

Nuclide	Activity Bq/Sample	1-Sigma Counting Uncert %	1-Sigma Counting Uncert Bq/Sample	1-Sigma Total Uncert Bq/Sample	Minimum Detectable Activity Bq/Sample
BE-7	-1.009E+00	94.9	9.576E-01	9.589E-01	3.209E+00
NA-22	-4.337E-03	1967.2	8.531E-02	8.531E-02	3.153E-01
K-40	-4.100E+00	43.7	1.792E+00	1.804E+00	5.403E+00
Sc-46	-1.352E-01	98.0	1.325E-01	1.327E-01	4.464E-01
CR-51	-1.032E+00	103.3	1.066E+00	1.068E+00	3.564E+00
MN-54	-1.824E-01	91.7	1.674E-01	1.676E-01	3.814E-01
FE-59	3.233E-01	38.1	1.231E-01	1.241E-01	3.615E-01
Co-56	2.016E-01	33.2	6.698E-02	6.772E-02	3.104E-01
CO-57	4.191E-02	186.4	7.809E-02	7.813E-02	2.575E-01
CO-58	-1.513E-01	88.5	1.339E-01	1.341E-01	4.484E-01
CO-60	1.399E-01	94.9	1.327E-01	1.329E-01	2.964E-01
ZN-65	0.000E+00	1.#INF	9.174E-02	9.174E-02	9.877E-01
NB-94	-6.251E-02	231.4	1.446E-01	1.446E-01	3.482E-01
ZR-95	8.490E-02	186.2	1.581E-01	1.582E-01	4.006E-01
NB-95	7.700E-02	131.0	1.009E-01	1.009E-01	3.446E-01
RU-103	-1.570E-02	601.7	9.448E-02	9.448E-02	2.284E-01
RH-106	1.045E+00	147.3	1.539E+00	1.540E+00	5.188E+00
AG-108M	-1.978E-02	416.3	8.234E-02	8.235E-02	2.381E-01
AG-110M	0.000E+00	1.#INF	3.229E-02	3.229E-02	5.348E-01
SN-113	-1.692E-01	121.4	2.055E-01	2.056E-01	6.879E-01
SB-124	5.439E-03	88.6	4.821E-03	4.829E-03	7.549E-01
SB-125	2.608E-01	91.6	2.388E-01	2.392E-01	6.444E-01
I-131	-6.554E-02	99.1	6.493E-02	6.502E-02	2.931E-01
Gd-153	1.658E-01	106.1	1.759E-01	1.762E-01	5.894E-01
Ga-68	1.193E+00	606.2	7.230E+00	7.231E+00	1.684E+01
Tc-99m	5.861E-02	180.5	1.058E-01	1.059E-01	3.550E-01
BA-133	-1.204E-01	146.1	1.759E-01	1.760E-01	5.919E-01
CS-134	-2.114E-01	54.4	1.149E-01	1.154E-01	4.755E-01
CS-137	1.172E-01	97.2	1.140E-01	1.141E-01	2.737E-01
CE-139	-2.218E-03	4235.6	9.396E-02	9.396E-02	3.197E-01
Ba-140	3.796E-01	95.1	3.611E-01	3.616E-01	8.289E-01
La-140	9.814E-02	142.6	1.399E-01	1.400E-01	3.142E-01
CE-141	3.928E-03	4366.2	1.715E-01	1.715E-01	5.809E-01

CE-144	-5.626E-01	121.5	6.838E-01	6.845E-01	2.287E+00
PM-144	2.549E-01	37.7	9.603E-02	9.687E-02	2.126E-01
EU-152	3.296E-01	90.3	2.977E-01	2.983E-01	7.627E-01
EU-154	2.853E-01	85.6	2.443E-01	2.448E-01	5.067E-01
EU-155	1.680E-01	106.7	1.792E-01	1.794E-01	6.436E-01
HF-181	5.400E-02	126.1	6.808E-02	6.814E-02	4.180E-01
Ta-182	-5.279E-01	92.6	4.887E-01	4.894E-01	1.640E+00
Hg-203	-3.238E-02	325.3	1.053E-01	1.054E-01	3.583E-01
TL-208	3.187E-02	417.2	1.330E-01	1.330E-01	3.396E-01
PM-146	-3.548E-02	394.8	1.401E-01	1.401E-01	3.547E-01
Y-88	5.506E-02	286.6	1.578E-01	1.578E-01	3.534E-01
Cd-113m	2.001E+02	623.2	1.247E+03	1.247E+03	3.273E+03
Cd-109	1.232E+00	211.6	2.607E+00	2.608E+00	8.723E+00
Cf-251	-1.786E-01	253.6	4.528E-01	4.531E-01	1.226E+00
Cf-249	-1.542E-01	120.4	1.857E-01	1.859E-01	6.223E-01
Sn-126	4.807E-01	168.3	8.092E-01	8.096E-01	2.715E+00
PB-210	-2.327E+00	86.9	2.021E+00	2.032E+00	5.999E+00
PB-212	-1.812E-01	138.1	2.503E-01	2.506E-01	8.392E-01
PB-214	9.101E-01	28.1	2.555E-01	2.599E-01	5.974E-01
BI-207	-1.288E-01	138.1	1.780E-01	1.781E-01	5.268E-01
BI-212	-5.067E-01	290.7	1.473E+00	1.473E+00	5.086E+00
U-235	2.990E-01	121.5	3.631E-01	3.635E-01	2.676E+00
BI-214	5.808E-01	46.4	2.693E-01	2.709E-01	6.712E-01
BI-210M	-1.749E-01	84.3	1.474E-01	1.478E-01	5.372E-01
AC-228	4.769E-01	78.2	3.731E-01	3.738E-01	9.929E-01
TH-227	6.220E-01	101.1	6.291E-01	6.302E-01	2.739E+00
TH-229	1.004E-01	1618.6	1.625E+00	1.625E+00	4.452E+00
TH-234	5.702E-01	210.4	1.200E+00	1.200E+00	3.763E+00
PA-231	-1.448E-07	3311464133.4	4.794E+00	4.794E+00	1.621E+01
PA-233	5.988E-02	458.2	2.744E-01	2.744E-01	9.333E-01
PA-234	5.704E-01	94.2	5.373E-01	5.382E-01	1.409E+00
PA-234M	3.159E+00	457.2	1.444E+01	1.444E+01	4.934E+01
AM-241	1.621E-01	108.8	1.764E-01	1.767E-01	4.996E-01
Np-237	4.221E-01	171.2	7.225E-01	7.229E-01	2.415E+00
Ir-192	-6.141E-03	70.4	4.324E-03	4.339E-03	3.781E-01
Cs-136	1.386E-01	60.5	8.390E-02	8.425E-02	4.300E-01
Np-239	1.617E-01	206.7	3.342E-01	3.344E-01	1.124E+00
Nd-147	-3.975E-01	210.7	8.374E-01	8.377E-01	2.099E+00
TL-210	-4.973E-03	2560.5	1.273E-01	1.273E-01	4.432E-01
Kr-85	0.000E+00	1.#INF	1.058E+01	1.058E+01	1.230E+02
Total	2.154E+02				

Analyst: Caleb Quinn

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Sample description
443730_Gamma_180-95857-B-6-B DU

Spectrum Filename: C:\User\SPC\Det17\17_Gamma_20191999.An1

Acquisition information
Start time: 10/21/2019 8:49:29 AM
Live time: 7200
Real time: 7214
Dead time: 0.20 %
Detector ID: 17

Detector system
Ge17 SN/11080671

Calibration
Filename: 17_Liquid_Marinelli 1L.Clb
17_1L marn_90062_030512

Energy Calibration
Created: 2/29/2012 10:33:23 AM
Zero offset: 0.108 keV
Gain: 0.250 keV/channel
Quadratic: -2.584E-08 keV/channel^2

Efficiency Calibration
Created: 3/7/2012 11:47:27 AM
Knee Energy: 165.85 keV
Above the Knee: Quadratic Uncertainty = 2.09 %
Log(Eff): -2.094103E+00 + (1.788156E-01*Log(E)) +
(-7.283143E-02*Log(E)^2)
Below the Knee: Quadratic Uncertainty = 0.66 %
Log(Eff): -1.201018E+01 + (4.016685E+00*Log(E)) +
(-4.439774E-01*Log(E)^2)

Library Files
Main analysis library: Client_Long_Rev15.lib
Library Match Width: 0.500
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G800W064
Start channel: 100 (25.12keV)
Stop channel: 8000 (1999.54keV)
Peak rejection level: 1000.000%
Peak search sensitivity: 3
Sample Size: 1.0000E+00 +/- 0.000E+00%
Activity scaling factor: 1.0000E+00/(1.0000E+00* 1.0000E+00) =
1.0000E+00
Detection limit method: Reg. Guide 4.16 Method

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Random error: 4.0000000E+00
Systematic error: 4.0000000E+00
Fraction Limit: 0.000%
Background width: 3
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:	YES	10/21/2019 8:49:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	17_2019-10-06_1931.PBC 10/6/2019 7:31:18 PM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 16 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 0.3251

***** 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
46.54	-31.	86.86	0.77	4.360E-02	46.54	4.250	PBC<MDA	PB210
59.65	24.	51.79	0.79	4.941E-02	59.54	35.900	1.858E-01	AM241
63.36	11.	257.11	1.27	5.038E-02	63.29	3.810	PBC<MDA	TH234
64.28	17.	168.34	0.79	5.064E-02	64.28	9.700	PBC<MDA	Sn126
80.99	44.	51.83	0.81	5.325E-02	80.99	34.060	PBC<MDA	BA133
86.49	21.	171.19	0.81	5.355E-02	86.49	13.100	PBC<MDA	Np237
86.94	21.	173.66	0.81	5.356E-02	86.54	30.700	PBC<MDA	EU155
					86.94	9.040	6.118E-01	Sn126
87.30	21.	170.99	0.81	5.355E-02	86.54	30.700	PBC<MDA	EU155
					86.94	9.040	6.116E-01	Sn126
					87.57	37.500	1.474E-01	Sn126
87.57	21.	176.19	0.81	5.358E-02	87.57	37.500	PBC<MDA	Sn126
88.04	18.	211.63	0.81	5.359E-02	88.04	3.790	PBC<MDA	Cd109
92.69	9.	333.09	1.48	5.364E-02	92.59	5.584	PBC<MDA	TH234
					93.35	5.561	PBC<MDA	AC228
97.50	19.	106.10	0.82	5.357E-02	97.50	30.000	PBC<MDA	Gd153
105.31	12.	127.51	0.83	5.322E-02	105.31	21.200	PBC<MDA	EU155
106.13	14.	206.67	0.83	5.317E-02	106.13	22.700	PBC<MDA	Np239
121.78	6.	378.84	0.85	5.183E-02	121.78	28.580	PBC<MDA	EU152
					122.06	85.600	1.984E-02	CO57
123.10	13.	171.08	0.85	5.168E-02	123.10	40.790	PBC<MDA	EU154
130.66	20.	136.09	0.85	5.074E-02	131.29	18.000	PBC<MDA	PA234

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
136.30	21.	126.09	0.86	5.012E-02	136.30	5.850	PBC<MDA	HF181
					136.47	10.680	5.483E-01	CO57
136.47	15.	186.35	0.86	5.010E-02	136.30	5.850	PBC<MDA	HF181
					136.47	10.680	3.778E-01	CO57
140.51	17.	180.53	0.86	4.957E-02	140.51	89.300	PBC<MDA	Tc99m
162.66	21.	114.83	0.88	4.648E-02	162.66	6.220	PBC<MDA	Ba140
163.38	20.	126.17	0.88	4.638E-02	163.38	5.080	PBC<MDA	U235
185.72	39.	59.05	0.91	4.295E-02	185.72	54.000	PBC<MDA	U235
205.33	8.	226.50	0.92	4.048E-02	205.33	5.010	PBC<MDA	U235
236.45	19.	138.44	0.95	3.721E-02	235.97	12.300	PBC<MDA	TH227
238.63	-21.	138.14	0.95	3.695E-02	238.63	43.300	PBC<MDA	PB212
241.42	19.	140.45	0.96	3.663E-02	242.00	7.430	PBC<MDA	PB214
244.69	15.	187.36	0.96	3.638E-02	244.69	7.580	PBC<MDA	EU152
257.00	12.	147.50	0.97	3.534E-02	256.24	7.000	PBC<MDA	TH227
263.70	3.	623.16	0.98	3.471E-02	263.70	0.006	PBC<MDA	Cd113m
294.83	20.	89.66	1.71	3.229E-02	295.09	19.300	PBC<MDA	PB214
312.01	5.	458.22	1.02	3.114E-02	312.01	36.000	PBC<MDA	PA233
338.32	16.	118.35	1.05	2.951E-02	338.32	12.010	PBC<MDA	AC228
340.57	16.	123.33	1.05	2.938E-02	340.57	46.900	PBC<MDA	Cs136
344.29	16.	127.93	1.05	2.917E-02	344.29	26.500	PBC<MDA	EU152
345.83	3.	767.62	1.05	2.908E-02	345.83	15.070	PBC<MDA	HF181
351.93	71.	28.08	1.33	2.874E-02	351.93	37.600	9.101E-01	PB214
427.81	11.	118.84	1.13	2.512E-02	427.88	29.600	PBC<MDA	SB125
468.06	15.	98.34	1.16	2.356E-02	468.06	51.750	PBC<MDA	Ir192
511.86	166.	12.61	2.45	2.209E-02	511.86	20.000	5.230E+00	RH106
537.26	8.	151.70	1.22	2.132E-02	537.26	24.390	PBC<MDA	Ba140
569.47	3.	428.77	1.25	2.042E-02	569.32	15.380	PBC<MDA	CS134
					569.47	8.200	2.740E-01	PA234
					569.70	97.740	2.300E-02	BI207
582.78	4.	417.21	1.26	2.006E-02	583.02	84.500	PBC<MDA	TL208
608.95	37.	46.38	1.66	1.941E-02	609.31	46.090	PBC<MDA	BI214
621.92	14.	147.31	1.30	1.911E-02	621.92	9.930	PBC<MDA	RH106
635.89	6.	139.34	1.31	1.879E-02	635.89	11.310	PBC<MDA	SB125
636.97	5.	184.09	1.31	1.876E-02	636.97	7.170	PBC<MDA	I131
661.66	13.	97.23	1.33	1.823E-02	661.66	85.210	PBC<MDA	CS137
696.54	32.	37.68	1.36	1.752E-02	696.54	99.000	2.549E-01	PM144
722.79	9.	135.63	1.39	1.702E-02	722.79	10.810	PBC<MDA	SB124
					722.94	90.840	8.085E-02	AG108M
					723.36	20.220	3.634E-01	EU154
756.73	5.	186.25	1.41	1.642E-02	756.73	54.460	PBC<MDA	ZR95
765.79	9.	131.00	1.42	1.627E-02	765.79	99.790	PBC<MDA	NB95
					766.41	0.294	PBC<MDA	PA234M
778.92	2.	678.97	1.43	1.605E-02	778.92	12.940	PBC<MDA	EU152
801.95	10.	91.03	1.45	1.568E-02	801.95	8.690	PBC<MDA	CS134
818.50	12.	113.00	1.47	1.543E-02	818.50	100.000	PBC<MDA	Cs136
873.23	3.	433.94	1.51	1.465E-02	873.23	12.270	PBC<MDA	EU154
880.49	3.	423.03	1.52	1.455E-02	880.53	6.000	PBC<MDA	PA234
883.20	12.	94.21	1.52	1.451E-02	883.24	9.600	PBC<MDA	PA234

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
911.07	12.	102.35	1.55	1.415E-02	911.07	29.000	PBC<MDA	AC228
945.86	9.	94.28	1.57	1.373E-02	946.02	13.400	PBC<MDA	PA234
964.11	3.	419.82	1.59	1.351E-02	964.11	14.605	PBC<MDA	EU152
996.33	11.	85.61	1.62	1.315E-02	996.33	10.600	PBC<MDA	EU154
1001.00	2.	457.15	1.62	1.310E-02	1001.00	0.837	PBC<MDA	PA234M
1037.84	20.	33.23	1.65	1.271E-02	1037.84	14.130	1.546E+00	Co56
1048.07	12.	70.54	1.66	1.261E-02	1048.07	80.000	PBC<MDA	Cs136
1077.40	2.	606.22	1.68	1.232E-02	1077.40	3.300	PBC<MDA	Ga68
1099.25	8.	97.98	1.70	1.212E-02	1099.25	56.500	PBC<MDA	FE59
1112.07	13.	90.32	1.71	1.200E-02	1112.07	13.644	PBC<MDA	EU152
1120.15	4.	322.11	1.72	1.193E-02	1120.29	15.100	PBC<MDA	BI214
					1120.55	99.987	PBC<MDA	Sc46
					1121.30	34.900	PBC<MDA	Ta182
1221.28	7.	135.27	1.80	1.108E-02	1221.41	27.000	PBC<MDA	Ta182
1291.60	18.	38.06	1.85	1.056E-02	1291.60	43.200	5.379E-01	FE59
1332.50	10.	94.90	1.89	1.028E-02	1332.50	99.980	PBC<MDA	CO60
1408.00	5.	121.64	1.94	9.796E-03	1408.00	21.005	PBC<MDA	EU152
1596.21	6.	142.60	2.09	8.765E-03	1596.21	95.400	PBC<MDA	La140
1690.98	5.	173.21	2.16	8.321E-03	1690.98	47.790	PBC<MDA	SB124
1836.06	3.	286.64	2.26	7.721E-03	1836.06	99.200	PBC<MDA	Y88

No unknown peaks passed sensitivity test.

This section based on library: Client_Long_Rev15.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 1 Sigma %	FWHM keV
PB-210	185.63	46.54	275.	-31.	-0.004	86.86	0.775s
TH-227	200.03	50.14	207.	-22.	-0.003	109.85	0.778s
AM-241	237.59	59.54	171.	21.	0.003	108.82	0.787s
TH-234	252.88	63.36	272.	11.	0.002	257.11	1.266s
Sn-126	256.56	64.28	401.	17.	0.002	168.34	0.792s
BA-133	323.36	80.99	168.	44.	0.006	51.83	0.807s
Np-237	345.35	86.49	655.	21.	0.003	171.19	0.813s
EU-155	345.56	86.54	654.	21.	0.003	170.99	0.813s
Sn-126	347.15	86.94	675.	21.	0.003	173.66	0.813s
Sn-126	349.67	87.57	697.	21.	0.003	176.19	0.814s
Cd-109	351.55	88.04	718.	18.	0.003	211.63	0.814s
Nd-147	363.79	91.10	845.	-24.	-0.003	170.69	0.817s
TH-234	370.16	92.69	283.	9.	0.001	333.09	1.478s
AC-228	372.78	93.35	821.	-24.	-0.003	167.83	0.819s
Gd-153	389.37	97.50	198.	19.	0.003	106.10	0.823s
Np-239	397.37	99.50	285.	-22.	-0.003	112.45	0.825
Gd-153	412.16	103.20	376.	-25.	-0.003	112.62	0.828s
Np-239	414.16	103.70	340.	-25.	-0.003	107.11	0.829s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
EU-155	420.61	105.31	113.	12.	0.002	127.51	0.830D
Np-239	423.88	106.13	405.	14.	0.002	206.67	0.831s
EU-152	486.45	121.78	285.	6.	0.001	378.84	0.846s
CO-57	487.57	122.06	291.	0.	0.000	1000.00	0.846s
EU-154	491.73	123.10	254.	13.	0.002	171.08	0.847s
PA-234	524.49	131.29	373.	20.	0.003	136.09	0.855s
HF-181	531.41	133.02	393.	0.	0.000	1000.00	0.856
CE-144	533.46	133.54	368.	-23.	-0.003	121.54	0.857s
HF-181	544.50	136.30	344.	21.	0.003	126.09	0.859s
CO-57	545.20	136.47	360.	15.	0.002	186.35	0.859s
Tc-99m	561.34	140.51	444.	17.	0.002	180.53	0.863s
U-235	574.43	143.79	470.	-9.	-0.001	256.02	0.866s
Ba-140	649.90	162.66	288.	21.	0.003	114.83	0.884s
U-235	652.78	163.38	310.	20.	0.003	126.17	0.885s
Cf-251	705.64	176.60	187.	-10.	-0.001	253.56	0.897s
U-235	742.10	185.72	157.	39.	0.005	59.05	0.905s
U-235	820.52	205.33	111.	8.	0.001	226.50	0.924s
TH-229	842.58	210.85	159.	-6.	-0.001	303.55	0.929
Cf-251	907.16	227.00	160.	-9.	-0.001	252.31	0.944s
TH-227	943.03	235.97	347.	19.	0.003	138.44	0.952s
PB-212	953.67	238.63	407.	-21.	-0.003	138.14	0.955
PB-214	967.13	242.00	362.	19.	0.003	140.45	0.958s
EU-152	977.91	244.69	390.	15.	0.002	187.36	0.960s
TH-227	1024.08	256.24	98.	12.	0.002	147.50	0.971s
Cd-113m	1053.91	263.70	99.	3.	0.000	623.16	0.978s
BI-210M	1062.44	265.83	189.	-22.	-0.003	84.28	0.979
TL-208	1108.23	277.28	180.	-21.	-0.003	94.51	0.990s
Hg-203	1115.89	279.20	211.	-6.	-0.001	325.32	0.992
I-131	1136.28	284.30	126.	-12.	-0.002	152.20	0.996s
PB-214	1178.38	294.83	89.	20.	0.003	89.66	1.710s
TL-210	1183.07	296.00	525.	-20.	-0.003	165.18	1.007
PB-212	1199.19	300.03	508.	-23.	-0.003	78.66	1.011s
PA-231	1199.35	300.07	485.	-13.	-0.002	235.39	1.011s
Ba-140	1218.46	304.85	485.	-13.	-0.002	235.27	1.015s
BI-210M	1218.64	304.90	499.	0.	0.000	1000.00	1.015
Ir-192	1232.82	308.44	499.	0.	0.000	1000.00	1.019s
PA-233	1247.10	312.01	243.	5.	0.001	458.22	1.022s
Ir-192	1265.01	316.49	228.	-22.	-0.003	100.81	1.026s
CR-51	1279.38	320.08	262.	-23.	-0.003	103.30	1.029s
La-140	1314.07	328.76	132.	-22.	-0.003	101.69	1.037s
Cf-249	1332.79	333.44	103.	-5.	-0.001	408.83	1.041
AC-228	1352.30	338.32	168.	16.	0.002	118.35	1.046s
Cs-136	1361.30	340.57	184.	16.	0.002	123.33	1.048s
EU-152	1376.16	344.29	200.	16.	0.002	127.93	1.051s
HF-181	1382.33	345.83	212.	3.	0.000	767.62	1.053
PB-214	1406.73	351.93	88.	71.	0.010	28.08	1.332s
BA-133	1423.00	356.00	243.	-15.	-0.002	146.12	1.062s
I-131	1456.93	364.48	95.	-19.	-0.003	99.07	1.070s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BA-133	1534.34	383.84	252.	-20.	-0.003	116.57	1.087s
Cf-249	1550.77	387.95	272.	-20.	-0.003	120.44	1.091s
SN-113	1565.73	391.69	309.	-21.	-0.003	121.40	1.094s
SB-125	1710.44	427.88	47.	11.	0.002	118.84	1.127s
AG-108M	1734.69	433.94	59.	-3.	0.000	416.33	1.132
PM-146	1814.44	453.88	64.	-4.	-0.001	394.76	1.150s
SB-125	1852.38	463.37	125.	-3.	0.000	595.29	1.158
Ir-192	1871.15	468.06	103.	15.	0.002	98.34	1.163s
BE-7	1909.29	477.59	133.	-18.	-0.002	94.93	1.171s
HF-181	1926.89	482.00	130.	-3.	0.000	489.83	1.175s
La-140	1946.98	487.02	65.	-12.	-0.002	113.92	1.180s
RU-103	1987.11	497.05	44.	-2.	0.000	601.73	1.188s
RH-106	2046.35	511.86	137.	166.	0.023	12.61	2.452
Kr-85	2054.81	513.98	303.	0.	0.000	1000.00	1.203
Nd-147	2122.88	531.00	72.	-8.	-0.001	210.65	1.219s
Ba-140	2147.92	537.26	37.	8.	0.001	151.70	1.224s
CS-134	2251.82	563.24	72.	-18.	-0.003	93.29	1.247s
CS-134	2276.15	569.32	80.	-19.	-0.003	68.81	1.252s
PA-234	2276.75	569.47	99.	3.	0.000	428.77	1.253
BI-207	2277.67	569.70	103.	-6.	-0.001	264.21	1.253s
TL-208	2330.95	583.02	69.	4.	0.001	417.21	1.264s
SB-125	2400.86	600.50	504.	-27.	-0.004	62.03	1.280s
SB-124	2409.78	602.73	477.	-21.	-0.003	149.42	1.282s
CS-134	2417.70	604.71	393.	-19.	-0.003	145.90	1.284s
BI-214	2434.65	608.95	76.	37.	0.005	46.38	1.662s
RU-103	2440.05	610.30	373.	-20.	-0.003	141.81	1.288s
AG-108M	2455.98	614.28	355.	-20.	-0.003	138.06	1.292s
PM-144	2471.11	618.06	375.	-10.	-0.001	266.34	1.295s
RH-106	2486.52	621.92	214.	14.	0.002	147.31	1.299s
SB-125	2542.41	635.89	34.	6.	0.001	139.34	1.311
I-131	2546.75	636.97	37.	5.	0.001	184.09	1.312s
CS-137	2645.49	661.66	36.	13.	0.002	97.23	1.333s
PM-144	2785.03	696.54	26.	32.	0.004	37.68	1.363
NB-94	2809.38	702.63	74.	-8.	-0.001	231.36	1.368s
SB-124	2890.01	722.79	70.	9.	0.001	135.63	1.386
AG-108M	2890.61	722.94	79.	0.	0.000	1000.00	1.386s
EU-154	2892.30	723.36	79.	0.	0.000	1000.00	1.386s
ZR-95	2895.66	724.20	79.	0.	0.000	1000.00	1.387s
BI-212	2907.54	727.17	90.	-5.	-0.001	290.67	1.390s
PM-146	2941.74	735.72	44.	-12.	-0.002	104.66	1.397s
ZR-95	3025.79	756.73	25.	5.	0.001	186.25	1.415s
AG-110M	3054.64	763.94	54.	-10.	-0.001	99.70	1.421s
NB-95	3062.03	765.79	65.	9.	0.001	131.00	1.423s
EU-152	3114.56	778.92	30.	2.	0.000	678.97	1.434s
BI-212	3140.56	785.42	39.	0.	0.000	1000.00	1.440s
CS-134	3182.36	795.87	87.	-21.	-0.003	54.37	1.448s
CS-134	3206.69	801.95	18.	10.	0.001	91.03	1.454s
CO-58	3241.99	810.78	103.	-17.	-0.002	88.47	1.461s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
La-140	3261.97	815.77	115.	-18.	-0.002	89.12	1.465s
Cs-136	3272.90	818.50	93.	12.	0.002	113.00	1.467s
MN-54	3338.30	834.85	70.	-20.	-0.003	91.75	1.481s
TL-208	3441.18	860.56	47.	-6.	-0.001	259.16	1.503s
NB-94	3483.32	871.10	60.	-12.	-0.002	92.43	1.512
EU-154	3491.85	873.23	74.	3.	0.000	433.94	1.514
PA-234	3521.06	880.53	63.	3.	0.000	423.03	1.520s
PA-234	3531.90	883.24	54.	12.	0.002	94.21	1.522s
AG-110M	3537.67	884.68	66.	0.	0.000	1000.00	1.523s
Sc-46	3556.06	889.28	88.	-14.	-0.002	98.04	1.527
Y-88	3591.11	898.04	67.	-22.	-0.003	65.39	1.534s
AC-228	3643.24	911.07	33.	12.	0.002	102.35	1.545
AG-110M	3748.95	937.49	51.	-17.	-0.002	90.91	1.567s
PA-234	3783.07	946.02	14.	9.	0.001	94.28	1.574s
EU-152	3855.45	964.11	61.	3.	0.000	419.82	1.589s
AC-228	3874.90	968.97	75.	-9.	-0.001	145.04	1.593s
EU-154	3984.36	996.33	41.	11.	0.002	85.61	1.616s
PA-234M	4003.04	1001.00	61.	2.	0.000	457.15	1.620s
EU-154	4018.15	1004.77	64.	-1.	0.000	855.13	1.623s
Co-56	4150.45	1037.84	5.	20.	0.003	33.23	1.650
Cs-136	4191.39	1048.07	27.	12.	0.002	70.54	1.658s
RH-106	4200.55	1050.36	45.	-2.	0.000	512.28	1.661s
BI-207	4253.77	1063.66	49.	-9.	-0.001	138.14	1.671s
Ga-68	4308.74	1077.40	30.	2.	0.000	606.22	1.683s
FE-59	4396.18	1099.25	11.	8.	0.001	97.98	1.700s
EU-152	4447.49	1112.07	62.	13.	0.002	90.32	1.711
ZN-65	4461.38	1115.55	75.	0.	0.000	1000.00	1.713s
BI-214	4480.35	1120.29	71.	4.	0.001	322.11	1.717s
Ta-182	4484.41	1121.30	99.	-16.	-0.002	92.57	1.718s
Ta-182	4755.52	1189.05	40.	-5.	-0.001	281.66	1.772
Ta-182	4885.02	1221.41	16.	7.	0.001	135.27	1.798s
EU-154	5097.64	1274.54	22.	0.	0.000	1000.00	1.840s
FE-59	5165.90	1291.60	5.	18.	0.002	38.06	1.854s
TL-210	5251.56	1313.00	37.	-14.	-0.002	100.43	1.870s
CO-60	5329.61	1332.50	17.	10.	0.001	94.90	1.886s
AG-110M	5536.92	1384.30	32.	-5.	-0.001	261.02	1.926s
EU-152	5631.79	1408.00	5.	5.	0.001	121.64	1.944s
K-40	5843.25	1460.83	62.	-30.	-0.004	43.72	1.985s
La-140	6385.15	1596.21	12.	6.	0.001	142.60	2.087s
SB-124	6764.55	1690.98	12.	5.	0.001	173.21	2.157s
Co-56	7086.31	1771.35	35.	-15.	-0.002	95.95	2.216s
Y-88	7345.39	1836.06	13.	3.	0.000	286.64	2.262s

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	-1.0087E+00				5.31E+01	
			477.60	-1.009E+00	?(	3.209E+00 9.49E+01	1.05E+01 G
NA-22	C	-4.3366E-03				9.50E+02	
			1274.53	-4.337E-03	&(	3.153E-01 1.97E+03	9.99E+01 G
K-40	N	-4.0996E+00				4.66E+11	
			1460.83	-4.100E+00	?(P	5.403E+00 4.37E+01	1.07E+01 G
Sc-46	F	-1.3520E-01				8.38E+01	
			889.28	-1.352E-01	?(	4.464E-01 9.80E+01	1.00E+02 G
			1120.55	9.709E-03	%	4.991E-01 1.47E+03	1.00E+02 G
CR-51	F	-1.0323E+00				2.77E+01	
			320.08	-1.032E+00	(	3.564E+00 1.03E+02	9.94E+00 G
MN-54	C	-1.8244E-01				3.12E+02	
			834.85	-1.824E-01	(	3.814E-01 9.17E+01	1.00E+02 G
FE-59	F	3.2332E-01				4.45E+01	
			1099.25	1.593E-01	?(P	3.615E-01 9.80E+01	5.65E+01 G
			1291.60	5.379E-01	&(	4.102E-01 3.81E+01	4.32E+01 G
Co-56	C	2.0158E-01				7.73E+01	
			846.77	1.147E-02	%(P	3.104E-01 1.13E+03	9.99E+01 G
			1238.28	-1.920E-02	%	5.581E-01 1.29E+03	6.61E+01 G
			1037.84	1.546E+00	&(	1.015E+00 3.32E+01	1.41E+01 G
			1771.35	-1.734E+00	+	3.400E+00 9.60E+01	1.55E+01 A
CO-57	C	4.1905E-02				2.72E+02	
			122.06	0.000E+00	&(	2.575E-01 1.00E+03	8.56E+01 G
			136.47	3.778E-01	&(	2.367E+00 1.86E+02	1.07E+01 G
CO-58	C	-1.5132E-01				7.09E+01	
			810.78	-1.513E-01	?(	4.484E-01 8.85E+01	9.95E+01 G
CO-60	F	1.3987E-01				1.93E+03	
			1332.50	1.399E-01	?(P	2.964E-01 9.49E+01	1.00E+02 G
			1173.24	-8.138E-03	% P	3.508E-01 1.82E+03	9.99E+01 G

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Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
NB-94	I	-6.2507E-02					7.41E+06	
			702.63	-6.251E-02	?(	3.482E-01	2.31E+02	9.79E+01 G
			871.10	-1.184E-01	+	3.690E-01	9.24E+01	9.99E+01 G
ZR-95	I	8.4903E-02					6.40E+01	
			756.73	8.490E-02	?(P	4.006E-01	1.86E+02	5.45E+01 G
			724.20	0.000E+00	-	8.168E-01	1.00E+03	4.42E+01 G
NB-95	I	7.7003E-02					6.40E+01	
			765.79	7.700E-02	?(	3.446E-01	1.31E+02	9.98E+01 G
RU-103	I	-1.5701E-02					3.93E+01	
			497.05	-1.570E-02	&(P	2.284E-01	6.02E+02	9.09E+01 G
			610.30	-2.433E+00	+	1.156E+01	1.42E+02	5.75E+00 GA
RH-106	I	1.0450E+00					3.74E+02	
			621.92	1.045E+00	?(	5.188E+00	1.47E+02	9.93E+00 G
			1050.36	-1.321E+00	&	2.399E+01	5.12E+02	1.56E+00 G
			511.86	5.230E+00		1.798E+00	1.26E+01	2.00E+01 GA
AG-108M	C	-1.9778E-02					1.53E+05	
			433.94	-1.978E-02	&(P	2.381E-01	4.16E+02	9.05E+01 G
			722.94	0.000E+00	+	3.964E-01	1.00E+03	9.08E+01 G
			614.28	-1.569E-01	+	7.258E-01	1.38E+02	8.98E+01 G
SN-113	F	-1.6924E-01					1.15E+02	
			391.69	-1.692E-01	?(	6.879E-01	1.21E+02	6.40E+01 G
SB-124	F	5.4386E-03					6.02E+01	
			602.73	-1.510E-01	&(	7.549E-01	1.49E+02	9.83E+01 G
			1690.98	1.746E-01	?(	6.584E-01	1.73E+02	4.78E+01 G
			722.79	6.793E-01	&(	3.147E+00	1.36E+02	1.08E+01 G
SB-125	I	2.6081E-01					1.01E+03	
			427.88	2.065E-01	?(P	6.444E-01	1.19E+02	2.96E+01 G
			600.50	-1.079E+00	+ P	4.255E+00	6.20E+01	1.79E+01 G
			635.89	4.031E-01	(	1.949E+00	1.39E+02	1.13E+01 G
			463.37	-1.490E-01	-	3.060E+00	5.95E+02	1.05E+01 G
I-131	I	-6.5543E-02					8.02E+00	
			364.48	-1.152E-01	?(	2.931E-01	9.91E+01	8.17E+01 G
			284.30	-8.397E-01	+ P	3.779E+00	1.52E+02	6.14E+00 G
			636.97	5.008E-01	?(	3.224E+00	1.84E+02	7.17E+00 G
Gd-153	F	1.6578E-01					2.42E+02	
			97.50	1.658E-01	*(	5.894E-01	1.06E+02	3.00E+01 G
			103.20	-2.957E-01	+	1.112E+00	1.13E+02	2.18E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Ga-68	C	1.1927E+00					4.71E-02	
			1077.40	1.193E+00	?(	1.684E+01	6.06E+02	3.30E+00 G
Tc-99m	I	5.8613E-02					2.51E-01	
			140.51	5.861E-02	&(	3.550E-01	1.81E+02	8.93E+01 G
BA-133	F	-1.2036E-01					3.85E+03	
			356.00	-1.204E-01	?(	5.919E-01	1.46E+02	6.20E+01 G
			302.85	-2.276E-08	%	2.548E+00	3.31E+09	1.83E+01 G
			383.84	-1.126E+00	&	4.398E+00	1.17E+02	8.94E+00 GA
			80.99	3.370E-01		4.833E-01	5.18E+01	3.41E+01 GA
CS-134	I	-2.1137E-01					7.54E+02	
			795.87	-2.114E-01	&(P	4.755E-01	5.44E+01	8.55E+01 G
			604.71	-1.418E-01	+	6.931E-01	1.46E+02	9.76E+01 G
			569.32	-8.610E-01	+	1.963E+00	6.88E+01	1.54E+01 G
			801.95	1.030E+00	+	2.285E+00	9.10E+01	8.69E+00 G
			563.24	-1.486E+00	&	3.414E+00	9.33E+01	8.35E+00 G
CS-137	I	1.1722E-01					1.10E+04	
			661.66	1.172E-01	?(	2.737E-01	9.72E+01	8.52E+01 G
CE-139	F	-2.2184E-03					1.38E+02	
			165.85	-2.218E-03	%(	3.197E-01	4.24E+03	7.99E+01 G
Ba-140	I	3.7955E-01					1.28E+01	
			537.26	2.156E-01	?(P	8.289E-01	1.52E+02	2.44E+01 G
			162.66	1.022E+00	@(	3.929E+00	1.15E+02	6.22E+00 G
			304.85	-1.365E+00	&	1.079E+01	2.35E+02	4.29E+00 G
La-140	I	9.8140E-02					1.28E+01	
			1596.21	9.814E-02	?(P	3.142E-01	1.43E+02	9.54E+01 G
			487.02	-1.613E-01	+ P	5.373E-01	1.14E+02	4.55E+01 G
			328.76	-4.919E-01	+	1.279E+00	1.02E+02	2.03E+01 G
			815.77	-6.805E-01	+	2.030E+00	8.91E+01	2.33E+01 G
CE-141	I	3.9279E-03					3.25E+01	
			145.44	3.928E-03	%(	5.809E-01	4.37E+03	4.82E+01 G
CE-144	I	-5.6264E-01					2.85E+02	
			133.54	-5.626E-01	?(	2.287E+00	1.22E+02	1.11E+01 G
PM-144	C	2.5488E-01					3.63E+02	
			696.54	2.549E-01	(P	2.126E-01	3.77E+01	9.90E+01 G
			618.06	-7.558E-02	&	6.785E-01	2.66E+02	9.91E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-152	F	3.2959E-01					4.94E+03	
			121.78	5.939E-02	&(	7.627E-01	3.79E+02	2.86E+01 G
			344.29	2.862E-01	*(	1.232E+00	1.28E+02	2.65E+01 G
			1112.07	1.099E+00	?(	3.344E+00	9.03E+01	1.36E+01 G
			778.92	1.115E-01	?(	1.898E+00	6.79E+02	1.29E+01 G
			964.11	1.877E-01	?(	2.759E+00	4.20E+02	1.46E+01 G
			244.69	7.603E-01	?(P	4.771E+00	1.87E+02	7.58E+00 G
			1408.00	3.150E-01	?	9.094E-01	1.22E+02	2.10E+01 GA
EU-154	I	2.8533E-01					3.14E+03	
			123.10	8.848E-02	?(P	5.067E-01	1.71E+02	4.08E+01 G
			1274.54	0.000E+00	&	9.016E-01	1.00E+03	3.52E+01 G
			723.36	0.000E+00	-	1.782E+00	1.00E+03	2.02E+01 G
			873.23	2.189E-01	?(	3.310E+00	4.34E+02	1.23E+01 G
			1004.77	-7.873E-02	+	2.367E+00	8.55E+02	1.80E+01 G
			996.33	1.120E+00	?(	3.230E+00	8.56E+01	1.06E+01 G
EU-155	I	1.6798E-01					1.81E+03	
			105.31	1.504E-01	(P	6.436E-01	1.28E+02	2.12E+01 G
			86.54	1.801E-01	&(	1.030E+00	1.71E+02	3.07E+01 G
HF-181	F	5.3996E-02					4.24E+01	
			482.00	-2.066E-02	?(P	4.180E-01	4.90E+02	8.05E+01 G
			133.02	0.000E+00	&	6.036E-01	1.00E+03	4.33E+01 G
			345.83	8.535E-02	?(	2.238E+00	7.68E+02	1.51E+01 G
			136.30	1.000E+00	&(	4.223E+00	1.26E+02	5.85E+00 G
Ta-182	F	-5.2794E-01					1.14E+02	
			1121.30	-5.279E-01	?(	1.640E+00	9.26E+01	3.49E+01 G
			1221.41	3.250E-01	+	9.912E-01	1.35E+02	2.70E+01 G
			1189.05	-3.781E-01	+	2.434E+00	2.82E+02	1.62E+01 G
Hg-203	F	-3.2383E-02					4.66E+01	
			279.20	-3.238E-02	&(	3.583E-01	3.25E+02	8.15E+01 G
TL-208	N	3.1867E-02					6.98E+02	
			583.02	3.187E-02	?(P	3.396E-01	4.17E+02	8.45E+01 G
			277.28	-1.352E+00	+	4.271E+00	9.45E+01	6.31E+00 G
			860.56	-4.275E-01	+	2.606E+00	2.59E+02	1.24E+01 G
PM-146	C	-3.5483E-02					2.02E+03	
			453.88	-3.548E-02	(	3.547E-01	3.95E+02	6.50E+01 G
			747.16	1.980E-02	% P	6.034E-01	1.20E+03	3.40E+01 G
			735.72	-4.281E-01	+ P	1.232E+00	1.05E+02	2.25E+01 G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

Y-88     F   5.5056E-02                                     1.07E+02
                         1836.06 5.506E-02 ?(P 3.534E-01 2.87E+02 9.92E+01 G
                          898.04-2.262E-01 + P 4.235E-01 6.54E+01 9.37E+01 G

Cd-113m      2.0007E+02                                     5.33E+03
                          263.70 2.001E+02 ?(  3.273E+03 6.23E+02 6.00E-03   K

Cd-109   F   1.2320E+00                                     4.53E+02
                           88.04 1.232E+00 &(  8.723E+00 2.12E+02 3.79E+00 G

Cf-251   T  -1.7860E-01                                     3.28E+05
                          176.60-1.786E-01 ?(  1.226E+00 2.54E+02 1.70E+01 G
                          227.00-5.207E-01 +   3.567E+00 2.52E+02 6.30E+00 GA

Cf-249   T  -1.5418E-01                                     1.28E+05
                          387.95-1.542E-01 ?(  6.223E-01 1.20E+02 6.60E+01 G
                          333.44-1.402E-01 +   1.500E+00 4.09E+02 1.55E+01 G

Sn-126       4.8068E-01                                     3.65E+07
                           87.57 1.476E-01     8.689E-01 1.76E+02 3.75E+01 GA
                           64.28 4.807E-01 ?(  2.715E+00 1.68E+02 9.70E+00 G
                           86.94 6.118E-01     3.551E+00 1.74E+02 9.04E+00 GA

PB-210   N  -2.3267E+00                                     8.14E+03
                           46.54-2.327E+00 *(P 5.999E+00 8.69E+01 4.25E+00 G

PB-212   N  -1.8120E-01                                     6.98E+02
                          238.63-1.812E-01  (P 8.392E-01 1.38E+02 4.33E+01 G
                          300.03-3.017E+00 + P 1.428E+01 7.87E+01 3.28E+00 GA

PB-214   N   9.1006E-01                                     5.84E+05
                          351.93 9.101E-01 *(P 5.974E-01 2.81E+01 3.76E+01 G
                          295.09 4.353E-01 - P 1.043E+00 8.97E+01 1.93E+01 G
                          242.00 9.902E-01 &   4.661E+00 1.40E+02 7.43E+00 GA

BI-207   C  -1.2883E-01                                     1.18E+04
                         1063.66-1.288E-01 ?(P 5.268E-01 1.38E+02 7.45E+01 G
                          569.70-3.829E-02 +   3.479E-01 2.64E+02 9.77E+01 G

BI-212   N  -5.0673E-01                                     6.98E+02
                          727.17-5.067E-01 ?(  5.086E+00 2.91E+02 7.55E+00 G
                          785.42 0.000E+00 &   2.165E+01 1.00E+03 1.28E+00 GA

U-235    N   2.9899E-01                                     2.57E+11
                          143.79-2.393E-01 *(P 2.676E+00 2.56E+02 1.10E+01 G
                          205.33 5.737E-01  (P 3.542E+00 2.26E+02 5.01E+00 G
                          163.38 1.189E+00  (P 5.000E+00 1.26E+02 5.08E+00 G
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Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
			185.72	2.346E-01	*	3.655E-01	5.91E+01	5.40E+01 GA
BI-214	N	5.8075E-01					5.84E+05	
			609.31	5.808E-01	*(P	6.712E-01	4.64E+01	4.61E+01 G
			1120.29	2.920E-01	- P	3.242E+00	3.22E+02	1.51E+01 G
			1764.49	-2.118E-02	% P	3.215E+00	4.35E+03	1.54E+01 G
BI-210M	T	-1.7489E-01					1.10E+09	
			265.83	-1.749E-01	(P	5.372E-01	8.43E+01	5.00E+01 G
			304.90	0.000E+00	+	1.675E+00	1.00E+03	2.80E+01 G
AC-228	N	4.7692E-01					2.10E+03	
			911.07	4.173E-01	&(	9.929E-01	1.02E+02	2.90E+01 G
			968.97	-5.123E-01	+	2.540E+00	1.45E+02	1.75E+01 G
			338.32	6.208E-01	?(	2.472E+00	1.18E+02	1.20E+01 G
			93.35	-1.132E+00	&	6.342E+00	1.68E+02	5.56E+00 XA
TH-227	N	6.2200E-01					7.95E+03	
			256.24	6.862E-01	&(P	2.739E+00	1.47E+02	7.00E+00 G
			235.97	5.855E-01	?(	2.717E+00	1.38E+02	1.23E+01 G
			50.14	-8.570E-01	+	2.661E+00	1.10E+02	8.00E+00 G
TH-229	N	1.0037E-01					2.68E+06	
			193.51	1.004E-01	&(	4.452E+00	1.62E+03	4.40E+00 G
			210.85	-7.450E-01	+ P	7.175E+00	3.04E+02	2.99E+00 G
TH-234	N	5.7018E-01					1.63E+12	
			92.59	3.964E-01	*(P	3.763E+00	3.33E+02	5.58E+00 G
			63.29	8.248E-01	*(P	5.753E+00	2.57E+02	3.81E+00 G
PA-231	N	-1.4478E-07					1.20E+07	
			302.65	-1.448E-07	%(	1.621E+01	3.31E+09	2.88E+00 G
			300.07	-2.355E+00	+	1.862E+01	2.35E+02	2.46E+00 G
PA-233	C	5.9885E-02					7.82E+08	
			312.01	5.988E-02	?(	9.333E-01	4.58E+02	3.60E+01 G
			300.18	2.007E-07	%	7.489E+00	1.10E+09	6.20E+00 G
PA-234	N	5.7038E-01					1.63E+12	
			131.29	3.092E-01	&(	1.409E+00	1.36E+02	1.80E+01 G
			946.02	6.796E-01	?(	1.521E+00	9.43E+01	1.34E+01 G
			569.47	2.740E-01	(	4.064E+00	4.29E+02	8.20E+00 G
			883.24	1.161E+00	?(	3.695E+00	9.42E+01	9.60E+00 G
			880.53	4.276E-01	?	6.330E+00	4.23E+02	6.00E+00 GA
PA-234M	N	3.1588E+00					1.63E+12	
			1001.00	3.159E+00	?(P	4.934E+01	4.57E+02	8.37E-01 G
			766.41	-8.524E-01	& P	1.139E+02	3.64E+03	2.94E-01 G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

AM-241   T   1.6213E-01                                      1.58E+05
                           59.54 1.621E-01 ?(  4.996E-01 1.09E+02 3.59E+01 G

Np-237   F   4.2206E-01                                      2.14E+06
                           86.49 4.221E-01 ?(  2.415E+00 1.71E+02 1.31E+01 G

Ir-192   F  -6.1411E-03                                      7.40E+01
                          316.49-1.122E-01  (  3.781E-01 1.01E+02 8.70E+01 G
                          468.06 1.722E-01 &(  5.695E-01 9.83E+01 5.18E+01 G
                          308.44 0.000E+00 &   1.489E+00 1.00E+03 3.18E+01 G

Cs-136   F   1.3865E-01                                      1.30E+01
                          818.50 1.125E-01 ?(  4.300E-01 1.13E+02 1.00E+02 G
                         1048.07 1.588E-01 ?(  3.727E-01 7.05E+01 8.00E+01 G
                          340.57 1.600E-01 ?(  6.639E-01 1.23E+02 4.69E+01 G

Np-239   T   1.6171E-01                                      2.36E+00
                          103.70-2.723E-01 &   9.737E-01 1.07E+02 2.40E+01 X
                          106.13 1.617E-01 ?(  1.124E+00 2.07E+02 2.27E+01 G
                           99.50-3.791E-01 +   1.426E+00 1.12E+02 1.50E+01 X

Nd-147      -3.9752E-01                                      1.11E+01
                          531.00-3.975E-01 &(  2.099E+00 2.11E+02 1.30E+01 G
                           91.10-2.219E-01 +   1.264E+00 1.71E+02 2.83E+01 G

TL-210   N  -4.9732E-03                                      5.84E+05
                          799.60-4.973E-03 %(  4.432E-01 2.56E+03 9.90E+01 G
                          296.00-1.080E-01 &   5.972E-01 1.65E+02 7.90E+01 G
                         1313.00-9.106E-01 +   1.981E+00 1.00E+02 2.10E+01 GA
   ( - 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
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} - 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 1 Sigma %	Activity	
PB-210	46.54	275.	-31.	-0.004	86.86	-2.327E+00	P
Sn-126	64.28	401.	17.	0.002	168.34	4.807E-01	
BA-133	80.99	168.	44.	0.006	51.83	3.370E-01	
Np-237	86.49	655.	21.	0.003	171.19	4.221E-01	
Sn-126	86.94	675.	21.	0.003	173.66	6.118E-01	
Sn-126	87.57	697.	21.	0.003	176.19	1.476E-01	
Cd-109	88.04	718.	18.	0.003	211.63	1.232E+00	
Nd-147	91.10	845.	-24.	-0.003	170.69	-2.219E-01	
AC-228	93.35	821.	-24.	-0.003	167.83	-1.132E+00	
Gd-153	97.50	198.	19.	0.003	106.10	1.658E-01	
Gd-153	103.20	376.	-25.	-0.003	112.62	-2.957E-01	
EU-152	121.78	285.	6.	0.001	378.84	5.939E-02	
EU-154	123.10	254.	13.	0.002	171.08	8.848E-02	P
CE-144	133.54	368.	-23.	-0.003	121.54	-5.626E-01	
HF-181	136.30	344.	21.	0.003	126.09	1.000E+00	
CO-57	136.47	360.	15.	0.002	186.35	3.778E-01	
Tc-99m	140.51	444.	17.	0.002	180.53	5.861E-02	
U-235	143.79	470.	-9.	-0.001	256.02	-2.393E-01	P
Ba-140	162.66	288.	21.	0.003	114.83	1.022E+00	
U-235	163.38	310.	20.	0.003	126.17	1.189E+00	P
Cf-251	176.60	187.	-10.	-0.001	253.56	-1.786E-01	
U-235	185.72	157.	39.	0.005	59.05	2.346E-01	
U-235	205.33	111.	8.	0.001	226.50	5.737E-01	P
TH-229	210.85	159.	-6.	-0.001	303.55	-7.450E-01	P
Cf-251	227.00	160.	-9.	-0.001	252.31	-5.207E-01	
PB-212	238.63	407.	-21.	-0.003	138.14	-1.812E-01	P
EU-152	244.69	390.	15.	0.002	187.36	7.603E-01	P
Cd-113m	263.70	99.	3.	0.000	623.16	2.001E+02	
BI-210M	265.83	189.	-22.	-0.003	84.28	-1.749E-01	P
Hg-203	279.20	211.	-6.	-0.001	325.32	-3.238E-02	
I-131	284.30	126.	-12.	-0.002	152.20	-8.397E-01	P
TL-210	296.00	525.	-20.	-0.003	165.18	-1.080E-01	
PB-212	300.03	508.	-23.	-0.003	78.66	-3.017E+00	P

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
PA-231	300.07	485.	-13.	-0.002	235.39	-2.355E+00	
Ba-140	304.85	485.	-13.	-0.002	235.27	-1.365E+00	
PA-233	312.01	243.	5.	0.001	458.22	5.988E-02	
Ir-192	316.49	228.	-22.	-0.003	100.81	-1.122E-01	
CR-51	320.08	262.	-23.	-0.003	103.30	-1.032E+00	
La-140	328.76	132.	-22.	-0.003	101.69	-4.919E-01	
Cf-249	333.44	103.	-5.	-0.001	408.83	-1.402E-01	
AC-228	338.32	168.	16.	0.002	118.35	6.208E-01	
Cs-136	340.57	184.	16.	0.002	123.33	1.600E-01	
EU-152	344.29	200.	16.	0.002	127.93	2.862E-01	
HF-181	345.83	212.	3.	0.000	767.62	8.535E-02	
BA-133	356.00	243.	-15.	-0.002	146.12	-1.204E-01	
I-131	364.48	95.	-19.	-0.003	99.07	-1.152E-01	
BA-133	383.84	252.	-20.	-0.003	116.57	-1.126E+00	
Cf-249	387.95	272.	-20.	-0.003	120.44	-1.542E-01	
SN-113	391.69	309.	-21.	-0.003	121.40	-1.692E-01	
AG-108M	433.94	59.	-3.	0.000	416.33	-1.978E-02	P
PM-146	453.88	64.	-4.	-0.001	394.76	-3.548E-02	
Ir-192	468.06	103.	15.	0.002	98.34	1.722E-01	
BE-7	477.59	133.	-18.	-0.002	94.93	-1.009E+00	
HF-181	482.00	130.	-3.	0.000	489.83	-2.066E-02	P
La-140	487.02	65.	-12.	-0.002	113.92	-1.613E-01	P
RU-103	497.05	44.	-2.	0.000	601.73	-1.570E-02	P
RH-106	511.86	137.	166.	0.023	12.61	5.230E+00	
Nd-147	531.00	72.	-8.	-0.001	210.65	-3.975E-01	
Ba-140	537.26	37.	8.	0.001	151.70	2.156E-01	P
CS-134	563.24	72.	-18.	-0.003	93.29	-1.486E+00	
CS-134	569.32	80.	-19.	-0.003	68.81	-8.610E-01	
BI-207	569.70	103.	-6.	-0.001	264.21	-3.829E-02	
SB-124	602.73	477.	-21.	-0.003	149.42	-1.510E-01	
CS-134	604.71	393.	-19.	-0.003	145.90	-1.418E-01	
RU-103	610.30	373.	-20.	-0.003	141.81	-2.433E+00	
AG-108M	614.28	355.	-20.	-0.003	138.06	-1.569E-01	
RH-106	621.92	214.	14.	0.002	147.31	1.045E+00	
I-131	636.97	37.	5.	0.001	184.09	5.008E-01	
CS-137	661.66	36.	13.	0.002	97.23	1.172E-01	
NB-94	702.63	74.	-8.	-0.001	231.36	-6.251E-02	
SB-124	722.79	70.	9.	0.001	135.63	6.793E-01	
BI-212	727.17	90.	-5.	-0.001	290.67	-5.067E-01	
PM-146	735.72	44.	-12.	-0.002	104.66	-4.281E-01	P
ZR-95	756.73	25.	5.	0.001	186.25	8.490E-02	P
AG-110M	763.94	54.	-10.	-0.001	99.70	-4.004E-01	P
NB-95	765.79	65.	9.	0.001	131.00	7.700E-02	
EU-152	778.92	30.	2.	0.000	678.97	1.115E-01	
CS-134	795.87	87.	-21.	-0.003	54.37	-2.114E-01	P
CS-134	801.95	18.	10.	0.001	91.03	1.030E+00	
CO-58	810.78	103.	-17.	-0.002	88.47	-1.513E-01	
La-140	815.77	115.	-18.	-0.002	89.12	-6.805E-01	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
Cs-136	818.50	93.	12.	0.002	113.00	1.125E-01		
MN-54	834.85	70.	-20.	-0.003	91.75	-1.824E-01		
NB-94	871.10	60.	-12.	-0.002	92.43	-1.184E-01		
EU-154	873.23	74.	3.	0.000	433.94	2.189E-01		
Sc-46	889.28	88.	-14.	-0.002	98.04	-1.352E-01		
Y-88	898.04	67.	-22.	-0.003	65.39	-2.262E-01		P
AC-228	911.07	33.	12.	0.002	102.35	4.173E-01		
AG-110M	937.49	51.	-17.	-0.002	90.91	-5.067E-01		
EU-152	964.11	61.	3.	0.000	419.82	1.877E-01		
AC-228	968.97	75.	-9.	-0.001	145.04	-5.123E-01		
EU-154	996.33	41.	11.	0.002	85.61	1.120E+00		
PA-234M	1001.00	61.	2.	0.000	457.15	3.159E+00		P
EU-154	1004.77	64.	-1.	0.000	855.13	-7.873E-02		
Co-56	1037.84	5.	20.	0.003	33.23	1.546E+00		
Cs-136	1048.07	27.	12.	0.002	70.54	1.588E-01		
RH-106	1050.36	45.	-2.	0.000	512.28	-1.321E+00		
BI-207	1063.66	49.	-9.	-0.001	138.14	-1.288E-01		P
Ga-68	1077.40	30.	2.	0.000	606.22	1.193E+00		
FE-59	1099.25	11.	8.	0.001	97.98	1.593E-01		P
EU-152	1112.07	62.	13.	0.002	90.32	1.099E+00		
FE-59	1291.60	5.	18.	0.002	38.06	5.379E-01		
TL-210	1313.00	37.	-14.	-0.002	100.43	-9.106E-01		
CO-60	1332.50	17.	10.	0.001	94.90	1.399E-01		P
AG-110M	1384.30	32.	-5.	-0.001	261.02	-2.876E-01		
EU-152	1408.00	5.	5.	0.001	121.64	3.150E-01		
K-40	1460.83	62.	-30.	-0.004	43.72	-4.100E+00		P
La-140	1596.21	12.	6.	0.001	142.60	9.814E-02		P
SB-124	1690.98	12.	5.	0.001	173.21	1.746E-01		
Co-56	1771.35	35.	-15.	-0.002	95.95	-1.734E+00		
Y-88	1836.06	13.	3.	0.000	286.64	5.506E-02		P

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	Time Corrected Activity Bq/Sample	Uncertainty Counting 1 Sigma	MDA Bq/Sample
BE-7	#A	-1.0087E+00	-1.0087E+00	9.493E+01%	3.21E+00
NA-22	#A	-4.3366E-03	-4.3366E-03	1.967E+03%	3.15E-01
K-40	#A	-4.0996E+00	-4.0996E+00	4.372E+01%	5.40E+00
Sc-46	#A	-1.3520E-01	-1.3520E-01	9.804E+01%	4.46E-01
CR-51	#A	-1.0323E+00	-1.0323E+00	1.033E+02%	3.56E+00
MN-54	#A	-1.8244E-01	-1.8244E-01	9.175E+01%	3.81E-01
FE-59	#A	3.2331E-01	3.2332E-01	3.806E+01%	3.61E-01
Co-56	#A	2.0158E-01	2.0158E-01	3.323E+01%	3.10E-01
CO-57	#A	4.1905E-02	4.1905E-02	1.864E+02%	2.58E-01
CO-58	#A	-1.5132E-01	-1.5132E-01	8.847E+01%	4.48E-01

CO-60	#A	1.3987E-01	1.3987E-01	9.490E+01%	2.96E-01
ZN-65	#A	0.0000E+00	0.0000E+00	1.000E+03%	9.88E-01
NB-94	#A	-6.2507E-02	-6.2507E-02	2.314E+02%	3.48E-01
ZR-95	#A	8.4902E-02	8.4903E-02	1.862E+02%	4.01E-01
NB-95	#A	7.7002E-02	7.7003E-02	1.310E+02%	3.45E-01
RU-103	#A	-1.5701E-02	-1.5701E-02	6.017E+02%	2.28E-01
RH-106	#A	1.0450E+00	1.0450E+00	1.473E+02%	5.19E+00
AG-108M	#A	-1.9778E-02	-1.9778E-02	4.163E+02%	2.38E-01
AG-110M	#A	0.0000E+00	0.0000E+00	1.000E+03%	5.35E-01
SN-113	#A	-1.6924E-01	-1.6924E-01	1.214E+02%	6.88E-01
SB-124	#A	5.4385E-03	5.4386E-03	8.864E+01%	7.55E-01
SB-125	A	2.6081E-01	2.6081E-01	9.157E+01%	6.44E-01
I-131	#A	-6.5541E-02	-6.5543E-02	9.907E+01%	2.93E-01
Gd-153	#A	1.6578E-01	1.6578E-01	1.061E+02%	5.89E-01
Ga-68	#A	1.1868E+00	1.1927E+00	6.062E+02%	1.68E+01
Tc-99m	#A	5.8558E-02	5.8613E-02	1.805E+02%	3.55E-01
BA-133	#A	-1.2036E-01	-1.2036E-01	1.461E+02%	5.92E-01
CS-134	#A	-2.1137E-01	-2.1137E-01	5.437E+01%	4.75E-01
CS-137	#A	1.1722E-01	1.1722E-01	9.723E+01%	2.74E-01
CE-139	#A	-2.2184E-03	-2.2184E-03	4.236E+03%	3.20E-01
Ba-140	#A	3.7955E-01	3.7955E-01	9.513E+01%	8.29E-01
La-140	#A	9.8138E-02	9.8140E-02	1.426E+02%	3.14E-01
CE-141	#A	3.9279E-03	3.9279E-03	4.366E+03%	5.81E-01
CE-144	#A	-5.6264E-01	-5.6264E-01	1.215E+02%	2.29E+00
PM-144	#	2.5488E-01	2.5488E-01	3.768E+01%	2.13E-01
EU-152	#A	3.2959E-01	3.2959E-01	9.032E+01%	7.63E-01
EU-154	#A	2.8533E-01	2.8533E-01	8.561E+01%	5.07E-01
EU-155	A	1.6798E-01	1.6798E-01	1.067E+02%	6.44E-01
HF-181	#A	5.3995E-02	5.3996E-02	1.261E+02%	4.18E-01
Ta-182	#A	-5.2793E-01	-5.2794E-01	9.257E+01%	1.64E+00
Hg-203	#A	-3.2383E-02	-3.2383E-02	3.253E+02%	3.58E-01
TL-208	#A	3.1867E-02	3.1867E-02	4.172E+02%	3.40E-01
PM-146	#A	-3.5483E-02	-3.5483E-02	3.948E+02%	3.55E-01
Y-88	#A	5.5056E-02	5.5056E-02	2.866E+02%	3.53E-01
Cd-113m	#A	2.0007E+02	2.0007E+02	6.232E+02%	3.27E+03
Cd-109	#A	1.2320E+00	1.2320E+00	2.116E+02%	8.72E+00
Cf-251	#A	-1.7860E-01	-1.7860E-01	2.536E+02%	1.23E+00
Cf-249	#A	-1.5418E-01	-1.5418E-01	1.204E+02%	6.22E-01
Sn-126	#A	4.8068E-01	4.8068E-01	1.683E+02%	2.72E+00
PB-210	#A	-2.3267E+00	-2.3267E+00	8.686E+01%	6.00E+00
PB-212	#A	-1.8120E-01	-1.8120E-01	1.381E+02%	8.39E-01
PB-214		9.1006E-01	9.1006E-01	2.808E+01%	5.97E-01
BI-207	#A	-1.2883E-01	-1.2883E-01	1.381E+02%	5.27E-01
BI-212	#A	-5.0673E-01	-5.0673E-01	2.907E+02%	5.09E+00
U-235	#A	2.9899E-01	2.9899E-01	1.215E+02%	2.68E+00
BI-214	#A	5.8075E-01	5.8075E-01	4.638E+01%	6.71E-01
BI-210M	#A	-1.7489E-01	-1.7489E-01	8.428E+01%	5.37E-01
AC-228	#A	4.7692E-01	4.7692E-01	7.823E+01%	9.93E-01
TH-227	A	6.2200E-01	6.2200E-01	1.011E+02%	2.74E+00

TH-229 #A	1.0037E-01	1.0037E-01	1.619E+03%		4.45E+00
TH-234 #A	5.7018E-01	5.7018E-01	2.104E+02%		3.76E+00
PA-231 #A	-1.4478E-07	-1.4478E-07	3.311E+09%		1.62E+01
PA-233 #A	5.9885E-02	5.9885E-02	4.582E+02%		9.33E-01
PA-234 A	5.7038E-01	5.7038E-01	9.421E+01%		1.41E+00
PA-234M#A	3.1588E+00	3.1588E+00	4.572E+02%		4.93E+01
AM-241 #A	1.6213E-01	1.6213E-01	1.088E+02%		5.00E-01
Np-237 #A	4.2206E-01	4.2206E-01	1.712E+02%		2.42E+00
Ir-192 #A	-6.1411E-03	-6.1411E-03	7.042E+01%		3.78E-01
Cs-136 #A	1.3864E-01	1.3865E-01	6.051E+01%		4.30E-01
Np-239 #A	1.6170E-01	1.6171E-01	2.067E+02%		1.12E+00
Nd-147 #A	-3.9751E-01	-3.9752E-01	2.107E+02%		2.10E+00
TL-210 #A	-4.9732E-03	-4.9732E-03	2.561E+03%		4.43E-01
Kr-85 #A	0.0000E+00	0.0000E+00	1.000E+03%		1.23E+02

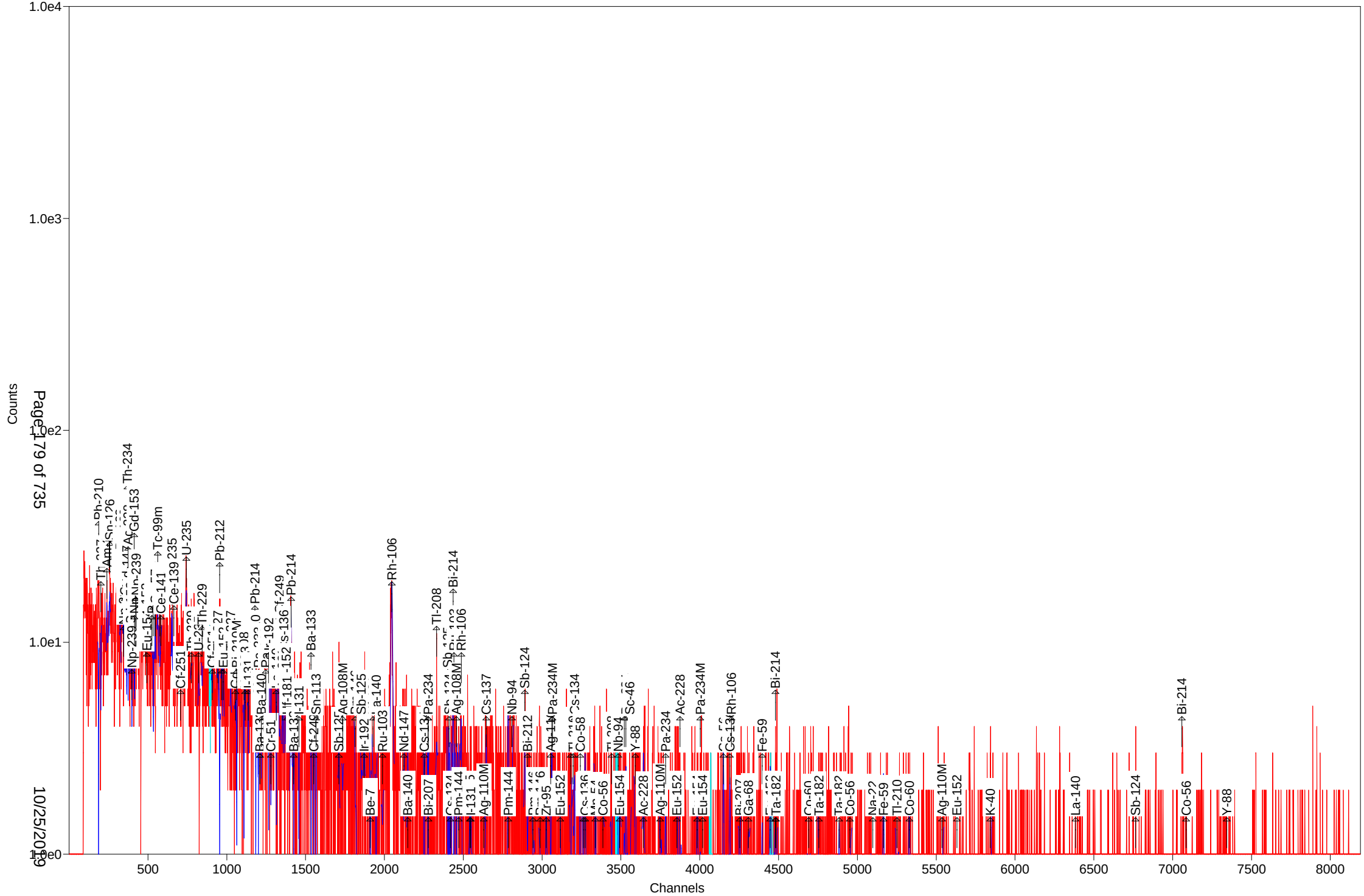
  # - All peaks for activity calculation had bad shape.
  * - Activity omitted from total
  & - Activity omitted from total and all peaks had bad shape.
  < - MDA value printed.
  A - Activity printed, but activity < MDA.
  B - Activity < MDA and failed test.
  C - Area < Critical level.
  F - Failed fraction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

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

Total Activity (25.1 to 1999.5 keV) 1.491E+00 Bq/Sample
Total Decayed Activity (25.1 to 1999.5 keV) 1.4908104E+00 Bq/Sample

(Page 21 of 21)

443730_Gamma_180-95857-B-6-B DU. 17_Gamma_20191999.spc.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1.0e3
1.0e2
1.0e1
1.0e0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
6500
7000
7500
8000
Th-234
Gd-153
Tc-99m
U-235
Pb-212
Rh-106
Bi-214
Tl-208
Pb-214
Ba-133
Sb-124
Bi-214
Co-56
Y-88
Co-56
Bi-214
Co-56
Y-88
La-140
Sb-124
K-40
Eu-152
Ag-110M
Co-60
Co-60
Ta-182
Ta-182
Co-56
Na-22
Fe-59
Tl-210
Co-60
Ta-182
Fe-59
Bi-214
Pa-234M
Pa-234
Ac-228
Pa-234M
Ac-228
Eu-152
Eu-154
Ag-110M
Eu-152
Eu-154
Ag-110M
Co-56
Eu-154
Nb-94
Sc-46
Y-88
Co-58
Cs-134
Eu-152
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Zr-95
Bi-212
Sb-124
Nb-94
Cs-137
Ag-108M
Rh-106
Pa-234
Cs-134
Be-7
Ba-140
Bi-207
Pm-144
Ag-110M
Pm-144
Ba-140
Cr-51
Ba-133
Cf-249
Sn-113
Ag-108M
Sb-125
Sb-125
Ir-192
Ru-103
Nd-147
Cs-137
Th-229
Cf-251
Np-239
Ce-141
Ce-139
235
Eu-152
Pb-212
Pb-214
Pb-214
Ba-140
Ba-133
Rh-106
Tl-208
Bi-214
Rh-106
Pb-212
Th-229
Pb-214
Pb-214
Ba-133
Ba-133
Cs-137
Nb-94
Sb-124
Pa-234M
Pa-234
Ac-228
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Rh-106
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Bi-214
Co-56
Y-88
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Co-60
Co-60
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Co-56
Na-22
Fe-59
Tl-210
Co-60
Ta-182
Fe-59
Bi-214
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Eu-154
Ag-110M
Eu-152
Eu-154
Ag-110M
Co-56
Eu-154
Nb-94
Sc-46
Y-88
Co-58
Cs-134
Eu-152
Pm-144
Zr-95
Bi-212
Sb-124
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Cs-137
Ag-108M
Rh-106
Pa-234
Cs-134
Be-7
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Bi-207
Pm-144
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Pm-144
Ba-140
Cr-51
Ba-133
Cf-249
Sn-113
Ag-108M
Sb-125
Sb-125
Ir-192
Ru-103
Nd-147
Cs-137
Th-229
Cf-251
Np-239
Ce-141
Ce-139
235
Eu-152
Pb-212
Pb-214
Pb-214
Ba-140
Ba-133
Rh-106
Tl-208
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Pb-212
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Pa-234M
Pa-234
Ac-228
Pa-234M
Rh-106
Bi-214
Bi-214
Co-56
Y-88
La-140
Sb-124
K-40
Eu-152

Test America St. Louis Spectrum ID: 17_Gamma_20191949

Sample Description: 443730_Gamma_180-95857-B-7-A
Detector: Detector #17
Batch ID: 443730
Work Order Number: Gamma
Lot Number: 180-95857-B-7-A

Decay to Time: 10/14/2019 09:19 Live Time: 7200 sec
Acquisition Time: 10/14/2019 09:20:00 Real Time: 7233 sec
Analysis Time: 10/14/2019 11:20 Dead Time: 0.46 %
Analysis Quantity: 1.000E+00 Sample

Efficiency Cal File: 17_Liquid_Marinelli 1L.Clb
Efficiency Cal Desc: 17_1L marn_90062_030512
Efficiency Cal Date: 3/7/2012 11:47
Energy Cal Date: 2/29/2012 10:33
Library: Client_Long_Rev15.lib
Bkgd Correction File: 17_2019-10-06_1931.PBC

Nuclide	Activity Bq/Sample	1-Sigma Counting Uncert %	1-Sigma Counting Uncert Bq/Sample	1-Sigma Total Uncert Bq/Sample	Minimum Detectable Activity Bq/Sample
BE-7	2.842E-01	302.7	8.602E-01	8.604E-01	2.958E+00
NA-22	-3.903E-02	197.2	7.697E-02	7.699E-02	2.778E-01
K-40	-5.765E-01	264.1	1.522E+00	1.523E+00	4.377E+00
Sc-46	3.208E-03	3442.4	1.104E-01	1.104E-01	3.895E-01
CR-51	2.282E-01	335.3	7.650E-01	7.651E-01	2.622E+00
MN-54	2.195E-01	38.9	8.531E-02	8.600E-02	1.843E-01
FE-59	3.021E-02	821.1	2.480E-01	2.480E-01	5.772E-01
Co-56	1.189E-01	89.8	1.067E-01	1.069E-01	2.781E-01
CO-57	4.833E-02	134.4	6.497E-02	6.502E-02	2.705E-01
CO-58	1.020E-01	90.1	9.190E-02	9.204E-02	3.103E-01
CO-60	-3.170E-02	528.1	1.674E-01	1.674E-01	3.343E-01
ZN-65	0.000E+00	1.#INF	3.244E-02	3.244E-02	9.499E-01
NB-94	4.963E-02	123.7	6.140E-02	6.145E-02	2.594E-01
ZR-95	3.346E-02	246.2	8.237E-02	8.238E-02	2.363E-01
NB-95	4.379E-02	162.2	7.101E-02	7.104E-02	2.483E-01
RU-103	-9.019E-02	101.5	9.155E-02	9.166E-02	3.081E-01
RH-106	-1.280E+00	150.0	1.920E+00	1.921E+00	6.443E+00
AG-108M	2.755E-02	346.2	9.538E-02	9.539E-02	2.514E-01
AG-110M	1.616E-01	78.9	1.276E-01	1.278E-01	5.213E-01
SN-113	-3.521E-02	449.3	1.582E-01	1.582E-01	5.402E-01
SB-124	-1.247E-01	150.4	1.875E-01	1.876E-01	6.295E-01
SB-125	1.121E-02	300.0	3.362E-02	3.362E-02	7.316E-01
I-131	8.411E-04	208.8	1.756E-03	1.756E-03	2.767E-01
Gd-153	1.747E-01	114.6	2.003E-01	2.006E-01	6.707E-01
Ga-68	-4.802E+00	141.9	6.814E+00	6.819E+00	1.561E+01
Tc-99m	7.975E-02	127.9	1.020E-01	1.021E-01	3.412E-01
BA-133	-1.229E-01	125.0	1.537E-01	1.538E-01	3.962E-01
CS-134	-5.428E-02	56.5	3.065E-02	3.077E-02	4.902E-01
CS-137	1.172E-01	90.4	1.060E-01	1.061E-01	3.568E-01
CE-139	7.577E-02	111.1	8.421E-02	8.449E-02	2.821E-01
Ba-140	3.217E-01	116.0	3.733E-01	3.737E-01	7.868E-01
La-140	-1.703E-02	219.3	3.735E-02	3.736E-02	3.712E-01
CE-141	-1.444E-01	111.5	1.609E-01	1.611E-01	4.304E-01

CE-144	-4.047E-01	202.3	8.189E-01	8.192E-01	2.746E+00
PM-144	-2.808E-02	434.0	1.218E-01	1.218E-01	3.022E-01
EU-152	2.401E-01	106.0	2.545E-01	2.548E-01	7.806E-01
EU-154	1.470E-01	87.7	1.289E-01	1.292E-01	5.718E-01
EU-155	-7.514E-02	544.2	4.089E-01	4.089E-01	1.151E+00
HF-181	4.856E-02	233.3	1.133E-01	1.133E-01	3.866E-01
Ta-182	4.888E-01	90.8	4.437E-01	4.443E-01	1.490E+00
Hg-203	9.292E-02	101.0	9.387E-02	9.402E-02	3.147E-01
TL-208	8.289E-02	142.6	1.182E-01	1.183E-01	3.005E-01
PM-146	2.863E-02	201.5	5.769E-02	5.771E-02	3.547E-01
Y-88	-1.263E-01	108.4	1.369E-01	1.371E-01	4.171E-01
Cd-113m	-6.669E+02	190.3	1.269E+03	1.270E+03	4.304E+03
Cd-109	0.000E+00	1.#INF	1.200E+00	1.200E+00	8.616E+00
Cf-251	-3.018E-01	149.6	4.514E-01	4.521E-01	1.216E+00
Cf-249	0.000E+00	1.#INF	7.425E-02	7.425E-02	4.883E-01
Sn-126	-7.214E-01	117.6	8.485E-01	8.494E-01	2.833E+00
PB-210	3.448E-01	550.0	1.896E+00	1.897E+00	5.365E+00
PB-212	-1.888E-01	123.7	2.336E-01	2.339E-01	7.837E-01
PB-214	-2.067E-03	10766.6	2.225E-01	2.225E-01	7.365E-01
BI-207	-3.000E-01	47.6	1.428E-01	1.435E-01	5.011E-01
BI-212	1.740E+00	95.9	1.668E+00	1.670E+00	5.601E+00
U-235	2.547E-01	137.8	3.510E-01	3.513E-01	2.592E+00
BI-214	3.944E-01	58.2	2.297E-01	2.306E-01	6.192E-01
BI-210M	1.364E-01	107.6	1.469E-01	1.471E-01	4.900E-01
AC-228	1.625E-01	143.6	2.333E-01	2.335E-01	9.929E-01
TH-227	-1.134E+00	50.6	5.731E-01	5.772E-01	3.670E+00
TH-229	-7.026E-01	238.4	1.675E+00	1.676E+00	4.548E+00
TH-234	2.127E+00	71.7	1.526E+00	1.531E+00	3.955E+00
PA-231	2.504E+00	123.2	3.085E+00	3.088E+00	1.392E+01
PA-233	3.339E-01	102.3	3.417E-01	3.422E-01	7.424E-01
PA-234	1.241E-01	82.0	1.017E-01	1.019E-01	1.606E+00
PA-234M	-8.022E-01	1408.8	1.130E+01	1.130E+01	3.928E+01
AM-241	-5.495E-02	367.4	2.019E-01	2.019E-01	5.773E-01
Np-237	-4.610E-01	168.9	7.787E-01	7.791E-01	2.600E+00
Ir-192	0.000E+00	1.#INF	3.940E-02	3.940E-02	3.073E-01
Cs-136	-7.501E-02	148.4	1.113E-01	1.114E-01	3.811E-01
Np-239	2.403E-01	120.7	2.901E-01	2.905E-01	9.715E-01
Nd-147	2.981E-01	200.0	5.963E-01	5.965E-01	1.524E+00
TL-210	3.695E-02	163.5	6.040E-02	6.043E-02	4.416E-01
Kr-85	2.213E+01	148.0	3.276E+01	3.278E+01	1.103E+02
Total	3.408E+01				

Analyst: Caleb Quinn

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Sample description
443730_Gamma_180-95857-B-7-A

Spectrum Filename: C:\User\SPC\Det17\17_Gamma_20191949.An1

Acquisition information
Start time: 10/14/2019 9:20:00 AM
Live time: 7200
Real time: 7233
Dead time: 0.46 %
Detector ID: 17

Detector system
Ge17 SN/11080671

Calibration
Filename: 17_Liquid_Marinelli 1L.Clb
17_1L marn_90062_030512

Energy Calibration
Created: 2/29/2012 10:33:23 AM
Zero offset: 0.108 keV
Gain: 0.250 keV/channel
Quadratic: -2.584E-08 keV/channel^2

Efficiency Calibration
Created: 3/7/2012 11:47:27 AM
Knee Energy: 165.85 keV
Above the Knee: Quadratic Uncertainty = 2.09 %
Log(Eff): -2.094103E+00 + (1.788156E-01*Log(E)) + (-7.283143E-02*Log(E)^2)
Below the Knee: Quadratic Uncertainty = 0.66 %
Log(Eff): -1.201018E+01 + (4.016685E+00*Log(E)) + (-4.439774E-01*Log(E)^2)

Library Files
Main analysis library: Client_Long_Rev15.lib
Library Match Width: 0.500
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G800W064
Start channel: 100 (25.12keV)
Stop channel: 8000 (1999.54keV)
Peak rejection level: 1000.000%
Peak search sensitivity: 3
Sample Size: 1.0000E+00 +/- 0.000E+00%
Activity scaling factor: 1.0000E+00/(1.0000E+00* 1.0000E+00) = 1.0000E+00
Detection limit method: Reg. Guide 4.16 Method

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Random error: 4.0000000E+00
Systematic error: 4.0000000E+00
Fraction Limit: 0.000%
Background width: 3
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:	YES	10/14/2019 9:19:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	17_2019-10-06_1931.PBC 10/6/2019 7:31:18 PM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 9 cutoff: 5.00E+01 %
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
46.67	5.	550.04	1.05	4.360E-02	46.54	4.250	PBC<MDA	PB210
50.13	4.	552.55	0.78	4.551E-02	50.14	8.000	PBC<MDA	TH227
63.44	4.	731.40	1.25	5.038E-02	63.29	3.810	PBC<MDA	TH234
92.72	46.	71.72	1.00	5.364E-02	92.59	5.584	PBC<MDA	TH234
					93.35	5.561	2.136E+00	AC228
97.41	20.	114.60	0.82	5.357E-02	97.50	30.000	PBC<MDA	Gd153
99.50	5.	448.39	0.82	5.350E-02	99.50	15.000	PBC<MDA	Np239
105.31	-6.	544.20	0.83	5.322E-02	105.31	21.200	PBC<MDA	EU155
106.13	21.	120.72	0.83	5.317E-02	106.13	22.700	PBC<MDA	Np239
136.47	24.	134.41	0.86	5.010E-02	136.30	5.850	PBC<MDA	HF181
					136.47	10.680	6.154E-01	CO57
140.51	23.	127.94	0.86	4.957E-02	140.51	89.300	PBC<MDA	Tc99m
162.66	11.	215.71	0.88	4.648E-02	162.66	6.220	PBC<MDA	Ba140
165.85	20.	111.14	0.89	4.583E-02	165.85	79.900	PBC<MDA	CE139
185.91	-10.	253.34	1.47	4.292E-02	185.72	54.000	-6.168E-02	U235
205.33	13.	137.80	0.92	4.048E-02	205.33	5.010	PBC<MDA	U235
235.32	18.	133.79	0.95	3.721E-02	235.97	12.300	PBC<MDA	TH227
238.63	-22.	123.72	0.95	3.695E-02	238.63	43.300	PBC<MDA	PB212
242.00	19.	140.88	0.96	3.663E-02	242.00	7.430	PBC<MDA	PB214
244.69	14.	165.46	0.96	3.638E-02	244.69	7.580	PBC<MDA	EU152
253.27	18.	49.27	0.47	3.560E-02				
265.83	17.	107.64	0.98	3.453E-02	265.83	50.000	PBC<MDA	BI210M

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
279.20	18.	101.02	0.99	3.347E-02	279.20	81.460	PBC<MDA	Hg203
295.09	-5.	517.00	1.01	3.229E-02	295.09	19.300	PBC<MDA	PB214
296.00	15.	163.47	1.01	3.223E-02	296.00	79.000	PBC<MDA	TL210
300.03	12.	206.66	1.01	3.195E-02	300.03	3.280	PBC<MDA	PB212
					300.07	2.460	PBC<MDA	PA231
					300.18	6.200	PBC<MDA	PA233
300.07	15.	170.70	1.01	3.194E-02	300.03	3.280	PBC<MDA	PB212
					300.07	2.460	2.706E+00	PA231
					300.18	6.200	1.074E+00	PA233
300.18	15.	174.45	1.01	3.194E-02	300.03	3.280	PBC<MDA	PB212
					300.07	2.460	2.707E+00	PA231
					300.18	6.200	1.074E+00	PA233
302.65	15.	177.75	1.01	3.177E-02	302.65	2.880	PBC<MDA	PA231
					302.85	18.330	3.663E-01	BA133
312.01	17.	107.08	1.02	3.114E-02	312.01	36.000	PBC<MDA	PA233
320.08	5.	335.26	1.03	3.062E-02	320.08	9.940	PBC<MDA	CR51
344.29	18.	119.51	1.05	2.917E-02	344.29	26.500	PBC<MDA	EU152
383.84	7.	244.19	1.09	2.709E-02	383.84	8.940	PBC<MDA	BA133
433.94	4.	346.22	1.13	2.487E-02	433.94	90.480	PBC<MDA	AG108M
477.60	5.	302.65	1.17	2.322E-02	477.60	10.520	PBC<MDA	BE7
482.00	6.	233.34	1.18	2.307E-02	482.00	80.500	PBC<MDA	HF181
487.02	5.	272.38	1.18	2.290E-02	487.02	45.500	PBC<MDA	La140
511.86	153.	12.86	2.45	2.209E-02	511.86	20.000	4.810E+00	RH106
514.18	15.	148.05	1.20	2.202E-02	513.98	0.430	PBC<MDA	Kr85
531.00	6.	200.00	1.22	2.150E-02	531.00	13.000	PBC<MDA	Nd147
537.26	10.	116.03	1.22	2.132E-02	537.26	24.390	PBC<MDA	Ba140
563.24	11.	95.40	1.25	2.058E-02	563.24	8.350	PBC<MDA	CS134
583.02	10.	142.64	1.26	2.006E-02	583.02	84.500	PBC<MDA	TL208
604.71	16.	145.35	1.28	1.952E-02	604.71	97.620	PBC<MDA	CS134
609.48	25.	58.25	2.68	1.941E-02	609.31	46.090	PBC<MDA	BI214
					610.30	5.750	3.165E+00	RU103
610.30	11.	226.61	1.29	1.938E-02	610.30	5.750	PBC<MDA	RU103
635.89	3.	300.00	1.31	1.879E-02	635.89	11.310	PBC<MDA	SB125
636.97	4.	262.06	1.31	1.876E-02	636.97	7.170	PBC<MDA	I131
661.66	13.	90.42	1.33	1.823E-02	661.66	85.210	PBC<MDA	CS137
702.63	4.	322.59	1.37	1.740E-02	702.63	97.900	PBC<MDA	NB94
723.36	5.	345.08	1.39	1.701E-02	722.79	10.810	PBC<MDA	SB124
					722.94	90.840	4.192E-02	AG108M
					723.36	20.220	1.884E-01	EU154
727.17	16.	95.87	1.39	1.694E-02	727.17	7.550	PBC<MDA	BI212
747.16	6.	201.50	1.41	1.659E-02	747.16	34.000	PBC<MDA	PM146
756.73	2.	246.17	1.41	1.642E-02	756.73	54.460	PBC<MDA	ZR95
763.94	9.	78.92	1.42	1.630E-02	763.94	22.280	PBC<MDA	AG110M
765.79	5.	162.17	1.42	1.627E-02	765.79	99.790	PBC<MDA	NB95
					766.41	0.294	PBC<MDA	PA234M
778.92	9.	134.09	1.43	1.605E-02	778.92	12.940	PBC<MDA	EU152
810.78	11.	90.08	1.46	1.555E-02	810.78	99.460	PBC<MDA	CO58
815.77	2.	550.12	1.47	1.547E-02	815.77	23.280	PBC<MDA	La140

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
834.85	24.	38.86	1.48	1.519E-02	834.85	99.980	2.195E-01	MN54
846.77	9.	148.15	1.49	1.502E-02	846.77	99.935	PBC<MDA	Co56
871.10	7.	123.72	1.51	1.468E-02	871.10	99.890	PBC<MDA	NB94
873.23	4.	214.44	1.51	1.465E-02	873.23	12.270	PBC<MDA	EU154
880.53	11.	91.36	1.52	1.455E-02	880.53	6.000	PBC<MDA	PA234
883.24	11.	101.04	1.52	1.451E-02	883.24	9.600	PBC<MDA	PA234
884.68	3.	449.39	1.52	1.450E-02	884.68	72.680	PBC<MDA	AG110M
946.02	2.	523.72	1.57	1.373E-02	946.02	13.400	PBC<MDA	PA234
964.11	7.	130.15	1.59	1.351E-02	964.11	14.605	PBC<MDA	EU152
968.97	7.	143.57	1.59	1.346E-02	968.97	17.460	PBC<MDA	AC228
996.33	8.	87.73	1.62	1.315E-02	996.33	10.600	PBC<MDA	EU154
1037.84	2.	606.22	1.65	1.271E-02	1037.84	14.130	PBC<MDA	Co56
1099.25	1.	821.07	1.70	1.212E-02	1099.25	56.500	PBC<MDA	FE59
1112.07	2.	583.10	1.71	1.200E-02	1112.07	13.644	PBC<MDA	EU152
1119.92	-1.	838.24	1.72	1.193E-02	1120.29	15.100	PBC<MDA	BI214
					1120.55	99.987	PBC<MDA	Sc46
1121.30	15.	90.77	1.72	1.192E-02	1120.55	99.987	PBC<MDA	Sc46
					1121.30	34.900	4.888E-01	Ta182
1238.28	9.	89.79	1.81	1.095E-02	1238.28	66.070	PBC<MDA	Co56
1313.00	8.	119.02	1.87	1.041E-02	1313.00	21.000	PBC<MDA	TL210
1384.30	6.	123.77	1.93	9.942E-03	1384.30	24.290	PBC<MDA	AG110M
1408.00	3.	308.52	1.94	9.796E-03	1408.00	21.005	PBC<MDA	EU152
1460.83	-4.	264.09	1.98	9.483E-03	1460.83	10.670	PBC<MDA	K40
1771.35	9.	100.30	2.22	7.978E-03	1771.35	15.480	PBC<MDA	Co56

********** 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	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide	
1012.65	253.27	40.	25.	7.030E+02	40.93	0.968	-	sD

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

This section based on library: Client_Long_Rev15.lib

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********** 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 1 Sigma %	FWHM keV
PB-210	186.14	46.67	218.	5.	0.001	550.04	1.053s
TH-227	200.03	50.14	171.	4.	0.001	552.55	0.778s
AM-241	237.59	59.54	231.	-7.	-0.001	367.42	0.787s
TH-234	253.20	63.44	252.	4.	0.001	731.40	1.249s
Sn-126	256.56	64.28	438.	-26.	-0.004	117.62	0.792s
BA-133	323.36	80.99	168.	-13.	-0.002	170.10	0.807s
Np-237	345.35	86.49	762.	-23.	-0.003	168.91	0.813s
EU-155	345.56	86.54	738.	-15.	-0.002	251.09	0.813s
Sn-126	349.67	87.57	700.	0.	0.000	1000.00	0.814s
Cd-109	351.55	88.04	700.	0.	0.000	1000.00	0.814s
Nd-147	363.79	91.10	700.	0.	0.000	1000.00	0.817s
TH-234	370.25	92.72	314.	46.	0.006	71.72	0.997s
AC-228	372.78	93.35	700.	0.	0.000	1000.00	0.819s
Gd-153	389.37	97.50	258.	20.	0.003	114.60	0.823s
Np-239	397.37	99.50	296.	5.	0.001	448.39	0.825s
Gd-153	412.16	103.20	346.	-22.	-0.003	118.85	0.828s
Np-239	414.16	103.70	368.	-5.	-0.001	525.01	0.829s
EU-155	420.61	105.31	379.	-6.	-0.001	544.20	0.830s
Np-239	423.88	106.13	300.	21.	0.003	120.72	0.831s
EU-152	486.45	121.78	299.	-24.	-0.003	105.98	0.846s
CO-57	487.57	122.06	322.	-7.	-0.001	356.64	0.846s
EU-154	491.73	123.10	326.	-14.	-0.002	234.93	0.847s
PA-234	524.49	131.29	487.	-24.	-0.003	129.08	0.855s
HF-181	531.41	133.02	512.	-25.	-0.003	131.95	0.856s
CE-144	533.46	133.54	536.	-16.	-0.002	202.34	0.857s
HF-181	544.50	136.30	553.	0.	0.000	1000.00	0.859s
CO-57	545.20	136.47	496.	24.	0.003	134.41	0.859s
Tc-99m	561.34	140.51	408.	23.	0.003	127.94	0.863s
CE-141	581.05	145.44	228.	-25.	-0.003	111.47	0.868s
Ba-140	649.90	162.66	276.	11.	0.002	215.71	0.884
U-235	652.78	163.38	224.	-7.	-0.001	453.99	0.885s
CE-139	662.67	165.85	236.	20.	0.003	111.14	0.887s
Cf-251	705.64	176.60	183.	-16.	-0.002	149.58	0.897s
U-235	742.10	185.72	243.	-13.	-0.002	176.18	0.905s
TH-229	773.25	193.51	153.	-9.	-0.001	238.35	0.913s
U-235	820.52	205.33	97.	13.	0.002	137.80	0.924s
TH-229	842.58	210.85	133.	-18.	-0.002	103.85	0.929s
Cf-251	907.16	227.00	113.	-6.	-0.001	301.75	0.944s
TH-227	943.03	235.97	294.	18.	0.003	133.79	0.952s
PB-212	953.67	238.63	353.	-22.	-0.003	123.72	0.955s
PB-214	967.13	242.00	331.	19.	0.003	140.88	0.958s
EU-152	977.91	244.69	277.	14.	0.002	165.46	0.960s
TH-227	1024.08	256.24	181.	-20.	-0.003	50.56	0.971s
Cd-113m	1053.91	263.70	176.	-10.	-0.001	190.26	0.978s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-210M	1062.44	265.83	156.	17.	0.002	107.64	0.979s
TL-208	1108.23	277.28	180.	-21.	-0.003	94.51	0.990s
Hg-203	1115.89	279.20	161.	18.	0.003	101.02	0.992s
I-131	1136.28	284.30	119.	-5.	-0.001	378.57	0.996s
PB-214	1179.43	295.09	308.	-5.	-0.001	517.00	1.006s
TL-210	1183.07	296.00	303.	15.	0.002	163.47	1.007s
PB-212	1199.19	300.03	322.	12.	0.002	206.66	1.011s
PA-231	1199.35	300.07	334.	15.	0.002	170.70	1.011s
PA-233	1199.79	300.18	349.	15.	0.002	174.45	1.011s
PA-231	1209.66	302.65	365.	15.	0.002	177.75	1.013s
Ir-192	1232.82	308.44	135.	-19.	-0.003	90.81	1.019s
PA-233	1247.10	312.01	151.	17.	0.002	107.08	1.022s
Ir-192	1265.01	316.49	148.	0.	0.000	1000.00	1.026s
CR-51	1279.38	320.08	138.	5.	0.001	335.26	1.029
La-140	1314.07	328.76	106.	-12.	-0.002	158.99	1.037s
Cf-249	1332.79	333.44	114.	-6.	-0.001	354.48	1.041s
AC-228	1352.30	338.32	238.	-19.	-0.003	117.92	1.046s
Cs-136	1361.30	340.57	257.	-19.	-0.003	124.07	1.048s
EU-152	1376.16	344.29	229.	18.	0.003	119.51	1.051s
HF-181	1382.33	345.83	245.	-11.	-0.002	201.49	1.053s
BA-133	1423.00	356.00	105.	-16.	-0.002	125.04	1.062
I-131	1456.93	364.48	84.	-5.	-0.001	325.03	1.070
BA-133	1534.34	383.84	157.	7.	0.001	244.19	1.087s
Cf-249	1550.77	387.95	164.	0.	0.000	1000.00	1.091
SN-113	1565.73	391.69	187.	-4.	-0.001	449.26	1.094s
SB-125	1710.44	427.88	61.	-3.	0.000	553.07	1.127s
AG-108M	1734.69	433.94	67.	4.	0.001	346.22	1.132
PM-146	1814.44	453.88	64.	-4.	-0.001	394.76	1.150s
SB-125	1852.38	463.37	144.	-18.	-0.003	94.72	1.158s
Ir-192	1871.15	468.06	183.	-19.	-0.003	101.36	1.163s
BE-7	1909.29	477.59	112.	5.	0.001	302.65	1.171s
HF-181	1926.89	482.00	111.	6.	0.001	233.34	1.175s
La-140	1946.98	487.02	45.	5.	0.001	272.38	1.180
RU-103	1987.11	497.05	84.	-13.	-0.002	101.51	1.188s
RH-106	2046.35	511.86	117.	153.	0.021	12.86	2.452s
Kr-85	2054.81	513.98	242.	15.	0.002	148.05	1.203s
Nd-147	2122.88	531.00	36.	6.	0.001	200.00	1.219s
Ba-140	2147.92	537.26	33.	10.	0.001	116.03	1.224s
CS-134	2251.82	563.24	24.	11.	0.001	95.40	1.247s
CS-134	2276.15	569.32	58.	-3.	0.000	328.63	1.252s
PA-234	2276.75	569.47	62.	0.	0.000	1000.00	1.253s
BI-207	2277.67	569.70	73.	-7.	-0.001	176.32	1.253s
TL-208	2330.95	583.02	53.	10.	0.001	142.64	1.264s
SB-125	2400.86	600.50	352.	-24.	-0.003	64.30	1.280s
SB-124	2409.78	602.73	328.	-17.	-0.002	150.41	1.282s
CS-134	2417.70	604.71	265.	16.	0.002	145.35	1.284s
BI-214	2436.79	609.48	64.	25.	0.004	58.25	2.677s
RU-103	2440.05	610.30	281.	11.	0.001	226.61	1.288s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
AG-108M	2455.98	614.28	292.	0.	0.000	1000.00	1.292s
PM-144	2471.11	618.06	292.	0.	0.000	1000.00	1.295s
RH-106	2486.52	621.92	335.	-17.	-0.002	150.00	1.299s
SB-125	2542.41	635.89	39.	3.	0.000	300.00	1.311s
I-131	2546.75	636.97	44.	4.	0.001	262.06	1.312s
AG-110M	2629.90	657.76	68.	-9.	-0.001	163.41	1.330s
CS-137	2645.49	661.66	64.	13.	0.002	90.42	1.333
PM-144	2785.03	696.54	57.	-4.	0.000	433.96	1.363s
NB-94	2809.38	702.63	39.	4.	0.001	322.59	1.368s
SB-124	2890.01	722.79	112.	-19.	-0.003	80.93	1.386s
AG-108M	2890.61	722.94	131.	-15.	-0.002	113.06	1.386s
EU-154	2892.30	723.36	127.	5.	0.001	345.08	1.386s
ZR-95	2895.66	724.20	123.	0.	0.000	1000.00	1.387s
BI-212	2907.54	727.17	110.	16.	0.002	95.87	1.390s
PM-146	2941.74	735.72	44.	-12.	-0.002	131.99	1.397s
PM-146	2987.51	747.16	35.	6.	0.001	201.50	1.407s
ZR-95	3025.79	756.73	7.	2.	0.000	246.17	1.415s
AG-110M	3054.64	763.94	22.	9.	0.001	78.92	1.421s
NB-95	3062.03	765.79	32.	5.	0.001	162.17	1.423s
PA-234M	3064.52	766.41	69.	-15.	-0.002	51.39	1.423s
EU-152	3114.56	778.92	30.	9.	0.001	134.09	1.434s
BI-212	3140.56	785.42	43.	-10.	-0.001	133.71	1.440s
CS-134	3182.36	795.87	93.	-14.	-0.002	60.46	1.448s
TL-210	3197.29	799.60	101.	0.	0.000	1000.00	1.451s
CO-58	3241.99	810.78	47.	11.	0.002	90.08	1.461
La-140	3261.97	815.77	58.	2.	0.000	550.12	1.465s
Cs-136	3272.90	818.50	72.	-8.	-0.001	148.43	1.467s
MN-54	3338.30	834.85	14.	24.	0.003	38.86	1.481s
Co-56	3385.99	846.77	34.	9.	0.001	148.15	1.491s
TL-208	3441.18	860.56	47.	-4.	-0.001	398.65	1.503s
NB-94	3483.32	871.10	34.	7.	0.001	123.72	1.512s
EU-154	3491.85	873.23	38.	4.	0.001	214.44	1.514s
PA-234	3521.06	880.53	41.	11.	0.001	91.36	1.520s
PA-234	3531.90	883.24	52.	11.	0.001	101.04	1.522s
AG-110M	3537.67	884.68	62.	3.	0.000	449.39	1.523s
AG-110M	3748.95	937.49	42.	-15.	-0.002	95.22	1.567s
PA-234	3783.07	946.02	33.	2.	0.000	523.72	1.574s
EU-152	3855.45	964.11	38.	7.	0.001	130.15	1.589s
AC-228	3874.90	968.97	47.	7.	0.001	143.57	1.593s
EU-154	3984.36	996.33	20.	8.	0.001	87.73	1.616s
EU-154	4018.15	1004.77	28.	-3.	0.000	396.18	1.623s
Co-56	4150.45	1037.84	30.	2.	0.000	606.22	1.650s
Cs-136	4191.39	1048.07	35.	-4.	-0.001	215.06	1.658s
RH-106	4200.55	1050.36	57.	-3.	0.000	325.88	1.661s
BI-207	4253.77	1063.66	44.	-20.	-0.003	47.59	1.671s
Ga-68	4308.74	1077.40	25.	-8.	-0.001	141.88	1.683s
FE-59	4396.18	1099.25	31.	1.	0.000	821.07	1.700s
EU-152	4447.49	1112.07	67.	2.	0.000	583.10	1.711s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
ZN-65	4461.38	1115.55	69.	0.	0.000	1000.00	1.713s
BI-214	4480.35	1120.29	70.	-1.	0.000	838.24	1.717s
Sc-46	4481.41	1120.55	100.	-18.	-0.002	82.39	1.717
Ta-182	4484.41	1121.30	81.	15.	0.002	90.77	1.718s
CO-60	4692.24	1173.24	32.	-9.	-0.001	140.59	1.760s
Ta-182	4755.52	1189.05	40.	-6.	-0.001	235.31	1.772s
Co-56	4952.53	1238.28	11.	9.	0.001	89.79	1.812s
NA-22	5097.60	1274.53	16.	-3.	0.000	197.20	1.840s
EU-154	5097.64	1274.54	19.	0.	0.000	1000.00	1.840s
FE-59	5165.90	1291.60	21.	-3.	0.000	319.69	1.854s
TL-210	5251.56	1313.00	16.	8.	0.001	119.02	1.870s
CO-60	5329.61	1332.50	22.	-2.	0.000	528.15	1.886s
AG-110M	5536.92	1384.30	11.	6.	0.001	123.77	1.926s
EU-152	5631.79	1408.00	16.	3.	0.000	308.52	1.944s
K-40	5843.25	1460.83	39.	-4.	-0.001	264.09	1.985s
La-140	6385.15	1596.21	18.	-5.	-0.001	236.81	2.087s
SB-124	6764.55	1690.98	18.	-7.	-0.001	151.19	2.157s
BI-214	7058.84	1764.49	50.	-14.	-0.002	50.80	2.211s
Co-56	7086.31	1771.35	35.	9.	0.001	100.30	2.216s
Y-88	7345.39	1836.06	19.	-7.	-0.001	108.40	2.262s

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	2.8423E-01				5.31E+01	
			477.60	2.842E-01	?(	2.958E+00 3.03E+02 1.05E+01	G
NA-22	C	-3.9029E-02				9.50E+02	
			1274.53	-3.903E-02	?(	2.778E-01 1.97E+02 9.99E+01	G
K-40	N	-5.7650E-01				4.66E+11	
			1460.83	-5.765E-01	&(P	4.377E+00 2.64E+02 1.07E+01	G
Sc-46	F	3.2078E-03				8.38E+01	
			889.28	3.208E-03	%(	3.895E-01 3.44E+03 1.00E+02	G
			1120.55	-2.088E-01	+	5.745E-01 8.24E+01 1.00E+02	G
CR-51	F	2.2818E-01				2.77E+01	
			320.08	2.282E-01	?(	2.622E+00 3.35E+02 9.94E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
MN-54	C 2.1951E-01					3.12E+02	
		834.85	2.195E-01	&(	1.843E-01	3.89E+01	1.00E+02 G
FE-59	F 3.0208E-02					4.45E+01	
		1099.25	3.021E-02	(P	5.772E-01	8.21E+02	5.65E+01 G
		1291.60	-1.015E-01	+	7.378E-01	3.20E+02	4.32E+01 G
Co-56	C 1.1889E-01					7.73E+01	
		846.77	7.934E-02	?(P	2.781E-01	1.48E+02	9.99E+01 G
		1238.28	1.711E-01	?(	3.442E-01	8.98E+01	6.61E+01 G
		1037.84	1.546E-01	(	2.183E+00	6.06E+02	1.41E+01 G
		1771.35	9.934E-01	?	3.398E+00	1.00E+02	1.55E+01 A
CO-57	C 4.8334E-02					2.72E+02	
		122.06	-2.242E-02	?(	2.705E-01	3.57E+02	8.56E+01 G
		136.47	6.154E-01	?(	2.764E+00	1.34E+02	1.07E+01 G
CO-58	C 1.0202E-01					7.09E+01	
		810.78	1.020E-01	?(	3.103E-01	9.01E+01	9.95E+01 G
CO-60	F -3.1701E-02					1.93E+03	
		1332.50	-3.170E-02	?(P	3.343E-01	5.28E+02	1.00E+02 G
		1173.24	-1.051E-01	+ P	3.508E-01	1.41E+02	9.99E+01 G
NB-94	I 4.9630E-02					7.41E+06	
		702.63	3.261E-02	?(	2.594E-01	3.23E+02	9.79E+01 G
		871.10	6.631E-02	?(	2.831E-01	1.24E+02	9.99E+01 G
ZR-95	I 3.3459E-02					6.40E+01	
		756.73	3.346E-02	?(P	2.363E-01	2.46E+02	5.45E+01 G
		724.20	0.000E+00	-	1.005E+00	1.00E+03	4.42E+01 G
NB-95	I 4.3786E-02					6.40E+01	
		765.79	4.379E-02	?(	2.483E-01	1.62E+02	9.98E+01 G
RU-103	I -9.0188E-02					3.93E+01	
		497.05	-9.019E-02	?(P	3.081E-01	1.02E+02	9.09E+01 G
		610.30	1.317E+00	&	1.008E+01	2.27E+02	5.75E+00 GA
RH-106	I -1.2798E+00					3.74E+02	
		621.92	-1.280E+00	&(	6.443E+00	1.50E+02	9.93E+00 G
		1050.36	-2.358E+00	+	2.687E+01	3.26E+02	1.56E+00 G
		511.86	4.810E+00	?	1.670E+00	1.29E+01	2.00E+01 GA
AG-108M	C 2.7548E-02					1.53E+05	
		433.94	2.755E-02	?(P	2.514E-01	3.46E+02	9.05E+01 G
		722.94	-1.323E-01	+	5.040E-01	1.13E+02	9.08E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
			614.28	0.000E+00	&	6.599E-01	1.00E+03	8.98E+01 G
AG-110M	F	1.6165E-01					2.50E+02	
			884.68	3.312E-02	?(	5.213E-01	4.49E+02	7.27E+01 G
			657.76	-7.351E-02	& P	3.301E-01	1.63E+02	9.46E+01 G
			937.49	-4.385E-01	&	9.621E-01	9.52E+01	3.44E+01 G
			1384.30	3.642E-01	?(	1.031E+00	1.24E+02	2.43E+01 G
			763.94	3.600E-01	?(P	9.359E-01	7.89E+01	2.23E+01 G
SN-113	F	-3.5206E-02					1.15E+02	
			391.69	-3.521E-02	?(	5.402E-01	4.49E+02	6.40E+01 G
SB-124	F	-1.2467E-01					6.02E+01	
			602.73	-1.247E-01	?(	6.295E-01	1.50E+02	9.83E+01 G
			1690.98	-2.445E-01	+	7.851E-01	1.51E+02	4.78E+01 G
			722.79	-1.455E+00	+	3.927E+00	8.09E+01	1.08E+01 G
SB-125	I	1.1207E-02					1.01E+03	
			427.88	-5.943E-02	?(P	7.316E-01	5.53E+02	2.96E+01 G
			600.50	-9.345E-01	& P	3.572E+00	6.43E+01	1.79E+01 G
			635.89	1.961E-01	&(	2.079E+00	3.00E+02	1.13E+01 G
			463.37	-1.031E+00	&	3.271E+00	9.47E+01	1.05E+01 G
I-131	I	8.4107E-04					8.02E+00	
			364.48	-3.243E-02	?(	2.767E-01	3.25E+02	8.17E+01 G
			284.30	-3.364E-01	+ P	3.673E+00	3.79E+02	6.14E+00 G
			636.97	3.799E-01	?(	3.496E+00	2.62E+02	7.17E+00 G
Gd-153	F	1.7475E-01					2.42E+02	
			97.50	1.747E-01	?(	6.707E-01	1.15E+02	3.00E+01 G
			103.20	-2.685E-01	&	1.067E+00	1.19E+02	2.18E+01 G
Ga-68	C	-4.8023E+00					4.71E-02	
			1077.40	-4.802E+00	?(	1.561E+01	1.42E+02	3.30E+00 G
Tc-99m	I	7.9750E-02					2.51E-01	
			140.51	7.975E-02	?(	3.412E-01	1.28E+02	8.93E+01 G
BA-133	F	-1.2291E-01					3.85E+03	
			356.00	-1.229E-01	&(	3.962E-01	1.25E+02	6.20E+01 G
			302.85	9.079E-04	%	2.232E+00	7.25E+04	1.83E+01 G
			383.84	4.206E-01	?	3.501E+00	2.44E+02	8.94E+00 GA
			80.99	-9.956E-02	+	4.833E-01	1.70E+02	3.41E+01 GA
CS-134	I	-5.4283E-02					7.54E+02	
			795.87	-1.434E-01	?(P	4.902E-01	6.05E+01	8.55E+01 G
			604.71	1.173E-01	+	5.731E-01	1.45E+02	9.76E+01 G
			569.32	-1.474E-01	+	1.694E+00	3.29E+02	1.54E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
			801.95	-6.794E-02	%	5.127E+00	2.17E+03	8.69E+00 G
			563.24	8.581E-01	&(	2.064E+00	9.54E+01	8.35E+00 G
CS-137	I	1.1722E-01					1.10E+04	
			661.66	1.172E-01	&(	3.568E-01	9.04E+01	8.52E+01 G
CE-139	F	7.5769E-02					1.38E+02	
			165.85	7.577E-02	&(	2.821E-01	1.11E+02	7.99E+01 G
Ba-140	I	3.2174E-01					1.28E+01	
			537.26	2.690E-01	?(P	7.868E-01	1.16E+02	2.44E+01 G
			162.66	5.285E-01	&(	3.849E+00	2.16E+02	6.22E+00 G
			304.85	7.813E-07	%	9.580E+00	3.61E+08	4.29E+00 G
La-140	I	-1.7030E-02					1.28E+01	
			1596.21	-7.904E-02	?(P	3.712E-01	2.37E+02	9.54E+01 G
			487.02	6.532E-02	?(P	4.533E-01	2.72E+02	4.55E+01 G
			328.76	-2.805E-01	+	1.155E+00	1.59E+02	2.03E+01 G
			815.77	7.615E-02	?(	1.473E+00	5.50E+02	2.33E+01 G
CE-141	I	-1.4436E-01					3.25E+01	
			145.44	-1.444E-01	?(	4.304E-01	1.11E+02	4.82E+01 G
CE-144	I	-4.0473E-01					2.85E+02	
			133.54	-4.047E-01	(	2.746E+00	2.02E+02	1.11E+01 G
PM-144	C	-2.8076E-02					3.63E+02	
			696.54	-2.808E-02	?(P	3.022E-01	4.34E+02	9.90E+01 G
			618.06	0.000E+00	+	6.011E-01	1.00E+03	9.91E+01 G
EU-152	F	2.4011E-01					4.94E+03	
			121.78	-2.204E-01	?(	7.806E-01	1.06E+02	2.86E+01 G
			344.29	3.283E-01	&(	1.316E+00	1.20E+02	2.65E+01 G
			1112.07	1.697E-01	?(	3.466E+00	5.83E+02	1.36E+01 G
			778.92	5.796E-01	?(	1.898E+00	1.34E+02	1.29E+01 G
			964.11	4.926E-01	&(	2.212E+00	1.30E+02	1.46E+01 G
			244.69	7.293E-01	&(P	4.045E+00	1.65E+02	7.58E+00 G
			1408.00	2.025E-01	?	1.441E+00	3.09E+02	2.10E+01 GA
EU-154	I	1.4696E-01					3.14E+03	
			123.10	-9.379E-02	?(P	5.718E-01	2.35E+02	4.08E+01 G
			1274.54	0.000E+00	+	8.506E-01	1.00E+03	3.52E+01 G
			723.36	1.884E-01	?(	2.233E+00	3.45E+02	2.02E+01 G
			873.23	3.220E-01	?(	2.424E+00	2.14E+02	1.23E+01 G
			1004.77	-1.752E-01	+	1.615E+00	3.96E+02	1.80E+01 G
			996.33	7.917E-01	?(	2.363E+00	8.77E+01	1.06E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	I	-7.5135E-02					1.81E+03	
			105.31	-7.514E-02	&(P	1.151E+00	5.44E+02	2.12E+01 G
			86.54	-1.300E-01	&	1.093E+00	2.51E+02	3.07E+01 G
HF-181	F	4.8559E-02					4.24E+01	
			482.00	4.856E-02	?(P	3.866E-01	2.33E+02	8.05E+01 G
			133.02	-1.558E-01	+	6.864E-01	1.32E+02	4.33E+01 G
			345.83	-3.518E-01	&	2.396E+00	2.01E+02	1.51E+01 G
			136.30	0.000E+00	-	5.318E+00	1.00E+03	5.85E+00 G
Ta-182	F	4.8877E-01					1.14E+02	
			1121.30	4.888E-01	&(	1.490E+00	9.08E+01	3.49E+01 G
			1221.41	-1.548E-02	%	1.448E+00	4.17E+03	2.70E+01 G
			1189.05	-4.537E-01	&	2.434E+00	2.35E+02	1.62E+01 G
Hg-203	F	9.2918E-02					4.66E+01	
			279.20	9.292E-02	?(	3.147E-01	1.01E+02	8.15E+01 G
TL-208	N	8.2886E-02					6.98E+02	
			583.02	8.289E-02	?(P	3.005E-01	1.43E+02	8.45E+01 G
			277.28	-1.352E+00	&	4.271E+00	9.45E+01	6.31E+00 G
			860.56	-2.766E-01	&	2.606E+00	3.99E+02	1.24E+01 G
PM-146	C	2.8629E-02					2.02E+03	
			453.88	-3.548E-02	?(	3.547E-01	3.95E+02	6.50E+01 G
			747.16	1.512E-01	?(P	7.444E-01	2.02E+02	3.40E+01 G
			735.72	-4.281E-01	+ P	1.232E+00	1.32E+02	2.25E+01 G
Y-88	F	-1.2628E-01					1.07E+02	
			1836.06	-1.263E-01	?(P	4.171E-01	1.08E+02	9.92E+01 G
			898.04	2.995E-03	% P	2.467E-01	3.28E+03	9.37E+01 G
Cd-113m		-6.6690E+02					5.33E+03	
			263.70	-6.669E+02	?(	4.304E+03	1.90E+02	6.00E-03 K
Cf-251	T	-3.0176E-01					3.28E+05	
			176.60	-3.018E-01	?(	1.216E+00	1.50E+02	1.70E+01 G
			227.00	-3.664E-01	&	3.027E+00	3.02E+02	6.30E+00 GA
Sn-126		-7.2140E-01					3.65E+07	
			87.57	0.000E+00	+	8.710E-01	1.00E+03	3.75E+01 GA
			64.28	-7.214E-01	?(	2.833E+00	1.18E+02	9.70E+00 G
			86.94	-9.562E-03	%	3.615E+00	1.12E+04	9.04E+00 GA
PB-210	N	3.4477E-01					8.14E+03	
			46.54	3.448E-01	*(P	5.365E+00	5.50E+02	4.25E+00 G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

PB-212   N  -1.8878E-01                                     6.98E+02
                         238.63-1.888E-01  (P 7.837E-01 1.24E+02 4.33E+01 G
                         300.03 1.647E+00 ? P 1.144E+01 2.07E+02 3.28E+00 GA

PB-214   N  -2.0670E-03                                     5.84E+05
                         351.93-2.067E-03 %(P 7.365E-01 1.08E+04 3.76E+01 G
                         295.09-1.090E-01 + P 1.884E+00 5.17E+02 1.93E+01 G
                         242.00 9.455E-01 &   4.467E+00 1.41E+02 7.43E+00 GA

BI-207   C  -3.0004E-01                                     1.18E+04
                        1063.66-3.000E-01 ?(P 5.011E-01 4.76E+01 7.45E+01 G
                         569.70-4.874E-02 +   2.954E-01 1.76E+02 9.77E+01 G

BI-212   N   1.7400E+00                                     6.98E+02
                         727.17 1.740E+00 &(  5.601E+00 9.59E+01 7.55E+00 G
                         785.42-7.032E+00 +   2.272E+01 1.34E+02 1.28E+00 GA

U-235    N   2.5473E-01                                     2.57E+11
                         143.79-3.678E-02 %(P 2.592E+00 2.09E+03 1.10E+01 G
                         205.33 8.924E-01 *(P 3.333E+00 1.38E+02 5.01E+00 G
                         163.38-3.905E-01 + P 4.268E+00 4.54E+02 5.08E+00 G
                         185.72-7.585E-02 +   4.509E-01 1.76E+02 5.40E+01 GA

BI-214   N   3.9441E-01                                     5.84E+05
                         609.31 3.944E-01 *(P 6.192E-01 5.82E+01 4.61E+01 G
                        1120.29-1.096E-01 - P 3.225E+00 8.38E+02 1.51E+01 G
                        1764.49-1.622E+00 - P 4.032E+00 5.08E+01 1.54E+01 G

BI-210M  T   1.3644E-01                                     1.10E+09
                         265.83 1.364E-01 &(P 4.900E-01 1.08E+02 5.00E+01 G
                         304.90-1.197E-07 %   1.468E+00 3.61E+08 2.80E+01 G

AC-228   N   1.6253E-01                                     2.10E+03
                         911.07 1.128E-02 %(  9.929E-01 3.64E+03 2.90E+01 G
                         968.97 4.138E-01 ?(  2.049E+00 1.44E+02 1.75E+01 G
                         338.32-7.401E-01 +   2.926E+00 1.18E+02 1.20E+01 G
                          93.35 0.000E+00 -   5.867E+00 1.00E+03 5.56E+00 XA

TH-227   N  -1.1336E+00                                     7.95E+03
                         256.24-1.134E+00 ?(P 3.670E+00 5.06E+01 7.00E+00 G
                         235.97 5.591E-01 &   2.509E+00 1.34E+02 1.23E+01 G
                          50.14 1.526E-01 +   2.428E+00 5.53E+02 8.00E+00 G

TH-229   N  -7.0261E-01                                     2.68E+06
                         193.51-7.026E-01 ?(  4.548E+00 2.38E+02 4.40E+00 G
                         210.85-2.066E+00 & P 6.575E+00 1.04E+02 2.99E+00 G
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Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-234	N	2.1275E+00					1.63E+12	
			92.59	2.127E+00	*(P	3.955E+00	7.17E+01	5.58E+00 G
			63.29	2.822E-01	- P	5.549E+00	7.31E+02	3.81E+00 G
PA-231	N	2.5037E+00					1.20E+07	
			302.65	2.331E+00	?(	1.392E+01	1.78E+02	2.88E+00 G
			300.07	2.706E+00	?(	1.553E+01	1.71E+02	2.46E+00 G
PA-233	C	3.3390E-01					7.82E+08	
			312.01	2.064E-01	&(	7.424E-01	1.07E+02	3.60E+01 G
			300.18	1.074E+00	&(	6.299E+00	1.74E+02	6.20E+00 G
PA-234	N	1.2412E-01					1.63E+12	
			131.29	-3.724E-01	?(	1.606E+00	1.29E+02	1.80E+01 G
			946.02	1.762E-01	+	2.216E+00	5.24E+02	1.34E+01 G
			569.47	0.000E+00	&	3.261E+00	1.00E+03	8.20E+00 G
			883.24	1.055E+00	&(	3.616E+00	1.01E+02	9.60E+00 G
			880.53	1.681E+00	?	5.197E+00	9.14E+01	6.00E+00 GA
PA-234M	N	-8.0219E-01					1.63E+12	
			1001.00	-8.022E-01	&(P	3.928E+01	1.41E+03	8.37E-01 G
			766.41	-4.399E+01	+ P	1.206E+02	5.14E+01	2.94E-01 G
AM-241	T	-5.4949E-02					1.58E+05	
			59.54	-5.495E-02	&(	5.773E-01	3.67E+02	3.59E+01 G
Np-237	F	-4.6099E-01					2.14E+06	
			86.49	-4.610E-01	?(	2.600E+00	1.69E+02	1.31E+01 G
Cs-136	F	-7.5010E-02					1.30E+01	
			818.50	-7.501E-02	?(	3.811E-01	1.48E+02	1.00E+02 G
			1048.07	-5.507E-02	&	4.169E-01	2.15E+02	8.00E+01 G
			340.57	-1.876E-01	+	7.809E-01	1.24E+02	4.69E+01 G
Np-239	T	2.4032E-01					2.36E+00	
			103.70	-5.701E-02	&	1.013E+00	5.25E+02	2.40E+01 X
			106.13	2.403E-01	?(	9.715E-01	1.21E+02	2.27E+01 G
			99.50	9.545E-02	&	1.451E+00	4.48E+02	1.50E+01 X
Nd-147		2.9815E-01					1.11E+01	
			531.00	2.981E-01	?(	1.524E+00	2.00E+02	1.30E+01 G
			91.10	0.000E+00	-	1.153E+00	1.00E+03	2.83E+01 G
TL-210	N	3.6947E-02					5.84E+05	
			799.60	0.000E+00	?(	4.416E-01	1.00E+03	9.90E+01 G
			296.00	8.323E-02	?(	4.576E-01	1.63E+02	7.90E+01 G
			1313.00	5.082E-01	&	1.356E+00	1.19E+02	2.10E+01 GA

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

Kr-85    I   2.2126E+01                                      3.92E+03
                            513.98 2.213E+01 ?(  1.103E+02 1.48E+02 4.30E-01 G
   ( - 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 ***************
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Nuclide	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	Activity	
AM-241	59.54	231.	-7.	-0.001	367.42	-5.495E-02	
Sn-126	64.28	438.	-26.	-0.004	117.62	-7.214E-01	
BA-133	80.99	168.	-13.	-0.002	170.10	-9.956E-02	
Np-237	86.49	762.	-23.	-0.003	168.91	-4.610E-01	
EU-155	86.54	738.	-15.	-0.002	251.09	-1.300E-01	
Np-239	99.50	296.	5.	0.001	448.39	9.545E-02	
Np-239	103.70	368.	-5.	-0.001	525.01	-5.701E-02	
EU-155	105.31	379.	-6.	-0.001	544.20	-7.514E-02	P
Np-239	106.13	300.	21.	0.003	120.72	2.403E-01	
EU-152	121.78	299.	-24.	-0.003	105.98	-2.204E-01	
CO-57	122.06	322.	-7.	-0.001	356.64	-2.242E-02	
EU-154	123.10	326.	-14.	-0.002	234.93	-9.379E-02	P

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
PA-234	131.29	487.	-24.	-0.003	129.08	-3.724E-01	
HF-181	133.02	512.	-25.	-0.003	131.95	-1.558E-01	
CE-144	133.54	536.	-16.	-0.002	202.34	-4.047E-01	
CO-57	136.47	496.	24.	0.003	134.41	6.154E-01	
Tc-99m	140.51	408.	23.	0.003	127.94	7.975E-02	
CE-141	145.44	228.	-25.	-0.003	111.47	-1.444E-01	
Ba-140	162.66	276.	11.	0.002	215.71	5.285E-01	
U-235	163.38	224.	-7.	-0.001	453.99	-3.905E-01	P
CE-139	165.85	236.	20.	0.003	111.14	7.577E-02	
Cf-251	176.60	183.	-16.	-0.002	149.58	-3.018E-01	
U-235	185.72	243.	-13.	-0.002	176.18	-7.585E-02	
TH-229	193.51	153.	-9.	-0.001	238.35	-7.026E-01	
U-235	205.33	97.	13.	0.002	137.80	8.924E-01	P
TH-229	210.85	133.	-18.	-0.002	103.85	-2.066E+00	P
Cf-251	227.00	113.	-6.	-0.001	301.75	-3.664E-01	
PB-212	238.63	353.	-22.	-0.003	123.72	-1.888E-01	P
PB-214	242.00	331.	19.	0.003	140.88	9.455E-01	
EU-152	244.69	277.	14.	0.002	165.46	7.293E-01	P
Cd-113m	263.70	176.	-10.	-0.001	190.26	-6.669E+02	
BI-210M	265.83	156.	17.	0.002	107.64	1.364E-01	P
TL-208	277.28	180.	-21.	-0.003	94.51	-1.352E+00	
Hg-203	279.20	161.	18.	0.003	101.02	9.292E-02	
I-131	284.30	119.	-5.	-0.001	378.57	-3.364E-01	P
PB-214	295.09	308.	-5.	-0.001	517.00	-1.090E-01	P
TL-210	296.00	303.	15.	0.002	163.47	8.323E-02	
PB-212	300.03	322.	12.	0.002	206.66	1.647E+00	P
PA-231	300.07	334.	15.	0.002	170.70	2.706E+00	
PA-233	300.18	349.	15.	0.002	174.45	1.074E+00	
PA-231	302.65	365.	15.	0.002	177.75	2.331E+00	
Ir-192	308.44	135.	-19.	-0.003	90.81	-2.612E-01	
PA-233	312.01	151.	17.	0.002	107.08	2.064E-01	
CR-51	320.08	138.	5.	0.001	335.26	2.282E-01	
La-140	328.76	106.	-12.	-0.002	158.99	-2.805E-01	
Cf-249	333.44	114.	-6.	-0.001	354.48	-1.703E-01	
AC-228	338.32	238.	-19.	-0.003	117.92	-7.401E-01	
Cs-136	340.57	257.	-19.	-0.003	124.07	-1.876E-01	
EU-152	344.29	229.	18.	0.003	119.51	3.283E-01	
HF-181	345.83	245.	-11.	-0.002	201.49	-3.518E-01	
BA-133	356.00	105.	-16.	-0.002	125.04	-1.229E-01	
I-131	364.48	84.	-5.	-0.001	325.03	-3.243E-02	
BA-133	383.84	157.	7.	0.001	244.19	4.206E-01	
SN-113	391.69	187.	-4.	-0.001	449.26	-3.521E-02	
SB-125	427.88	61.	-3.	0.000	553.07	-5.943E-02	P
AG-108M	433.94	67.	4.	0.001	346.22	2.755E-02	P
PM-146	453.88	64.	-4.	-0.001	394.76	-3.548E-02	
SB-125	463.37	144.	-18.	-0.003	94.72	-1.031E+00	
Ir-192	468.06	183.	-19.	-0.003	101.36	-2.208E-01	
BE-7	477.59	112.	5.	0.001	302.65	2.842E-01	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
HF-181	482.00	111.	6.	0.001	233.34	4.856E-02	P
La-140	487.02	45.	5.	0.001	272.38	6.532E-02	P
RU-103	497.05	84.	-13.	-0.002	101.51	-9.019E-02	P
RH-106	511.86	117.	153.	0.021	12.86	4.810E+00	
Nd-147	531.00	36.	6.	0.001	200.00	2.981E-01	
Ba-140	537.26	33.	10.	0.001	116.03	2.690E-01	P
CS-134	563.24	24.	11.	0.001	95.40	8.581E-01	
CS-134	569.32	58.	-3.	0.000	328.63	-1.474E-01	
BI-207	569.70	73.	-7.	-0.001	176.32	-4.874E-02	
TL-208	583.02	53.	10.	0.001	142.64	8.289E-02	P
SB-125	600.50	352.	-24.	-0.003	64.30	-9.345E-01	P
SB-124	602.73	328.	-17.	-0.002	150.41	-1.247E-01	
CS-134	604.71	265.	16.	0.002	145.35	1.173E-01	
RU-103	610.30	281.	11.	0.001	226.61	1.317E+00	
RH-106	621.92	335.	-17.	-0.002	150.00	-1.280E+00	
SB-125	635.89	39.	3.	0.000	300.00	1.961E-01	
I-131	636.97	44.	4.	0.001	262.06	3.799E-01	
AG-110M	657.76	68.	-9.	-0.001	163.41	-7.351E-02	P
CS-137	661.66	64.	13.	0.002	90.42	1.172E-01	
PM-144	696.54	57.	-4.	0.000	433.96	-2.808E-02	P
NB-94	702.63	39.	4.	0.001	322.59	3.261E-02	
SB-124	722.79	112.	-19.	-0.003	80.93	-1.455E+00	
AG-108M	722.94	131.	-15.	-0.002	113.06	-1.323E-01	
EU-154	723.36	127.	5.	0.001	345.08	1.884E-01	
BI-212	727.17	110.	16.	0.002	95.87	1.740E+00	
PM-146	735.72	44.	-12.	-0.002	131.99	-4.281E-01	P
PM-146	747.16	35.	6.	0.001	201.50	1.512E-01	P
ZR-95	756.73	7.	2.	0.000	246.17	3.346E-02	P
AG-110M	763.94	22.	9.	0.001	78.92	3.600E-01	P
NB-95	765.79	32.	5.	0.001	162.17	4.379E-02	
PA-234M	766.41	69.	-15.	-0.002	51.39	-4.399E+01	P
EU-152	778.92	30.	9.	0.001	134.09	5.796E-01	
BI-212	785.42	43.	-10.	-0.001	133.71	-7.032E+00	
CS-134	795.87	93.	-14.	-0.002	60.46	-1.434E-01	P
CO-58	810.78	47.	11.	0.002	90.08	1.020E-01	
La-140	815.77	58.	2.	0.000	550.12	7.615E-02	
Cs-136	818.50	72.	-8.	-0.001	148.43	-7.501E-02	
Co-56	846.77	34.	9.	0.001	148.15	7.934E-02	P
TL-208	860.56	47.	-4.	-0.001	398.65	-2.766E-01	
NB-94	871.10	34.	7.	0.001	123.72	6.631E-02	
EU-154	873.23	38.	4.	0.001	214.44	3.220E-01	
PA-234	880.53	41.	11.	0.001	91.36	1.681E+00	
PA-234	883.24	52.	11.	0.001	101.04	1.055E+00	
AG-110M	884.68	62.	3.	0.000	449.39	3.312E-02	
AG-110M	937.49	42.	-15.	-0.002	95.22	-4.385E-01	
PA-234	946.02	33.	2.	0.000	523.72	1.762E-01	
EU-152	964.11	38.	7.	0.001	130.15	4.926E-01	
AC-228	968.97	47.	7.	0.001	143.57	4.138E-01	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
EU-154	996.33	20.	8.	0.001	87.73	7.917E-01		
EU-154	1004.77	28.	-3.	0.000	396.18	-1.752E-01		
Co-56	1037.84	30.	2.	0.000	606.22	1.546E-01		
Cs-136	1048.07	35.	-4.	-0.001	215.06	-5.507E-02		
RH-106	1050.36	57.	-3.	0.000	325.88	-2.358E+00		
BI-207	1063.66	44.	-20.	-0.003	47.59	-3.000E-01		P
Ga-68	1077.40	25.	-8.	-0.001	141.88	-4.802E+00		
FE-59	1099.25	31.	1.	0.000	821.07	3.021E-02		P
EU-152	1112.07	67.	2.	0.000	583.10	1.697E-01		
Sc-46	1120.55	100.	-18.	-0.002	82.39	-2.088E-01		
Ta-182	1121.30	81.	15.	0.002	90.77	4.888E-01		
CO-60	1173.24	32.	-9.	-0.001	140.59	-1.051E-01		P
Ta-182	1189.05	40.	-6.	-0.001	235.31	-4.537E-01		
Co-56	1238.28	11.	9.	0.001	89.79	1.711E-01		
NA-22	1274.53	16.	-3.	0.000	197.20	-3.903E-02		
FE-59	1291.60	21.	-3.	0.000	319.69	-1.015E-01		
TL-210	1313.00	16.	8.	0.001	119.02	5.082E-01		
CO-60	1332.50	22.	-2.	0.000	528.15	-3.170E-02		P
AG-110M	1384.30	11.	6.	0.001	123.77	3.642E-01		
EU-152	1408.00	16.	3.	0.000	308.52	2.025E-01		
K-40	1460.83	39.	-4.	-0.001	264.09	-5.765E-01		P
La-140	1596.21	18.	-5.	-0.001	236.81	-7.904E-02		P
SB-124	1690.98	18.	-7.	-0.001	151.19	-2.445E-01		
Co-56	1771.35	35.	9.	0.001	100.30	9.934E-01		
Y-88	1836.06	19.	-7.	-0.001	108.40	-1.263E-01		P

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	Time Corrected Activity Bq/Sample	Uncertainty Counting 1 Sigma	MDA Bq/Sample
BE-7	#A	2.8423E-01	2.8423E-01	3.027E+02%	2.96E+00
NA-22	#A	-3.9029E-02	-3.9029E-02	1.972E+02%	2.78E-01
K-40	#A	-5.7650E-01	-5.7650E-01	2.641E+02%	4.38E+00
Sc-46	#A	3.2078E-03	3.2078E-03	3.442E+03%	3.89E-01
CR-51	#A	2.2818E-01	2.2818E-01	3.353E+02%	2.62E+00
MN-54	#	2.1951E-01	2.1951E-01	3.886E+01%	1.84E-01
FE-59	#A	3.0208E-02	3.0208E-02	8.211E+02%	5.77E-01
Co-56	#A	1.1889E-01	1.1889E-01	8.979E+01%	2.78E-01
CO-57	#A	4.8333E-02	4.8334E-02	1.344E+02%	2.71E-01
CO-58	#A	1.0202E-01	1.0202E-01	9.008E+01%	3.10E-01
CO-60	#A	-3.1701E-02	-3.1701E-02	5.281E+02%	3.34E-01
ZN-65	#A	0.0000E+00	0.0000E+00	1.000E+03%	9.50E-01
NB-94	#A	4.9630E-02	4.9630E-02	1.237E+02%	2.59E-01
ZR-95	#A	3.3459E-02	3.3459E-02	2.462E+02%	2.36E-01
NB-95	#A	4.3786E-02	4.3786E-02	1.622E+02%	2.48E-01

RU-103 #A	-9.0187E-02	-9.0188E-02	1.015E+02%	3.08E-01
RH-106 #A	-1.2798E+00	-1.2798E+00	1.500E+02%	6.44E+00
AG-108M#A	2.7548E-02	2.7548E-02	3.462E+02%	2.51E-01
AG-110M#A	1.6165E-01	1.6165E-01	7.892E+01%	5.21E-01
SN-113 #A	-3.5206E-02	-3.5206E-02	4.493E+02%	5.40E-01
SB-124 #A	-1.2467E-01	-1.2467E-01	1.504E+02%	6.30E-01
SB-125 #A	1.1207E-02	1.1207E-02	3.000E+02%	7.32E-01
I-131 #A	8.4102E-04	8.4107E-04	2.088E+02%	2.77E-01
Gd-153 #A	1.7475E-01	1.7475E-01	1.146E+02%	6.71E-01
Ga-68 #A	-4.7534E+00	-4.8023E+00	1.419E+02%	1.56E+01
Tc-99m #A	7.9597E-02	7.9750E-02	1.279E+02%	3.41E-01
BA-133 #A	-1.2291E-01	-1.2291E-01	1.250E+02%	3.96E-01
CS-134 #A	-5.4283E-02	-5.4283E-02	5.647E+01%	4.90E-01
CS-137 #A	1.1722E-01	1.1722E-01	9.042E+01%	3.57E-01
CE-139 #A	7.5769E-02	7.5769E-02	1.111E+02%	2.82E-01
Ba-140 #A	3.2173E-01	3.2174E-01	1.160E+02%	7.87E-01
La-140 #A	-1.7029E-02	-1.7030E-02	2.193E+02%	3.71E-01
CE-141 #A	-1.4436E-01	-1.4436E-01	1.115E+02%	4.30E-01
CE-144 #A	-4.0473E-01	-4.0473E-01	2.023E+02%	2.75E+00
PM-144 #A	-2.8076E-02	-2.8076E-02	4.340E+02%	3.02E-01
EU-152 #A	2.4011E-01	2.4011E-01	1.060E+02%	7.81E-01
EU-154 #A	1.4696E-01	1.4696E-01	8.773E+01%	5.72E-01
EU-155 #A	-7.5135E-02	-7.5135E-02	5.442E+02%	1.15E+00
HF-181 #A	4.8558E-02	4.8559E-02	2.333E+02%	3.87E-01
Ta-182 #A	4.8877E-01	4.8877E-01	9.077E+01%	1.49E+00
Hg-203 #A	9.2917E-02	9.2918E-02	1.010E+02%	3.15E-01
TL-208 #A	8.2886E-02	8.2886E-02	1.426E+02%	3.00E-01
PM-146 #A	2.8629E-02	2.8629E-02	2.015E+02%	3.55E-01
Y-88 #A	-1.2628E-01	-1.2628E-01	1.084E+02%	4.17E-01
Cd-113m#A	-6.6690E+02	-6.6690E+02	1.903E+02%	4.30E+03
Cd-109 #A	0.0000E+00	0.0000E+00	1.000E+03%	8.62E+00
Cf-251 #A	-3.0176E-01	-3.0176E-01	1.496E+02%	1.22E+00
Cf-249 #A	0.0000E+00	0.0000E+00	1.000E+03%	4.88E-01
Sn-126 #A	-7.2140E-01	-7.2140E-01	1.176E+02%	2.83E+00
PB-210 #A	3.4477E-01	3.4477E-01	5.500E+02%	5.36E+00
PB-212 #A	-1.8878E-01	-1.8878E-01	1.237E+02%	7.84E-01
PB-214 #A	-2.0670E-03	-2.0670E-03	1.077E+04%	7.36E-01
BI-207 #A	-3.0004E-01	-3.0004E-01	4.759E+01%	5.01E-01
BI-212 #A	1.7400E+00	1.7400E+00	9.587E+01%	5.60E+00
U-235 #A	2.5473E-01	2.5473E-01	1.378E+02%	2.59E+00
BI-214 #A	3.9441E-01	3.9441E-01	5.825E+01%	6.19E-01
BI-210M#A	1.3644E-01	1.3644E-01	1.076E+02%	4.90E-01
AC-228 #A	1.6253E-01	1.6253E-01	1.436E+02%	9.93E-01
TH-227 #A	-1.1336E+00	-1.1336E+00	5.056E+01%	3.67E+00
TH-229 #A	-7.0261E-01	-7.0261E-01	2.384E+02%	4.55E+00
TH-234 #A	2.1275E+00	2.1275E+00	7.172E+01%	3.96E+00
PA-231 #A	2.5037E+00	2.5037E+00	1.232E+02%	1.39E+01
PA-233 #A	3.3390E-01	3.3390E-01	1.023E+02%	7.42E-01
PA-234 #A	1.2412E-01	1.2412E-01	8.196E+01%	1.61E+00

PA-234M#A	-8.0219E-01	-8.0219E-01	1.409E+03%	3.93E+01
AM-241 #A	-5.4949E-02	-5.4949E-02	3.674E+02%	5.77E-01
Np-237 #A	-4.6099E-01	-4.6099E-01	1.689E+02%	2.60E+00
Ir-192 #A	0.0000E+00	0.0000E+00	1.000E+03%	3.07E-01
Cs-136 #A	-7.5007E-02	-7.5010E-02	1.484E+02%	3.81E-01
Np-239 #A	2.4027E-01	2.4032E-01	1.207E+02%	9.72E-01
Nd-147 #A	2.9813E-01	2.9815E-01	2.000E+02%	1.52E+00
TL-210 #A	3.6947E-02	3.6947E-02	1.635E+02%	4.42E-01
Kr-85 #A	2.2126E+01	2.2126E+01	1.480E+02%	1.10E+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 (25.1 to 1999.5 keV) 2.522E+00 Bq/Sample
Total Decayed Activity (25.1 to 1999.5 keV) 2.5218773E+00 Bq/Sample

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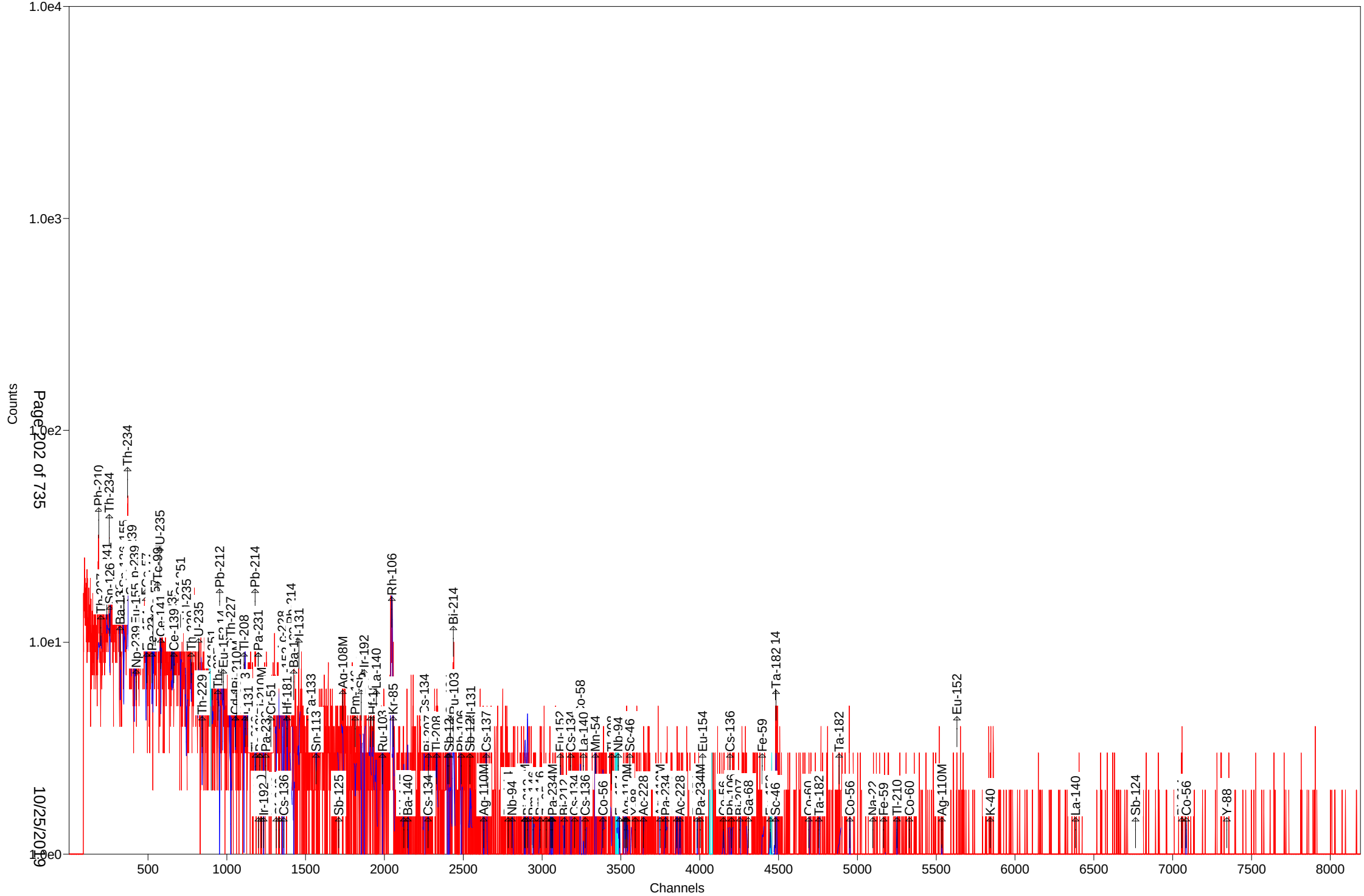
443730_Gamma_180-95857-B-7-A. 17_Gamma_20191949.spc.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1.0e2
1.0e1
1.0e0
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1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
6500
7000
7500
8000
Th-234
Pb-210
Th-234
Pb-212
Pb-214
Rh-106
Bi-214
Ta-182 14
Eu-152
Ta-182
Eu-154
Cs-136
Fe-59
Sc-46
Co-56
Na-22
Fe-59
Tl-210
Co-60
Ag-110M
K-40
La-140
Sb-124
Co-56
Y-88
Co-60
Ta-182
Co-56
Ga-68
Pa-234M
Ac-228
Pa-234
Ac-228
Ag-110M
Nb-94
Cs-137
Mn-54
Co-58
La-140
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Sc-46
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Sn-113
Cs-136
Ir-192
Pa-231
Tl-208
Th-227
Th-229
U-235
Ce-139
Ce-141
Np-239
Sn-126
Ba-133
Ba-131
Pb-214
Pb-212
Th-234
Pb-210

Prep Batch: 444057

Fill Geometry, 21-Day In-Growth

Gamma Spectroscopy Analysis Detail Report
Prep Batch: 444057

Lab Id: MB 160-444057/1-A | Analyzed: 10/15/19 10:06 | Ts: 30 | Sigma: 2
Client ID: | Detector: GV12 | Decay Corrected: | Ingrowth:

Analyte	MB Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Radium 226 and 228 (positive only)	0.2367	0.117	0.119	U	pCi/g		0.288	446100
Radium-226	0.04714	0.0422	0.0424	U	pCi/g	1.00	0.288	446100
Radium-228	0.1896	0.109	0.111		pCi/g		0.129	446100

Lab Id: LCS 160-444057/2-A | Analyzed: 10/15/19 10:04 | Ts: 30 | Sigma: 2
Client ID: | Detector: GV5 | Decay Corrected: No | Ingrowth:

Analyte	LCS Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Americium-241	98.56	1.76	10.4		pCi/g		1.28	446102
Cesium-137	26.80	0.775	2.89		pCi/g		0.362	446102
Cobalt-60	11.04	0.425	1.19		pCi/g		0.0587	446102

Lab Id: 180-95857-1 | Analyzed: 10/15/19 10:05 | Ts: 30 | Sigma: 2
Client ID: WBF-BS-BG11-1.5/3.5-2019 0917 ~ WBF-BG-11 | Detector: GV8 | Decay Corrected: | Ingrowth:

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Radium 226 and 228 (positive only)	2.25	0.428	0.459		pCi/g		0.404	446103
Radium-226	0.988	0.211	0.235		pCi/g	1.00	0.178	446103
Radium-228	1.26	0.372	0.394		pCi/g		0.404	446103

Lab Id: 180-95857-2 | Analyzed: 10/15/19 10:44 | Ts: 30 | Sigma: 2
Client ID: WBF-BS-BG11-6.5/8.5-2019 0917 ~ WBF-BG-11 | Detector: GV12 | Decay Corrected: | Ingrowth:

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Radium 226 and 228 (positive only)	3.43	0.494	0.554		pCi/g		0.283	446100
Radium-226	1.33	0.325	0.352		pCi/g	1.00	0.283	446100
Radium-228	2.10	0.372	0.428		pCi/g		0.159	446100

Lab Id: 180-95857-3 | Analyzed: 10/15/19 10:42 | Ts: 30 | Sigma: 2
Client ID: WBF-BS-BG11-11.5/13.5-20 190917 ~ WBF-BG-11 | Detector: GV5 | Decay Corrected: | Ingrowth:

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Radium 226 and 228 (positive only)	2.91	0.471	0.517		pCi/g		0.278	446102

Gamma Spectroscopy Analysis Detail Report
Prep Batch: 444057

Lab Id: 180-95857-3 Analyzed: 10/15/19 10:42 Ts: 30 Sigma: 2
Client ID: WBF-BS-BG11-11.5/13.5-20190917 ~ WBF-BG-11 Detector: GV5 Decay Corrected: No Ingrowth:

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Radium-226	1.26	0.279	0.309		pCi/g	1.00	0.278	446102
Radium-228	1.65	0.379	0.415		pCi/g		0.266	446102

Lab Id: 180-95857-3 DU Analyzed: 10/15/19 11:16 Ts: 30 Sigma: 2
Client ID: WBF-BS-BG11-11.5/13.5-20190917 ~ WBF-BG-11 Detector: GV8 Decay Corrected: Ingrowth:

Analyte	DU Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Radium 226 and 228 (positive only)	3.113	0.430	0.486		pCi/g		0.206	446103
Radium-226	1.491	0.301	0.338		pCi/g	1.00	0.206	446103
Radium-228	1.622	0.307	0.349		pCi/g		0.147	446103

Lab Id: 180-95857-4 Analyzed: 10/15/19 10:43 Ts: 30 Sigma: 2
Client ID: WBF-BS-BG11-16.5/18.5-20190917 ~ WBF-BG-11 Detector: GV8 Decay Corrected: Ingrowth:

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Radium 226 and 228 (positive only)	3.09	0.408	0.468		pCi/g		0.238	446103
Radium-226	1.18	0.248	0.276		pCi/g	1.00	0.166	446103
Radium-228	1.91	0.324	0.378		pCi/g		0.238	446103

Lab Id: 180-95857-5 Analyzed: 10/15/19 11:04 Ts: 30 Sigma: 2
Client ID: WBF-BS-BG11-0.0/0.5-20190917 ~ WBF-BG-11 Detector: GV9 Decay Corrected: Ingrowth:

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Radium 226 and 228 (positive only)	2.49	0.326	0.372		pCi/g		0.202	446101
Radium-226	1.24	0.204	0.241		pCi/g	1.00	0.140	446101
Radium-228	1.25	0.254	0.284		pCi/g		0.202	446101

Gamma Spectroscopy Analysis Detail Report
Prep Batch: 444057

Lab Id: 180-95857-8 Analyzed: 10/15/19 11:17 Ts: 30 Sigma: 2
Client ID: WBF-BS-BG12-1.5/3.5-2019 0917 ~ WBF-BG-12 Detector: GV5 Decay Corrected: Ingrowth:

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Radium 226 and 228 (positive only)	3.23	0.494	0.548		pCi/g		0.461	446102
Radium-226	1.38	0.293	0.326		pCi/g	1.00	0.191	446102
Radium-228	1.85	0.398	0.441		pCi/g		0.461	446102

Lab Id: 180-95857-9 Analyzed: 10/15/19 11:20 Ts: 30 Sigma: 2
Client ID: WBF-BS-BG12-6.5/8.5-2019 0917 ~ WBF-BG-12 Detector: GV12 Decay Corrected: Ingrowth:

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Radium 226 and 228 (positive only)	3.44	0.605	0.654		pCi/g		0.582	446100
Radium-226	1.54	0.339	0.373		pCi/g	1.00	0.263	446100
Radium-228	1.90	0.501	0.537		pCi/g		0.582	446100

Lab Id: 180-95857-10 Analyzed: 10/15/19 11:57 Ts: 30 Sigma: 2
Client ID: WBF-BS-BG12-11.5/13.5-20 190917 ~ WBF-BG-12 Detector: GV9 Decay Corrected: Ingrowth:

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Radium 226 and 228 (positive only)	3.18	0.371	0.438		pCi/g		0.272	446101
Radium-226	1.39	0.237	0.277		pCi/g	1.00	0.173	446101
Radium-228	1.79	0.285	0.339		pCi/g		0.272	446101

Lab Id: 180-95857-11 Analyzed: 10/15/19 11:59 Ts: 30 Sigma: 2
Client ID: WBF-BS-BG12-16.5/18.5-20 190917 ~ WBF-BG-12 Detector: GV12 Decay Corrected: Ingrowth:

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Radium 226 and 228 (positive only)	3.00	0.428	0.480		pCi/g		0.240	446100
Radium-226	1.33	0.257	0.291		pCi/g	1.00	0.195	446100
Radium-228	1.67	0.342	0.382		pCi/g		0.240	446100

Gamma Spectroscopy Analysis Detail Report
Prep Batch: 444057

Lab Id: 180-95857-12 Analyzed: 10/15/19 11:55 Ts: 30 Sigma: 2
Client ID: WBF-BS-BG12-21.5/23.5-20190917 ~ WBF-BG-12 Detector: GV5 Decay Corrected: Ingrowth:

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Radium 226 and 228 (positive only)	2.93	0.517	0.560		pCi/g		0.239	446102
Radium-226	1.20	0.300	0.325		pCi/g	1.00	0.239	446102
Radium-228	1.73	0.421	0.456		pCi/g		0.188	446102

Lab Id: 180-95857-13 Analyzed: 10/15/19 11:56 Ts: 30 Sigma: 2
Client ID: WBF-BS-BG12-0.0/0.5-20190917 ~ WBF-BG-12 Detector: GV8 Decay Corrected: Ingrowth:

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Radium 226 and 228 (positive only)	2.05	0.379	0.413		pCi/g		0.542	446103
Radium-226	0.528	0.220	0.227	U	pCi/g	1.00	0.542	446103
Radium-228	1.52	0.309	0.345		pCi/g		0.193	446103

Lab Id: 180-95857-14 Analyzed: 10/15/19 12:45 Ts: 30 Sigma: 2
Client ID: WBF-BS-DUP03-20190917 ~ NA Detector: GV9 Decay Corrected: Ingrowth:

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Radium 226 and 228 (positive only)	2.94	0.391	0.446		pCi/g		0.250	446101
Radium-226	1.41	0.239	0.280		pCi/g	1.00	0.157	446101
Radium-228	1.53	0.309	0.347		pCi/g		0.250	446101

Gamma Spectroscopy Analysis Detail Report
Prep Batch: 444057

Quality Control Summary

Method Blank ID:	Analyte	Parent Result	Spike Added	MB Result	Qualifier	Unit	% Rec	% Rec Limits	RPD	RER	DER	RER Limit	Z Factor
MB 160-444057/1-A	Radium 226 and 228 (positive only)			0.2367	U	pCi/g							
MB 160-444057/1-A	Radium-226			0.04714	U	pCi/g							2.2217
MB 160-444057/1-A	Radium-228			0.1896		pCi/g							3.4119
Lab Control Sample ID:	**Analyte**	**Parent Result**	**Spike Added**	**LCS Result**	**Qualifier**	**Unit**	**% Rec**	**% Rec Limits**	**RPD**	**RER**	**DER**	**RER Limit**	**Z Factor**
LCS 160-444057/2-A	Americium-241		96.6	98.56		pCi/g	102	87 - 116					.3562
LCS 160-444057/2-A	Cesium-137		27.5	26.80		pCi/g	98	87 - 120					-.4317
LCS 160-444057/2-A	Cobalt-60		11.0	11.04		pCi/g	100	87 - 115					.0149
Duplicate ID:	**Analyte**	**Parent Result**	**Spike Added**	**DU Result**	**Qualifier**	**Unit**	**% Rec**	**% Rec Limits**	**RPD**	**RER**	**DER**	**RER Limit**	**Z Factor**
180-95857-3	Radium 226 and 228 (positive only)	2.91		3.113		pCi/g			7	0.20	0.57		
180-95857-3	Radium-226	1.26		1.491		pCi/g			17	0.36	1.01	1	1.0146
180-95857-3	Radium-228	1.65		1.622		pCi/g			2	0.04	0.11	1	.1099

Glossary:

Ts = Count Duration, Sample

GAMMA SPECTROSCOPY BATCH WORKSHEET

Lab Name: Eurofins TestAmerica, St. Loui Job No.: 180-95857-1

SDG No.:

Batch Number: 444057 Batch Start Date: 09/24/19 13:36 Batch Analyst: Slama, Kurt R

Batch Method: Fill_Geo-21 Batch End Date: 09/24/19 14:15

Lab Sample ID	Client Sample ID	Method Chain	Basis	TareWeight	GrossWeight	InitialAmount	IngDecDate1	IngDecDate3	Geometry
MB 160-444057/1		Fill_Geo-21, 901.1				291.18 g	09/24/19 14:15	10/15/19 14:15	tuna can
LCS 160-444057/2		Fill_Geo-21, 901.1				341.9 g	09/24/19 14:15	10/15/19 14:15	tuna can
180-95857-A-1-A	WBF-BS-BG11-1.5/3.5-20190917 ~ WBF-BG-11	Fill_Geo-21, 901.1	T	46.0 g	325.3 g	279.3 g	09/24/19 14:15	10/15/19 14:15	tuna can
180-95857-A-2-A	WBF-BS-BG11-6.5/8.5-20190917 ~ WBF-BG-11	Fill_Geo-21, 901.1	T	46.4 g	282.6 g	236.2 g	09/24/19 14:15	10/15/19 14:15	tuna can
180-95857-A-3-A	WBF-BS-BG11-11.5/13.5-20190917 ~ WBF-BG-11	Fill_Geo-21, 901.1	T	46.3 g	326.7 g	280.4 g	09/24/19 14:15	10/15/19 14:15	tuna can
180-95857-A-3-B DU	WBF-BS-BG11-11.5/13.5-20190917 ~ WBF-BG-11	Fill_Geo-21, 901.1	T	46.3 g	326.7 g	280.4 g	09/24/19 14:15	10/15/19 14:15	tuna can
180-95857-A-4-A	WBF-BS-BG11-16.5/18.5-20190917 ~ WBF-BG-11	Fill_Geo-21, 901.1	T	46.4 g	299.9 g	253.5 g	09/24/19 14:15	10/15/19 14:15	tuna can
180-95857-A-5-A	WBF-BS-BG11-0.0/0.5-20190917 ~ WBF-BG-11	Fill_Geo-21, 901.1	T	46.2 g	286.7 g	240.5 g	09/24/19 14:15	10/15/19 14:15	tuna can
180-95857-A-8-A	WBF-BS-BG12-1.5/3.5-20190917 ~ WBF-BG-12	Fill_Geo-21, 901.1	T	46.1 g	300.2 g	254.1 g	09/24/19 14:15	10/15/19 14:15	tuna can
180-95857-A-9-A	WBF-BS-BG12-6.5/8.5-20190917 ~ WBF-BG-12	Fill_Geo-21, 901.1	T	46.3 g	274.5 g	228.2 g	09/24/19 14:15	10/15/19 14:15	tuna can
180-95857-A-10-A	WBF-BS-BG12-11.5/13.5-20190917 ~ WBF-BG-12	Fill_Geo-21, 901.1	T	46.6 g	314.1 g	267.5 g	09/24/19 14:15	10/15/19 14:15	tuna can
180-95857-A-11-A	WBF-BS-BG12-16.5/18.5-20190917 ~ WBF-BG-12	Fill_Geo-21, 901.1	T	46.6 g	298.1 g	251.5 g	09/24/19 14:15	10/15/19 14:15	tuna can
180-95857-A-12-A	WBF-BS-BG12-21.5/23.5-20190917 ~ WBF-BG-12	Fill_Geo-21, 901.1	T	46.3 g	314.2 g	267.9 g	09/24/19 14:15	10/15/19 14:15	tuna can
180-95857-A-13-A	WBF-BS-BG12-0.0/0.5-20190917 ~ WBF-BG-12	Fill_Geo-21, 901.1	T	46.0 g	259.3 g	213.3 g	09/24/19 14:15	10/15/19 14:15	tuna can
180-95857-A-14-A	WBF-BS-DUP03-20190917 ~ NA	Fill_Geo-21, 901.1	T	46.1 g	291.8 g	245.7 g	09/24/19 14:15	10/15/19 14:15	tuna can

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

GAMMA SPECTROSCOPY BATCH WORKSHEET

Lab Name: Eurofins TestAmerica, St. Loui Job No.: 180-95857-1

SDG No.:

Batch Number: 444057 Batch Start Date: 09/24/19 13:36 Batch Analyst: Slama, Kurt R

Batch Method: Fill_Geo-21 Batch End Date: 09/24/19 14:15

Lab Sample ID	Client Sample ID	Method Chain	Basis	Tuna Can LCS 00009					
MB 160-444057/1		Fill_Geo-21, 901.1							
LCS 160-444057/2		Fill_Geo-21, 901.1		# g					
180-95857-A-1-A	WBF-BS-BG11-1.5/3.5-20190917 ~ WBF-BG-11	Fill_Geo-21, 901.1	T						
180-95857-A-2-A	WBF-BS-BG11-6.5/8.5-20190917 ~ WBF-BG-11	Fill_Geo-21, 901.1	T						
180-95857-A-3-A	WBF-BS-BG11-11.5/13.5-20190917 ~ WBF-BG-11	Fill_Geo-21, 901.1	T						
180-95857-A-3-B DU	WBF-BS-BG11-11.5/13.5-20190917 ~ WBF-BG-11	Fill_Geo-21, 901.1	T						
180-95857-A-4-A	WBF-BS-BG11-16.5/18.5-20190917 ~ WBF-BG-11	Fill_Geo-21, 901.1	T						
180-95857-A-5-A	WBF-BS-BG11-0.0/0.5-20190917 ~ WBF-BG-11	Fill_Geo-21, 901.1	T						
180-95857-A-8-A	WBF-BS-BG12-1.5/3.5-20190917 ~ WBF-BG-12	Fill_Geo-21, 901.1	T						
180-95857-A-9-A	WBF-BS-BG12-6.5/8.5-20190917 ~ WBF-BG-12	Fill_Geo-21, 901.1	T						
180-95857-A-10-A	WBF-BS-BG12-11.5/13.5-20190917 ~ WBF-BG-12	Fill_Geo-21, 901.1	T						
180-95857-A-11-A	WBF-BS-BG12-16.5/18.5-20190917 ~ WBF-BG-12	Fill_Geo-21, 901.1	T						
180-95857-A-12-A	WBF-BS-BG12-21.5/23.5-20190917 ~ WBF-BG-12	Fill_Geo-21, 901.1	T						
180-95857-A-13-A	WBF-BS-BG12-0.0/0.5-20190917 ~ WBF-BG-12	Fill_Geo-21, 901.1	T						
180-95857-A-14-A	WBF-BS-DUP03-20190917 ~ NA	Fill_Geo-21, 901.1	T						

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

GAMMA SPECTROSCOPY BATCH WORKSHEET

Lab Name: Eurofins TestAmerica, St. Loui Job No.: 180-95857-1

SDG No.:

Batch Number: 444057 Batch Start Date: 09/24/19 13:36 Batch Analyst: Slama, Kurt R

Batch Method: Fill_Geo-21 Batch End Date: 09/24/19 14:15

Batch Notes	
Balance ID	1121432711
SOP Number	ST-RC-0003, ST-RC-0025

Basis	Basis Description
T	Total/NA

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

Sample Description: 444057_Gamma_MB 160-444057~1-A
Detector: Detector #12
Batch ID: 444057
Work Order Number: Gamma
Lot Number: MB 160-444057~1-A

Decay to Time: 10/15/2019 10:05 Live Time: 1800 sec
Acquisition Time: 10/15/2019 10:06:00 Real Time: 1801 sec
Analysis Time: 10/15/2019 10:36 Dead Time: 0.05 %
Analysis Quantity: 1.000E+00 Sample

Efficiency Cal File: 12_Soil_TunaCan.Clb
Efficiency Cal Desc: 12_TunaCan_108513
Efficiency Cal Date: 4/20/2018 11:53
Energy Cal Date: 4/20/2018 11:13
Library: Client_Long_Rev15.lib
Bkgd Correction File: 12_2019-10-06_1923.PBC

Nuclide	Activity Bq/Sample	1-Sigma Counting Uncert %	1-Sigma Counting Uncert Bq/Sample	1-Sigma Total Uncert Bq/Sample	Minimum Detectable Activity Bq/Sample
BE-7	2.040E+00	104.2	2.126E+00	2.128E+00	7.350E+00
NA-22	1.639E-01	158.4	2.597E-01	2.598E-01	9.696E-01
K-40	7.321E-01	600.0	4.392E+00	4.393E+00	1.034E+01
Sc-46	-1.794E-02	1824.8	3.273E-01	3.273E-01	1.220E+00
CR-51	-1.980E+00	216.8	4.291E+00	4.292E+00	1.463E+01
MN-54	4.627E-01	33.3	1.542E-01	1.560E-01	3.789E-01
FE-59	5.558E-01	44.7	2.486E-01	2.501E-01	8.193E-01
Co-56	-9.986E-02	168.9	1.686E-01	1.687E-01	1.224E+00
CO-57	-2.248E-01	86.6	1.948E-01	1.951E-01	6.550E-01
CO-58	-5.606E-01	84.2	4.722E-01	4.731E-01	1.591E+00
CO-60	1.043E-01	44.7	4.666E-02	4.695E-02	1.003E+00
ZN-65	0.000E+00	1.#INF	1.775E-01	1.775E-01	2.605E+00
NB-94	1.684E-01	100.0	1.684E-01	1.686E-01	7.855E-01
ZR-95	5.861E-02	979.8	5.743E-01	5.743E-01	1.490E+00
NB-95	-2.581E-01	132.6	3.422E-01	3.425E-01	1.197E+00
RU-103	1.547E-01	147.2	2.277E-01	2.279E-01	6.147E-01
RH-106	2.914E+00	162.5	4.734E+00	4.736E+00	1.630E+01
AG-108M	1.470E-01	207.4	3.050E-01	3.051E-01	7.487E-01
AG-110M	2.730E-01	83.9	2.289E-01	2.293E-01	1.658E+00
SN-113	7.641E-03	6658.8	5.088E-01	5.088E-01	1.800E+00
SB-124	2.009E-01	164.9	3.312E-01	3.314E-01	1.161E+00
SB-125	1.036E+00	63.9	6.621E-01	6.642E-01	1.685E+00
I-131	-2.504E-02	203.4	5.093E-02	5.094E-02	7.257E-01
Gd-153	-6.508E-01	145.2	9.447E-01	9.455E-01	3.192E+00
Ga-68	1.760E+01	35.4	6.222E+00	6.300E+00	1.621E+01
Tc-99m	0.000E+00	1.#INF	9.368E-02	9.368E-02	1.191E+00
BA-133	6.174E-02	201.3	1.243E-01	1.243E-01	1.523E+00
CS-134	1.750E-01	73.0	1.277E-01	1.280E-01	1.735E+00
CS-137	-2.108E-01	188.0	3.962E-01	3.964E-01	1.398E+00
CE-139	9.189E-02	207.9	1.910E-01	1.911E-01	6.683E-01
Ba-140	6.902E-01	111.3	7.680E-01	7.687E-01	2.510E+00
La-140	5.281E-01	40.8	2.156E-01	2.174E-01	6.487E-01
CE-141	3.189E-01	177.4	5.659E-01	5.661E-01	1.922E+00

CE-144	-1.544E+00	168.2	2.597E+00	2.598E+00	8.792E+00
PM-144	1.063E-01	207.0	2.200E-01	2.201E-01	5.820E-01
EU-152	8.416E-01	37.8	3.181E-01	3.211E-01	1.861E+00
EU-154	2.587E-01	157.9	4.085E-01	4.087E-01	1.407E+00
EU-155	2.636E-01	179.4	4.728E-01	4.731E-01	4.124E+00
HF-181	1.014E-01	302.4	3.066E-01	3.067E-01	1.103E+00
Ta-182	0.000E+00	1.#INF	2.583E-01	2.583E-01	2.197E+00
Hg-203	1.114E-01	196.9	2.193E-01	2.193E-01	7.743E-01
TL-208	-3.124E-02	909.7	2.842E-01	2.842E-01	7.698E-01
PM-146	1.858E-01	109.9	2.043E-01	2.045E-01	6.076E-01
Y-88	0.000E+00	1.#INF	9.547E-02	9.547E-02	7.036E-01
Cd-113m	-4.264E+03	95.1	4.055E+03	4.062E+03	1.370E+04
Cd-109	-3.752E+00	185.0	6.940E+00	6.943E+00	2.361E+01
Cf-251	-9.236E-01	131.4	1.214E+00	1.215E+00	3.197E+00
Cf-249	-2.469E-01	192.3	4.748E-01	4.749E-01	1.646E+00
Sn-126	-2.147E+00	144.5	3.103E+00	3.105E+00	1.052E+01
PB-210	7.227E+00	99.5	7.193E+00	7.207E+00	2.331E+01
PB-212	-4.430E-01	141.7	6.278E-01	6.282E-01	2.227E+00
PB-214	1.657E-01	163.4	2.709E-01	2.710E-01	2.335E+00
BI-207	-1.097E-01	403.1	4.422E-01	4.423E-01	1.108E+00
BI-212	5.135E+00	111.9	5.747E+00	5.753E+00	1.968E+01
U-235	5.267E-01	110.6	5.824E-01	5.831E-01	9.599E+00
BI-214	5.079E-01	44.7	2.271E-01	2.286E-01	3.103E+00
BI-210M	2.277E-02	167.4	3.811E-02	3.813E-02	1.785E+00
AC-228	2.043E+00	28.9	5.896E-01	5.987E-01	1.391E+00
TH-227	-2.536E+00	126.4	3.206E+00	3.209E+00	8.506E+00
TH-229	-1.072E+00	429.2	4.602E+00	4.602E+00	1.243E+01
TH-234	7.279E+00	38.4	2.798E+00	2.827E+00	9.759E+00
PA-231	4.897E+00	153.9	7.535E+00	7.540E+00	3.548E+01
PA-233	3.086E-01	217.3	6.707E-01	6.709E-01	3.329E+00
PA-234	3.643E-01	336.6	1.226E+00	1.226E+00	3.609E+00
PA-234M	-4.710E+00	1139.0	5.365E+01	5.365E+01	1.947E+02
AM-241	-6.174E-01	148.9	9.191E-01	9.198E-01	3.116E+00
Np-237	1.044E+00	172.9	1.806E+00	1.807E+00	6.160E+00
Ir-192	5.369E-02	530.3	2.847E-01	2.847E-01	1.392E+00
Cs-136	5.907E-01	28.9	1.705E-01	1.738E-01	1.799E+00
Np-239	6.241E-01	161.4	1.007E+00	1.008E+00	3.430E+00
Nd-147	1.231E+00	146.8	1.807E+00	1.809E+00	4.669E+00
TL-210	-3.533E-01	140.3	4.958E-01	4.962E-01	1.710E+00
Kr-85	-1.397E+01	811.7	1.134E+02	1.134E+02	3.948E+02
Total	6.237E+01				

Analyst: Kellene Robbs

Sample description
444057_Gamma_MB 160-444057~1-A

Spectrum Filename: C:\User\SPC\Det12\12_Gamma_20192671.An1

Acquisition information

Start time:	10/15/2019 10:06:00 AM
Live time:	1800
Real time:	1801
Dead time:	0.05 %
Detector ID:	12

Detector system
Ge12 S/N10034336

Calibration

Filename:	12_Soil_TunaCan.Clb

12_TunaCan_108513

Energy Calibration

Created:	4/20/2018 11:13:27 AM
Zero offset:	0.059 keV
Gain:	0.250 keV/channel
Quadratic:	-3.735E-08 keV/channel^2

Efficiency Calibration

Created:	4/20/2018 11:53:09 AM
Type:	Polynomial
Uncertainty:	1.020 %
Coefficients:	-0.363508 -4.707999 0.462125
	-0.051256 0.002384 -0.000043

Library Files

Main analysis library:	Client_Long_Rev15.lib
Library Match Width:	0.500
Peak stripping:	Library based

Analysis parameters

Analysis engine:	Env32 G800W064
Start channel:	100 (25.08keV)
Stop channel:	8000 (1999.13keV)
Peak rejection level:	1000.000%
Peak search sensitivity:	3
Sample Size:	1.0000E+00 +/- 0.000E+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:	4.0000000E+00
Systematic error:	4.0000000E+00
Fraction Limit:	0.000%
Background width:	3
Half lives decay limit:	12.000

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

Corrections	Status	Comments
Decay correct to date:	YES	10/15/2019 10:05:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	12_2019-10-06_1923.PBC 10/6/2019 7:23:34 PM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 3 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 0.0690

***** 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
46.60	10.	99.54	1.09	1.805E-02	46.54	4.250	PBC<MDA	PB210
63.21	28.	38.43	0.49	2.978E-02	63.29	3.810	PBC<MDA	TH234
80.99	9.	120.00	0.89	3.466E-02	80.99	34.060	PBC<MDA	BA133
86.49	9.	172.94	0.89	3.559E-02	86.49	13.100	PBC<MDA	Np237
					86.54	30.700	4.455E-01	EU155
86.54	9.	179.37	0.89	3.560E-02	86.49	13.100	PBC<MDA	Np237
					86.54	30.700	4.457E-01	EU155
					86.94	9.040	1.511E+00	Sn126
86.94	7.	232.76	0.89	3.566E-02	86.54	30.700	PBC<MDA	EU155
					86.94	9.040	1.201E+00	Sn126
92.65	11.	112.12	0.73	3.637E-02	92.59	5.584	PBC<MDA	TH234
103.70	7.	253.58	0.91	3.720E-02	103.70	24.000	PBC<MDA	Np239
106.13	10.	161.43	0.91	3.729E-02	106.13	22.700	PBC<MDA	Np239
123.10	7.	157.89	0.93	3.721E-02	123.10	40.790	PBC<MDA	EU154
143.79	-5.	245.84	0.95	3.599E-02	143.79	10.960	PBC<MDA	U235
145.44	10.	177.44	0.95	3.586E-02	145.44	48.200	PBC<MDA	CE141
162.66	8.	111.26	0.97	3.435E-02	162.66	6.220	PBC<MDA	Ba140
163.38	6.	172.37	0.97	3.428E-02	163.38	5.080	PBC<MDA	U235
165.85	4.	207.87	0.97	3.405E-02	165.85	79.900	PBC<MDA	CE139
185.72	-6.	216.87	0.99	3.215E-02	185.72	54.000	PBC<MDA	U235
205.33	5.	141.14	1.01	3.030E-02	205.33	5.010	PBC<MDA	U235
227.00	2.	411.44	1.03	2.839E-02	227.00	6.300	PBC<MDA	Cf251
238.63	-9.	141.70	1.05	2.743E-02	238.63	43.300	PBC<MDA	PB212
244.69	5.	141.14	1.05	2.695E-02	244.69	7.580	PBC<MDA	EU152
279.20	4.	196.85	1.09	2.449E-02	279.20	81.460	PBC<MDA	Hg203
284.30	3.	306.57	1.09	2.416E-02	284.30	6.140	PBC<MDA	I131
295.09	6.	163.45	1.10	2.350E-02	295.09	19.300	PBC<MDA	PB214

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
296.00	5.	192.18	1.10	2.345E-02	296.00	79.000	PBC<MDA	TL210
300.03	5.	200.85	1.11	2.321E-02	300.03	3.280	PBC<MDA	PB212
					300.07	2.460	5.292E+00	PA231
					300.18	6.200	2.100E+00	PA233
300.07	5.	209.81	1.11	2.321E-02	300.03	3.280	PBC<MDA	PB212
					300.07	2.460	5.292E+00	PA231
					300.18	6.200	2.100E+00	PA233
300.18	5.	217.32	1.11	2.320E-02	300.03	3.280	PBC<MDA	PB212
					300.07	2.460	5.293E+00	PA231
					300.18	6.200	2.101E+00	PA233
302.65	5.	225.13	1.11	2.306E-02	302.65	2.880	PBC<MDA	PA231
					302.85	18.330	7.169E-01	BA133
302.85	5.	233.08	1.11	2.304E-02	302.65	2.880	PBC<MDA	PA231
					302.85	18.330	7.171E-01	BA133
304.85	5.	240.45	1.11	2.293E-02	304.85	4.290	PBC<MDA	Ba140
					304.90	28.000	4.725E-01	BI210M
304.90	5.	247.90	1.11	2.293E-02	304.85	4.290	PBC<MDA	Ba140
					304.90	28.000	4.727E-01	BI210M
308.44	3.	530.26	1.11	2.273E-02	308.44	31.750	PBC<MDA	Ir192
338.32	7.	114.23	1.14	2.118E-02	338.32	12.010	PBC<MDA	AC228
340.57	7.	126.07	1.15	2.108E-02	340.57	46.900	PBC<MDA	Cs136
344.29	2.	535.99	1.15	2.090E-02	344.29	26.500	PBC<MDA	EU152
351.93	-2.	493.59	1.16	2.055E-02	351.93	37.600	PBC<MDA	PB214
427.88	4.	147.20	1.23	1.770E-02	427.88	29.600	PBC<MDA	SB125
433.94	2.	397.91	1.24	1.751E-02	433.94	90.480	PBC<MDA	AG108M
453.88	4.	109.92	1.26	1.692E-02	453.88	65.000	PBC<MDA	PM146
463.37	1.	670.82	1.27	1.666E-02	463.37	10.470	PBC<MDA	SB125
477.60	6.	104.19	1.28	1.628E-02	477.60	10.520	PBC<MDA	BE7
482.00	2.	302.40	1.28	1.617E-02	482.00	80.500	PBC<MDA	HF181
497.05	4.	147.20	1.30	1.580E-02	497.05	90.900	PBC<MDA	RU103
511.86	56.	19.87	2.56	1.546E-02	511.86	20.000	1.000E+01	RH106
531.00	4.	146.76	1.33	1.504E-02	531.00	13.000	PBC<MDA	Nd147
563.24	3.	252.03	1.36	1.439E-02	563.24	8.350	PBC<MDA	CS134
569.32	7.	72.95	1.37	1.428E-02	569.32	15.380	PBC<MDA	CS134
					569.47	8.200	3.190E+00	PA234
					569.70	97.740	2.677E-01	BI207
600.50	11.	63.90	1.40	1.373E-02	600.50	17.860	PBC<MDA	SB125
602.73	5.	164.89	1.40	1.369E-02	602.73	98.260	PBC<MDA	SB124
604.71	5.	176.69	1.40	1.366E-02	604.71	97.620	PBC<MDA	CS134
609.31	-4.	272.78	1.41	1.358E-02	609.31	46.090	PBC<MDA	BI214
610.30	5.	197.89	1.41	1.357E-02	610.30	5.750	PBC<MDA	RU103
614.28	5.	207.42	1.41	1.350E-02	614.28	89.850	PBC<MDA	AG108M
621.92	7.	162.46	1.42	1.338E-02	621.92	9.930	PBC<MDA	RH106
657.76	7.	83.86	1.45	1.284E-02	657.76	94.640	PBC<MDA	AG110M
696.54	2.	207.02	1.49	1.232E-02	696.54	99.000	PBC<MDA	PM144
702.63	3.	250.62	1.49	1.224E-02	702.63	97.900	PBC<MDA	NB94
727.17	8.	111.93	1.52	1.194E-02	727.17	7.550	PBC<MDA	BI212
735.72	1.	979.80	1.52	1.184E-02	735.72	22.500	PBC<MDA	PM146

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
756.73	1.	979.80	1.54	1.160E-02	756.73	54.460	PBC<MDA	ZR95
763.94	4.	121.38	1.55	1.152E-02	763.94	22.280	PBC<MDA	AG110M
778.92	7.	37.80	1.56	1.136E-02	778.92	12.940	PBC<MDA	EU152
785.42	5.	94.23	1.57	1.129E-02	785.42	1.280	PBC<MDA	BI212
801.95	8.	130.98	1.58	1.113E-02	801.95	8.690	PBC<MDA	CS134
818.50	8.	121.98	1.60	1.096E-02	818.50	100.000	PBC<MDA	Cs136
834.85	9.	33.33	1.61	1.081E-02	834.85	99.980	4.627E-01	MN54
871.10	4.	100.00	1.65	1.048E-02	871.10	99.890	PBC<MDA	NB94
880.53	6.	89.80	1.66	1.040E-02	880.53	6.000	PBC<MDA	PA234
883.24	2.	336.58	1.66	1.038E-02	883.24	9.600	PBC<MDA	PA234
911.07	12.	28.87	1.68	1.015E-02	911.07	29.000	2.266E+00	AC228
946.02	1.	501.66	1.72	9.873E-03	946.02	13.400	PBC<MDA	PA234
1037.84	1.	796.87	1.80	9.228E-03	1037.84	14.130	PBC<MDA	Co56
1048.07	12.	28.87	1.81	9.162E-03	1048.07	80.000	9.096E-01	Cs136
1077.40	8.	35.36	1.83	8.978E-03	1077.40	3.300	1.760E+01	Ga68
1099.25	5.	44.72	1.85	8.846E-03	1099.25	56.500	PBC<MDA	FE59
1112.07	4.	127.48	1.86	8.770E-03	1112.07	13.644	PBC<MDA	EU152
1173.24	5.	44.72	1.92	8.426E-03	1173.24	99.900	PBC<MDA	CO60
1238.28	1.	427.57	1.97	8.090E-03	1238.28	66.070	PBC<MDA	Co56
1274.53	2.	158.44	2.00	7.914E-03	1274.53	99.940	PBC<MDA	NA22
					1274.54	35.190	4.655E-01	EU154
1460.83	1.	600.00	2.16	7.112E-03	1460.83	10.670	PBC<MDA	K40
1596.21	6.	40.82	2.27	6.616E-03	1596.21	95.400	PBC<MDA	La140
1764.49	5.	44.72	2.40	6.075E-03	1764.49	15.400	PBC<MDA	BI214

No unknown peaks passed sensitivity test.

This section based on library: Client_Long_Rev15.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 1 Sigma %	FWHM keV
PB-210	186.02	46.60	40.	10.	0.006	99.54	1.094s
TH-227	200.18	50.14	87.	-5.	-0.003	285.89	0.855s
AM-241	237.74	59.54	134.	-11.	-0.006	148.86	0.865s
TH-234	252.44	63.21	30.	28.	0.015	38.43	0.486s
Sn-126	256.71	64.28	128.	-11.	-0.006	144.52	0.869s
BA-133	323.50	80.99	37.	9.	0.005	120.00	0.887s
Np-237	345.49	86.49	110.	9.	0.005	172.94	0.892s
EU-155	345.70	86.54	119.	9.	0.005	179.37	0.892s
Sn-126	347.29	86.94	128.	7.	0.004	232.76	0.892s
Sn-126	349.81	87.57	135.	0.	0.000	1000.00	0.893s
Cd-109	351.68	88.04	139.	-9.	-0.005	184.97	0.894s
Nd-147	363.92	91.10	130.	0.	0.000	1000.00	0.897s
TH-234	370.12	92.65	50.	11.	0.006	112.12	0.726s
AC-228	372.91	93.35	144.	-10.	-0.006	167.01	0.899s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Gd-153	389.50	97.50	170.	-13.	-0.007	145.17	0.903s
Np-239	397.50	99.50	183.	-13.	-0.007	150.11	0.905s
Gd-153	412.29	103.20	196.	-13.	-0.007	154.52	0.909s
Np-239	414.29	103.70	151.	7.	0.004	253.58	0.909s
Np-239	424.00	106.13	113.	10.	0.005	161.43	0.912s
EU-152	486.56	121.78	50.	0.	0.000	1000.00	0.928s
CO-57	487.69	122.06	56.	-13.	-0.007	86.63	0.928s
EU-154	491.84	123.10	59.	7.	0.004	157.89	0.929s
PA-234	524.60	131.29	75.	0.	0.000	1000.00	0.938s
HF-181	531.51	133.02	164.	-11.	-0.006	162.91	0.939s
CE-144	533.57	133.54	175.	-11.	-0.006	168.16	0.940s
HF-181	544.61	136.30	187.	-11.	-0.006	172.83	0.943s
CO-57	545.30	136.47	190.	-2.	-0.001	961.50	0.943s
Tc-99m	561.44	140.51	192.	0.	0.000	1000.00	0.947s
U-235	574.53	143.79	197.	-5.	-0.003	245.84	0.950s
CE-141	581.15	145.44	150.	10.	0.006	177.44	0.952s
Ba-140	649.99	162.66	38.	8.	0.005	111.26	0.969s
U-235	652.87	163.38	46.	6.	0.003	172.37	0.970s
CE-139	662.76	165.85	42.	4.	0.002	207.87	0.973s
Cf-251	705.72	176.60	40.	-9.	-0.005	131.44	0.983s
U-235	742.18	185.72	53.	-6.	-0.003	216.87	0.992s
TH-229	773.32	193.51	37.	-3.	-0.001	429.21	1.000s
U-235	820.59	205.33	15.	5.	0.003	141.14	1.012s
TH-229	842.65	210.85	48.	-13.	-0.007	105.09	1.018s
Cf-251	907.22	227.00	26.	2.	0.001	411.44	1.034s
TH-227	943.09	235.97	79.	-5.	-0.003	272.74	1.043s
PB-212	953.73	238.63	93.	-9.	-0.005	141.70	1.046s
EU-152	977.96	244.69	15.	5.	0.003	141.14	1.051s
TH-227	1024.13	256.24	29.	-8.	-0.005	126.43	1.063s
Cd-113m	1053.96	263.70	57.	-12.	-0.007	95.08	1.070s
BI-210M	1062.48	265.83	67.	-5.	-0.003	224.93	1.072s
TL-208	1108.27	277.28	32.	-4.	-0.002	206.16	1.084s
Hg-203	1115.93	279.20	29.	4.	0.002	196.85	1.086s
I-131	1136.32	284.30	18.	3.	0.001	306.57	1.091s
PB-214	1179.47	295.09	45.	6.	0.003	163.45	1.101
TL-210	1183.11	296.00	52.	5.	0.003	192.18	1.102s
PB-212	1199.22	300.03	57.	5.	0.003	200.85	1.106s
PA-231	1199.38	300.07	62.	5.	0.003	209.81	1.106s
PA-233	1199.82	300.18	67.	5.	0.003	217.32	1.107s
PA-231	1209.70	302.65	73.	5.	0.003	225.13	1.109s
BA-133	1210.50	302.85	78.	5.	0.003	233.08	1.109s
Ba-140	1218.49	304.85	83.	5.	0.003	240.45	1.111
BI-210M	1218.68	304.90	89.	5.	0.003	247.90	1.111
Ir-192	1232.85	308.44	94.	3.	0.001	530.26	1.115s
PA-233	1247.13	312.01	97.	0.	0.000	1000.00	1.118s
Ir-192	1265.04	316.49	97.	0.	0.000	1000.00	1.123s
CR-51	1279.41	320.08	140.	-8.	-0.004	216.75	1.126s
Cf-249	1332.81	333.44	25.	-9.	-0.005	109.21	1.139s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
AC-228	1352.33	338.32	28.	7.	0.004	114.23	1.144s
Cs-136	1361.32	340.57	34.	7.	0.004	126.07	1.146s
EU-152	1376.18	344.29	41.	2.	0.001	535.99	1.150s
PB-214	1406.76	351.93	41.	-2.	-0.001	493.59	1.158s
BA-133	1423.02	356.00	47.	-3.	-0.002	328.30	1.162s
I-131	1456.95	364.48	16.	-3.	-0.002	267.36	1.170s
BA-133	1534.35	383.84	46.	-9.	-0.005	108.74	1.189s
Cf-249	1550.79	387.95	55.	-6.	-0.003	192.27	1.193
SB-125	1710.45	427.88	8.	4.	0.002	147.20	1.232s
AG-108M	1734.69	433.94	16.	2.	0.001	397.91	1.238s
PM-146	1814.45	453.88	4.	4.	0.002	109.92	1.257s
SB-125	1852.39	463.37	22.	1.	0.001	670.82	1.266s
BE-7	1909.29	477.60	18.	6.	0.003	104.19	1.280s
HF-181	1926.90	482.00	25.	2.	0.001	302.40	1.284s
La-140	1946.98	487.02	60.	-10.	-0.006	114.12	1.289s
RU-103	1987.11	497.05	8.	4.	0.002	147.20	1.298s
RH-106	2046.35	511.86	33.	56.	0.031	19.87	2.563s
Kr-85	2054.81	513.98	91.	-2.	-0.001	811.66	1.315s
Nd-147	2122.88	531.00	9.	4.	0.002	146.76	1.331s
Ba-140	2147.92	537.26	9.	-1.	0.000	909.67	1.337s
CS-134	2251.82	563.24	13.	3.	0.002	252.03	1.362s
CS-134	2276.15	569.32	9.	7.	0.004	72.95	1.367s
TL-208	2330.96	583.02	9.	-1.	0.000	909.67	1.381s
SB-125	2400.87	600.50	19.	11.	0.006	63.90	1.397s
SB-124	2409.79	602.73	30.	5.	0.003	164.89	1.399s
CS-134	2417.71	604.71	35.	5.	0.003	176.69	1.401s
BI-214	2436.11	609.31	48.	-4.	-0.002	272.78	1.405
RU-103	2440.06	610.30	44.	5.	0.003	197.89	1.406s
AG-108M	2455.99	614.28	49.	5.	0.003	207.42	1.410s
PM-144	2471.12	618.06	138.	-12.	-0.007	141.13	1.414s
RH-106	2486.54	621.92	61.	7.	0.004	162.46	1.417s
SB-125	2542.43	635.89	13.	-2.	-0.001	264.58	1.430s
I-131	2546.77	636.97	23.	-7.	-0.004	108.17	1.432s
AG-110M	2629.92	657.76	14.	7.	0.004	83.86	1.451s
CS-137	2645.51	661.66	28.	-4.	-0.002	187.96	1.455s
PM-144	2785.05	696.54	5.	2.	0.001	207.02	1.487s
NB-94	2809.41	702.63	9.	3.	0.001	250.62	1.493s
SB-124	2890.04	722.79	29.	-11.	-0.006	79.12	1.512s
AG-108M	2890.65	722.94	40.	-6.	-0.003	158.88	1.512s
EU-154	2892.34	723.36	46.	0.	0.000	1000.00	1.512s
ZR-95	2895.69	724.20	46.	0.	0.000	1000.00	1.513s
BI-212	2907.58	727.17	39.	8.	0.005	111.93	1.516s
PM-146	2941.78	735.72	9.	1.	0.000	979.80	1.524
PM-146	2987.55	747.16	9.	-1.	-0.001	493.71	1.535s
ZR-95	3025.83	756.73	9.	1.	0.000	979.80	1.543s
AG-110M	3054.69	763.94	12.	4.	0.002	121.38	1.550s
NB-95	3062.08	765.79	22.	-5.	-0.003	132.58	1.552s
PA-234M	3064.57	766.41	20.	-1.	-0.001	640.31	1.552s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
EU-152	3114.61	778.92	0.	7.	0.004	37.80	1.564s
BI-212	3140.62	785.42	5.	5.	0.003	94.23	1.570s
CS-134	3182.43	795.87	34.	-11.	-0.006	80.92	1.579s
TL-210	3197.35	799.60	45.	-7.	-0.004	140.34	1.583s
CS-134	3206.76	801.95	44.	8.	0.004	130.98	1.585s
CO-58	3242.06	810.78	38.	-11.	-0.006	84.23	1.593
La-140	3262.05	815.77	49.	-9.	-0.005	115.99	1.598s
Cs-136	3272.97	818.50	50.	8.	0.005	121.98	1.600s
MN-54	3338.38	834.85	0.	9.	0.005	33.33	1.615s
Co-56	3386.08	846.77	20.	-6.	-0.003	168.87	1.626s
TL-208	3441.27	860.56	10.	-3.	-0.002	238.82	1.638s
NB-94	3483.41	871.10	6.	4.	0.002	100.00	1.648s
EU-154	3491.95	873.23	4.	0.	0.000	1000.00	1.650s
PA-234	3521.16	880.53	10.	6.	0.003	89.80	1.657s
PA-234	3532.00	883.24	16.	2.	0.001	336.58	1.659s
AG-110M	3537.78	884.68	18.	0.	0.000	1000.00	1.660s
Y-88	3591.22	898.04	10.	0.	0.000	1000.00	1.672s
AC-228	3643.36	911.07	0.	12.	0.007	28.87	1.684s
AG-110M	3749.09	937.49	0.	0.	0.000	1000.00	1.708s
PA-234	3783.21	946.02	5.	1.	0.001	501.66	1.716s
EU-152	3855.60	964.11	13.	-4.	-0.002	128.49	1.732s
AC-228	3875.05	968.97	21.	-2.	-0.001	329.14	1.736s
EU-154	3984.54	996.33	20.	-9.	-0.005	81.09	1.761s
EU-154	4018.33	1004.77	11.	-3.	-0.002	222.69	1.768s
Co-56	4150.66	1037.84	5.	1.	0.000	796.87	1.798s
Cs-136	4191.60	1048.07	0.	12.	0.007	28.87	1.807s
RH-106	4200.76	1050.36	19.	-6.	-0.003	113.06	1.809
BI-207	4253.99	1063.66	5.	-1.	-0.001	403.11	1.820s
Ga-68	4308.98	1077.40	0.	8.	0.004	35.36	1.833s
FE-59	4396.44	1099.25	0.	5.	0.003	44.72	1.852s
EU-152	4447.76	1112.07	11.	4.	0.002	127.48	1.863s
ZN-65	4461.66	1115.55	15.	0.	0.000	1000.00	1.866s
BI-214	4480.63	1120.29	15.	0.	0.000	1000.00	1.870s
Sc-46	4481.68	1120.55	15.	0.	0.000	1000.00	1.870s
Ta-182	4484.69	1121.30	4.	0.	0.000	1000.00	1.871s
CO-60	4692.57	1173.24	0.	5.	0.003	44.72	1.916s
Ta-182	4755.86	1189.05	0.	0.	0.000	1000.00	1.930s
Ta-182	4885.39	1221.41	17.	-10.	-0.006	101.73	1.957s
Co-56	4952.92	1238.28	6.	1.	0.001	427.57	1.972s
NA-22	5098.03	1274.53	6.	2.	0.001	158.44	2.003s
EU-154	5098.08	1274.54	8.	0.	0.000	1000.00	2.003s
FE-59	5166.35	1291.60	0.	0.	0.000	1000.00	2.017s
TL-210	5252.04	1313.00	0.	0.	0.000	1000.00	2.036s
CO-60	5330.11	1332.50	6.	-2.	-0.001	343.80	2.052s
AG-110M	5537.48	1384.30	6.	-3.	-0.001	218.12	2.096s
EU-152	5632.39	1408.00	6.	-1.	-0.001	600.00	2.115s
K-40	5843.92	1460.83	6.	1.	0.001	600.00	2.159s
La-140	6386.02	1596.21	0.	6.	0.003	40.82	2.269s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
SB-124	6765.58	1690.98	0.	0.	0.000	1000.00	2.345s
BI-214	7060.00	1764.49	0.	5.	0.003	44.72	2.403s
Co-56	7087.48	1771.35	5.	0.	0.000	1000.00	2.408s
Y-88	7346.69	1836.06	0.	0.	0.000	1000.00	2.459s

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	2.0403E+00					5.31E+01	
			477.60	2.040E+00	?(	7.350E+00	1.04E+02	1.05E+01 G
NA-22	C	1.6390E-01					9.50E+02	
			1274.53	1.639E-01	?(	9.696E-01	1.58E+02	9.99E+01 G
K-40	N	7.3208E-01					4.66E+11	
			1460.83	7.321E-01	?(	1.034E+01	6.00E+02	1.07E+01 G
Sc-46	F	-1.7937E-02					8.38E+01	
			889.28	-1.794E-02	&(	1.220E+00	1.82E+03	1.00E+02 G
			1120.55	0.000E+00	+	1.323E+00	1.00E+03	1.00E+02 G
CR-51	F	-1.9798E+00					2.77E+01	
			320.08	-1.980E+00	&(	1.463E+01	2.17E+02	9.94E+00 G
MN-54	C	4.6271E-01					3.12E+02	
			834.85	4.627E-01	?(	3.789E-01	3.33E+01	1.00E+02 G
FE-59	F	5.5581E-01					4.45E+01	
			1099.25	5.558E-01	?(	8.193E-01	4.47E+01	5.65E+01 G
			1291.60	0.000E+00	-	1.210E+00	1.00E+03	4.32E+01 G
Co-56	C	-9.9864E-02					7.73E+01	
			846.77	-3.118E-01	?(	1.224E+00	1.69E+02	9.99E+01 G
			1238.28	1.386E-01	?(	1.435E+00	4.28E+02	6.61E+01 G
			1037.84	2.840E-01	?(	5.740E+00	7.97E+02	1.41E+01 G
			1771.35	0.000E+00	+	7.783E+00	1.00E+03	1.55E+01 A
CO-57	C	-2.2484E-01					2.72E+02	
			122.06	-2.248E-01	?(	6.550E-01	8.66E+01	8.56E+01 G
			136.47	-2.896E-01	+	9.536E+00	9.62E+02	1.07E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CO-58	C	-5.6060E-01					7.09E+01	
			810.78	-5.606E-01	?(	1.591E+00	8.42E+01	9.95E+01 G
CO-60	F	1.0435E-01					1.93E+03	
			1332.50	-1.211E-01	?(	1.003E+00	3.44E+02	1.00E+02 G
			1173.24	3.300E-01	?(	4.864E-01	4.47E+01	9.99E+01 G
NB-94	I	1.6837E-01					7.41E+06	
			702.63	1.236E-01	?(	7.855E-01	2.51E+02	9.79E+01 G
			871.10	2.122E-01	?(	7.495E-01	1.00E+02	9.99E+01 G
ZR-95	I	5.8615E-02					6.40E+01	
			756.73	5.861E-02	?(	1.490E+00	9.80E+02	5.45E+01 G
			724.20	0.000E+00	-	3.593E+00	1.00E+03	4.42E+01 G
NB-95	I	-2.5812E-01					6.40E+01	
			765.79	-2.581E-01	?(	1.197E+00	1.33E+02	9.98E+01 G
RU-103	I	1.5472E-01					3.93E+01	
			497.05	1.547E-01	?(	6.147E-01	1.47E+02	9.09E+01 G
			610.30	3.482E+00	?	2.403E+01	1.98E+02	5.75E+00 GA
RH-106	I	2.9138E+00					3.74E+02	
			621.92	2.914E+00	&(	1.630E+01	1.62E+02	9.93E+00 G
			1050.36	-2.271E+01	+	8.928E+01	1.13E+02	1.56E+00 G
			511.86	1.000E+01	?	5.322E+00	1.99E+01	2.00E+01 GA
AG-108M	C	1.4704E-01					1.53E+05	
			433.94	7.014E-02	?(	7.487E-01	3.98E+02	9.05E+01 G
			722.94	-2.968E-01	+	1.638E+00	1.59E+02	9.08E+01 G
			614.28	2.245E-01	?(	1.622E+00	2.07E+02	8.98E+01 G
AG-110M	F	2.7295E-01					2.50E+02	
			884.68	0.000E+00	?(	1.658E+00	1.00E+03	7.27E+01 G
			657.76	3.261E-01	?(	9.302E-01	8.39E+01	9.46E+01 G
			937.49	0.000E+00	-	1.199E+00	1.00E+03	3.44E+01 G
			1384.30	-8.217E-01	+	4.253E+00	2.18E+02	2.43E+01 G
			763.94	9.377E-01	?(	4.031E+00	1.21E+02	2.23E+01 G
SN-113	F	7.6413E-03					1.15E+02	
			391.69	7.641E-03	%(	1.800E+00	6.66E+03	6.40E+01 G
SB-124	F	2.0087E-01					6.02E+01	
			602.73	2.009E-01	&(	1.161E+00	1.65E+02	9.83E+01 G
			1690.98	0.000E+00	-	1.359E+00	1.00E+03	4.78E+01 G
			722.79	-4.505E+00	+	1.198E+01	7.91E+01	1.08E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	I	1.0361E+00					1.01E+03	
			427.88	4.242E-01	?(	1.685E+00	1.47E+02	2.96E+01 G
			600.50	2.471E+00	?(	5.196E+00	6.39E+01	1.79E+01 G
			635.89	-7.462E-01	+	7.280E+00	2.65E+02	1.13E+01 G
			463.37	3.185E-01	?(	7.825E+00	6.71E+02	1.05E+01 G
I-131	I	-2.5039E-02					8.02E+00	
			364.48	-1.020E-01	?(	7.257E-01	2.67E+02	8.17E+01 G
			284.30	9.986E-01	?(	8.486E+00	3.07E+02	6.14E+00 G
			636.97	-3.929E+00	+	1.467E+01	1.08E+02	7.17E+00 G
Gd-153	F	-6.5075E-01					2.42E+02	
			97.50	-6.508E-01	&(	3.192E+00	1.45E+02	3.00E+01 G
			103.20	-8.927E-01	+	4.657E+00	1.55E+02	2.18E+01 G
Ga-68	C	1.7600E+01					4.71E-02	
			1077.40	1.760E+01	?(	1.621E+01	3.54E+01	3.30E+00 G
BA-133	F	6.1740E-02					3.85E+03	
			356.00	-1.318E-01	?(	1.523E+00	3.28E+02	6.20E+01 G
			302.85	7.171E-01	?(	5.770E+00	2.33E+02	1.83E+01 G
			383.84	-2.985E+00	+	1.107E+01	1.09E+02	8.94E+00 GA
			80.99	4.393E-01	?	1.456E+00	1.20E+02	3.41E+01 GA
CS-134	I	1.7502E-01					7.54E+02	
			795.87	-6.377E-01	?(	1.735E+00	8.09E+01	8.55E+01 G
			604.71	2.030E-01	+	1.255E+00	1.77E+02	9.76E+01 G
			569.32	1.701E+00	?(	4.156E+00	7.30E+01	1.54E+01 G
			801.95	4.309E+00	?(	1.942E+01	1.31E+02	8.69E+00 G
			563.24	1.387E+00	?(	9.019E+00	2.52E+02	8.35E+00 G
CS-137	I	-2.1079E-01					1.10E+04	
			661.66	-2.108E-01	(	1.398E+00	1.88E+02	8.52E+01 G
CE-139	F	9.1886E-02					1.38E+02	
			165.85	9.189E-02	*(	6.683E-01	2.08E+02	7.99E+01 G
Ba-140	I	6.9020E-01					1.28E+01	
			537.26	-1.019E-01	?(	2.510E+00	9.10E+02	2.44E+01 G
			162.66	2.145E+00	*(	8.174E+00	1.11E+02	6.22E+00 G
			304.85	3.084E+00	?(	2.558E+01	2.40E+02	4.29E+00 G
La-140	I	5.2814E-01					1.28E+01	
			1596.21	5.281E-01	?(	6.487E-01	4.08E+01	9.54E+01 G
			487.02	-7.624E-01	-	2.961E+00	1.14E+02	4.55E+01 G
			328.76	-8.427E-02	%	3.147E+00	1.02E+03	2.03E+01 G
			815.77	-1.937E+00	-	7.678E+00	1.16E+02	2.33E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CE-141	I	3.1894E-01					3.25E+01	
			145.44	3.189E-01	?(	1.922E+00	1.77E+02	4.82E+01 G
CE-144	I	-1.5443E+00					2.85E+02	
			133.54	-1.544E+00	&(	8.792E+00	1.68E+02	1.11E+01 G
PM-144	C	1.0628E-01					3.63E+02	
			696.54	1.063E-01	?(	5.820E-01	2.07E+02	9.90E+01 G
			618.06	-5.021E-01	+	2.399E+00	1.41E+02	9.91E+01 G
EU-152	F	8.4163E-01					4.94E+03	
			121.78	0.000E+00	?(	1.861E+00	1.00E+03	2.86E+01 G
			344.29	1.718E-01	?(	3.275E+00	5.36E+02	2.65E+01 G
			1112.07	1.857E+00	?(	8.434E+00	1.27E+02	1.36E+01 G
			778.92	2.645E+00	?(	2.785E+00	3.78E+01	1.29E+01 G
			964.11	-1.693E+00	+	7.705E+00	1.28E+02	1.46E+01 G
			244.69	1.450E+00	?(	5.590E+00	1.41E+02	7.58E+00 G
			1408.00	-3.611E-01	+	5.101E+00	6.00E+02	2.10E+01 GA
EU-154	I	2.5874E-01					3.14E+03	
			123.10	2.587E-01	?(	1.407E+00	1.58E+02	4.08E+01 G
			1274.54	0.000E+00	-	3.170E+00	1.00E+03	3.52E+01 G
			723.36	0.000E+00	-	7.839E+00	1.00E+03	2.02E+01 G
			873.23	0.000E+00	-	5.206E+00	1.00E+03	1.23E+01 G
			1004.77	-1.086E+00	+	5.854E+00	2.23E+02	1.80E+01 G
			996.33	-4.774E+00	+	1.308E+01	8.11E+01	1.06E+01 G
EU-155	I	2.6362E-01					1.81E+03	
			105.31	-1.341E-07	%(	4.124E+00	8.90E+08	2.12E+01 G
			86.54	4.457E-01	?(	2.725E+00	1.79E+02	3.07E+01 G
HF-181	F	1.0141E-01					4.24E+01	
			482.00	1.014E-01	?(	1.103E+00	3.02E+02	8.05E+01 G
			133.02	-3.950E-01	+	2.179E+00	1.63E+02	4.33E+01 G
			345.83	-8.849E-02	&	5.856E+00	1.85E+03	1.51E+01 G
			136.30	-2.950E+00	+	1.726E+01	1.73E+02	5.85E+00 G
Hg-203	F	1.1139E-01					4.66E+01	
			279.20	1.114E-01	?(	7.743E-01	1.97E+02	8.15E+01 G
TL-208	N	-3.1237E-02					6.98E+02	
			583.02	-3.124E-02	?(	7.698E-01	9.10E+02	8.45E+01 G
			277.28	-1.431E+00	&	1.040E+01	2.06E+02	6.31E+00 G
			860.56	-1.269E+00	+	7.380E+00	2.39E+02	1.24E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PM-146	C	1.8583E-01					2.02E+03	
			453.88	2.020E-01	?(	6.076E-01	1.10E+02	6.50E+01 G
			747.16	-1.861E-01	+	2.365E+00	4.94E+02	3.40E+01 G
			735.72	1.390E-01	?(	3.534E+00	9.80E+02	2.25E+01 G
Cd-113m		-4.2641E+03					5.33E+03	
			263.70	-4.264E+03	?(	1.370E+04	9.51E+01	6.00E-03 K
Cd-109	F	-3.7517E+00					4.53E+02	
			88.04	-3.752E+00	(	2.361E+01	1.85E+02	3.79E+00 G
Cf-251	T	-9.2356E-01					3.28E+05	
			176.60	-9.236E-01	?(	3.197E+00	1.31E+02	1.70E+01 G
			227.00	7.249E-01	?	8.176E+00	4.11E+02	6.30E+00 GA
Cf-249	T	-2.4693E-01					1.28E+05	
			387.95	-2.469E-01	&(	1.646E+00	1.92E+02	6.60E+01 G
			333.44	-1.561E+00	+	4.324E+00	1.09E+02	1.55E+01 G
Sn-126		-2.1469E+00					3.65E+07	
			87.57	0.000E+00	&	2.356E+00	1.00E+03	3.75E+01 GA
			64.28	-2.147E+00	?(	1.052E+01	1.45E+02	9.70E+00 G
			86.94	1.201E+00	?	9.554E+00	2.33E+02	9.04E+00 GA
PB-210	N	7.2266E+00					8.14E+03	
			46.54	7.227E+00	(P	2.331E+01	9.95E+01	4.25E+00 G
PB-212	N	-4.4302E-01					6.98E+02	
			238.63	-4.430E-01	?(P	2.227E+00	1.42E+02	4.33E+01 G
			300.03	3.968E+00	?	2.764E+01	2.01E+02	3.28E+00 GA
PB-214	N	1.6575E-01					5.84E+05	
			351.93	-1.312E-01	?(P	2.335E+00	4.94E+02	3.76E+01 G
			295.09	7.443E-01	?(P	4.179E+00	1.63E+02	1.93E+01 G
			242.00	-1.313E-07	%	1.246E+01	2.71E+09	7.43E+00 GA
BI-207	C	-1.0971E-01					1.18E+04	
			1063.66	-1.097E-01	?(	1.108E+00	4.03E+02	7.45E+01 G
			569.70	-1.327E-02	%	8.579E-01	1.72E+03	9.77E+01 G
BI-212	N	5.1349E+00					6.98E+02	
			727.17	5.135E+00	?(	1.968E+01	1.12E+02	7.55E+00 G
			785.42	2.098E+01	?	4.910E+01	9.42E+01	1.28E+00 GA
U-235	N	5.2667E-01					2.57E+11	
			143.79	-7.310E-01	?(P	9.599E+00	2.46E+02	1.10E+01 G
			205.33	1.952E+00	(	7.524E+00	1.41E+02	5.01E+00 G

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Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
			163.38	1.834E+00	?(	1.097E+01	1.72E+02	5.08E+00 G
			185.72	-1.857E-01	+ P	1.176E+00	2.17E+02	5.40E+01 GA
BI-214	N	5.0792E-01						5.84E+05
			609.31	-3.144E-01	?(P	3.103E+00	2.73E+02	4.61E+01 G
			1120.29	0.000E+00	+	8.756E+00	1.00E+03	1.51E+01 G
			1764.49	2.969E+00	?(	4.376E+00	4.47E+01	1.54E+01 G
BI-210M	T	2.2773E-02						1.10E+09
			265.83	-2.292E-01	?(	1.785E+00	2.25E+02	5.00E+01 G
			304.90	4.727E-01	?(	4.037E+00	2.48E+02	2.80E+01 G
AC-228	N	2.0426E+00						2.10E+03
			911.07	2.266E+00	?(	1.391E+00	2.89E+01	2.90E+01 G
			968.97	-6.559E-01	&	7.836E+00	3.29E+02	1.75E+01 G
			338.32	1.504E+00	?(	5.928E+00	1.14E+02	1.20E+01 G
			93.35	-2.839E+00	-	1.609E+01	1.67E+02	5.56E+00 XA
TH-227	N	-2.5361E+00						7.95E+03
			256.24	-2.536E+00	?(	8.506E+00	1.26E+02	7.00E+00 G
			235.97	-7.625E-01	+	7.196E+00	2.73E+02	1.23E+01 G
			50.14	-1.478E+00	+	1.459E+01	2.86E+02	8.00E+00 G
TH-229	N	-1.0722E+00						2.68E+06
			193.51	-1.072E+00	(	1.243E+01	4.29E+02	4.40E+00 G
			210.85	-7.952E+00	&	2.175E+01	1.05E+02	2.99E+00 G
TH-234	N	7.2794E+00						1.63E+12
			92.59	2.993E+00	(P	9.759E+00	1.12E+02	5.58E+00 G
			63.29	1.356E+01	*(P	1.389E+01	3.84E+01	3.81E+00 G
PA-231	N	4.8973E+00						1.20E+07
			302.65	4.560E+00	?(	3.548E+01	2.25E+02	2.88E+00 G
			300.07	5.292E+00	?(	3.845E+01	2.10E+02	2.46E+00 G
PA-233	C	3.0863E-01						7.82E+08
			312.01	0.000E+00	&(	3.329E+00	1.00E+03	3.60E+01 G
			300.18	2.101E+00	&(	1.579E+01	2.17E+02	6.20E+00 G
PA-234	N	3.6432E-01						1.63E+12
			131.29	0.000E+00	?(	3.609E+00	1.00E+03	1.80E+01 G
			946.02	4.199E-01	?(	5.513E+00	5.02E+02	1.34E+01 G
			569.47	1.314E-01	%	1.005E+01	2.03E+03	8.20E+00 G
			883.24	9.698E-01	?(	1.199E+01	3.37E+02	9.60E+00 G
			880.53	5.129E+00	?	1.586E+01	8.98E+01	6.00E+00 GA

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PA-234M	N	-4.7103E+00					1.63E+12	
			1001.00	-4.710E+00	%(	1.947E+02	1.14E+03	8.37E-01 G
			766.41	-1.644E+01	+	3.871E+02	6.40E+02	2.94E-01 G
AM-241	T	-6.1741E-01					1.58E+05	
			59.54	-6.174E-01	?(	3.116E+00	1.49E+02	3.59E+01 G
Np-237	F	1.0443E+00					2.14E+06	
			86.49	1.044E+00	?(	6.160E+00	1.73E+02	1.31E+01 G
Ir-192	F	5.3686E-02					7.40E+01	
			316.49	0.000E+00	&(	1.392E+00	1.00E+03	8.70E+01 G
			468.06	3.247E-02	%	1.611E+00	1.35E+03	5.18E+01 G
			308.44	2.009E-01	&(	3.694E+00	5.30E+02	3.18E+01 G
Cs-136	F	5.9070E-01					1.30E+01	
			818.50	4.307E-01	?(	1.799E+00	1.22E+02	1.00E+02 G
			1048.07	9.096E-01	?(	5.586E-01	2.89E+01	8.00E+01 G
			340.57	3.878E-01	?(	1.688E+00	1.26E+02	4.69E+01 G
Np-239	T	6.2410E-01					2.36E+00	
			103.70	4.313E-01	?	3.732E+00	2.54E+02	2.40E+01 X
			106.13	6.241E-01	?(	3.430E+00	1.61E+02	2.27E+01 G
			99.50	-1.299E+00	+	6.587E+00	1.50E+02	1.50E+01 X
Nd-147		1.2315E+00					1.11E+01	
			531.00	1.231E+00	?(	4.669E+00	1.47E+02	1.30E+01 G
			91.10	0.000E+00	-	3.028E+00	1.00E+03	2.83E+01 G
TL-210	N	-3.5331E-01					5.84E+05	
			799.60	-3.533E-01	?(	1.710E+00	1.40E+02	9.90E+01 G
			296.00	1.625E-01	+	1.084E+00	1.92E+02	7.90E+01 G
			1313.00	0.000E+00	+	2.521E+00	1.00E+03	2.10E+01 GA
Kr-85	I	-1.3974E+01					3.92E+03	
			513.98	-1.397E+01	?(	3.948E+02	8.12E+02	4.30E-01 G

(- 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

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********** 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 1 Sigma %	Activity	
TH-227	50.14	87.	-5.	-0.003	285.89	-1.478E+00	
AM-241	59.54	134.	-11.	-0.006	148.86	-6.174E-01	
Sn-126	64.28	128.	-11.	-0.006	144.52	-2.147E+00	
BA-133	80.99	37.	9.	0.005	120.00	4.393E-01	
Np-237	86.49	110.	9.	0.005	172.94	1.044E+00	
EU-155	86.54	119.	9.	0.005	179.37	4.457E-01	
Sn-126	86.94	128.	7.	0.004	232.76	1.201E+00	
Cd-109	88.04	139.	-9.	-0.005	184.97	-3.752E+00	
Gd-153	97.50	170.	-13.	-0.007	145.17	-6.508E-01	
Np-239	99.50	183.	-13.	-0.007	150.11	-1.299E+00	
Gd-153	103.20	196.	-13.	-0.007	154.52	-8.927E-01	
Np-239	103.70	151.	7.	0.004	253.58	4.313E-01	
Np-239	106.13	113.	10.	0.005	161.43	6.241E-01	
CO-57	122.06	56.	-13.	-0.007	86.63	-2.248E-01	
EU-154	123.10	59.	7.	0.004	157.89	2.587E-01	
HF-181	133.02	164.	-11.	-0.006	162.91	-3.950E-01	
CE-144	133.54	175.	-11.	-0.006	168.16	-1.544E+00	
HF-181	136.30	187.	-11.	-0.006	172.83	-2.950E+00	
CO-57	136.47	190.	-2.	-0.001	961.50	-2.896E-01	
U-235	143.79	197.	-5.	-0.003	245.84	-7.310E-01	P
CE-141	145.44	150.	10.	0.006	177.44	3.189E-01	
Ba-140	162.66	38.	8.	0.005	111.26	2.145E+00	
U-235	163.38	46.	6.	0.003	172.37	1.834E+00	
CE-139	165.85	42.	4.	0.002	207.87	9.189E-02	
Cf-251	176.60	40.	-9.	-0.005	131.44	-9.236E-01	
U-235	185.72	53.	-6.	-0.003	216.87	-1.857E-01	P
TH-229	193.51	37.	-3.	-0.001	429.21	-1.072E+00	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
U-235	205.33	15.	5.	0.003	141.14	1.952E+00		
TH-229	210.85	48.	-13.	-0.007	105.09	-7.952E+00		
Cf-251	227.00	26.	2.	0.001	411.44	7.249E-01		
TH-227	235.97	79.	-5.	-0.003	272.74	-7.625E-01		
PB-212	238.63	93.	-9.	-0.005	141.70	-4.430E-01		P
EU-152	244.69	15.	5.	0.003	141.14	1.450E+00		
TH-227	256.24	29.	-8.	-0.005	126.43	-2.536E+00		
Cd-113m	263.70	57.	-12.	-0.007	95.08	-4.264E+03		
BI-210M	265.83	67.	-5.	-0.003	224.93	-2.292E-01		
TL-208	277.28	32.	-4.	-0.002	206.16	-1.431E+00		
Hg-203	279.20	29.	4.	0.002	196.85	1.114E-01		
I-131	284.30	18.	3.	0.001	306.57	9.986E-01		
PB-214	295.09	45.	6.	0.003	163.45	7.443E-01		P
TL-210	296.00	52.	5.	0.003	192.18	1.625E-01		
PB-212	300.03	57.	5.	0.003	200.85	3.968E+00		
PA-231	300.07	62.	5.	0.003	209.81	5.292E+00		
PA-233	300.18	67.	5.	0.003	217.32	2.101E+00		
PA-231	302.65	73.	5.	0.003	225.13	4.560E+00		
BA-133	302.85	78.	5.	0.003	233.08	7.171E-01		
Ba-140	304.85	83.	5.	0.003	240.45	3.084E+00		
BI-210M	304.90	89.	5.	0.003	247.90	4.727E-01		
Ir-192	308.44	94.	3.	0.001	530.26	2.009E-01		
CR-51	320.08	140.	-8.	-0.004	216.75	-1.980E+00		
Cf-249	333.44	25.	-9.	-0.005	109.21	-1.561E+00		
Cs-136	340.57	34.	7.	0.004	126.07	3.878E-01		
EU-152	344.29	41.	2.	0.001	535.99	1.718E-01		
PB-214	351.93	41.	-2.	-0.001	493.59	-1.312E-01		P
BA-133	356.00	47.	-3.	-0.002	328.30	-1.318E-01		
I-131	364.48	16.	-3.	-0.002	267.36	-1.020E-01		
BA-133	383.84	46.	-9.	-0.005	108.74	-2.985E+00		
Cf-249	387.95	55.	-6.	-0.003	192.27	-2.469E-01		
SB-125	427.88	8.	4.	0.002	147.20	4.242E-01		
AG-108M	433.94	16.	2.	0.001	397.91	7.014E-02		
PM-146	453.88	4.	4.	0.002	109.92	2.020E-01		
SB-125	463.37	22.	1.	0.001	670.82	3.185E-01		
BE-7	477.60	18.	6.	0.003	104.19	2.040E+00		
HF-181	482.00	25.	2.	0.001	302.40	1.014E-01		
La-140	487.02	60.	-10.	-0.006	114.12	-7.624E-01		
RU-103	497.05	8.	4.	0.002	147.20	1.547E-01		
RH-106	511.86	33.	56.	0.031	19.87	1.000E+01		
Kr-85	513.98	91.	-2.	-0.001	811.66	-1.397E+01		
Nd-147	531.00	9.	4.	0.002	146.76	1.231E+00		
Ba-140	537.26	9.	-1.	0.000	909.67	-1.019E-01		
CS-134	563.24	13.	3.	0.002	252.03	1.387E+00		
CS-134	569.32	9.	7.	0.004	72.95	1.701E+00		
TL-208	583.02	9.	-1.	0.000	909.67	-3.124E-02		
SB-125	600.50	19.	11.	0.006	63.90	2.471E+00		
SB-124	602.73	30.	5.	0.003	164.89	2.009E-01		

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
CS-134	604.71	35.	5.	0.003	176.69	2.030E-01		
BI-214	609.31	48.	-4.	-0.002	272.78	-3.144E-01		P
RU-103	610.30	44.	5.	0.003	197.89	3.482E+00		
AG-108M	614.28	49.	5.	0.003	207.42	2.245E-01		
PM-144	618.06	138.	-12.	-0.007	141.13	-5.021E-01		
RH-106	621.92	61.	7.	0.004	162.46	2.914E+00		
SB-125	635.89	13.	-2.	-0.001	264.58	-7.462E-01		
I-131	636.97	23.	-7.	-0.004	108.17	-3.929E+00		
AG-110M	657.76	14.	7.	0.004	83.86	3.261E-01		
CS-137	661.66	28.	-4.	-0.002	187.96	-2.108E-01		
PM-144	696.54	5.	2.	0.001	207.02	1.063E-01		
NB-94	702.63	9.	3.	0.001	250.62	1.236E-01		
SB-124	722.79	29.	-11.	-0.006	79.12	-4.505E+00		
AG-108M	722.94	40.	-6.	-0.003	158.88	-2.968E-01		
BI-212	727.17	39.	8.	0.005	111.93	5.135E+00		
PM-146	735.72	9.	1.	0.000	979.80	1.390E-01		
PM-146	747.16	9.	-1.	-0.001	493.71	-1.861E-01		
ZR-95	756.73	9.	1.	0.000	979.80	5.861E-02		
AG-110M	763.94	12.	4.	0.002	121.38	9.377E-01		
NB-95	765.79	22.	-5.	-0.003	132.58	-2.581E-01		
PA-234M	766.41	20.	-1.	-0.001	640.31	-1.644E+01		
EU-152	778.92	0.	7.	0.004	37.80	2.645E+00		
BI-212	785.42	5.	5.	0.003	94.23	2.098E+01		
CS-134	795.87	34.	-11.	-0.006	80.92	-6.377E-01		
TL-210	799.60	45.	-7.	-0.004	140.34	-3.533E-01		
CS-134	801.95	44.	8.	0.004	130.98	4.309E+00		
CO-58	810.78	38.	-11.	-0.006	84.23	-5.606E-01		
La-140	815.77	49.	-9.	-0.005	115.99	-1.937E+00		
Cs-136	818.50	50.	8.	0.005	121.98	4.307E-01		
Co-56	846.77	20.	-6.	-0.003	168.87	-3.118E-01		
TL-208	860.56	10.	-3.	-0.002	238.82	-1.269E+00		
NB-94	871.10	6.	4.	0.002	100.00	2.122E-01		
PA-234	880.53	10.	6.	0.003	89.80	5.129E+00		
PA-234	883.24	16.	2.	0.001	336.58	9.698E-01		
PA-234	946.02	5.	1.	0.001	501.66	4.199E-01		
EU-152	964.11	13.	-4.	-0.002	128.49	-1.693E+00		
EU-154	996.33	20.	-9.	-0.005	81.09	-4.774E+00		
EU-154	1004.77	11.	-3.	-0.002	222.69	-1.086E+00		
Co-56	1037.84	5.	1.	0.000	796.87	2.840E-01		
Cs-136	1048.07	0.	12.	0.007	28.87	9.096E-01		
RH-106	1050.36	19.	-6.	-0.003	113.06	-2.271E+01		
BI-207	1063.66	5.	-1.	-0.001	403.11	-1.097E-01		
FE-59	1099.25	0.	5.	0.003	44.72	5.558E-01		
EU-152	1112.07	11.	4.	0.002	127.48	1.857E+00		
CO-60	1173.24	0.	5.	0.003	44.72	3.300E-01		
Ta-182	1221.41	17.	-10.	-0.006	101.73	-2.517E+00		
Co-56	1238.28	6.	1.	0.001	427.57	1.386E-01		
NA-22	1274.53	6.	2.	0.001	158.44	1.639E-01		

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
CO-60	1332.50	6.	-2.	-0.001	343.80	-1.211E-01	
AG-110M	1384.30	6.	-3.	-0.001	218.12	-8.217E-01	
EU-152	1408.00	6.	-1.	-0.001	600.00	-3.611E-01	
K-40	1460.83	6.	1.	0.001	600.00	7.321E-01	
La-140	1596.21	0.	6.	0.003	40.82	5.281E-01	
BI-214	1764.49	0.	5.	0.003	44.72	2.969E+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 *****

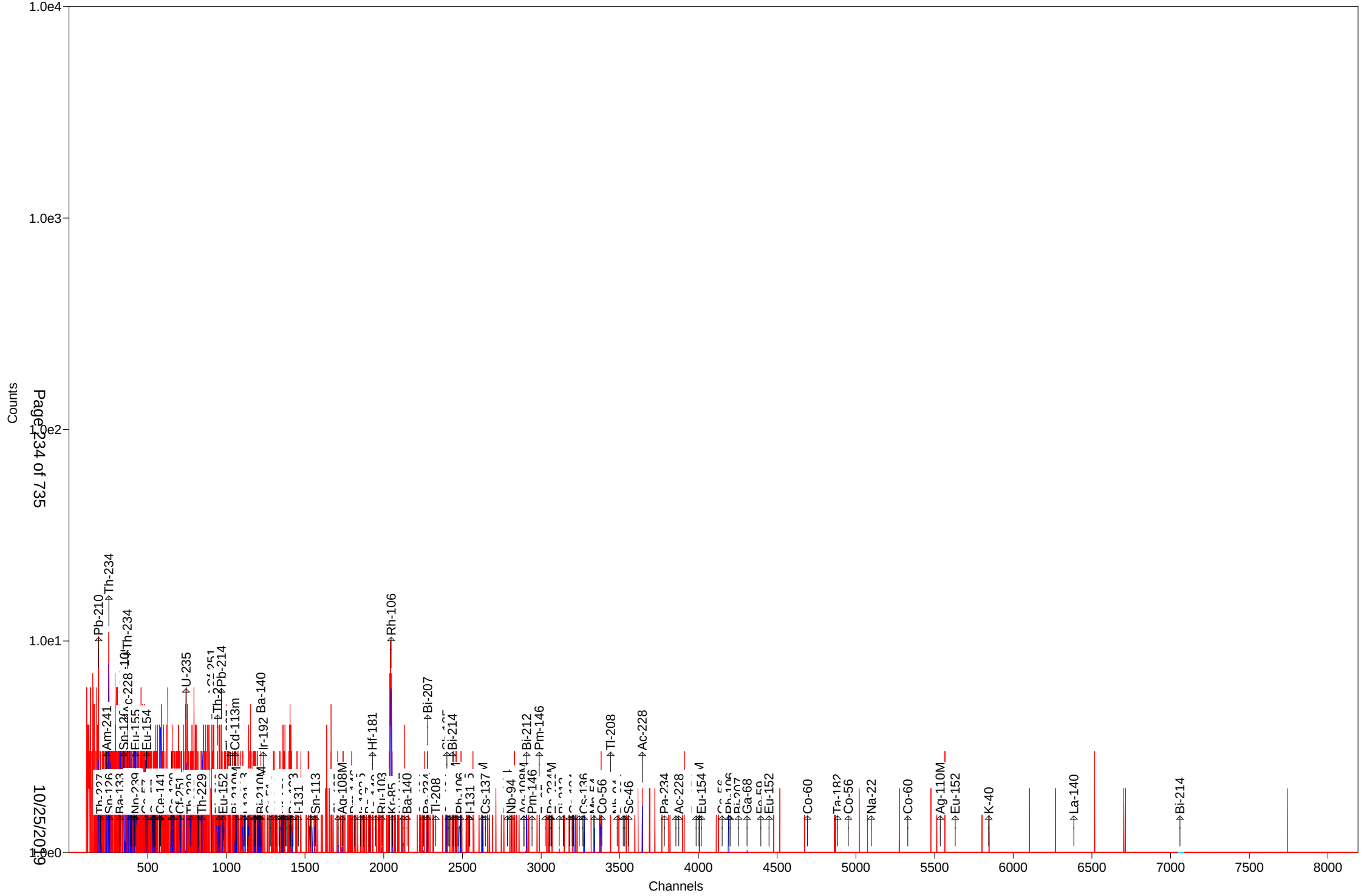
Nuclide		Time of Count Activity Bq/Sample	Time Corrected Activity Bq/Sample	Uncertainty Counting 1 Sigma	MDA Bq/Sample
BE-7	#A	2.0403E+00	2.0403E+00	1.042E+02%	7.35E+00
NA-22	#A	1.6390E-01	1.6390E-01	1.584E+02%	9.70E-01
K-40	#A	7.3208E-01	7.3208E-01	6.000E+02%	1.03E+01
Sc-46	#A	-1.7937E-02	-1.7937E-02	1.825E+03%	1.22E+00
CR-51	#A	-1.9797E+00	-1.9798E+00	2.168E+02%	1.46E+01
MN-54	#	4.6271E-01	4.6271E-01	3.333E+01%	3.79E-01
FE-59	#A	5.5581E-01	5.5581E-01	4.472E+01%	8.19E-01
Co-56	#A	-9.9864E-02	-9.9864E-02	1.689E+02%	1.22E+00
CO-57	#A	-2.2484E-01	-2.2484E-01	8.663E+01%	6.55E-01
CO-58	#A	-5.6060E-01	-5.6060E-01	8.423E+01%	1.59E+00
CO-60	#A	1.0435E-01	1.0435E-01	4.472E+01%	1.00E+00
ZN-65	#A	0.0000E+00	0.0000E+00	1.000E+03%	2.60E+00
NB-94	#A	1.6837E-01	1.6837E-01	1.000E+02%	7.86E-01
ZR-95	#A	5.8614E-02	5.8615E-02	9.798E+02%	1.49E+00
NB-95	#A	-2.5812E-01	-2.5812E-01	1.326E+02%	1.20E+00
RU-103	#A	1.5472E-01	1.5472E-01	1.472E+02%	6.15E-01
RH-106	#A	2.9138E+00	2.9138E+00	1.625E+02%	1.63E+01
AG-108M	#A	1.4704E-01	1.4704E-01	2.074E+02%	7.49E-01
AG-110M	#A	2.7295E-01	2.7295E-01	8.386E+01%	1.66E+00
SN-113	#A	7.6412E-03	7.6413E-03	6.659E+03%	1.80E+00
SB-124	#A	2.0087E-01	2.0087E-01	1.649E+02%	1.16E+00
SB-125	#A	1.0361E+00	1.0361E+00	6.390E+01%	1.69E+00
I-131	#A	-2.5037E-02	-2.5039E-02	2.034E+02%	7.26E-01
Gd-153	#A	-6.5075E-01	-6.5075E-01	1.452E+02%	3.19E+00
Ga-68	#	1.7421E+01	1.7600E+01	3.536E+01%	1.62E+01
Tc-99m	#A	0.0000E+00	0.0000E+00	1.000E+03%	1.19E+00
BA-133	#A	6.1740E-02	6.1740E-02	2.013E+02%	1.52E+00
CS-134	#A	1.7502E-01	1.7502E-01	7.295E+01%	1.73E+00
CS-137	#A	-2.1079E-01	-2.1079E-01	1.880E+02%	1.40E+00
CE-139	#A	9.1886E-02	9.1886E-02	2.079E+02%	6.68E-01
Ba-140	#A	6.9017E-01	6.9020E-01	1.113E+02%	2.51E+00
La-140	#A	5.2812E-01	5.2814E-01	4.082E+01%	6.49E-01
CE-141	#A	3.1894E-01	3.1894E-01	1.774E+02%	1.92E+00
CE-144	#A	-1.5443E+00	-1.5443E+00	1.682E+02%	8.79E+00

PM-144 #A	1.0628E-01	1.0628E-01	2.070E+02%		5.82E-01
EU-152 #A	8.4163E-01	8.4163E-01	3.780E+01%		1.86E+00
EU-154 #A	2.5874E-01	2.5874E-01	1.579E+02%		1.41E+00
EU-155 #A	2.6362E-01	2.6362E-01	1.794E+02%		4.12E+00
HF-181 #A	1.0141E-01	1.0141E-01	3.024E+02%		1.10E+00
Ta-182 #A	0.0000E+00	0.0000E+00	7.071E+02%		2.20E+00
Hg-203 #A	1.1138E-01	1.1139E-01	1.969E+02%		7.74E-01
TL-208 #A	-3.1237E-02	-3.1237E-02	9.097E+02%		7.70E-01
PM-146 #A	1.8583E-01	1.8583E-01	1.099E+02%		6.08E-01
Y-88 #A	0.0000E+00	0.0000E+00	7.071E+02%		7.04E-01
Cd-113m#A	-4.2641E+03	-4.2641E+03	9.508E+01%		1.37E+04
Cd-109 #A	-3.7517E+00	-3.7517E+00	1.850E+02%		2.36E+01
Cf-251 #A	-9.2356E-01	-9.2356E-01	1.314E+02%		3.20E+00
Cf-249 #A	-2.4693E-01	-2.4693E-01	1.923E+02%		1.65E+00
Sn-126 #A	-2.1469E+00	-2.1469E+00	1.445E+02%		1.05E+01
PB-210 A	7.2266E+00	7.2266E+00	9.954E+01%		2.33E+01
PB-212 #A	-4.4302E-01	-4.4302E-01	1.417E+02%		2.23E+00
PB-214 #A	1.6575E-01	1.6575E-01	1.634E+02%		2.34E+00
BI-207 #A	-1.0971E-01	-1.0971E-01	4.031E+02%		1.11E+00
BI-212 #A	5.1349E+00	5.1349E+00	1.119E+02%		1.97E+01
U-235 #A	5.2667E-01	5.2667E-01	1.106E+02%		9.60E+00
BI-214 #A	5.0792E-01	5.0792E-01	4.472E+01%		3.10E+00
BI-210M#A	2.2773E-02	2.2773E-02	1.674E+02%		1.78E+00
AC-228 #	2.0426E+00	2.0426E+00	2.887E+01%		1.39E+00
TH-227 #A	-2.5361E+00	-2.5361E+00	1.264E+02%		8.51E+00
TH-229 #A	-1.0722E+00	-1.0722E+00	4.292E+02%		1.24E+01
TH-234 #A	7.2794E+00	7.2794E+00	3.843E+01%		9.76E+00
PA-231 #A	4.8973E+00	4.8973E+00	1.539E+02%		3.55E+01
PA-233 #A	3.0863E-01	3.0863E-01	2.173E+02%		3.33E+00
PA-234 #A	3.6432E-01	3.6432E-01	3.366E+02%		3.61E+00
PA-234M#A	-4.7103E+00	-4.7103E+00	1.139E+03%		1.95E+02
AM-241 #A	-6.1741E-01	-6.1741E-01	1.489E+02%		3.12E+00
Np-237 #A	1.0443E+00	1.0443E+00	1.729E+02%		6.16E+00
Ir-192 #A	5.3685E-02	5.3686E-02	5.303E+02%		1.39E+00
Cs-136 #A	5.9068E-01	5.9070E-01	2.887E+01%		1.80E+00
Np-239 #A	6.2398E-01	6.2410E-01	1.614E+02%		3.43E+00
Nd-147 #A	1.2314E+00	1.2315E+00	1.468E+02%		4.67E+00
TL-210 #A	-3.5331E-01	-3.5331E-01	1.403E+02%		1.71E+00
Kr-85 #A	-1.3974E+01	-1.3974E+01	8.117E+02%		3.95E+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 (   25.1 to  1999.1 keV)     0.000E+00  Bq/Sample
Total Decayed Activity (   25.1 to  1999.1 keV) 0.0000000E+00  Bq/Sample
```

444057_Gamma_MB 160-444057~1-A. 12_Gamma_20192671.spc.



Sample Description: 444057_Gamma_LCS 160-444057~2-A
Detector: Detector # 5
Batch ID: 444057
Work Order Number: Gamma
Lot Number: LCS 160-444057~2-A

Decay to Time: 10/15/2019 10:04 Live Time: 1800 sec
Acquisition Time: 10/15/2019 10:04:13 Real Time: 1809 sec
Analysis Time: 10/15/2019 10:34 Dead Time: 0.52 %
Analysis Quantity: 1.000E+00 Sample

Efficiency Cal File: 5_Soil_TunaCan.Clb
Efficiency Cal Desc: 5_Soil_TunaCan_90099_032612
Efficiency Cal Date: 3/27/2012 17:20
Energy Cal Date: 2/28/2012 19:35
Library: Client_Long_Rev15.lib
Bkgd Correction File: 5_2019-10-06_1911.PBC

Nuclide	Activity Bq/Sample	1-Sigma Counting Uncert %	1-Sigma Counting Uncert Bq/Sample	1-Sigma Total Uncert Bq/Sample	Minimum Detectable Activity Bq/Sample
BE-7	1.142E+01	119.4	1.364E+01	1.365E+01	4.546E+01
NA-22	-4.208E-01	158.2	6.657E-01	6.660E-01	2.353E+00
K-40	6.896E+00	86.7	5.977E+00	5.987E+00	1.374E+01
Sc-46	-2.010E+00	88.7	1.782E+00	1.785E+00	5.930E+00
CR-51	-1.104E+01	99.5	1.098E+01	1.099E+01	3.578E+01
MN-54	-1.737E+00	76.3	1.324E+00	1.327E+00	3.875E+00
FE-59	2.730E+00	118.2	3.228E+00	3.231E+00	7.115E+00
Co-56	5.412E-01	63.3	3.426E-01	3.437E-01	4.110E+00
CO-57	-2.657E-01	262.1	6.964E-01	6.966E-01	2.332E+00
CO-58	2.891E-01	478.3	1.383E+00	1.383E+00	4.715E+00
CO-60	1.397E+02	1.9	2.690E+00	7.511E+00	7.427E-01
ZN-65	0.000E+00	1.#INF	4.849E-01	4.849E-01	1.204E+01
NB-94	8.343E-01	90.3	7.532E-01	7.544E-01	2.422E+00
ZR-95	-1.611E+00	117.5	1.892E+00	1.894E+00	6.539E+00
NB-95	1.358E+00	69.9	9.490E-01	9.516E-01	3.146E+00
RU-103	-3.429E-01	241.9	8.293E-01	8.295E-01	3.776E+00
RH-106	1.606E+00	1169.5	1.878E+01	1.878E+01	6.326E+01
AG-108M	3.150E-01	146.3	4.608E-01	4.611E-01	4.133E+00
AG-110M	2.002E+00	90.4	1.809E+00	1.812E+00	7.690E+00
SN-113	-2.209E+00	110.5	2.442E+00	2.444E+00	8.114E+00
SB-124	1.229E+00	148.2	1.821E+00	1.823E+00	6.086E+00
SB-125	3.010E+00	145.5	4.381E+00	4.384E+00	1.217E+01
I-131	1.124E+00	133.4	1.499E+00	1.501E+00	3.701E+00
Gd-153	2.353E+00	85.0	2.001E+00	2.006E+00	8.067E+00
Ga-68	4.460E+01	155.9	6.952E+01	6.957E+01	1.534E+02
Tc-99m	-6.604E-01	141.0	9.310E-01	9.317E-01	3.096E+00
BA-133	-1.947E+00	106.2	2.069E+00	2.071E+00	6.879E+00
CS-134	2.755E+00	74.7	2.058E+00	2.063E+00	4.963E+00
CS-137	3.390E+02	1.4	4.904E+00	1.830E+01	4.574E+00
CE-139	8.389E-01	110.1	9.237E-01	9.271E-01	3.070E+00
Ba-140	1.024E+01	41.1	4.206E+00	4.239E+00	7.906E+00
La-140	-5.927E-01	143.2	8.489E-01	8.495E-01	2.696E+00
CE-141	-2.179E-01	650.1	1.416E+00	1.416E+00	3.795E+00

CE-144	5.466E+00	113.9	6.224E+00	6.231E+00	2.069E+01
PM-144	2.548E-01	454.5	1.158E+00	1.158E+00	2.794E+00
EU-152	-7.504E-01	318.2	2.388E+00	2.388E+00	7.986E+00
EU-154	6.491E+00	52.3	3.396E+00	3.413E+00	5.216E+00
EU-155	-3.162E+00	149.4	4.723E+00	4.727E+00	1.568E+01
HF-181	1.190E+00	114.7	1.364E+00	1.366E+00	6.068E+00
Ta-182	4.681E+00	66.7	3.123E+00	3.132E+00	1.652E+01
Hg-203	-1.940E-01	568.9	1.103E+00	1.103E+00	3.717E+00
TL-208	2.098E+00	75.0	1.573E+00	1.577E+00	3.363E+00
PM-146	3.626E-01	100.5	3.645E-01	3.650E-01	6.093E+00
Y-88	0.000E+00	1.#INF	1.882E-01	1.882E-01	9.809E-01
Cd-113m	-1.568E+04	99.6	1.563E+04	1.566E+04	5.195E+04
Cd-109	1.913E+01	142.0	2.718E+01	2.720E+01	9.020E+01
Cf-251	1.465E-01	2758.2	4.040E+00	4.040E+00	1.087E+01
Cf-249	0.000E+00	1.#INF	8.659E-01	8.659E-01	7.301E+00
Sn-126	2.285E+00	400.5	9.153E+00	9.154E+00	3.064E+01
PB-210	1.002E+04	1.2	1.216E+02	6.010E+02	2.123E+02
PB-212	6.703E+00	20.8	1.396E+00	1.462E+00	4.289E+00
PB-214	9.333E+00	25.4	2.367E+00	2.416E+00	6.363E+00
BI-207	-4.870E-01	519.1	2.528E+00	2.528E+00	6.140E+00
BI-212	2.541E+00	602.1	1.530E+01	1.530E+01	5.236E+01
U-235	-5.657E-01	1098.9	6.216E+00	6.217E+00	2.518E+01
BI-214	1.280E+01	27.8	3.562E+00	3.624E+00	6.220E+00
BI-210M	2.576E+00	87.1	2.243E+00	2.248E+00	6.246E+00
AC-228	-2.539E-01	83.7	2.125E-01	2.129E-01	1.528E+01
TH-227	1.418E+01	97.3	1.379E+01	1.382E+01	3.354E+01
TH-229	-5.945E+00	164.6	9.786E+00	9.797E+00	5.021E+01
TH-234	8.306E+00	170.7	1.418E+01	1.418E+01	5.994E+01
PA-231	-3.701E+01	117.5	4.350E+01	4.354E+01	1.446E+02
PA-233	-1.732E+00	171.3	2.967E+00	2.968E+00	1.491E+01
PA-234	2.996E+00	86.7	2.597E+00	2.602E+00	1.572E+01
PA-234M	-7.515E+01	312.9	2.351E+02	2.352E+02	6.826E+02
AM-241	1.247E+03	0.9	1.112E+01	6.565E+01	1.622E+01
Np-237	-5.843E+00	145.7	8.515E+00	8.521E+00	2.825E+01
Ir-192	1.330E+00	95.1	1.265E+00	1.267E+00	3.971E+00
Cs-136	-1.550E+00	98.8	1.531E+00	1.533E+00	5.112E+00
Np-239	-2.874E+00	147.5	4.238E+00	4.241E+00	1.407E+01
Nd-147	4.986E-01	135.8	6.768E-01	6.774E-01	2.261E+01
TL-210	4.307E-01	213.9	9.213E-01	9.216E-01	4.570E+00
Kr-85	-3.482E+02	91.8	3.198E+02	3.204E+02	1.063E+03
Total	1.195E+04				

Analyst: Kellene Robbs

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Sample description
444057_Gamma_LCS 160-444057~2-A

Spectrum Filename: C:\User\SPC\Det5\5_Gamma_20192605.An1

Acquisition information
Start time: 10/15/2019 10:04:13 AM
Live time: 1800
Real time: 1809
Dead time: 0.52 %
Detector ID: 5

Detector system
Ge 5 SN/157

Calibration
Filename: 5_Soil_TunaCan.Clb
5_Soil_TunaCan_90099_032612

Energy Calibration
Created: 2/28/2012 7:35:48 PM
Zero offset: 0.158 keV
Gain: 0.250 keV/channel
Quadratic: 3.911E-08 keV/channel^2

Efficiency Calibration
Created: 3/27/2012 5:20:37 PM
Knee Energy: 165.85 keV
Above the Knee: Quadratic Uncertainty = 0.87 %
Log(Eff): 6.466115E-01 + (-7.830454E-01*Log(E)) + (-4.117504E-03*Log(E)^2)
Below the Knee: Quadratic Uncertainty = 1.43 %
Log(Eff): -2.462251E+01 + (9.075211E+00*Log(E)) + (-9.664422E-01*Log(E)^2)

Library Files
Main analysis library: Client_Long_Rev15.lib
Library Match Width: 0.500
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G800W064
Start channel: 150 (37.62keV)
Stop channel: 8000 (2000.81keV)
Peak rejection level: 1000.000%
Peak search sensitivity: 3
Sample Size: 1.0000E+00 +/- 0.000E+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: 4.0000000E+00
Systematic error: 4.0000000E+00
Fraction Limit: 0.000%
Background width: 3
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:	YES	10/15/2019 10:04:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	5_2019-10-06_1911.PBC 10/6/2019 7:11:20 PM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 20 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 0.1375

***** 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
46.59	13712.	1.21	0.81	1.791E-02	46.54	4.250	1.002E+04	PB210
50.16	433.	22.63	1.37	2.013E-02	50.14	8.000	1.495E+02	TH227
59.55	20410.	0.89	0.84	2.534E-02	59.54	35.900	1.247E+03	AM241
63.29	20.	212.74	0.80	2.712E-02	63.29	3.810	PBC<MDA	TH234
64.28	11.	400.52	0.80	2.757E-02	64.28	9.700	PBC<MDA	Sn126
77.04	99.	37.70	0.72	3.217E-02				
88.04	45.	142.04	0.83	3.462E-02	88.04	3.790	PBC<MDA	Cd109
89.28	42.	58.89	0.80	3.482E-02				
91.10	45.	139.96	0.83	3.508E-02	91.10	28.300	PBC<MDA	Nd147
92.59	24.	266.98	0.83	3.527E-02	92.59	5.584	PBC<MDA	TH234
93.35	45.	140.23	0.83	3.536E-02	93.35	5.561	PBC<MDA	AC228
97.50	38.	122.83	0.84	3.577E-02	97.50	30.000	PBC<MDA	Gd153
103.20	41.	117.65	0.84	3.612E-02	103.20	21.800	PBC<MDA	Gd153
103.70	32.	149.79	0.84	3.614E-02	103.70	24.000	PBC<MDA	Np239
123.10	41.	101.28	0.86	3.575E-02	123.10	40.790	PBC<MDA	EU154
133.02	38.	114.67	0.87	3.492E-02	133.02	43.300	PBC<MDA	HF181
134.24	38.	113.88	0.87	3.487E-02	133.54	11.090	PBC<MDA	CE144
157.03	31.	56.24	0.45	3.194E-02				
165.85	38.	110.11	0.91	3.133E-02	165.85	79.900	PBC<MDA	CE139
227.00	8.	473.27	0.97	2.417E-02	227.00	6.300	PBC<MDA	Cf251
235.97	34.	152.57	0.98	2.341E-02	235.97	12.300	PBC<MDA	TH227
238.82	128.	23.80	0.75	2.318E-02	238.63	43.300	7.063E+00	PB212

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
242.23	18.	291.70	0.98	2.293E-02	242.00	7.430	PBC<MDA	PB214
256.24	15.	246.85	1.00	2.186E-02	256.24	7.000	PBC<MDA	TH227
265.95	37.	96.17	1.00	2.121E-02	265.83	50.000	PBC<MDA	BI210M
277.28	35.	89.63	1.02	2.048E-02	277.28	6.310	PBC<MDA	TL208
284.30	27.	133.35	1.02	2.006E-02	284.30	6.140	PBC<MDA	I131
295.34	53.	41.83	1.09	1.945E-02	295.09	19.300	PBC<MDA	PB214
296.00	18.	213.92	1.03	1.940E-02	296.00	79.000	PBC<MDA	TL210
304.85	35.	143.61	1.04	1.893E-02	304.85	4.290	PBC<MDA	Ba140
					304.90	28.000	3.685E+00	BI210M
304.90	35.	145.21	1.04	1.893E-02	304.85	4.290	2.405E+01	Ba140
					304.90	28.000	3.685E+00	BI210M
308.44	8.	670.07	1.05	1.875E-02	308.44	31.750	PBC<MDA	Ir192
316.49	9.	377.29	1.05	1.835E-02	316.49	87.040	PBC<MDA	Ir192
328.76	4.	722.30	1.07	1.778E-02	328.76	20.300	PBC<MDA	La140
338.32	34.	115.87	1.07	1.736E-02	338.32	12.010	PBC<MDA	AC228
340.57	23.	173.55	1.08	1.727E-02	340.57	46.900	PBC<MDA	Cs136
345.83	32.	116.78	1.08	1.705E-02	345.83	15.070	PBC<MDA	HF181
352.01	115.	28.69	0.83	1.680E-02	351.93	37.600	1.008E+01	PB214
422.22	23.	54.13	0.64	1.444E-02				
427.88	6.	648.87	1.16	1.428E-02	427.88	29.600	PBC<MDA	SB125
468.06	42.	95.10	1.20	1.325E-02	468.06	51.750	PBC<MDA	Ir192
476.56	28.	119.44	1.20	1.303E-02	477.60	10.520	PBC<MDA	BE7
511.86	40.	67.16	2.48	1.230E-02	511.86	20.000	PBC<MDA	RH106
537.48	40.	41.08	0.36	1.181E-02	537.26	24.390	PBC<MDA	Ba140
563.24	5.	462.36	1.28	1.135E-02	563.24	8.350	PBC<MDA	CS134
569.32	22.	74.69	1.29	1.125E-02	569.32	15.380	PBC<MDA	CS134
					569.47	8.200	1.325E+01	PA234
					569.70	97.740	1.112E+00	BI207
583.37	19.	120.30	1.30	1.103E-02	583.02	84.500	PBC<MDA	TL208
600.50	23.	145.54	1.31	1.076E-02	600.50	17.860	PBC<MDA	SB125
602.73	23.	148.24	1.32	1.073E-02	602.73	98.260	PBC<MDA	SB124
604.71	5.	699.95	1.32	1.070E-02	604.71	97.620	PBC<MDA	CS134
609.01	32.	51.89	1.32	1.063E-02	609.31	46.090	PBC<MDA	BI214
609.99	23.	145.36	1.32	1.062E-02	610.30	5.750	PBC<MDA	RU103
614.28	22.	156.09	1.33	1.056E-02	614.28	89.850	PBC<MDA	AG108M
636.97	7.	334.32	1.34	1.025E-02	636.97	7.170	PBC<MDA	I131
657.87	27.	389.87	1.36	9.974E-03	657.76	94.640	PBC<MDA	AG110M
661.75	5335.	1.43	1.38	9.923E-03	661.66	85.210	3.505E+02	CS137
696.54	4.	454.50	1.40	9.507E-03	696.54	99.000	PBC<MDA	PM144
702.63	19.	90.27	1.40	9.438E-03	702.63	97.900	PBC<MDA	NB94
727.17	3.	602.07	1.42	9.170E-03	727.17	7.550	PBC<MDA	BI212
735.72	16.	100.51	1.43	9.081E-03	735.72	22.500	PBC<MDA	PM146
765.79	21.	69.87	1.45	8.781E-03	765.79	99.790	PBC<MDA	NB95
					766.41	0.294	PBC<MDA	PA234M
785.42	21.	93.79	1.47	8.597E-03	785.42	1.280	PBC<MDA	BI212
795.87	24.	82.91	1.48	8.503E-03	795.87	85.530	PBC<MDA	CS134
799.60	4.	508.72	1.48	8.469E-03	799.60	98.960	PBC<MDA	TL210
801.95	6.	348.88	1.48	8.448E-03	801.95	8.690	PBC<MDA	CS134

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
810.78	4.	478.35	1.49	8.371E-03	810.78	99.460	PBC<MDA	CO58
871.10	8.	194.49	1.54	7.882E-03	871.10	99.890	PBC<MDA	NB94
885.67	26.	90.36	1.55	7.781E-03	884.68	72.680	PBC<MDA	AG110M
946.02	21.	116.29	1.60	7.355E-03	946.02	13.400	PBC<MDA	PA234
996.33	25.	81.96	1.63	7.042E-03	996.33	10.600	PBC<MDA	EU154
1004.77	24.	87.52	1.64	6.992E-03	1004.77	18.010	PBC<MDA	EU154
1037.84	26.	88.09	1.66	6.805E-03	1037.84	14.130	PBC<MDA	Co56
1048.07	8.	192.03	1.67	6.749E-03	1048.07	80.000	PBC<MDA	Cs136
1077.40	15.	155.87	1.69	6.594E-03	1077.40	3.300	PBC<MDA	Ga68
1099.25	18.	118.24	1.71	6.484E-03	1099.25	56.500	PBC<MDA	FE59
1119.88	71.	27.82	1.51	6.381E-03	1120.29	15.100	4.065E+01	BI214
					1120.55	99.987	PBC<MDA	Sc46
1121.30	20.	99.52	1.72	6.376E-03	1120.55	99.987	PBC<MDA	Sc46
					1121.30	34.900	4.960E+00	Ta182
1173.31	1528.	2.77	1.75	6.138E-03	1173.24	99.900	1.384E+02	CO60
1221.41	12.	88.90	1.79	5.934E-03	1221.41	27.000	PBC<MDA	Ta182
1291.60	3.	211.23	1.84	5.661E-03	1291.60	43.200	PBC<MDA	FE59
1332.66	1399.	2.67	1.85	5.514E-03	1332.50	99.980	1.409E+02	CO60
1408.00	8.	38.95	1.91	5.264E-03	1408.00	21.005	3.771E+00	EU152
1460.83	7.	86.67	1.95	5.103E-03	1460.83	10.670	PBC<MDA	K40
1763.97	5.	102.65	2.11	4.351E-03	1764.49	15.400	PBC<MDA	BI214
1771.35	7.	89.23	2.12	4.337E-03	1771.35	15.480	PBC<MDA	Co56

********** 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	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide	
200.19	50.16	2897.	433.	2.152E+04	22.63	1.369	-	s
307.79	77.04	456.	99.	3.073E+03	37.70	0.717	-	
356.81	89.28	270.	42.	1.221E+03	58.89	0.802	-	s
628.02	157.03	126.	31.	9.705E+02	56.24	0.454	-	s
1689.36	422.22	66.	23.	1.593E+03	54.13	0.637	-	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: Client_Long_Rev15.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 1 Sigma %	FWHM keV
PB-210	185.88	46.59	3810.	13712.	7.618	1.21	0.807s
TH-227	200.11	50.14	4445.	97.	0.054	97.27	0.787s
AM-241	237.79	59.55	3182.	20410.	11.339	0.89	0.837s
TH-234	252.74	63.29	867.	20.	0.011	212.74	0.801s
Sn-126	256.71	64.28	965.	11.	0.006	400.52	0.802s
BA-133	323.61	80.99	943.	-48.	-0.027	114.91	0.819s
Np-237	345.63	86.49	2354.	-47.	-0.026	145.72	0.825s
EU-155	345.84	86.54	2317.	-47.	-0.026	144.56	0.825s
Sn-126	347.43	86.94	2364.	-9.	-0.005	778.20	0.825s
Sn-126	349.95	87.57	2373.	0.	0.000	1000.00	0.826s
Cd-109	351.83	88.04	2037.	45.	0.025	142.04	0.826s
Nd-147	364.08	91.10	1992.	45.	0.025	139.96	0.829s
TH-234	370.05	92.59	2027.	24.	0.013	266.98	0.831s
AC-228	373.09	93.35	1986.	45.	0.025	140.23	0.832s
Gd-153	389.70	97.50	1080.	38.	0.021	122.83	0.836s
Np-239	397.71	99.50	1032.	-32.	-0.018	142.34	0.838s
Gd-153	412.52	103.20	1126.	41.	0.023	117.65	0.842s
Np-239	414.52	103.70	1167.	32.	0.018	149.79	0.842s
EU-155	420.98	105.31	2105.	-44.	-0.024	149.40	0.844s
Np-239	424.25	106.13	1944.	-43.	-0.024	147.46	0.845
EU-152	486.90	121.78	962.	-14.	-0.008	318.20	0.861s
CO-57	488.03	122.06	731.	-15.	-0.008	262.06	0.861s
EU-154	492.18	123.10	829.	41.	0.023	101.28	0.862
PA-234	524.99	131.29	1427.	-42.	-0.023	128.55	0.871s
HF-181	531.91	133.02	932.	38.	0.021	114.67	0.872s
CE-144	533.97	133.54	920.	38.	0.021	113.88	0.873s
HF-181	545.02	136.30	1148.	-8.	-0.004	635.40	0.876s
Tc-99m	561.88	140.51	1211.	-35.	-0.020	140.97	0.880s
CE-141	581.61	145.44	533.	-6.	-0.004	650.10	0.885s
Ba-140	650.54	162.66	954.	-40.	-0.022	52.69	0.902s
U-235	653.42	163.38	994.	-40.	-0.022	52.60	0.903s
CE-139	663.32	165.85	847.	38.	0.021	110.11	0.905s
U-235	742.85	185.72	581.	-39.	-0.022	54.11	0.925s
TH-229	774.03	193.51	527.	-13.	-0.007	164.61	0.933s
U-235	821.35	205.33	481.	-23.	-0.013	92.38	0.945s
Cf-251	908.08	227.00	413.	8.	0.004	473.27	0.966s
TH-227	943.98	235.97	1328.	34.	0.019	152.57	0.975
PB-212	954.64	238.63	258.	121.	0.067	20.83	0.978D
PB-214	968.10	242.00	1344.	18.	0.010	291.70	0.981
EU-152	978.89	244.69	1484.	-40.	-0.022	136.42	0.984s
TH-227	1025.11	256.24	370.	15.	0.008	246.85	0.995s
Cd-113m	1054.97	263.70	631.	-36.	-0.020	99.64	1.002s
BI-210M	1063.50	265.83	625.	37.	0.021	96.17	1.005s
TL-208	1109.33	277.28	469.	35.	0.019	89.63	1.016

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Hg-203	1117.00	279.20	540.	-6.	-0.003	568.89	1.017s
I-131	1137.41	284.30	356.	27.	0.015	133.35	1.022s
PB-214	1181.59	295.34	156.	53.	0.030	41.83	1.089
TL-210	1184.24	296.00	705.	18.	0.010	213.92	1.034
PB-212	1200.37	300.03	723.	0.	0.000	1000.00	1.038
PA-231	1200.53	300.07	723.	0.	0.000	1000.00	1.038s
PA-233	1200.97	300.18	723.	0.	0.000	1000.00	1.038s
PA-231	1210.86	302.65	904.	-37.	-0.020	117.52	1.040s
BA-133	1211.66	302.85	934.	-38.	-0.021	116.09	1.040s
Ba-140	1219.66	304.85	1257.	35.	0.020	143.61	1.042
BI-210M	1219.85	304.90	1285.	35.	0.020	145.21	1.042
Ir-192	1234.03	308.44	1320.	8.	0.004	670.07	1.046s
PA-233	1248.32	312.01	1437.	-21.	-0.012	171.29	1.049s
Ir-192	1266.25	316.49	572.	9.	0.005	377.29	1.053s
CR-51	1280.63	320.08	595.	-36.	-0.020	99.47	1.057s
La-140	1315.35	328.76	279.	4.	0.002	722.30	1.065
Cf-249	1334.08	333.44	308.	-5.	-0.003	658.18	1.070
AC-228	1353.61	338.32	742.	34.	0.019	115.87	1.074
Cs-136	1362.62	340.57	776.	23.	0.013	173.55	1.077s
EU-152	1377.49	344.29	799.	0.	0.000	1000.00	1.080
HF-181	1383.66	345.83	698.	32.	0.018	116.78	1.082s
PB-214	1408.40	352.01	223.	115.	0.064	28.69	0.834s
BA-133	1424.36	356.00	721.	-36.	-0.020	106.24	1.091s
BA-133	1535.78	383.84	767.	-32.	-0.018	124.93	1.117s
Cf-249	1552.22	387.95	798.	0.	0.000	1000.00	1.121
SN-113	1567.19	391.69	915.	-39.	-0.022	110.53	1.125
SB-125	1711.99	427.88	372.	6.	0.003	648.87	1.158s
AG-108M	1736.25	433.94	392.	-15.	-0.008	247.44	1.164s
PM-146	1816.05	453.88	409.	-17.	-0.009	227.18	1.182s
SB-125	1854.01	463.37	860.	-46.	-0.025	83.24	1.191
Ir-192	1872.79	468.06	784.	42.	0.023	95.10	1.195s
BE-7	1910.94	477.59	552.	28.	0.016	119.44	1.204s
La-140	1948.65	487.02	280.	-9.	-0.005	418.22	1.212s
RU-103	1988.80	497.05	260.	-7.	-0.004	241.87	1.221
RH-106	2048.06	511.86	347.	40.	0.022	67.16	2.485s
Kr-85	2056.53	513.98	444.	-33.	-0.018	91.82	1.237s
Nd-147	2124.62	531.00	168.	-11.	-0.006	232.66	1.252s
Ba-140	2150.56	537.48	68.	40.	0.023	41.08	0.358s
CS-134	2253.60	563.24	136.	5.	0.003	462.36	1.280s
CS-134	2277.94	569.32	124.	22.	0.012	74.69	1.286
PA-234	2278.54	569.47	160.	-6.	-0.004	277.56	1.286
BI-207	2279.47	569.70	153.	0.	0.000	1000.00	1.286
TL-208	2332.76	583.02	133.	19.	0.011	120.30	1.298s
SB-125	2402.69	600.50	562.	23.	0.013	145.54	1.313s
SB-124	2411.61	602.73	586.	23.	0.013	148.24	1.315s
CS-134	2419.53	604.71	609.	5.	0.003	699.95	1.317
BI-214	2437.93	609.31	125.	32.	0.018	51.89	1.320D
RU-103	2441.89	610.30	568.	23.	0.013	145.36	1.322s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
AG-108M	2457.82	614.28	592.	22.	0.012	156.09	1.325s
PM-144	2472.94	618.06	614.	0.	0.000	1000.00	1.328s
I-131	2548.61	636.97	126.	7.	0.004	334.32	1.345s
AG-110M	2631.76	657.76	5444.	27.	0.015	389.87	1.362s
CS-137	2647.36	661.66	206.	5160.	2.867	1.45	1.366D
PM-144	2786.90	696.54	92.	4.	0.002	454.50	1.395s
NB-94	2811.25	702.63	65.	19.	0.010	90.27	1.400s
SB-124	2891.88	722.79	179.	-8.	-0.005	234.42	1.417s
AG-108M	2892.48	722.94	187.	0.	0.000	1000.00	1.417s
EU-154	2894.17	723.36	187.	0.	0.000	1000.00	1.418s
ZR-95	2897.53	724.20	187.	0.	0.000	1000.00	1.418s
BI-212	2909.41	727.17	180.	3.	0.002	602.07	1.421s
PM-146	2943.61	735.72	61.	16.	0.009	100.51	1.428
PM-146	2989.37	747.16	117.	-18.	-0.010	124.91	1.437s
ZR-95	3027.65	756.73	135.	-14.	-0.008	117.46	1.445s
AG-110M	3056.50	763.94	82.	-2.	-0.001	553.84	1.451
NB-95	3063.89	765.79	101.	21.	0.012	69.87	1.453s
PA-234M	3066.38	766.41	142.	-14.	-0.008	118.25	1.453s
EU-152	3116.41	778.92	94.	-3.	-0.002	553.18	1.463s
BI-212	3142.41	785.42	80.	21.	0.012	93.79	1.468s
CS-134	3184.20	795.87	178.	24.	0.013	82.91	1.477s
TL-210	3199.12	799.60	202.	4.	0.002	508.72	1.480s
CS-134	3208.53	801.95	204.	6.	0.003	348.88	1.482s
CO-58	3243.82	810.78	213.	4.	0.002	478.35	1.489s
La-140	3263.80	815.77	217.	0.	0.000	1000.00	1.493s
Cs-136	3274.72	818.50	250.	-23.	-0.013	98.76	1.495s
MN-54	3340.10	834.85	136.	-26.	-0.014	76.26	1.508s
Co-56	3387.78	846.77	149.	-21.	-0.012	90.92	1.518s
TL-208	3442.95	860.56	140.	-12.	-0.007	211.15	1.529s
NB-94	3485.08	871.10	107.	8.	0.004	194.49	1.537s
EU-154	3493.61	873.23	187.	-22.	-0.012	92.38	1.539s
PA-234	3522.80	880.53	274.	-15.	-0.008	158.18	1.544s
PA-234	3533.64	883.24	259.	0.	0.000	1000.00	1.547s
AG-110M	3539.41	884.68	263.	26.	0.014	90.36	1.547s
Sc-46	3557.79	889.28	294.	-28.	-0.016	88.66	1.551s
Y-88	3592.83	898.04	149.	-4.	-0.002	600.15	1.558s
AC-228	3644.94	911.07	154.	-16.	-0.009	120.84	1.568
PA-234	3784.70	946.02	131.	21.	0.012	116.29	1.595s
EU-152	3857.05	964.11	245.	-31.	-0.017	73.63	1.609s
AC-228	3876.48	968.97	353.	-37.	-0.020	67.64	1.612s
EU-154	3985.88	996.33	193.	25.	0.014	81.96	1.633s
PA-234M	4004.55	1001.00	222.	-8.	-0.004	312.89	1.636
EU-154	4019.65	1004.77	212.	24.	0.013	87.52	1.639s
Co-56	4151.87	1037.84	100.	26.	0.014	88.09	1.664
Cs-136	4192.77	1048.07	114.	8.	0.004	192.03	1.671s
RH-106	4201.93	1050.36	138.	-7.	-0.004	321.87	1.673s
BI-207	4255.11	1063.66	125.	-4.	-0.002	519.09	1.682
Ga-68	4310.04	1077.40	110.	15.	0.008	155.87	1.692

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
FE-59	4397.41	1099.25	90.	18.	0.010	118.24	1.708s
EU-152	4448.68	1112.07	220.	-10.	-0.006	208.77	1.717s
ZN-65	4462.56	1115.55	210.	0.	0.000	1000.00	1.720s
BI-214	4479.89	1119.88	45.	71.	0.039	27.82	1.511s
Sc-46	4482.57	1120.55	210.	0.	0.000	1000.00	1.723
Ta-182	4485.56	1121.30	186.	20.	0.011	99.52	1.724s
CO-60	4693.50	1173.31	37.	1528.	0.849	2.77	1.751
Ta-182	4756.42	1189.05	65.	-19.	-0.011	96.07	1.771s
Ta-182	4885.79	1221.41	21.	12.	0.007	88.90	1.793s
NA-22	5098.13	1274.53	21.	-4.	-0.002	158.21	1.828s
EU-154	5098.17	1274.54	26.	0.	0.000	1000.00	1.828s
FE-59	5166.35	1291.60	5.	3.	0.001	211.23	1.840s
TL-210	5251.91	1313.00	21.	-5.	-0.003	201.56	1.854s
CO-60	5330.47	1332.66	0.	1399.	0.777	2.67	1.847
AG-110M	5536.88	1384.30	0.	0.	0.000	1000.00	1.899s
EU-152	5631.62	1408.00	0.	8.	0.004	38.95	1.914s
K-40	5842.75	1460.83	5.	7.	0.004	86.67	1.946s
La-140	6383.73	1596.21	17.	-7.	-0.004	143.21	2.024s
SB-124	6762.39	1690.98	6.	-1.	0.000	846.32	2.076s
BI-214	7056.06	1764.49	12.	5.	0.003	102.65	2.114s
Co-56	7083.46	1771.35	18.	7.	0.004	89.23	2.117s
Y-88	7341.96	1836.06	0.	0.	0.000	1000.00	2.149s

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	1.1416E+01				5.31E+01	
			477.60	1.142E+01	&(	4.546E+01	1.19E+02 1.05E+01 G
NA-22	C	-4.2077E-01				9.50E+02	
			1274.53	-4.208E-01	?(	2.353E+00	1.58E+02 9.99E+01 G
K-40	N	6.8958E+00				4.66E+11	
			1460.83	6.896E+00	?(	1.374E+01	8.67E+01 1.07E+01 G
Sc-46	F	-2.0096E+00				8.38E+01	
			889.28	-2.010E+00	?(	5.930E+00	8.87E+01 1.00E+02 G
			1120.55	0.000E+00	+	6.117E+00	1.00E+03 1.00E+02 G
CR-51	F	-1.1035E+01				2.77E+01	
			320.08	-1.104E+01	?(P	3.578E+01	9.95E+01 9.94E+00 G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

MN-54    C  -1.7367E+00                                     3.12E+02
                          834.85-1.737E+00 ?(P 3.875E+00 7.63E+01 1.00E+02 G

FE-59    F   2.7298E+00                                     4.45E+01
                         1099.25 2.730E+00 ?(  7.115E+00 1.18E+02 5.65E+01 G
                         1291.60 5.924E-01 - P 3.074E+00 2.11E+02 4.32E+01 G

Co-56    C   5.4124E-01                                     7.73E+01
                          846.77-1.475E+00 ?(P 4.110E+00 9.09E+01 9.99E+01 G
                         1238.28-8.352E-02 % P 3.109E+00 3.37E+03 6.61E+01 G
                         1037.84 1.480E+01 &(P 2.852E+01 8.81E+01 1.41E+01 G
                         1771.35 6.083E+00 ?   1.853E+01 8.92E+01 1.55E+01  A

CO-57    C  -2.6575E-01                                     2.72E+02
                          122.06-2.657E-01 *(  2.332E+00 2.62E+02 8.56E+01 G
                          136.47 6.020E-01 %   2.430E+01 1.21E+03 1.07E+01 G

CO-58    C   2.8914E-01                                     7.09E+01
                          810.78 2.891E-01 ?(  4.715E+00 4.78E+02 9.95E+01 G

CO-60    F   1.3968E+02                                     1.93E+03
                         1332.50 1.409E+02  (P 7.427E-01 2.67E+00 1.00E+02 G
                         1173.24 1.384E+02  (  2.814E+00 2.77E+00 9.99E+01 G

NB-94    I   8.3432E-01                                     7.41E+06
                          702.63 1.134E+00  (  2.422E+00 9.03E+01 9.79E+01 G
                          871.10 5.409E-01 &(  3.598E+00 1.94E+02 9.99E+01 G

ZR-95    I  -1.6111E+00                                     6.40E+01
                          756.73-1.611E+00 ?(P 6.539E+00 1.17E+02 5.45E+01 G
                          724.20 0.000E+00 &   9.093E+00 1.00E+03 4.42E+01 G

NB-95    I   1.3583E+00                                     6.40E+01
                          765.79 1.358E+00 ?(  3.146E+00 6.99E+01 9.98E+01 G

RU-103   I  -3.4286E-01                                     3.93E+01
                          497.05-3.429E-01 &(P 3.776E+00 2.42E+02 9.09E+01 G
                          610.30 2.132E+01 ?   1.036E+02 1.45E+02 5.75E+00 GA

RH-106   I   1.6058E+00                                     3.74E+02
                          621.92 1.606E+00 %(  6.326E+01 1.17E+03 9.93E+00 G
                         1050.36-3.708E+01 + P 3.037E+02 3.22E+02 1.56E+00 G
                          511.86 9.110E+00 ?   2.021E+01 6.72E+01 2.00E+01 GA

AG-108M  C   3.1504E-01                                     1.53E+05
                          433.94-6.656E-01 ?(P 4.133E+00 2.47E+02 9.05E+01 G
                          722.94 0.000E+00 +   4.413E+00 1.00E+03 9.08E+01 G
```

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
			614.28	1.303E+00	*(	6.796E+00	1.56E+02	8.98E+01 G
AG-110M	F	2.0016E+00					2.50E+02	
			884.68	2.554E+00	&(	7.690E+00	9.04E+01	7.27E+01 G
			657.76	1.577E+00	&(	2.040E+01	3.90E+02	9.46E+01 G
			937.49	-7.272E-02	%	1.179E+01	7.01E+03	3.44E+01 G
			1384.30	0.000E+00	-	3.157E+00	1.00E+03	2.43E+01 G
			763.94	-6.612E-01	-	1.275E+01	5.54E+02	2.23E+01 G
SN-113	F	-2.2090E+00					1.15E+02	
			391.69	-2.209E+00	?(	8.114E+00	1.11E+02	6.40E+01 G
SB-124	F	1.2287E+00					6.02E+01	
			602.73	1.229E+00	*(	6.086E+00	1.48E+02	9.83E+01 G
			1690.98	-1.718E-01	-	3.557E+00	8.46E+02	4.78E+01 G
			722.79	-4.554E+00	+	3.629E+01	2.34E+02	1.08E+01 G
SB-125	I	3.0103E+00					1.01E+03	
			427.88	7.666E-01	?(P	1.217E+01	6.49E+02	2.96E+01 G
			600.50	6.729E+00	&(	3.272E+01	1.46E+02	1.79E+01 G
			635.89	-3.739E-01	% P	2.758E+01	2.16E+03	1.13E+01 G
			463.37	-1.807E+01	& P	5.535E+01	8.32E+01	1.05E+01 G
I-131	I	1.1244E+00					8.02E+00	
			364.48	-5.799E-02	%(P	3.701E+00	2.57E+03	8.17E+01 G
			284.30	1.207E+01	&(P	4.090E+01	1.33E+02	6.14E+00 G
			636.97	5.226E+00	?(P	4.168E+01	3.34E+02	7.17E+00 G
Gd-153	F	2.3528E+00					2.42E+02	
			97.50	1.976E+00	?(	8.067E+00	1.23E+02	3.00E+01 G
			103.20	2.872E+00	(	1.122E+01	1.18E+02	2.18E+01 G
Ga-68	C	4.4601E+01					4.71E-02	
			1077.40	4.460E+01	&(	1.534E+02	1.56E+02	3.30E+00 G
Tc-99m	I	-6.6041E-01					2.51E-01	
			140.51	-6.604E-01	?(	3.096E+00	1.41E+02	8.93E+01 G
BA-133	F	-1.9475E+00					3.85E+03	
			356.00	-1.947E+00	?(	6.879E+00	1.06E+02	6.20E+01 G
			302.85	-5.989E+00	+	2.311E+01	1.16E+02	1.83E+01 G
			383.84	-1.259E+01	&	5.237E+01	1.25E+02	8.94E+00 GA
			80.99	-2.355E+00	+	7.165E+00	1.15E+02	3.41E+01 GA
CS-134	I	2.7553E+00					7.54E+02	
			795.87	1.798E+00	(	4.963E+00	8.29E+01	8.55E+01 G
			604.71	2.657E-01	-	6.261E+00	7.00E+02	9.76E+01 G
			569.32	7.062E+00	&(	1.753E+01	7.47E+01	1.54E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
			801.95	4.414E+00	?(	5.244E+01	3.49E+02	8.69E+00 G
			563.24	2.908E+00	?(P	3.344E+01	4.62E+02	8.35E+00 G
CS-137	I	3.3897E+02					1.10E+04	
			661.66	3.390E+02	(P	4.574E+00	1.45E+00	8.52E+01 G
CE-139	F	8.3887E-01					1.38E+02	
			165.85	8.389E-01	?(	3.070E+00	1.10E+02	7.99E+01 G
Ba-140	I	1.0239E+01					1.28E+01	
			537.26	7.811E+00	(	7.906E+00	4.11E+01	2.44E+01 G
			162.66	-1.139E+01	- P	4.208E+01	5.27E+01	6.22E+00 G
			304.85	2.405E+01	(	1.149E+02	1.44E+02	4.29E+00 G
La-140	I	-5.9273E-01					1.28E+01	
			1596.21	-8.608E-01	?(	2.696E+00	1.43E+02	9.54E+01 G
			487.02	-8.629E-01	+ P	7.686E+00	4.18E+02	4.55E+01 G
			328.76	6.670E-01	&(	1.239E+01	7.22E+02	2.03E+01 G
			815.77	0.000E+00	+	2.045E+01	1.00E+03	2.33E+01 G
CE-141	I	-2.1786E-01					3.25E+01	
			145.44	-2.179E-01	?(	3.795E+00	6.50E+02	4.82E+01 G
CE-144	I	5.4659E+00					2.85E+02	
			133.54	5.466E+00	&(	2.069E+01	1.14E+02	1.11E+01 G
PM-144	C	2.5483E-01					3.63E+02	
			696.54	2.548E-01	&(P	2.794E+00	4.55E+02	9.90E+01 G
			618.06	0.000E+00	&	6.306E+00	1.00E+03	9.91E+01 G
EU-152	F	-7.5035E-01					4.94E+03	
			121.78	-7.504E-01	*(	7.986E+00	3.18E+02	2.86E+01 G
			344.29	0.000E+00	+	1.647E+01	1.00E+03	2.65E+01 G
			1112.07	-6.447E+00	&	4.557E+01	2.09E+02	1.36E+01 G
			778.92	-1.481E+00	+ P	2.375E+01	5.53E+02	1.29E+01 G
			964.11	-1.629E+01	+	3.975E+01	7.36E+01	1.46E+01 G
			244.69	-1.297E+01	+	5.879E+01	1.36E+02	7.58E+00 G
			1408.00	3.771E+00	? P	3.703E+00	3.90E+01	2.10E+01 GA
EU-154	I	6.4906E+00					3.14E+03	
			123.10	1.551E+00	?(P	5.216E+00	1.01E+02	4.08E+01 G
			1274.54	0.000E+00	-	7.258E+00	1.00E+03	3.52E+01 G
			723.36	0.000E+00	-	1.983E+01	1.00E+03	2.02E+01 G
			873.23	-1.238E+01	+	3.819E+01	9.24E+01	1.23E+01 G
			1004.77	1.066E+01	&(	3.110E+01	8.75E+01	1.80E+01 G
			996.33	1.841E+01	?(	5.022E+01	8.20E+01	1.06E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	I	-3.1616E+00					1.81E+03	
			105.31	-3.162E+00	?(	1.568E+01	1.49E+02	2.12E+01 G
			86.54	-2.493E+00	+	1.196E+01	1.45E+02	3.07E+01 G
HF-181	F	1.1898E+00					4.24E+01	
			482.00	-8.896E-03	%(	6.068E+00	2.02E+04	8.05E+01 G
			133.02	1.397E+00	&(	5.325E+00	1.15E+02	4.33E+01 G
			345.83	6.998E+00	&(	2.721E+01	1.17E+02	1.51E+01 G
			136.30	-2.074E+00	+	4.409E+01	6.35E+02	5.85E+00 G
Ta-182	F	4.6809E+00					1.14E+02	
			1121.30	4.960E+00	&(	1.652E+01	9.95E+01	3.49E+01 G
			1221.41	4.320E+00	(	8.403E+00	8.89E+01	2.70E+01 G
			1189.05	-1.074E+01	+	2.276E+01	9.61E+01	1.62E+01 G
Hg-203	F	-1.9396E-01					4.66E+01	
			279.20	-1.940E-01	?(	3.717E+00	5.69E+02	8.15E+01 G
TL-208	N	2.0977E+00					6.98E+02	
			583.02	1.137E+00	?(P	3.363E+00	1.20E+02	8.45E+01 G
			277.28	1.496E+01	(	4.454E+01	8.96E+01	6.31E+00 G
			860.56	-6.741E+00	+	3.249E+01	2.11E+02	1.24E+01 G
PM-146	C	3.6264E-01					2.02E+03	
			453.88	-1.048E+00	?(P	6.093E+00	2.27E+02	6.50E+01 G
			747.16	-3.281E+00	+	9.682E+00	1.25E+02	3.40E+01 G
			735.72	4.438E+00	?(P	1.061E+01	1.01E+02	2.25E+01 G
Cd-113m		-1.5685E+04					5.33E+03	
			263.70	-1.568E+04	?(	5.195E+04	9.96E+01	6.00E-03 K
Cd-109	F	1.9133E+01					4.53E+02	
			88.04	1.913E+01	(	9.020E+01	1.42E+02	3.79E+00 G
Cf-251	T	1.4648E-01					3.28E+05	
			176.60	1.465E-01	&(	1.087E+01	2.76E+03	1.70E+01 G
			227.00	2.797E+00	?	3.555E+01	4.73E+02	6.30E+00 GA
Sn-126		2.2854E+00					3.65E+07	
			87.57	0.000E+00	-	9.853E+00	1.00E+03	3.75E+01 GA
			64.28	2.285E+00	&(	3.064E+01	4.01E+02	9.70E+00 G
			86.94	-1.579E+00	+	4.093E+01	7.78E+02	9.04E+00 GA
PB-210	N	1.0024E+04					8.14E+03	
			46.54	1.002E+04	@(P	2.123E+02	1.21E+00	4.25E+00 G

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Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PB-212	N	6.7034E+00					6.98E+02	
			238.63	6.703E+00	(	4.289E+00	2.08E+01	4.33E+01 G
			300.03	0.000E+00	-	1.130E+02	1.00E+03	3.28E+00 GA
PB-214	N	9.3326E+00					5.84E+05	
			351.93	1.008E+01	@(	6.363E+00	2.87E+01	3.76E+01 G
			295.09	7.869E+00	(	9.011E+00	4.18E+01	1.93E+01 G
			242.00	5.817E+00	&	5.661E+01	2.92E+02	7.43E+00 GA
BI-207	C	-4.8702E-01					1.18E+04	
			1063.66	-4.870E-01	?(P	6.140E+00	5.19E+02	7.45E+01 G
			569.70	0.000E+00	+	3.050E+00	1.00E+03	9.77E+01 G
BI-212	N	2.5409E+00					6.98E+02	
			727.17	2.541E+00	&(	5.236E+01	6.02E+02	7.55E+00 G
			785.42	1.047E+02	& P	2.236E+02	9.38E+01	1.28E+00 GA
U-235	N	-5.6568E-01					2.57E+11	
			143.79	-5.657E-01	%(P	2.518E+01	1.10E+03	1.10E+01 G
			205.33	-9.802E+00	+ P	4.430E+01	9.24E+01	5.01E+00 G
			163.38	-1.403E+01	& P	5.274E+01	5.26E+01	5.08E+00 G
			185.72	-1.423E+00	+ P	4.149E+00	5.41E+01	5.40E+01 GA
BI-214	N	1.2803E+01					5.84E+05	
			609.31	3.679E+00	(P	6.220E+00	5.19E+01	4.61E+01 G
			1120.29	4.065E+01	*(P	1.968E+01	2.78E+01	1.51E+01 G
			1764.49	4.365E+00	- P	1.558E+01	1.03E+02	1.54E+01 G
BI-210M	T	2.5758E+00					1.10E+09	
			265.83	1.955E+00	?(	6.246E+00	9.62E+01	5.00E+01 G
			304.90	3.685E+00	(	1.780E+01	1.45E+02	2.80E+01 G
AC-228	N	-2.5390E-01					2.10E+03	
			911.07	-4.070E+00	?(P	1.528E+01	1.21E+02	2.90E+01 G
			968.97	-1.613E+01	+ P	3.983E+01	6.76E+01	1.75E+01 G
			338.32	8.961E+00	(	3.455E+01	1.16E+02	1.20E+01 G
			93.35	1.277E+01	*	5.944E+01	1.40E+02	5.56E+00 XA
TH-227	N	1.4180E+01					7.95E+03	
			256.24	5.324E+00	?(	3.354E+01	2.47E+02	7.00E+00 G
			235.97	6.559E+00	?(	3.329E+01	1.53E+02	1.23E+01 G
			50.14	3.365E+01	*(	1.082E+02	9.73E+01	8.00E+00 G
TH-229	N	-5.9446E+00					2.68E+06	
			193.51	-5.945E+00	&(P	5.021E+01	1.65E+02	4.40E+00 G
			210.85	1.039E+00	% P	7.560E+01	2.71E+03	2.99E+00 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-234	N	8.3059E+00					1.63E+12	
			92.59	6.748E+00	*(P	5.994E+01	2.67E+02	5.58E+00 G
			63.29	1.059E+01	&(P	7.524E+01	2.13E+02	3.81E+00 G
PA-231	N	-3.7012E+01					1.20E+07	
			302.65	-3.701E+01	?(	1.446E+02	1.18E+02	2.88E+00 G
			300.07	0.000E+00	+	1.507E+02	1.00E+03	2.46E+00 G
PA-233	C	-1.7319E+00					7.82E+08	
			312.01	-1.732E+00	?(P	1.491E+01	1.71E+02	3.60E+01 G
			300.18	0.000E+00	+	5.982E+01	1.00E+03	6.20E+00 G
PA-234	N	2.9963E+00					1.63E+12	
			131.29	-3.682E+00	*(	1.572E+01	1.29E+02	1.80E+01 G
			946.02	1.197E+01	(P	3.157E+01	1.16E+02	1.34E+01 G
			569.47	-3.914E+00	+	3.707E+01	2.78E+02	8.20E+00 G
			883.24	0.000E+00	-	5.772E+01	1.00E+03	9.60E+00 G
			880.53	-1.778E+01	&	9.464E+01	1.58E+02	6.00E+00 GA
PA-234M	N	-7.5147E+01					1.63E+12	
			1001.00	-7.515E+01	(P	6.826E+02	3.13E+02	8.37E-01 G
			766.41	-3.001E+02	+ P	1.254E+03	1.18E+02	2.94E-01 G
AM-241	T	1.2468E+03					1.58E+05	
			59.54	1.247E+03	@(P	1.622E+01	8.92E-01	3.59E+01 G
Np-237	F	-5.8431E+00					2.14E+06	
			86.49	-5.843E+00	?(	2.825E+01	1.46E+02	1.31E+01 G
Ir-192	F	1.3303E+00					7.40E+01	
			316.49	3.130E-01	&(	3.971E+00	3.77E+02	8.70E+01 G
			468.06	3.418E+00	(	1.079E+01	9.51E+01	5.18E+01 G
			308.44	7.168E-01	&(	1.606E+01	6.70E+02	3.18E+01 G
Cs-136	F	-1.5497E+00					1.30E+01	
			818.50	-1.550E+00	?(	5.112E+00	9.88E+01	1.00E+02 G
			1048.07	8.232E-01	+	5.399E+00	1.92E+02	8.00E+01 G
			340.57	1.569E+00	&	9.093E+00	1.74E+02	4.69E+01 G
Np-239	T	-2.8739E+00					2.36E+00	
			103.70	2.080E+00	&	1.037E+01	1.50E+02	2.40E+01 X
			106.13	-2.874E+00	(	1.407E+01	1.47E+02	2.27E+01 G
			99.50	-3.317E+00	+	1.572E+01	1.42E+02	1.50E+01 X
Nd-147		4.9856E-01					1.11E+01	
			531.00	-3.941E+00	@(	2.261E+01	2.33E+02	1.30E+01 G
			91.10	2.538E+00	?(	1.179E+01	1.40E+02	2.83E+01 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-210	N 4.3066E-01					5.84E+05	
		799.60	2.632E-01	?(	4.570E+00	5.09E+02	9.90E+01 G
		296.00	6.404E-01	&(	4.585E+00	2.14E+02	7.90E+01 G
		1313.00	-2.527E+00	+	1.148E+01	2.02E+02	2.10E+01 GA
Kr-85	I -3.4825E+02					3.92E+03	
		513.98	-3.482E+02	?(	1.063E+03	9.18E+01	4.30E-01 G

(- 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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********** 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 1 Sigma %	Activity	
TH-227	50.14	4445.	97.	0.054	97.27	3.365E+01	
TH-234	63.29	867.	20.	0.011	212.74	1.059E+01	P
Sn-126	64.28	965.	11.	0.006	400.52	2.285E+00	
BA-133	80.99	943.	-48.	-0.027	114.91	-2.355E+00	
Np-237	86.49	2354.	-47.	-0.026	145.72	-5.843E+00	
EU-155	86.54	2317.	-47.	-0.026	144.56	-2.493E+00	
Sn-126	86.94	2364.	-9.	-0.005	778.20	-1.579E+00	

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Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Cd-109	88.04	2037.	45.	0.025	142.04	1.913E+01	
Nd-147	91.10	1992.	45.	0.025	139.96	2.538E+00	
TH-234	92.59	2027.	24.	0.013	266.98	6.748E+00	P
AC-228	93.35	1986.	45.	0.025	140.23	1.277E+01	
Gd-153	97.50	1080.	38.	0.021	122.83	1.976E+00	
Np-239	99.50	1032.	-32.	-0.018	142.34	-3.317E+00	
Gd-153	103.20	1126.	41.	0.023	117.65	2.872E+00	
Np-239	103.70	1167.	32.	0.018	149.79	2.080E+00	
EU-155	105.31	2105.	-44.	-0.024	149.40	-3.162E+00	
Np-239	106.13	1944.	-43.	-0.024	147.46	-2.874E+00	
EU-152	121.78	962.	-14.	-0.008	318.20	-7.504E-01	
CO-57	122.06	731.	-15.	-0.008	262.06	-2.657E-01	
PA-234	131.29	1427.	-42.	-0.023	128.55	-3.682E+00	
HF-181	133.02	932.	38.	0.021	114.67	1.397E+00	
HF-181	136.30	1148.	-8.	-0.004	635.40	-2.074E+00	
Tc-99m	140.51	1211.	-35.	-0.020	140.97	-6.604E-01	
CE-141	145.44	533.	-6.	-0.004	650.10	-2.179E-01	
U-235	163.38	994.	-40.	-0.022	52.60	-1.403E+01	P
CE-139	165.85	847.	38.	0.021	110.11	8.389E-01	
U-235	185.72	581.	-39.	-0.022	54.11	-1.423E+00	P
TH-229	193.51	527.	-13.	-0.007	164.61	-5.945E+00	P
U-235	205.33	481.	-23.	-0.013	92.38	-9.802E+00	P
Cf-251	227.00	413.	8.	0.004	473.27	2.797E+00	
TH-227	235.97	1328.	34.	0.019	152.57	6.559E+00	
EU-152	244.69	1484.	-40.	-0.022	136.42	-1.297E+01	
TH-227	256.24	370.	15.	0.008	246.85	5.324E+00	
Cd-113m	263.70	631.	-36.	-0.020	99.64	-1.568E+04	
Hg-203	279.20	540.	-6.	-0.003	568.89	-1.940E-01	
I-131	284.30	356.	27.	0.015	133.35	1.207E+01	P
TL-210	296.00	705.	18.	0.010	213.92	6.404E-01	
PA-231	302.65	904.	-37.	-0.020	117.52	-3.701E+01	
BA-133	302.85	934.	-38.	-0.021	116.09	-5.989E+00	
Ir-192	308.44	1320.	8.	0.004	670.07	7.168E-01	
PA-233	312.01	1437.	-21.	-0.012	171.29	-1.732E+00	P
Ir-192	316.49	572.	9.	0.005	377.29	3.130E-01	
CR-51	320.08	595.	-36.	-0.020	99.47	-1.104E+01	P
La-140	328.76	279.	4.	0.002	722.30	6.670E-01	
Cf-249	333.44	308.	-5.	-0.003	658.18	-1.019E+00	
AC-228	338.32	742.	34.	0.019	115.87	8.961E+00	
Cs-136	340.57	776.	23.	0.013	173.55	1.569E+00	
HF-181	345.83	698.	32.	0.018	116.78	6.998E+00	
BA-133	356.00	721.	-36.	-0.020	106.24	-1.947E+00	
BA-133	383.84	767.	-32.	-0.018	124.93	-1.259E+01	
SN-113	391.69	915.	-39.	-0.022	110.53	-2.209E+00	
SB-125	427.88	372.	6.	0.003	648.87	7.666E-01	P
AG-108M	433.94	392.	-15.	-0.008	247.44	-6.656E-01	P
PM-146	453.88	409.	-17.	-0.009	227.18	-1.048E+00	P
SB-125	463.37	860.	-46.	-0.025	83.24	-1.807E+01	P

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Ir-192	468.06	784.	42.	0.023	95.10	3.418E+00	
La-140	487.02	280.	-9.	-0.005	418.22	-8.629E-01	P
RH-106	511.86	347.	40.	0.022	67.16	9.110E+00	
Kr-85	513.98	444.	-33.	-0.018	91.82	-3.482E+02	
Nd-147	531.00	168.	-11.	-0.006	232.66	-3.941E+00	
CS-134	563.24	136.	5.	0.003	462.36	2.908E+00	P
CS-134	569.32	124.	22.	0.012	74.69	7.062E+00	
PA-234	569.47	160.	-6.	-0.004	277.56	-3.914E+00	
SB-125	600.50	562.	23.	0.013	145.54	6.729E+00	
SB-124	602.73	586.	23.	0.013	148.24	1.229E+00	
CS-134	604.71	609.	5.	0.003	699.95	2.657E-01	
AG-108M	614.28	592.	22.	0.012	156.09	1.303E+00	
I-131	636.97	126.	7.	0.004	334.32	5.226E+00	P
PM-144	696.54	92.	4.	0.002	454.50	2.548E-01	P
NB-94	702.63	65.	19.	0.010	90.27	1.134E+00	
SB-124	722.79	179.	-8.	-0.005	234.42	-4.554E+00	
BI-212	727.17	180.	3.	0.002	602.07	2.541E+00	
PM-146	735.72	61.	16.	0.009	100.51	4.438E+00	P
PM-146	747.16	117.	-18.	-0.010	124.91	-3.281E+00	
ZR-95	756.73	135.	-14.	-0.008	117.46	-1.611E+00	P
NB-95	765.79	101.	21.	0.012	69.87	1.358E+00	
PA-234M	766.41	142.	-14.	-0.008	118.25	-3.001E+02	P
EU-152	778.92	94.	-3.	-0.002	553.18	-1.481E+00	P
BI-212	785.42	80.	21.	0.012	93.79	1.047E+02	P
CS-134	795.87	178.	24.	0.013	82.91	1.798E+00	
TL-210	799.60	202.	4.	0.002	508.72	2.632E-01	
CS-134	801.95	204.	6.	0.003	348.88	4.414E+00	
CO-58	810.78	213.	4.	0.002	478.35	2.891E-01	
Cs-136	818.50	250.	-23.	-0.013	98.76	-1.550E+00	
MN-54	834.85	136.	-26.	-0.014	76.26	-1.737E+00	P
Co-56	846.77	149.	-21.	-0.012	90.92	-1.475E+00	P
NB-94	871.10	107.	8.	0.004	194.49	5.409E-01	
PA-234	880.53	274.	-15.	-0.008	158.18	-1.778E+01	
Sc-46	889.28	294.	-28.	-0.016	88.66	-2.010E+00	
Y-88	898.04	149.	-4.	-0.002	600.15	-3.344E-01	
AC-228	911.07	154.	-16.	-0.009	120.84	-4.070E+00	P
PA-234	946.02	131.	21.	0.012	116.29	1.197E+01	P
EU-152	964.11	245.	-31.	-0.017	73.63	-1.629E+01	
AC-228	968.97	353.	-37.	-0.020	67.64	-1.613E+01	P
PA-234M	1001.00	222.	-8.	-0.004	312.89	-7.515E+01	P
Co-56	1037.84	100.	26.	0.014	88.09	1.480E+01	P
Cs-136	1048.07	114.	8.	0.004	192.03	8.232E-01	
RH-106	1050.36	138.	-7.	-0.004	321.87	-3.708E+01	P
BI-207	1063.66	125.	-4.	-0.002	519.09	-4.870E-01	P
Ga-68	1077.40	110.	15.	0.008	155.87	4.460E+01	
FE-59	1099.25	90.	18.	0.010	118.24	2.730E+00	
EU-152	1112.07	220.	-10.	-0.006	208.77	-6.447E+00	
Ta-182	1121.30	186.	20.	0.011	99.52	4.960E+00	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
Ta-182	1189.05	65.	-19.	-0.011	96.07	-1.074E+01		
Ta-182	1221.41	21.	12.	0.007	88.90	4.320E+00		
NA-22	1274.53	21.	-4.	-0.002	158.21	-4.208E-01		
FE-59	1291.60	5.	3.	0.001	211.23	5.924E-01		P
TL-210	1313.00	21.	-5.	-0.003	201.56	-2.527E+00		
EU-152	1408.00	0.	8.	0.004	38.95	3.771E+00		P
K-40	1460.83	5.	7.	0.004	86.67	6.896E+00		
La-140	1596.21	17.	-7.	-0.004	143.21	-8.608E-01		
SB-124	1690.98	6.	-1.	0.000	846.32	-1.718E-01		
Co-56	1771.35	18.	7.	0.004	89.23	6.083E+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	Time Corrected Activity Bq/Sample	Uncertainty Counting 1 Sigma	MDA Bq/Sample
BE-7	#A	1.1416E+01	1.1416E+01	1.194E+02%	4.55E+01
NA-22	#A	-4.2077E-01	-4.2077E-01	1.582E+02%	2.35E+00
K-40	#A	6.8958E+00	6.8958E+00	8.667E+01%	1.37E+01
Sc-46	#A	-2.0096E+00	-2.0096E+00	8.866E+01%	5.93E+00
CR-51	#A	-1.1035E+01	-1.1035E+01	9.947E+01%	3.58E+01
MN-54	#A	-1.7367E+00	-1.7367E+00	7.626E+01%	3.87E+00
FE-59	#A	2.7298E+00	2.7298E+00	1.182E+02%	7.12E+00
Co-56	#A	5.4124E-01	5.4124E-01	6.330E+01%	4.11E+00
CO-57	#A	-2.6575E-01	-2.6575E-01	2.621E+02%	2.33E+00
CO-58	#A	2.8914E-01	2.8914E-01	4.783E+02%	4.72E+00
CO-60		1.3968E+02	1.3968E+02	1.926E+00%	7.43E-01
ZN-65	#A	0.0000E+00	0.0000E+00	1.000E+03%	1.20E+01
NB-94	#A	8.3432E-01	8.3432E-01	9.027E+01%	2.42E+00
ZR-95	#A	-1.6111E+00	-1.6111E+00	1.175E+02%	6.54E+00
NB-95	#A	1.3583E+00	1.3583E+00	6.987E+01%	3.15E+00
RU-103	#A	-3.4286E-01	-3.4286E-01	2.419E+02%	3.78E+00
RH-106	#A	1.6058E+00	1.6058E+00	1.170E+03%	6.33E+01
AG-108M	#A	3.1504E-01	3.1504E-01	1.463E+02%	4.13E+00
AG-110M	A	2.0016E+00	2.0016E+00	9.036E+01%	7.69E+00
SN-113	#A	-2.2090E+00	-2.2090E+00	1.105E+02%	8.11E+00
SB-124	#A	1.2287E+00	1.2287E+00	1.482E+02%	6.09E+00
SB-125	#A	3.0103E+00	3.0103E+00	1.455E+02%	1.22E+01
I-131	#A	1.1244E+00	1.1244E+00	1.334E+02%	3.70E+00
Gd-153	#A	2.3528E+00	2.3528E+00	8.504E+01%	8.07E+00
Ga-68	#A	4.4502E+01	4.4601E+01	1.559E+02%	1.53E+02
Tc-99m	#A	-6.6014E-01	-6.6041E-01	1.410E+02%	3.10E+00
BA-133	#A	-1.9475E+00	-1.9475E+00	1.062E+02%	6.88E+00
CS-134	#A	2.7553E+00	2.7553E+00	7.469E+01%	4.96E+00
CS-137		3.3897E+02	3.3897E+02	1.447E+00%	4.57E+00
CE-139	#A	8.3887E-01	8.3887E-01	1.101E+02%	3.07E+00

Ba-140	1.0239E+01	1.0239E+01	4.108E+01%	7.91E+00
La-140 #A	-5.9273E-01	-5.9273E-01	1.432E+02%	2.70E+00
CE-141 #A	-2.1786E-01	-2.1786E-01	6.501E+02%	3.80E+00
CE-144 #A	5.4659E+00	5.4659E+00	1.139E+02%	2.07E+01
PM-144 #A	2.5483E-01	2.5483E-01	4.545E+02%	2.79E+00
EU-152 #A	-7.5035E-01	-7.5035E-01	3.182E+02%	7.99E+00
EU-154 #C	6.4906E+00	6.4906E+00	5.232E+01%	5.22E+00
EU-155 #A	-3.1616E+00	-3.1616E+00	1.494E+02%	1.57E+01
HF-181 #A	1.1898E+00	1.1898E+00	1.147E+02%	6.07E+00
Ta-182 #A	4.6809E+00	4.6809E+00	6.672E+01%	1.65E+01
Hg-203 #A	-1.9396E-01	-1.9396E-01	5.689E+02%	3.72E+00
TL-208 A	2.0977E+00	2.0977E+00	7.501E+01%	3.36E+00
PM-146 #A	3.6264E-01	3.6264E-01	1.005E+02%	6.09E+00
Y-88 #A	0.0000E+00	0.0000E+00	1.000E+03%	9.81E-01
Cd-113m#A	-1.5685E+04	-1.5685E+04	9.964E+01%	5.19E+04
Cd-109 #A	1.9133E+01	1.9133E+01	1.420E+02%	9.02E+01
Cf-251 #A	1.4648E-01	1.4648E-01	2.758E+03%	1.09E+01
Cf-249 #A	0.0000E+00	0.0000E+00	1.000E+03%	7.30E+00
Sn-126 #A	2.2854E+00	2.2854E+00	4.005E+02%	3.06E+01
PB-210 #	1.0024E+04	1.0024E+04	1.213E+00%	2.12E+02
PB-212	6.7034E+00	6.7034E+00	2.083E+01%	4.29E+00
PB-214	9.3326E+00	9.3326E+00	2.536E+01%	6.36E+00
BI-207 #A	-4.8702E-01	-4.8702E-01	5.191E+02%	6.14E+00
BI-212 #A	2.5409E+00	2.5409E+00	6.021E+02%	5.24E+01
U-235 #A	-5.6568E-01	-5.6568E-01	1.099E+03%	2.52E+01
BI-214 #	1.2803E+01	1.2803E+01	2.782E+01%	6.22E+00
BI-210M A	2.5758E+00	2.5758E+00	8.709E+01%	6.25E+00
AC-228 #A	-2.5390E-01	-2.5390E-01	8.371E+01%	1.53E+01
TH-227 #A	1.4180E+01	1.4180E+01	9.727E+01%	3.35E+01
TH-229 #A	-5.9446E+00	-5.9446E+00	1.646E+02%	5.02E+01
TH-234 #A	8.3059E+00	8.3059E+00	1.707E+02%	5.99E+01
PA-231 #A	-3.7012E+01	-3.7012E+01	1.175E+02%	1.45E+02
PA-233 #A	-1.7319E+00	-1.7319E+00	1.713E+02%	1.49E+01
PA-234 #A	2.9963E+00	2.9963E+00	8.667E+01%	1.57E+01
PA-234M#A	-7.5147E+01	-7.5147E+01	3.129E+02%	6.83E+02
AM-241 #	1.2468E+03	1.2468E+03	8.918E-01%	1.62E+01
Np-237 #A	-5.8431E+00	-5.8431E+00	1.457E+02%	2.83E+01
Ir-192 #A	1.3303E+00	1.3303E+00	9.510E+01%	3.97E+00
Cs-136 #A	-1.5497E+00	-1.5497E+00	9.876E+01%	5.11E+00
Np-239 #A	-2.8738E+00	-2.8739E+00	1.475E+02%	1.41E+01
Nd-147 #A	4.9856E-01	4.9856E-01	1.358E+02%	2.26E+01
TL-210 #A	4.3066E-01	4.3066E-01	2.139E+02%	4.57E+00
Kr-85 #A	-3.4825E+02	-3.4825E+02	9.182E+01%	1.06E+03

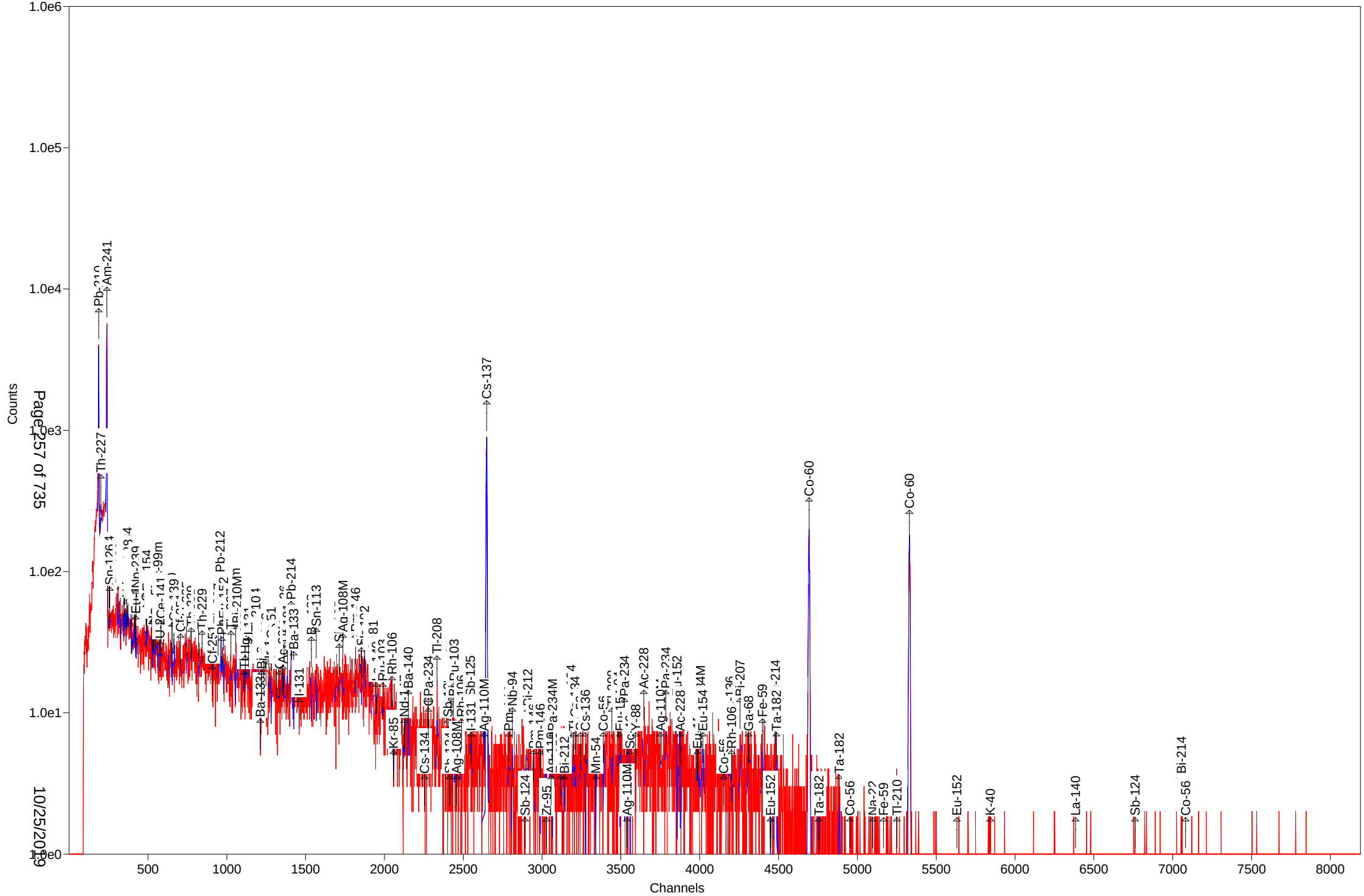
- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.

< - 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 (37.6 to 2000.8 keV) 1.179E+04 Bq/Sample
Total Decayed Activity (37.6 to 2000.8 keV) 1.1788316E+04 Bq/Sample

444057_Gamma_LCS 160-444057~2-A. 5_Gamma_20192605.spc.



Test America St. Louis Spectrum ID: 8_Gamma_20191609

Sample Description: 444057_Gamma_180-95857-A-1-B
Detector: Detector # 8
Batch ID: 444057
Work Order Number: Gamma
Lot Number: 180-95857-A-1-B

Decay to Time: 10/15/2019 10:04 Live Time: 1800 sec
Acquisition Time: 10/15/2019 10:05:03 Real Time: 1844 sec
Analysis Time: 10/15/2019 10:36 Dead Time: 2.40 %
Analysis Quantity: 1.000E+00 Sample

Efficiency Cal File: 8_Soil_TunaCan.Clb
Efficiency Cal Desc: 8_Soil_TunaCan_90099_032712
Efficiency Cal Date: 3/28/2012 10:35
Energy Cal Date: 2/28/2012 10:34
Library: Client_Long_Rev15.lib
Bkgd Correction File: 8_2019-10-06_1931.PBC

Nuclide	Activity Bq/Sample	1-Sigma Counting Uncert %	1-Sigma Counting Uncert Bq/Sample	1-Sigma Total Uncert Bq/Sample	Minimum Detectable Activity Bq/Sample
BE-7	-5.205E+00	88.1	4.585E+00	4.593E+00	1.805E+01
NA-22	2.670E-01	225.8	6.030E-01	6.032E-01	2.145E+00
K-40	3.359E+02	5.1	1.699E+01	2.417E+01	9.370E+00
Sc-46	4.889E-01	101.1	4.944E-01	4.950E-01	1.761E+00
CR-51	-4.983E+00	160.4	7.993E+00	7.997E+00	2.677E+01
MN-54	-3.907E-01	200.0	7.815E-01	7.817E-01	1.837E+00
FE-59	2.745E+00	30.9	8.478E-01	8.588E-01	1.638E+00
Co-56	1.723E+00	22.1	3.811E-01	3.912E-01	1.550E+00
CO-57	-2.275E-01	162.8	3.703E-01	3.705E-01	1.247E+00
CO-58	5.915E-01	87.5	5.179E-01	5.188E-01	1.748E+00
CO-60	1.982E-01	260.2	5.157E-01	5.158E-01	1.415E+00
ZN-65	-2.104E-01	509.2	1.071E+00	1.071E+00	6.095E+00
NB-94	4.013E-01	71.2	2.858E-01	2.865E-01	1.455E+00
ZR-95	-3.775E-01	285.0	1.076E+00	1.076E+00	2.583E+00
NB-95	3.901E-01	100.8	3.932E-01	3.937E-01	1.348E+00
RU-103	1.712E-01	284.8	4.876E-01	4.877E-01	1.205E+00
RH-106	4.374E+00	215.2	9.411E+00	9.414E+00	3.186E+01
AG-108M	3.175E-01	89.5	2.841E-01	2.846E-01	1.407E+00
AG-110M	5.961E-01	57.6	3.434E-01	3.447E-01	2.231E+00
SN-113	6.205E-01	116.1	7.204E-01	7.211E-01	2.433E+00
SB-124	9.436E-01	80.3	7.573E-01	7.589E-01	2.848E+00
SB-125	-4.346E-01	328.5	1.428E+00	1.428E+00	3.653E+00
I-131	-4.573E-01	86.3	3.947E-01	3.954E-01	1.611E+00
Gd-153	0.000E+00	1.#INF	4.298E-01	4.298E-01	7.174E+00
Ga-68	-2.473E+01	124.5	3.079E+01	3.082E+01	6.983E+01
Tc-99m	2.483E-07	284409134.2	7.061E-01	7.061E-01	2.371E+00
BA-133	-8.214E-01	142.3	1.169E+00	1.170E+00	3.920E+00
CS-134	7.612E-01	92.9	7.073E-01	7.084E-01	2.215E+00
CS-137	-1.160E+00	56.9	6.603E-01	6.630E-01	2.405E+00
CE-139	3.513E-02	1147.0	4.029E-01	4.029E-01	1.377E+00
Ba-140	9.775E-01	178.2	1.742E+00	1.743E+00	4.200E+00
La-140	9.649E-01	40.8	3.939E-01	3.972E-01	7.522E-01
CE-141	6.137E-01	117.8	7.230E-01	7.237E-01	2.421E+00

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CE-144	-3.549E+00	146.2	5.190E+00	5.193E+00	1.730E+01
PM-144	2.500E-01	210.8	5.271E-01	5.272E-01	1.421E+00
EU-152	6.215E-02	91.3	5.676E-02	5.685E-02	3.563E+00
EU-154	9.718E-01	117.9	1.145E+00	1.147E+00	2.408E+00
EU-155	0.000E+00	1.#INF	1.151E+00	1.151E+00	1.003E+01
HF-181	1.258E-01	507.7	6.385E-01	6.385E-01	2.209E+00
Ta-182	7.393E-01	105.0	7.765E-01	7.773E-01	9.430E+00
Hg-203	2.146E-01	190.8	4.094E-01	4.096E-01	1.401E+00
TL-208	6.211E+00	9.6	5.954E-01	6.770E-01	7.334E-01
PM-146	3.408E-01	208.5	7.106E-01	7.108E-01	1.734E+00
Y-88	-9.250E-01	100.9	9.331E-01	9.346E-01	2.042E+00
Cd-113m	-7.164E+03	87.5	6.272E+03	6.289E+03	2.096E+04
Cd-109	0.000E+00	1.#INF	1.746E+01	1.746E+01	5.852E+01
Cf-251	-2.204E-01	948.7	2.091E+00	2.091E+00	5.452E+00
Cf-249	1.006E+00	94.2	9.480E-01	9.494E-01	2.173E+00
Sn-126	5.315E+00	107.5	5.713E+00	5.720E+00	1.451E+01
PB-210	-1.926E+00	683.1	1.316E+01	1.316E+01	5.322E+01
PB-212	1.684E+01	6.0	1.015E+00	1.489E+00	1.743E+00
PB-214	1.425E+01	7.9	1.123E+00	1.346E+00	2.159E+00
BI-207	-1.116E+00	62.4	6.960E-01	6.983E-01	2.790E+00
BI-212	-4.389E+00	195.6	8.584E+00	8.587E+00	2.951E+01
U-235	-4.554E+00	60.3	2.748E+00	2.758E+00	1.758E+01
BI-214	1.021E+01	10.7	1.093E+00	1.215E+00	1.839E+00
BI-210M	3.242E-01	223.8	7.256E-01	7.259E-01	2.477E+00
AC-228	1.301E+01	14.8	1.923E+00	2.034E+00	4.174E+00
TH-227	2.647E+00	163.7	4.333E+00	4.336E+00	1.389E+01
TH-229	8.285E+00	87.5	7.252E+00	7.282E+00	2.019E+01
TH-234	1.258E+01	40.4	5.076E+00	5.124E+00	1.626E+01
PA-231	-1.589E+01	167.0	2.654E+01	2.655E+01	8.890E+01
PA-233	0.000E+00	1.#INF	3.672E-01	3.672E-01	7.117E+00
PA-234	-2.357E-01	95.9	2.262E-01	2.265E-01	1.024E+01
PA-234M	2.186E+00	156.2	3.414E+00	3.416E+00	2.781E+02
AM-241	9.428E-01	182.3	1.718E+00	1.719E+00	5.756E+00
Np-237	0.000E+00	1.#INF	5.580E+00	5.580E+00	1.858E+01
Ir-192	3.247E-01	99.6	3.236E-01	3.241E-01	2.977E+00
Cs-136	4.906E-01	99.2	4.867E-01	4.876E-01	1.905E+00
Np-239	-1.694E+00	169.3	2.867E+00	2.869E+00	9.550E+00
Nd-147	8.283E-01	170.8	1.415E+00	1.416E+00	9.380E+00
TL-210	1.269E-01	423.5	5.375E-01	5.375E-01	1.897E+00
Kr-85	2.893E+00	4663.7	1.349E+02	1.349E+02	4.678E+02
Total	4.543E+02				

Analyst: Kellene Robbs

Sample description
444057_Gamma_180-95857-A-1-B

Spectrum Filename: C:\User\SPC\Det8\8_Gamma_20191609.An1

Acquisition information
Start time: 10/15/2019 10:05:03 AM
Live time: 1800
Real time: 1844
Dead time: 2.40 %
Detector ID: 8

Detector system
Ge 8 SN/174

Calibration
Filename: 8_Soil_TunaCan.Clb
8_Soil_TunaCan_90099_032712

Energy Calibration
Created: 2/28/2012 10:34:41 AM
Zero offset: 0.052 keV
Gain: 0.250 keV/channel
Quadratic: 5.282E-10 keV/channel^2

Efficiency Calibration
Created: 3/28/2012 10:35:20 AM
Knee Energy: 165.85 keV
Above the Knee: Quadratic Uncertainty = 1.39 %
Log(Eff): -1.098764E-01 + (-4.958544E-01*Log(E)) + (-2.572270E-02*Log(E)^2)
Below the Knee: Quadratic Uncertainty = 1.71 %
Log(Eff): -2.525301E+01 + (9.398253E+00*Log(E)) + (-1.000034E+00*Log(E)^2)

Library Files
Main analysis library: Client_Long_Rev15.lib
Library Match Width: 0.500
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G800W064
Start channel: 150 (37.55keV)
Stop channel: 8000 (1999.97keV)
Peak rejection level: 1000.000%
Peak search sensitivity: 3
Sample Size: 1.0000E+00 +/- 0.000E+00%
Activity scaling factor: 1.0000E+00/(1.0000E+00* 1.0000E+00) = 1.0000E+00
Detection limit method: Reg. Guide 4.16 Method

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Random error: 4.0000000E+00
Systematic error: 4.0000000E+00
Fraction Limit: 0.000%
Background width: 3
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:	YES	10/15/2019 10:04:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	8_2019-10-06_1931.PBC 10/6/2019 7:31:35 PM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 24 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 0.1376

***** 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
59.54	18.	182.28	1.02	2.881E-02	59.54	35.900	PBC<MDA	AM241
63.44	69.	39.47	1.05	3.102E-02	63.29	3.810	PBC<MDA	TH234
					64.28	9.700	1.255E+01	Sn126
74.86	154.	13.83	1.03	3.621E-02				
77.11	237.	9.92	1.04	3.700E-02				
87.10	117.	19.48	1.16	3.973E-02	86.49	13.100	1.253E+01	Np237
					86.54	30.700	5.346E+00	EU155
					86.94	9.040	1.812E+01	Sn126
					87.57	37.500	4.352E+00	Sn126
					88.04	3.790	4.296E+01	Cd109
91.10	28.	170.81	1.05	4.048E-02	91.10	28.300	PBC<MDA	Nd147
92.74	68.	36.69	1.00	4.074E-02	92.59	5.584	1.663E+01	TH234
					93.35	5.561	1.665E+01	AC228
123.10	18.	117.87	1.07	4.138E-02	123.10	40.790	PBC<MDA	EU154
145.44	21.	117.81	1.09	3.874E-02	145.44	48.200	PBC<MDA	CE141
162.66	4.	514.81	1.10	3.593E-02	162.66	6.220	PBC<MDA	Ba140
185.72	63.	38.24	1.12	3.329E-02	185.72	54.000	1.949E+00	U235
193.51	14.	142.68	1.13	3.226E-02	193.51	4.400	PBC<MDA	TH229
210.85	20.	101.42	1.14	3.020E-02	210.85	2.990	PBC<MDA	TH229
227.00	5.	409.39	1.15	2.853E-02	227.00	6.300	PBC<MDA	Cf251
235.97	18.	200.03	1.16	2.768E-02	235.97	12.300	PBC<MDA	TH227
238.64	338.	6.86	1.09	2.744E-02	238.63	43.300	1.581E+01	PB212

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
242.02	66.	22.66	1.16	2.714E-02	242.00	7.430	1.805E+01	PB214
256.24	7.	259.12	1.17	2.596E-02	256.24	7.000	PBC<MDA	TH227
265.83	7.	223.83	1.18	2.523E-02	265.83	50.000	PBC<MDA	BI210M
277.39	17.	75.30	1.19	2.440E-02	277.28	6.310	PBC<MDA	TL208
279.20	8.	190.79	1.19	2.427E-02	279.20	81.460	PBC<MDA	Hg203
284.30	8.	183.24	1.19	2.393E-02	284.30	6.140	PBC<MDA	I131
295.39	129.	13.36	0.82	2.322E-02	295.09	19.300	1.566E+01	PB214
					296.00	79.000	3.913E+00	TL210
300.30	14.	61.63	1.20	2.294E-02	300.03	3.280	PBC<MDA	PB212
					300.07	2.460	PBC<MDA	PA231
					300.18	6.200	PBC<MDA	PA233
328.76	15.	162.02	1.23	2.133E-02	328.76	20.300	PBC<MDA	La140
333.44	15.	157.97	1.23	2.110E-02	333.44	15.510	PBC<MDA	Cf249
338.11	72.	22.48	0.80	2.086E-02	338.32	12.010	1.590E+01	AC228
340.57	13.	190.80	1.23	2.074E-02	340.57	46.900	PBC<MDA	Cs136
351.79	196.	9.20	1.06	2.022E-02	351.93	37.600	1.432E+01	PB214
383.84	14.	104.06	1.27	1.885E-02	383.84	8.940	PBC<MDA	BA133
387.95	14.	102.69	1.27	1.869E-02	387.95	66.000	PBC<MDA	Cf249
391.69	13.	116.10	1.27	1.855E-02	391.69	64.000	PBC<MDA	SN113
453.88	7.	208.50	1.32	1.647E-02	453.88	65.000	PBC<MDA	PM146
468.06	13.	99.64	1.33	1.606E-02	468.06	51.750	PBC<MDA	Ir192
482.00	3.	507.67	1.34	1.569E-02	482.00	80.500	PBC<MDA	HF181
497.05	4.	284.80	1.35	1.530E-02	497.05	90.900	PBC<MDA	RU103
511.86	92.	13.22	2.61	1.494E-02	511.86	20.000	1.711E+01	RH106
537.26	6.	178.21	1.37	1.436E-02	537.26	24.390	PBC<MDA	Ba140
563.24	4.	320.63	1.39	1.381E-02	563.24	8.350	PBC<MDA	CS134
569.32	3.	264.58	1.40	1.369E-02	569.32	15.380	PBC<MDA	CS134
					569.47	8.200	1.485E+00	PA234
					569.70	97.740	PBC<MDA	BI207
569.70	7.	111.88	1.40	1.368E-02	569.32	15.380	1.763E+00	CS134
					569.47	8.200	3.306E+00	PA234
					569.70	97.740	PBC<MDA	BI207
583.02	127.	9.59	1.14	1.342E-02	583.02	84.500	6.224E+00	TL208
602.73	9.	207.04	1.42	1.306E-02	602.73	98.260	PBC<MDA	SB124
604.61	10.	197.26	1.42	1.303E-02	604.71	97.620	PBC<MDA	CS134
609.22	110.	10.70	1.42	1.294E-02	609.31	46.090	1.021E+01	BI214
610.30	10.	201.82	1.42	1.293E-02	610.30	5.750	PBC<MDA	RU103
614.28	10.	206.38	1.43	1.286E-02	614.28	89.850	PBC<MDA	AG108M
618.06	10.	210.84	1.43	1.279E-02	618.06	99.100	PBC<MDA	PM144
621.92	10.	215.16	1.43	1.273E-02	621.92	9.930	PBC<MDA	RH106
657.76	5.	183.34	1.45	1.215E-02	657.76	94.640	PBC<MDA	AG110M
696.54	1.	913.44	1.48	1.158E-02	696.54	99.000	PBC<MDA	PM144
702.63	5.	249.54	1.48	1.150E-02	702.63	97.900	PBC<MDA	NB94
722.79	13.	80.26	1.50	1.123E-02	722.79	10.810	PBC<MDA	SB124
					722.94	90.840	6.944E-01	AG108M
					723.36	20.220	3.121E+00	EU154
722.94	13.	89.49	1.50	1.123E-02	722.79	10.810	5.835E+00	SB124
					722.94	90.840	6.945E-01	AG108M

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
					723.36	20.220	3.122E+00	EU154
723.36	2.	483.69	1.50	1.123E-02	722.79	10.810	PBC<MDA	SB124
					722.94	90.840	1.358E-01	AG108M
					723.36	20.220	6.104E-01	EU154
763.94	11.	57.60	1.52	1.072E-02	763.94	22.280	PBC<MDA	AG110M
765.79	7.	100.79	1.53	1.070E-02	765.79	99.790	PBC<MDA	NB95
					766.41	0.294	PBC<MDA	PA234M
766.41	5.	161.06	1.53	1.070E-02	765.79	99.790	PBC<MDA	NB95
					766.41	0.294	PBC<MDA	PA234M
785.42	13.	91.69	1.54	1.048E-02	785.42	1.280	PBC<MDA	BI212
795.45	7.	146.82	1.54	1.036E-02	795.87	85.530	PBC<MDA	CS134
799.60	2.	423.54	1.55	1.032E-02	799.60	98.960	PBC<MDA	TL210
801.53	11.	92.91	1.55	1.030E-02	801.95	8.690	PBC<MDA	CS134
810.78	11.	87.54	1.55	1.020E-02	810.78	99.460	PBC<MDA	CO58
815.77	7.	150.85	1.56	1.015E-02	815.77	23.280	PBC<MDA	La140
818.50	9.	108.50	1.56	1.012E-02	818.50	100.000	PBC<MDA	Cs136
860.30	2.	700.14	1.59	9.703E-03	860.56	12.420	PBC<MDA	TL208
871.10	10.	71.21	1.59	9.604E-03	871.10	99.890	PBC<MDA	NB94
880.53	12.	46.62	1.60	9.517E-03	880.53	6.000	PBC<MDA	PA234
883.24	6.	129.49	1.60	9.493E-03	883.24	9.600	PBC<MDA	PA234
884.68	6.	142.62	1.60	9.480E-03	884.68	72.680	PBC<MDA	AG110M
889.28	6.	154.11	1.60	9.438E-03	889.28	99.984	PBC<MDA	Sc46
898.04	6.	131.78	1.61	9.360E-03	898.04	93.700	PBC<MDA	Y88
911.09	57.	19.22	1.62	9.247E-03	911.07	29.000	1.181E+01	AC228
964.11	6.	201.77	1.65	8.814E-03	964.11	14.605	PBC<MDA	EU152
969.11	55.	18.97	0.67	8.776E-03	968.97	17.460	1.982E+01	AC228
996.33	5.	188.68	1.67	8.571E-03	996.33	10.600	PBC<MDA	EU154
1001.00	-3.	267.72	1.67	8.537E-03	1001.00	0.837	PBC<MDA	PA234M
1037.84	8.	91.02	1.69	8.278E-03	1037.84	14.130	PBC<MDA	Co56
1048.07	4.	201.03	1.70	8.209E-03	1048.07	80.000	PBC<MDA	Cs136
1099.25	22.	30.88	1.73	7.881E-03	1099.25	56.500	2.745E+00	FE59
1120.11	13.	92.86	1.74	7.754E-03	1120.29	15.100	PBC<MDA	BI214
					1120.55	99.987	PBC<MDA	Sc46
1120.55	9.	130.96	1.74	7.752E-03	1120.29	15.100	PBC<MDA	BI214
					1120.55	99.987	6.497E-01	Sc46
					1121.30	34.900	1.862E+00	Ta182
1189.41	5.	224.35	1.78	7.367E-03	1189.05	16.200	PBC<MDA	Ta182
1222.52	9.	106.38	1.80	7.199E-03	1221.41	27.000	PBC<MDA	Ta182
1238.28	36.	22.12	1.81	7.114E-03	1238.28	66.070	4.296E+00	Co56
1274.53	3.	225.83	1.83	6.939E-03	1274.53	99.940	PBC<MDA	NA22
					1274.54	35.190	7.583E-01	EU154
1291.60	3.	238.07	1.84	6.860E-03	1291.60	43.200	PBC<MDA	FE59
1313.00	5.	145.77	1.85	6.763E-03	1313.00	21.000	PBC<MDA	TL210
1332.50	2.	260.23	1.86	6.678E-03	1332.50	99.980	PBC<MDA	CO60
1408.00	5.	121.64	1.90	6.366E-03	1408.00	21.005	PBC<MDA	EU152
1460.68	398.	5.06	1.49	6.166E-03	1460.83	10.670	3.359E+02	K40
1596.21	6.	40.82	1.99	5.706E-03	1596.21	95.400	PBC<MDA	La140
1764.44	29.	18.57	2.07	5.226E-03	1764.49	15.400	2.002E+01	BI214

pk energy area uncert fwhm corr nuclide brnch. act. nuc

********** 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	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide
299.27	74.90	151.	154.	4.262E+03	13.83	1.034	- sD
308.25	77.15	159.	237.	6.413E+03	9.92	1.036	- D

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

This section based on library: Client_Long_Rev15.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 1 Sigma %	FWHM keV
PB-210	185.96	46.54	287.	-3.	-0.002	683.07	1.012s
TH-227	200.36	50.14	332.	-26.	-0.015	100.38	1.015s
AM-241	237.95	59.54	503.	18.	0.010	182.28	1.022s
Sn-126	256.93	64.28	273.	29.	0.016	107.48	1.026s
BA-133	323.77	80.99	1061.	-33.	-0.018	141.92	1.039s
Np-237	345.77	86.49	1343.	0.	0.000	180.95	1.043A
EU-155	345.98	86.54	1187.	-28.	-0.015	177.39	1.043s
Sn-126	350.09	87.57	1079.	82.	0.046	23.08	1.044D
Cd-109	351.97	88.04	1130.	0.	0.000	1000.00	1.044A
Nd-147	364.21	91.10	1107.	28.	0.015	170.81	1.047s
TH-234	370.17	92.59	188.	51.	0.029	40.35	1.048D
AC-228	373.21	93.35	1123.	18.	0.010	262.66	1.049s
Gd-153	389.81	97.50	1141.	0.	0.000	1000.00	1.052s
Np-239	397.81	99.50	1141.	0.	0.000	1000.00	1.053s
Gd-153	412.62	103.20	1141.	0.	0.000	1000.00	1.056s
Np-239	414.62	103.70	1141.	0.	0.000	1000.00	1.057s
EU-155	421.07	105.31	1141.	0.	0.000	1000.00	1.058s
Np-239	424.34	106.13	1188.	-29.	-0.016	169.28	1.058s
EU-152	486.94	121.78	248.	-25.	-0.014	91.33	1.071
CO-57	488.06	122.06	272.	-15.	-0.008	162.77	1.071
EU-154	492.22	123.10	228.	18.	0.010	117.87	1.072
PA-234	525.00	131.29	802.	-29.	-0.016	141.60	1.078s
HF-181	531.92	133.02	831.	-29.	-0.016	143.88	1.079
CE-144	533.98	133.54	859.	-29.	-0.016	146.24	1.080
HF-181	545.02	136.30	888.	-29.	-0.016	148.32	1.082s
CO-57	545.72	136.47	917.	-25.	-0.014	172.50	1.082s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
U-235	574.97	143.79	809.	-35.	-0.019	60.34	1.087s
CE-141	581.59	145.44	285.	21.	0.011	117.81	1.089s
Ba-140	650.47	162.66	247.	4.	0.002	514.81	1.102s
Cf-251	706.23	176.60	139.	-2.	-0.001	948.68	1.112s
U-235	742.71	185.72	152.	63.	0.035	38.24	1.119s
TH-229	773.87	193.51	110.	14.	0.008	142.68	1.125
TH-229	843.24	210.85	104.	20.	0.011	101.42	1.138s
Cf-251	907.84	227.00	108.	5.	0.003	409.39	1.151s
TH-227	943.73	235.97	639.	18.	0.010	200.03	1.157s
PB-212	954.37	238.63	55.	360.	0.200	6.03	1.159D
PB-214	967.84	242.00	77.	66.	0.036	22.66	1.162D
EU-152	978.62	244.69	676.	-5.	-0.003	705.60	1.164s
TH-227	1024.81	256.24	84.	7.	0.004	259.12	1.172s
Cd-113m	1054.65	263.70	138.	-20.	-0.011	87.55	1.178
BI-210M	1063.18	265.83	132.	7.	0.004	223.83	1.179s
TL-208	1108.99	277.28	71.	17.	0.009	75.30	1.188s
Hg-203	1116.66	279.20	102.	8.	0.004	190.79	1.189s
I-131	1137.05	284.30	57.	8.	0.005	183.24	1.193s
PB-214	1180.22	295.09	49.	114.	0.063	12.80	1.201D
TL-210	1183.86	296.00	554.	-19.	-0.010	179.71	1.202s
PB-212	1199.98	300.03	30.	14.	0.008	61.63	1.205D
PA-231	1200.14	300.07	536.	-19.	-0.010	176.28	1.205
PA-233	1200.58	300.18	500.	-19.	-0.010	170.43	1.205
PA-231	1210.46	302.65	482.	-19.	-0.010	167.04	1.207s
BA-133	1211.27	302.85	463.	-4.	-0.002	793.23	1.207s
Ba-140	1219.26	304.85	459.	0.	0.000	1000.00	1.208s
BI-210M	1219.45	304.90	459.	0.	0.000	1000.00	1.208s
Ir-192	1233.62	308.44	459.	0.	0.000	1000.00	1.211s
PA-233	1247.91	312.01	459.	0.	0.000	1000.00	1.214s
Ir-192	1265.82	316.49	459.	0.	0.000	1000.00	1.217s
CR-51	1280.20	320.08	476.	-19.	-0.011	160.41	1.219s
La-140	1314.91	328.76	274.	15.	0.008	162.02	1.226s
Cf-249	1333.63	333.44	289.	15.	0.009	157.97	1.229
AC-228	1352.31	338.11	43.	72.	0.040	22.48	0.797s
Cs-136	1362.15	340.57	304.	13.	0.007	190.80	1.234s
EU-152	1377.01	344.29	330.	-17.	-0.009	156.29	1.237s
HF-181	1383.19	345.83	329.	-13.	-0.007	201.61	1.238s
PB-214	1407.02	351.79	33.	196.	0.109	9.20	1.065
BA-133	1423.87	356.00	332.	-18.	-0.010	142.29	1.245s
I-131	1457.81	364.48	89.	-21.	-0.012	86.32	1.252s
BA-133	1535.24	383.84	97.	14.	0.008	104.06	1.266s
Cf-249	1551.68	387.95	96.	14.	0.008	102.69	1.269s
SN-113	1566.64	391.69	112.	13.	0.007	116.10	1.271s
SB-125	1711.39	427.88	44.	-4.	-0.002	328.51	1.297s
AG-108M	1735.64	433.94	61.	-6.	-0.003	237.04	1.301s
PM-146	1815.41	453.88	43.	7.	0.004	208.50	1.315
SB-125	1853.36	463.37	120.	-18.	-0.010	90.20	1.322s
Ir-192	1872.14	468.06	78.	13.	0.007	99.64	1.325s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BE-7	1910.28	477.60	121.	-16.	-0.009	88.08	1.332s
HF-181	1927.89	482.00	104.	3.	0.002	507.67	1.335s
RU-103	1988.12	497.05	35.	4.	0.002	284.80	1.346s
RH-106	2047.36	511.86	28.	92.	0.051	13.22	2.606s
Ba-140	2148.95	537.26	26.	6.	0.003	178.21	1.373s
CS-134	2252.86	563.24	30.	4.	0.002	320.63	1.391
CS-134	2277.20	569.32	30.	3.	0.002	264.58	1.395
PA-234	2277.80	569.47	33.	0.	0.000	1000.00	1.395s
BI-207	2278.73	569.70	24.	7.	0.004	111.88	1.396s
TL-208	2332.00	583.02	7.	127.	0.071	9.59	1.140
SB-125	2401.92	600.50	277.	-15.	-0.008	81.24	1.416s
SB-124	2410.85	602.73	183.	9.	0.005	207.04	1.418s
CS-134	2418.76	604.71	185.	10.	0.005	197.26	1.419s
BI-214	2437.17	609.31	13.	110.	0.061	10.70	1.422D
RU-103	2441.12	610.30	194.	10.	0.005	201.82	1.423s
AG-108M	2457.05	614.28	204.	10.	0.006	206.38	1.426s
PM-144	2472.18	618.06	214.	10.	0.006	210.84	1.428s
RH-106	2487.60	621.92	224.	10.	0.006	215.16	1.431s
SB-125	2543.49	635.89	35.	-4.	-0.002	233.02	1.440s
I-131	2547.83	636.97	60.	-17.	-0.009	70.60	1.441s
AG-110M	2630.98	657.76	22.	5.	0.003	183.34	1.455s
CS-137	2646.58	661.66	81.	-22.	-0.012	56.93	1.457
PM-144	2786.11	696.54	33.	1.	0.001	913.44	1.480s
NB-94	2810.46	702.63	33.	5.	0.003	249.54	1.484s
SB-124	2891.09	722.79	46.	13.	0.007	80.26	1.497s
AG-108M	2891.70	722.94	59.	13.	0.007	89.49	1.498s
EU-154	2893.39	723.36	72.	2.	0.001	483.69	1.498s
ZR-95	2896.74	724.20	74.	0.	0.000	1000.00	1.498s
BI-212	2908.63	727.17	82.	-7.	-0.004	195.58	1.500
PM-146	2942.83	735.72	29.	-2.	-0.001	714.76	1.506s
PM-146	2988.59	747.16	38.	-14.	-0.008	92.13	1.513s
ZR-95	3026.87	756.73	28.	-4.	-0.002	285.04	1.519s
AG-110M	3055.73	763.94	14.	11.	0.006	57.60	1.524s
NB-95	3063.11	765.79	25.	7.	0.004	100.79	1.525s
PA-234M	3065.60	766.41	25.	5.	0.003	161.06	1.526s
EU-152	3115.64	778.92	33.	-6.	-0.003	218.04	1.534s
BI-212	3141.64	785.42	28.	13.	0.007	91.69	1.538
CS-134	3183.44	795.87	49.	7.	0.004	146.82	1.544s
TL-210	3198.36	799.60	48.	2.	0.001	423.54	1.547s
CS-134	3207.77	801.95	45.	11.	0.006	92.91	1.548s
CO-58	3243.06	810.78	39.	11.	0.006	87.54	1.554
La-140	3263.04	815.77	50.	7.	0.004	150.85	1.557s
Cs-136	3273.97	818.50	47.	9.	0.005	108.50	1.559s
MN-54	3339.36	834.85	42.	-7.	-0.004	200.00	1.569s
Co-56	3387.05	846.77	28.	-5.	-0.003	230.12	1.577s
TL-208	3442.23	860.56	33.	2.	0.001	700.14	1.585s
NB-94	3484.36	871.10	18.	10.	0.005	71.21	1.592s
EU-154	3492.89	873.23	47.	-14.	-0.008	76.15	1.593s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
PA-234	3522.10	880.53	11.	12.	0.007	46.62	1.598s
PA-234	3532.94	883.24	23.	6.	0.003	129.49	1.599s
AG-110M	3538.71	884.68	29.	6.	0.003	142.62	1.600s
Sc-46	3557.10	889.28	34.	6.	0.003	154.11	1.603s
Y-88	3592.14	898.04	15.	6.	0.004	131.78	1.608s
AC-228	3644.26	911.07	14.	57.	0.032	19.22	1.616s
AG-110M	3749.96	937.49	20.	-2.	-0.001	496.66	1.633s
PA-234	3784.07	946.02	40.	-15.	-0.008	96.23	1.638s
EU-152	3856.43	964.11	64.	6.	0.003	201.77	1.649s
AC-228	3876.42	969.11	9.	55.	0.030	18.97	0.673s
EU-154	3985.31	996.33	42.	5.	0.003	188.68	1.668
PA-234M	4003.99	1001.00	50.	-3.	-0.002	267.72	1.671s
Co-56	4151.36	1037.84	10.	8.	0.005	91.02	1.693s
Cs-136	4192.29	1048.07	25.	4.	0.002	201.03	1.698s
BI-207	4254.65	1063.66	35.	-12.	-0.007	62.38	1.708s
Ga-68	4309.61	1077.40	30.	-10.	-0.006	124.50	1.716s
FE-59	4397.02	1099.25	5.	22.	0.012	30.88	1.728s
EU-152	4448.32	1112.07	89.	-13.	-0.007	102.49	1.736s
ZN-65	4462.20	1115.55	75.	-1.	-0.001	509.17	1.738s
BI-214	4481.17	1120.29	65.	13.	0.007	92.86	1.740
Sc-46	4482.22	1120.55	66.	9.	0.005	130.96	1.740
Ta-182	4485.22	1121.30	86.	-7.	-0.004	193.95	1.741
CO-60	4692.97	1173.24	47.	-19.	-0.011	63.40	1.770s
Ta-182	4756.23	1189.05	25.	5.	0.003	224.35	1.779s
Ta-182	4885.67	1221.41	16.	9.	0.005	106.38	1.797s
Co-56	4953.16	1238.28	6.	36.	0.020	22.12	1.806s
NA-22	5098.16	1274.53	27.	3.	0.002	225.83	1.826s
EU-154	5098.20	1274.54	30.	0.	0.000	1000.00	1.826s
FE-59	5166.43	1291.60	11.	3.	0.002	238.07	1.835s
TL-210	5252.05	1313.00	11.	5.	0.003	145.77	1.847s
CO-60	5330.06	1332.50	9.	2.	0.001	260.23	1.857s
AG-110M	5537.25	1384.30	16.	-7.	-0.004	135.27	1.884s
EU-152	5632.07	1408.00	5.	5.	0.003	121.64	1.896s
K-40	5842.77	1460.68	3.	398.	0.221	5.06	1.492
La-140	6384.93	1596.21	0.	6.	0.003	40.82	1.990s
BI-214	7058.07	1764.49	0.	29.	0.016	18.57	2.067
Co-56	7085.51	1771.35	39.	-7.	-0.004	128.75	2.070s
Y-88	7344.36	1836.06	11.	-8.	-0.005	100.88	2.098s

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	-5.2052E+00				5.31E+01	
			477.60	-5.205E+00	?(P	1.805E+01 8.81E+01 1.05E+01	G
NA-22	C	2.6702E-01				9.50E+02	
			1274.53	2.670E-01	?(	2.145E+00 2.26E+02 9.99E+01	G
K-40	N	3.3593E+02				4.66E+11	
			1460.83	3.359E+02	(P	9.370E+00 5.06E+00 1.07E+01	G
Sc-46	F	4.8891E-01				8.38E+01	
			889.28	3.281E-01	?(	1.761E+00 1.54E+02 1.00E+02	G
			1120.55	6.497E-01	?(	2.906E+00 1.31E+02 1.00E+02	G
CR-51	F	-4.9826E+00				2.77E+01	
			320.08	-4.983E+00	?(	2.677E+01 1.60E+02 9.94E+00	G
MN-54	C	-3.9074E-01				3.12E+02	
			834.85	-3.907E-01	?(	1.837E+00 2.00E+02 1.00E+02	G
FE-59	F	2.7449E+00				4.45E+01	
			1099.25	2.745E+00	&(	1.638E+00 3.09E+01 5.65E+01	G
			1291.60	6.028E-01	- P	3.377E+00 2.38E+02 4.32E+01	G
Co-56	C	1.7229E+00				7.73E+01	
			846.77	-2.904E-01	?(P	1.550E+00 2.30E+02 9.99E+01	G
			1238.28	4.296E+00	(P	1.630E+00 2.21E+01 6.61E+01	G
			1037.84	3.932E+00	?(P	8.301E+00 9.10E+01 1.41E+01	G
			1771.35	-4.960E+00	+	2.201E+01 1.29E+02 1.55E+01	A
CO-57	C	-2.2750E-01				2.72E+02	
			122.06	-2.275E-01	&(	1.247E+00 1.63E+02 8.56E+01	G
			136.47	-3.251E+00	+	1.871E+01 1.72E+02 1.07E+01	G
CO-58	C	5.9155E-01				7.09E+01	
			810.78	5.915E-01	?(	1.748E+00 8.75E+01 9.95E+01	G
CO-60	F	1.9815E-01				1.93E+03	
			1332.50	1.982E-01	?(P	1.415E+00 2.60E+02 1.00E+02	G
			1173.24	-1.429E+00	+ P	2.590E+00 6.34E+01 9.99E+01	G

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Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
ZN-65	F	-2.1039E-01					2.44E+02	
			1115.55	-2.104E-01	&(P	6.095E+00	5.09E+02	5.06E+01 G
NB-94	I	4.0130E-01					7.41E+06	
			702.63	2.444E-01	?(P	1.455E+00	2.50E+02	9.79E+01 G
			871.10	5.550E-01	?(	1.318E+00	7.12E+01	9.99E+01 G
ZR-95	I	-3.7746E-01					6.40E+01	
			756.73	-3.775E-01	?(	2.583E+00	2.85E+02	5.45E+01 G
			724.20	0.000E+00	+	4.802E+00	1.00E+03	4.42E+01 G
NB-95	I	3.9007E-01					6.40E+01	
			765.79	3.901E-01	?(	1.348E+00	1.01E+02	9.98E+01 G
RU-103	I	1.7122E-01					3.93E+01	
			497.05	1.712E-01	?(P	1.205E+00	2.85E+02	9.09E+01 G
			610.30	7.396E+00	?	5.059E+01	2.02E+02	5.75E+00 GA
RH-106	I	4.3738E+00					3.74E+02	
			621.92	4.374E+00	?(	3.186E+01	2.15E+02	9.93E+00 G
			1050.36	1.449E+00	%	1.221E+02	2.32E+03	1.56E+00 G
			511.86	1.711E+01	?	5.090E+00	1.32E+01	2.00E+01 GA
AG-108M	C	3.1751E-01					1.53E+05	
			433.94	-2.191E-01	&(P	1.407E+00	2.37E+02	9.05E+01 G
			722.94	6.945E-01	*(	2.093E+00	8.95E+01	9.08E+01 G
			614.28	4.767E-01	(	3.334E+00	2.06E+02	8.98E+01 G
AG-110M	F	5.9610E-01					2.50E+02	
			884.68	4.486E-01	?(	2.231E+00	1.43E+02	7.27E+01 G
			657.76	2.577E-01	?(	1.179E+00	1.83E+02	9.46E+01 G
			937.49	-3.583E-01	+	4.219E+00	4.97E+02	3.44E+01 G
			1384.30	-2.478E+00	+	7.559E+00	1.35E+02	2.43E+01 G
			763.94	2.515E+00	&(	4.684E+00	5.76E+01	2.23E+01 G
SN-113	F	6.2047E-01					1.15E+02	
			391.69	6.205E-01	?(	2.433E+00	1.16E+02	6.40E+01 G
SB-124	F	9.4356E-01					6.02E+01	
			602.73	4.055E-01	?(P	2.848E+00	2.07E+02	9.83E+01 G
			1690.98	-6.637E-03	% P	1.579E+00	6.50E+04	4.78E+01 G
			722.79	5.834E+00	*(	1.570E+01	8.03E+01	1.08E+01 G
SB-125	I	-4.3456E-01					1.01E+03	
			427.88	-4.346E-01	?(	3.653E+00	3.29E+02	2.96E+01 G
			600.50	-3.593E+00	+ P	1.904E+01	8.12E+01	1.79E+01 G
			635.89	-1.441E+00	+	1.185E+01	2.33E+02	1.13E+01 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		463.37	-5.832E+00	+	1.761E+01	9.02E+01	1.05E+01 G
I-131	I -4.5727E-01					8.02E+00	
		364.48	-7.241E-01	?(P	1.611E+00	8.63E+01	8.17E+01 G
		284.30	3.093E+00	(P	1.431E+01	1.83E+02	6.14E+00 G
		636.97	-1.032E+01	+	2.419E+01	7.06E+01	7.17E+00 G
Ga-68	C -2.4734E+01					4.71E-02	
		1077.40	-2.473E+01	?(	6.983E+01	1.24E+02	3.30E+00 G
Tc-99m	I 2.4828E-07					2.51E-01	
		140.51	2.483E-07	%(	2.371E+00	2.84E+08	8.93E+01 G
BA-133	F -8.2144E-01					3.85E+03	
		356.00	-8.214E-01	?(	3.920E+00	1.42E+02	6.20E+01 G
		302.85	-5.117E-01	+	1.371E+01	7.93E+02	1.83E+01 G
		383.84	4.563E+00	? P	1.600E+01	1.04E+02	8.94E+00 GA
		80.99	-1.397E+00	+	6.597E+00	1.42E+02	3.41E+01 GA
CS-134	I 7.6124E-01					7.54E+02	
		795.87	4.375E-01	?(	2.215E+00	1.47E+02	8.55E+01 G
		604.71	4.312E-01	?(	2.884E+00	1.97E+02	9.76E+01 G
		569.32	7.916E-01	(	7.450E+00	2.65E+02	1.54E+01 G
		801.95	6.684E+00	?(	2.101E+01	9.29E+01	8.69E+00 G
		563.24	1.715E+00	(P	1.369E+01	3.21E+02	8.35E+00 G
CS-137	I -1.1598E+00					1.10E+04	
		661.66	-1.160E+00	(P	2.405E+00	5.69E+01	8.52E+01 G
CE-139	F 3.5126E-02					1.38E+02	
		165.85	3.513E-02	%(	1.377E+00	1.15E+03	7.99E+01 G
Ba-140	I 9.7750E-01					1.28E+01	
		537.26	9.521E-01	?(	4.200E+00	1.78E+02	2.44E+01 G
		162.66	1.077E+00	&(	1.887E+01	5.15E+02	6.22E+00 G
		304.85	0.000E+00	&	5.863E+01	1.00E+03	4.29E+00 G
La-140	I 9.6490E-01					1.28E+01	
		1596.21	6.124E-01	?(	7.522E-01	4.08E+01	9.54E+01 G
		487.02	1.032E-01	% P	4.027E+00	1.13E+03	4.55E+01 G
		328.76	1.878E+00	?(P	1.024E+01	1.62E+02	2.03E+01 G
		815.77	1.613E+00	?(	8.395E+00	1.51E+02	2.33E+01 G
CE-141	I 6.1368E-01					3.25E+01	
		145.44	6.137E-01	?(	2.421E+00	1.18E+02	4.82E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CE-144	I	-3.5490E+00					2.85E+02	
			133.54	-3.549E+00	&(	1.730E+01	1.46E+02	1.11E+01 G
PM-144	C	2.4999E-01					3.63E+02	
			696.54	6.459E-02	?(	1.421E+00	9.13E+02	9.90E+01 G
			618.06	4.352E-01	?(	3.108E+00	2.11E+02	9.91E+01 G
EU-152	F	6.2147E-02					4.94E+03	
			121.78	-1.170E+00	&(	3.563E+00	9.13E+01	2.86E+01 G
			344.29	-1.698E+00	+	8.912E+00	1.56E+02	2.65E+01 G
			1112.07	-7.041E+00	+	2.434E+01	1.02E+02	1.36E+01 G
			778.92	-2.306E+00	+	1.194E+01	2.18E+02	1.29E+01 G
			964.11	2.474E+00	?(	1.726E+01	2.02E+02	1.46E+01 G
			244.69	-1.422E+00	+	3.374E+01	7.06E+02	7.58E+00 G
			1408.00	1.939E+00	?	5.597E+00	1.22E+02	2.10E+01 GA
EU-154	I	9.7179E-01					3.14E+03	
			123.10	6.089E-01	?(	2.408E+00	1.18E+02	4.08E+01 G
			1274.54	0.000E+00	-	6.423E+00	1.00E+03	3.52E+01 G
			723.36	6.104E-01	&(	1.031E+01	4.84E+02	2.02E+01 G
			873.23	-6.409E+00	+	1.631E+01	7.62E+01	1.23E+01 G
			1004.77	1.208E-01	%	1.265E+01	2.93E+03	1.80E+01 G
			996.33	3.058E+00	?(	2.012E+01	1.89E+02	1.06E+01 G
HF-181	F	1.2576E-01					4.24E+01	
			482.00	1.258E-01	?(	2.209E+00	5.08E+02	8.05E+01 G
			133.02	-9.073E-01	+	4.351E+00	1.44E+02	4.33E+01 G
			345.83	-2.311E+00	+	1.569E+01	2.02E+02	1.51E+01 G
			136.30	-6.798E+00	+	3.360E+01	1.48E+02	5.85E+00 G
Ta-182	F	7.3932E-01					1.14E+02	
			1121.30	-1.416E+00	&(	9.430E+00	1.94E+02	3.49E+01 G
			1221.41	2.572E+00	&(	6.102E+00	1.06E+02	2.70E+01 G
			1189.05	2.327E+00	?(	1.211E+01	2.24E+02	1.62E+01 G
Hg-203	F	2.1461E-01					4.66E+01	
			279.20	2.146E-01	?(	1.401E+00	1.91E+02	8.15E+01 G
TL-208	N	6.2114E+00					6.98E+02	
			583.02	6.224E+00	(P	7.334E-01	9.59E+00	8.45E+01 G
			277.28	6.044E+00	?(P	1.515E+01	7.53E+01	6.31E+00 G
			860.56	8.064E-01	- P	1.364E+01	7.00E+02	1.24E+01 G
PM-146	C	3.4081E-01					2.02E+03	
			453.88	3.408E-01	?(P	1.734E+00	2.09E+02	6.50E+01 G
			747.16	-2.021E+00	+ P	4.674E+00	9.21E+01	3.40E+01 G
			735.72	-3.880E-01	+ P	6.178E+00	7.15E+02	2.25E+01 G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

Y-88     F  -9.2497E-01                                     1.07E+02
                        1836.06-9.250E-01 ?(  2.042E+00 1.01E+02 9.92E+01 G
                         898.04 4.041E-01 + P 1.300E+00 1.32E+02 9.37E+01 G

Cd-113m     -7.1638E+03                                     5.33E+03
                         263.70-7.164E+03 ?(  2.096E+04 8.75E+01 6.00E-03   K

Cf-251   T  -2.2039E-01                                     3.28E+05
                         176.60-2.204E-01 &(  5.452E+00 9.49E+02 1.70E+01 G
                         227.00 1.546E+00     1.581E+01 4.09E+02 6.30E+00 GA

Cf-249   T   1.0063E+00                                     1.28E+05
                         387.95 6.280E-01 ?(  2.173E+00 1.03E+02 6.60E+01 G
                         333.44 2.616E+00 ?(  1.390E+01 1.58E+02 1.55E+01 G

Sn-126       5.3150E+00                                     3.65E+07
                          87.57 3.050E+00 }   5.796E+00 2.31E+01 3.75E+01 GA
                          64.28 5.315E+00 ?(  1.451E+01 1.07E+02 9.70E+00 G
                          86.94 0.000E+00 }   2.438E+01 2.06E+03 9.04E+00 GA

PB-210   N  -1.9264E+00                                     8.14E+03
                          46.54-1.926E+00 &(P 5.322E+01 6.83E+02 4.25E+00 G

PB-212   N   1.6838E+01                                     6.98E+02
                         238.63 1.684E+01  (P 1.743E+00 6.03E+00 4.33E+01 G
                         300.03 1.034E+01 - P 2.089E+01 6.16E+01 3.28E+00 GA

PB-214   N   1.4251E+01                                     5.84E+05
                         351.93 1.432E+01  (P 2.159E+00 9.20E+00 3.76E+01 G
                         295.09 1.411E+01  (P 4.378E+00 1.28E+01 1.93E+01 G
                         242.00 1.805E+01 +   1.204E+01 2.27E+01 7.43E+00 GA

BI-207   C  -1.1157E+00                                     1.18E+04
                        1063.66-1.116E+00 ?(P 2.790E+00 6.24E+01 7.45E+01 G
                         569.70 2.775E-01 + P 1.067E+00 1.12E+02 9.77E+01 G

BI-212   N  -4.3892E+00                                     6.98E+02
                         727.17-4.389E+00  (  2.951E+01 1.96E+02 7.55E+00 G
                         785.42 5.334E+01 ? P 1.138E+02 9.17E+01 1.28E+00 GA

U-235    N  -4.5541E+00                                     2.57E+11
                         143.79-4.554E+00  (P 1.758E+01 6.03E+01 1.10E+01 G
                         205.33 4.646E-02 & P 1.756E+01 1.43E+04 5.01E+00 G
                         163.38-3.765E-01 % P 2.343E+01 1.72E+03 5.08E+00 G
                         185.72 1.949E+00 + P 1.859E+00 3.82E+01 5.40E+01 GA
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Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
BI-214	N	1.0209E+01					5.84E+05	
			609.31	1.021E+01	(P	1.839E+00	1.07E+01	4.61E+01 G
			1120.29	6.100E+00	- P	1.908E+01	9.29E+01	1.51E+01 G
			1764.49	2.002E+01	+	5.088E+00	1.86E+01	1.54E+01 G
BI-210M	T	3.2419E-01					1.10E+09	
			265.83	3.242E-01	?(P	2.477E+00	2.24E+02	5.00E+01 G
			304.90	0.000E+00	&	8.984E+00	1.00E+03	2.80E+01 G
AC-228	N	1.3006E+01					2.10E+03	
			911.07	1.181E+01	?(	4.174E+00	1.92E+01	2.90E+01 G
			968.97	1.982E+01	+	6.144E+00	1.90E+01	1.75E+01 G
			338.32	1.590E+01	(	7.406E+00	2.25E+01	1.20E+01 G
			93.35	4.433E+00	-	3.887E+01	2.63E+02	5.56E+00 XA
TH-227	N	2.6472E+00					7.95E+03	
			256.24	2.140E+00	(	1.389E+01	2.59E+02	7.00E+00 G
			235.97	2.936E+00	?(	1.966E+01	2.00E+02	1.23E+01 G
			50.14	-8.017E+00	&	2.684E+01	1.00E+02	8.00E+00 G
TH-229	N	8.2851E+00					2.68E+06	
			193.51	5.479E+00	?(	2.019E+01	1.43E+02	4.40E+00 G
			210.85	1.241E+01	?(	3.090E+01	1.01E+02	2.99E+00 G
TH-234	N	1.2579E+01					1.63E+12	
			92.59	1.258E+01	(P	1.626E+01	4.04E+01	5.58E+00 G
			63.29	8.624E-01	% P	4.820E+01	1.65E+03	3.81E+00 G
PA-231	N	-1.5886E+01					1.20E+07	
			302.65	-1.589E+01	*(	8.890E+01	1.67E+02	2.88E+00 G
			300.07	-1.844E+01	+	1.089E+02	1.76E+02	2.46E+00 G
PA-234	N	-2.3572E-01					1.63E+12	
			131.29	-2.169E+00	&(	1.024E+01	1.42E+02	1.80E+01 G
			946.02	-6.943E+00	+	1.490E+01	9.62E+01	1.34E+01 G
			569.47	0.000E+00	+	1.459E+01	1.00E+03	8.20E+00 G
			883.24	3.390E+00	?(	1.532E+01	1.29E+02	9.60E+00 G
			880.53	1.213E+01	?	1.744E+01	4.66E+01	6.00E+00 GA
PA-234M	N	2.1857E+00					1.63E+12	
			1001.00	-2.572E+01	?(P	2.781E+02	2.68E+02	8.37E-01 G
			766.41	8.164E+01	&(P	4.622E+02	1.61E+02	2.94E-01 G
AM-241	T	9.4275E-01					1.58E+05	
			59.54	9.428E-01	?(P	5.756E+00	1.82E+02	3.59E+01 G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

Ir-192   F   3.2473E-01                                      7.40E+01
                          316.49 0.000E+00 ?(  2.977E+00 1.00E+03 8.70E+01 G
                          468.06 8.709E-01 ?(  2.928E+00 9.96E+01 5.18E+01 G
                          308.44 0.000E+00 -   7.996E+00 1.00E+03 3.18E+01 G

Cs-136   F   4.9061E-01                                      1.30E+01
                          818.50 5.152E-01 &(  1.905E+00 1.08E+02 1.00E+02 G
                         1048.07 3.102E-01 &(  2.214E+00 2.01E+02 8.00E+01 G
                          340.57 7.458E-01 ?(  4.794E+00 1.91E+02 4.69E+01 G

Np-239   T  -1.6939E+00                                      2.36E+00
                          103.70 0.000E+00 +   8.873E+00 1.00E+03 2.40E+01 X
                          106.13-1.694E+00  (  9.550E+00 1.69E+02 2.27E+01 G
                           99.50 0.000E+00 &   1.429E+01 1.00E+03 1.50E+01 X

Nd-147       8.2827E-01                                      1.11E+01
                          531.00-2.949E-01 %(  9.380E+00 1.28E+03 1.30E+01 G
                           91.10 1.344E+00 ?(  7.650E+00 1.71E+02 2.83E+01 G

TL-210   N   1.2690E-01                                      5.84E+05
                          799.60 1.269E-01 ?(  1.897E+00 4.24E+02 9.90E+01 G
                          296.00-5.668E-01 +   3.411E+00 1.80E+02 7.90E+01 G
                         1313.00 2.086E+00 ?   7.013E+00 1.46E+02 2.10E+01 GA

Kr-85    I   2.8932E+00                                      3.92E+03
                          513.98 2.893E+00 %(  4.678E+02 4.66E+03 4.30E-01 G
   ( - 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
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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
X - X-Ray
P - Positron Decay
S - Single-Escape
D - Double-Escape
K - Key Line
A - Not in Average
C - Coincidence Peak

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********** 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 1 Sigma %	Activity	
PB-210	46.54	287.	-3.	-0.002	683.07	-1.926E+00	P
TH-227	50.14	332.	-26.	-0.015	100.38	-8.017E+00	
AM-241	59.54	503.	18.	0.010	182.28	9.428E-01	P
BA-133	80.99	1061.	-33.	-0.018	141.92	-1.397E+00	
EU-155	86.54	1187.	-28.	-0.015	177.39	-1.262E+00	
Nd-147	91.10	1107.	28.	0.015	170.81	1.344E+00	
Np-239	106.13	1188.	-29.	-0.016	169.28	-1.694E+00	
EU-152	121.78	248.	-25.	-0.014	91.33	-1.170E+00	
CO-57	122.06	272.	-15.	-0.008	162.77	-2.275E-01	
EU-154	123.10	228.	18.	0.010	117.87	6.089E-01	
PA-234	131.29	802.	-29.	-0.016	141.60	-2.169E+00	
HF-181	133.02	831.	-29.	-0.016	143.88	-9.073E-01	
CE-144	133.54	859.	-29.	-0.016	146.24	-3.549E+00	
HF-181	136.30	888.	-29.	-0.016	148.32	-6.798E+00	
CO-57	136.47	917.	-25.	-0.014	172.50	-3.251E+00	
U-235	143.79	809.	-35.	-0.019	60.34	-4.554E+00	P
CE-141	145.44	285.	21.	0.011	117.81	6.137E-01	
Ba-140	162.66	247.	4.	0.002	514.81	1.077E+00	
Cf-251	176.60	139.	-2.	-0.001	948.68	-2.204E-01	
U-235	185.72	152.	63.	0.035	38.24	1.949E+00	P
TH-229	193.51	110.	14.	0.008	142.68	5.479E+00	
TH-229	210.85	104.	20.	0.011	101.42	1.241E+01	
Cf-251	227.00	108.	5.	0.003	409.39	1.546E+00	
TH-227	235.97	639.	18.	0.010	200.03	2.936E+00	
EU-152	244.69	676.	-5.	-0.003	705.60	-1.422E+00	
TH-227	256.24	84.	7.	0.004	259.12	2.140E+00	
Cd-113m	263.70	138.	-20.	-0.011	87.55	-7.164E+03	
BI-210M	265.83	132.	7.	0.004	223.83	3.242E-01	P
Hg-203	279.20	102.	8.	0.004	190.79	2.146E-01	
I-131	284.30	57.	8.	0.005	183.24	3.093E+00	P
TL-210	296.00	554.	-19.	-0.010	179.71	-5.668E-01	
PA-231	300.07	536.	-19.	-0.010	176.28	-1.844E+01	
PA-233	300.18	500.	-19.	-0.010	170.43	-7.322E+00	
PA-231	302.65	482.	-19.	-0.010	167.04	-1.589E+01	
BA-133	302.85	463.	-4.	-0.002	793.23	-5.117E-01	
CR-51	320.08	476.	-19.	-0.011	160.41	-4.983E+00	
Cf-249	333.44	289.	15.	0.009	157.97	2.616E+00	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
Cs-136	340.57	304.	13.	0.007	190.80	7.458E-01		
EU-152	344.29	330.	-17.	-0.009	156.29	-1.698E+00		
HF-181	345.83	329.	-13.	-0.007	201.61	-2.311E+00		
BA-133	356.00	332.	-18.	-0.010	142.29	-8.214E-01		
I-131	364.48	89.	-21.	-0.012	86.32	-7.241E-01		P
BA-133	383.84	97.	14.	0.008	104.06	4.563E+00		P
Cf-249	387.95	96.	14.	0.008	102.69	6.280E-01		
SN-113	391.69	112.	13.	0.007	116.10	6.205E-01		
SB-125	427.88	44.	-4.	-0.002	328.51	-4.346E-01		
AG-108M	433.94	61.	-6.	-0.003	237.04	-2.191E-01		P
PM-146	453.88	43.	7.	0.004	208.50	3.408E-01		P
SB-125	463.37	120.	-18.	-0.010	90.20	-5.832E+00		
Ir-192	468.06	78.	13.	0.007	99.64	8.709E-01		
BE-7	477.60	121.	-16.	-0.009	88.08	-5.205E+00		P
HF-181	482.00	104.	3.	0.002	507.67	1.258E-01		
RU-103	497.05	35.	4.	0.002	284.80	1.712E-01		P
RH-106	511.86	28.	92.	0.051	13.22	1.711E+01		
Ba-140	537.26	26.	6.	0.003	178.21	9.521E-01		
BI-207	569.70	24.	7.	0.004	111.88	2.775E-01		P
SB-125	600.50	277.	-15.	-0.008	81.24	-3.593E+00		P
SB-124	602.73	183.	9.	0.005	207.04	4.055E-01		P
RU-103	610.30	194.	10.	0.005	201.82	7.396E+00		
AG-108M	614.28	204.	10.	0.006	206.38	4.767E-01		
PM-144	618.06	214.	10.	0.006	210.84	4.352E-01		
RH-106	621.92	224.	10.	0.006	215.16	4.374E+00		
SB-125	635.89	35.	-4.	-0.002	233.02	-1.441E+00		
I-131	636.97	60.	-17.	-0.009	70.60	-1.032E+01		
AG-110M	657.76	22.	5.	0.003	183.34	2.577E-01		
CS-137	661.66	81.	-22.	-0.012	56.93	-1.160E+00		P
PM-144	696.54	33.	1.	0.001	913.44	6.459E-02		
NB-94	702.63	33.	5.	0.003	249.54	2.444E-01		P
SB-124	722.79	46.	13.	0.007	80.26	5.834E+00		
AG-108M	722.94	59.	13.	0.007	89.49	6.945E-01		
EU-154	723.36	72.	2.	0.001	483.69	6.104E-01		
BI-212	727.17	82.	-7.	-0.004	195.58	-4.389E+00		
PM-146	735.72	29.	-2.	-0.001	714.76	-3.880E-01		P
PM-146	747.16	38.	-14.	-0.008	92.13	-2.021E+00		P
ZR-95	756.73	28.	-4.	-0.002	285.04	-3.775E-01		
AG-110M	763.94	14.	11.	0.006	57.60	2.515E+00		
NB-95	765.79	25.	7.	0.004	100.79	3.901E-01		
PA-234M	766.41	25.	5.	0.003	161.06	8.164E+01		P
EU-152	778.92	33.	-6.	-0.003	218.04	-2.306E+00		
BI-212	785.42	28.	13.	0.007	91.69	5.334E+01		P
TL-210	799.60	48.	2.	0.001	423.54	1.269E-01		
CO-58	810.78	39.	11.	0.006	87.54	5.915E-01		
Cs-136	818.50	47.	9.	0.005	108.50	5.152E-01		
MN-54	834.85	42.	-7.	-0.004	200.00	-3.907E-01		
NB-94	871.10	18.	10.	0.005	71.21	5.550E-01		

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
EU-154	873.23	47.	-14.	-0.008	76.15	-6.409E+00		
PA-234	880.53	11.	12.	0.007	46.62	1.213E+01		
PA-234	883.24	23.	6.	0.003	129.49	3.390E+00		
AG-110M	884.68	29.	6.	0.003	142.62	4.486E-01		
Sc-46	889.28	34.	6.	0.003	154.11	3.281E-01		
Y-88	898.04	15.	6.	0.004	131.78	4.041E-01		P
AG-110M	937.49	20.	-2.	-0.001	496.66	-3.583E-01		
PA-234	946.02	40.	-15.	-0.008	96.23	-6.943E+00		
EU-152	964.11	64.	6.	0.003	201.77	2.474E+00		
EU-154	996.33	42.	5.	0.003	188.68	3.058E+00		
PA-234M	1001.00	50.	-3.	-0.002	267.72	-2.572E+01		P
Cs-136	1048.07	25.	4.	0.002	201.03	3.102E-01		
BI-207	1063.66	35.	-12.	-0.007	62.38	-1.116E+00		P
Ga-68	1077.40	30.	-10.	-0.006	124.50	-2.473E+01		
EU-152	1112.07	89.	-13.	-0.007	102.49	-7.041E+00		
ZN-65	1115.55	75.	-1.	-0.001	509.17	-2.104E-01		P
Sc-46	1120.55	66.	9.	0.005	130.96	6.497E-01		
CO-60	1173.24	47.	-19.	-0.011	63.40	-1.429E+00		P
NA-22	1274.53	27.	3.	0.002	225.83	2.670E-01		
TL-210	1313.00	11.	5.	0.003	145.77	2.086E+00		
CO-60	1332.50	9.	2.	0.001	260.23	1.982E-01		P
AG-110M	1384.30	16.	-7.	-0.004	135.27	-2.478E+00		
EU-152	1408.00	5.	5.	0.003	121.64	1.939E+00		
Y-88	1836.06	11.	-8.	-0.005	100.88	-9.250E-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	Time Corrected Activity Bq/Sample	Uncertainty Counting	1 Sigma MDA Bq/Sample
BE-7	#A	-5.2052E+00	-5.2052E+00	8.808E+01%	1.81E+01
NA-22	#A	2.6702E-01	2.6702E-01	2.258E+02%	2.14E+00
K-40		3.3593E+02	3.3593E+02	5.056E+00%	9.37E+00
Sc-46	#A	4.8891E-01	4.8891E-01	1.011E+02%	1.76E+00
CR-51	#A	-4.9825E+00	-4.9826E+00	1.604E+02%	2.68E+01
MN-54	#A	-3.9074E-01	-3.9074E-01	2.000E+02%	1.84E+00
FE-59	#	2.7449E+00	2.7449E+00	3.088E+01%	1.64E+00
Co-56	#C	1.7229E+00	1.7229E+00	2.212E+01%	1.55E+00
CO-57	#A	-2.2750E-01	-2.2750E-01	1.628E+02%	1.25E+00
CO-58	#A	5.9154E-01	5.9155E-01	8.754E+01%	1.75E+00
CO-60	#A	1.9815E-01	1.9815E-01	2.602E+02%	1.41E+00
ZN-65	#A	-2.1039E-01	-2.1039E-01	5.092E+02%	6.09E+00
NB-94	#A	4.0130E-01	4.0130E-01	7.121E+01%	1.46E+00
ZR-95	#A	-3.7746E-01	-3.7746E-01	2.850E+02%	2.58E+00
NB-95	#A	3.9007E-01	3.9007E-01	1.008E+02%	1.35E+00
RU-103	#A	1.7122E-01	1.7122E-01	2.848E+02%	1.21E+00

RH-106 #A	4.3738E+00	4.3738E+00	2.152E+02%	3.19E+01
AG-108M#A	3.1751E-01	3.1751E-01	8.949E+01%	1.41E+00
AG-110M#A	5.9610E-01	5.9610E-01	5.760E+01%	2.23E+00
SN-113 #A	6.2047E-01	6.2047E-01	1.161E+02%	2.43E+00
SB-124 #A	9.4355E-01	9.4356E-01	8.026E+01%	2.85E+00
SB-125 #A	-4.3456E-01	-4.3456E-01	3.285E+02%	3.65E+00
I-131 #A	-4.5725E-01	-4.5727E-01	8.632E+01%	1.61E+00
Gd-153 #A	0.0000E+00	0.0000E+00	7.071E+02%	7.17E+00
Ga-68 #A	-2.4470E+01	-2.4734E+01	1.245E+02%	6.98E+01
Tc-99m #A	2.4778E-07	2.4828E-07	2.844E+08%	2.37E+00
BA-133 #A	-8.2143E-01	-8.2144E-01	1.423E+02%	3.92E+00
CS-134 A	7.6124E-01	7.6124E-01	9.291E+01%	2.21E+00
CS-137 #A	-1.1598E+00	-1.1598E+00	5.693E+01%	2.41E+00
CE-139 #A	3.5126E-02	3.5126E-02	1.147E+03%	1.38E+00
Ba-140 #A	9.7746E-01	9.7750E-01	1.782E+02%	4.20E+00
La-140 #	9.6486E-01	9.6490E-01	4.082E+01%	7.52E-01
CE-141 #A	6.1367E-01	6.1368E-01	1.178E+02%	2.42E+00
CE-144 #A	-3.5490E+00	-3.5490E+00	1.462E+02%	1.73E+01
PM-144 #A	2.4999E-01	2.4999E-01	2.108E+02%	1.42E+00
EU-152 #A	6.2147E-02	6.2147E-02	9.133E+01%	3.56E+00
EU-154 #A	9.7179E-01	9.7179E-01	1.179E+02%	2.41E+00
EU-155 #A	0.0000E+00	0.0000E+00	1.000E+03%	1.00E+01
HF-181 #A	1.2576E-01	1.2576E-01	5.077E+02%	2.21E+00
Ta-182 #A	7.3932E-01	7.3932E-01	1.050E+02%	9.43E+00
Hg-203 #A	2.1461E-01	2.1461E-01	1.908E+02%	1.40E+00
TL-208	6.2114E+00	6.2114E+00	9.585E+00%	7.33E-01
PM-146 #A	3.4081E-01	3.4081E-01	2.085E+02%	1.73E+00
Y-88 #A	-9.2497E-01	-9.2497E-01	1.009E+02%	2.04E+00
Cd-113m#A	-7.1638E+03	-7.1638E+03	8.755E+01%	2.10E+04
Cd-109 #A	0.0000E+00	0.0000E+00	1.000E+03%	5.85E+01
Cf-251 #A	-2.2039E-01	-2.2039E-01	9.487E+02%	5.45E+00
Cf-249 #A	1.0063E+00	1.0063E+00	9.421E+01%	2.17E+00
Sn-126 #A	5.3150E+00	5.3150E+00	1.075E+02%	1.45E+01
PB-210 #A	-1.9264E+00	-1.9264E+00	6.831E+02%	5.32E+01
PB-212	1.6838E+01	1.6838E+01	6.029E+00%	1.74E+00
PB-214	1.4251E+01	1.4251E+01	7.883E+00%	2.16E+00
BI-207 #A	-1.1157E+00	-1.1157E+00	6.238E+01%	2.79E+00
BI-212 #A	-4.3892E+00	-4.3892E+00	1.956E+02%	2.95E+01
U-235 #A	-4.5541E+00	-4.5541E+00	6.034E+01%	1.76E+01
BI-214	1.0209E+01	1.0209E+01	1.070E+01%	1.84E+00
BI-210M#A	3.2419E-01	3.2419E-01	2.238E+02%	2.48E+00
AC-228	1.3006E+01	1.3006E+01	1.479E+01%	4.17E+00
TH-227 #A	2.6472E+00	2.6472E+00	1.637E+02%	1.39E+01
TH-229 #A	8.2851E+00	8.2851E+00	8.752E+01%	2.02E+01
TH-234 #A	1.2579E+01	1.2579E+01	4.035E+01%	1.63E+01
PA-231 #A	-1.5886E+01	-1.5886E+01	1.670E+02%	8.89E+01
PA-233 #A	0.0000E+00	0.0000E+00	1.000E+03%	7.12E+00
PA-234 #A	-2.3572E-01	-2.3572E-01	9.594E+01%	1.02E+01
PA-234M#A	2.1857E+00	2.1857E+00	1.562E+02%	2.78E+02

AM-241 #A	9.4275E-01	9.4275E-01	1.823E+02%		5.76E+00
Np-237 #A	0.0000E+00	0.0000E+00	1.000E+03%		1.86E+01
Ir-192 #A	3.2473E-01	3.2473E-01	9.964E+01%		2.98E+00
Cs-136 #A	4.9059E-01	4.9061E-01	9.921E+01%		1.91E+00
Np-239 #A	-1.6936E+00	-1.6939E+00	1.693E+02%		9.55E+00
Nd-147 #A	8.2824E-01	8.2827E-01	1.708E+02%		9.38E+00
TL-210 #A	1.2690E-01	1.2690E-01	4.235E+02%		1.90E+00
Kr-85 #A	2.8932E+00	2.8932E+00	4.664E+03%		4.68E+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 (37.5 to 2000.0 keV) 4.090E+02 Bq/Sample
Total Decayed Activity (37.5 to 2000.0 keV) 4.0902039E+02 Bq/Sample

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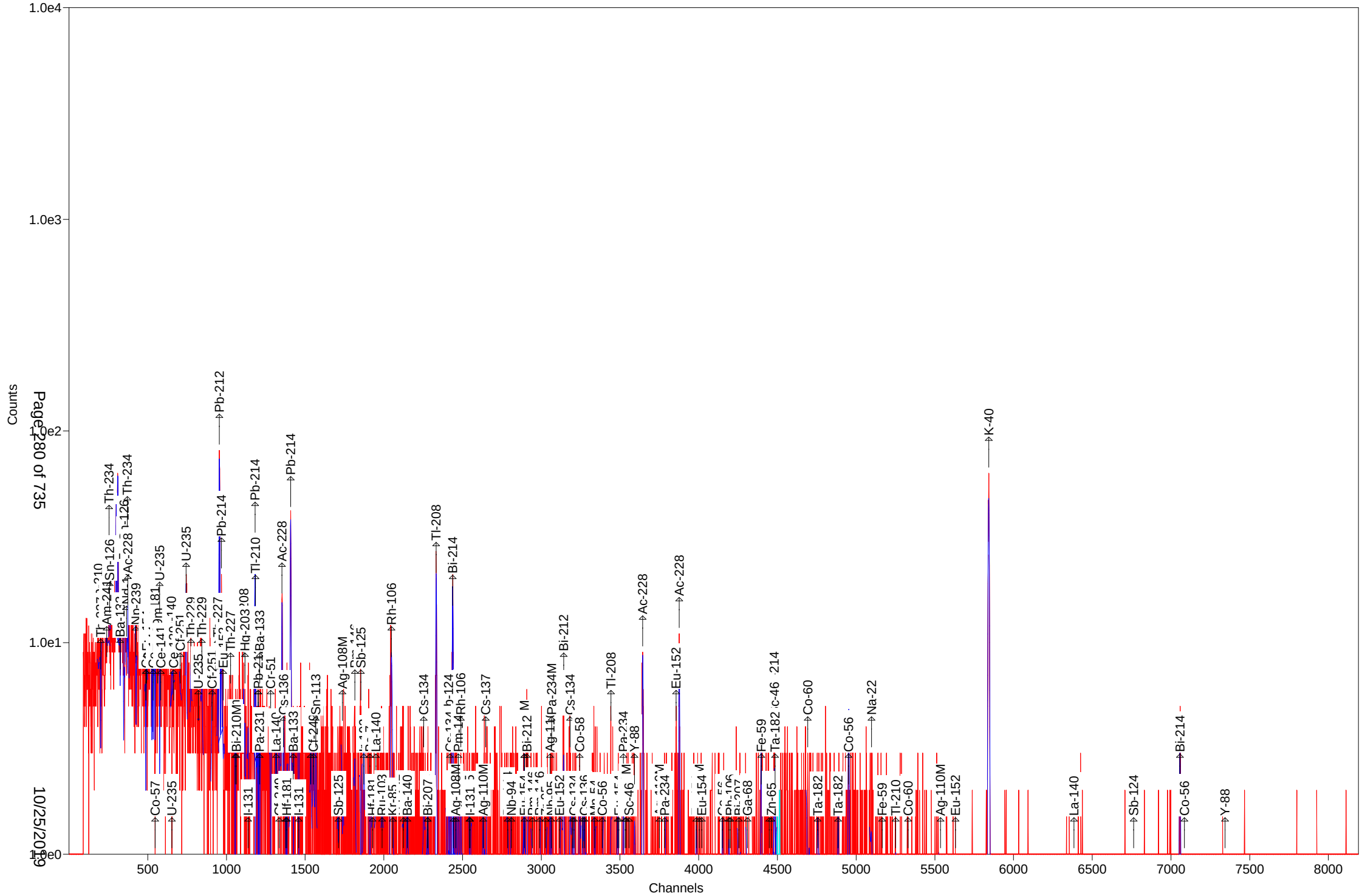
444057_Gamma_180-95857-A-1-B. 8_Gamma_20191609.spc.



Sample Description: 444057_Gamma_180-95857-A-2-B
Detector: Detector #12
Batch ID: 444057
Work Order Number: Gamma
Lot Number: 180-95857-A-2-B

Decay to Time: 10/15/2019 10:44 Live Time: 1800 sec
Acquisition Time: 10/15/2019 10:44:29 Real Time: 1801 sec
Analysis Time: 10/15/2019 11:14 Dead Time: 0.07 %
Analysis Quantity: 1.000E+00 Sample

Efficiency Cal File: 12_Soil_TunaCan.Clb
Efficiency Cal Desc: 12_TunaCan_108513
Efficiency Cal Date: 4/20/2018 11:53
Energy Cal Date: 4/20/2018 11:13
Library: Client_Long_Rev15.lib
Bkgd Correction File: 12_2019-10-06_1923.PBC

Nuclide	Activity Bq/Sample	1-Sigma Counting Uncert %	1-Sigma Counting Uncert Bq/Sample	1-Sigma Total Uncert Bq/Sample	Minimum Detectable Activity Bq/Sample
BE-7	-5.587E+00	105.0	5.867E+00	5.874E+00	1.970E+01
NA-22	1.873E-01	188.7	3.535E-01	3.537E-01	1.292E+00
K-40	1.596E+02	6.8	1.081E+01	1.348E+01	5.395E+00
Sc-46	4.275E-01	83.6	3.573E-01	3.579E-01	1.465E+00
CR-51	3.429E+00	205.6	7.050E+00	7.052E+00	2.371E+01
MN-54	5.313E-01	94.0	4.993E-01	5.001E-01	1.174E+00
FE-59	1.741E-01	176.2	3.068E-01	3.069E-01	2.373E+00
Co-56	6.985E-01	83.5	5.833E-01	5.844E-01	1.079E+00
CO-57	3.027E-01	103.7	3.139E-01	3.143E-01	1.054E+00
CO-58	-6.866E-01	77.8	5.345E-01	5.356E-01	1.788E+00
CO-60	-7.751E-01	109.1	8.453E-01	8.462E-01	1.809E+00
ZN-65	8.145E-01	111.2	9.059E-01	9.068E-01	3.133E+00
NB-94	5.562E-01	97.9	5.445E-01	5.453E-01	1.269E+00
ZR-95	-1.415E+00	89.0	1.259E+00	1.261E+00	2.894E+00
NB-95	6.372E-01	84.9	5.407E-01	5.417E-01	1.816E+00
RU-103	-1.547E-01	297.9	4.609E-01	4.610E-01	1.186E+00
RH-106	4.607E+00	203.6	9.379E+00	9.382E+00	3.170E+01
AG-108M	-3.507E-02	1360.1	4.770E-01	4.770E-01	1.227E+00
AG-110M	4.517E-01	35.4	1.597E-01	1.613E-01	2.581E+00
SN-113	-8.311E-01	117.3	9.749E-01	9.758E-01	3.272E+00
SB-124	6.311E-01	145.5	9.180E-01	9.186E-01	3.093E+00
SB-125	2.750E+00	22.1	6.076E-01	6.232E-01	3.566E+00
I-131	-6.024E-01	99.2	5.975E-01	5.983E-01	1.473E+00
Gd-153	-1.181E+00	144.0	1.700E+00	1.702E+00	5.682E+00
Ga-68	1.973E+01	88.8	1.752E+01	1.756E+01	3.924E+01
Tc-99m	-3.989E-01	160.4	6.398E-01	6.402E-01	2.138E+00
BA-133	4.346E-01	200.5	8.711E-01	8.714E-01	2.953E+00
CS-134	6.247E-01	83.7	5.231E-01	5.241E-01	2.007E+00
CS-137	-5.098E-02	1014.9	5.174E-01	5.174E-01	1.835E+00
CE-139	-3.842E-01	109.4	4.204E-01	4.208E-01	1.409E+00
Ba-140	1.530E+00	109.9	1.682E+00	1.684E+00	3.728E+00
La-140	2.880E-01	99.2	2.856E-01	2.860E-01	1.659E+00
CE-141	-7.288E-01	165.0	1.202E+00	1.203E+00	4.017E+00

CE-144	-1.772E+00	246.7	4.370E+00	4.371E+00	1.468E+01
PM-144	-3.796E-01	159.3	6.048E-01	6.052E-01	1.420E+00
EU-152	1.338E+00	96.6	1.292E+00	1.294E+00	3.070E+00
EU-154	1.426E+00	49.9	7.119E-01	7.157E-01	2.517E+00
EU-155	-8.227E-01	310.6	2.556E+00	2.556E+00	8.574E+00
HF-181	-2.510E-01	92.9	2.333E-01	2.337E-01	2.707E+00
Ta-182	-7.917E-01	120.5	9.537E-01	9.545E-01	7.114E+00
Hg-203	-4.069E-01	100.9	4.108E-01	4.113E-01	1.383E+00
TL-208	7.566E+00	9.3	7.030E-01	8.013E-01	8.058E-01
PM-146	1.010E+00	52.9	5.345E-01	5.370E-01	1.290E+00
Y-88	4.773E-01	44.7	2.135E-01	2.152E-01	7.036E-01
Cd-113m	4.671E+03	94.7	4.423E+03	4.431E+03	1.491E+04
Cd-109	6.849E+00	212.6	1.456E+01	1.456E+01	4.876E+01
Cf-251	9.895E-01	198.7	1.967E+00	1.967E+00	5.104E+00
Cf-249	-2.225E-01	76.4	1.699E-01	1.703E-01	3.269E+00
Sn-126	1.792E+00	319.8	5.732E+00	5.733E+00	1.930E+01
PB-210	1.833E+01	63.1	1.157E+01	1.163E+01	3.338E+01
PB-212	1.764E+01	5.9	1.034E+00	1.384E+00	1.741E+00
PB-214	1.102E+01	9.9	1.087E+00	1.223E+00	2.400E+00
BI-207	1.207E+00	44.3	5.346E-01	5.380E-01	1.108E+00
BI-212	6.234E+00	129.8	8.089E+00	8.096E+00	2.753E+01
U-235	-3.920E+00	86.1	3.376E+00	3.382E+00	1.738E+01
BI-214	1.160E+01	12.2	1.421E+00	1.539E+00	2.477E+00
BI-210M	5.408E-01	98.5	5.326E-01	5.333E-01	1.799E+00
AC-228	1.834E+01	8.9	1.624E+00	1.871E+00	1.391E+00
TH-227	-5.273E+00	99.9	5.268E+00	5.275E+00	1.356E+01
TH-229	4.489E+00	103.8	4.659E+00	4.664E+00	1.973E+01
TH-234	-8.267E+00	78.4	6.485E+00	6.501E+00	3.376E+01
PA-231	0.000E+00	1.#INF	3.924E+00	3.924E+00	8.264E+01
PA-233	1.301E+00	39.0	5.080E-01	5.123E-01	1.291E+00
PA-234	1.669E+00	121.8	2.033E+00	2.035E+00	6.732E+00
PA-234M	8.494E+01	61.3	5.208E+01	5.226E+01	1.987E+02
AM-241	1.318E+00	131.2	1.730E+00	1.732E+00	5.781E+00
Np-237	2.477E+00	169.4	4.196E+00	4.198E+00	1.403E+01
Ir-192	0.000E+00	1.#INF	2.497E-01	2.497E-01	2.829E+00
Cs-136	7.830E-01	33.6	2.630E-01	2.667E-01	1.698E+00
Np-239	1.500E+00	149.7	2.246E+00	2.248E+00	7.507E+00
Nd-147	-4.741E+00	95.0	4.506E+00	4.514E+00	1.071E+01
TL-210	3.433E-01	144.6	4.963E-01	4.967E-01	1.714E+00
Kr-85	9.387E+01	115.8	1.087E+02	1.088E+02	3.686E+02
Total	5.169E+03				

Analyst: Kellene Robbs

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Sample description
444057_Gamma_180-95857-A-2-B

Spectrum Filename: C:\User\SPC\Det12\12_Gamma_20192672.An1

Acquisition information
Start time: 10/15/2019 10:44:29 AM
Live time: 1800
Real time: 1801
Dead time: 0.07 %
Detector ID: 12

Detector system
Ge12 S/N10034336

Calibration
Filename: 12_Soil_TunaCan.Clb
12_TunaCan_108513

Energy Calibration
Created: 4/20/2018 11:13:27 AM
Zero offset: 0.059 keV
Gain: 0.250 keV/channel
Quadratic: -3.735E-08 keV/channel^2

Efficiency Calibration
Created: 4/20/2018 11:53:09 AM
Type: Polynomial
Uncertainty: 1.020 %
Coefficients: -0.363508 -4.707999 0.462125
-0.051256 0.002384 -0.000043

Library Files
Main analysis library: Client_Long_Rev15.lib
Library Match Width: 0.500
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G800W064
Start channel: 100 (25.08keV)
Stop channel: 8000 (1999.13keV)
Peak rejection level: 1000.000%
Peak search sensitivity: 3
Sample Size: 1.0000E+00 +/- 0.000E+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: 4.0000000E+00
Systematic error: 4.0000000E+00
Fraction Limit: 0.000%
Background width: 3
Half lives decay limit: 12.000

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

Corrections	Status	Comments
Decay correct to date:	YES	10/15/2019 10:44:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	12_2019-10-06_1923.PBC 10/6/2019 7:23:34 PM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 21 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 0.0932

***** 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
46.52	25.	63.11	0.96	1.805E-02	46.54	4.250	PBC<MDA	PB210
59.54	24.	131.23	0.86	2.817E-02	59.54	35.900	PBC<MDA	AM241
63.29	3.	870.93	0.87	2.978E-02	63.29	3.810	PBC<MDA	TH234
64.28	9.	319.82	0.87	3.015E-02	64.28	9.700	PBC<MDA	Sn126
74.75	146.	13.79	0.88	3.331E-02				
77.17	264.	8.44	0.88	3.387E-02				
86.45	21.	169.40	0.89	3.559E-02	86.49	13.100	PBC<MDA	Np237
					86.54	30.700	1.057E+00	EU155
86.90	10.	176.16	0.89	3.566E-02	86.54	30.700	PBC<MDA	EU155
					86.94	9.040	1.792E+00	Sn126
87.53	43.	41.54	0.89	3.575E-02	87.57	37.500	PBC<MDA	Sn126
88.02	17.	212.56	0.89	3.582E-02	88.04	3.790	PBC<MDA	Cd109
92.59	-30.	78.44	0.90	3.637E-02	92.59	5.584	PBC<MDA	TH234
93.19	119.	20.48	1.87	3.645E-02	92.59	5.584	PBC<MDA	TH234
					93.35	5.561	3.270E+01	AC228
106.13	23.	149.75	0.91	3.729E-02	106.13	22.700	PBC<MDA	Np239
121.78	9.	201.94	0.93	3.725E-02	121.78	28.580	PBC<MDA	EU152
					122.06	85.600	1.491E-01	CO57
122.06	17.	103.71	0.93	3.724E-02	121.78	28.580	PBC<MDA	EU152
					122.06	85.600	3.027E-01	CO57
131.29	8.	316.23	0.94	3.683E-02	131.29	18.000	PBC<MDA	PA234
162.66	17.	121.39	0.97	3.435E-02	162.66	6.220	PBC<MDA	Ba140
163.38	15.	119.66	0.97	3.428E-02	163.38	5.080	PBC<MDA	U235
176.60	10.	198.75	0.98	3.303E-02	176.60	17.000	PBC<MDA	Cf251
185.72	35.	67.44	0.99	3.215E-02	185.72	54.000	PBC<MDA	U235
210.85	20.	103.77	1.02	2.980E-02	210.85	2.990	PBC<MDA	TH229
235.97	17.	218.75	1.04	2.764E-02	235.97	12.300	PBC<MDA	TH227

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
238.58	378.	6.38	1.20	2.743E-02	238.63	43.300	1.768E+01	PB212
241.98	58.	22.33	1.05	2.716E-02	242.00	7.430	1.606E+01	PB214
263.70	13.	94.69	1.07	2.554E-02	263.70	0.006	PBC<MDA	Cd113m
265.83	12.	98.47	1.07	2.539E-02	265.83	50.000	PBC<MDA	BI210M
277.39	32.	30.66	1.74	2.462E-02	277.28	6.310	1.127E+01	TL208
295.12	108.	14.78	0.85	2.350E-02	295.09	19.300	1.322E+01	PB214
					296.00	79.000	3.237E+00	TL210
298.09	8.	370.47	1.11	2.321E-02	300.03	3.280	PBC<MDA	PB212
312.03	19.	39.03	1.64	2.253E-02	312.01	36.000	1.301E+00	PA233
320.08	14.	205.60	1.13	2.210E-02	320.08	9.940	PBC<MDA	CR51
328.76	16.	99.15	1.13	2.165E-02	328.76	20.300	PBC<MDA	La140
333.44	15.	104.70	1.14	2.142E-02	333.44	15.510	PBC<MDA	Cf249
338.01	108.	13.63	1.03	2.118E-02	338.32	12.010	2.369E+01	AC228
345.83	13.	150.40	1.15	2.083E-02	345.83	15.070	PBC<MDA	HF181
351.81	138.	13.06	0.82	2.056E-02	351.93	37.600	9.898E+00	PB214
356.00	10.	200.45	1.16	2.037E-02	356.00	62.050	PBC<MDA	BA133
453.88	20.	52.92	1.26	1.692E-02	453.88	65.000	PBC<MDA	PM146
463.37	50.	22.09	1.27	1.666E-02	463.37	10.470	1.603E+01	SB125
511.86	36.	26.04	2.56	1.546E-02	511.86	20.000	6.536E+00	RH106
513.98	11.	115.75	1.31	1.541E-02	513.98	0.430	PBC<MDA	Kr85
537.26	5.	183.34	1.34	1.491E-02	537.26	24.390	PBC<MDA	Ba140
563.24	6.	202.79	1.36	1.439E-02	563.24	8.350	PBC<MDA	CS134
569.47	8.	121.79	1.37	1.428E-02	569.47	8.200	PBC<MDA	PA234
					569.70	97.740	3.319E-01	BI207
583.14	157.	9.29	1.27	1.403E-02	583.02	84.500	7.372E+00	TL208
600.50	8.	237.65	1.40	1.373E-02	600.50	17.860	PBC<MDA	SB125
602.73	11.	203.71	1.40	1.369E-02	602.73	98.260	PBC<MDA	SB124
604.76	9.	249.97	1.40	1.366E-02	604.71	97.620	PBC<MDA	CS134
609.15	131.	12.25	0.99	1.359E-02	609.31	46.090	1.160E+01	BI214
					610.30	5.750	9.310E+01	RU103
621.92	11.	203.57	1.42	1.338E-02	621.92	9.930	PBC<MDA	RH106
635.89	1.	793.73	1.43	1.317E-02	635.89	11.310	PBC<MDA	SB125
657.76	2.	412.31	1.45	1.284E-02	657.76	94.640	PBC<MDA	AG110M
702.63	12.	97.89	1.49	1.224E-02	702.63	97.900	PBC<MDA	NB94
722.79	5.	207.67	1.51	1.199E-02	722.79	10.810	PBC<MDA	SB124
					722.94	90.840	2.720E-01	AG108M
					723.36	20.220	1.222E+00	EU154
727.17	10.	129.77	1.52	1.194E-02	727.17	7.550	PBC<MDA	BI212
765.79	13.	84.86	1.55	1.150E-02	765.79	99.790	PBC<MDA	NB95
					766.41	0.294	2.164E+02	PA234M
766.41	9.	76.40	1.55	1.150E-02	765.79	99.790	PBC<MDA	NB95
					766.41	0.294	1.537E+02	PA234M
778.92	6.	150.07	1.56	1.136E-02	778.92	12.940	PBC<MDA	EU152
785.42	3.	378.59	1.57	1.129E-02	785.42	1.280	PBC<MDA	BI212
795.87	12.	83.75	1.58	1.119E-02	795.87	85.530	PBC<MDA	CS134
799.60	7.	144.56	1.58	1.115E-02	799.60	98.960	PBC<MDA	TL210
818.50	8.	124.00	1.60	1.096E-02	818.50	100.000	PBC<MDA	Cs136
834.85	10.	93.99	1.61	1.081E-02	834.85	99.980	PBC<MDA	MN54

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
846.77	8.	112.15	1.63	1.070E-02	846.77	99.935	PBC<MDA	Co56
860.73	21.	21.82	1.50	1.057E-02	860.56	12.420	8.884E+00	TL208
873.23	11.	83.34	1.65	1.046E-02	873.23	12.270	PBC<MDA	EU154
889.28	8.	97.36	1.66	1.033E-02	889.28	99.984	PBC<MDA	Sc46
898.04	3.	332.78	1.67	1.025E-02	898.04	93.700	PBC<MDA	Y88
911.37	95.	10.26	0.73	1.015E-02	911.07	29.000	1.794E+01	AC228
937.49	6.	168.87	1.71	9.939E-03	937.49	34.360	PBC<MDA	AG110M
964.11	2.	924.96	1.73	9.739E-03	964.11	14.605	PBC<MDA	EU152
969.22	58.	14.43	1.23	9.703E-03	968.97	17.460	1.902E+01	AC228
996.33	9.	83.26	1.76	9.508E-03	996.33	10.600	PBC<MDA	EU154
1001.00	9.	95.92	1.76	9.476E-03	1001.00	0.837	PBC<MDA	PA234M
1004.77	6.	127.87	1.77	9.450E-03	1004.77	18.010	PBC<MDA	EU154
1037.84	6.	123.77	1.80	9.228E-03	1037.84	14.130	PBC<MDA	Co56
1048.07	17.	33.59	1.81	9.162E-03	1048.07	80.000	1.263E+00	Cs136
1063.66	15.	44.30	1.82	9.063E-03	1063.66	74.500	1.207E+00	BI207
1077.40	9.	88.84	1.83	8.978E-03	1077.40	3.300	PBC<MDA	Ga68
1112.07	6.	96.55	1.86	8.770E-03	1112.07	13.644	PBC<MDA	EU152
1115.55	6.	111.22	1.87	8.750E-03	1115.55	50.600	PBC<MDA	ZN65
1120.29	7.	124.04	1.87	8.722E-03	1120.29	15.100	PBC<MDA	BI214
					1120.55	99.987	4.145E-01	Sc46
1120.55	7.	135.86	1.87	8.721E-03	1120.29	15.100	2.744E+00	BI214
					1120.55	99.987	4.145E-01	Sc46
1189.58	3.	308.52	1.93	8.342E-03	1189.05	16.200	PBC<MDA	Ta182
1274.53	3.	188.75	2.00	7.914E-03	1274.53	99.940	PBC<MDA	NA22
					1274.54	35.190	5.320E-01	EU154
1291.60	3.	176.21	2.02	7.834E-03	1291.60	43.200	PBC<MDA	FE59
1384.30	8.	35.36	2.10	7.423E-03	1384.30	24.290	2.465E+00	AG110M
1408.00	1.	600.00	2.12	7.324E-03	1408.00	21.005	PBC<MDA	EU152
1460.89	218.	6.77	1.20	7.112E-03	1460.83	10.670	1.596E+02	K40
1764.20	8.	64.04	2.40	6.075E-03	1764.49	15.400	PBC<MDA	BI214
1836.06	5.	44.72	2.46	5.866E-03	1836.06	99.200	PBC<MDA	Y88

********** 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	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide	
298.57	74.77	130.	146.	4.393E+03	13.79	0.880	-	D
308.23	77.19	115.	264.	7.786E+03	8.44	0.883	-	D

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

This section based on library: Client_Long_Rev15.lib

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********** 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 1 Sigma %	FWHM keV
PB-210	185.71	46.52	87.	25.	0.014	63.11	0.958
TH-227	200.18	50.14	256.	-11.	-0.006	201.98	0.855s
AM-241	237.74	59.54	484.	24.	0.013	131.23	0.865
TH-234	252.74	63.29	400.	3.	0.002	870.93	0.868s
Sn-126	256.71	64.28	451.	9.	0.005	319.82	0.869
BA-133	323.50	80.99	955.	-25.	-0.014	177.10	0.887
Np-237	345.49	86.49	610.	21.	0.012	169.40	0.892A
EU-155	345.70	86.54	741.	-24.	-0.013	160.33	0.892s
Sn-126	347.29	86.94	669.	10.	0.006	176.16	0.892D
Sn-126	349.81	87.57	600.	43.	0.024	41.54	0.893D
Cd-109	351.68	88.04	624.	17.	0.009	212.56	0.894A
Nd-147	363.92	91.10	641.	0.	0.000	1000.00	0.897s
TH-234	369.87	92.59	671.	-30.	-0.017	78.44	0.898s
AC-228	372.27	93.19	125.	119.	0.066	20.48	1.874s
Gd-153	389.50	97.50	560.	-23.	-0.013	143.97	0.903s
Np-239	397.50	99.50	583.	-24.	-0.013	146.61	0.905
Gd-153	412.29	103.20	607.	-24.	-0.013	148.86	0.909s
Np-239	414.29	103.70	631.	-24.	-0.013	151.59	0.909s
EU-155	420.73	105.31	654.	-12.	-0.006	310.65	0.911s
Np-239	424.00	106.13	574.	23.	0.013	149.75	0.912s
EU-152	486.56	121.78	145.	9.	0.005	201.94	0.928s
CO-57	487.69	122.06	154.	17.	0.010	103.71	0.928s
EU-154	491.84	123.10	201.	-21.	-0.012	98.26	0.929s
PA-234	524.60	131.29	278.	8.	0.004	316.23	0.938
HF-181	531.51	133.02	526.	-20.	-0.011	164.87	0.939s
CE-144	533.57	133.54	506.	-13.	-0.007	246.67	0.940s
CO-57	545.30	136.47	596.	-22.	-0.012	155.15	0.943s
Tc-99m	561.44	140.51	643.	-23.	-0.013	160.41	0.947
U-235	574.53	143.79	671.	-28.	-0.015	86.13	0.950s
CE-141	581.15	145.44	688.	-23.	-0.013	164.98	0.952s
Ba-140	649.99	162.66	196.	17.	0.009	121.39	0.969s
U-235	652.87	163.38	161.	15.	0.009	119.66	0.970s
CE-139	662.76	165.85	202.	-19.	-0.010	109.42	0.973s
Cf-251	705.72	176.60	110.	10.	0.006	198.75	0.983s
U-235	742.18	185.72	152.	35.	0.019	67.44	0.992
TH-229	773.32	193.51	99.	-2.	-0.001	933.41	1.000s
U-235	820.59	205.33	117.	-4.	-0.002	470.11	1.012s
TH-229	842.65	210.85	114.	20.	0.011	103.77	1.018s
Cf-251	907.22	227.00	117.	-20.	-0.011	102.16	1.034s
TH-227	943.09	235.97	651.	17.	0.009	218.75	1.043s
PB-212	953.73	238.63	55.	377.	0.210	5.86	1.045D
PB-214	967.18	242.00	56.	58.	0.032	22.33	1.049D
TH-227	1024.13	256.24	81.	-17.	-0.010	99.91	1.063s
Cd-113m	1053.96	263.70	68.	13.	0.007	94.69	1.070s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-210M	1062.48	265.83	68.	12.	0.007	98.47	1.072s
TL-208	1108.69	277.39	20.	32.	0.018	30.66	1.738s
Hg-203	1115.93	279.20	102.	-15.	-0.008	100.94	1.086s
PB-214	1179.59	295.12	38.	108.	0.060	14.78	0.852
TL-210	1183.11	296.00	430.	-6.	-0.003	535.21	1.102s
PB-212	1199.22	300.03	417.	8.	0.004	370.47	1.106s
PA-231	1199.38	300.07	425.	0.	0.000	1000.00	1.106s
PA-233	1199.82	300.18	425.	0.	0.000	1000.00	1.107
PA-231	1209.70	302.65	425.	0.	0.000	1000.00	1.109s
BA-133	1210.50	302.85	425.	0.	0.000	1000.00	1.109s
Ba-140	1218.49	304.85	425.	0.	0.000	1000.00	1.111
BI-210M	1218.68	304.90	425.	0.	0.000	1000.00	1.111
Ir-192	1232.85	308.44	425.	0.	0.000	1000.00	1.115s
PA-233	1247.19	312.03	12.	19.	0.011	39.03	1.640s
Ir-192	1265.04	316.49	425.	0.	0.000	1000.00	1.123s
CR-51	1279.41	320.08	382.	14.	0.008	205.60	1.126s
La-140	1314.10	328.76	122.	16.	0.009	99.15	1.135s
Cf-249	1332.81	333.44	121.	15.	0.009	104.70	1.139s
AC-228	1351.08	338.01	24.	108.	0.060	13.63	1.028s
Cs-136	1361.32	340.57	215.	-8.	-0.004	267.02	1.146s
EU-152	1376.18	344.29	218.	-14.	-0.008	147.17	1.150s
HF-181	1382.35	345.83	193.	13.	0.007	150.40	1.151s
PB-214	1406.27	351.81	43.	138.	0.076	13.06	0.818s
BA-133	1423.02	356.00	192.	10.	0.005	200.45	1.162s
I-131	1456.95	364.48	76.	-18.	-0.010	99.20	1.170
BA-133	1534.35	383.84	215.	-20.	-0.011	106.96	1.189s
Cf-249	1550.79	387.95	234.	-20.	-0.011	111.20	1.193s
SN-113	1565.74	391.69	217.	-18.	-0.010	117.31	1.196s
SB-125	1710.45	427.88	44.	-5.	-0.003	263.57	1.232s
PM-146	1814.45	453.88	24.	20.	0.011	52.92	1.257s
SB-125	1852.39	463.37	37.	50.	0.028	22.09	1.266s
Ir-192	1871.16	468.06	93.	-6.	-0.004	219.35	1.271s
BE-7	1909.29	477.60	155.	-17.	-0.010	105.00	1.280s
HF-181	1926.90	482.00	170.	-17.	-0.010	109.26	1.284s
La-140	1946.98	487.02	190.	-17.	-0.010	114.74	1.289
RU-103	1987.11	497.05	36.	-4.	-0.002	297.91	1.298
RH-106	2046.35	511.86	27.	36.	0.020	26.04	2.563s
Kr-85	2054.81	513.98	78.	11.	0.006	115.75	1.315
Nd-147	2122.88	531.00	56.	-17.	-0.009	95.04	1.331s
Ba-140	2147.92	537.26	22.	5.	0.003	183.34	1.337s
CS-134	2251.82	563.24	30.	6.	0.003	202.79	1.362
CS-134	2276.15	569.32	43.	-11.	-0.006	87.35	1.367s
PA-234	2276.75	569.47	47.	8.	0.005	121.79	1.368s
TL-208	2331.42	583.14	10.	157.	0.087	9.29	1.273s
SB-125	2400.87	600.50	196.	8.	0.005	237.65	1.397s
SB-124	2409.79	602.73	240.	11.	0.006	203.71	1.399s
CS-134	2417.71	604.71	251.	9.	0.005	249.97	1.401s
BI-214	2435.47	609.15	29.	131.	0.073	12.25	0.990s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
RU-103	2440.06	610.30	260.	0.	0.000	1000.00	1.406s
AG-108M	2455.99	614.28	260.	0.	0.000	1000.00	1.410s
PM-144	2471.12	618.06	322.	-15.	-0.008	174.07	1.414s
RH-106	2486.54	621.92	246.	11.	0.006	203.57	1.417s
SB-125	2542.43	635.89	31.	1.	0.001	793.73	1.430s
I-131	2546.77	636.97	32.	-1.	-0.001	806.23	1.432s
AG-110M	2629.92	657.76	33.	2.	0.001	412.31	1.451s
PM-144	2785.05	696.54	37.	-8.	-0.005	159.35	1.487s
NB-94	2809.41	702.63	28.	12.	0.007	97.89	1.493s
SB-124	2890.04	722.79	59.	5.	0.003	207.67	1.512s
AG-108M	2890.65	722.94	64.	0.	0.000	1000.00	1.512s
EU-154	2892.34	723.36	64.	0.	0.000	1000.00	1.512s
ZR-95	2895.69	724.20	80.	-17.	-0.010	76.55	1.513s
BI-212	2907.58	727.17	81.	10.	0.006	129.77	1.516s
PM-146	2941.78	735.72	23.	-12.	-0.007	91.24	1.524s
PM-146	2987.55	747.16	51.	-18.	-0.010	89.12	1.535s
ZR-95	3025.83	756.73	42.	-16.	-0.009	88.96	1.543s
AG-110M	3054.69	763.94	42.	-15.	-0.008	66.33	1.550s
NB-95	3062.08	765.79	56.	13.	0.007	84.86	1.552s
PA-234M	3064.57	766.41	21.	9.	0.005	76.40	1.552s
EU-152	3114.61	778.92	19.	6.	0.004	150.07	1.564
BI-212	3140.62	785.42	28.	3.	0.002	378.59	1.570s
CS-134	3182.43	795.87	47.	12.	0.007	83.75	1.579s
TL-210	3197.35	799.60	45.	7.	0.004	144.56	1.583s
CS-134	3206.76	801.95	72.	-7.	-0.004	173.28	1.585s
CO-58	3242.06	810.78	49.	-14.	-0.008	77.85	1.593s
La-140	3262.05	815.77	63.	-10.	-0.006	111.62	1.598s
Cs-136	3272.97	818.50	44.	8.	0.004	124.00	1.600s
MN-54	3338.38	834.85	19.	10.	0.006	93.99	1.615s
Co-56	3386.08	846.77	15.	8.	0.004	112.15	1.626s
TL-208	3441.95	860.73	0.	21.	0.012	21.82	1.500
NB-94	3483.41	871.10	42.	-14.	-0.008	70.71	1.648s
EU-154	3491.95	873.23	40.	11.	0.006	83.34	1.650s
PA-234	3521.16	880.53	42.	-6.	-0.003	158.11	1.657s
PA-234	3532.00	883.24	48.	0.	0.000	1000.00	1.659s
AG-110M	3537.78	884.68	48.	0.	0.000	1000.00	1.660s
Sc-46	3556.17	889.28	28.	8.	0.005	97.36	1.664s
Y-88	3591.22	898.04	20.	3.	0.002	332.78	1.672
AC-228	3644.58	911.37	0.	95.	0.053	10.26	0.732s
AG-110M	3749.09	937.49	20.	6.	0.003	168.87	1.708s
PA-234	3783.21	946.02	35.	-16.	-0.009	86.15	1.716s
EU-152	3855.60	964.11	96.	2.	0.001	924.96	1.732s
AC-228	3876.03	969.22	3.	58.	0.032	14.43	1.232s
EU-154	3984.54	996.33	22.	9.	0.005	83.26	1.761s
PA-234M	4003.22	1001.00	30.	9.	0.005	95.92	1.765s
EU-154	4018.33	1004.77	28.	6.	0.003	127.87	1.768s
Co-56	4150.66	1037.84	11.	6.	0.004	123.77	1.798s
Cs-136	4191.60	1048.07	7.	17.	0.009	33.59	1.807s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
RH-106	4200.76	1050.36	37.	-11.	-0.006	84.73	1.809s
BI-207	4253.99	1063.66	5.	15.	0.008	44.30	1.820s
Ga-68	4308.98	1077.40	11.	9.	0.005	88.84	1.833
FE-59	4396.44	1099.25	16.	-1.	-0.001	914.69	1.852s
EU-152	4447.76	1112.07	16.	6.	0.004	96.55	1.863s
ZN-65	4461.66	1115.55	23.	6.	0.004	111.22	1.866s
BI-214	4480.63	1120.29	29.	7.	0.004	124.04	1.870s
Sc-46	4481.68	1120.55	36.	7.	0.004	135.86	1.870s
Ta-182	4484.69	1121.30	60.	-9.	-0.005	120.45	1.871s
CO-60	4692.57	1173.24	21.	-3.	-0.002	319.69	1.916s
Ta-182	4755.86	1189.05	16.	3.	0.002	308.52	1.930s
Ta-182	4885.39	1221.41	17.	0.	0.000	1000.00	1.957s
Co-56	4952.92	1238.28	34.	-6.	-0.003	231.54	1.972s
NA-22	5098.03	1274.53	11.	3.	0.001	188.75	2.003s
EU-154	5098.08	1274.54	14.	0.	0.000	1000.00	2.003s
FE-59	5166.35	1291.60	6.	3.	0.002	176.21	2.017s
TL-210	5252.04	1313.00	11.	-3.	-0.002	243.10	2.036s
CO-60	5330.11	1332.50	23.	-11.	-0.006	109.06	2.052
AG-110M	5537.48	1384.30	0.	8.	0.004	35.36	2.096s
EU-152	5632.39	1408.00	6.	1.	0.001	600.00	2.115
K-40	5844.17	1460.89	0.	218.	0.121	6.77	1.201s
La-140	6386.02	1596.21	12.	-1.	-0.001	842.61	2.269s
SB-124	6765.58	1690.98	0.	0.	0.000	1000.00	2.345s
BI-214	7060.00	1764.49	10.	8.	0.005	64.04	2.403
Co-56	7087.48	1771.35	8.	0.	0.000	1000.00	2.408s
Y-88	7346.69	1836.06	0.	5.	0.003	44.72	2.459s

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	-5.5875E+00				5.31E+01	
			477.60	-5.587E+00	?(	1.970E+01 1.05E+02 1.05E+01	G
NA-22	C	1.8731E-01				9.50E+02	
			1274.53	1.873E-01	?(	1.292E+00 1.89E+02 9.99E+01	G
K-40	N	1.5959E+02				4.66E+11	
			1460.83	1.596E+02	(	5.395E+00 6.77E+00 1.07E+01	G
Sc-46	F	4.2752E-01				8.38E+01	
			889.28	4.405E-01	?(	1.465E+00 9.74E+01 1.00E+02	G
			1120.55	4.145E-01	&(	1.949E+00 1.36E+02 1.00E+02	G

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Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CR-51	F	3.4290E+00					2.77E+01	
			320.08	3.429E+00	?(	2.371E+01	2.06E+02	9.94E+00 G
MN-54	C	5.3126E-01					3.12E+02	
			834.85	5.313E-01	?(	1.174E+00	9.40E+01	1.00E+02 G
FE-59	F	1.7412E-01					4.45E+01	
			1099.25	-1.112E-01	?(	2.373E+00	9.15E+02	5.65E+01 G
			1291.60	5.472E-01	&(	2.266E+00	1.76E+02	4.32E+01 G
Co-56	C	6.9848E-01					7.73E+01	
			846.77	4.157E-01	?(	1.079E+00	1.12E+02	9.99E+01 G
			1238.28	-6.236E-01	&	3.106E+00	2.32E+02	6.61E+01 G
			1037.84	2.698E+00	?(	7.639E+00	1.24E+02	1.41E+01 G
			1771.35	0.000E+00	-	9.595E+00	1.00E+03	1.55E+01 A
CO-57	C	3.0270E-01					2.72E+02	
			122.06	3.027E-01	&(	1.054E+00	1.04E+02	8.56E+01 G
			136.47	-3.199E+00	&	1.659E+01	1.55E+02	1.07E+01 G
CO-58	C	-6.8659E-01					7.09E+01	
			810.78	-6.866E-01	?(	1.788E+00	7.78E+01	9.95E+01 G
CO-60	F	-7.7509E-01					1.93E+03	
			1332.50	-7.751E-01	?(	1.809E+00	1.09E+02	1.00E+02 G
			1173.24	-2.200E-01	+	1.599E+00	3.20E+02	9.99E+01 G
ZN-65	F	8.1449E-01					2.44E+02	
			1115.55	8.145E-01	?(	3.133E+00	1.11E+02	5.06E+01 G
NB-94	I	5.5623E-01					7.41E+06	
			702.63	5.562E-01	(	1.269E+00	9.79E+01	9.79E+01 G
			871.10	-7.429E-01	+	1.746E+00	7.07E+01	9.99E+01 G
ZR-95	I	-1.4154E+00					6.40E+01	
			756.73	-1.415E+00	&(	2.894E+00	8.90E+01	5.45E+01 G
			724.20	-1.833E+00	+	4.677E+00	7.66E+01	4.42E+01 G
NB-95	I	6.3723E-01					6.40E+01	
			765.79	6.372E-01	?(	1.816E+00	8.49E+01	9.98E+01 G
RU-103	I	-1.5472E-01					3.93E+01	
			497.05	-1.547E-01	&(	1.186E+00	2.98E+02	9.09E+01 G
			610.30	0.000E+00	+	5.544E+01	1.00E+03	5.75E+00 GA

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
RH-106	I	4.6072E+00					3.74E+02	
			621.92	4.607E+00	?(	3.170E+01	2.04E+02	9.93E+00 G
			1050.36	-4.242E+01	+	1.212E+02	8.47E+01	1.56E+00 G
			511.86	6.536E+00	?	4.812E+00	2.60E+01	2.00E+01 GA
AG-108M	C	-3.5068E-02					1.53E+05	
			433.94	-3.507E-02	%(	1.227E+00	1.36E+03	9.05E+01 G
			722.94	0.000E+00	+	2.039E+00	1.00E+03	9.08E+01 G
			614.28	0.000E+00	+	3.565E+00	1.00E+03	8.98E+01 G
AG-110M	F	4.5169E-01					2.50E+02	
			884.68	0.000E+00	?(	2.581E+00	1.00E+03	7.27E+01 G
			657.76	9.141E-02	?(	1.347E+00	4.12E+02	9.46E+01 G
			937.49	9.761E-01	&(	3.831E+00	1.69E+02	3.44E+01 G
			1384.30	2.465E+00	?(	2.271E+00	3.54E+01	2.43E+01 G
			763.94	-3.246E+00	+	7.121E+00	6.63E+01	2.23E+01 G
SN-113	F	-8.3107E-01					1.15E+02	
			391.69	-8.311E-01	?(	3.272E+00	1.17E+02	6.40E+01 G
SB-124	F	6.3114E-01					6.02E+01	
			602.73	4.492E-01	?(	3.093E+00	2.04E+02	9.83E+01 G
			1690.98	0.000E+00	-	1.359E+00	1.00E+03	4.78E+01 G
			722.79	2.285E+00	?(	1.645E+01	2.08E+02	1.08E+01 G
SB-125	I	2.7502E+00					1.01E+03	
			427.88	-5.303E-01	?(	3.566E+00	2.64E+02	2.96E+01 G
			600.50	1.906E+00	?(	1.538E+01	2.38E+02	1.79E+01 G
			635.89	3.731E-01	?(	1.069E+01	7.94E+02	1.13E+01 G
			463.37	1.603E+01	(	9.851E+00	2.21E+01	1.05E+01 G
I-131	I	-6.0235E-01					8.02E+00	
			364.48	-6.024E-01	?(	1.473E+00	9.92E+01	8.17E+01 G
			284.30	3.745E-01	%	1.259E+01	1.24E+03	6.14E+00 G
			636.97	-5.893E-01	+	1.713E+01	8.06E+02	7.17E+00 G
Gd-153	F	-1.1811E+00					2.42E+02	
			97.50	-1.181E+00	&(	5.682E+00	1.44E+02	3.00E+01 G
			103.20	-1.620E+00	+	8.056E+00	1.49E+02	2.18E+01 G
Ga-68	C	1.9727E+01					4.71E-02	
			1077.40	1.973E+01	?(	3.924E+01	8.88E+01	3.30E+00 G
Tc-99m	I	-3.9887E-01					2.51E-01	
			140.51	-3.989E-01	&(	2.138E+00	1.60E+02	8.93E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
BA-133	F	4.3458E-01					3.85E+03	
			356.00	4.346E-01	&(	2.953E+00	2.00E+02	6.20E+01 G
			302.85	0.000E+00	-	1.299E+01	1.00E+03	1.83E+01 G
			383.84	-6.403E+00	+	2.294E+01	1.07E+02	8.94E+00 GA
			80.99	-1.169E+00	+	6.904E+00	1.77E+02	3.41E+01 GA
CS-134	I	6.2468E-01					7.54E+02	
			795.87	7.129E-01	&(	2.007E+00	8.37E+01	8.55E+01 G
			604.71	3.767E-01	?(	3.189E+00	2.50E+02	9.76E+01 G
			569.32	-2.867E+00	&	8.445E+00	8.73E+01	1.54E+01 G
			801.95	-4.079E+00	+	2.429E+01	1.73E+02	8.69E+00 G
			563.24	2.619E+00	(	1.312E+01	2.03E+02	8.35E+00 G
CS-137	I	-5.0979E-02					1.10E+04	
			661.66	-5.098E-02	%(	1.835E+00	1.01E+03	8.52E+01 G
CE-139	F	-3.8418E-01					1.38E+02	
			165.85	-3.842E-01	&(	1.409E+00	1.09E+02	7.99E+01 G
Ba-140	I	1.5299E+00					1.28E+01	
			537.26	8.149E-01	?(	3.728E+00	1.83E+02	2.44E+01 G
			162.66	4.334E+00	?(	1.768E+01	1.21E+02	6.22E+00 G
			304.85	0.000E+00	&	5.579E+01	1.00E+03	4.29E+00 G
La-140	I	2.8803E-01					1.28E+01	
			1596.21	-8.802E-02	?(	1.659E+00	8.43E+02	9.54E+01 G
			487.02	-1.320E+00	&	5.088E+00	1.15E+02	4.55E+01 G
			328.76	2.055E+00	?(	6.844E+00	9.92E+01	2.03E+01 G
			815.77	-2.265E+00	+	8.593E+00	1.12E+02	2.33E+01 G
CE-141	I	-7.2885E-01					3.25E+01	
			145.44	-7.288E-01	(	4.017E+00	1.65E+02	4.82E+01 G
CE-144	I	-1.7716E+00					2.85E+02	
			133.54	-1.772E+00	(	1.468E+01	2.47E+02	1.11E+01 G
PM-144	C	-3.7957E-01					3.63E+02	
			696.54	-3.796E-01	&(	1.420E+00	1.59E+02	9.90E+01 G
			618.06	-6.149E-01	+	3.600E+00	1.74E+02	9.91E+01 G
EU-152	F	1.3378E+00					4.94E+03	
			121.78	4.465E-01	&(	3.070E+00	2.02E+02	2.86E+01 G
			344.29	-1.445E+00	&	7.168E+00	1.47E+02	2.65E+01 G
			1112.07	3.009E+00	(	1.000E+01	9.66E+01	1.36E+01 G
			778.92	2.393E+00	?(	8.631E+00	1.50E+02	1.29E+01 G
			964.11	5.859E-01	?(	1.885E+01	9.25E+02	1.46E+01 G
			244.69	-1.120E-02	%	3.332E+01	8.83E+04	7.58E+00 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
			1408.00	3.611E-01	?	5.101E+00	6.00E+02	2.10E+01 GA
EU-154	I	1.4259E+00					3.14E+03	
			123.10	-7.660E-01	?(	2.517E+00	9.83E+01	4.08E+01 G
			1274.54	0.000E+00	+	4.019E+00	1.00E+03	3.52E+01 G
			723.36	0.000E+00	+	9.166E+00	1.00E+03	2.02E+01 G
			873.23	4.966E+00	?(	1.393E+01	8.33E+01	1.23E+01 G
			1004.77	2.007E+00	&(	8.911E+00	1.28E+02	1.80E+01 G
			996.33	4.774E+00	?(	1.345E+01	8.33E+01	1.06E+01 G
EU-155	I	-8.2267E-01					1.81E+03	
			105.31	-8.227E-01	*(	8.574E+00	3.11E+02	2.12E+01 G
			86.54	-1.231E+00	&	6.587E+00	1.60E+02	3.07E+01 G
HF-181	F	-2.5101E-01					4.24E+01	
			482.00	-7.378E-01	?(	2.707E+00	1.09E+02	8.05E+01 G
			133.02	-6.936E-01	&	3.827E+00	1.65E+02	4.33E+01 G
			345.83	2.349E+00	?(	1.193E+01	1.50E+02	1.51E+01 G
			136.30	2.015E-07	&	2.763E+01	4.06E+09	5.85E+00 G
Ta-182	F	-7.9173E-01					1.14E+02	
			1121.30	-1.732E+00	?(	7.114E+00	1.20E+02	3.49E+01 G
			1221.41	0.000E+00	+	5.518E+00	1.00E+03	2.70E+01 G
			1189.05	1.233E+00	?(	8.777E+00	3.09E+02	1.62E+01 G
Hg-203	F	-4.0695E-01					4.66E+01	
			279.20	-4.069E-01	?(	1.383E+00	1.01E+02	8.15E+01 G
TL-208	N	7.5656E+00					6.98E+02	
			583.02	7.372E+00	*(	8.058E-01	9.29E+00	8.45E+01 G
			277.28	1.127E+01	+	8.329E+00	3.07E+01	6.31E+00 G
			860.56	8.884E+00	(	3.118E+00	2.18E+01	1.24E+01 G
PM-146	C	1.0102E+00					2.02E+03	
			453.88	1.010E+00	?(	1.290E+00	5.29E+01	6.50E+01 G
			747.16	-2.469E+00	-	5.037E+00	8.91E+01	3.40E+01 G
			735.72	-2.471E+00	-	5.259E+00	9.12E+01	2.25E+01 G
Y-88	F	4.7734E-01					1.07E+02	
			1836.06	4.773E-01	?(	7.036E-01	4.47E+01	9.92E+01 G
			898.04	1.735E-01	-	1.362E+00	3.33E+02	9.37E+01 G
Cd-113m		4.6711E+03					5.33E+03	
			263.70	4.671E+03	*(	1.491E+04	9.47E+01	6.00E-03 K
Cd-109	F	6.8491E+00					4.53E+02	
							Derived Ave Activity	
			88.04	6.849E+00	}(	4.876E+01	2.13E+02	3.79E+00 G

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Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Cf-251	T	9.8953E-01					3.28E+05	
			176.60	9.895E-01	&(	5.104E+00	1.99E+02	1.70E+01 G
			227.00	-6.313E+00	+	1.652E+01	1.02E+02	6.30E+00 GA
Cf-249	T	-2.2248E-01					1.28E+05	
			387.95	-8.775E-01	?(	3.269E+00	1.11E+02	6.60E+01 G
			333.44	2.565E+00	&(	9.035E+00	1.05E+02	1.55E+01 G
Sn-126		1.7922E+00					3.65E+07	
			87.57	1.792E+00	}	4.843E+00	4.15E+01	3.75E+01 GA
			64.28	1.792E+00	(	1.930E+01	3.20E+02	9.70E+00 G
			86.94	1.792E+00	}	2.124E+01	1.76E+02	9.04E+00 GA
PB-210	N	1.8331E+01					8.14E+03	
			46.54	1.833E+01	(P	3.338E+01	6.31E+01	4.25E+00 G
PB-212	N	1.7642E+01					6.98E+02	
			238.63	1.764E+01	(P	1.741E+00	5.86E+00	4.33E+01 G
			300.03	5.717E+00	&	7.144E+01	3.70E+02	3.28E+00 GA
PB-214	N	1.1024E+01					5.84E+05	
			351.93	9.898E+00	(P	2.400E+00	1.31E+01	3.76E+01 G
			295.09	1.322E+01	(P	3.855E+00	1.48E+01	1.93E+01 G
			242.00	1.606E+01	+	1.032E+01	2.23E+01	7.43E+00 GA
BI-207	C	1.2068E+00					1.18E+04	
			1063.66	1.207E+00	&(	1.108E+00	4.43E+01	7.45E+01 G
			569.70	-1.327E-02	&	1.286E+00	2.70E+03	9.77E+01 G
BI-212	N	6.2337E+00					6.98E+02	
			727.17	6.234E+00	&(	2.753E+01	1.30E+02	7.55E+00 G
			785.42	1.153E+01	&	1.052E+02	3.79E+02	1.28E+00 GA
U-235	N	-3.9196E+00					2.57E+11	
			143.79	-3.920E+00	?(P	1.738E+01	8.61E+01	1.10E+01 G
			205.33	-1.586E+00	+	1.947E+01	4.70E+02	5.01E+00 G
			163.38	4.891E+00	+	1.971E+01	1.20E+02	5.08E+00 G
			185.72	1.108E+00	& P	1.928E+00	6.74E+01	5.40E+01 GA
BI-214	N	1.1601E+01					5.84E+05	
			609.31	1.160E+01	(P	2.477E+00	1.22E+01	4.61E+01 G
			1120.29	2.744E+00	&	1.178E+01	1.24E+02	1.51E+01 G
			1764.49	4.968E+00	-	1.043E+01	6.40E+01	1.54E+01 G
BI-210M	T	5.4084E-01					1.10E+09	
			265.83	5.408E-01	?(	1.799E+00	9.85E+01	5.00E+01 G
			304.90	0.000E+00	&	8.548E+00	1.00E+03	2.80E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
AC-228	N	1.8343E+01					2.10E+03	
			911.07	1.794E+01	(	1.391E+00	1.03E+01	2.90E+01 G
			968.97	1.902E+01	(	3.536E+00	1.44E+01	1.75E+01 G
			338.32	2.369E+01	+	5.629E+00	1.36E+01	1.20E+01 G
			93.35	3.270E+01	+	1.500E+01	2.05E+01	5.56E+00 XA
TH-227	N	-5.2726E+00					7.95E+03	
			256.24	-5.273E+00	?(	1.356E+01	9.99E+01	7.00E+00 G
			235.97	2.713E+00	+	1.988E+01	2.19E+02	1.23E+01 G
			50.14	-3.588E+00	+	2.448E+01	2.02E+02	8.00E+00 G
TH-229	N	4.4893E+00					2.68E+06	
			193.51	-8.041E-01	?(	1.973E+01	9.33E+02	4.40E+00 G
			210.85	1.228E+01	?(	3.267E+01	1.04E+02	2.99E+00 G
TH-234	N	-8.2671E+00					1.63E+12	
			92.59	-8.267E+00	*(P	3.376E+01	7.84E+01	5.58E+00 G
			63.29	1.596E+00	+ P	4.698E+01	8.71E+02	3.81E+00 G
PA-233	C	1.3014E+00					7.82E+08	
			312.01	1.301E+00	(	1.291E+00	3.90E+01	3.60E+01 G
			300.18	0.000E+00	-	3.815E+01	1.00E+03	6.20E+00 G
PA-234	N	1.6694E+00					1.63E+12	
			131.29	6.285E-01	?(	6.732E+00	3.16E+02	1.80E+01 G
			946.02	-6.629E+00	+	1.271E+01	8.61E+01	1.34E+01 G
			569.47	3.954E+00	?(	1.650E+01	1.22E+02	8.20E+00 G
			883.24	0.000E+00	-	1.952E+01	1.00E+03	9.60E+00 G
			880.53	-5.342E+00	+	2.930E+01	1.58E+02	6.00E+00 GA
PA-234M	N	8.4944E+01					1.63E+12	
			1001.00	6.081E+01	&(	1.987E+02	9.59E+01	8.37E-01 G
			766.41	1.537E+02	?(	3.942E+02	7.64E+01	2.94E-01 G
AM-241	T	1.3184E+00					1.58E+05	
			59.54	1.318E+00	&(	5.781E+00	1.31E+02	3.59E+01 G
Np-237	F	2.4769E+00					2.14E+06	
							Derived Ave Activity	
			86.49	2.477E+00	}(	1.403E+01	1.69E+02	1.31E+01 G
Cs-136	F	7.8298E-01					1.30E+01	
			818.50	3.987E-01	?(	1.698E+00	1.24E+02	1.00E+02 G
			1048.07	1.263E+00	?(	1.162E+00	3.36E+01	8.00E+01 G
			340.57	-4.403E-01	-	3.991E+00	2.67E+02	4.69E+01 G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

Np-239   T   1.5000E+00                                      2.36E+00
                          103.70-1.472E+00 &   7.452E+00 1.52E+02 2.40E+01 X
                          106.13 1.500E+00 &(  7.507E+00 1.50E+02 2.27E+01 G
                           99.50-2.358E+00 &   1.155E+01 1.47E+02 1.50E+01 X

Nd-147      -4.7408E+00                                     1.11E+01
                          531.00-4.741E+00 ?(  1.071E+01 9.50E+01 1.30E+01 G
                           91.10 0.000E+00 &   6.544E+00 1.00E+03 2.83E+01 G

TL-210   N   3.4334E-01                                      5.84E+05
                          799.60 3.433E-01 ?(  1.714E+00 1.45E+02 9.90E+01 G
                          296.00-1.650E-01 -   2.981E+00 5.35E+02 7.90E+01 G
                         1313.00-1.140E+00 +   6.293E+00 2.43E+02 2.10E+01 GA

Kr-85    I   9.3866E+01                                      3.92E+03
                          513.98 9.387E+01 ?(  3.686E+02 1.16E+02 4.30E-01 G
   ( - 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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********** 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 1 Sigma %	Activity	
TH-227	50.14	256.	-11.	-0.006	201.98	-3.588E+00	
AM-241	59.54	484.	24.	0.013	131.23	1.318E+00	
TH-234	63.29	400.	3.	0.002	870.93	1.596E+00	P
BA-133	80.99	955.	-25.	-0.014	177.10	-1.169E+00	
EU-155	86.54	741.	-24.	-0.013	160.33	-1.231E+00	
TH-234	92.59	671.	-30.	-0.017	78.44	-8.267E+00	P
Gd-153	97.50	560.	-23.	-0.013	143.97	-1.181E+00	
Np-239	99.50	583.	-24.	-0.013	146.61	-2.358E+00	
Gd-153	103.20	607.	-24.	-0.013	148.86	-1.620E+00	
Np-239	103.70	631.	-24.	-0.013	151.59	-1.472E+00	
EU-155	105.31	654.	-12.	-0.006	310.65	-8.227E-01	
Np-239	106.13	574.	23.	0.013	149.75	1.500E+00	
EU-152	121.78	145.	9.	0.005	201.94	4.465E-01	
CO-57	122.06	154.	17.	0.010	103.71	3.027E-01	
EU-154	123.10	201.	-21.	-0.012	98.26	-7.660E-01	
PA-234	131.29	278.	8.	0.004	316.23	6.285E-01	
HF-181	133.02	526.	-20.	-0.011	164.87	-6.936E-01	
CE-144	133.54	506.	-13.	-0.007	246.67	-1.772E+00	
CO-57	136.47	596.	-22.	-0.012	155.15	-3.199E+00	
Tc-99m	140.51	643.	-23.	-0.013	160.41	-3.989E-01	
U-235	143.79	671.	-28.	-0.015	86.13	-3.920E+00	P
CE-141	145.44	688.	-23.	-0.013	164.98	-7.288E-01	
Ba-140	162.66	196.	17.	0.009	121.39	4.334E+00	
U-235	163.38	161.	15.	0.009	119.66	4.891E+00	
CE-139	165.85	202.	-19.	-0.010	109.42	-3.842E-01	
Cf-251	176.60	110.	10.	0.006	198.75	9.895E-01	
U-235	185.72	152.	35.	0.019	67.44	1.108E+00	P
TH-229	193.51	99.	-2.	-0.001	933.41	-8.041E-01	
U-235	205.33	117.	-4.	-0.002	470.11	-1.586E+00	
TH-229	210.85	114.	20.	0.011	103.77	1.228E+01	
Cf-251	227.00	117.	-20.	-0.011	102.16	-6.313E+00	
TH-227	235.97	651.	17.	0.009	218.75	2.713E+00	
TH-227	256.24	81.	-17.	-0.010	99.91	-5.273E+00	
Cd-113m	263.70	68.	13.	0.007	94.69	4.671E+03	
BI-210M	265.83	68.	12.	0.007	98.47	5.408E-01	
Hg-203	279.20	102.	-15.	-0.008	100.94	-4.069E-01	
TL-210	296.00	430.	-6.	-0.003	535.21	-1.650E-01	
CR-51	320.08	382.	14.	0.008	205.60	3.429E+00	
La-140	328.76	122.	16.	0.009	99.15	2.055E+00	
Cf-249	333.44	121.	15.	0.009	104.70	2.565E+00	
Cs-136	340.57	215.	-8.	-0.004	267.02	-4.403E-01	
EU-152	344.29	218.	-14.	-0.008	147.17	-1.445E+00	
HF-181	345.83	193.	13.	0.007	150.40	2.349E+00	
BA-133	356.00	192.	10.	0.005	200.45	4.346E-01	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
I-131	364.48	76.	-18.	-0.010	99.20	-6.024E-01	
BA-133	383.84	215.	-20.	-0.011	106.96	-6.403E+00	
Cf-249	387.95	234.	-20.	-0.011	111.20	-8.775E-01	
SN-113	391.69	217.	-18.	-0.010	117.31	-8.311E-01	
SB-125	427.88	44.	-5.	-0.003	263.57	-5.303E-01	
PM-146	453.88	24.	20.	0.011	52.92	1.010E+00	
SB-125	463.37	37.	50.	0.028	22.09	1.603E+01	
Ir-192	468.06	93.	-6.	-0.004	219.35	-4.113E-01	
BE-7	477.60	155.	-17.	-0.010	105.00	-5.587E+00	
HF-181	482.00	170.	-17.	-0.010	109.26	-7.378E-01	
La-140	487.02	190.	-17.	-0.010	114.74	-1.320E+00	
RU-103	497.05	36.	-4.	-0.002	297.91	-1.547E-01	
RH-106	511.86	27.	36.	0.020	26.04	6.536E+00	
Kr-85	513.98	78.	11.	0.006	115.75	9.387E+01	
Nd-147	531.00	56.	-17.	-0.009	95.04	-4.741E+00	
Ba-140	537.26	22.	5.	0.003	183.34	8.149E-01	
PA-234	569.47	47.	8.	0.005	121.79	3.954E+00	
SB-125	600.50	196.	8.	0.005	237.65	1.906E+00	
SB-124	602.73	240.	11.	0.006	203.71	4.492E-01	
PM-144	618.06	322.	-15.	-0.008	174.07	-6.149E-01	
RH-106	621.92	246.	11.	0.006	203.57	4.607E+00	
SB-125	635.89	31.	1.	0.001	793.73	3.731E-01	
I-131	636.97	32.	-1.	-0.001	806.23	-5.893E-01	
AG-110M	657.76	33.	2.	0.001	412.31	9.141E-02	
PM-144	696.54	37.	-8.	-0.005	159.35	-3.796E-01	
NB-94	702.63	28.	12.	0.007	97.89	5.562E-01	
SB-124	722.79	59.	5.	0.003	207.67	2.285E+00	
ZR-95	724.20	80.	-17.	-0.010	76.55	-1.833E+00	
BI-212	727.17	81.	10.	0.006	129.77	6.234E+00	
PM-146	735.72	23.	-12.	-0.007	91.24	-2.471E+00	
PM-146	747.16	51.	-18.	-0.010	89.12	-2.469E+00	
ZR-95	756.73	42.	-16.	-0.009	88.96	-1.415E+00	
AG-110M	763.94	42.	-15.	-0.008	66.33	-3.246E+00	
NB-95	765.79	56.	13.	0.007	84.86	6.372E-01	
PA-234M	766.41	21.	9.	0.005	76.40	1.537E+02	
EU-152	778.92	19.	6.	0.004	150.07	2.393E+00	
BI-212	785.42	28.	3.	0.002	378.59	1.153E+01	
TL-210	799.60	45.	7.	0.004	144.56	3.433E-01	
CO-58	810.78	49.	-14.	-0.008	77.85	-6.866E-01	
La-140	815.77	63.	-10.	-0.006	111.62	-2.265E+00	
Cs-136	818.50	44.	8.	0.004	124.00	3.987E-01	
MN-54	834.85	19.	10.	0.006	93.99	5.313E-01	
Co-56	846.77	15.	8.	0.004	112.15	4.157E-01	
NB-94	871.10	42.	-14.	-0.008	70.71	-7.429E-01	
EU-154	873.23	40.	11.	0.006	83.34	4.966E+00	
PA-234	880.53	42.	-6.	-0.003	158.11	-5.342E+00	
Sc-46	889.28	28.	8.	0.005	97.36	4.405E-01	
Y-88	898.04	20.	3.	0.002	332.78	1.735E-01	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
AG-110M	937.49	20.	6.	0.003	168.87	9.761E-01	
PA-234	946.02	35.	-16.	-0.009	86.15	-6.629E+00	
EU-152	964.11	96.	2.	0.001	924.96	5.859E-01	
EU-154	996.33	22.	9.	0.005	83.26	4.774E+00	
PA-234M	1001.00	30.	9.	0.005	95.92	6.081E+01	
EU-154	1004.77	28.	6.	0.003	127.87	2.007E+00	
Co-56	1037.84	11.	6.	0.004	123.77	2.698E+00	
Cs-136	1048.07	7.	17.	0.009	33.59	1.263E+00	
RH-106	1050.36	37.	-11.	-0.006	84.73	-4.242E+01	
Ga-68	1077.40	11.	9.	0.005	88.84	1.973E+01	
FE-59	1099.25	16.	-1.	-0.001	914.69	-1.112E-01	
EU-152	1112.07	16.	6.	0.004	96.55	3.009E+00	
ZN-65	1115.55	23.	6.	0.004	111.22	8.145E-01	
Sc-46	1120.55	36.	7.	0.004	135.86	4.145E-01	
CO-60	1173.24	21.	-3.	-0.002	319.69	-2.200E-01	
Co-56	1238.28	34.	-6.	-0.003	231.54	-6.236E-01	
NA-22	1274.53	11.	3.	0.001	188.75	1.873E-01	
FE-59	1291.60	6.	3.	0.002	176.21	5.472E-01	
TL-210	1313.00	11.	-3.	-0.002	243.10	-1.140E+00	
CO-60	1332.50	23.	-11.	-0.006	109.06	-7.751E-01	
AG-110M	1384.30	0.	8.	0.004	35.36	2.465E+00	
EU-152	1408.00	6.	1.	0.001	600.00	3.611E-01	
La-140	1596.21	12.	-1.	-0.001	842.61	-8.802E-02	
Y-88	1836.06	0.	5.	0.003	44.72	4.773E-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	Time Corrected Activity Bq/Sample	Uncertainty Counting 1 Sigma	MDA Bq/Sample
BE-7	#A	-5.5875E+00	-5.5875E+00	1.050E+02%	1.97E+01
NA-22	#A	1.8731E-01	1.8731E-01	1.887E+02%	1.29E+00
K-40		1.5959E+02	1.5959E+02	6.773E+00%	5.40E+00
Sc-46	#A	4.2752E-01	4.2752E-01	8.357E+01%	1.46E+00
CR-51	#A	3.4290E+00	3.4290E+00	2.056E+02%	2.37E+01
MN-54	#A	5.3126E-01	5.3126E-01	9.399E+01%	1.17E+00
FE-59	#A	1.7412E-01	1.7412E-01	1.762E+02%	2.37E+00
Co-56	#A	6.9848E-01	6.9848E-01	8.351E+01%	1.08E+00
CO-57	#A	3.0270E-01	3.0270E-01	1.037E+02%	1.05E+00
CO-58	#A	-6.8659E-01	-6.8659E-01	7.785E+01%	1.79E+00
CO-60	#A	-7.7509E-01	-7.7509E-01	1.091E+02%	1.81E+00
ZN-65	#A	8.1448E-01	8.1449E-01	1.112E+02%	3.13E+00
NB-94	#A	5.5623E-01	5.5623E-01	9.789E+01%	1.27E+00
ZR-95	#A	-1.4154E+00	-1.4154E+00	8.896E+01%	2.89E+00
NB-95	#A	6.3723E-01	6.3723E-01	8.486E+01%	1.82E+00
RU-103	#A	-1.5472E-01	-1.5472E-01	2.979E+02%	1.19E+00

RH-106 #A	4.6072E+00	4.6072E+00	2.036E+02%	3.17E+01
AG-108M#A	-3.5068E-02	-3.5068E-02	1.360E+03%	1.23E+00
AG-110M#A	4.5169E-01	4.5169E-01	3.536E+01%	2.58E+00
SN-113 #A	-8.3107E-01	-8.3107E-01	1.173E+02%	3.27E+00
SB-124 #A	6.3114E-01	6.3114E-01	1.455E+02%	3.09E+00
SB-125 #A	2.7502E+00	2.7502E+00	2.209E+01%	3.57E+00
I-131 #A	-6.0233E-01	-6.0235E-01	9.920E+01%	1.47E+00
Gd-153 #A	-1.1811E+00	-1.1811E+00	1.440E+02%	5.68E+00
Ga-68 #A	1.9629E+01	1.9727E+01	8.884E+01%	3.92E+01
Tc-99m #A	-3.9850E-01	-3.9887E-01	1.604E+02%	2.14E+00
BA-133 #A	4.3458E-01	4.3458E-01	2.005E+02%	2.95E+00
CS-134 A	6.2468E-01	6.2468E-01	8.375E+01%	2.01E+00
CS-137 #A	-5.0979E-02	-5.0979E-02	1.015E+03%	1.83E+00
CE-139 #A	-3.8418E-01	-3.8418E-01	1.094E+02%	1.41E+00
Ba-140 #A	1.5299E+00	1.5299E+00	1.099E+02%	3.73E+00
La-140 #A	2.8802E-01	2.8803E-01	9.915E+01%	1.66E+00
CE-141 #A	-7.2884E-01	-7.2885E-01	1.650E+02%	4.02E+00
CE-144 #A	-1.7716E+00	-1.7716E+00	2.467E+02%	1.47E+01
PM-144 #A	-3.7957E-01	-3.7957E-01	1.593E+02%	1.42E+00
EU-152 #A	1.3378E+00	1.3378E+00	9.655E+01%	3.07E+00
EU-154 #A	1.4259E+00	1.4259E+00	4.993E+01%	2.52E+00
EU-155 #A	-8.2267E-01	-8.2267E-01	3.106E+02%	8.57E+00
HF-181 #A	-2.5101E-01	-2.5101E-01	9.295E+01%	2.71E+00
Ta-182 #A	-7.9173E-01	-7.9173E-01	1.205E+02%	7.11E+00
Hg-203 #A	-4.0694E-01	-4.0695E-01	1.009E+02%	1.38E+00
TL-208	7.5656E+00	7.5656E+00	9.292E+00%	8.06E-01
PM-146 #A	1.0102E+00	1.0102E+00	5.292E+01%	1.29E+00
Y-88 #A	4.7734E-01	4.7734E-01	4.472E+01%	7.04E-01
Cd-113m#A	4.6711E+03	4.6711E+03	9.469E+01%	1.49E+04
Cd-109 #A	6.8491E+00	6.8491E+00	2.126E+02%	4.88E+01
Cf-251 #A	9.8953E-01	9.8953E-01	1.987E+02%	5.10E+00
Cf-249 #A	-2.2248E-01	-2.2248E-01	7.637E+01%	3.27E+00
Sn-126 A	1.7922E+00	1.7922E+00	3.198E+02%	1.93E+01
PB-210 A	1.8331E+01	1.8331E+01	6.311E+01%	3.34E+01
PB-212	1.7642E+01	1.7642E+01	5.859E+00%	1.74E+00
PB-214	1.1024E+01	1.1024E+01	9.863E+00%	2.40E+00
BI-207 #	1.2068E+00	1.2068E+00	4.430E+01%	1.11E+00
BI-212 #A	6.2337E+00	6.2337E+00	1.298E+02%	2.75E+01
U-235 #A	-3.9196E+00	-3.9196E+00	8.613E+01%	1.74E+01
BI-214	1.1601E+01	1.1601E+01	1.225E+01%	2.48E+00
BI-210M#A	5.4084E-01	5.4084E-01	9.847E+01%	1.80E+00
AC-228	1.8343E+01	1.8343E+01	8.851E+00%	1.39E+00
TH-227 #A	-5.2726E+00	-5.2726E+00	9.991E+01%	1.36E+01
TH-229 #A	4.4893E+00	4.4893E+00	1.038E+02%	1.97E+01
TH-234 #A	-8.2671E+00	-8.2671E+00	7.844E+01%	3.38E+01
PA-231 #A	0.0000E+00	0.0000E+00	7.071E+02%	8.26E+01
PA-233	1.3014E+00	1.3014E+00	3.903E+01%	1.29E+00
PA-234 #A	1.6694E+00	1.6694E+00	1.218E+02%	6.73E+00
PA-234M#A	8.4944E+01	8.4944E+01	6.132E+01%	1.99E+02

AM-241 #A	1.3184E+00	1.3184E+00	1.312E+02%		5.78E+00
Np-237 #A	2.4769E+00	2.4769E+00	1.694E+02%		1.40E+01
Ir-192 #A	0.0000E+00	0.0000E+00	7.071E+02%		2.83E+00
Cs-136 #A	7.8297E-01	7.8298E-01	3.359E+01%		1.70E+00
Np-239 #A	1.4999E+00	1.5000E+00	1.497E+02%		7.51E+00
Nd-147 #A	-4.7407E+00	-4.7408E+00	9.504E+01%		1.07E+01
TL-210 #A	3.4334E-01	3.4334E-01	1.446E+02%		1.71E+00
Kr-85 #A	9.3866E+01	9.3866E+01	1.158E+02%		3.69E+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 (25.1 to 1999.1 keV) 2.454E+02 Bq/Sample
Total Decayed Activity (25.1 to 1999.1 keV) 2.4540129E+02 Bq/Sample

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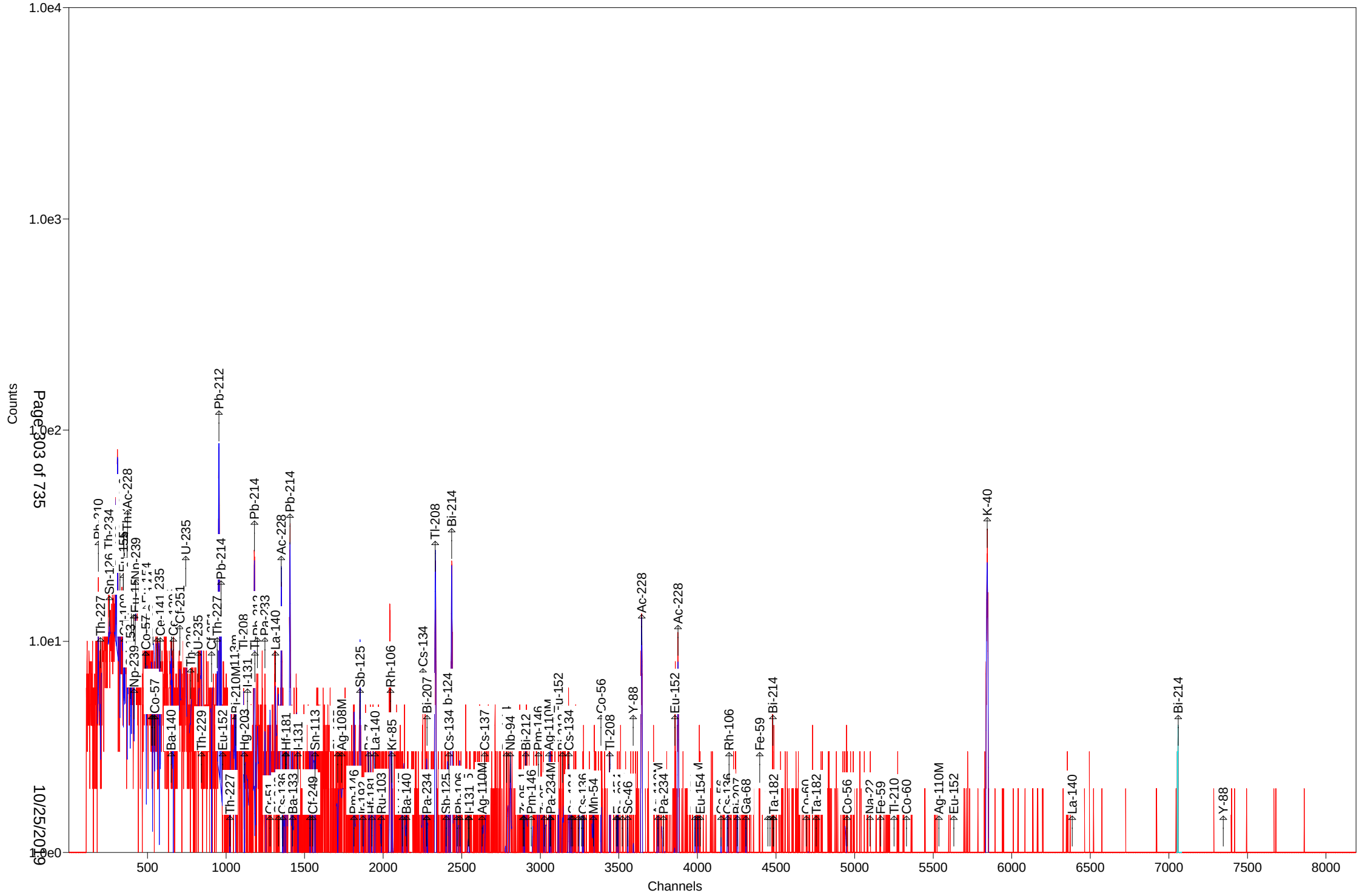
444057_Gamma_180-95857-A-2-B. 12_Gamma_20192672.spc.



Test America St. Louis Spectrum ID: 5_Gamma_20192606

Sample Description: 444057_Gamma_180-95857-A-3-C
Detector: Detector # 5
Batch ID: 444057
Work Order Number: Gamma
Lot Number: 180-95857-A-3-C

Decay to Time: 10/15/2019 10:42 Live Time: 1800 sec
Acquisition Time: 10/15/2019 10:42:50 Real Time: 1807 sec
Analysis Time: 10/15/2019 11:13 Dead Time: 0.38 %
Analysis Quantity: 1.000E+00 Sample

Efficiency Cal File: 5_Soil_TunaCan.Clb
Efficiency Cal Desc: 5_Soil_TunaCan_90099_032612
Efficiency Cal Date: 3/27/2012 17:20
Energy Cal Date: 2/28/2012 19:35
Library: Client_Long_Rev15.lib
Bkgd Correction File: 5_2019-10-06_1911.PBC

Nuclide	Activity Bq/Sample	1-Sigma Counting Uncert %	1-Sigma Counting Uncert Bq/Sample	1-Sigma Total Uncert Bq/Sample	Minimum Detectable Activity Bq/Sample
BE-7	-5.627E+00	94.3	5.308E+00	5.316E+00	1.787E+01
NA-22	-4.855E-01	121.7	5.906E-01	5.911E-01	2.073E+00
K-40	1.949E+02	7.2	1.410E+01	1.727E+01	7.519E+00
Sc-46	2.751E-01	146.5	4.029E-01	4.032E-01	2.658E+00
CR-51	-5.320E+00	110.7	5.887E+00	5.894E+00	1.816E+01
MN-54	4.911E-01	97.7	4.796E-01	4.803E-01	1.163E+00
FE-59	-1.972E+00	89.0	1.754E+00	1.757E+00	3.945E+00
Co-56	1.028E+00	51.0	5.248E-01	5.274E-01	1.172E+00
CO-57	5.331E-01	80.7	4.304E-01	4.313E-01	8.692E-01
CO-58	4.885E-01	92.6	4.525E-01	4.532E-01	1.548E+00
CO-60	-9.327E-02	135.0	1.259E-01	1.260E-01	2.177E+00
ZN-65	1.025E+00	156.9	1.608E+00	1.608E+00	5.579E+00
NB-94	8.819E-01	39.0	3.439E-01	3.470E-01	7.462E-01
ZR-95	7.396E-01	103.1	7.628E-01	7.638E-01	1.950E+00
NB-95	-1.062E+00	71.5	7.592E-01	7.612E-01	2.523E+00
RU-103	-6.823E-01	74.5	5.081E-01	5.093E-01	1.632E+00
RH-106	-7.010E+00	181.5	1.272E+01	1.273E+01	4.289E+01
AG-108M	3.049E-02	1684.7	5.136E-01	5.136E-01	1.339E+00
AG-110M	9.988E-01	115.5	1.153E+00	1.154E+00	3.924E+00
SN-113	4.939E-01	134.4	6.636E-01	6.641E-01	2.269E+00
SB-124	1.281E-01	340.3	4.359E-01	4.359E-01	3.939E+00
SB-125	1.451E+00	98.8	1.434E+00	1.436E+00	3.607E+00
I-131	5.044E-02	426.1	2.149E-01	2.150E-01	1.352E+00
Gd-153	8.651E-01	104.1	9.007E-01	9.022E-01	3.025E+00
Ga-68	2.992E+00	857.3	2.565E+01	2.565E+01	6.210E+01
Tc-99m	-2.413E-01	176.7	4.265E-01	4.267E-01	1.439E+00
BA-133	-1.255E-01	943.8	1.185E+00	1.185E+00	4.041E+00
CS-134	1.195E+00	73.5	8.781E-01	8.803E-01	1.927E+00
CS-137	-1.361E+00	43.6	5.931E-01	5.973E-01	2.887E+00
CE-139	1.628E-01	222.7	3.624E-01	3.627E-01	1.238E+00
Ba-140	-1.135E+00	121.7	1.381E+00	1.382E+00	5.915E+00
La-140	1.943E-01	198.9	3.864E-01	3.866E-01	9.063E-01
CE-141	5.991E-01	124.4	7.456E-01	7.462E-01	2.504E+00

CE-144	2.180E+00	154.7	3.374E+00	3.376E+00	1.135E+01
PM-144	-2.064E-02	2735.3	5.644E-01	5.644E-01	1.460E+00
EU-152	3.604E+00	34.6	1.249E+00	1.263E+00	3.387E+00
EU-154	3.384E+00	21.3	7.214E-01	7.430E-01	2.096E+00
EU-155	2.438E+00	43.3	1.055E+00	1.063E+00	2.729E+00
HF-181	7.179E-02	568.9	4.084E-01	4.084E-01	2.423E+00
Ta-182	1.811E+00	91.5	1.658E+00	1.660E+00	5.415E+00
Hg-203	2.971E-01	158.3	4.702E-01	4.706E-01	1.605E+00
TL-208	6.460E+00	12.6	8.133E-01	8.797E-01	1.304E+00
PM-146	2.621E-01	268.0	7.025E-01	7.026E-01	1.945E+00
Y-88	0.000E+00	1.#INF	1.331E-01	1.331E-01	9.809E-01
Cd-113m	3.903E+03	128.1	5.001E+03	5.008E+03	1.709E+04
Cd-109	0.000E+00	1.#INF	1.512E+01	1.512E+01	5.090E+01
Cf-251	-2.011E+00	104.6	2.104E+00	2.111E+00	5.667E+00
Cf-249	5.551E-01	125.2	6.953E-01	6.959E-01	2.366E+00
Sn-126	3.620E+00	118.2	4.278E+00	4.282E+00	1.437E+01
PB-210	2.447E+01	46.3	1.133E+01	1.142E+01	2.977E+01
PB-212	1.788E+01	6.0	1.080E+00	1.582E+00	1.534E+00
PB-214	1.477E+01	9.7	1.429E+00	1.622E+00	2.246E+00
BI-207	2.960E-01	145.4	4.302E-01	4.305E-01	1.981E+00
BI-212	4.333E+01	13.6	5.896E+00	6.311E+00	5.914E+00
U-235	-5.657E-01	434.5	2.458E+00	2.458E+00	1.186E+01
BI-214	1.305E+01	11.1	1.449E+00	1.600E+00	2.887E+00
BI-210M	0.000E+00	1.#INF	3.990E-01	3.990E-01	2.199E+00
AC-228	1.714E+01	11.5	1.967E+00	2.153E+00	2.764E+00
TH-227	6.728E-01	151.2	1.017E+00	1.018E+00	1.547E+01
TH-229	-6.555E+00	132.2	8.663E+00	8.679E+00	2.364E+01
TH-234	1.466E+01	31.3	4.593E+00	4.665E+00	1.665E+01
PA-231	-1.679E+01	183.2	3.076E+01	3.078E+01	1.032E+02
PA-233	-1.237E+00	128.6	1.590E+00	1.592E+00	7.643E+00
PA-234	-1.787E+00	128.4	2.294E+00	2.296E+00	7.684E+00
PA-234M	-2.717E+01	327.6	8.898E+01	8.900E+01	2.456E+02
AM-241	7.557E-01	169.4	1.280E+00	1.281E+00	3.671E+00
Np-237	0.000E+00	1.#INF	4.944E+00	4.944E+00	1.650E+01
Ir-192	3.652E-01	136.5	4.986E-01	4.991E-01	1.695E+00
Cs-136	4.918E-01	98.9	4.861E-01	4.869E-01	1.667E+00
Np-239	9.778E-01	182.4	1.783E+00	1.784E+00	5.998E+00
Nd-147	1.433E+00	176.8	2.534E+00	2.535E+00	6.755E+00
TL-210	-9.646E-01	84.1	8.112E-01	8.131E-01	2.719E+00
Kr-85	1.054E+01	1603.1	1.690E+02	1.690E+02	5.843E+02
Total	4.298E+03				

Analyst: Kellene Robbs

Sample description
444057_Gamma_180-95857-A-3-C

Spectrum Filename: C:\User\SPC\Det5\5_Gamma_20192606.An1

Acquisition information
Start time: 10/15/2019 10:42:50 AM
Live time: 1800
Real time: 1807
Dead time: 0.38 %
Detector ID: 5

Detector system
Ge 5 SN/157

Calibration
Filename: 5_Soil_TunaCan.Clb
5_Soil_TunaCan_90099_032612

Energy Calibration
Created: 2/28/2012 7:35:48 PM
Zero offset: 0.158 keV
Gain: 0.250 keV/channel
Quadratic: 3.911E-08 keV/channel^2

Efficiency Calibration
Created: 3/27/2012 5:20:37 PM
Knee Energy: 165.85 keV
Above the Knee: Quadratic Uncertainty = 0.87 %
Log(Eff): 6.466115E-01 + (-7.830454E-01*Log(E)) +
(-4.117504E-03*Log(E)^2)
Below the Knee: Quadratic Uncertainty = 1.43 %
Log(Eff): -2.462251E+01 + (9.075211E+00*Log(E)) +
(-9.664422E-01*Log(E)^2)

Library Files
Main analysis library: Client_Long_Rev15.lib
Library Match Width: 0.500
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G800W064
Start channel: 150 (37.62keV)
Stop channel: 8000 (2000.81keV)
Peak rejection level: 1000.000%
Peak search sensitivity: 3
Sample Size: 1.0000E+00 +/- 0.000E+00%
Activity scaling factor: 1.0000E+00/(1.0000E+00* 1.0000E+00) =
1.0000E+00
Detection limit method: Reg. Guide 4.16 Method

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Random error: 4.0000000E+00
Systematic error: 4.0000000E+00
Fraction Limit: 0.000%
Background width: 3
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:	YES	10/15/2019 10:42:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	5_2019-10-06_1911.PBC 10/6/2019 7:11:20 PM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 27 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 0.1664

***** 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
46.29	33.	46.29	1.01	1.788E-02	46.54	4.250	PBC<MDA	PB210
59.54	12.	169.39	0.80	2.533E-02	59.54	35.900	PBC<MDA	AM241
63.35	33.	46.82	0.80	2.712E-02	63.29	3.810	PBC<MDA	TH234
64.34	17.	118.18	0.80	2.757E-02	64.28	9.700	PBC<MDA	Sn126
74.83	136.	13.79	0.81	3.151E-02				
77.15	243.	8.37	0.82	3.220E-02				
80.99	19.	116.32	0.82	3.320E-02	80.99	34.060	PBC<MDA	BA133
87.20	80.	19.78	0.83	3.448E-02	86.49	13.100	9.871E+00	Np237
					86.54	30.700	4.211E+00	EU155
					86.94	9.040	1.427E+01	Sn126
					87.57	37.500	3.430E+00	Sn126
89.77	43.	34.62	0.83	3.489E-02				
92.60	44.	41.64	0.83	3.527E-02	92.59	5.584	PBC<MDA	TH234
93.36	21.	153.71	0.83	3.536E-02	93.35	5.561	PBC<MDA	AC228
97.50	17.	104.12	0.84	3.577E-02	97.50	30.000	PBC<MDA	Gd153
99.50	2.	842.19	0.84	3.592E-02	99.50	15.000	PBC<MDA	Np239
105.41	34.	43.25	0.79	3.618E-02	105.31	21.200	PBC<MDA	EU155
106.13	14.	182.37	0.84	3.620E-02	106.13	22.700	PBC<MDA	Np239
122.06	15.	97.15	0.86	3.582E-02	121.78	28.580	PBC<MDA	EU152
					122.06	85.600	2.659E-01	CO57
123.10	5.	323.15	0.86	3.575E-02	123.10	40.790	PBC<MDA	EU154
133.54	15.	154.75	0.87	3.487E-02	133.54	11.090	PBC<MDA	CE144

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pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
136.30	4.	568.87	0.88	3.458E-02	136.30	5.850	PBC<MDA	HF181
					136.47	10.680	6.270E-01	CO57
136.47	18.	128.97	0.88	3.457E-02	136.30	5.850	PBC<MDA	HF181
					136.47	10.680	2.674E+00	CO57
143.79	-4.	434.45	0.88	3.371E-02	143.79	10.960	PBC<MDA	U235
145.44	17.	124.44	0.88	3.351E-02	145.44	48.200	PBC<MDA	CE141
162.66	7.	249.31	0.90	3.113E-02	162.66	6.220	PBC<MDA	Ba140
165.85	7.	222.68	0.91	3.133E-02	165.85	79.900	PBC<MDA	CE139
185.72	45.	42.42	0.93	2.854E-02	185.72	54.000	PBC<MDA	U235
227.00	27.	52.44	0.97	2.417E-02	227.00	6.300	PBC<MDA	Cf251
235.97	14.	230.80	0.98	2.341E-02	235.97	12.300	PBC<MDA	TH227
238.62	314.	6.59	1.05	2.319E-02	238.63	43.300	1.737E+01	PB212
242.02	44.	28.27	0.98	2.293E-02	242.00	7.430	1.448E+01	PB214
263.70	9.	128.14	1.00	2.135E-02	263.70	0.006	PBC<MDA	Cd113m
276.80	14.	94.81	1.02	2.048E-02	277.28	6.310	PBC<MDA	TL208
279.20	9.	158.29	1.02	2.036E-02	279.20	81.460	PBC<MDA	Hg203
295.16	129.	14.17	1.07	1.945E-02	295.09	19.300	1.909E+01	PB214
					296.00	79.000	4.676E+00	TL210
300.12	44.	27.95	0.36	1.918E-02	300.03	3.280	3.929E+01	PB212
					300.07	2.460	5.240E+01	PA231
					300.18	6.200	2.080E+01	PA233
316.49	10.	136.53	1.05	1.835E-02	316.49	87.040	PBC<MDA	Ir192
328.76	7.	198.86	1.07	1.778E-02	328.76	20.300	PBC<MDA	La140
338.22	69.	18.62	0.99	1.737E-02	338.32	12.010	1.838E+01	AC228
344.29	11.	118.31	1.08	1.711E-02	344.29	26.500	PBC<MDA	EU152
351.98	168.	9.67	1.23	1.680E-02	351.93	37.600	1.477E+01	PB214
383.84	10.	116.42	1.12	1.563E-02	383.84	8.940	PBC<MDA	BA133
387.95	10.	125.24	1.12	1.549E-02	387.95	66.000	PBC<MDA	Cf249
391.69	9.	134.36	1.12	1.537E-02	391.69	64.000	PBC<MDA	SN113
427.88	9.	122.26	1.16	1.428E-02	427.88	29.600	PBC<MDA	SB125
453.88	4.	277.08	1.18	1.360E-02	453.88	65.000	PBC<MDA	PM146
463.37	9.	98.82	1.19	1.336E-02	463.37	10.470	PBC<MDA	SB125
487.02	2.	539.11	1.21	1.282E-02	487.02	45.500	PBC<MDA	La140
511.86	87.	14.85	2.48	1.230E-02	511.86	20.000	1.965E+01	RH106
531.00	4.	176.78	1.25	1.193E-02	531.00	13.000	PBC<MDA	Nd147
563.24	5.	198.61	1.28	1.135E-02	563.24	8.350	PBC<MDA	CS134
569.33	7.	109.73	1.29	1.125E-02	569.32	15.380	PBC<MDA	CS134
					569.47	8.200	4.215E+00	PA234
					569.70	97.740	3.538E-01	BI207
569.70	4.	211.74	1.29	1.125E-02	569.32	15.380	PBC<MDA	CS134
					569.47	8.200	2.509E+00	PA234
					569.70	97.740	2.106E-01	BI207
583.30	111.	12.45	1.02	1.103E-02	583.02	84.500	6.561E+00	TL208
600.50	5.	479.73	1.31	1.076E-02	600.50	17.860	PBC<MDA	SB125
604.81	5.	432.03	1.32	1.070E-02	604.71	97.620	PBC<MDA	CS134
609.41	115.	11.10	1.32	1.063E-02	609.31	46.090	1.305E+01	BI214
635.89	1.	823.76	1.34	1.026E-02	635.89	11.310	PBC<MDA	SB125
636.97	2.	426.15	1.34	1.025E-02	636.97	7.170	PBC<MDA	I131

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
702.63	15.	39.00	1.40	9.438E-03	702.63	97.900	8.819E-01	NB94
722.79	3.	340.29	1.42	9.217E-03	722.79	10.810	PBC<MDA	SB124
					722.94	90.840	2.212E-01	AG108M
					723.36	20.220	9.943E-01	EU154
727.35	54.	13.61	1.75	9.170E-03	727.17	7.550	4.333E+01	BI212
747.16	1.	458.94	1.44	8.965E-03	747.16	34.000	PBC<MDA	PM146
756.73	6.	103.13	1.45	8.869E-03	756.73	54.460	PBC<MDA	ZR95
796.61	10.	73.48	1.48	8.503E-03	795.87	85.530	PBC<MDA	CS134
801.95	2.	473.42	1.48	8.448E-03	801.95	8.690	PBC<MDA	CS134
810.78	7.	92.63	1.49	8.371E-03	810.78	99.460	PBC<MDA	CO58
818.50	7.	98.85	1.50	8.305E-03	818.50	100.000	PBC<MDA	Cs136
834.85	7.	97.67	1.51	8.168E-03	834.85	99.980	PBC<MDA	MN54
859.99	11.	91.53	1.53	7.963E-03	860.56	12.420	PBC<MDA	TL208
873.23	5.	149.91	1.54	7.866E-03	873.23	12.270	PBC<MDA	EU154
884.68	10.	115.48	1.55	7.781E-03	884.68	72.680	PBC<MDA	AG110M
911.00	66.	13.43	1.84	7.591E-03	911.07	29.000	1.662E+01	AC228
964.11	30.	34.64	1.61	7.239E-03	964.11	14.605	PBC<MDA	EU152
969.08	5.	183.28	1.61	7.209E-03	968.97	17.460	PBC<MDA	AC228
996.33	22.	21.32	1.63	7.042E-03	996.33	10.600	1.637E+01	EU154
1001.00	-3.	327.56	1.64	7.014E-03	1001.00	0.837	PBC<MDA	PA234M
1037.84	3.	259.73	1.66	6.805E-03	1037.84	14.130	PBC<MDA	Co56
1063.66	4.	199.25	1.68	6.666E-03	1063.66	74.500	PBC<MDA	BI207
1077.40	1.	857.32	1.69	6.594E-03	1077.40	3.300	PBC<MDA	Ga68
1112.07	6.	146.08	1.72	6.421E-03	1112.07	13.644	PBC<MDA	EU152
1115.55	6.	156.91	1.72	6.404E-03	1115.55	50.600	PBC<MDA	ZN65
1120.55	7.	146.45	1.72	6.380E-03	1120.29	15.100	PBC<MDA	BI214
					1120.55	99.987	5.980E-01	Sc46
					1121.30	34.900	1.714E+00	Ta182
1121.30	6.	104.48	1.72	6.376E-03	1120.55	99.987	PBC<MDA	Sc46
					1121.30	34.900	1.495E+00	Ta182
1173.24	4.	218.66	1.76	6.138E-03	1173.24	99.900	PBC<MDA	CO60
1189.94	6.	91.54	1.77	6.069E-03	1189.05	16.200	PBC<MDA	Ta182
1217.71	4.	291.05	1.79	5.934E-03	1221.41	27.000	PBC<MDA	Ta182
1238.28	17.	51.04	1.80	5.866E-03	1238.28	66.070	PBC<MDA	Co56
1313.00	13.	27.74	1.85	5.583E-03	1313.00	21.000	6.160E+00	TL210
1408.00	5.	161.40	1.91	5.264E-03	1408.00	21.005	PBC<MDA	EU152
1461.05	191.	7.24	1.39	5.103E-03	1460.83	10.670	1.949E+02	K40
1771.35	7.	81.26	2.12	4.337E-03	1771.35	15.480	PBC<MDA	Co56

********** 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	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide	
298.93	74.82	107.	136.	4.312E+03	13.79	0.813	-	sD
308.24	77.14	85.	243.	7.546E+03	8.37	0.815	-	D
358.88	89.80	96.	39.	1.125E+03	38.77	0.828	-	sD

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

This section based on library: Client_Long_Rev15.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 1 Sigma %	FWHM keV
PB-210	184.71	46.29	67.	33.	0.019	46.29	1.009s
TH-227	200.11	50.14	138.	-6.	-0.003	332.08	0.787s
AM-241	237.72	59.54	152.	12.	0.007	169.39	0.797
TH-234	252.74	63.29	104.	33.	0.018	46.82	0.801D
Sn-126	256.71	64.28	203.	17.	0.010	118.18	0.802
BA-133	323.61	80.99	143.	19.	0.010	116.32	0.819s
Np-237	345.63	86.49	790.	0.	0.000	170.47	0.825A
Sn-126	347.43	86.94	109.	20.	0.011	118.22	0.825A
Sn-126	349.95	87.57	659.	29.	0.016	62.48	0.826D
Cd-109	351.83	88.04	636.	0.	0.000	930.66	0.826A
Nd-147	364.08	91.10	632.	0.	0.000	1000.00	0.829D
TH-234	370.05	92.59	146.	44.	0.025	41.64	0.831D
AC-228	373.09	93.35	504.	21.	0.012	153.71	0.832s
Gd-153	389.70	97.50	143.	17.	0.009	104.12	0.836s
Np-239	397.71	99.50	185.	2.	0.001	842.19	0.838s
Gd-153	412.52	103.20	255.	-18.	-0.010	127.33	0.842s
Np-239	414.52	103.70	237.	-18.	-0.010	122.83	0.842s
EU-155	421.35	105.41	56.	34.	0.019	43.25	0.787s
Np-239	424.25	106.13	341.	14.	0.008	182.37	0.845s
EU-152	486.90	121.78	164.	-10.	-0.006	178.18	0.861s
CO-57	488.03	122.06	94.	15.	0.008	97.15	0.861s
EU-154	492.18	123.10	126.	5.	0.003	323.15	0.862s
PA-234	524.99	131.29	330.	-20.	-0.011	128.38	0.871s
HF-181	531.91	133.02	350.	-20.	-0.011	131.89	0.872s
CE-144	533.97	133.54	268.	15.	0.008	154.75	0.873s
HF-181	545.02	136.30	279.	4.	0.002	568.87	0.876
CO-57	545.72	136.47	254.	18.	0.010	128.97	0.876
Tc-99m	561.88	140.51	251.	-13.	-0.007	176.75	0.880s
U-235	574.99	143.79	267.	-4.	-0.002	434.45	0.883s
CE-141	581.61	145.44	226.	17.	0.010	124.44	0.885s
Ba-140	650.54	162.66	144.	7.	0.004	249.31	0.902s
CE-139	663.32	165.85	130.	7.	0.004	222.68	0.905s
Cf-251	706.34	176.60	110.	-18.	-0.010	104.58	0.916s
U-235	742.85	185.72	101.	45.	0.025	42.42	0.925s
TH-229	774.03	193.51	110.	-14.	-0.008	132.16	0.933s
U-235	821.35	205.33	85.	-5.	-0.003	417.69	0.945

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
TH-229	843.44	210.85	108.	-9.	-0.005	222.60	0.950s
Cf-251	908.08	227.00	53.	27.	0.015	52.44	0.966s
TH-227	943.98	235.97	545.	14.	0.008	230.80	0.975
PB-212	954.64	238.63	29.	323.	0.180	6.04	0.978D
PB-214	968.10	242.00	57.	44.	0.025	28.27	0.981D
EU-152	978.89	244.69	572.	-6.	-0.003	568.17	0.984
TH-227	1025.11	256.24	73.	-8.	-0.005	195.35	0.995
Cd-113m	1054.97	263.70	62.	9.	0.005	128.14	1.002s
BI-210M	1063.50	265.83	71.	0.	0.000	1000.00	1.005
TL-208	1109.33	277.28	83.	14.	0.008	94.81	1.016s
Hg-203	1117.00	279.20	94.	9.	0.005	158.29	1.017s
I-131	1137.41	284.30	78.	-17.	-0.009	113.20	1.022s
PB-214	1180.87	295.16	44.	129.	0.072	14.17	1.072s
TL-210	1184.24	296.00	502.	-16.	-0.009	193.97	1.034s
PB-212	1200.74	300.12	24.	44.	0.025	27.95	0.359s
PA-231	1200.53	300.07	486.	-17.	-0.009	190.07	1.038s
PA-233	1200.97	300.18	469.	-17.	-0.009	186.87	1.038s
PA-231	1210.86	302.65	453.	-17.	-0.009	183.18	1.040s
BA-133	1211.66	302.85	436.	-17.	-0.009	179.82	1.040
Ba-140	1219.66	304.85	420.	-17.	-0.009	176.11	1.042s
BI-210M	1219.85	304.90	403.	-17.	-0.009	172.66	1.042s
Ir-192	1234.03	308.44	387.	-17.	-0.009	168.60	1.046s
PA-233	1248.32	312.01	367.	-15.	-0.008	128.57	1.049s
Ir-192	1266.25	316.49	98.	10.	0.006	136.53	1.053
CR-51	1280.63	320.08	146.	-17.	-0.010	110.66	1.057s
La-140	1315.35	328.76	59.	7.	0.004	198.86	1.065s
Cf-249	1334.08	333.44	59.	-7.	-0.004	218.40	1.070s
AC-228	1353.23	338.22	24.	69.	0.038	18.62	0.991
EU-152	1377.49	344.29	74.	11.	0.006	118.31	1.080s
PB-214	1408.30	351.98	24.	168.	0.093	9.67	1.233s
BA-133	1424.36	356.00	241.	-2.	-0.001	943.83	1.091s
BA-133	1535.78	383.84	66.	10.	0.006	116.42	1.117s
Cf-249	1552.22	387.95	77.	10.	0.006	125.24	1.121s
SN-113	1567.19	391.69	65.	9.	0.005	134.36	1.125
SB-125	1711.99	427.88	28.	9.	0.005	122.26	1.158s
PM-146	1816.05	453.88	37.	4.	0.002	277.08	1.182s
SB-125	1854.01	463.37	36.	9.	0.005	98.82	1.191s
Ir-192	1872.79	468.06	59.	-2.	-0.001	453.73	1.195s
BE-7	1910.94	477.59	79.	-14.	-0.008	94.33	1.204s
La-140	1948.65	487.02	28.	2.	0.001	539.11	1.212s
RU-103	1988.80	497.05	44.	-14.	-0.008	74.47	1.221s
RH-106	2048.06	511.86	40.	87.	0.048	14.85	2.485s
Nd-147	2124.62	531.00	12.	4.	0.002	176.78	1.252s
Ba-140	2149.67	537.26	36.	-10.	-0.006	121.66	1.258s
CS-134	2253.60	563.24	24.	5.	0.003	198.61	1.280
CS-134	2277.94	569.32	26.	7.	0.004	109.73	1.286s
PA-234	2278.54	569.47	48.	-10.	-0.006	97.82	1.286
BI-207	2279.47	569.70	37.	4.	0.002	211.74	1.286

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
TL-208	2333.88	583.30	17.	110.	0.061	12.59	1.024
SB-125	2402.69	600.50	234.	5.	0.003	479.73	1.313s
SB-124	2411.61	602.73	239.	0.	0.000	1000.00	1.315s
CS-134	2419.53	604.71	234.	5.	0.003	432.03	1.317s
BI-214	2437.93	609.31	24.	115.	0.064	11.10	1.321D
RU-103	2441.89	610.30	239.	0.	0.000	1000.00	1.322s
AG-108M	2457.82	614.28	239.	0.	0.000	1000.00	1.325s
PM-144	2472.94	618.06	239.	0.	0.000	1000.00	1.328s
RH-106	2488.37	621.92	276.	-13.	-0.007	181.53	1.332s
SB-125	2544.26	635.89	26.	1.	0.000	823.76	1.344
I-131	2548.61	636.97	32.	2.	0.001	426.15	1.345s
AG-110M	2631.76	657.76	37.	-10.	-0.006	89.22	1.362s
CS-137	2647.36	661.66	78.	-21.	-0.012	43.59	1.366s
NB-94	2811.25	702.63	4.	15.	0.008	39.00	1.400s
SB-124	2891.88	722.79	63.	3.	0.002	340.29	1.417s
AG-108M	2892.48	722.94	66.	0.	0.000	1000.00	1.417s
EU-154	2894.17	723.36	66.	0.	0.000	1000.00	1.418s
ZR-95	2897.53	724.20	74.	-7.	-0.004	178.90	1.418s
BI-212	2910.12	727.35	0.	54.	0.030	13.61	1.750s
PM-146	2943.61	735.72	26.	-5.	-0.003	191.07	1.428s
PM-146	2989.37	747.16	9.	1.	0.001	458.94	1.437s
ZR-95	3027.65	756.73	9.	6.	0.004	103.13	1.445s
AG-110M	3056.50	763.94	32.	-1.	-0.001	806.23	1.451s
NB-95	3063.89	765.79	63.	-17.	-0.009	71.50	1.453s
PA-234M	3066.38	766.41	82.	-6.	-0.003	116.22	1.453s
CS-134	3184.20	795.87	23.	10.	0.006	73.48	1.477s
TL-210	3199.12	799.60	68.	-15.	-0.008	84.09	1.480s
CS-134	3208.53	801.95	57.	2.	0.001	473.42	1.482
CO-58	3243.82	810.78	19.	7.	0.004	92.63	1.489
La-140	3263.80	815.77	40.	-10.	-0.006	91.57	1.493s
Cs-136	3274.72	818.50	23.	7.	0.004	98.85	1.495s
MN-54	3340.10	834.85	10.	7.	0.004	97.67	1.508s
TL-208	3442.95	860.56	19.	11.	0.006	91.53	1.529s
NB-94	3485.08	871.10	23.	-5.	-0.003	135.21	1.537s
EU-154	3493.61	873.23	24.	5.	0.003	149.91	1.539s
PA-234	3522.80	880.53	52.	-12.	-0.007	90.11	1.544s
PA-234	3533.64	883.24	65.	-10.	-0.006	112.53	1.547s
AG-110M	3539.41	884.68	64.	10.	0.006	115.48	1.547s
Y-88	3592.83	898.04	14.	0.	0.000	1000.00	1.558s
AC-228	3644.67	911.00	3.	66.	0.037	13.43	1.836
PA-234	3784.70	946.02	23.	-5.	-0.003	163.03	1.595s
EU-152	3857.05	964.11	39.	30.	0.017	34.64	1.609s
AC-228	3876.48	968.97	38.	5.	0.003	183.28	1.612s
EU-154	3985.88	996.33	0.	22.	0.012	21.32	1.633s
PA-234M	4004.55	1001.00	25.	-3.	-0.002	327.56	1.636s
EU-154	4019.65	1004.77	33.	-6.	-0.003	147.93	1.639
Co-56	4151.87	1037.84	10.	3.	0.002	259.73	1.664s
Cs-136	4192.77	1048.07	30.	-7.	-0.004	116.93	1.671s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
RH-106	4201.93	1050.36	46.	-8.	-0.004	89.84	1.673s
BI-207	4255.11	1063.66	10.	4.	0.002	199.25	1.682s
Ga-68	4310.04	1077.40	15.	1.	0.001	857.32	1.692s
FE-59	4397.41	1099.25	25.	-13.	-0.007	88.99	1.708s
EU-152	4448.68	1112.07	35.	6.	0.003	146.08	1.717s
ZN-65	4462.56	1115.55	41.	6.	0.003	156.91	1.720s
BI-214	4481.51	1120.29	73.	-16.	-0.009	45.53	1.723s
Sc-46	4482.57	1120.55	47.	7.	0.004	146.45	1.723s
Ta-182	4485.56	1121.30	17.	6.	0.003	104.48	1.724s
CO-60	4693.21	1173.24	15.	4.	0.002	218.66	1.760s
Ta-182	4756.42	1189.05	5.	6.	0.003	91.54	1.771s
Ta-182	4885.79	1221.41	21.	4.	0.002	291.05	1.793s
Co-56	4953.23	1238.28	11.	17.	0.009	51.04	1.804s
NA-22	5098.13	1274.53	16.	-5.	-0.003	121.66	1.828s
EU-154	5098.17	1274.54	21.	0.	0.000	1000.00	1.828s
FE-59	5166.35	1291.60	21.	-3.	-0.002	252.46	1.840s
TL-210	5251.91	1313.00	0.	13.	0.007	27.74	1.854s
CO-60	5329.85	1332.50	16.	-5.	-0.003	158.41	1.866s
AG-110M	5536.88	1384.30	11.	-2.	-0.001	452.11	1.899s
EU-152	5631.62	1408.00	11.	5.	0.003	161.40	1.914s
K-40	5843.61	1461.05	0.	191.	0.106	7.24	1.385s
La-140	6383.73	1596.21	0.	0.	0.000	1000.00	2.024s
SB-124	6762.39	1690.98	0.	0.	0.000	1000.00	2.076s
BI-214	7056.06	1764.49	22.	-6.	-0.003	70.52	2.114s
Co-56	7083.46	1771.35	14.	7.	0.004	81.26	2.117s
Y-88	7341.96	1836.06	0.	0.	0.000	1000.00	2.149s

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	-5.6275E+00				5.31E+01	
			477.60	-5.627E+00	?(	1.787E+01 9.43E+01 1.05E+01	G
NA-22	C	-4.8551E-01				9.50E+02	
			1274.53	-4.855E-01	?(	2.073E+00 1.22E+02 9.99E+01	G
K-40	N	1.9487E+02				4.66E+11	
			1460.83	1.949E+02	(	7.519E+00 7.24E+00 1.07E+01	G
Sc-46	F	2.7511E-01				8.38E+01	
			889.28	-4.782E-02	&(	2.658E+00 1.57E+03 1.00E+02	G
			1120.55	5.980E-01	?(	3.022E+00 1.46E+02 1.00E+02	G

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Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CR-51	F	-5.3200E+00					2.77E+01	
			320.08	-5.320E+00	?(P	1.816E+01	1.11E+02	9.94E+00 G
MN-54	C	4.9105E-01					3.12E+02	
			834.85	4.911E-01	&(P	1.163E+00	9.77E+01	1.00E+02 G
FE-59	F	-1.9715E+00					4.45E+01	
			1099.25	-1.972E+00	?(	3.945E+00	8.90E+01	5.65E+01 G
			1291.60	-7.706E-01	+ P	5.512E+00	2.52E+02	4.32E+01 G
Co-56	C	1.0281E+00					7.73E+01	
			846.77	3.966E-02	%(P	1.172E+00	1.14E+03	9.99E+01 G
			1238.28	2.401E+00	?(P	2.629E+00	5.10E+01	6.61E+01 G
			1037.84	1.598E+00	&(P	1.018E+01	2.60E+02	1.41E+01 G
			1771.35	6.083E+00	?	1.676E+01	8.13E+01	1.55E+01 A
CO-57	C	5.3306E-01					2.72E+02	
			122.06	2.659E-01	?(	8.692E-01	9.72E+01	8.56E+01 G
			136.47	2.674E+00	?(	1.158E+01	1.29E+02	1.07E+01 G
CO-58	C	4.8847E-01					7.09E+01	
			810.78	4.885E-01	&(	1.548E+00	9.26E+01	9.95E+01 G
CO-60	F	-9.3269E-02					1.93E+03	
			1332.50	-5.486E-01	?(P	2.177E+00	1.58E+02	1.00E+02 G
			1173.24	3.624E-01	?(	1.881E+00	2.19E+02	9.99E+01 G
ZN-65	F	1.0245E+00					2.44E+02	
			1115.55	1.025E+00	?(	5.579E+00	1.57E+02	5.06E+01 G
NB-94	I	8.8187E-01					7.41E+06	
			702.63	8.819E-01	&(	7.462E-01	3.90E+01	9.79E+01 G
			871.10	-3.763E-01	-	1.779E+00	1.35E+02	9.99E+01 G
ZR-95	I	7.3963E-01					6.40E+01	
			756.73	7.396E-01	&(P	1.950E+00	1.03E+02	5.45E+01 G
			724.20	-9.536E-01	+	5.865E+00	1.79E+02	4.42E+01 G
NB-95	I	-1.0618E+00					6.40E+01	
			765.79	-1.062E+00	?(	2.523E+00	7.15E+01	9.98E+01 G
RU-103	I	-6.8232E-01					3.93E+01	
			497.05	-6.823E-01	?(P	1.632E+00	7.45E+01	9.09E+01 G
			610.30	0.000E+00	+	6.802E+01	1.00E+03	5.75E+00 GA

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
RH-106	I	-7.0095E+00					3.74E+02	
			621.92	-7.010E+00	?(	4.289E+01	1.82E+02	9.93E+00 G
			1050.36	-4.237E+01	+ P	1.814E+02	8.98E+01	1.56E+00 G
			511.86	1.965E+01	?	7.269E+00	1.49E+01	2.00E+01 GA
AG-108M	C	3.0488E-02					1.53E+05	
			433.94	3.049E-02	%(P	1.339E+00	1.68E+03	9.05E+01 G
			722.94	0.000E+00	-	2.692E+00	1.00E+03	9.08E+01 G
			614.28	0.000E+00	-	4.377E+00	1.00E+03	8.98E+01 G
AG-110M	F	9.9878E-01					2.50E+02	
			884.68	9.988E-01	?(	3.924E+00	1.15E+02	7.27E+01 G
			657.76	-6.082E-01	-	1.835E+00	8.92E+01	9.46E+01 G
			937.49	7.272E-02	%	4.984E+00	2.75E+03	3.44E+01 G
			1384.30	-7.138E-01	-	7.679E+00	4.52E+02	2.43E+01 G
			763.94	-2.834E-01	-	8.238E+00	8.06E+02	2.23E+01 G
SN-113	F	4.9394E-01					1.15E+02	
			391.69	4.939E-01	(	2.269E+00	1.34E+02	6.40E+01 G
SB-124	F	1.2809E-01					6.02E+01	
			602.73	0.000E+00	?(	3.939E+00	1.00E+03	9.83E+01 G
			1690.98	0.000E+00	?(	1.899E+00	1.00E+03	4.78E+01 G
			722.79	1.859E+00	?(	2.208E+01	3.40E+02	1.08E+01 G
SB-125	I	1.4511E+00					1.01E+03	
			427.88	1.161E+00	?(P	3.607E+00	1.22E+02	2.96E+01 G
			600.50	1.311E+00	&(	2.141E+01	4.80E+02	1.79E+01 G
			635.89	4.240E-01	(P	1.270E+01	8.24E+02	1.13E+01 G
			463.37	3.620E+00	*(P	1.218E+01	9.88E+01	1.05E+01 G
I-131	I	5.0437E-02					8.02E+00	
			364.48	-7.188E-02	%(P	1.352E+00	1.11E+03	8.17E+01 G
			284.30	-7.612E+00	+ P	1.974E+01	1.13E+02	6.14E+00 G
			636.97	1.444E+00	&(P	2.202E+01	4.26E+02	7.17E+00 G
Gd-153	F	8.6506E-01					2.42E+02	
			97.50	8.651E-01	&(	3.025E+00	1.04E+02	3.00E+01 G
			103.20	-1.274E+00	+	5.445E+00	1.27E+02	2.18E+01 G
Ga-68	C	2.9916E+00					4.71E-02	
			1077.40	2.992E+00	?(	6.210E+01	8.57E+02	3.30E+00 G
Tc-99m	I	-2.4128E-01					2.51E-01	
			140.51	-2.413E-01	?(	1.439E+00	1.77E+02	8.93E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
BA-133	F	-1.2553E-01					3.85E+03	
			356.00	-1.255E-01	&(	4.041E+00	9.44E+02	6.20E+01 G
			302.85	-2.641E+00	+	1.593E+01	1.80E+02	1.83E+01 G
			383.84	4.087E+00	&	1.618E+01	1.16E+02	8.94E+00 GA
			80.99	9.181E-01		2.874E+00	1.16E+02	3.41E+01 GA
CS-134	I	1.1950E+00					7.54E+02	
			795.87	7.845E-01	&(	1.927E+00	7.35E+01	8.55E+01 G
			604.71	2.677E-01	-	3.935E+00	4.32E+02	9.76E+01 G
			569.32	2.247E+00	?(	8.497E+00	1.10E+02	1.54E+01 G
			801.95	1.728E+00	(	2.874E+01	4.73E+02	8.69E+00 G
			563.24	2.908E+00	(P	1.498E+01	1.99E+02	8.35E+00 G
CS-137	I	-1.3606E+00					1.10E+04	
			661.66	-1.361E+00	?(P	2.887E+00	4.36E+01	8.52E+01 G
CE-139	F	1.6275E-01					1.38E+02	
			165.85	1.628E-01	?(	1.238E+00	2.23E+02	7.99E+01 G
Ba-140	I	-1.1348E+00					1.28E+01	
			537.26	-1.929E+00	?(	5.915E+00	1.22E+02	2.44E+01 G
			162.66	1.978E+00	&(P	1.683E+01	2.49E+02	6.22E+00 G
			304.85	-1.137E+01	&	6.717E+01	1.76E+02	4.29E+00 G
La-140	I	1.9433E-01					1.28E+01	
			1596.21	0.000E+00	?(	9.063E-01	1.00E+03	9.54E+01 G
			487.02	1.849E-01	?(P	2.609E+00	5.39E+02	4.55E+01 G
			328.76	1.129E+00	?(	5.911E+00	1.99E+02	2.03E+01 G
			815.77	-2.975E+00	+	9.221E+00	9.16E+01	2.33E+01 G
CE-141	I	5.9913E-01					3.25E+01	
			145.44	5.991E-01	?(	2.504E+00	1.24E+02	4.82E+01 G
CE-144	I	2.1801E+00					2.85E+02	
			133.54	2.180E+00	(	1.135E+01	1.55E+02	1.11E+01 G
PM-144	C	-2.0636E-02					3.63E+02	
			696.54	-2.064E-02	%(P	1.460E+00	2.74E+03	9.90E+01 G
			618.06	0.000E+00	+	3.989E+00	1.00E+03	9.91E+01 G
EU-152	F	3.6042E+00					4.94E+03	
			121.78	-5.605E-01	?(	3.387E+00	1.78E+02	2.86E+01 G
			344.29	1.302E+00	&(	5.232E+00	1.18E+02	2.65E+01 G
			1112.07	3.784E+00	?(	1.920E+01	1.46E+02	1.36E+01 G
			778.92	1.716E-01	% P	1.371E+01	3.27E+03	1.29E+01 G
			964.11	1.576E+01	(	1.672E+01	3.46E+01	1.46E+01 G
			244.69	-1.926E+00	&	3.683E+01	5.68E+02	7.58E+00 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
			1408.00	2.431E+00	? P	9.184E+00	1.61E+02	2.10E+01 GA
EU-154	I	3.3837E+00					3.14E+03	
			123.10	1.891E-01	?(P	2.096E+00	3.23E+02	4.08E+01 G
			1274.54	0.000E+00	-	6.636E+00	1.00E+03	3.52E+01 G
			723.36	0.000E+00	-	1.210E+01	1.00E+03	2.02E+01 G
			873.23	2.782E+00	?(	1.465E+01	1.50E+02	1.23E+01 G
			1004.77	-2.513E+00	+	1.295E+01	1.48E+02	1.80E+01 G
			996.33	1.637E+01	?(	5.485E+00	2.13E+01	1.06E+01 G
EU-155	I	2.4382E+00					1.81E+03	
			105.31	2.438E+00	*(	2.729E+00	4.33E+01	2.12E+01 G
			86.54	8.288E-02	}	6.729E+00	1.21E+03	3.07E+01 G
HF-181	F	7.1788E-02					4.24E+01	
			482.00	-6.142E-03	%(	2.423E+00	1.13E+04	8.05E+01 G
			133.02	-7.480E-01	+	3.304E+00	1.32E+02	4.33E+01 G
			345.83	1.896E-01	%	7.280E+00	1.08E+03	1.51E+01 G
			136.30	1.144E+00	?(	2.211E+01	5.69E+02	5.85E+00 G
Ta-182	F	1.8110E+00					1.14E+02	
			1121.30	1.495E+00	?(	5.415E+00	1.04E+02	3.49E+01 G
			1221.41	1.271E+00	&(	8.403E+00	2.91E+02	2.70E+01 G
			1189.05	3.390E+00	&(	7.419E+00	9.15E+01	1.62E+01 G
Hg-203	F	2.9708E-01					4.66E+01	
			279.20	2.971E-01	?(	1.605E+00	1.58E+02	8.15E+01 G
TL-208	N	6.4599E+00					6.98E+02	
			583.02	6.561E+00	(P	1.304E+00	1.26E+01	8.45E+01 G
			277.28	6.075E+00	?(	1.938E+01	9.48E+01	6.31E+00 G
			860.56	5.970E+00	?(	1.283E+01	9.15E+01	1.24E+01 G
PM-146	C	2.6208E-01					2.02E+03	
			453.88	2.721E-01	?(P	1.945E+00	2.77E+02	6.50E+01 G
			747.16	2.430E-01	?(	2.994E+00	4.59E+02	3.40E+01 G
			735.72	-1.362E+00	+ P	7.199E+00	1.91E+02	2.25E+01 G
Cd-113m		3.9031E+03					5.33E+03	
			263.70	3.903E+03	(	1.709E+04	1.28E+02	6.00E-03 K
Cf-251	T	-2.0115E+00					3.28E+05	
			176.60	-2.011E+00	?(	5.667E+00	1.05E+02	1.70E+01 G
			227.00	9.728E+00	*	1.340E+01	5.24E+01	6.30E+00 GA
Cf-249	T	5.5515E-01					1.28E+05	
			387.95	5.551E-01	?(	2.366E+00	1.25E+02	6.60E+01 G
			333.44	-1.359E+00	&	7.828E+00	2.18E+02	1.55E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Sn-126		3.6197E+00					3.65E+07	
			87.57	1.256E+00	}	5.249E+00	6.25E+01	3.75E+01 GA
			64.28	3.620E+00	?(	1.437E+01	1.18E+02	9.70E+00 G
			86.94	3.620E+00	}	9.177E+00	1.18E+02	9.04E+00 GA
PB-210	N	2.4471E+01					8.14E+03	
			46.54	2.447E+01	*(P	2.977E+01	4.63E+01	4.25E+00 G
PB-212	N	1.7878E+01					6.98E+02	
			238.63	1.788E+01	(	1.534E+00	6.04E+00	4.33E+01 G
			300.03	3.929E+01	+	2.276E+01	2.80E+01	3.28E+00 GA
PB-214	N	1.4774E+01					5.84E+05	
			351.93	1.477E+01	*(	2.246E+00	9.67E+00	3.76E+01 G
			295.09	1.909E+01	+	4.976E+00	1.42E+01	1.93E+01 G
			242.00	1.448E+01		1.232E+01	2.83E+01	7.43E+00 GA
BI-207	C	2.9597E-01					1.18E+04	
			1063.66	4.080E-01	?(P	1.981E+00	1.99E+02	7.45E+01 G
			569.70	2.106E-01	&(	1.566E+00	2.12E+02	9.77E+01 G
BI-212	N	4.3330E+01					6.98E+02	
			727.17	4.333E+01	(	5.914E+00	1.36E+01	7.55E+00 G
			785.42	1.291E-01	% P	1.162E+02	3.60E+04	1.28E+00 GA
U-235	N	-5.6568E-01					2.57E+11	
			143.79	-5.657E-01	*(P	1.186E+01	4.34E+02	1.10E+01 G
			205.33	-1.921E+00	& P	1.924E+01	4.18E+02	5.01E+00 G
			163.38	-6.717E-02	& P	2.115E+01	9.03E+03	5.08E+00 G
			185.72	1.606E+00	P	1.790E+00	4.24E+01	5.40E+01 GA
BI-214	N	1.3055E+01					5.84E+05	
			609.31	1.305E+01	(P	2.887E+00	1.11E+01	4.61E+01 G
			1120.29	-9.060E+00	- P	2.447E+01	4.55E+01	1.51E+01 G
			1764.49	-4.760E+00	- P	2.026E+01	7.05E+01	1.54E+01 G
AC-228	N	1.7139E+01					2.10E+03	
			911.07	1.662E+01	(P	2.764E+00	1.34E+01	2.90E+01 G
			968.97	2.181E+00	- P	1.396E+01	1.83E+02	1.75E+01 G
			338.32	1.838E+01	(	6.805E+00	1.86E+01	1.20E+01 G
			93.35	5.895E+00	-	3.032E+01	1.54E+02	5.56E+00 XA
TH-227	N	6.7277E-01					7.95E+03	
			256.24	-3.025E+00	?(	1.547E+01	1.95E+02	7.00E+00 G
			235.97	2.777E+00	?(	2.151E+01	2.31E+02	1.23E+01 G
			50.14	-2.071E+00	+	1.983E+01	3.32E+02	8.00E+00 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-229	N	-6.5549E+00					2.68E+06	
			193.51	-6.555E+00	?(P	2.364E+01	1.32E+02	4.40E+00 G
			210.85	-6.192E+00	+ P	3.691E+01	2.23E+02	2.99E+00 G
TH-234	N	1.4661E+01					1.63E+12	
			92.59	1.245E+01	(P	1.665E+01	4.16E+01	5.58E+00 G
			63.29	1.790E+01	(P	2.701E+01	4.68E+01	3.81E+00 G
PA-231	N	-1.6794E+01					1.20E+07	
			302.65	-1.679E+01	?(	1.032E+02	1.83E+02	2.88E+00 G
			300.07	-1.948E+01	&	1.242E+02	1.90E+02	2.46E+00 G
PA-233	C	-1.2370E+00					7.82E+08	
			312.01	-1.237E+00	?(P	7.643E+00	1.29E+02	3.60E+01 G
			300.18	-7.730E+00	&	4.845E+01	1.87E+02	6.20E+00 G
PA-234	N	-1.7870E+00					1.63E+12	
			131.29	-1.787E+00	&(	7.684E+00	1.28E+02	1.80E+01 G
			946.02	-3.065E+00	+ P	1.424E+01	1.63E+02	1.34E+01 G
			569.47	-6.323E+00	&	2.097E+01	9.78E+01	8.20E+00 G
			883.24	-7.796E+00	+	2.981E+01	1.13E+02	9.60E+00 G
			880.53	-1.423E+01	+	4.323E+01	9.01E+01	6.00E+00 GA
PA-234M	N	-2.7166E+01					1.63E+12	
			1001.00	-2.717E+01	?(P	2.456E+02	3.28E+02	8.37E-01 G
			766.41	-1.241E+02	& P	9.685E+02	1.16E+02	2.94E-01 G
AM-241	T	7.5569E-01					1.58E+05	
			59.54	7.557E-01	&(P	3.671E+00	1.69E+02	3.59E+01 G
Ir-192	F	3.6521E-01					7.40E+01	
			316.49	3.652E-01	?(	1.695E+00	1.37E+02	8.70E+01 G
			468.06	-1.966E-01	-	3.130E+00	4.54E+02	5.18E+01 G
			308.44	-1.556E+00	&	8.804E+00	1.69E+02	3.18E+01 G
Cs-136	F	4.9176E-01					1.30E+01	
			818.50	4.918E-01	&(	1.667E+00	9.89E+01	1.00E+02 G
			1048.07	-7.203E-01	&	2.905E+00	1.17E+02	8.00E+01 G
			340.57	-2.287E-02	%	4.259E+00	5.41E+03	4.69E+01 G
Np-239	T	9.7776E-01					2.36E+00	
			103.70	-1.158E+00	+	4.773E+00	1.23E+02	2.40E+01 X
			106.13	9.778E-01	?(	5.998E+00	1.82E+02	2.27E+01 G
			99.50	2.361E-01	?	6.811E+00	8.42E+02	1.50E+01 X

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

Nd-147       1.4332E+00                                      1.11E+01
                          531.00 1.433E+00 ?(  6.755E+00 1.77E+02 1.30E+01 G
                           91.10 0.000E+00 -   6.708E+00 1.00E+03 2.83E+01 G

TL-210   N  -9.6462E-01                                      5.84E+05
                          799.60-9.646E-01 ?(  2.719E+00 8.41E+01 9.90E+01 G
                          296.00-5.973E-01 +   3.885E+00 1.94E+02 7.90E+01 G
                         1313.00 6.160E+00 ?   3.492E+00 2.77E+01 2.10E+01 GA

Kr-85    I   1.0542E+01                                      3.92E+03
                          513.98 1.054E+01 %(  5.843E+02 1.60E+03 4.30E-01 G
   ( - 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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********** 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 1 Sigma %	Activity	
TH-227	50.14	138.	-6.	-0.003	332.08	-2.071E+00	
AM-241	59.54	152.	12.	0.007	169.39	7.557E-01	P
BA-133	80.99	143.	19.	0.010	116.32	9.181E-01	
Gd-153	97.50	143.	17.	0.009	104.12	8.651E-01	
Np-239	99.50	185.	2.	0.001	842.19	2.361E-01	
Gd-153	103.20	255.	-18.	-0.010	127.33	-1.274E+00	
Np-239	103.70	237.	-18.	-0.010	122.83	-1.158E+00	
Np-239	106.13	341.	14.	0.008	182.37	9.778E-01	
CO-57	122.06	94.	15.	0.008	97.15	2.659E-01	
PA-234	131.29	330.	-20.	-0.011	128.38	-1.787E+00	
HF-181	133.02	350.	-20.	-0.011	131.89	-7.480E-01	
CE-144	133.54	268.	15.	0.008	154.75	2.180E+00	
HF-181	136.30	279.	4.	0.002	568.87	1.144E+00	
CO-57	136.47	254.	18.	0.010	128.97	2.674E+00	
Tc-99m	140.51	251.	-13.	-0.007	176.75	-2.413E-01	
U-235	143.79	267.	-4.	-0.002	434.45	-5.657E-01	P
CE-141	145.44	226.	17.	0.010	124.44	5.991E-01	
Ba-140	162.66	144.	7.	0.004	249.31	1.978E+00	P
CE-139	165.85	130.	7.	0.004	222.68	1.628E-01	
Cf-251	176.60	110.	-18.	-0.010	104.58	-2.011E+00	
U-235	185.72	101.	45.	0.025	42.42	1.606E+00	P
TH-229	193.51	110.	-14.	-0.008	132.16	-6.555E+00	P
U-235	205.33	85.	-5.	-0.003	417.69	-1.921E+00	P
TH-229	210.85	108.	-9.	-0.005	222.60	-6.192E+00	P
Cf-251	227.00	53.	27.	0.015	52.44	9.728E+00	
TH-227	235.97	545.	14.	0.008	230.80	2.777E+00	
TH-227	256.24	73.	-8.	-0.005	195.35	-3.025E+00	
Cd-113m	263.70	62.	9.	0.005	128.14	3.903E+03	
Hg-203	279.20	94.	9.	0.005	158.29	2.971E-01	
I-131	284.30	78.	-17.	-0.009	113.20	-7.612E+00	P
TL-210	296.00	502.	-16.	-0.009	193.97	-5.973E-01	
PA-231	300.07	486.	-17.	-0.009	190.07	-1.948E+01	
PA-233	300.18	469.	-17.	-0.009	186.87	-7.730E+00	
PA-231	302.65	453.	-17.	-0.009	183.18	-1.679E+01	
BA-133	302.85	436.	-17.	-0.009	179.82	-2.641E+00	
Ba-140	304.85	420.	-17.	-0.009	176.11	-1.137E+01	
BI-210M	304.90	403.	-17.	-0.009	172.66	-1.742E+00	
Ir-192	308.44	387.	-17.	-0.009	168.60	-1.556E+00	
PA-233	312.01	367.	-15.	-0.008	128.57	-1.237E+00	P
Ir-192	316.49	98.	10.	0.006	136.53	3.652E-01	
CR-51	320.08	146.	-17.	-0.010	110.66	-5.320E+00	P
La-140	328.76	59.	7.	0.004	198.86	1.129E+00	
Cf-249	333.44	59.	-7.	-0.004	218.40	-1.359E+00	
BA-133	356.00	241.	-2.	-0.001	943.83	-1.255E-01	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BA-133	383.84	66.	10.	0.006	116.42	4.087E+00	
Cf-249	387.95	77.	10.	0.006	125.24	5.551E-01	
SN-113	391.69	65.	9.	0.005	134.36	4.939E-01	
SB-125	427.88	28.	9.	0.005	122.26	1.161E+00	P
PM-146	453.88	37.	4.	0.002	277.08	2.721E-01	P
SB-125	463.37	36.	9.	0.005	98.82	3.620E+00	P
Ir-192	468.06	59.	-2.	-0.001	453.73	-1.966E-01	
BE-7	477.59	79.	-14.	-0.008	94.33	-5.627E+00	
La-140	487.02	28.	2.	0.001	539.11	1.849E-01	P
RU-103	497.05	44.	-14.	-0.008	74.47	-6.823E-01	P
RH-106	511.86	40.	87.	0.048	14.85	1.965E+01	
Nd-147	531.00	12.	4.	0.002	176.78	1.433E+00	
Ba-140	537.26	36.	-10.	-0.006	121.66	-1.929E+00	
PA-234	569.47	48.	-10.	-0.006	97.82	-6.323E+00	
BI-207	569.70	37.	4.	0.002	211.74	2.106E-01	
SB-125	600.50	234.	5.	0.003	479.73	1.311E+00	
RH-106	621.92	276.	-13.	-0.007	181.53	-7.010E+00	
SB-125	635.89	26.	1.	0.000	823.76	4.240E-01	P
I-131	636.97	32.	2.	0.001	426.15	1.444E+00	P
AG-110M	657.76	37.	-10.	-0.006	89.22	-6.082E-01	
CS-137	661.66	78.	-21.	-0.012	43.59	-1.361E+00	P
SB-124	722.79	63.	3.	0.002	340.29	1.859E+00	
ZR-95	724.20	74.	-7.	-0.004	178.90	-9.536E-01	
PM-146	735.72	26.	-5.	-0.003	191.07	-1.362E+00	P
PM-146	747.16	9.	1.	0.001	458.94	2.430E-01	
ZR-95	756.73	9.	6.	0.004	103.13	7.396E-01	P
AG-110M	763.94	32.	-1.	-0.001	806.23	-2.834E-01	
NB-95	765.79	63.	-17.	-0.009	71.50	-1.062E+00	
PA-234M	766.41	82.	-6.	-0.003	116.22	-1.241E+02	P
TL-210	799.60	68.	-15.	-0.008	84.09	-9.646E-01	
CO-58	810.78	19.	7.	0.004	92.63	4.885E-01	
La-140	815.77	40.	-10.	-0.006	91.57	-2.975E+00	
Cs-136	818.50	23.	7.	0.004	98.85	4.918E-01	
MN-54	834.85	10.	7.	0.004	97.67	4.911E-01	P
PA-234	880.53	52.	-12.	-0.007	90.11	-1.423E+01	
PA-234	883.24	65.	-10.	-0.006	112.53	-7.796E+00	
AG-110M	884.68	64.	10.	0.006	115.48	9.988E-01	
PA-234	946.02	23.	-5.	-0.003	163.03	-3.065E+00	P
PA-234M	1001.00	25.	-3.	-0.002	327.56	-2.717E+01	P
Co-56	1037.84	10.	3.	0.002	259.73	1.598E+00	P
Cs-136	1048.07	30.	-7.	-0.004	116.93	-7.203E-01	
RH-106	1050.36	46.	-8.	-0.004	89.84	-4.237E+01	P
BI-207	1063.66	10.	4.	0.002	199.25	4.080E-01	P
Ga-68	1077.40	15.	1.	0.001	857.32	2.992E+00	
FE-59	1099.25	25.	-13.	-0.007	88.99	-1.972E+00	
ZN-65	1115.55	41.	6.	0.003	156.91	1.025E+00	
Sc-46	1120.55	47.	7.	0.004	146.45	5.980E-01	
CO-60	1173.24	15.	4.	0.002	218.66	3.624E-01	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Co-56	1238.28	11.	17.	0.009	51.04	2.401E+00	P
NA-22	1274.53	16.	-5.	-0.003	121.66	-4.855E-01	
FE-59	1291.60	21.	-3.	-0.002	252.46	-7.706E-01	P
TL-210	1313.00	0.	13.	0.007	27.74	6.160E+00	
CO-60	1332.50	16.	-5.	-0.003	158.41	-5.486E-01	P
AG-110M	1384.30	11.	-2.	-0.001	452.11	-7.138E-01	
Co-56	1771.35	14.	7.	0.004	81.26	6.083E+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	Time Corrected Activity Bq/Sample	Uncertainty Counting 1 Sigma	MDA Bq/Sample
BE-7	#A	-5.6274E+00	-5.6275E+00	9.433E+01%	1.79E+01
NA-22	#A	-4.8551E-01	-4.8551E-01	1.217E+02%	2.07E+00
K-40		1.9487E+02	1.9487E+02	7.236E+00%	7.52E+00
Sc-46	#A	2.7511E-01	2.7511E-01	1.465E+02%	2.66E+00
CR-51	#A	-5.3199E+00	-5.3200E+00	1.107E+02%	1.82E+01
MN-54	#A	4.9105E-01	4.9105E-01	9.767E+01%	1.16E+00
FE-59	#A	-1.9715E+00	-1.9715E+00	8.899E+01%	3.94E+00
Co-56	#A	1.0281E+00	1.0281E+00	5.104E+01%	1.17E+00
CO-57	#A	5.3306E-01	5.3306E-01	8.073E+01%	8.69E-01
CO-58	#A	4.8847E-01	4.8847E-01	9.263E+01%	1.55E+00
CO-60	#A	-9.3269E-02	-9.3269E-02	1.350E+02%	2.18E+00
ZN-65	#A	1.0245E+00	1.0245E+00	1.569E+02%	5.58E+00
NB-94	#	8.8187E-01	8.8187E-01	3.900E+01%	7.46E-01
ZR-95	#A	7.3962E-01	7.3963E-01	1.031E+02%	1.95E+00
NB-95	#A	-1.0618E+00	-1.0618E+00	7.150E+01%	2.52E+00
RU-103	#A	-6.8231E-01	-6.8232E-01	7.447E+01%	1.63E+00
RH-106	#A	-7.0095E+00	-7.0095E+00	1.815E+02%	4.29E+01
AG-108M	#A	3.0488E-02	3.0488E-02	1.685E+03%	1.34E+00
AG-110M	#A	9.9878E-01	9.9878E-01	1.155E+02%	3.92E+00
SN-113	#A	4.9394E-01	4.9394E-01	1.344E+02%	2.27E+00
SB-124	#A	1.2809E-01	1.2809E-01	3.403E+02%	3.94E+00
SB-125	#A	1.4511E+00	1.4511E+00	9.882E+01%	3.61E+00
I-131	#A	5.0434E-02	5.0437E-02	4.261E+02%	1.35E+00
Gd-153	#A	8.6506E-01	8.6506E-01	1.041E+02%	3.03E+00
Ga-68	#A	2.9662E+00	2.9916E+00	8.573E+02%	6.21E+01
Tc-99m	#A	-2.4089E-01	-2.4128E-01	1.767E+02%	1.44E+00
BA-133	#A	-1.2553E-01	-1.2553E-01	9.438E+02%	4.04E+00
CS-134	A	1.1950E+00	1.1950E+00	7.348E+01%	1.93E+00
CS-137	#A	-1.3606E+00	-1.3606E+00	4.359E+01%	2.89E+00
CE-139	#A	1.6275E-01	1.6275E-01	2.227E+02%	1.24E+00
Ba-140	#A	-1.1347E+00	-1.1348E+00	1.217E+02%	5.91E+00
La-140	#A	1.9432E-01	1.9433E-01	1.989E+02%	9.06E-01
CE-141	#A	5.9912E-01	5.9913E-01	1.244E+02%	2.50E+00

CE-144 #A	2.1801E+00	2.1801E+00	1.547E+02%		1.14E+01
PM-144 #A	-2.0636E-02	-2.0636E-02	2.735E+03%		1.46E+00
EU-152 #C	3.6042E+00	3.6042E+00	3.464E+01%		3.39E+00
EU-154 #C	3.3837E+00	3.3837E+00	2.132E+01%		2.10E+00
EU-155 #A	2.4382E+00	2.4382E+00	4.325E+01%		2.73E+00
HF-181 #A	7.1787E-02	7.1788E-02	5.689E+02%		2.42E+00
Ta-182 #A	1.8110E+00	1.8110E+00	9.154E+01%		5.41E+00
Hg-203 #A	2.9708E-01	2.9708E-01	1.583E+02%		1.61E+00
TL-208	6.4599E+00	6.4599E+00	1.259E+01%		1.30E+00
PM-146 #A	2.6208E-01	2.6208E-01	2.680E+02%		1.94E+00
Y-88 #A	0.0000E+00	0.0000E+00	7.071E+02%		9.81E-01
Cd-113m#A	3.9031E+03	3.9031E+03	1.281E+02%		1.71E+04
Cd-109 #A	0.0000E+00	0.0000E+00	1.000E+03%		5.09E+01
Cf-251 #A	-2.0115E+00	-2.0115E+00	1.046E+02%		5.67E+00
Cf-249 #A	5.5515E-01	5.5515E-01	1.252E+02%		2.37E+00
Sn-126 A	3.6197E+00	3.6197E+00	1.182E+02%		1.44E+01
PB-210 #A	2.4471E+01	2.4471E+01	4.629E+01%		2.98E+01
PB-212	1.7878E+01	1.7878E+01	6.038E+00%		1.53E+00
PB-214 #	1.4774E+01	1.4774E+01	9.671E+00%		2.25E+00
BI-207 #A	2.9597E-01	2.9597E-01	1.454E+02%		1.98E+00
BI-212 #	4.3330E+01	4.3330E+01	1.361E+01%		5.91E+00
U-235 #A	-5.6568E-01	-5.6568E-01	4.345E+02%		1.19E+01
BI-214	1.3055E+01	1.3055E+01	1.110E+01%		2.89E+00
BI-210M#A	0.0000E+00	0.0000E+00	1.000E+03%		2.20E+00
AC-228	1.7139E+01	1.7139E+01	1.148E+01%		2.76E+00
TH-227 #A	6.7277E-01	6.7277E-01	1.512E+02%		1.55E+01
TH-229 #A	-6.5549E+00	-6.5549E+00	1.322E+02%		2.36E+01
TH-234 #A	1.4661E+01	1.4661E+01	3.133E+01%		1.66E+01
PA-231 #A	-1.6794E+01	-1.6794E+01	1.832E+02%		1.03E+02
PA-233 #A	-1.2370E+00	-1.2370E+00	1.286E+02%		7.64E+00
PA-234 #A	-1.7870E+00	-1.7870E+00	1.284E+02%		7.68E+00
PA-234M#A	-2.7166E+01	-2.7166E+01	3.276E+02%		2.46E+02
AM-241 #A	7.5569E-01	7.5569E-01	1.694E+02%		3.67E+00
Np-237 #A	0.0000E+00	0.0000E+00	1.000E+03%		1.65E+01
Ir-192 #A	3.6521E-01	3.6521E-01	1.365E+02%		1.69E+00
Cs-136 #A	4.9175E-01	4.9176E-01	9.885E+01%		1.67E+00
Np-239 #A	9.7759E-01	9.7776E-01	1.824E+02%		6.00E+00
Nd-147 #A	1.4332E+00	1.4332E+00	1.768E+02%		6.76E+00
TL-210 #A	-9.6462E-01	-9.6462E-01	8.409E+01%		2.72E+00
Kr-85 #A	1.0542E+01	1.0542E+01	1.603E+03%		5.84E+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

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-----------------------------   S U M M A R Y   -----------------------------
Total Activity (   37.6 to  2000.8 keV)     3.491E+02  Bq/Sample
Total Decayed Activity (   37.6 to  2000.8 keV) 3.4907883E+02  Bq/Sample
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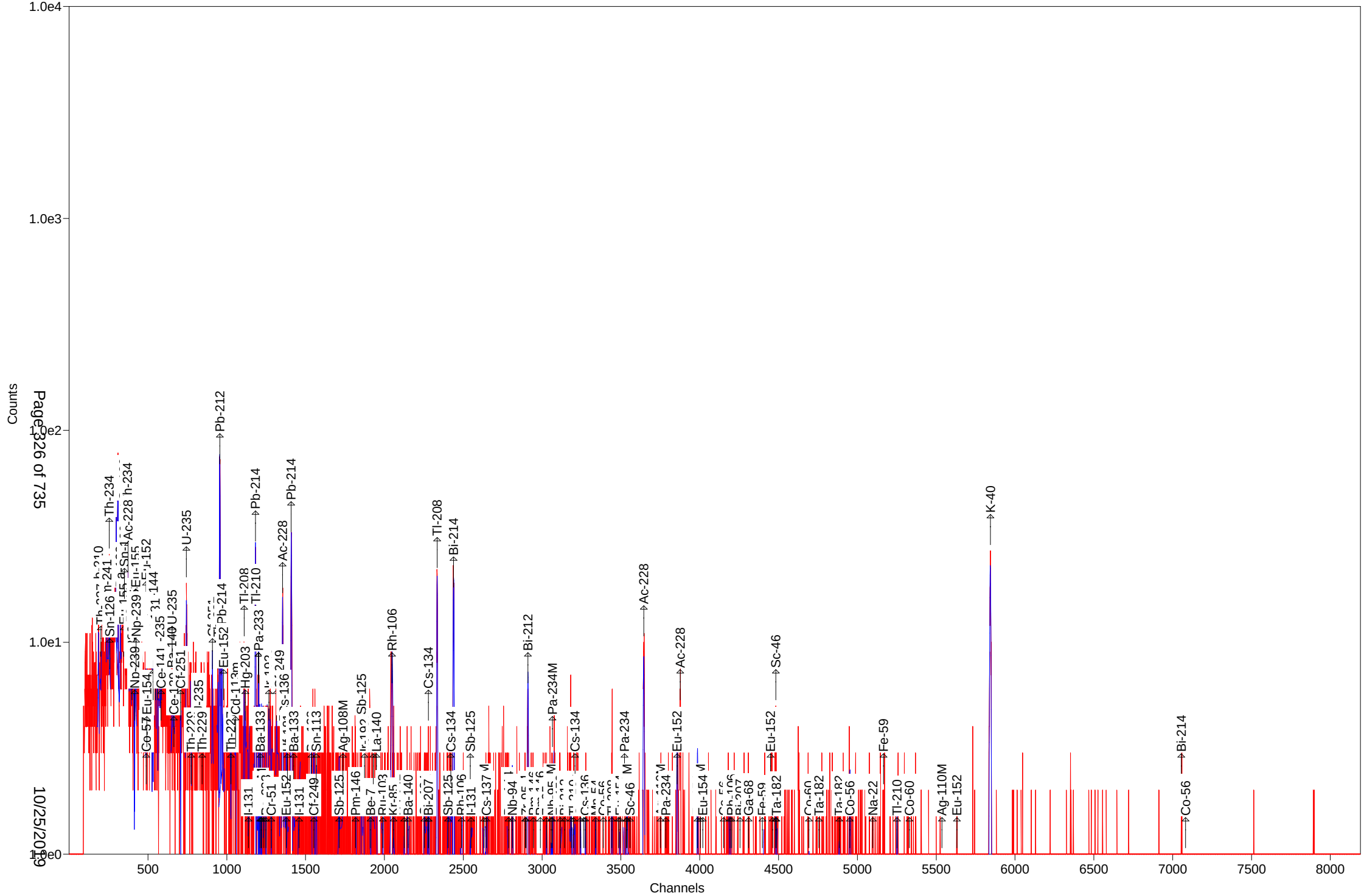
444057_Gamma_180-95857-A-3-C. 5_Gamma_20192606.spc.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1.0e3
1.0e2
1.0e1
1.0e0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
6500
7000
7500
8000
Pb-212
Th-234
Ac-228
U-235
Pb-214
Ac-228
Pb-214
Tl-208
Bi-214
Ac-228
K-40
Rh-106
Cs-134
Bi-212
Pa-234M
Ac-228
Sc-46
Eu-152
Fe-59
Bi-214
Co-56
Ag-110M
Na-22
Tl-210
Co-60
Ta-182
Ga-68
Pa-234
Sb-125
Ag-108M
La-140
Be-7
Cs-137
Nb-94
Eu-154
Cs-136
Sc-46
Eu-152
Co-60
Ta-182
Co-56
Eu-152
Cf-249
Sn-113
Ba-133
Cd-113m
Hg-203
Pa-233
Th-229
Th-227
Th-228
Cf-251
Np-239
Eu-155
Sn-126
Ce-141
Ce-144
Pm-146
Ru-103
Kr-85
Ba-140
Bi-207
Rh-106
I-131
Cr-51
Pb-210
Pa-233
Th-230
Th-232
Th-231
Np-237
Np-239
Eu-154
Co-57
Ce-139
Ce-143
Ce-144
Ce-141
Ce-139
Ce-143
Ce-144
Ce-141
Ce-139
Ce-143
Ce-144
Ce-141

Test America St. Louis Spectrum ID: 8_Gamma_20191611

Sample Description: 444057_Gamma_180-95857-A-3-D DU
Detector: Detector # 8
Batch ID: 444057
Work Order Number: Gamma
Lot Number: 180-95857-A-3-D DU

Decay to Time: 10/15/2019 11:16 Live Time: 1800 sec
Acquisition Time: 10/15/2019 11:16:57 Real Time: 1844 sec
Analysis Time: 10/15/2019 11:48 Dead Time: 2.41 %
Analysis Quantity: 1.000E+00 Sample

Efficiency Cal File: 8_Soil_TunaCan.Clb
Efficiency Cal Desc: 8_Soil_TunaCan_90099_032712
Efficiency Cal Date: 3/28/2012 10:35
Energy Cal Date: 2/28/2012 10:34
Library: Client_Long_Rev15.lib
Bkgd Correction File: 8_2019-10-06_1931.PBC

Nuclide	Activity Bq/Sample	1-Sigma Counting Uncert %	1-Sigma Counting Uncert Bq/Sample	1-Sigma Total Uncert Bq/Sample	Minimum Detectable Activity Bq/Sample
BE-7	1.932E+00	233.6	4.513E+00	4.514E+00	1.553E+01
NA-22	1.602E-01	244.9	3.924E-01	3.925E-01	1.455E+00
K-40	2.059E+02	6.5	1.337E+01	1.702E+01	9.370E+00
Sc-46	2.019E-01	219.9	4.439E-01	4.441E-01	1.808E+00
CR-51	2.663E+00	283.6	7.552E+00	7.554E+00	2.543E+01
MN-54	2.419E-01	216.9	5.246E-01	5.248E-01	1.275E+00
FE-59	1.514E-01	119.0	1.801E-01	1.802E-01	2.938E+00
Co-56	-7.991E-01	67.1	5.364E-01	5.380E-01	1.863E+00
CO-57	0.000E+00	1.#INF	2.591E-01	2.591E-01	1.587E+01
CO-58	-7.825E-01	86.2	6.749E-01	6.761E-01	2.265E+00
CO-60	-3.114E-01	206.7	6.437E-01	6.439E-01	1.714E+00
ZN-65	-1.617E-02	7812.2	1.263E+00	1.263E+00	5.768E+00
NB-94	-6.108E-01	99.5	6.076E-01	6.084E-01	1.631E+00
ZR-95	3.838E-01	105.3	4.043E-01	4.048E-01	2.943E+00
NB-95	-5.017E-01	144.6	7.252E-01	7.256E-01	2.470E+00
RU-103	-3.748E-01	144.4	5.411E-01	5.414E-01	1.335E+00
RH-106	-6.561E+00	142.0	9.314E+00	9.320E+00	3.137E+01
AG-108M	3.483E-01	103.7	3.612E-01	3.617E-01	8.848E-01
AG-110M	-1.404E-01	40.8	5.731E-02	5.776E-02	2.990E+00
SN-113	7.394E-02	791.8	5.855E-01	5.855E-01	1.513E+00
SB-124	-7.203E-02	45.2	3.258E-02	3.279E-02	3.596E+00
SB-125	2.242E+00	55.9	1.254E+00	1.259E+00	2.973E+00
I-131	4.536E-01	103.8	4.709E-01	4.715E-01	1.120E+00
Gd-153	1.290E+00	132.3	1.707E+00	1.709E+00	5.692E+00
Ga-68	-9.883E+00	279.3	2.761E+01	2.761E+01	6.427E+01
Tc-99m	-3.929E-01	146.5	5.756E-01	5.760E-01	1.922E+00
BA-133	-3.315E-01	148.9	4.935E-01	4.938E-01	3.988E+00
CS-134	1.050E+00	62.1	6.517E-01	6.540E-01	1.398E+00
CS-137	-1.785E-01	370.8	6.619E-01	6.619E-01	2.346E+00
CE-139	1.852E-01	203.3	3.766E-01	3.770E-01	1.277E+00
Ba-140	1.916E+00	123.9	2.375E+00	2.377E+00	4.200E+00
La-140	-1.089E+00	109.1	1.187E+00	1.189E+00	2.541E+00
CE-141	4.562E-01	228.5	1.042E+00	1.043E+00	3.494E+00

CE-144	2.376E+00	161.5	3.838E+00	3.840E+00	1.286E+01
PM-144	2.963E+00	11.5	3.398E-01	3.731E-01	1.749E+00
EU-152	2.271E-01	90.5	2.055E-01	2.059E-01	9.376E+00
EU-154	-1.865E-01	316.8	5.909E-01	5.910E-01	2.019E+00
EU-155	1.267E+00	82.0	1.039E+00	1.041E+00	3.464E+00
HF-181	8.259E-01	77.8	6.426E-01	6.440E-01	1.772E+00
Ta-182	-1.027E-01	1892.1	1.944E+00	1.944E+00	6.944E+00
Hg-203	2.154E-01	193.6	4.171E-01	4.172E-01	1.426E+00
TL-208	5.767E+00	10.1	5.828E-01	6.551E-01	7.476E-01
PM-146	5.255E-01	99.1	5.210E-01	5.217E-01	1.269E+00
Y-88	-7.400E-02	846.3	6.263E-01	6.263E-01	1.532E+00
Cd-113m	-7.318E+03	87.5	6.402E+03	6.419E+03	2.139E+04
Cd-109	0.000E+00	1.#INF	1.783E+01	1.783E+01	5.939E+01
Cf-251	1.790E+00	95.4	1.708E+00	1.715E+00	4.385E+00
Cf-249	1.891E-02	3544.0	6.703E-01	6.703E-01	2.329E+00
Sn-126	-5.433E+00	112.3	6.102E+00	6.109E+00	2.033E+01
PB-210	1.395E+01	114.2	1.594E+01	1.596E+01	5.333E+01
PB-212	1.802E+01	5.6	1.016E+00	1.546E+00	1.550E+00
PB-214	1.525E+01	7.5	1.141E+00	1.389E+00	2.525E+00
BI-207	4.925E-01	81.4	4.011E-01	4.018E-01	1.917E+00
BI-212	5.948E+00	85.0	5.057E+00	5.066E+00	1.712E+01
U-235	1.983E-01	82.6	1.638E-01	1.641E-01	1.514E+01
BI-214	1.547E+01	10.1	1.561E+00	1.756E+00	2.136E+00
BI-210M	3.645E-01	291.6	1.063E+00	1.063E+00	2.528E+00
AC-228	1.683E+01	9.5	1.593E+00	1.810E+00	1.527E+00
TH-227	-6.114E-01	900.0	5.503E+00	5.503E+00	1.389E+01
TH-229	1.265E+01	54.9	6.942E+00	7.016E+00	1.744E+01
TH-234	1.139E+01	43.8	4.983E+00	5.023E+00	1.740E+01
PA-231	8.532E+00	196.0	1.672E+01	1.673E+01	7.529E+01
PA-233	1.096E+00	203.4	2.230E+00	2.230E+00	6.567E+00
PA-234	2.851E+00	76.6	2.183E+00	2.188E+00	7.551E+00
PA-234M	6.606E+01	94.6	6.249E+01	6.258E+01	2.949E+02
AM-241	3.212E-01	503.1	1.616E+00	1.616E+00	5.449E+00
Np-237	-3.059E+00	178.8	5.471E+00	5.474E+00	1.822E+01
Ir-192	4.257E-01	152.0	6.468E-01	6.473E-01	2.779E+00
Cs-136	2.398E-01	84.8	2.033E-01	2.038E-01	2.289E+00
Np-239	3.561E-01	775.9	2.763E+00	2.763E+00	9.251E+00
Nd-147	0.000E+00	1.#INF	1.383E+00	1.383E+00	7.805E+00
TL-210	1.344E+00	29.7	3.986E-01	4.060E-01	1.503E+00
Kr-85	0.000E+00	1.#INF	5.489E+01	5.490E+01	4.516E+02
Total	4.274E+02				

Analyst: Kellene Robbs

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Sample description
444057_Gamma_180-95857-A-3-D DU

Spectrum Filename: C:\User\SPC\Det8\8_Gamma_20191611.An1

Acquisition information
Start time: 10/15/2019 11:16:57 AM
Live time: 1800
Real time: 1844
Dead time: 2.41 %
Detector ID: 8

Detector system
Ge 8 SN/174

Calibration
Filename: 8_Soil_TunaCan.Clb
8_Soil_TunaCan_90099_032712

Energy Calibration
Created: 2/28/2012 10:34:41 AM
Zero offset: 0.052 keV
Gain: 0.250 keV/channel
Quadratic: 5.282E-10 keV/channel^2

Efficiency Calibration
Created: 3/28/2012 10:35:20 AM
Knee Energy: 165.85 keV
Above the Knee: Quadratic Uncertainty = 1.39 %
Log(Eff): -1.098764E-01 + (-4.958544E-01*Log(E)) +
(-2.572270E-02*Log(E)^2)
Below the Knee: Quadratic Uncertainty = 1.71 %
Log(Eff): -2.525301E+01 + (9.398253E+00*Log(E)) +
(-1.000034E+00*Log(E)^2)

Library Files
Main analysis library: Client_Long_Rev15.lib
Library Match Width: 0.500
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G800W064
Start channel: 150 (37.55keV)
Stop channel: 8000 (1999.97keV)
Peak rejection level: 1000.000%
Peak search sensitivity: 3
Sample Size: 1.0000E+00 +/- 0.000E+00%
Activity scaling factor: 1.0000E+00/(1.0000E+00* 1.0000E+00) =
1.0000E+00
Detection limit method: Reg. Guide 4.16 Method

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Random error: 4.0000000E+00
Systematic error: 4.0000000E+00
Fraction Limit: 0.000%
Background width: 3
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:	YES	10/15/2019 11:16:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	8_2019-10-06_1931.PBC 10/6/2019 7:31:35 PM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 31 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 0.1482

***** 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
46.54	21.	114.23	1.01	2.005E-02	46.54	4.250	PBC<MDA	PB210
59.54	6.	503.14	1.02	2.881E-02	59.54	35.900	PBC<MDA	AM241
63.31	27.	70.77	1.03	3.093E-02	63.29	3.810	PBC<MDA	TH234
74.66	157.	13.95	1.03	3.612E-02				
77.17	331.	7.30	1.04	3.701E-02				
86.54	28.	74.09	1.04	3.961E-02	86.49	13.100	PBC<MDA	Np237
					86.54	30.700	1.267E+00	EU155
					86.94	9.040	4.294E+00	Sn126
87.56	25.	85.08	1.04	3.982E-02	87.57	37.500	PBC<MDA	Sn126
					88.04	3.790	9.107E+00	Cd109
92.56	43.	51.48	1.05	4.072E-02	92.59	5.584	PBC<MDA	TH234
93.32	29.	161.11	1.05	4.083E-02	93.35	5.561	PBC<MDA	AC228
97.50	29.	132.34	1.05	4.133E-02	97.50	30.000	PBC<MDA	Gd153
105.40	20.	81.97	1.06	4.185E-02	105.31	21.200	PBC<MDA	EU155
106.22	6.	775.86	1.06	4.187E-02	106.13	22.700	PBC<MDA	Np239
108.22	20.	36.74	0.51	4.191E-02				
121.80	1.	853.22	1.07	4.148E-02	121.78	28.580	PBC<MDA	EU152
					122.06	85.600	2.160E-02	CO57
131.63	19.	155.17	1.08	4.061E-02	131.29	18.000	PBC<MDA	PA234
133.02	19.	158.31	1.08	4.041E-02	133.02	43.300	PBC<MDA	HF181
					133.54	11.090	2.375E+00	CE144
133.54	19.	161.52	1.08	4.035E-02	133.02	43.300	PBC<MDA	HF181

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
					133.54	11.090	2.376E+00	CE144
146.92	15.	228.48	1.09	3.874E-02	145.44	48.200	PBC<MDA	CE141
162.66	13.	153.46	1.10	3.593E-02	162.66	6.220	PBC<MDA	Ba140
165.85	10.	203.33	1.10	3.629E-02	165.85	79.900	PBC<MDA	CE139
176.60	19.	95.43	1.11	3.460E-02	176.60	17.000	PBC<MDA	Cf251
185.72	21.	117.86	1.12	3.329E-02	185.72	54.000	PBC<MDA	U235
193.51	32.	54.86	1.13	3.226E-02	193.51	4.400	PBC<MDA	TH229
205.33	16.	109.33	1.13	3.083E-02	205.33	5.010	PBC<MDA	U235
210.85	9.	263.17	1.14	3.020E-02	210.85	2.990	PBC<MDA	TH229
227.00	13.	153.14	1.15	2.853E-02	227.00	6.300	PBC<MDA	Cf251
238.71	385.	5.64	1.16	2.744E-02	238.63	43.300	1.802E+01	PB212
241.80	81.	17.89	1.16	2.716E-02	242.00	7.430	2.218E+01	PB214
265.83	2.	680.79	1.18	2.523E-02	265.83	50.000	PBC<MDA	BI210M
277.08	59.	23.63	1.30	2.440E-02	277.28	6.310	2.143E+01	TL208
279.20	8.	193.61	1.19	2.427E-02	279.20	81.460	PBC<MDA	Hg203
284.30	14.	103.80	1.19	2.393E-02	284.30	6.140	PBC<MDA	I131
295.24	128.	14.33	1.13	2.323E-02	295.09	19.300	1.589E+01	PB214
					296.00	79.000	3.892E+00	TL210
300.07	9.	273.52	1.20	2.293E-02	300.03	3.280	PBC<MDA	PB212
					300.07	2.460	9.222E+00	PA231
					300.18	6.200	3.660E+00	PA233
300.17	9.	288.21	1.20	2.294E-02	300.03	3.280	PBC<MDA	PB212
					300.07	2.460	PBC<MDA	PA231
					300.18	6.200	PBC<MDA	PA233
300.18	9.	277.36	1.20	2.293E-02	300.03	3.280	PBC<MDA	PB212
					300.07	2.460	9.224E+00	PA231
					300.18	6.200	3.661E+00	PA233
302.65	9.	280.80	1.21	2.278E-02	302.65	2.880	PBC<MDA	PA231
					302.85	18.330	1.249E+00	BA133
302.85	9.	284.52	1.21	2.277E-02	302.65	2.880	PBC<MDA	PA231
					302.85	18.330	1.249E+00	BA133
304.85	9.	287.90	1.21	2.265E-02	304.85	4.290	PBC<MDA	Ba140
					304.90	28.000	8.229E-01	BI210M
304.90	9.	291.57	1.21	2.265E-02	304.85	4.290	PBC<MDA	Ba140
					304.90	28.000	8.229E-01	BI210M
308.44	9.	294.54	1.21	2.244E-02	308.44	31.750	PBC<MDA	Ir192
312.01	9.	297.49	1.21	2.224E-02	312.01	36.000	PBC<MDA	PA233
316.49	9.	300.23	1.22	2.199E-02	316.49	87.040	PBC<MDA	Ir192
320.08	10.	283.57	1.22	2.179E-02	320.08	9.940	PBC<MDA	CR51
338.14	83.	15.17	1.17	2.085E-02	338.32	12.010	1.845E+01	AC228
345.83	18.	136.00	1.24	2.049E-02	345.83	15.070	PBC<MDA	HF181
351.77	209.	10.22	1.30	2.022E-02	351.93	37.600	1.531E+01	PB214
364.48	2.	504.07	1.25	1.965E-02	364.48	81.700	PBC<MDA	I131
383.84	14.	104.06	1.27	1.885E-02	383.84	8.940	PBC<MDA	BA133
391.69	2.	791.84	1.27	1.855E-02	391.69	64.000	PBC<MDA	SN113
427.88	9.	119.84	1.30	1.728E-02	427.88	29.600	PBC<MDA	SB125
433.94	10.	103.72	1.30	1.708E-02	433.94	90.480	PBC<MDA	AG108M
453.96	10.	99.14	1.32	1.647E-02	453.88	65.000	PBC<MDA	PM146

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
463.37	12.	91.63	1.32	1.620E-02	463.37	10.470	PBC<MDA	SB125
468.06	7.	175.88	1.33	1.606E-02	468.06	51.750	PBC<MDA	Ir192
477.60	6.	233.57	1.33	1.580E-02	477.60	10.520	PBC<MDA	BE7
482.00	11.	104.58	1.34	1.569E-02	482.00	80.500	PBC<MDA	HF181
511.86	69.	18.04	2.61	1.494E-02	511.86	20.000	1.283E+01	RH106
537.26	6.	178.21	1.37	1.436E-02	537.26	24.390	PBC<MDA	Ba140
563.24	10.	110.07	1.39	1.381E-02	563.24	8.350	PBC<MDA	CS134
569.52	14.	76.57	1.40	1.369E-02	569.32	15.380	PBC<MDA	CS134
					569.47	8.200	6.793E+00	PA234
					569.70	97.740	PBC<MDA	BI207
569.70	9.	98.20	1.40	1.368E-02	569.32	15.380	2.452E+00	CS134
					569.47	8.200	4.599E+00	PA234
					569.70	97.740	PBC<MDA	BI207
583.00	118.	10.11	1.20	1.342E-02	583.02	84.500	5.767E+00	TL208
609.24	157.	10.10	1.30	1.295E-02	609.31	46.090	1.464E+01	BI214
					610.30	5.750	1.175E+02	RU103
618.06	154.	11.47	1.43	1.279E-02	618.06	99.100	6.749E+00	PM144
635.89	10.	73.39	1.44	1.250E-02	635.89	11.310	PBC<MDA	SB125
661.66	-3.	370.78	1.46	1.209E-02	661.66	85.210	PBC<MDA	CS137
724.20	9.	105.35	1.50	1.121E-02	724.20	44.150	PBC<MDA	ZR95
727.28	9.	85.01	1.50	1.118E-02	727.17	7.550	PBC<MDA	BI212
766.41	13.	94.59	1.53	1.070E-02	765.79	99.790	PBC<MDA	NB95
					766.41	0.294	PBC<MDA	PA234M
785.74	5.	185.12	1.54	1.048E-02	785.42	1.280	PBC<MDA	BI212
795.87	11.	62.08	1.54	1.036E-02	795.87	85.530	PBC<MDA	CS134
799.60	8.	105.90	1.55	1.032E-02	799.60	98.960	PBC<MDA	TL210
815.77	3.	346.03	1.56	1.015E-02	815.77	23.280	PBC<MDA	La140
834.85	4.	216.89	1.57	9.955E-03	834.85	99.980	PBC<MDA	MN54
880.53	8.	94.40	1.60	9.517E-03	880.53	6.000	PBC<MDA	PA234
883.24	8.	103.50	1.60	9.493E-03	883.24	9.600	PBC<MDA	PA234
889.28	2.	450.98	1.60	9.438E-03	889.28	99.984	PBC<MDA	Sc46
911.23	78.	11.32	1.06	9.247E-03	911.07	29.000	1.616E+01	AC228
946.02	2.	431.57	1.64	8.957E-03	946.02	13.400	PBC<MDA	PA234
964.11	10.	115.55	1.65	8.814E-03	964.11	14.605	PBC<MDA	EU152
968.95	66.	16.47	1.65	8.776E-03	968.97	17.460	2.408E+01	AC228
1048.07	8.	84.78	1.70	8.209E-03	1048.07	80.000	PBC<MDA	Cs136
1063.66	7.	129.94	1.71	8.106E-03	1063.66	74.500	PBC<MDA	BI207
1120.41	11.	89.05	1.74	7.754E-03	1120.29	15.100	PBC<MDA	BI214
					1120.55	99.987	PBC<MDA	Sc46
1120.55	4.	219.88	1.74	7.752E-03	1120.29	15.100	PBC<MDA	BI214
					1120.55	99.987	2.914E-01	Sc46
					1121.30	34.900	8.354E-01	Ta182
1238.28	11.	91.82	1.81	7.114E-03	1238.28	66.070	PBC<MDA	Co56
1274.53	2.	244.95	1.83	6.939E-03	1274.53	99.940	PBC<MDA	NA22
1291.60	6.	126.28	1.84	6.860E-03	1291.60	43.200	PBC<MDA	FE59
1332.50	-4.	206.73	1.86	6.678E-03	1332.50	99.980	PBC<MDA	CO60
1384.30	6.	40.82	1.88	6.460E-03	1384.30	24.290	PBC<MDA	AG110M
1407.73	3.	206.16	1.90	6.366E-03	1408.00	21.005	PBC<MDA	EU152

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1460.59	244.	6.49	1.99	6.165E-03	1460.83	10.670	2.059E+02	K40
1690.98	5.	45.23	2.03	5.425E-03	1690.98	47.790	PBC<MDA	SB124
1764.46	26.	19.61	2.07	5.226E-03	1764.49	15.400	1.795E+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 Centroid Channel	Energy	Background Counts	Net Area Counts	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide
298.47	74.66	161.	157.	4.347E+03	13.95	1.034	- sD
308.47	77.16	127.	331.	8.949E+03	7.30	1.036	- sD
433.08	108.22	62.	16.	3.792E+02	74.52	1.060	- sc

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

This section based on library: Client_Long_Rev15.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 1 Sigma %	FWHM keV
PB-210	185.96	46.54	288.	21.	0.012	114.23	1.012s
TH-227	200.36	50.14	293.	-8.	-0.004	323.27	1.015s
AM-241	237.95	59.54	449.	6.	0.003	503.14	1.022s
TH-234	252.96	63.29	172.	27.	0.015	70.77	1.025D
Sn-126	256.93	64.28	547.	-30.	-0.017	112.32	1.026s
BA-133	323.77	80.99	1080.	-30.	-0.017	153.74	1.039s
Np-237	345.77	86.49	1290.	-29.	-0.016	178.84	1.043
EU-155	345.98	86.54	1262.	28.	0.015	74.09	1.043D
Sn-126	347.57	86.94	1193.	-29.	-0.016	171.99	1.044s
Sn-126	350.09	87.57	1089.	25.	0.014	85.08	1.044D
Cd-109	351.97	88.04	1165.	0.	0.000	169.82	1.044A
Nd-147	364.21	91.10	1114.	0.	0.000	1000.00	1.047s
TH-234	370.17	92.59	216.	43.	0.024	51.48	1.048D
AC-228	373.21	93.35	1055.	29.	0.016	161.11	1.049s
Gd-153	389.81	97.50	712.	29.	0.016	132.34	1.052s
Np-239	397.81	99.50	1199.	-29.	-0.016	168.18	1.053
Gd-153	412.62	103.20	1170.	-29.	-0.016	165.69	1.056s
Np-239	414.62	103.70	1141.	-21.	-0.011	231.89	1.057
EU-155	421.07	105.31	127.	20.	0.011	81.97	1.058D
Np-239	424.34	106.13	1114.	6.	0.003	775.86	1.058s
EU-152	486.94	121.78	129.	1.	0.001	853.22	1.071D
CO-57	488.06	122.06	130.	0.	0.000	124.15	1.071A

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
EU-154	492.22	123.10	158.	-6.	-0.003	316.83	1.072s
PA-234	525.00	131.29	430.	19.	0.011	155.17	1.078s
HF-181	531.92	133.02	449.	19.	0.011	158.31	1.079s
CE-144	533.98	133.54	468.	19.	0.011	161.52	1.080s
HF-181	545.02	136.30	679.	-24.	-0.013	154.42	1.082s
CO-57	545.72	136.47	655.	0.	0.000	151.68	1.082A
Tc-99m	561.86	140.51	614.	-24.	-0.013	146.49	1.085s
U-235	574.97	143.79	596.	-18.	-0.010	123.83	1.087s
CE-141	581.59	145.44	606.	15.	0.009	228.48	1.089s
Ba-140	650.47	162.66	203.	13.	0.007	153.46	1.102s
CE-139	663.24	165.85	188.	10.	0.005	203.33	1.104s
Cf-251	706.23	176.60	88.	19.	0.011	95.43	1.112s
U-235	742.71	185.72	174.	21.	0.012	117.86	1.119
TH-229	773.87	193.51	81.	32.	0.018	54.86	1.125s
U-235	821.17	205.33	83.	16.	0.009	109.33	1.134s
TH-229	843.24	210.85	144.	9.	0.005	263.17	1.138s
Cf-251	907.84	227.00	100.	13.	0.007	153.14	1.151s
TH-227	943.73	235.97	644.	-18.	-0.010	199.06	1.157s
PB-212	954.37	238.63	43.	385.	0.214	5.64	1.159D
PB-214	967.84	242.00	58.	80.	0.044	17.52	1.162D
EU-152	978.62	244.69	680.	-6.	-0.003	651.99	1.164
TH-227	1024.81	256.24	84.	-2.	-0.001	900.00	1.172
Cd-113m	1054.65	263.70	144.	-20.	-0.011	87.48	1.178s
BI-210M	1063.18	265.83	138.	2.	0.001	680.79	1.179s
TL-208	1108.19	277.08	30.	59.	0.033	23.63	1.305s
Hg-203	1116.66	279.20	106.	8.	0.004	193.61	1.189s
I-131	1137.05	284.30	53.	14.	0.008	103.80	1.193s
PB-214	1180.22	295.09	28.	122.	0.068	10.95	1.201D
TL-210	1183.86	296.00	260.	83.	0.046	29.65	1.202s
PB-212	1199.98	300.03	315.	9.	0.005	288.21	1.205
PA-231	1200.14	300.07	323.	9.	0.005	273.52	1.205
PA-233	1200.58	300.18	333.	9.	0.005	277.36	1.205
PA-231	1210.46	302.65	342.	9.	0.005	280.80	1.207s
BA-133	1211.27	302.85	352.	9.	0.005	284.52	1.207s
Ba-140	1219.26	304.85	361.	9.	0.005	287.90	1.208s
BI-210M	1219.45	304.90	370.	9.	0.005	291.57	1.208s
Ir-192	1233.62	308.44	380.	9.	0.005	294.54	1.211s
PA-233	1247.91	312.01	389.	9.	0.005	297.49	1.214s
Ir-192	1265.82	316.49	399.	9.	0.005	300.23	1.217s
CR-51	1280.20	320.08	428.	10.	0.006	283.57	1.219s
La-140	1314.91	328.76	313.	-18.	-0.010	142.36	1.226s
Cf-249	1333.63	333.44	295.	-6.	-0.004	378.68	1.229s
AC-228	1352.41	338.14	20.	83.	0.046	15.17	1.174
Cs-136	1362.15	340.57	273.	-18.	-0.010	130.39	1.234s
EU-152	1377.01	344.29	367.	-20.	-0.011	139.29	1.237
HF-181	1383.19	345.83	282.	18.	0.010	136.00	1.238
PB-214	1406.95	351.77	47.	209.	0.116	10.22	1.298
BA-133	1423.87	356.00	344.	-18.	-0.010	148.88	1.245s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
I-131	1457.81	364.48	41.	2.	0.001	504.07	1.252s
BA-133	1535.24	383.84	97.	14.	0.008	104.06	1.266s
SN-113	1566.64	391.69	40.	2.	0.001	791.84	1.271s
SB-125	1711.39	427.88	28.	9.	0.005	119.84	1.297s
AG-108M	1735.64	433.94	22.	10.	0.005	103.72	1.301s
PM-146	1815.41	453.88	22.	10.	0.006	99.14	1.315s
SB-125	1853.36	463.37	56.	12.	0.007	91.63	1.322s
Ir-192	1872.14	468.06	80.	7.	0.004	175.88	1.325s
BE-7	1910.28	477.60	88.	6.	0.003	233.57	1.332s
HF-181	1927.89	482.00	65.	11.	0.006	104.58	1.335s
La-140	1947.98	487.02	124.	-15.	-0.008	90.78	1.339s
RU-103	1988.12	497.05	43.	-9.	-0.005	144.37	1.346s
RH-106	2047.36	511.86	43.	69.	0.038	18.04	2.606s
Kr-85	2055.83	513.98	112.	0.	0.000	1000.00	1.357s
Nd-147	2123.91	531.00	26.	0.	0.000	1000.00	1.369
Ba-140	2148.95	537.26	26.	6.	0.003	178.21	1.373s
CS-134	2252.86	563.24	26.	10.	0.005	110.07	1.391s
CS-134	2277.20	569.32	56.	-12.	-0.007	90.65	1.395s
PA-234	2277.80	569.47	48.	14.	0.008	76.57	1.395s
BI-207	2278.73	569.70	37.	9.	0.005	98.20	1.396s
TL-208	2331.92	583.00	7.	118.	0.065	10.11	1.203
SB-125	2401.92	600.50	312.	-15.	-0.008	79.40	1.416s
SB-124	2410.85	602.73	297.	-14.	-0.008	83.62	1.418s
CS-134	2418.76	604.71	283.	-14.	-0.008	172.54	1.419s
BI-214	2436.89	609.24	19.	157.	0.087	10.10	1.298
PM-144	2472.18	618.06	79.	154.	0.086	11.47	1.428s
RH-106	2487.60	621.92	217.	-15.	-0.008	141.97	1.431s
SB-125	2543.49	635.89	22.	10.	0.006	73.39	1.440
AG-110M	2630.98	657.76	68.	-15.	-0.008	80.76	1.455s
CS-137	2646.58	661.66	77.	-3.	-0.002	370.78	1.457s
PM-144	2786.11	696.54	51.	-17.	-0.009	92.27	1.480s
NB-94	2810.46	702.63	42.	-12.	-0.007	99.47	1.484s
SB-124	2891.09	722.79	70.	-11.	-0.006	111.71	1.497
AG-108M	2891.70	722.94	59.	0.	0.000	1000.00	1.498
EU-154	2893.39	723.36	59.	0.	0.000	1000.00	1.498
ZR-95	2896.74	724.20	41.	9.	0.005	105.35	1.498s
BI-212	2908.63	727.17	25.	9.	0.005	85.01	1.500
PM-146	2988.59	747.16	33.	-5.	-0.003	214.40	1.513
ZR-95	3026.87	756.73	37.	-1.	-0.001	975.96	1.519s
AG-110M	3055.73	763.94	74.	-18.	-0.010	70.27	1.524s
NB-95	3063.11	765.79	92.	-10.	-0.005	144.55	1.525s
PA-234M	3065.60	766.41	73.	13.	0.007	94.59	1.526s
EU-152	3115.64	778.92	28.	0.	0.000	1000.00	1.534
BI-212	3141.64	785.42	19.	5.	0.003	185.12	1.538s
CS-134	3183.44	795.87	18.	11.	0.006	62.08	1.544s
TL-210	3198.36	799.60	29.	8.	0.004	105.90	1.547s
CS-134	3207.77	801.95	63.	-12.	-0.007	99.84	1.548s
CO-58	3243.06	810.78	69.	-14.	-0.008	86.24	1.554s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
La-140	3263.04	815.77	63.	3.	0.002	346.03	1.557s
Cs-136	3273.97	818.50	70.	-2.	-0.001	595.82	1.559
MN-54	3339.36	834.85	19.	4.	0.002	216.89	1.569
Co-56	3387.05	846.77	42.	-14.	-0.008	67.13	1.577s
NB-94	3484.36	871.10	23.	-1.	-0.001	773.39	1.592s
EU-154	3492.89	873.23	38.	-8.	-0.004	119.78	1.593
PA-234	3522.10	880.53	24.	8.	0.004	94.40	1.598s
PA-234	3532.94	883.24	29.	8.	0.004	103.50	1.599s
AG-110M	3538.71	884.68	54.	-11.	-0.006	98.41	1.600s
Sc-46	3557.10	889.28	36.	2.	0.001	450.98	1.603s
Y-88	3592.14	898.04	19.	-2.	-0.001	496.85	1.608s
AC-228	3644.90	911.23	0.	78.	0.043	11.32	1.062s
AG-110M	3749.96	937.49	30.	-12.	-0.007	104.42	1.633s
PA-234	3784.07	946.02	15.	2.	0.001	431.57	1.638
EU-152	3856.43	964.11	61.	10.	0.006	115.55	1.649
AC-228	3875.88	968.97	27.	66.	0.037	16.47	1.652s
EU-154	3985.31	996.33	52.	-13.	-0.007	83.77	1.668s
EU-154	4019.10	1004.77	39.	-15.	-0.009	92.94	1.673
Co-56	4151.36	1037.84	30.	-10.	-0.006	107.18	1.693s
Cs-136	4192.29	1048.07	19.	8.	0.004	84.78	1.698s
BI-207	4254.65	1063.66	15.	7.	0.004	129.94	1.708s
Ga-68	4309.61	1077.40	25.	-4.	-0.002	279.32	1.716s
FE-59	4397.02	1099.25	20.	-5.	-0.003	201.66	1.728s
EU-152	4448.32	1112.07	74.	-7.	-0.004	177.86	1.736
BI-214	4481.17	1120.29	46.	11.	0.006	89.05	1.740s
Sc-46	4482.22	1120.55	38.	4.	0.002	219.88	1.740s
CO-60	4692.97	1173.24	27.	-6.	-0.003	169.35	1.770s
Ta-182	4756.23	1189.05	20.	-3.	-0.002	332.78	1.779s
Ta-182	4885.67	1221.41	32.	-6.	-0.003	218.16	1.797s
Co-56	4953.16	1238.28	16.	11.	0.006	91.82	1.806s
NA-22	5098.16	1274.53	11.	2.	0.001	244.95	1.826
FE-59	5166.43	1291.60	11.	6.	0.003	126.28	1.835s
CO-60	5330.06	1332.50	15.	-4.	-0.002	206.73	1.857s
AG-110M	5537.25	1384.30	0.	6.	0.003	40.82	1.884s
EU-152	5632.07	1408.00	5.	3.	0.001	206.16	1.896s
K-40	5842.42	1460.59	3.	244.	0.135	6.49	1.988
La-140	6384.93	1596.21	23.	-11.	-0.006	109.06	1.990s
SB-124	6764.03	1690.98	0.	5.	0.003	45.23	2.034s
BI-214	7058.07	1764.49	0.	26.	0.014	19.61	2.067
Co-56	7085.51	1771.35	26.	0.	0.000	1000.00	2.070s
Y-88	7344.36	1836.06	6.	-1.	0.000	846.32	2.098s

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	1.9321E+00				5.31E+01	
			477.60	1.932E+00	?(P	1.553E+01	2.34E+02 1.05E+01 G
NA-22	C	1.6021E-01				9.50E+02	
			1274.53	1.602E-01	&(	1.455E+00	2.45E+02 9.99E+01 G
K-40	N	2.0587E+02				4.66E+11	
			1460.83	2.059E+02	(P	9.370E+00	6.49E+00 1.07E+01 G
Sc-46	F	2.0190E-01				8.38E+01	
			889.28	1.124E-01	&(	1.808E+00	4.51E+02 1.00E+02 G
			1120.55	2.914E-01	?(	2.251E+00	2.20E+02 1.00E+02 G
CR-51	F	2.6633E+00				2.77E+01	
			320.08	2.663E+00	?(	2.543E+01	2.84E+02 9.94E+00 G
MN-54	C	2.4189E-01				3.12E+02	
			834.85	2.419E-01	?(	1.275E+00	2.17E+02 1.00E+02 G
FE-59	F	1.5136E-01				4.45E+01	
			1099.25	-6.238E-01	?(	2.938E+00	2.02E+02 5.65E+01 G
			1291.60	1.165E+00	&(P	3.377E+00	1.26E+02 4.32E+01 G
Co-56	C	-7.9909E-01				7.73E+01	
			846.77	-7.991E-01	?(P	1.863E+00	6.71E+01 9.99E+01 G
			1238.28	1.248E+00	+ P	2.545E+00	9.18E+01 6.61E+01 G
			1037.84	-4.770E+00	+ P	1.342E+01	1.07E+02 1.41E+01 G
			1771.35	0.000E+00	+	1.824E+01	1.00E+03 1.55E+01 A
CO-58	C	-7.8254E-01				7.09E+01	
			810.78	-7.825E-01	(	2.265E+00	8.62E+01 9.95E+01 G
CO-60	F	-3.1136E-01				1.93E+03	
			1332.50	-3.114E-01	?(P	1.714E+00	2.07E+02 1.00E+02 G
			1173.24	-4.589E-01	& P	2.014E+00	1.69E+02 9.99E+01 G
ZN-65	F	-1.6167E-02				2.44E+02	
			1115.55	-1.617E-02	%(P	5.768E+00	7.81E+03 5.06E+01 G
NB-94	I	-6.1080E-01				7.41E+06	
			702.63	-6.108E-01	?(P	1.631E+00	9.95E+01 9.79E+01 G
			871.10	-7.721E-02	+	1.460E+00	7.73E+02 9.99E+01 G

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Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
ZR-95	I	3.8381E-01					6.40E+01	
			756.73	-1.258E-01	?(	2.943E+00	9.76E+02	5.45E+01 G
			724.20	1.012E+00	?(	3.638E+00	1.05E+02	4.42E+01 G
NB-95	I	-5.0165E-01					6.40E+01	
			765.79	-5.017E-01	?(	2.470E+00	1.45E+02	9.98E+01 G
RU-103	I	-3.7479E-01					3.93E+01	
			497.05	-3.748E-01	?(P	1.335E+00	1.44E+02	9.09E+01 G
			610.30	-3.211E-03	%	5.915E+01	5.40E+05	5.75E+00 GA
RH-106	I	-6.5608E+00					3.74E+02	
			621.92	-6.561E+00	?(	3.137E+01	1.42E+02	9.93E+00 G
			1050.36	2.173E+00	%	1.180E+02	1.49E+03	1.56E+00 G
			511.86	1.283E+01	?	6.187E+00	1.80E+01	2.00E+01 GA
AG-108M	C	3.4830E-01					1.53E+05	
			433.94	3.483E-01	?(P	8.848E-01	1.04E+02	9.05E+01 G
			722.94	0.000E+00	-	2.097E+00	1.00E+03	9.08E+01 G
			614.28	3.669E-07	%	3.806E+00	3.04E+08	8.98E+01 G
AG-110M	F	-1.4038E-01					2.50E+02	
			884.68	-8.972E-01	&(	2.990E+00	9.84E+01	7.27E+01 G
			657.76	-7.331E-01	&	1.981E+00	8.08E+01	9.46E+01 G
			937.49	-2.150E+00	+	5.058E+00	1.04E+02	3.44E+01 G
			1384.30	2.124E+00	?(	2.609E+00	4.08E+01	2.43E+01 G
			763.94	-4.268E+00	+	9.950E+00	7.03E+01	2.23E+01 G
SN-113	F	7.3936E-02					1.15E+02	
			391.69	7.394E-02	?(	1.513E+00	7.92E+02	6.40E+01 G
SB-124	F	-7.2029E-02					6.02E+01	
			602.73	-6.250E-01	?(P	3.596E+00	8.36E+01	9.83E+01 G
			1690.98	1.065E+00	?(P	1.579E+00	4.52E+01	4.78E+01 G
			722.79	-5.033E+00	+	1.908E+01	1.12E+02	1.08E+01 G
SB-125	I	2.2416E+00					1.01E+03	
			427.88	9.778E-01	(	2.973E+00	1.20E+02	2.96E+01 G
			600.50	-3.593E+00	+ P	2.019E+01	7.94E+01	1.79E+01 G
			635.89	3.937E+00	&(	9.658E+00	7.34E+01	1.13E+01 G
			463.37	3.984E+00	?(	1.231E+01	9.16E+01	1.05E+01 G
I-131	I	4.5365E-01					8.02E+00	
			364.48	8.604E-02	?(P	1.120E+00	5.04E+02	8.17E+01 G
			284.30	5.345E+00	&(P	1.383E+01	1.04E+02	6.14E+00 G
			636.97	9.508E-02	&	1.901E+01	5.54E+03	7.17E+00 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Gd-153	F	1.2902E+00					2.42E+02	
			97.50	1.290E+00	&(	5.692E+00	1.32E+02	3.00E+01 G
			103.20	-1.793E+00	+	9.893E+00	1.66E+02	2.18E+01 G
Ga-68	C	-9.8835E+00					4.71E-02	
			1077.40	-9.883E+00	?(	6.427E+01	2.79E+02	3.30E+00 G
Tc-99m	I	-3.9293E-01					2.51E-01	
			140.51	-3.929E-01	?(	1.922E+00	1.46E+02	8.93E+01 G
BA-133	F	-3.3146E-01					3.85E+03	
			356.00	-7.983E-01	&(	3.988E+00	1.49E+02	6.20E+01 G
			302.85	1.249E+00	?(	1.199E+01	2.85E+02	1.83E+01 G
			383.84	4.563E+00	? P	1.600E+01	1.04E+02	8.94E+00 GA
			80.99	-1.300E+00	+	6.653E+00	1.54E+02	3.41E+01 GA
CS-134	I	1.0498E+00					7.54E+02	
			795.87	6.870E-01	?(	1.398E+00	6.21E+01	8.55E+01 G
			604.71	-6.098E-01	-	3.543E+00	1.73E+02	9.76E+01 G
			569.32	-3.255E+00	+	9.945E+00	9.07E+01	1.54E+01 G
			801.95	-7.284E+00	+	2.460E+01	9.98E+01	8.69E+00 G
			563.24	4.766E+00	(P	1.278E+01	1.10E+02	8.35E+00 G
CS-137	I	-1.7851E-01					1.10E+04	
			661.66	-1.785E-01	?(P	2.346E+00	3.71E+02	8.52E+01 G
CE-139	F	1.8521E-01					1.38E+02	
			165.85	1.852E-01	(	1.277E+00	2.03E+02	7.99E+01 G
Ba-140	I	1.9162E+00					1.28E+01	
			537.26	9.521E-01	&(	4.200E+00	1.78E+02	2.44E+01 G
			162.66	3.315E+00	?(	1.717E+01	1.53E+02	6.22E+00 G
			304.85	5.370E+00	?(	5.217E+01	2.88E+02	4.29E+00 G
La-140	I	-1.0886E+00					1.28E+01	
			1596.21	-1.089E+00	?(	2.541E+00	1.09E+02	9.54E+01 G
			487.02	-1.170E+00	& P	4.290E+00	9.08E+01	4.55E+01 G
			328.76	-2.280E+00	& P	1.093E+01	1.42E+02	2.03E+01 G
			815.77	7.744E-01	+	9.354E+00	3.46E+02	2.33E+01 G
CE-141	I	4.5618E-01					3.25E+01	
			145.44	4.562E-01	&(	3.494E+00	2.28E+02	4.82E+01 G
CE-144	I	2.3761E+00					2.85E+02	
			133.54	2.376E+00	(	1.286E+01	1.62E+02	1.11E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PM-144	C	2.9629E+00					3.63E+02	
			696.54	-8.268E-01	?(	1.749E+00	9.23E+01	9.90E+01 G
			618.06	6.749E+00	&(	1.934E+00	1.15E+01	9.91E+01 G
EU-152	F	2.2714E-01					4.94E+03	
			121.78	6.467E-02	}	2.604E+00	8.53E+02	2.86E+01 G
			344.29	-2.009E+00	(	9.376E+00	1.39E+02	2.65E+01 G
			1112.07	-3.653E+00	+	2.233E+01	1.78E+02	1.36E+01 G
			778.92	0.000E+00	+	1.114E+01	1.00E+03	1.29E+01 G
			964.11	4.285E+00	(	1.686E+01	1.16E+02	1.46E+01 G
			244.69	-1.543E+00	+	3.382E+01	6.52E+02	7.58E+00 G
			1408.00	1.108E+00	?	5.597E+00	2.06E+02	2.10E+01 GA
EU-154	I	-1.8652E-01					3.14E+03	
			123.10	-1.865E-01	?(	2.019E+00	3.17E+02	4.08E+01 G
			1274.54	7.583E-02	&	4.390E+00	1.52E+03	3.52E+01 G
			723.36	0.000E+00	+	9.424E+00	1.00E+03	2.02E+01 G
			873.23	-3.622E+00	+	1.491E+01	1.20E+02	1.23E+01 G
			1004.77	-5.578E+00	+	1.155E+01	9.29E+01	1.80E+01 G
			996.33	-7.929E+00	+	2.230E+01	8.38E+01	1.06E+01 G
EU-155	I	1.2672E+00					1.81E+03	
			105.31	1.267E+00	(	3.464E+00	8.20E+01	2.12E+01 G
			86.54	1.267E+00	}	7.687E+00	7.41E+01	3.07E+01 G
HF-181	F	8.2585E-01					4.24E+01	
			482.00	5.002E-01	?(	1.772E+00	1.05E+02	8.05E+01 G
			133.02	6.075E-01	&(	3.222E+00	1.58E+02	4.33E+01 G
			345.83	3.193E+00	?(	1.458E+01	1.36E+02	1.51E+01 G
			136.30	-5.716E+00	+	2.947E+01	1.54E+02	5.85E+00 G
Ta-182	F	-1.0273E-01					1.14E+02	
			1121.30	-1.027E-01	&(	6.944E+00	1.89E+03	3.49E+01 G
			1221.41	-1.715E+00	+	8.309E+00	2.18E+02	2.70E+01 G
			1189.05	-1.396E+00	+	1.096E+01	3.33E+02	1.62E+01 G
Hg-203	F	2.1541E-01					4.66E+01	
			279.20	2.154E-01	?(	1.426E+00	1.94E+02	8.15E+01 G
TL-208	N	5.7668E+00					6.98E+02	
			583.02	5.767E+00	(P	7.476E-01	1.01E+01	8.45E+01 G
			277.28	2.143E+01	+ P	1.013E+01	2.36E+01	6.31E+00 G
			860.56	1.918E-01	% P	1.273E+01	2.72E+03	1.24E+01 G
PM-146	C	5.2546E-01					2.02E+03	
			453.88	5.255E-01	?(P	1.269E+00	9.91E+01	6.50E+01 G
			747.16	-7.250E-01	+ P	4.399E+00	2.14E+02	3.40E+01 G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          735.72 2.069E-01 % P 5.705E+00 1.12E+03 2.25E+01 G

Y-88     F  -7.3998E-02                                     1.07E+02
                         1836.06-7.400E-02 ?(  1.532E+00 8.46E+02 9.92E+01 G
                          898.04-1.448E-01 + P 1.468E+00 4.97E+02 9.37E+01 G

Cd-113m     -7.3179E+03                                     5.33E+03
                          263.70-7.318E+03 ?(  2.139E+04 8.75E+01 6.00E-03   K

Cf-251   T   1.7897E+00                                     3.28E+05
                          176.60 1.790E+00  (  4.385E+00 9.54E+01 1.70E+01 G
                          227.00 4.019E+00 ?   1.524E+01 1.53E+02 6.30E+00 GA

Cf-249   T   1.8913E-02                                     1.28E+05
                          387.95 1.891E-02 %(  2.329E+00 3.54E+03 6.60E+01 G
                          333.44-1.096E+00 &   1.406E+01 3.79E+02 1.55E+01 G

Sn-126      -5.4327E+00                                     3.65E+07
                           87.57 9.226E-01 }   5.822E+00 8.51E+01 3.75E+01 GA
                           64.28-5.433E+00 ?(  2.033E+01 1.12E+02 9.70E+00 G
                           86.94-4.424E+00 }   2.534E+01 1.72E+02 9.04E+00 GA

PB-210   N   1.3955E+01                                     8.14E+03
                           46.54 1.395E+01 ?(P 5.333E+01 1.14E+02 4.25E+00 G

PB-212   N   1.8015E+01                                     6.98E+02
                          238.63 1.802E+01  (P 1.550E+00 5.64E+00 4.33E+01 G
                          300.03 6.473E+00 & P 6.304E+01 2.88E+02 3.28E+00 GA

PB-214   N   1.5246E+01                                     5.84E+05
                          351.93 1.531E+01  (P 2.525E+00 1.02E+01 3.76E+01 G
                          295.09 1.513E+01  (P 3.384E+00 1.09E+01 1.93E+01 G
                          242.00 2.202E+01 +   1.053E+01 1.75E+01 7.43E+00 GA

BI-207   C   4.9248E-01                                     1.18E+04
                         1063.66 6.322E-01 ?(P 1.917E+00 1.30E+02 7.45E+01 G
                          569.70 3.860E-01 ?(P 1.286E+00 9.82E+01 9.77E+01 G

BI-212   N   5.9484E+00                                     6.98E+02
                          727.17 5.948E+00 ?(  1.712E+01 8.50E+01 7.55E+00 G
                          785.42 2.119E+01 ? P 9.511E+01 1.85E+02 1.28E+00 GA

U-235    N   1.9833E-01                                     2.57E+11
                          143.79-2.335E+00 &(P 1.514E+01 1.24E+02 1.10E+01 G
                          205.33 5.740E+00 *(P 1.627E+01 1.09E+02 5.01E+00 G
                          163.38-3.765E-01 % P 2.181E+01 1.81E+03 5.08E+00 G
                          185.72 6.510E-01   P 1.983E+00 1.18E+02 5.40E+01 GA
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Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
BI-214	N	1.5465E+01					5.84E+05	
			609.31	1.464E+01	(P	2.136E+00	1.01E+01	4.61E+01 G
			1120.29	5.422E+00	- P	1.628E+01	8.90E+01	1.51E+01 G
			1764.49	1.795E+01	?(	5.088E+00	1.96E+01	1.54E+01 G
BI-210M	T	3.6455E-01					1.10E+09	
			265.83	1.079E-01	?(P	2.528E+00	6.81E+02	5.00E+01 G
			304.90	8.229E-01	?(	8.094E+00	2.92E+02	2.80E+01 G
AC-228	N	1.6830E+01					2.10E+03	
			911.07	1.616E+01	(	1.527E+00	1.13E+01	2.90E+01 G
			968.97	2.408E+01	+	9.695E+00	1.65E+01	1.75E+01 G
			338.32	1.845E+01	(	5.205E+00	1.52E+01	1.20E+01 G
			93.35	7.024E+00	-	3.770E+01	1.61E+02	5.56E+00 XA
TH-227	N	-6.1142E-01					7.95E+03	
			256.24	-6.114E-01	(	1.389E+01	9.00E+02	7.00E+00 G
			235.97	-2.963E+00	+	1.974E+01	1.99E+02	1.23E+01 G
			50.14	-2.307E+00	+	2.525E+01	3.23E+02	8.00E+00 G
TH-229	N	1.2654E+01					2.68E+06	
			193.51	1.265E+01	&(	1.744E+01	5.49E+01	4.40E+00 G
			210.85	5.537E+00	-	3.607E+01	2.63E+02	2.99E+00 G
TH-234	N	1.1388E+01					1.63E+12	
			92.59	1.039E+01	(P	1.740E+01	5.15E+01	5.58E+00 G
			63.29	1.285E+01	(P	3.005E+01	7.08E+01	3.81E+00 G
PA-231	N	8.5323E+00					1.20E+07	
			302.65	7.943E+00	?(	7.529E+01	2.81E+02	2.88E+00 G
			300.07	9.222E+00	(	8.519E+01	2.74E+02	2.46E+00 G
PA-233	C	1.0963E+00					7.82E+08	
			312.01	6.547E-01	?(	6.567E+00	2.97E+02	3.60E+01 G
			300.18	3.661E+00	(	3.428E+01	2.77E+02	6.20E+00 G
PA-234	N	2.8510E+00					1.63E+12	
			131.29	1.452E+00	?(	7.551E+00	1.55E+02	1.80E+01 G
			946.02	9.258E-01	(	9.609E+00	4.32E+02	1.34E+01 G
			569.47	6.793E+00	?(	1.738E+01	7.66E+01	8.20E+00 G
			883.24	4.794E+00	?(	1.700E+01	1.04E+02	9.60E+00 G
			880.53	7.642E+00	?	2.464E+01	9.44E+01	6.00E+00 GA
PA-234M	N	6.6058E+01					1.63E+12	
			1001.00	6.412E+00	%(P	2.949E+02	1.30E+03	8.37E-01 G
			766.41	2.359E+02	?(P	7.514E+02	9.46E+01	2.94E-01 G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

AM-241   T   3.2117E-01                                      1.58E+05
                           59.54 3.212E-01 &(P 5.449E+00 5.03E+02 3.59E+01 G

Np-237   F  -3.0591E+00                                      2.14E+06
                           86.49-3.059E+00  (  1.822E+01 1.79E+02 1.31E+01 G

Ir-192   F   4.2565E-01                                      7.40E+01
                          316.49 2.746E-01 ?(  2.779E+00 3.00E+02 8.70E+01 G
                          468.06 4.905E-01 ?(  2.961E+00 1.76E+02 5.18E+01 G
                          308.44 7.340E-01 &(  7.292E+00 2.95E+02 3.18E+01 G

Cs-136   F   2.3981E-01                                      1.30E+01
                          818.50-1.098E-01 &(  2.289E+00 5.96E+02 1.00E+02 G
                         1048.07 6.768E-01 ?(  1.948E+00 8.48E+01 8.00E+01 G
                          340.57-1.040E+00 +   4.549E+00 1.30E+02 4.69E+01 G

Np-239   T   3.5614E-01                                      2.36E+00
                          103.70-1.147E+00 +   8.871E+00 2.32E+02 2.40E+01 X
                          106.13 3.561E-01 ?(  9.251E+00 7.76E+02 2.27E+01 G
                           99.50-2.614E+00 &   1.464E+01 1.68E+02 1.50E+01 X

TL-210   N   1.3440E+00                                      5.84E+05
                          799.60 4.136E-01 ?(  1.503E+00 1.06E+02 9.90E+01 G
                          296.00 2.510E+00 ?(  2.360E+00 2.97E+01 7.90E+01 G
                         1313.00-2.608E-01 %   7.013E+00 1.12E+03 2.10E+01 GA
   ( - 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
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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

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 1 Sigma %	Activity	
PB-210	46.54	288.	21.	0.012	114.23	1.395E+01	P
TH-227	50.14	293.	-8.	-0.004	323.27	-2.307E+00	
AM-241	59.54	449.	6.	0.003	503.14	3.212E-01	P
BA-133	80.99	1080.	-30.	-0.017	153.74	-1.300E+00	
Np-237	86.49	1290.	-29.	-0.016	178.84	-3.059E+00	
Gd-153	97.50	712.	29.	0.016	132.34	1.290E+00	
Gd-153	103.20	1170.	-29.	-0.016	165.69	-1.793E+00	
EU-154	123.10	158.	-6.	-0.003	316.83	-1.865E-01	
HF-181	133.02	449.	19.	0.011	158.31	6.075E-01	
CE-144	133.54	468.	19.	0.011	161.52	2.376E+00	
HF-181	136.30	679.	-24.	-0.013	154.42	-5.716E+00	
Tc-99m	140.51	614.	-24.	-0.013	146.49	-3.929E-01	
U-235	143.79	596.	-18.	-0.010	123.83	-2.335E+00	P
Ba-140	162.66	203.	13.	0.007	153.46	3.315E+00	
CE-139	165.85	188.	10.	0.005	203.33	1.852E-01	
Cf-251	176.60	88.	19.	0.011	95.43	1.790E+00	
U-235	185.72	174.	21.	0.012	117.86	6.510E-01	P
TH-229	193.51	81.	32.	0.018	54.86	1.265E+01	
U-235	205.33	83.	16.	0.009	109.33	5.740E+00	P
TH-229	210.85	144.	9.	0.005	263.17	5.537E+00	
Cf-251	227.00	100.	13.	0.007	153.14	4.019E+00	
TH-227	235.97	644.	-18.	-0.010	199.06	-2.963E+00	
TH-227	256.24	84.	-2.	-0.001	900.00	-6.114E-01	
Cd-113m	263.70	144.	-20.	-0.011	87.48	-7.318E+03	
BI-210M	265.83	138.	2.	0.001	680.79	1.079E-01	P
Hg-203	279.20	106.	8.	0.004	193.61	2.154E-01	
I-131	284.30	53.	14.	0.008	103.80	5.345E+00	P
TL-210	296.00	260.	83.	0.046	29.65	2.510E+00	
PA-231	300.07	323.	9.	0.005	273.52	9.222E+00	
PA-233	300.18	333.	9.	0.005	277.36	3.661E+00	
PA-231	302.65	342.	9.	0.005	280.80	7.943E+00	
BA-133	302.85	352.	9.	0.005	284.52	1.249E+00	
Ba-140	304.85	361.	9.	0.005	287.90	5.370E+00	
BI-210M	304.90	370.	9.	0.005	291.57	8.229E-01	
Ir-192	308.44	380.	9.	0.005	294.54	7.340E-01	
PA-233	312.01	389.	9.	0.005	297.49	6.547E-01	
Ir-192	316.49	399.	9.	0.005	300.23	2.746E-01	
CR-51	320.08	428.	10.	0.006	283.57	2.663E+00	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
La-140	328.76	313.	-18.	-0.010	142.36	-2.280E+00	P
Cf-249	333.44	295.	-6.	-0.004	378.68	-1.096E+00	
Cs-136	340.57	273.	-18.	-0.010	130.39	-1.040E+00	
HF-181	345.83	282.	18.	0.010	136.00	3.193E+00	
BA-133	356.00	344.	-18.	-0.010	148.88	-7.983E-01	
I-131	364.48	41.	2.	0.001	504.07	8.604E-02	P
BA-133	383.84	97.	14.	0.008	104.06	4.563E+00	P
SN-113	391.69	40.	2.	0.001	791.84	7.394E-02	
SB-125	427.88	28.	9.	0.005	119.84	9.778E-01	
AG-108M	433.94	22.	10.	0.005	103.72	3.483E-01	P
SB-125	463.37	56.	12.	0.007	91.63	3.984E+00	
Ir-192	468.06	80.	7.	0.004	175.88	4.905E-01	
BE-7	477.60	88.	6.	0.003	233.57	1.932E+00	P
HF-181	482.00	65.	11.	0.006	104.58	5.002E-01	
La-140	487.02	124.	-15.	-0.008	90.78	-1.170E+00	P
RU-103	497.05	43.	-9.	-0.005	144.37	-3.748E-01	P
RH-106	511.86	43.	69.	0.038	18.04	1.283E+01	
Ba-140	537.26	26.	6.	0.003	178.21	9.521E-01	
CS-134	563.24	26.	10.	0.005	110.07	4.766E+00	P
CS-134	569.32	56.	-12.	-0.007	90.65	-3.255E+00	
BI-207	569.70	37.	9.	0.005	98.20	3.860E-01	P
SB-125	600.50	312.	-15.	-0.008	79.40	-3.593E+00	P
SB-124	602.73	297.	-14.	-0.008	83.62	-6.250E-01	P
CS-134	604.71	283.	-14.	-0.008	172.54	-6.098E-01	
RH-106	621.92	217.	-15.	-0.008	141.97	-6.561E+00	
SB-125	635.89	22.	10.	0.006	73.39	3.937E+00	
AG-110M	657.76	68.	-15.	-0.008	80.76	-7.331E-01	
CS-137	661.66	77.	-3.	-0.002	370.78	-1.785E-01	P
NB-94	702.63	42.	-12.	-0.007	99.47	-6.108E-01	P
SB-124	722.79	70.	-11.	-0.006	111.71	-5.033E+00	
ZR-95	724.20	41.	9.	0.005	105.35	1.012E+00	
ZR-95	756.73	37.	-1.	-0.001	975.96	-1.258E-01	
AG-110M	763.94	74.	-18.	-0.010	70.27	-4.268E+00	
NB-95	765.79	92.	-10.	-0.005	144.55	-5.017E-01	
PA-234M	766.41	73.	13.	0.007	94.59	2.359E+02	P
CS-134	795.87	18.	11.	0.006	62.08	6.870E-01	
TL-210	799.60	29.	8.	0.004	105.90	4.136E-01	
CS-134	801.95	63.	-12.	-0.007	99.84	-7.284E+00	
CO-58	810.78	69.	-14.	-0.008	86.24	-7.825E-01	
La-140	815.77	63.	3.	0.002	346.03	7.744E-01	
Cs-136	818.50	70.	-2.	-0.001	595.82	-1.098E-01	
MN-54	834.85	19.	4.	0.002	216.89	2.419E-01	
Co-56	846.77	42.	-14.	-0.008	67.13	-7.991E-01	P
NB-94	871.10	23.	-1.	-0.001	773.39	-7.721E-02	
EU-154	873.23	38.	-8.	-0.004	119.78	-3.622E+00	
AG-110M	884.68	54.	-11.	-0.006	98.41	-8.972E-01	
Sc-46	889.28	36.	2.	0.001	450.98	1.124E-01	
Y-88	898.04	19.	-2.	-0.001	496.85	-1.448E-01	P

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
AG-110M	937.49	30.	-12.	-0.007	104.42	-2.150E+00		
EU-154	996.33	52.	-13.	-0.007	83.77	-7.929E+00		
EU-154	1004.77	39.	-15.	-0.009	92.94	-5.578E+00		
Co-56	1037.84	30.	-10.	-0.006	107.18	-4.770E+00		P
Cs-136	1048.07	19.	8.	0.004	84.78	6.768E-01		
BI-207	1063.66	15.	7.	0.004	129.94	6.322E-01		P
Ga-68	1077.40	25.	-4.	-0.002	279.32	-9.883E+00		
FE-59	1099.25	20.	-5.	-0.003	201.66	-6.238E-01		
Sc-46	1120.55	38.	4.	0.002	219.88	2.914E-01		
CO-60	1173.24	27.	-6.	-0.003	169.35	-4.589E-01		P
Ta-182	1189.05	20.	-3.	-0.002	332.78	-1.396E+00		
Ta-182	1221.41	32.	-6.	-0.003	218.16	-1.715E+00		
Co-56	1238.28	16.	11.	0.006	91.82	1.248E+00		P
NA-22	1274.53	11.	2.	0.001	244.95	1.602E-01		
FE-59	1291.60	11.	6.	0.003	126.28	1.165E+00		P
CO-60	1332.50	15.	-4.	-0.002	206.73	-3.114E-01		P
AG-110M	1384.30	0.	6.	0.003	40.82	2.124E+00		
La-140	1596.21	23.	-11.	-0.006	109.06	-1.089E+00		
SB-124	1690.98	0.	5.	0.003	45.23	1.065E+00		P
Y-88	1836.06	6.	-1.	0.000	846.32	-7.400E-02		

P - Peakbackground subtraction

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

Nuclide		Time of Count Activity Bq/Sample	Time Corrected Activity Bq/Sample	Uncertainty Counting 1 Sigma	MDA Bq/Sample
BE-7	#A	1.9320E+00	1.9321E+00	2.336E+02%	1.55E+01
NA-22	#A	1.6021E-01	1.6021E-01	2.449E+02%	1.46E+00
K-40		2.0587E+02	2.0587E+02	6.493E+00%	9.37E+00
Sc-46	#A	2.0189E-01	2.0190E-01	2.199E+02%	1.81E+00
CR-51	#A	2.6632E+00	2.6633E+00	2.836E+02%	2.54E+01
MN-54	#A	2.4189E-01	2.4189E-01	2.169E+02%	1.28E+00
FE-59	#A	1.5136E-01	1.5136E-01	1.190E+02%	2.94E+00
Co-56	#A	-7.9909E-01	-7.9909E-01	6.713E+01%	1.86E+00
CO-57	#A	0.0000E+00	0.0000E+00	1.000E+03%	1.59E+01
CO-58	#A	-7.8254E-01	-7.8254E-01	8.624E+01%	2.27E+00
CO-60	#A	-3.1136E-01	-3.1136E-01	2.067E+02%	1.71E+00
ZN-65	#A	-1.6167E-02	-1.6167E-02	7.812E+03%	5.77E+00
NB-94	#A	-6.1080E-01	-6.1080E-01	9.947E+01%	1.63E+00
ZR-95	#A	3.8380E-01	3.8381E-01	1.053E+02%	2.94E+00
NB-95	#A	-5.0165E-01	-5.0165E-01	1.446E+02%	2.47E+00
RU-103	#A	-3.7479E-01	-3.7479E-01	1.444E+02%	1.33E+00
RH-106	#A	-6.5608E+00	-6.5608E+00	1.420E+02%	3.14E+01
AG-108M	#A	3.4830E-01	3.4830E-01	1.037E+02%	8.85E-01
AG-110M	#A	-1.4038E-01	-1.4038E-01	4.082E+01%	2.99E+00
SN-113	#A	7.3936E-02	7.3936E-02	7.918E+02%	1.51E+00

SB-124	#A	-7.2029E-02	-7.2029E-02	4.523E+01%	3.60E+00
SB-125	#A	2.2416E+00	2.2416E+00	5.592E+01%	2.97E+00
I-131	#A	4.5362E-01	4.5365E-01	1.038E+02%	1.12E+00
Gd-153	#A	1.2902E+00	1.2902E+00	1.323E+02%	5.69E+00
Ga-68	#A	-9.7880E+00	-9.8835E+00	2.793E+02%	6.43E+01
Tc-99m	#A	-3.9221E-01	-3.9293E-01	1.465E+02%	1.92E+00
BA-133	#A	-3.3146E-01	-3.3146E-01	1.489E+02%	3.99E+00
CS-134	#A	1.0498E+00	1.0498E+00	6.208E+01%	1.40E+00
CS-137	#A	-1.7851E-01	-1.7851E-01	3.708E+02%	2.35E+00
CE-139	#A	1.8521E-01	1.8521E-01	2.033E+02%	1.28E+00
Ba-140	#A	1.9162E+00	1.9162E+00	1.239E+02%	4.20E+00
La-140	#A	-1.0886E+00	-1.0886E+00	1.091E+02%	2.54E+00
CE-141	#A	4.5617E-01	4.5618E-01	2.285E+02%	3.49E+00
CE-144	#A	2.3761E+00	2.3761E+00	1.615E+02%	1.29E+01
PM-144	#C	2.9629E+00	2.9629E+00	1.147E+01%	1.75E+00
EU-152	A	2.2714E-01	2.2714E-01	9.049E+01%	9.38E+00
EU-154	#A	-1.8652E-01	-1.8652E-01	3.168E+02%	2.02E+00
EU-155	#A	1.2672E+00	1.2672E+00	8.197E+01%	3.46E+00
HF-181	#A	8.2584E-01	8.2585E-01	7.781E+01%	1.77E+00
Ta-182	#A	-1.0273E-01	-1.0273E-01	1.892E+03%	6.94E+00
Hg-203	#A	2.1541E-01	2.1541E-01	1.936E+02%	1.43E+00
TL-208		5.7668E+00	5.7668E+00	1.011E+01%	7.48E-01
PM-146	#A	5.2546E-01	5.2546E-01	9.914E+01%	1.27E+00
Y-88	#A	-7.3997E-02	-7.3998E-02	8.463E+02%	1.53E+00
Cd-113m	#A	-7.3179E+03	-7.3179E+03	8.748E+01%	2.14E+04
Cd-109	#A	0.0000E+00	0.0000E+00	1.000E+03%	5.94E+01
Cf-251	#A	1.7897E+00	1.7897E+00	9.543E+01%	4.39E+00
Cf-249	#A	1.8913E-02	1.8913E-02	3.544E+03%	2.33E+00
Sn-126	#A	-5.4327E+00	-5.4327E+00	1.123E+02%	2.03E+01
PB-210	#A	1.3955E+01	1.3955E+01	1.142E+02%	5.33E+01
PB-212		1.8015E+01	1.8015E+01	5.638E+00%	1.55E+00
PB-214		1.5246E+01	1.5246E+01	7.486E+00%	2.52E+00
BI-207	#A	4.9248E-01	4.9248E-01	8.143E+01%	1.92E+00
BI-212	#A	5.9484E+00	5.9484E+00	8.501E+01%	1.71E+01
U-235	#A	1.9833E-01	1.9833E-01	8.259E+01%	1.51E+01
BI-214		1.5465E+01	1.5465E+01	1.010E+01%	2.14E+00
BI-210M	#A	3.6455E-01	3.6455E-01	2.916E+02%	2.53E+00
AC-228		1.6830E+01	1.6830E+01	9.465E+00%	1.53E+00
TH-227	#A	-6.1142E-01	-6.1142E-01	9.000E+02%	1.39E+01
TH-229	#A	1.2654E+01	1.2654E+01	5.486E+01%	1.74E+01
TH-234	A	1.1388E+01	1.1388E+01	4.376E+01%	1.74E+01
PA-231	#A	8.5323E+00	8.5323E+00	1.960E+02%	7.53E+01
PA-233	#A	1.0963E+00	1.0963E+00	2.034E+02%	6.57E+00
PA-234	A	2.8510E+00	2.8510E+00	7.657E+01%	7.55E+00
PA-234M	#A	6.6058E+01	6.6058E+01	9.459E+01%	2.95E+02
AM-241	#A	3.2117E-01	3.2117E-01	5.031E+02%	5.45E+00
Np-237	#A	-3.0591E+00	-3.0591E+00	1.788E+02%	1.82E+01
Ir-192	#A	4.2565E-01	4.2565E-01	1.520E+02%	2.78E+00
Cs-136	#A	2.3981E-01	2.3981E-01	8.478E+01%	2.29E+00

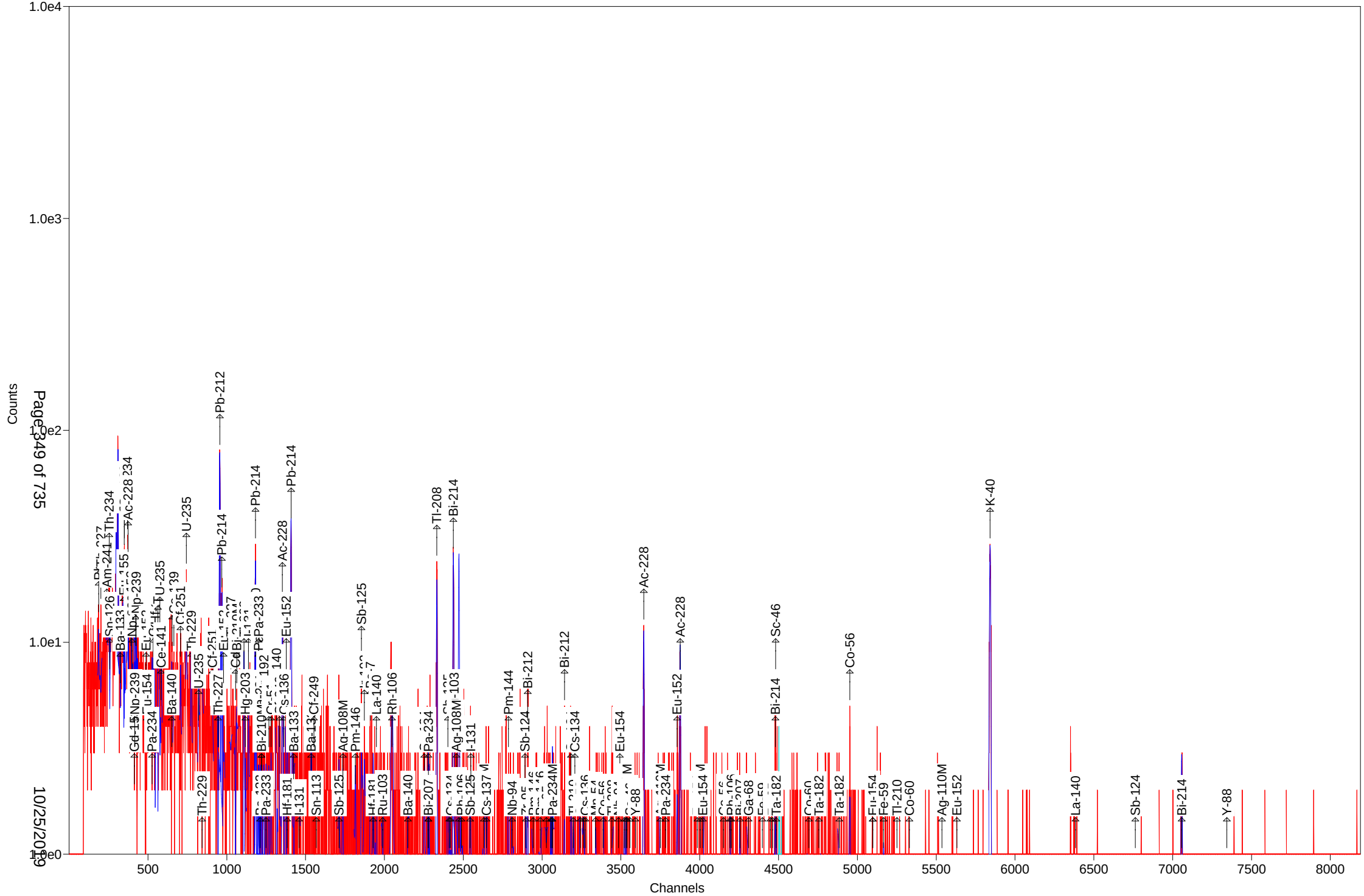
Np-239 #A	3.5607E-01	3.5614E-01	7.759E+02%		9.25E+00
Nd-147 #A	0.0000E+00	0.0000E+00	7.071E+02%		7.81E+00
TL-210 #A	1.3440E+00	1.3440E+00	2.965E+01%		1.50E+00
Kr-85 #A	0.0000E+00	0.0000E+00	1.000E+03%		4.52E+02

- 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 (37.5 to 2000.0 keV) 2.886E+02 Bq/Sample
Total Decayed Activity (37.5 to 2000.0 keV) 2.8857877E+02 Bq/Sample

444057_Gamma_180-95857-A-3-D DU. 8_Gamma_20191611.spc.


Counts
Channels
1.0e4
1.0e3
1.0e2
1.0e1
1.0e0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
6500
7000
7500
8000
Pb-212
Pb-214
Ac-228
Tl-208
Bi-214
K-40
Sc-46
Co-56
Sb-125
U-235
Th-229
Th-227
Th-234
Ac-228 234
Eu-152
Eu-154
Ba-140
Ce-141
Cf-251
Np-239
Nb-239
Pa-234
Rh-106
Ag-108M
Pm-146
La-140
Cs-134
Cs-136
Cs-137
Pm-144
Sb-124
Bi-212
Ta-182
Co-60
Eu-152
Ag-110M
Y-88
Sb-124
Bi-214
La-140
Fe-59
Tl-210
Ga-68
Hg-203
Sn-113
Sn-126
Am-241
Ba-133
Ba-133
Ba-133

Test America St. Louis Spectrum ID: 8_Gamma_20191610

Sample Description: 444057_Gamma_180-95857-A-4-B
Detector: Detector # 8
Batch ID: 444057
Work Order Number: Gamma
Lot Number: 180-95857-A-4-B

Decay to Time: 10/15/2019 10:43 Live Time: 1800 sec
Acquisition Time: 10/15/2019 10:43:44 Real Time: 1844 sec
Analysis Time: 10/15/2019 11:14 Dead Time: 2.40 %
Analysis Quantity: 1.000E+00 Sample

Efficiency Cal File: 8_Soil_TunaCan.Clb
Efficiency Cal Desc: 8_Soil_TunaCan_90099_032712
Efficiency Cal Date: 3/28/2012 10:35
Energy Cal Date: 2/28/2012 10:34
Library: Client_Long_Rev15.lib
Bkgd Correction File: 8_2019-10-06_1931.PBC

Nuclide	Activity Bq/Sample	1-Sigma Counting Uncert %	1-Sigma Counting Uncert Bq/Sample	1-Sigma Total Uncert Bq/Sample	Minimum Detectable Activity Bq/Sample
BE-7	3.022E+00	107.8	3.256E+00	3.260E+00	1.110E+01
NA-22	5.085E-01	65.0	3.304E-01	3.314E-01	1.079E+00
K-40	1.856E+02	6.8	1.271E+01	1.587E+01	9.370E+00
Sc-46	3.379E-01	116.5	3.935E-01	3.939E-01	2.704E+00
CR-51	-4.613E+00	177.5	8.189E+00	8.192E+00	2.744E+01
MN-54	3.721E-01	104.6	3.894E-01	3.899E-01	9.460E-01
FE-59	-1.497E+00	112.2	1.679E+00	1.681E+00	3.778E+00
Co-56	1.116E+00	47.7	5.325E-01	5.356E-01	1.143E+00
CO-57	-3.866E-01	95.7	3.698E-01	3.704E-01	1.234E+00
CO-58	-3.924E-01	143.3	5.623E-01	5.627E-01	1.937E+00
CO-60	-3.398E-02	1461.4	4.966E-01	4.966E-01	1.415E+00
ZN-65	1.273E+00	117.8	1.500E+00	1.502E+00	5.122E+00
NB-94	1.622E-01	317.8	5.155E-01	5.156E-01	1.253E+00
ZR-95	-1.007E+00	117.7	1.185E+00	1.186E+00	2.769E+00
NB-95	7.744E-02	547.8	4.242E-01	4.242E-01	1.523E+00
RU-103	-2.949E-01	155.9	4.598E-01	4.600E-01	1.134E+00
RH-106	5.417E+00	170.9	9.260E+00	9.264E+00	3.128E+01
AG-108M	1.577E-01	152.3	2.401E-01	2.402E-01	1.149E+00
AG-110M	5.007E-01	68.2	3.414E-01	3.424E-01	3.703E+00
SN-113	5.850E-01	116.4	6.808E-01	6.815E-01	2.303E+00
SB-124	-7.606E-01	64.5	4.907E-01	4.923E-01	3.819E+00
SB-125	1.987E+00	64.8	1.287E+00	1.291E+00	3.158E+00
I-131	-2.946E-01	201.5	5.938E-01	5.940E-01	1.170E+00
Gd-153	-3.013E-01	606.3	1.827E+00	1.827E+00	6.129E+00
Ga-68	-4.650E+01	85.6	3.979E+01	3.988E+01	8.792E+01
Tc-99m	-1.518E-01	343.9	5.219E-01	5.220E-01	1.756E+00
BA-133	-6.123E-01	169.7	1.039E+00	1.040E+00	3.501E+00
CS-134	6.073E-01	92.7	5.631E-01	5.639E-01	1.906E+00
CS-137	-3.496E-01	199.7	6.983E-01	6.985E-01	1.932E+00
CE-139	-4.226E-01	98.8	4.176E-01	4.195E-01	1.396E+00
Ba-140	1.875E+00	83.3	1.562E+00	1.565E+00	3.872E+00
La-140	7.001E-02	126.0	8.820E-02	8.828E-02	1.878E+00
CE-141	6.850E-01	137.8	9.439E-01	9.446E-01	3.155E+00

CE-144	0.000E+00	1.#INF	1.349E+00	1.349E+00	1.400E+01
PM-144	3.229E-01	158.5	5.119E-01	5.122E-01	1.222E+00
EU-152	6.577E-01	91.4	6.008E-01	6.018E-01	3.524E+00
EU-154	1.007E+00	86.4	8.699E-01	8.715E-01	1.958E+00
EU-155	1.654E-01	1745.6	2.887E+00	2.887E+00	9.677E+00
HF-181	4.084E-01	114.6	4.680E-01	4.685E-01	1.597E+00
Ta-182	2.103E+00	86.4	1.817E+00	1.820E+00	7.263E+00
Hg-203	-2.201E-01	175.7	3.868E-01	3.870E-01	1.324E+00
TL-208	5.048E+00	10.8	5.462E-01	6.057E-01	7.334E-01
PM-146	6.435E-01	47.7	3.070E-01	3.087E-01	1.475E+00
Y-88	0.000E+00	1.#INF	1.570E-01	1.570E-01	8.180E-01
Cd-113m	-5.654E+03	92.3	5.216E+03	5.229E+03	1.751E+04
Cd-109	0.000E+00	1.#INF	1.429E+01	1.429E+01	4.808E+01
Cf-251	-6.927E-01	265.6	1.840E+00	1.841E+00	4.795E+00
Cf-249	5.617E-01	111.1	6.240E-01	6.247E-01	2.110E+00
Sn-126	4.296E-02	13329.9	5.727E+00	5.727E+00	1.936E+01
PB-210	1.224E+01	96.8	1.185E+01	1.188E+01	3.968E+01
PB-212	1.663E+01	6.1	1.011E+00	1.476E+00	1.748E+00
PB-214	1.347E+01	7.9	1.068E+00	1.277E+00	1.860E+00
BI-207	7.606E-01	91.3	6.943E-01	6.954E-01	1.614E+00
BI-212	5.948E+00	93.3	5.549E+00	5.558E+00	1.887E+01
U-235	8.007E-01	138.2	1.106E+00	1.107E+00	1.412E+01
BI-214	1.108E+01	10.5	1.161E+00	1.296E+00	1.555E+00
BI-210M	-2.546E-01	374.5	9.536E-01	9.537E-01	2.440E+00
AC-228	1.794E+01	8.5	1.520E+00	1.774E+00	2.234E+00
TH-227	2.893E+00	130.2	3.768E+00	3.772E+00	1.223E+01
TH-229	3.131E+00	235.4	7.369E+00	7.373E+00	1.921E+01
TH-234	2.040E+01	25.1	5.126E+00	5.250E+00	1.627E+01
PA-231	0.000E+00	1.#INF	6.337E+00	6.337E+00	8.365E+01
PA-233	0.000E+00	1.#INF	4.497E-01	4.498E-01	6.855E+00
PA-234	7.960E-01	238.8	1.901E+00	1.901E+00	8.538E+00
PA-234M	2.838E+01	108.7	3.086E+01	3.090E+01	2.277E+02
AM-241	4.316E-01	376.1	1.623E+00	1.623E+00	5.467E+00
Np-237	1.097E-02	39182.5	4.298E+00	4.298E+00	1.445E+01
Ir-192	2.812E-01	98.6	2.772E-01	2.777E-01	2.867E+00
Cs-136	-7.870E-01	89.9	7.079E-01	7.094E-01	2.379E+00
Np-239	1.089E+00	246.5	2.685E+00	2.686E+00	8.966E+00
Nd-147	1.541E+00	102.6	1.582E+00	1.584E+00	7.195E+00
TL-210	0.000E+00	1.#INF	1.538E-01	1.538E-01	1.848E+00
Kr-85	9.159E+01	119.8	1.098E+02	1.099E+02	3.730E+02
Total	4.447E+02				

Analyst: Kellene Robbs

(Page 2 of 21)

Sample description
444057_Gamma_180-95857-A-4-B

Spectrum Filename: C:\User\SPC\Det8\8_Gamma_20191610.An1

Acquisition information
Start time: 10/15/2019 10:43:44 AM
Live time: 1800
Real time: 1844
Dead time: 2.40 %
Detector ID: 8

Detector system
Ge 8 SN/174

Calibration
Filename: 8_Soil_TunaCan.Clb
8_Soil_TunaCan_90099_032712

Energy Calibration
Created: 2/28/2012 10:34:41 AM
Zero offset: 0.052 keV
Gain: 0.250 keV/channel
Quadratic: 5.282E-10 keV/channel^2

Efficiency Calibration
Created: 3/28/2012 10:35:20 AM
Knee Energy: 165.85 keV
Above the Knee: Quadratic Uncertainty = 1.39 %
Log(Eff): -1.098764E-01 + (-4.958544E-01*Log(E)) + (-2.572270E-02*Log(E)^2)
Below the Knee: Quadratic Uncertainty = 1.71 %
Log(Eff): -2.525301E+01 + (9.398253E+00*Log(E)) + (-1.000034E+00*Log(E)^2)

Library Files
Main analysis library: Client_Long_Rev15.lib
Library Match Width: 0.500
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G800W064
Start channel: 150 (37.55keV)
Stop channel: 8000 (1999.97keV)
Peak rejection level: 1000.000%
Peak search sensitivity: 3
Sample Size: 1.0000E+00 +/- 0.000E+00%
Activity scaling factor: 1.0000E+00/(1.0000E+00* 1.0000E+00) = 1.0000E+00
Detection limit method: Reg. Guide 4.16 Method

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Random error: 4.0000000E+00
Systematic error: 4.0000000E+00
Fraction Limit: 0.000%
Background width: 3
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:	YES	10/15/2019 10:43:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	8_2019-10-06_1931.PBC 10/6/2019 7:31:35 PM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 26 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 0.1057

***** 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
40.08	20.	59.18	0.51	1.517E-02				
46.54	19.	96.83	1.01	2.005E-02	46.54	4.250	PBC<MDA	PB210
59.54	8.	376.06	1.02	2.881E-02	59.54	35.900	PBC<MDA	AM241
63.34	103.	23.35	1.71	3.096E-02	63.29	3.810	4.845E+01	TH234
74.76	176.	12.46	1.03	3.614E-02				
77.22	286.	8.12	1.04	3.702E-02				
87.24	85.	25.52	0.92	3.976E-02	86.49	13.100	9.140E+00	Np237
					86.54	30.700	3.899E+00	EU155
					86.94	9.040	1.321E+01	Sn126
					87.57	37.500	3.174E+00	Sn126
					88.04	3.790	3.133E+01	Cd109
91.10	23.	167.07	1.05	4.048E-02	91.10	28.300	PBC<MDA	Nd147
93.09	171.	13.74	1.06	4.079E-02	92.59	5.584	3.003E+01	TH234
					93.35	5.561	4.180E+01	AC228
106.13	19.	246.52	1.06	4.187E-02	106.13	22.700	PBC<MDA	Np239
123.10	17.	101.45	1.07	4.138E-02	123.10	40.790	PBC<MDA	EU154
131.29	5.	714.35	1.08	4.061E-02	131.29	18.000	PBC<MDA	PA234
143.79	-6.	514.45	1.09	3.899E-02	143.79	10.960	PBC<MDA	U235
145.44	23.	137.79	1.09	3.874E-02	145.44	48.200	PBC<MDA	CE141
162.66	19.	98.08	1.10	3.593E-02	162.66	6.220	PBC<MDA	Ba140
163.38	14.	138.18	1.10	3.580E-02	163.38	5.080	PBC<MDA	U235
185.72	70.	30.05	1.12	3.329E-02	185.72	54.000	2.175E+00	U235

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
193.51	8.	235.35	1.13	3.226E-02	193.51	4.400	PBC<MDA	TH229
209.01	52.	22.92	0.50	3.041E-02				
235.97	16.	215.98	1.16	2.768E-02	235.97	12.300	PBC<MDA	TH227
238.65	329.	6.89	1.06	2.744E-02	238.63	43.300	1.539E+01	PB212
242.01	69.	19.41	1.16	2.714E-02	242.00	7.430	1.890E+01	PB214
244.69	14.	241.28	1.16	2.691E-02	244.69	7.580	PBC<MDA	EU152
256.24	11.	145.55	1.17	2.596E-02	256.24	7.000	PBC<MDA	TH227
277.84	23.	45.35	0.35	2.440E-02	277.28	6.310	PBC<MDA	TL208
295.22	112.	13.38	1.02	2.323E-02	295.09	19.300	1.393E+01	PB214
					296.00	79.000	3.412E+00	TL210
300.15	30.	26.43	1.20	2.294E-02	300.03	3.280	2.206E+01	PB212
					300.07	2.460	2.942E+01	PA231
					300.18	6.200	PBC<MDA	PA233
338.21	87.	14.18	0.68	2.086E-02	338.32	12.010	1.930E+01	AC228
344.29	15.	155.53	1.24	2.057E-02	344.29	26.500	PBC<MDA	EU152
352.04	190.	9.00	1.21	2.020E-02	351.93	37.600	1.391E+01	PB214
383.84	12.	104.55	1.27	1.885E-02	383.84	8.940	PBC<MDA	BA133
387.95	12.	111.09	1.27	1.869E-02	387.95	66.000	PBC<MDA	Cf249
391.69	13.	116.38	1.27	1.855E-02	391.69	64.000	PBC<MDA	SN113
427.88	13.	91.25	1.30	1.728E-02	427.88	29.600	PBC<MDA	SB125
463.37	11.	91.99	1.32	1.620E-02	463.37	10.470	PBC<MDA	SB125
468.06	11.	98.59	1.33	1.606E-02	468.06	51.750	PBC<MDA	Ir192
477.60	9.	107.76	1.33	1.580E-02	477.60	10.520	PBC<MDA	BE7
482.00	9.	114.58	1.34	1.569E-02	482.00	80.500	PBC<MDA	HF181
487.02	9.	125.98	1.34	1.555E-02	487.02	45.500	PBC<MDA	La140
511.86	39.	23.15	2.61	1.494E-02	511.86	20.000	7.223E+00	RH106
513.98	11.	119.83	1.36	1.489E-02	513.98	0.430	PBC<MDA	Kr85
531.00	8.	119.16	1.37	1.449E-02	531.00	13.000	PBC<MDA	Nd147
537.26	7.	134.73	1.37	1.436E-02	537.26	24.390	PBC<MDA	Ba140
583.13	103.	10.82	1.54	1.342E-02	583.02	84.500	5.048E+00	TL208
609.03	119.	10.48	1.29	1.294E-02	609.31	46.090	1.108E+01	BI214
614.28	10.	152.26	1.43	1.286E-02	614.28	89.850	PBC<MDA	AG108M
621.92	12.	170.94	1.43	1.273E-02	621.92	9.930	PBC<MDA	RH106
696.54	7.	158.51	1.48	1.158E-02	696.54	99.000	PBC<MDA	PM144
702.63	3.	317.82	1.48	1.150E-02	702.63	97.900	PBC<MDA	NB94
727.26	9.	93.29	1.50	1.118E-02	727.17	7.550	PBC<MDA	BI212
747.16	12.	47.70	1.51	1.093E-02	747.16	34.000	PBC<MDA	PM146
763.94	9.	68.20	1.52	1.072E-02	763.94	22.280	PBC<MDA	AG110M
765.79	1.	547.77	1.53	1.070E-02	765.79	99.790	PBC<MDA	NB95
					766.41	0.294	PBC<MDA	PA234M
766.41	7.	108.73	1.53	1.070E-02	765.79	99.790	PBC<MDA	NB95
					766.41	0.294	PBC<MDA	PA234M
784.87	6.	108.54	1.54	1.048E-02	785.42	1.280	PBC<MDA	BI212
795.87	10.	92.72	1.54	1.036E-02	795.87	85.530	PBC<MDA	CS134
801.95	1.	953.94	1.55	1.030E-02	801.95	8.690	PBC<MDA	CS134
834.85	7.	104.64	1.57	9.955E-03	834.85	99.980	PBC<MDA	MN54
846.77	1.	930.88	1.58	9.836E-03	846.77	99.935	PBC<MDA	Co56
860.57	25.	20.32	1.25	9.703E-03	860.56	12.420	1.172E+01	TL208

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
911.05	76.	12.34	1.17	9.247E-03	911.07	29.000	1.575E+01	AC228
946.02	3.	238.82	1.64	8.957E-03	946.02	13.400	PBC<MDA	PA234
964.11	2.	531.27	1.65	8.814E-03	964.11	14.605	PBC<MDA	EU152
968.78	57.	17.10	1.65	8.776E-03	968.97	17.460	2.067E+01	AC228
996.33	8.	86.40	1.67	8.571E-03	996.33	10.600	PBC<MDA	EU154
1037.84	8.	91.02	1.69	8.278E-03	1037.84	14.130	PBC<MDA	Co56
1063.66	8.	91.28	1.71	8.106E-03	1063.66	74.500	PBC<MDA	BI207
1115.55	9.	117.81	1.74	7.782E-03	1115.55	50.600	PBC<MDA	ZN65
1120.10	10.	90.70	1.74	7.754E-03	1120.29	15.100	PBC<MDA	BI214
					1120.55	99.987	PBC<MDA	Sc46
1120.55	9.	116.46	1.74	7.752E-03	1120.29	15.100	PBC<MDA	BI214
					1120.55	99.987	6.758E-01	Sc46
					1121.30	34.900	1.937E+00	Ta182
1121.11	10.	99.41	1.74	7.748E-03	1120.55	99.987	PBC<MDA	Sc46
					1121.30	34.900	2.154E+00	Ta182
1188.64	9.	86.37	1.78	7.367E-03	1189.05	16.200	PBC<MDA	Ta182
1220.82	3.	308.52	1.80	7.199E-03	1221.41	27.000	PBC<MDA	Ta182
1238.28	18.	47.71	1.81	7.114E-03	1238.28	66.070	PBC<MDA	Co56
1274.53	6.	64.98	1.83	6.939E-03	1274.53	99.940	PBC<MDA	NA22
					1274.54	35.190	1.444E+00	EU154
1274.54	1.	376.87	1.83	6.939E-03	1274.53	99.940	PBC<MDA	NA22
					1274.54	35.190	2.999E-01	EU154
1408.00	6.	101.72	1.90	6.366E-03	1408.00	21.005	PBC<MDA	EU152
1460.52	220.	6.85	1.64	6.165E-03	1460.83	10.670	1.856E+02	K40
1690.98	7.	38.10	2.03	5.425E-03	1690.98	47.790	PBC<MDA	SB124
1764.41	7.	67.49	2.07	5.226E-03	1764.49	15.400	PBC<MDA	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	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide
160.12	40.08	47.	20.	1.340E+03	59.18	0.512	- s
298.85	74.73	153.	176.	4.876E+03	12.46	1.034	- D
308.68	77.19	126.	286.	7.717E+03	8.12	1.036	- D
835.87	209.01	30.	52.	1.710E+03	22.92	0.504	- 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: Client_Long_Rev15.lib

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********** 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 1 Sigma %	FWHM keV
PB-210	185.96	46.54	156.	19.	0.010	96.83	1.012
TH-227	200.36	50.14	254.	-14.	-0.008	164.27	1.015s
AM-241	237.95	59.54	452.	8.	0.004	376.06	1.022s
TH-234	252.96	63.29	154.	69.	0.038	28.26	1.025D
BA-133	323.77	80.99	1089.	-32.	-0.018	145.48	1.039s
EU-155	345.98	86.54	838.	-28.	-0.016	146.97	1.043s
Cd-109	351.97	88.04	757.	0.	0.000	1000.00	1.044A
Nd-147	364.21	91.10	734.	23.	0.013	167.07	1.047s
TH-234	370.17	92.59	188.	50.	0.028	41.56	1.048D
AC-228	373.21	93.35	696.	28.	0.016	133.51	1.049s
Gd-153	389.81	97.50	828.	-7.	-0.004	606.27	1.052s
Np-239	397.81	99.50	1192.	-28.	-0.016	173.12	1.053
Gd-153	412.62	103.20	1163.	-28.	-0.016	170.61	1.056s
Np-239	414.62	103.70	1110.	-28.	-0.016	166.62	1.057s
Np-239	424.34	106.13	1045.	19.	0.010	246.52	1.058s
EU-152	486.94	121.78	242.	-25.	-0.014	91.35	1.071s
CO-57	488.06	122.06	267.	-25.	-0.014	95.67	1.071s
EU-154	492.22	123.10	148.	17.	0.010	101.45	1.072s
PA-234	525.00	131.29	553.	5.	0.003	714.35	1.078s
HF-181	531.92	133.02	558.	0.	0.000	1000.00	1.079
CE-144	533.98	133.54	558.	0.	0.000	1000.00	1.080
HF-181	545.02	136.30	558.	0.	0.000	1000.00	1.082
CO-57	545.72	136.47	558.	0.	0.000	1000.00	1.082
Tc-99m	561.86	140.51	510.	-9.	-0.005	343.86	1.085s
U-235	574.97	143.79	517.	-6.	-0.003	514.45	1.087s
CE-141	581.59	145.44	492.	23.	0.013	137.79	1.089s
Ba-140	650.47	162.66	160.	19.	0.010	98.08	1.102
U-235	653.35	163.38	180.	14.	0.008	138.18	1.102
CE-139	663.24	165.85	226.	-22.	-0.012	98.83	1.104s
Cf-251	706.23	176.60	106.	-7.	-0.004	265.65	1.112s
U-235	742.71	185.72	112.	70.	0.039	30.05	1.119
TH-229	773.87	193.51	99.	8.	0.004	235.35	1.125s
U-235	821.17	205.33	220.	-9.	-0.005	249.78	1.134s
TH-229	843.24	210.85	211.	0.	0.000	1000.00	1.138
Cf-251	907.84	227.00	104.	-8.	-0.004	252.07	1.151s
TH-227	943.73	235.97	596.	16.	0.009	215.98	1.157s
PB-212	954.37	238.63	55.	356.	0.198	6.08	1.159D
PB-214	967.84	242.00	54.	69.	0.038	19.41	1.162D
EU-152	978.62	244.69	565.	14.	0.008	241.28	1.164s
TH-227	1024.81	256.24	64.	11.	0.006	145.55	1.172s
Cd-113m	1054.65	263.70	94.	-16.	-0.009	92.26	1.178s
BI-210M	1063.18	265.83	128.	-6.	-0.003	374.54	1.179s
TL-208	1111.21	277.84	26.	23.	0.013	45.35	0.349s
Hg-203	1116.66	279.20	91.	-8.	-0.004	175.73	1.189s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
PB-214	1180.22	295.09	37.	102.	0.057	13.06	1.201D
TL-210	1183.86	296.00	431.	-6.	-0.003	475.24	1.202s
PB-212	1199.98	300.03	16.	30.	0.017	26.43	1.205D
PA-231	1200.14	300.07	425.	0.	0.000	1000.00	1.205
PA-233	1200.58	300.18	425.	0.	0.000	1000.00	1.205
PA-231	1210.46	302.65	425.	0.	0.000	1000.00	1.207
BA-133	1211.27	302.85	425.	0.	0.000	1000.00	1.207
Ba-140	1219.26	304.85	425.	0.	0.000	1000.00	1.208s
BI-210M	1219.45	304.90	425.	0.	0.000	1000.00	1.208s
Ir-192	1233.62	308.44	425.	0.	0.000	1000.00	1.211s
PA-233	1247.91	312.01	425.	0.	0.000	1000.00	1.214s
Ir-192	1265.82	316.49	425.	0.	0.000	1000.00	1.217
CR-51	1280.20	320.08	501.	-18.	-0.010	177.51	1.219s
La-140	1314.91	328.76	305.	-5.	-0.003	169.46	1.226s
Cf-249	1333.63	333.44	300.	0.	0.000	1000.00	1.229s
AC-228	1352.72	338.21	17.	87.	0.048	14.18	0.677s
Cs-136	1362.15	340.57	300.	0.	0.000	1000.00	1.234s
EU-152	1377.01	344.29	261.	15.	0.008	155.53	1.237s
HF-181	1383.19	345.83	343.	-17.	-0.010	154.07	1.238
PB-214	1408.03	352.04	24.	190.	0.106	9.00	1.213
BA-133	1423.87	356.00	263.	-14.	-0.008	169.71	1.245s
I-131	1457.81	364.48	45.	-9.	-0.005	201.54	1.252s
BA-133	1535.24	383.84	77.	12.	0.007	104.55	1.266s
Cf-249	1551.68	387.95	90.	12.	0.007	111.09	1.269s
SN-113	1566.64	391.69	100.	13.	0.007	116.38	1.271s
SB-125	1711.39	427.88	32.	13.	0.007	91.25	1.297s
AG-108M	1735.64	433.94	39.	-4.	-0.002	293.22	1.301s
SB-125	1853.36	463.37	48.	11.	0.006	91.99	1.322s
Ir-192	1872.14	468.06	56.	11.	0.006	98.59	1.325s
BE-7	1910.28	477.60	43.	9.	0.005	107.76	1.332s
HF-181	1927.89	482.00	52.	9.	0.005	114.58	1.335
La-140	1947.98	487.02	61.	9.	0.005	125.98	1.339s
RU-103	1988.12	497.05	30.	-7.	-0.004	155.92	1.346s
RH-106	2047.36	511.86	21.	39.	0.022	23.15	2.606s
Kr-85	2055.83	513.98	75.	11.	0.006	119.83	1.357s
Nd-147	2123.91	531.00	22.	8.	0.005	119.16	1.369s
Ba-140	2148.95	537.26	22.	7.	0.004	134.73	1.373s
CS-134	2252.86	563.24	43.	-12.	-0.007	92.69	1.391s
CS-134	2277.20	569.32	36.	-9.	-0.005	100.00	1.395s
PA-234	2277.80	569.47	45.	0.	0.000	1000.00	1.395s
BI-207	2278.73	569.70	58.	-11.	-0.006	104.26	1.396s
TL-208	2332.46	583.13	7.	103.	0.057	10.82	1.540
SB-125	2401.92	600.50	355.	-18.	-0.010	61.74	1.416s
SB-124	2410.85	602.73	337.	-18.	-0.010	64.52	1.418s
CS-134	2418.76	604.71	319.	-17.	-0.009	149.78	1.419s
BI-214	2436.05	609.03	9.	119.	0.066	10.48	1.295s
RU-103	2441.12	610.30	302.	-17.	-0.010	145.45	1.423s
AG-108M	2457.05	614.28	109.	10.	0.006	152.26	1.426s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
PM-144	2472.18	618.06	295.	-17.	-0.010	143.23	1.428
RH-106	2487.60	621.92	216.	12.	0.007	170.94	1.431s
SB-125	2543.49	635.89	38.	-12.	-0.007	75.68	1.440s
I-131	2547.83	636.97	54.	-5.	-0.003	219.45	1.441s
AG-110M	2630.98	657.76	41.	-3.	-0.002	307.32	1.455s
CS-137	2646.58	661.66	50.	-6.	-0.004	199.72	1.457s
PM-144	2786.11	696.54	23.	7.	0.004	158.51	1.480
NB-94	2810.46	702.63	24.	3.	0.002	317.82	1.484s
SB-124	2891.09	722.79	55.	-8.	-0.004	135.78	1.497s
AG-108M	2891.70	722.94	47.	0.	0.000	1000.00	1.498s
EU-154	2893.39	723.36	47.	0.	0.000	1000.00	1.498s
ZR-95	2896.74	724.20	45.	0.	0.000	1000.00	1.498s
BI-212	2908.63	727.17	31.	9.	0.005	93.29	1.500s
PM-146	2942.83	735.72	38.	-10.	-0.006	104.52	1.506s
PM-146	2988.59	747.16	5.	12.	0.007	47.70	1.513s
ZR-95	3026.87	756.73	33.	-11.	-0.006	117.72	1.519s
AG-110M	3055.73	763.94	15.	9.	0.005	68.20	1.524
NB-95	3063.11	765.79	33.	1.	0.001	547.77	1.525s
PA-234M	3065.60	766.41	24.	7.	0.004	108.73	1.526s
EU-152	3115.64	778.92	28.	-4.	-0.002	285.04	1.534s
BI-212	3141.64	785.42	10.	6.	0.004	108.54	1.538s
CS-134	3183.44	795.87	35.	10.	0.005	92.72	1.544s
TL-210	3198.36	799.60	45.	0.	0.000	1000.00	1.547s
CS-134	3207.77	801.95	45.	1.	0.001	953.94	1.548s
CO-58	3243.06	810.78	49.	-7.	-0.004	143.32	1.554s
La-140	3263.04	815.77	56.	0.	0.000	1000.00	1.557
Cs-136	3273.97	818.50	76.	-14.	-0.008	89.95	1.559s
MN-54	3339.36	834.85	9.	7.	0.004	104.64	1.569s
Co-56	3387.05	846.77	14.	1.	0.000	930.88	1.577s
TL-208	3442.25	860.57	1.	25.	0.014	20.32	1.250
NB-94	3484.36	871.10	14.	-2.	-0.001	273.86	1.592s
EU-154	3492.89	873.23	33.	-6.	-0.003	144.96	1.593s
PA-234	3522.10	880.53	64.	-14.	-0.008	87.47	1.598s
PA-234	3532.94	883.24	77.	-9.	-0.005	135.73	1.599s
AG-110M	3538.71	884.68	86.	0.	0.000	1000.00	1.600s
Sc-46	3557.10	889.28	86.	0.	0.000	1000.00	1.603s
Y-88	3592.14	898.04	19.	-1.	-0.001	411.81	1.608s
AC-228	3644.18	911.05	3.	76.	0.042	12.34	1.174s
AG-110M	3749.96	937.49	30.	-9.	-0.005	137.89	1.633s
PA-234	3784.07	946.02	10.	3.	0.002	238.82	1.638s
EU-152	3856.43	964.11	76.	2.	0.001	531.27	1.649s
AC-228	3875.88	968.97	19.	57.	0.032	17.10	1.652s
EU-154	3985.31	996.33	21.	8.	0.005	86.40	1.668s
EU-154	4019.10	1004.77	18.	-3.	-0.002	336.68	1.673s
Co-56	4151.36	1037.84	10.	8.	0.005	91.02	1.693s
Cs-136	4192.29	1048.07	19.	-5.	-0.003	131.15	1.698s
RH-106	4201.45	1050.36	31.	-6.	-0.003	137.44	1.700s
BI-207	4254.65	1063.66	10.	8.	0.005	91.28	1.708s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Ga-68	4309.61	1077.40	50.	-19.	-0.010	85.57	1.716s
FE-59	4397.02	1099.25	35.	-12.	-0.007	112.17	1.728s
EU-152	4448.32	1112.07	91.	-13.	-0.007	103.37	1.736s
ZN-65	4462.20	1115.55	52.	9.	0.005	117.81	1.738s
BI-214	4481.17	1120.29	35.	10.	0.005	90.70	1.740
Sc-46	4482.22	1120.55	56.	9.	0.005	116.46	1.740
Ta-182	4485.22	1121.30	49.	10.	0.006	99.41	1.741s
CO-60	4692.97	1173.24	32.	-15.	-0.008	60.51	1.770s
Ta-182	4756.23	1189.05	10.	9.	0.005	86.37	1.779s
Ta-182	4885.67	1221.41	16.	3.	0.002	308.52	1.797s
Co-56	4953.16	1238.28	11.	18.	0.010	47.71	1.806s
NA-22	5098.16	1274.53	5.	6.	0.004	64.98	1.826s
EU-154	5098.20	1274.54	12.	1.	0.001	376.87	1.826s
AG-110M	5537.25	1384.30	11.	-5.	-0.003	165.68	1.884s
EU-152	5632.07	1408.00	5.	6.	0.003	101.72	1.896s
K-40	5842.17	1460.52	3.	220.	0.122	6.85	1.637
La-140	6384.93	1596.21	11.	-2.	-0.001	344.64	1.990s
SB-124	6764.03	1690.98	0.	7.	0.004	38.10	2.034s
BI-214	7058.07	1764.49	8.	7.	0.004	67.49	2.067
Co-56	7085.51	1771.35	28.	-4.	-0.002	200.30	2.070s
Y-88	7344.36	1836.06	0.	0.	0.000	1000.00	2.098s

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	3.0219E+00				5.31E+01	
			477.60	3.022E+00	?(P	1.110E+01 1.08E+02 1.05E+01	G
NA-22	C	5.0854E-01				9.50E+02	
			1274.53	5.085E-01	?(	1.079E+00 6.50E+01 9.99E+01	G
K-40	N	1.8560E+02				4.66E+11	
			1460.83	1.856E+02	(P	9.370E+00 6.85E+00 1.07E+01	G
Sc-46	F	3.3790E-01				8.38E+01	
			889.28	0.000E+00	?(	2.704E+00 1.00E+03 1.00E+02	G
			1120.55	6.758E-01	?(	2.684E+00 1.16E+02 1.00E+02	G
CR-51	F	-4.6129E+00				2.77E+01	
			320.08	-4.613E+00	(	2.744E+01 1.78E+02 9.94E+00	G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

MN-54    C   3.7213E-01                                     3.12E+02
                          834.85 3.721E-01 ?(  9.460E-01 1.05E+02 1.00E+02 G

FE-59    F  -1.4972E+00                                     4.45E+01
                         1099.25-1.497E+00 ?(  3.778E+00 1.12E+02 5.65E+01 G
                         1291.60 4.046E-02 % P 3.377E+00 3.46E+03 4.32E+01 G

Co-56    C   1.1163E+00                                     7.73E+01
                          846.77 4.865E-02 ?(P 1.143E+00 9.31E+02 9.99E+01 G
                         1238.28 2.129E+00 ?(P 2.146E+00 4.77E+01 6.61E+01 G
                         1037.84 3.932E+00 ?(P 8.301E+00 9.10E+01 1.41E+01 G
                         1771.35-2.655E+00 +   1.882E+01 2.00E+02 1.55E+01  A

CO-57    C  -3.8659E-01                                     2.72E+02
                          122.06-3.866E-01 *(  1.234E+00 9.57E+01 8.56E+01 G
                          136.47 0.000E+00 &   1.467E+01 1.00E+03 1.07E+01 G

CO-58    C  -3.9236E-01                                     7.09E+01
                          810.78-3.924E-01 ?(  1.937E+00 1.43E+02 9.95E+01 G

CO-60    F  -3.3979E-02                                     1.93E+03
                         1332.50-3.398E-02 %(P 1.415E+00 1.46E+03 1.00E+02 G
                         1173.24-1.130E+00 + P 2.174E+00 6.05E+01 9.99E+01 G

ZN-65    F   1.2734E+00                                     2.44E+02
                         1115.55 1.273E+00 ?(P 5.122E+00 1.18E+02 5.06E+01 G

NB-94    I   1.6220E-01                                     7.41E+06
                          702.63 1.622E-01 ?(P 1.253E+00 3.18E+02 9.79E+01 G
                          871.10-1.158E-01 +   1.167E+00 2.74E+02 9.99E+01 G

ZR-95    I  -1.0066E+00                                     6.40E+01
                          756.73-1.007E+00 ?(  2.769E+00 1.18E+02 5.45E+01 G
                          724.20 0.000E+00 +   3.812E+00 1.00E+03 4.42E+01 G

NB-95    I   7.7442E-02                                     6.40E+01
                          765.79 7.744E-02 ?(  1.523E+00 5.48E+02 9.98E+01 G

RU-103   I  -2.9488E-01                                     3.93E+01
                          497.05-2.949E-01  (P 1.134E+00 1.56E+02 9.09E+01 G
                          610.30-1.281E+01 +   6.257E+01 1.45E+02 5.75E+00 GA

RH-106   I   5.4168E+00                                     3.74E+02
                          621.92 5.417E+00 ?(  3.128E+01 1.71E+02 9.93E+00 G
                         1050.36-2.608E+01 +   1.246E+02 1.37E+02 1.56E+00 G
                          511.86 7.223E+00 ?   4.476E+00 2.32E+01 2.00E+01 GA
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Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
AG-108M	C	1.5768E-01					1.53E+05	
			433.94	-1.592E-01	?(P	1.149E+00	2.93E+02	9.05E+01 G
			722.94	0.000E+00	+	1.887E+00	1.00E+03	9.08E+01 G
			614.28	4.767E-01	*(	2.470E+00	1.52E+02	8.98E+01 G
AG-110M	F	5.0065E-01					2.50E+02	
			884.68	0.000E+00	?(	3.703E+00	1.00E+03	7.27E+01 G
			657.76	-1.449E-01	+	1.573E+00	3.07E+02	9.46E+01 G
			937.49	-1.612E+00	+	5.058E+00	1.38E+02	3.44E+01 G
			1384.30	-1.652E+00	+	6.348E+00	1.66E+02	2.43E+01 G
			763.94	2.134E+00	?(	4.826E+00	6.82E+01	2.23E+01 G
SN-113	F	5.8498E-01					1.15E+02	
			391.69	5.850E-01	?(	2.303E+00	1.16E+02	6.40E+01 G
SB-124	F	-7.6062E-01					6.02E+01	
			602.73	-7.606E-01	?(P	3.819E+00	6.45E+01	9.83E+01 G
			1690.98	1.493E+00	+ P	1.579E+00	3.81E+01	4.78E+01 G
			722.79	-3.660E+00	+	1.705E+01	1.36E+02	1.08E+01 G
SB-125	I	1.9872E+00					1.01E+03	
			427.88	1.386E+00	?(	3.158E+00	9.12E+01	2.96E+01 G
			600.50	-4.337E+00	& P	2.148E+01	6.17E+01	1.79E+01 G
			635.89	-4.914E+00	&	1.243E+01	7.57E+01	1.13E+01 G
			463.37	3.688E+00	(	1.146E+01	9.20E+01	1.05E+01 G
I-131	I	-2.9461E-01					8.02E+00	
			364.48	-2.946E-01	(P	1.170E+00	2.02E+02	8.17E+01 G
			284.30	-3.100E-01	% P	1.564E+01	1.29E+03	6.14E+00 G
			636.97	-3.002E+00	&	2.292E+01	2.19E+02	7.17E+00 G
Gd-153	F	-3.0131E-01					2.42E+02	
			97.50	-3.013E-01	?(	6.129E+00	6.06E+02	3.00E+01 G
			103.20	-1.736E+00	+	9.866E+00	1.71E+02	2.18E+01 G
Ga-68	C	-4.6503E+01					4.71E-02	
			1077.40	-4.650E+01	?(	8.792E+01	8.56E+01	3.30E+00 G
Tc-99m	I	-1.5177E-01					2.51E-01	
			140.51	-1.518E-01	?(	1.756E+00	3.44E+02	8.93E+01 G
BA-133	F	-6.1226E-01					3.85E+03	
			356.00	-6.123E-01	?(	3.501E+00	1.70E+02	6.20E+01 G
			302.85	0.000E+00	+	1.315E+01	1.00E+03	1.83E+01 G
			383.84	4.079E+00	? P	1.441E+01	1.05E+02	8.94E+00 GA
			80.99	-1.379E+00	+	6.680E+00	1.45E+02	3.41E+01 GA

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CS-134	I	6.0728E-01					7.54E+02	
			795.87	6.059E-01	?(	1.906E+00	9.27E+01	8.55E+01 G
			604.71	-7.469E-01	+	3.756E+00	1.50E+02	9.76E+01 G
			569.32	-2.375E+00	+	8.093E+00	1.00E+02	1.54E+01 G
			801.95	6.209E-01	(	2.109E+01	9.54E+02	8.69E+00 G
			563.24	-5.993E+00	+ P	1.610E+01	9.27E+01	8.35E+00 G
CS-137	I	-3.4962E-01					1.10E+04	
			661.66	-3.496E-01	?(P	1.932E+00	2.00E+02	8.52E+01 G
CE-139	F	-4.2256E-01					1.38E+02	
			165.85	-4.226E-01	?(	1.396E+00	9.88E+01	7.99E+01 G
Ba-140	I	1.8751E+00					1.28E+01	
			537.26	1.164E+00	?(	3.872E+00	1.35E+02	2.44E+01 G
			162.66	4.665E+00	&(	1.533E+01	9.81E+01	6.22E+00 G
			304.85	0.000E+00	&	5.648E+01	1.00E+03	4.29E+00 G
La-140	I	7.0012E-02					1.28E+01	
			1596.21	-2.381E-01	?(	1.878E+00	3.45E+02	9.54E+01 G
			487.02	7.161E-01	?(P	3.079E+00	1.26E+02	4.55E+01 G
			328.76	-6.061E-01	& P	1.078E+01	1.69E+02	2.03E+01 G
			815.77	0.000E+00	-	8.861E+00	1.00E+03	2.33E+01 G
CE-141	I	6.8504E-01					3.25E+01	
			145.44	6.850E-01	?(	3.155E+00	1.38E+02	4.82E+01 G
PM-144	C	3.2294E-01					3.63E+02	
			696.54	3.229E-01	(	1.222E+00	1.59E+02	9.90E+01 G
			618.06	-7.538E-01	+	3.626E+00	1.43E+02	9.91E+01 G
EU-152	F	6.5769E-01					4.94E+03	
			121.78	-1.157E+00	&(	3.524E+00	9.14E+01	2.86E+01 G
			344.29	1.519E+00	?(	7.951E+00	1.56E+02	2.65E+01 G
			1112.07	-7.041E+00	+	2.455E+01	1.03E+02	1.36E+01 G
			778.92	-1.628E+00	+	1.114E+01	2.85E+02	1.29E+01 G
			964.11	1.007E+00	?(	1.866E+01	5.31E+02	1.46E+01 G
			244.69	3.817E+00	&(	3.090E+01	2.41E+02	7.58E+00 G
			1408.00	2.354E+00	?	5.597E+00	1.02E+02	2.10E+01 GA
EU-154	I	1.0068E+00					3.14E+03	
			123.10	5.751E-01	*(	1.958E+00	1.01E+02	4.08E+01 G
			1274.54	2.999E-01	?(	4.240E+00	3.77E+02	3.52E+01 G
			723.36	0.000E+00	-	8.483E+00	1.00E+03	2.02E+01 G
			873.23	-2.756E+00	+	1.389E+01	1.45E+02	1.23E+01 G
			1004.77	-1.015E+00	+	8.109E+00	3.37E+02	1.80E+01 G
			996.33	5.015E+00	?(	1.472E+01	8.64E+01	1.06E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	I	1.6539E-01					1.81E+03	
			105.31	1.654E-01	&(	9.677E+00	1.75E+03	2.12E+01 G
			86.54	-1.284E+00	+	6.289E+00	1.47E+02	3.07E+01 G
HF-181	F	4.0844E-01					4.24E+01	
			482.00	4.084E-01	?(	1.597E+00	1.15E+02	8.05E+01 G
			133.02	0.000E+00	&	3.581E+00	1.00E+03	4.33E+01 G
			345.83	-3.097E+00	+	1.602E+01	1.54E+02	1.51E+01 G
			136.30	0.000E+00	-	2.677E+01	1.00E+03	5.85E+00 G
Ta-182	F	2.1034E+00					1.14E+02	
			1121.30	2.154E+00	?(	7.263E+00	9.94E+01	3.49E+01 G
			1221.41	8.575E-01	?(	6.102E+00	3.09E+02	2.70E+01 G
			1189.05	4.072E+00	?(	8.121E+00	8.64E+01	1.62E+01 G
Hg-203	F	-2.2009E-01					4.66E+01	
			279.20	-2.201E-01	?(	1.324E+00	1.76E+02	8.15E+01 G
TL-208	N	5.0485E+00					6.98E+02	
			583.02	5.048E+00	(P	7.334E-01	1.08E+01	8.45E+01 G
			277.28	8.318E+00	+ P	9.540E+00	4.54E+01	6.31E+00 G
			860.56	1.172E+01	+ P	3.397E+00	2.03E+01	1.24E+01 G
PM-146	C	6.4346E-01					2.02E+03	
			453.88	2.945E-02	&(P	1.475E+00	1.99E+03	6.50E+01 G
			747.16	1.817E+00	?(P	1.940E+00	4.77E+01	3.40E+01 G
			735.72	-2.247E+00	& P	7.019E+00	1.05E+02	2.25E+01 G
Cd-113m		-5.6537E+03					5.33E+03	
			263.70	-5.654E+03	?(	1.751E+04	9.23E+01	6.00E-03 K
Cf-251	T	-6.9266E-01					3.28E+05	
			176.60	-6.927E-01	*(	4.795E+00	2.66E+02	1.70E+01 G
			227.00	-2.473E+00	+	1.553E+01	2.52E+02	6.30E+00 GA
Cf-249	T	5.6171E-01					1.28E+05	
			387.95	5.617E-01	&(	2.110E+00	1.11E+02	6.60E+01 G
			333.44	0.000E+00	-	1.416E+01	1.00E+03	1.55E+01 G
Sn-126		4.2964E-02					3.65E+07	
			87.57	4.296E-02	}	4.706E+00	1.69E+03	3.75E+01 GA
			64.28	4.296E-02	%(	1.936E+01	1.33E+04	9.70E+00 G
			86.94	4.296E-02	}	2.046E+01	1.98E+03	9.04E+00 GA
PB-210	N	1.2243E+01					8.14E+03	
			46.54	1.224E+01	?(P	3.968E+01	9.68E+01	4.25E+00 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PB-212	N	1.6631E+01					6.98E+02	
			238.63	1.663E+01	(P	1.748E+00	6.08E+00	4.33E+01 G
			300.03	2.206E+01	+ P	1.582E+01	2.64E+01	3.28E+00 GA
PB-214	N	1.3469E+01					5.84E+05	
			351.93	1.391E+01	(P	1.860E+00	9.00E+00	3.76E+01 G
			295.09	1.262E+01	(P	3.854E+00	1.31E+01	1.93E+01 G
			242.00	1.890E+01	+	1.021E+01	1.94E+01	7.43E+00 GA
BI-207	C	7.6064E-01					1.18E+04	
			1063.66	7.606E-01	?(P	1.614E+00	9.13E+01	7.45E+01 G
			569.70	-4.703E-01	- P	1.591E+00	1.04E+02	9.77E+01 G
BI-212	N	5.9484E+00					6.98E+02	
			727.17	5.948E+00	?(	1.887E+01	9.33E+01	7.55E+00 G
			785.42	2.671E+01	? P	7.088E+01	1.09E+02	1.28E+00 GA
U-235	N	8.0066E-01					2.57E+11	
			143.79	-8.104E-01	?(P	1.412E+01	5.14E+02	1.10E+01 G
			205.33	-3.071E+00	+ P	2.581E+01	2.50E+02	5.01E+00 G
			163.38	4.277E+00	(P	1.992E+01	1.38E+02	5.08E+00 G
			185.72	2.175E+00	P	1.605E+00	3.01E+01	5.40E+01 GA
BI-214	N	1.1081E+01					5.84E+05	
			609.31	1.108E+01	@(P	1.555E+00	1.05E+01	4.61E+01 G
			1120.29	4.653E+00	- P	1.429E+01	9.07E+01	1.51E+01 G
			1764.49	4.961E+00	-	1.106E+01	6.75E+01	1.54E+01 G
BI-210M	T	-2.5460E-01					1.10E+09	
			265.83	-2.546E-01	&(P	2.440E+00	3.75E+02	5.00E+01 G
			304.90	0.000E+00	&	8.654E+00	1.00E+03	2.80E+01 G
AC-228	N	1.7944E+01					2.10E+03	
			911.07	1.575E+01	(	2.234E+00	1.23E+01	2.90E+01 G
			968.97	2.067E+01	?(	8.347E+00	1.71E+01	1.75E+01 G
			338.32	1.930E+01	(	4.863E+00	1.42E+01	1.20E+01 G
			93.35	6.910E+00	-	3.076E+01	1.34E+02	5.56E+00 XA
TH-227	N	2.8931E+00					7.95E+03	
			256.24	3.363E+00	(	1.223E+01	1.46E+02	7.00E+00 G
			235.97	2.626E+00	&(	1.901E+01	2.16E+02	1.23E+01 G
			50.14	-4.260E+00	+	2.358E+01	1.64E+02	8.00E+00 G
TH-229	N	3.1308E+00					2.68E+06	
			193.51	3.131E+00	&(	1.921E+01	2.35E+02	4.40E+00 G
			210.85	0.000E+00	-	4.331E+01	1.00E+03	2.99E+00 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-234	N	2.0396E+01					1.63E+12	
			92.59	1.220E+01	(P	1.627E+01	4.16E+01	5.58E+00 G
			63.29	3.241E+01	(P	2.851E+01	2.83E+01	3.81E+00 G
PA-234	N	7.9596E-01					1.63E+12	
			131.29	3.547E-01	(	8.538E+00	7.14E+02	1.80E+01 G
			946.02	1.389E+00	?(	8.076E+00	2.39E+02	1.34E+01 G
			569.47	0.000E+00	-	1.682E+01	1.00E+03	8.20E+00 G
			883.24	-5.727E+00	+	2.652E+01	1.36E+02	9.60E+00 G
			880.53	-1.324E+01	+	3.891E+01	8.75E+01	6.00E+00 GA
PA-234M	N	2.8384E+01					1.63E+12	
			1001.00	-3.957E+00	%(P	2.277E+02	1.59E+03	8.37E-01 G
			766.41	1.205E+02	?(P	4.513E+02	1.09E+02	2.94E-01 G
AM-241	T	4.3158E-01					1.58E+05	
			59.54	4.316E-01	*(P	5.467E+00	3.76E+02	3.59E+01 G
Np-237	F	1.0968E-02					2.14E+06	
								Derived Ave Activity
			86.49	1.097E-02	}(	1.445E+01	3.92E+04	1.31E+01 G
Ir-192	F	2.8122E-01					7.40E+01	
			316.49	0.000E+00	?(	2.867E+00	1.00E+03	8.70E+01 G
			468.06	7.542E-01	(	2.517E+00	9.86E+01	5.18E+01 G
			308.44	0.000E+00	&	7.702E+00	1.00E+03	3.18E+01 G
Cs-136	F	-7.8703E-01					1.30E+01	
			818.50	-7.870E-01	?(	2.379E+00	8.99E+01	1.00E+02 G
			1048.07	-4.230E-01	+	1.948E+00	1.31E+02	8.00E+01 G
			340.57	0.000E+00	+	4.764E+00	1.00E+03	4.69E+01 G
Np-239	T	1.0891E+00					2.36E+00	
			103.70	-1.577E+00	+	8.752E+00	1.67E+02	2.40E+01 X
			106.13	1.089E+00	&(	8.966E+00	2.47E+02	2.27E+01 G
			99.50	-2.531E+00	+	1.460E+01	1.73E+02	1.50E+01 X
Nd-147		1.5414E+00					1.11E+01	
			531.00	2.457E+00	?(	7.195E+00	1.19E+02	1.30E+01 G
			91.10	1.121E+00	?(	6.254E+00	1.67E+02	2.83E+01 G
Kr-85	I	9.1587E+01					3.92E+03	
			513.98	9.159E+01	?(	3.730E+02	1.20E+02	4.30E-01 G

(- 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

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********** 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 1 Sigma %	Activity	
PB-210	46.54	156.	19.	0.010	96.83	1.224E+01	P
TH-227	50.14	254.	-14.	-0.008	164.27	-4.260E+00	
AM-241	59.54	452.	8.	0.004	376.06	4.316E-01	P
BA-133	80.99	1089.	-32.	-0.018	145.48	-1.379E+00	
EU-155	86.54	838.	-28.	-0.016	146.97	-1.284E+00	
Nd-147	91.10	734.	23.	0.013	167.07	1.121E+00	
Gd-153	97.50	828.	-7.	-0.004	606.27	-3.013E-01	
Gd-153	103.20	1163.	-28.	-0.016	170.61	-1.736E+00	
EU-152	121.78	242.	-25.	-0.014	91.35	-1.157E+00	
CO-57	122.06	267.	-25.	-0.014	95.67	-3.866E-01	
EU-154	123.10	148.	17.	0.010	101.45	5.751E-01	
PA-234	131.29	553.	5.	0.003	714.35	3.547E-01	
Tc-99m	140.51	510.	-9.	-0.005	343.86	-1.518E-01	
U-235	143.79	517.	-6.	-0.003	514.45	-8.104E-01	P
CE-141	145.44	492.	23.	0.013	137.79	6.850E-01	
Ba-140	162.66	160.	19.	0.010	98.08	4.665E+00	
U-235	163.38	180.	14.	0.008	138.18	4.277E+00	P
CE-139	165.85	226.	-22.	-0.012	98.83	-4.226E-01	
Cf-251	176.60	106.	-7.	-0.004	265.65	-6.927E-01	
U-235	185.72	112.	70.	0.039	30.05	2.175E+00	P

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
TH-229	193.51	99.	8.	0.004	235.35	3.131E+00		
U-235	205.33	220.	-9.	-0.005	249.78	-3.071E+00		P
Cf-251	227.00	104.	-8.	-0.004	252.07	-2.473E+00		
TH-227	235.97	596.	16.	0.009	215.98	2.626E+00		
EU-152	244.69	565.	14.	0.008	241.28	3.817E+00		
TH-227	256.24	64.	11.	0.006	145.55	3.363E+00		
Cd-113m	263.70	94.	-16.	-0.009	92.26	-5.654E+03		
BI-210M	265.83	128.	-6.	-0.003	374.54	-2.546E-01		P
Hg-203	279.20	91.	-8.	-0.004	175.73	-2.201E-01		
TL-210	296.00	431.	-6.	-0.003	475.24	-1.881E-01		
CR-51	320.08	501.	-18.	-0.010	177.51	-4.613E+00		
La-140	328.76	305.	-5.	-0.003	169.46	-6.061E-01		P
EU-152	344.29	261.	15.	0.008	155.53	1.519E+00		
HF-181	345.83	343.	-17.	-0.010	154.07	-3.097E+00		
BA-133	356.00	263.	-14.	-0.008	169.71	-6.123E-01		
I-131	364.48	45.	-9.	-0.005	201.54	-2.946E-01		P
BA-133	383.84	77.	12.	0.007	104.55	4.079E+00		P
Cf-249	387.95	90.	12.	0.007	111.09	5.617E-01		
SN-113	391.69	100.	13.	0.007	116.38	5.850E-01		
SB-125	427.88	32.	13.	0.007	91.25	1.386E+00		
AG-108M	433.94	39.	-4.	-0.002	293.22	-1.592E-01		P
SB-125	463.37	48.	11.	0.006	91.99	3.688E+00		
Ir-192	468.06	56.	11.	0.006	98.59	7.542E-01		
BE-7	477.60	43.	9.	0.005	107.76	3.022E+00		P
HF-181	482.00	52.	9.	0.005	114.58	4.084E-01		
La-140	487.02	61.	9.	0.005	125.98	7.161E-01		P
RU-103	497.05	30.	-7.	-0.004	155.92	-2.949E-01		P
RH-106	511.86	21.	39.	0.022	23.15	7.223E+00		
Kr-85	513.98	75.	11.	0.006	119.83	9.159E+01		
Nd-147	531.00	22.	8.	0.005	119.16	2.457E+00		
Ba-140	537.26	22.	7.	0.004	134.73	1.164E+00		
CS-134	563.24	43.	-12.	-0.007	92.69	-5.993E+00		P
CS-134	569.32	36.	-9.	-0.005	100.00	-2.375E+00		
BI-207	569.70	58.	-11.	-0.006	104.26	-4.703E-01		P
SB-125	600.50	355.	-18.	-0.010	61.74	-4.337E+00		P
SB-124	602.73	337.	-18.	-0.010	64.52	-7.606E-01		P
CS-134	604.71	319.	-17.	-0.009	149.78	-7.469E-01		
RU-103	610.30	302.	-17.	-0.010	145.45	-1.281E+01		
AG-108M	614.28	109.	10.	0.006	152.26	4.767E-01		
RH-106	621.92	216.	12.	0.007	170.94	5.417E+00		
SB-125	635.89	38.	-12.	-0.007	75.68	-4.914E+00		
I-131	636.97	54.	-5.	-0.003	219.45	-3.002E+00		
AG-110M	657.76	41.	-3.	-0.002	307.32	-1.449E-01		
CS-137	661.66	50.	-6.	-0.004	199.72	-3.496E-01		P
NB-94	702.63	24.	3.	0.002	317.82	1.622E-01		P
SB-124	722.79	55.	-8.	-0.004	135.78	-3.660E+00		
PM-146	735.72	38.	-10.	-0.006	104.52	-2.247E+00		P
PM-146	747.16	5.	12.	0.007	47.70	1.817E+00		P

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
ZR-95	756.73	33.	-11.	-0.006	117.72	-1.007E+00		
AG-110M	763.94	15.	9.	0.005	68.20	2.134E+00		
NB-95	765.79	33.	1.	0.001	547.77	7.744E-02		
PA-234M	766.41	24.	7.	0.004	108.73	1.205E+02		P
EU-152	778.92	28.	-4.	-0.002	285.04	-1.628E+00		
CS-134	795.87	35.	10.	0.005	92.72	6.059E-01		
CS-134	801.95	45.	1.	0.001	953.94	6.209E-01		
CO-58	810.78	49.	-7.	-0.004	143.32	-3.924E-01		
Cs-136	818.50	76.	-14.	-0.008	89.95	-7.870E-01		
MN-54	834.85	9.	7.	0.004	104.64	3.721E-01		
Co-56	846.77	14.	1.	0.000	930.88	4.865E-02		P
NB-94	871.10	14.	-2.	-0.001	273.86	-1.158E-01		
EU-154	873.23	33.	-6.	-0.003	144.96	-2.756E+00		
PA-234	880.53	64.	-14.	-0.008	87.47	-1.324E+01		
PA-234	883.24	77.	-9.	-0.005	135.73	-5.727E+00		
Y-88	898.04	19.	-1.	-0.001	411.81	-8.150E-02		P
AG-110M	937.49	30.	-9.	-0.005	137.89	-1.612E+00		
PA-234	946.02	10.	3.	0.002	238.82	1.389E+00		
EU-152	964.11	76.	2.	0.001	531.27	1.007E+00		
EU-154	996.33	21.	8.	0.005	86.40	5.015E+00		
EU-154	1004.77	18.	-3.	-0.002	336.68	-1.015E+00		
Co-56	1037.84	10.	8.	0.005	91.02	3.932E+00		P
Cs-136	1048.07	19.	-5.	-0.003	131.15	-4.230E-01		
RH-106	1050.36	31.	-6.	-0.003	137.44	-2.608E+01		
BI-207	1063.66	10.	8.	0.005	91.28	7.606E-01		P
Ga-68	1077.40	50.	-19.	-0.010	85.57	-4.650E+01		
FE-59	1099.25	35.	-12.	-0.007	112.17	-1.497E+00		
EU-152	1112.07	91.	-13.	-0.007	103.37	-7.041E+00		
ZN-65	1115.55	52.	9.	0.005	117.81	1.273E+00		P
Sc-46	1120.55	56.	9.	0.005	116.46	6.758E-01		
CO-60	1173.24	32.	-15.	-0.008	60.51	-1.130E+00		P
Co-56	1238.28	11.	18.	0.010	47.71	2.129E+00		P
NA-22	1274.53	5.	6.	0.004	64.98	5.085E-01		
EU-154	1274.54	12.	1.	0.001	376.87	2.999E-01		
AG-110M	1384.30	11.	-5.	-0.003	165.68	-1.652E+00		
EU-152	1408.00	5.	6.	0.003	101.72	2.354E+00		
La-140	1596.21	11.	-2.	-0.001	344.64	-2.381E-01		
SB-124	1690.98	0.	7.	0.004	38.10	1.493E+00		P
Co-56	1771.35	28.	-4.	-0.002	200.30	-2.655E+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	Time Corrected Activity Bq/Sample	Uncertainty 1 Sigma Counting	MDA Bq/Sample
BE-7	#A	3.0219E+00	3.0219E+00	1.078E+02%	1.11E+01
NA-22	#A	5.0854E-01	5.0854E-01	6.498E+01%	1.08E+00
K-40		1.8560E+02	1.8560E+02	6.849E+00%	9.37E+00
Sc-46	#A	3.3789E-01	3.3790E-01	1.165E+02%	2.70E+00
CR-51	#A	-4.6129E+00	-4.6129E+00	1.775E+02%	2.74E+01
MN-54	#A	3.7213E-01	3.7213E-01	1.046E+02%	9.46E-01
FE-59	#A	-1.4972E+00	-1.4972E+00	1.122E+02%	3.78E+00
Co-56	#A	1.1163E+00	1.1163E+00	4.771E+01%	1.14E+00
CO-57	#A	-3.8659E-01	-3.8659E-01	9.567E+01%	1.23E+00
CO-58	#A	-3.9236E-01	-3.9236E-01	1.433E+02%	1.94E+00
CO-60	#A	-3.3979E-02	-3.3979E-02	1.461E+03%	1.41E+00
ZN-65	#A	1.2734E+00	1.2734E+00	1.178E+02%	5.12E+00
NB-94	#A	1.6220E-01	1.6220E-01	3.178E+02%	1.25E+00
ZR-95	#A	-1.0066E+00	-1.0066E+00	1.177E+02%	2.77E+00
NB-95	#A	7.7441E-02	7.7442E-02	5.478E+02%	1.52E+00
RU-103	#A	-2.9488E-01	-2.9488E-01	1.559E+02%	1.13E+00
RH-106	#A	5.4168E+00	5.4168E+00	1.709E+02%	3.13E+01
AG-108M	#A	1.5768E-01	1.5768E-01	1.523E+02%	1.15E+00
AG-110M	#A	5.0065E-01	5.0065E-01	6.820E+01%	3.70E+00
SN-113	#A	5.8498E-01	5.8498E-01	1.164E+02%	2.30E+00
SB-124	#A	-7.6062E-01	-7.6062E-01	6.452E+01%	3.82E+00
SB-125	#A	1.9872E+00	1.9872E+00	6.479E+01%	3.16E+00
I-131	#A	-2.9460E-01	-2.9461E-01	2.015E+02%	1.17E+00
Gd-153	#A	-3.0130E-01	-3.0131E-01	6.063E+02%	6.13E+00
Ga-68	#A	-4.6156E+01	-4.6503E+01	8.557E+01%	8.79E+01
Tc-99m	#A	-1.5156E-01	-1.5177E-01	3.439E+02%	1.76E+00
BA-133	#A	-6.1226E-01	-6.1226E-01	1.697E+02%	3.50E+00
CS-134	#A	6.0728E-01	6.0728E-01	9.272E+01%	1.91E+00
CS-137	#A	-3.4962E-01	-3.4962E-01	1.997E+02%	1.93E+00
CE-139	#A	-4.2256E-01	-4.2256E-01	9.883E+01%	1.40E+00
Ba-140	#A	1.8751E+00	1.8751E+00	8.332E+01%	3.87E+00
La-140	#A	7.0010E-02	7.0012E-02	1.260E+02%	1.88E+00
CE-141	#A	6.8504E-01	6.8504E-01	1.378E+02%	3.16E+00
CE-144	#A	0.0000E+00	0.0000E+00	1.000E+03%	1.40E+01
PM-144	A	3.2294E-01	3.2294E-01	1.585E+02%	1.22E+00
EU-152	#A	6.5769E-01	6.5769E-01	9.135E+01%	3.52E+00
EU-154	#A	1.0068E+00	1.0068E+00	8.640E+01%	1.96E+00
EU-155	#A	1.6539E-01	1.6539E-01	1.746E+03%	9.68E+00
HF-181	#A	4.0844E-01	4.0844E-01	1.146E+02%	1.60E+00
Ta-182	#A	2.1034E+00	2.1034E+00	8.637E+01%	7.26E+00
Hg-203	#A	-2.2009E-01	-2.2009E-01	1.757E+02%	1.32E+00
TL-208		5.0485E+00	5.0485E+00	1.082E+01%	7.33E-01
PM-146	#A	6.4346E-01	6.4346E-01	4.770E+01%	1.47E+00

Y-88	#A	0.0000E+00	0.0000E+00	1.000E+03%	8.18E-01
Cd-113m	#A	-5.6537E+03	-5.6537E+03	9.226E+01%	1.75E+04
Cd-109	#A	0.0000E+00	0.0000E+00	1.000E+03%	4.81E+01
Cf-251	#A	-6.9266E-01	-6.9266E-01	2.656E+02%	4.79E+00
Cf-249	#A	5.6171E-01	5.6171E-01	1.111E+02%	2.11E+00
Sn-126	#A	4.2964E-02	4.2964E-02	1.333E+04%	1.94E+01
PB-210	#A	1.2243E+01	1.2243E+01	9.683E+01%	3.97E+01
PB-212		1.6631E+01	1.6631E+01	6.080E+00%	1.75E+00
PB-214		1.3469E+01	1.3469E+01	7.930E+00%	1.86E+00
BI-207	#A	7.6064E-01	7.6064E-01	9.128E+01%	1.61E+00
BI-212	#A	5.9484E+00	5.9484E+00	9.329E+01%	1.89E+01
U-235	#A	8.0066E-01	8.0066E-01	1.382E+02%	1.41E+01
BI-214	#	1.1081E+01	1.1081E+01	1.048E+01%	1.55E+00
BI-210M	#A	-2.5460E-01	-2.5460E-01	3.745E+02%	2.44E+00
AC-228		1.7944E+01	1.7944E+01	8.471E+00%	2.23E+00
TH-227	#A	2.8931E+00	2.8931E+00	1.302E+02%	1.22E+01
TH-229	#A	3.1308E+00	3.1308E+00	2.354E+02%	1.92E+01
TH-234		2.0396E+01	2.0396E+01	2.513E+01%	1.63E+01
PA-231	#A	0.0000E+00	0.0000E+00	7.071E+02%	8.36E+01
PA-233	#A	0.0000E+00	0.0000E+00	7.071E+02%	6.85E+00
PA-234	#A	7.9596E-01	7.9596E-01	2.388E+02%	8.54E+00
PA-234M	#A	2.8384E+01	2.8384E+01	1.087E+02%	2.28E+02
AM-241	#A	4.3158E-01	4.3158E-01	3.761E+02%	5.47E+00
Np-237	#A	1.0968E-02	1.0968E-02	3.918E+04%	1.45E+01
Ir-192	#A	2.8122E-01	2.8122E-01	9.859E+01%	2.87E+00
Cs-136	#A	-7.8701E-01	-7.8703E-01	8.995E+01%	2.38E+00
Np-239	A	1.0890E+00	1.0891E+00	2.465E+02%	8.97E+00
Nd-147	#A	1.5414E+00	1.5414E+00	1.026E+02%	7.19E+00
TL-210	#A	0.0000E+00	0.0000E+00	1.000E+03%	1.85E+00
Kr-85	#A	9.1587E+01	9.1587E+01	1.198E+02%	3.73E+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 (37.5 to 2000.0 keV) 2.702E+02 Bq/Sample
Total Decayed Activity (37.5 to 2000.0 keV) 2.7016858E+02 Bq/Sample

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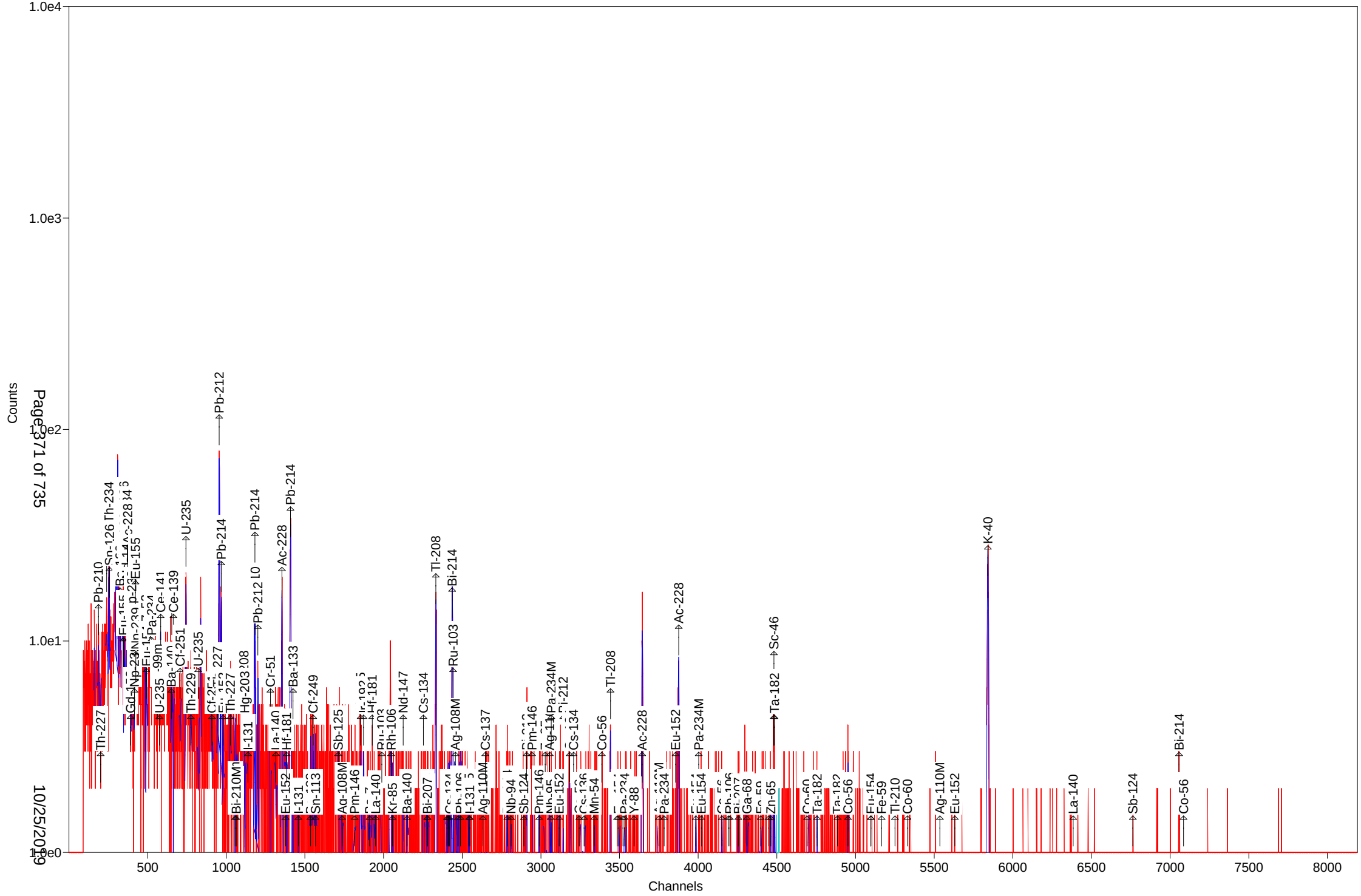
444057_Gamma_180-95857-A-4-B. 8_Gamma_20191610.spc.



Test America St. Louis Spectrum ID: 9_Gamma_20192874

Sample Description: 444057_Gamma_180-95857-A-5-B
Detector: Detector # 9
Batch ID: 444057
Work Order Number: Gamma
Lot Number: 180-95857-A-5-B

Decay to Time: 10/15/2019 11:04 Live Time: 1800 sec
Acquisition Time: 10/15/2019 11:04:53 Real Time: 1804 sec
Analysis Time: 10/15/2019 11:35 Dead Time: 0.21 %
Analysis Quantity: 1.000E+00 Sample

Efficiency Cal File: 9_Soil_TunaCan.Clb
Efficiency Cal Desc: 9_Soil_TunaCan_90099_050312
Efficiency Cal Date: 6/14/2012 10:19
Energy Cal Date: 3/1/2012 13:57
Library: Client_Long_Rev15.lib
Bkgd Correction File: 9_2019-10-06_1923.PBC

Nuclide	Activity Bq/Sample	1-Sigma Counting Uncert %	1-Sigma Counting Uncert Bq/Sample	1-Sigma Total Uncert Bq/Sample	Minimum Detectable Activity Bq/Sample
BE-7	5.354E-01	643.8	3.447E+00	3.447E+00	1.192E+01
NA-22	-3.235E-01	125.3	4.054E-01	4.057E-01	1.405E+00
K-40	1.457E+02	6.2	9.026E+00	1.171E+01	7.638E+00
Sc-46	-5.516E-01	87.9	4.849E-01	4.858E-01	1.628E+00
CR-51	-3.474E+00	91.9	3.194E+00	3.199E+00	1.069E+01
MN-54	-5.289E-01	64.7	3.423E-01	3.434E-01	1.185E+00
FE-59	2.945E-01	291.1	8.571E-01	8.572E-01	1.946E+00
Co-56	7.241E-01	34.2	2.480E-01	2.507E-01	5.036E-01
CO-57	0.000E+00	1.#INF	1.880E-01	1.880E-01	8.937E-01
CO-58	-1.080E-01	303.7	3.280E-01	3.280E-01	1.159E+00
CO-60	-1.940E-01	309.0	5.994E-01	5.995E-01	1.317E+00
ZN-65	-1.584E+00	90.3	1.430E+00	1.432E+00	4.789E+00
NB-94	-3.349E-02	65.4	2.191E-02	2.198E-02	1.711E+00
ZR-95	4.142E-01	84.9	3.517E-01	3.524E-01	1.622E+00
NB-95	3.900E-01	81.3	3.170E-01	3.177E-01	1.066E+00
RU-103	6.014E-01	39.7	2.386E-01	2.406E-01	5.334E-01
RH-106	-4.669E+00	95.4	4.456E+00	4.463E+00	2.664E+01
AG-108M	-3.569E-01	110.1	3.930E-01	3.934E-01	9.384E-01
AG-110M	-1.240E-01	51.5	6.390E-02	6.421E-02	2.184E+00
SN-113	2.825E-01	184.4	5.209E-01	5.211E-01	1.776E+00
SB-124	2.639E-01	40.8	1.077E-01	1.086E-01	2.489E+00
SB-125	2.522E+00	34.0	8.579E-01	8.676E-01	1.470E+00
I-131	-4.898E-01	89.9	4.405E-01	4.412E-01	1.082E+00
Gd-153	-9.623E-01	148.0	1.424E+00	1.425E+00	4.749E+00
Ga-68	4.759E+00	308.5	1.468E+01	1.468E+01	3.387E+01
Tc-99m	-3.720E-01	139.4	5.186E-01	5.190E-01	1.728E+00
BA-133	2.104E-02	3978.0	8.369E-01	8.369E-01	2.842E+00
CS-134	5.866E-01	66.7	3.910E-01	3.922E-01	1.744E+00
CS-137	2.485E+00	17.7	4.399E-01	4.585E-01	7.693E-01
CE-139	-8.564E-02	391.7	3.355E-01	3.356E-01	1.139E+00
Ba-140	-6.198E-01	206.3	1.278E+00	1.279E+00	3.616E+00
La-140	4.843E-01	43.5	2.108E-01	2.124E-01	4.733E-01
CE-141	-6.819E-01	148.3	1.011E+00	1.012E+00	3.369E+00

CE-144	-2.406E+00	144.5	3.478E+00	3.480E+00	1.161E+01
PM-144	-5.586E-01	80.4	4.489E-01	4.498E-01	1.499E+00
EU-152	7.977E-01	83.9	6.694E-01	6.707E-01	2.593E+00
EU-154	4.787E-01	88.6	4.244E-01	4.251E-01	1.419E+00
EU-155	-1.377E+00	69.0	9.499E-01	9.529E-01	6.495E+00
HF-181	0.000E+00	1.#INF	7.394E-02	7.395E-02	1.584E+00
Ta-182	1.942E+00	67.3	1.307E+00	1.311E+00	5.969E+00
Hg-203	3.644E-01	87.6	3.193E-01	3.200E-01	1.068E+00
TL-208	3.959E+00	10.7	4.220E-01	4.693E-01	6.063E-01
PM-146	4.470E-01	94.5	4.226E-01	4.232E-01	1.018E+00
Y-88	1.251E-01	144.0	1.801E-01	1.803E-01	5.109E-01
Cd-113m	-1.858E+03	210.4	3.909E+03	3.911E+03	1.339E+04
Cd-109	0.000E+00	1.#INF	1.333E+01	1.333E+01	4.442E+01
Cf-251	1.372E+00	94.7	1.299E+00	1.305E+00	3.335E+00
Cf-249	4.319E-01	107.8	4.654E-01	4.659E-01	1.570E+00
Sn-126	-4.023E+00	110.2	4.432E+00	4.437E+00	1.478E+01
PB-210	1.041E+01	102.3	1.065E+01	1.067E+01	3.563E+01
PB-212	1.160E+01	6.3	7.313E-01	1.048E+00	1.302E+00
PB-214	1.252E+01	6.9	8.635E-01	1.081E+00	1.722E+00
BI-207	3.131E-01	179.3	5.614E-01	5.617E-01	1.292E+00
BI-212	2.416E+01	16.3	3.948E+00	4.142E+00	5.578E+00
U-235	-2.979E+00	143.8	4.283E+00	4.286E+00	1.427E+01
BI-214	1.101E+01	8.2	9.068E-01	1.072E+00	1.246E+00
BI-210M	2.359E-01	196.2	4.627E-01	4.629E-01	1.584E+00
AC-228	1.113E+01	10.2	1.130E+00	1.265E+00	1.796E+00
TH-227	1.812E+00	100.4	1.820E+00	1.823E+00	1.100E+01
TH-229	3.208E+00	147.1	4.718E+00	4.725E+00	1.396E+01
TH-234	-5.404E+00	53.9	2.915E+00	2.930E+00	2.637E+01
PA-231	-1.197E+01	171.9	2.059E+01	2.060E+01	6.890E+01
PA-233	-2.196E-02	3314.1	7.278E-01	7.278E-01	5.359E+00
PA-234	7.708E-01	79.9	6.156E-01	6.169E-01	7.166E+00
PA-234M	6.250E+01	88.2	5.512E+01	5.521E+01	1.855E+02
AM-241	1.043E+00	117.3	1.224E+00	1.225E+00	4.088E+00
Np-237	0.000E+00	1.#INF	4.160E+00	4.160E+00	1.386E+01
Ir-192	4.944E-01	89.3	4.413E-01	4.423E-01	2.043E+00
Cs-136	2.104E-01	68.6	1.443E-01	1.448E-01	1.200E+00
Np-239	-5.011E-01	353.8	1.773E+00	1.773E+00	5.946E+00
Nd-147	3.343E-01	679.0	2.270E+00	2.270E+00	5.692E+00
TL-210	0.000E+00	1.#INF	1.340E-01	1.340E-01	1.570E+00
Kr-85	0.000E+00	1.#INF	3.350E+01	3.350E+01	3.640E+02
Total	3.217E+02				

Analyst: Kellene Robbs

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Sample description
444057_Gamma_180-95857-A-5-B

Spectrum Filename: C:\User\SPC\Det9\9_Gamma_20192874.An1

Acquisition information
Start time: 10/15/2019 11:04:53 AM
Live time: 1800
Real time: 1804
Dead time: 0.21 %
Detector ID: 9

Detector system
Ge9 S/N100228730

Calibration
Filename: 9_Soil_TunaCan.Clb
9_Soil_TunaCan_90099_050312

Energy Calibration
Created: 3/1/2012 1:57:17 PM
Zero offset: 0.074 keV
Gain: 0.250 keV/channel
Quadratic: -2.269E-08 keV/channel^2

Efficiency Calibration
Created: 6/14/2012 10:19:51 AM
Knee Energy: 165.85 keV
Above the Knee: Quadratic Uncertainty = 1.30 %
Log(Eff): -8.079856E-01 + (-2.367265E-01*Log(E)) +
(-3.950640E-02*Log(E)^2)
Below the Knee: Quadratic Uncertainty = 1.42 %
Log(Eff): -2.387916E+01 + (8.875647E+00*Log(E)) +
(-9.401100E-01*Log(E)^2)

Library Files
Main analysis library: Client_Long_Rev15.lib
Library Match Width: 0.500
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G800W064
Start channel: 100 (25.08keV)
Stop channel: 8000 (1999.34keV)
Peak rejection level: 1000.000%
Peak search sensitivity: 3
Sample Size: 1.0000E+00 +/- 0.000E+00%
Activity scaling factor: 1.0000E+00/(1.0000E+00* 1.0000E+00) =
1.0000E+00
Detection limit method: Reg. Guide 4.16 Method

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Random error: 4.0000000E+00
Systematic error: 4.0000000E+00
Fraction Limit: 0.000%
Background width: 3
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:	YES	10/15/2019 11:04:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	9_2019-10-06_1923.PBC 10/6/2019 7:23:18 PM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 25 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 0.1342

***** 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
46.54	21.	102.29	1.00	2.577E-02	46.54	4.250	PBC<MDA	PB210
50.14	21.	106.60	1.00	2.900E-02	50.14	8.000	PBC<MDA	TH227
60.88	25.	117.31	1.01	3.659E-02	59.54	35.900	PBC<MDA	AM241
63.29	7.	396.11	1.01	3.921E-02	63.29	3.810	PBC<MDA	TH234
74.67	169.	12.81	1.02	4.564E-02				
77.24	286.	7.81	1.03	4.679E-02				
92.95	97.	19.79	1.61	5.171E-02	92.59	5.584	PBC<MDA	TH234
					93.35	5.561	1.877E+01	AC228
123.10	19.	88.65	1.07	5.296E-02	123.10	40.790	PBC<MDA	EU154
176.60	19.	94.71	1.12	4.549E-02	176.60	17.000	PBC<MDA	Cf251
185.74	84.	19.63	1.09	4.403E-02	185.72	54.000	1.951E+00	U235
193.51	13.	147.10	1.14	4.287E-02	193.51	4.400	PBC<MDA	TH229
210.85	5.	424.11	1.15	4.052E-02	210.85	2.990	PBC<MDA	TH229
235.97	17.	200.19	1.18	3.760E-02	235.97	12.300	PBC<MDA	TH227
238.46	309.	7.74	1.13	3.734E-02	238.63	43.300	1.061E+01	PB212
241.86	67.	22.53	1.18	3.697E-02	242.00	7.430	1.358E+01	PB214
265.83	7.	196.20	1.20	3.470E-02	265.83	50.000	PBC<MDA	BI210M
279.20	18.	87.63	1.22	3.356E-02	279.20	81.460	PBC<MDA	Hg203
295.05	156.	11.48	1.01	3.232E-02	295.09	19.300	1.386E+01	PB214
					296.00	79.000	3.392E+00	TL210
299.99	33.	30.93	1.24	3.195E-02	300.03	3.280	1.755E+01	PB212
					300.07	2.460	2.340E+01	PA231

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
					300.18	6.200	9.288E+00	PA233
316.49	19.	151.46	1.25	3.080E-02	316.49	87.040	PBC<MDA	Ir192
338.08	116.	12.26	1.00	2.942E-02	338.32	12.010	1.820E+01	AC228
351.63	255.	8.22	1.36	2.862E-02	351.93	37.600	1.275E+01	PB214
383.84	14.	101.05	1.31	2.691E-02	383.84	8.940	PBC<MDA	BA133
387.95	14.	107.76	1.31	2.671E-02	387.95	66.000	PBC<MDA	Cf249
391.69	9.	184.39	1.32	2.653E-02	391.69	64.000	PBC<MDA	SN113
427.88	23.	38.19	1.35	2.491E-02	427.88	29.600	1.733E+00	SB125
453.88	12.	94.52	1.37	2.388E-02	453.88	65.000	PBC<MDA	PM146
463.37	14.	80.54	1.38	2.352E-02	463.37	10.470	PBC<MDA	SB125
468.06	14.	94.55	1.38	2.335E-02	468.06	51.750	PBC<MDA	Ir192
477.28	2.	643.81	1.39	2.301E-02	477.60	10.520	PBC<MDA	BE7
487.02	12.	100.13	1.40	2.269E-02	487.02	45.500	PBC<MDA	La140
497.05	22.	39.67	1.41	2.236E-02	497.05	90.900	6.014E-01	RU103
511.86	75.	20.78	2.67	2.188E-02	511.86	20.000	9.520E+00	RH106
531.00	2.	678.97	1.44	2.130E-02	531.00	13.000	PBC<MDA	Nd147
563.24	5.	256.51	1.47	2.040E-02	563.24	8.350	PBC<MDA	CS134
569.32	11.	66.66	1.47	2.024E-02	569.32	15.380	PBC<MDA	CS134
					569.47	8.200	3.828E+00	PA234
					569.70	97.740	3.213E-01	BI207
569.47	5.	165.28	1.47	2.024E-02	569.32	15.380	PBC<MDA	CS134
					569.47	8.200	1.752E+00	PA234
					569.70	97.740	1.470E-01	BI207
583.27	120.	10.66	1.20	1.989E-02	583.02	84.500	3.959E+00	TL208
600.50	8.	299.20	1.50	1.946E-02	600.50	17.860	PBC<MDA	SB125
609.32	182.	8.24	0.87	1.925E-02	609.31	46.090	1.142E+01	BI214
					610.30	5.750	9.167E+01	RU103
635.89	22.	34.02	1.53	1.864E-02	635.89	11.310	5.796E+00	SB125
661.48	69.	17.70	1.69	1.810E-02	661.66	85.210	2.485E+00	CS137
724.20	12.	84.92	1.60	1.691E-02	724.20	44.150	PBC<MDA	ZR95
727.79	55.	16.34	0.71	1.686E-02	727.17	7.550	2.416E+01	BI212
763.94	12.	51.53	1.63	1.624E-02	763.94	22.280	PBC<MDA	AG110M
765.79	11.	81.30	1.63	1.621E-02	765.79	99.790	PBC<MDA	NB95
					766.41	0.294	1.324E+02	PA234M
778.92	10.	91.75	1.64	1.600E-02	778.92	12.940	PBC<MDA	EU152
785.13	10.	96.71	1.65	1.590E-02	785.42	1.280	PBC<MDA	BI212
801.95	13.	83.01	1.66	1.565E-02	801.95	8.690	PBC<MDA	CS134
846.77	20.	34.24	1.70	1.501E-02	846.77	99.935	7.241E-01	Co56
861.34	2.	606.22	1.71	1.482E-02	860.56	12.420	PBC<MDA	TL208
871.10	8.	65.41	1.71	1.468E-02	871.10	99.890	PBC<MDA	NB94
880.53	10.	83.13	1.72	1.456E-02	880.53	6.000	PBC<MDA	PA234
883.24	10.	93.91	1.72	1.453E-02	883.24	9.600	PBC<MDA	PA234
898.04	6.	144.05	1.74	1.434E-02	898.04	93.700	PBC<MDA	Y88
911.01	76.	13.07	1.38	1.418E-02	911.07	29.000	1.024E+01	AC228
964.11	6.	183.01	1.79	1.357E-02	964.11	14.605	PBC<MDA	EU152
968.97	54.	15.55	1.08	1.352E-02	968.97	17.460	1.259E+01	AC228
1001.00	12.	88.18	1.81	1.318E-02	1001.00	0.837	PBC<MDA	PA234M
1048.07	9.	68.59	1.85	1.271E-02	1048.07	80.000	PBC<MDA	Cs136

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1063.66	5.	179.33	1.86	1.257E-02	1063.66	74.500	PBC<MDA	BI207
1077.40	3.	308.52	1.87	1.244E-02	1077.40	3.300	PBC<MDA	Ga68
1099.25	4.	291.05	1.89	1.224E-02	1099.25	56.500	PBC<MDA	FE59
1120.19	14.	110.33	1.90	1.206E-02	1120.29	15.100	PBC<MDA	BI214
					1120.55	99.987	PBC<MDA	Sc46
					1121.30	34.900	PBC<MDA	Ta182
1120.55	15.	83.83	1.90	1.206E-02	1120.29	15.100	PBC<MDA	BI214
					1120.55	99.987	6.812E-01	Sc46
					1121.30	34.900	1.953E+00	Ta182
1120.97	13.	102.07	1.90	1.205E-02	1120.29	15.100	PBC<MDA	BI214
					1120.55	99.987	6.046E-01	Sc46
					1121.30	34.900	1.733E+00	Ta182
1189.05	9.	112.49	1.95	1.150E-02	1189.05	16.200	PBC<MDA	Ta182
1221.41	10.	133.08	1.97	1.126E-02	1221.41	27.000	PBC<MDA	Ta182
1408.00	7.	85.00	2.10	1.004E-02	1408.00	21.005	PBC<MDA	EU152
1460.73	273.	6.19	1.45	9.749E-03	1460.83	10.670	1.457E+02	K40
1596.21	6.	43.53	2.22	9.069E-03	1596.21	95.400	PBC<MDA	La140
1690.98	6.	40.82	2.27	8.649E-03	1690.98	47.790	PBC<MDA	SB124
1765.04	23.	24.91	2.31	8.350E-03	1764.49	15.400	9.767E+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 Channel	Centroid Energy	Background Counts	Net Area Counts	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide
298.27	74.60	151.	169.	3.714E+03	12.81	1.025	- D
308.55	77.17	107.	286.	6.116E+03	7.81	1.027	- D

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

This section based on library: Client_Long_Rev15.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 1 Sigma %	FWHM keV
PB-210	185.80	46.54	210.	21.	0.011	102.29	0.998
TH-227	200.20	50.14	231.	21.	0.011	106.60	1.001s
AM-241	237.77	59.54	406.	25.	0.014	117.31	1.010s
TH-234	252.77	63.29	345.	7.	0.004	396.11	1.014s
Sn-126	256.74	64.28	462.	-28.	-0.016	110.17	1.015
BA-133	323.56	80.99	1068.	-30.	-0.017	153.04	1.031s
Np-237	345.55	86.49	1194.	0.	0.000	182.28	1.036A

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
EU-155	345.76	86.54	1167.	-27.	-0.015	180.23	1.036
Sn-126	347.35	86.94	1068.	-27.	-0.015	172.51	1.037A
Sn-126	349.87	87.57	1000.	-7.	-0.004	658.25	1.037s
Cd-109	351.75	88.04	1041.	0.	0.000	170.15	1.038A
TH-234	369.94	92.59	826.	-28.	-0.016	53.94	1.042s
AC-228	371.37	92.95	82.	97.	0.054	19.79	1.609s
Gd-153	389.58	97.50	798.	-27.	-0.015	147.99	1.047s
Np-239	397.58	99.50	771.	-27.	-0.015	145.23	1.049s
Gd-153	412.37	103.20	744.	-27.	-0.015	142.23	1.052s
Np-239	414.37	103.70	740.	-27.	-0.015	141.78	1.053s
EU-155	420.82	105.31	768.	-28.	-0.016	69.00	1.054s
Np-239	424.09	106.13	738.	-11.	-0.006	353.83	1.055s
EU-152	486.67	121.78	213.	-14.	-0.008	146.51	1.070s
CO-57	487.80	122.06	228.	0.	0.000	1000.00	1.070s
EU-154	491.95	123.10	127.	19.	0.010	88.65	1.071s
PA-234	524.72	131.29	646.	-25.	-0.014	145.83	1.079s
HF-181	531.64	133.02	621.	-25.	-0.014	142.83	1.081s
CE-144	533.69	133.54	636.	-25.	-0.014	144.52	1.081s
HF-181	544.74	136.30	661.	-25.	-0.014	148.07	1.084s
CO-57	545.43	136.47	686.	0.	0.000	1000.00	1.084s
Tc-99m	561.57	140.51	832.	-30.	-0.016	139.42	1.088s
U-235	574.67	143.79	892.	-30.	-0.016	143.79	1.091s
CE-141	581.29	145.44	952.	-30.	-0.016	148.29	1.092s
Ba-140	650.15	162.66	249.	-24.	-0.013	96.28	1.108s
U-235	653.03	163.38	264.	-7.	-0.004	334.54	1.109s
CE-139	662.92	165.85	258.	-6.	-0.003	391.73	1.111s
Cf-251	705.90	176.60	88.	19.	0.011	94.71	1.122s
U-235	742.44	185.74	58.	84.	0.046	19.63	1.089
TH-229	773.52	193.51	92.	13.	0.007	147.10	1.137s
U-235	820.80	205.33	105.	-4.	-0.002	492.50	1.148
TH-229	842.87	210.85	116.	5.	0.003	424.11	1.153
Cf-251	907.45	227.00	96.	0.	0.000	1000.00	1.168s
TH-227	943.33	235.97	595.	17.	0.010	200.19	1.176s
PB-212	953.97	238.63	57.	338.	0.188	6.30	1.179D
PB-214	967.43	242.00	81.	67.	0.037	22.53	1.182D
EU-152	978.21	244.69	711.	-22.	-0.012	95.21	1.185s
TH-227	1024.39	256.24	100.	-10.	-0.006	198.33	1.195s
Cd-113m	1054.23	263.70	105.	-7.	-0.004	210.44	1.202s
BI-210M	1062.75	265.83	101.	7.	0.004	196.20	1.204s
TL-208	1108.55	277.28	152.	-22.	-0.012	83.73	1.215
Hg-203	1116.22	279.20	115.	18.	0.010	87.63	1.216
I-131	1136.61	284.30	100.	-21.	-0.012	94.79	1.221
PB-214	1179.77	295.09	38.	136.	0.075	10.78	1.231D
TL-210	1183.41	296.00	624.	-20.	-0.011	181.45	1.231s
PB-212	1199.52	300.03	36.	33.	0.018	30.93	1.235D
PA-231	1199.68	300.07	604.	-20.	-0.011	178.06	1.235s
PA-233	1200.12	300.18	584.	-20.	-0.011	175.18	1.235s
PA-231	1210.00	302.65	565.	-20.	-0.011	171.94	1.237s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BA-133	1210.81	302.85	545.	-20.	-0.011	168.94	1.238s
Ba-140	1218.80	304.85	525.	-15.	-0.008	215.86	1.240s
BI-210M	1218.99	304.90	510.	0.	0.000	1000.00	1.240s
Ir-192	1233.16	308.44	510.	0.	0.000	1000.00	1.243s
Ir-192	1265.35	316.49	423.	19.	0.011	151.46	1.250
CR-51	1279.73	320.08	143.	-19.	-0.011	91.94	1.253s
La-140	1314.43	328.76	480.	-21.	-0.012	148.97	1.261s
Cf-249	1333.15	333.44	358.	-18.	-0.010	149.44	1.265s
AC-228	1351.72	338.08	18.	116.	0.064	12.26	1.000
EU-152	1376.53	344.29	73.	-13.	-0.007	97.08	1.275s
HF-181	1382.70	345.83	114.	-15.	-0.008	103.92	1.276s
PB-214	1405.88	351.63	43.	247.	0.137	8.60	1.363s
I-131	1457.31	364.48	80.	-20.	-0.011	89.93	1.293s
BA-133	1534.73	383.84	88.	14.	0.008	101.05	1.310s
Cf-249	1551.17	387.95	102.	14.	0.008	107.76	1.314s
SN-113	1566.12	391.69	122.	9.	0.005	184.39	1.317
SB-125	1710.86	427.88	13.	23.	0.013	38.19	1.349s
AG-108M	1735.10	433.94	56.	-14.	-0.008	110.10	1.354s
PM-146	1814.87	453.88	30.	12.	0.007	94.52	1.372s
SB-125	1852.82	463.37	60.	14.	0.008	80.54	1.380s
Ir-192	1871.59	468.06	82.	14.	0.008	94.55	1.384s
BE-7	1909.73	477.60	112.	2.	0.001	643.81	1.392s
HF-181	1927.34	482.00	114.	0.	0.000	1000.00	1.396s
La-140	1947.43	487.02	65.	12.	0.007	100.13	1.400s
RU-103	1987.56	497.05	13.	22.	0.012	39.67	1.409s
RH-106	2046.81	511.86	84.	75.	0.042	20.78	2.672s
Kr-85	2055.27	513.98	159.	0.	0.000	1000.00	1.424s
Nd-147	2123.35	531.00	30.	2.	0.001	678.97	1.438s
Ba-140	2148.39	537.26	44.	-6.	-0.003	206.26	1.444s
CS-134	2252.30	563.24	33.	5.	0.003	256.51	1.466s
CS-134	2276.64	569.32	23.	11.	0.006	66.66	1.471s
PA-234	2277.24	569.47	35.	5.	0.003	165.28	1.471s
BI-207	2278.16	569.70	46.	-5.	-0.003	209.96	1.471s
TL-208	2332.44	583.27	11.	120.	0.067	10.66	1.196
SB-125	2401.36	600.50	307.	8.	0.005	299.20	1.497s
SB-124	2410.29	602.73	315.	0.	0.000	1000.00	1.499s
CS-134	2418.21	604.71	315.	0.	0.000	1000.00	1.500s
BI-214	2436.65	609.32	14.	182.	0.101	8.24	0.866s
RU-103	2440.56	610.30	315.	0.	0.000	1000.00	1.505s
AG-108M	2456.49	614.28	315.	0.	0.000	1000.00	1.508s
PM-144	2471.62	618.06	315.	0.	0.000	1000.00	1.512s
RH-106	2487.04	621.92	353.	-16.	-0.009	95.44	1.515s
SB-125	2542.94	635.89	17.	22.	0.012	34.02	1.526s
I-131	2547.28	636.97	60.	-15.	-0.008	103.76	1.527s
AG-110M	2630.43	657.76	111.	-8.	-0.005	180.04	1.544s
CS-137	2645.30	661.48	16.	69.	0.038	17.70	1.687
PM-144	2785.58	696.54	88.	-17.	-0.010	80.36	1.576s
NB-94	2809.93	702.63	113.	-12.	-0.007	128.38	1.581s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
SB-124	2890.57	722.79	138.	-17.	-0.009	102.59	1.598s
AG-108M	2891.17	722.94	121.	-17.	-0.009	96.56	1.598s
EU-154	2892.86	723.36	105.	-17.	-0.009	90.11	1.598s
ZR-95	2896.22	724.20	49.	12.	0.007	84.92	1.599s
BI-212	2910.58	727.79	5.	55.	0.031	16.34	0.713s
PM-146	2942.31	735.72	42.	-13.	-0.007	92.45	1.608s
ZR-95	3026.36	756.73	25.	0.	0.000	1000.00	1.625s
AG-110M	3055.23	763.94	12.	12.	0.006	51.53	1.631s
NB-95	3062.61	765.79	37.	11.	0.006	81.30	1.632s
PA-234M	3065.10	766.41	83.	-17.	-0.009	79.40	1.633s
EU-152	3115.14	778.92	15.	10.	0.005	91.75	1.643s
BI-212	3141.15	785.42	38.	10.	0.005	96.71	1.648s
CS-134	3182.96	795.87	72.	-6.	-0.003	204.12	1.656s
TL-210	3197.88	799.60	78.	0.	0.000	1000.00	1.659s
CS-134	3207.29	801.95	51.	13.	0.007	83.01	1.661s
CO-58	3242.59	810.78	40.	-3.	-0.002	303.68	1.668s
La-140	3262.58	815.77	43.	0.	0.000	1000.00	1.672s
Cs-136	3273.50	818.50	43.	0.	0.000	1000.00	1.674s
MN-54	3338.91	834.85	40.	-14.	-0.008	64.73	1.687s
Co-56	3386.61	846.77	5.	20.	0.011	34.24	1.696s
TL-208	3441.80	860.56	30.	2.	0.001	606.22	1.707s
NB-94	3483.94	871.10	11.	8.	0.005	65.41	1.715s
EU-154	3492.47	873.23	27.	-3.	-0.002	222.35	1.717s
PA-234	3521.68	880.53	32.	10.	0.006	83.13	1.722s
PA-234	3532.53	883.24	42.	10.	0.006	93.91	1.724s
AG-110M	3538.30	884.68	69.	-13.	-0.007	91.77	1.725s
Sc-46	3556.69	889.28	72.	-14.	-0.008	87.92	1.729s
Y-88	3591.74	898.04	16.	6.	0.003	144.05	1.736s
AC-228	3643.65	911.01	5.	76.	0.042	13.07	1.384
AG-110M	3749.60	937.49	65.	-22.	-0.012	82.82	1.766s
PA-234	3783.72	946.02	40.	-13.	-0.007	110.49	1.772s
EU-152	3856.11	964.11	62.	6.	0.003	183.01	1.786s
AC-228	3875.54	968.97	4.	54.	0.030	15.55	1.076s
EU-154	3985.03	996.33	64.	-15.	-0.009	77.66	1.810s
PA-234M	4003.71	1001.00	54.	12.	0.007	88.18	1.814s
EU-154	4018.82	1004.77	69.	-15.	-0.009	79.96	1.816s
Co-56	4151.13	1037.84	32.	-12.	-0.007	89.50	1.841s
Cs-136	4192.07	1048.07	13.	9.	0.005	68.59	1.848s
RH-106	4201.23	1050.36	29.	-6.	-0.003	130.24	1.850s
BI-207	4254.46	1063.66	17.	5.	0.003	179.33	1.860s
Ga-68	4309.44	1077.40	16.	3.	0.002	308.52	1.870s
FE-59	4396.88	1099.25	21.	4.	0.002	291.05	1.886s
EU-152	4448.20	1112.07	133.	-17.	-0.010	96.53	1.895s
ZN-65	4462.09	1115.55	115.	-17.	-0.010	90.28	1.897s
BI-214	4481.06	1120.29	115.	14.	0.008	110.33	1.901s
Sc-46	4482.12	1120.55	69.	15.	0.008	83.83	1.901s
Ta-182	4485.12	1121.30	83.	13.	0.007	102.07	1.901s
CO-60	4692.96	1173.24	37.	-13.	-0.007	107.70	1.938s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Ta-182	4756.25	1189.05	17.	9.	0.005	112.49	1.949
Ta-182	4885.75	1221.41	28.	10.	0.005	133.08	1.972
Co-56	4953.27	1238.28	29.	-2.	-0.001	665.76	1.984s
NA-22	5098.35	1274.53	28.	-6.	-0.004	125.33	2.008s
EU-154	5098.39	1274.54	35.	0.	0.000	1000.00	2.008s
FE-59	5166.65	1291.60	23.	-6.	-0.003	201.47	2.020s
TL-210	5252.32	1313.00	17.	-6.	-0.003	166.25	2.034s
CO-60	5330.37	1332.50	23.	-4.	-0.002	308.96	2.047s
EU-152	5632.56	1408.00	6.	7.	0.004	85.00	2.097s
K-40	5843.64	1460.73	6.	273.	0.152	6.19	1.449s
La-140	6385.95	1596.21	1.	6.	0.004	43.53	2.215s
SB-124	6765.35	1690.98	0.	6.	0.003	40.82	2.272s
BI-214	7059.65	1764.49	4.	23.	0.013	24.91	2.314s
Co-56	7087.11	1771.35	38.	-8.	-0.004	113.45	2.318s
Y-88	7346.20	1836.06	0.	0.	0.000	1000.00	2.354s

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	5.3543E-01				5.31E+01	
			477.60	5.354E-01	?(	1.192E+01 6.44E+02 1.05E+01	G
NA-22	C	-3.2349E-01				9.50E+02	
			1274.53	-3.235E-01	?(	1.405E+00 1.25E+02 9.99E+01	G
K-40	N	1.4571E+02				4.66E+11	
			1460.83	1.457E+02	(P	7.638E+00 6.19E+00 1.07E+01	G
Sc-46	F	-5.5158E-01				8.38E+01	
			889.28	-5.516E-01	?(	1.628E+00 8.79E+01 1.00E+02	G
			1120.55	6.812E-01	+	1.914E+00 8.38E+01 1.00E+02	G
CR-51	F	-3.4736E+00				2.77E+01	
			320.08	-3.474E+00	?(	1.069E+01 9.19E+01 9.94E+00	G
MN-54	C	-5.2886E-01				3.12E+02	
			834.85	-5.289E-01	&(P	1.185E+00 6.47E+01 1.00E+02	G
FE-59	F	2.9448E-01				4.45E+01	
			1099.25	2.945E-01	?(	1.946E+00 2.91E+02 5.65E+01	G
			1291.60	-6.768E-01	+	2.973E+00 2.01E+02 4.32E+01	G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Co-56	C	7.2412E-01					7.73E+01	
			846.77	7.241E-01	?(P	5.036E-01	3.42E+01	9.99E+01 G
			1238.28	-1.780E-01	- P	2.111E+00	6.66E+02	6.61E+01 G
			1037.84	-3.764E+00	- P	8.956E+00	8.95E+01	1.41E+01 G
			1771.35	-3.478E+00	-	1.353E+01	1.13E+02	1.55E+01 A
CO-58	C	-1.0801E-01					7.09E+01	
			810.78	-1.080E-01	?(	1.159E+00	3.04E+02	9.95E+01 G
CO-60	F	-1.9402E-01					1.93E+03	
			1332.50	-1.940E-01	?(	1.317E+00	3.09E+02	1.00E+02 G
			1173.24	-6.377E-01	+	1.491E+00	1.08E+02	9.99E+01 G
ZN-65	F	-1.5840E+00					2.44E+02	
			1115.55	-1.584E+00	?(	4.789E+00	9.03E+01	5.06E+01 G
NB-94	I	-3.3495E-02					7.41E+06	
			702.63	-3.937E-01	?(	1.711E+00	1.28E+02	9.79E+01 G
			871.10	3.195E-01	?(	6.881E-01	6.54E+01	9.99E+01 G
ZR-95	I	4.1418E-01					6.40E+01	
			756.73	0.000E+00	&(	1.622E+00	1.00E+03	5.45E+01 G
			724.20	9.251E-01	&(	2.642E+00	8.49E+01	4.42E+01 G
NB-95	I	3.8995E-01					6.40E+01	
			765.79	3.900E-01	?(	1.066E+00	8.13E+01	9.98E+01 G
RU-103	I	6.0143E-01					3.93E+01	
			497.05	6.014E-01	?(	5.334E-01	3.97E+01	9.09E+01 G
			610.30	0.000E+00	-	4.293E+01	1.00E+03	5.75E+00 GA
RH-106	I	-4.6691E+00					3.74E+02	
			621.92	-4.669E+00	?(P	2.664E+01	9.54E+01	9.93E+00 G
			1050.36	-1.731E+01	+	7.823E+01	1.30E+02	1.56E+00 G
			511.86	9.520E+00	?	5.765E+00	2.08E+01	2.00E+01 GA
AG-108M	C	-3.5690E-01					1.53E+05	
			433.94	-3.569E-01	&(	9.384E-01	1.10E+02	9.05E+01 G
			722.94	-6.020E-01	+	1.951E+00	9.66E+01	9.08E+01 G
			614.28	0.000E+00	&	2.761E+00	1.00E+03	8.98E+01 G
AG-110M	F	-1.2399E-01					2.50E+02	
			884.68	-7.069E-01	?(	2.184E+00	9.18E+01	7.27E+01 G
			657.76	-2.723E-01	+ P	1.676E+00	1.80E+02	9.46E+01 G
			937.49	-2.581E+00	+	4.696E+00	8.28E+01	3.44E+01 G
			1384.30	7.487E-02	%	3.100E+00	1.68E+03	2.43E+01 G
			763.94	1.778E+00	&(	2.895E+00	5.15E+01	2.23E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SN-113	F	2.8250E-01					1.15E+02	
			391.69	2.825E-01	(	1.776E+00	1.84E+02	6.40E+01 G
SB-124	F	2.6389E-01					6.02E+01	
			602.73	0.000E+00	?(	2.489E+00	1.00E+03	9.83E+01 G
			1690.98	8.065E-01	?(	9.906E-01	4.08E+01	4.78E+01 G
			722.79	-5.058E+00	+	1.743E+01	1.03E+02	1.08E+01 G
SB-125	I	2.5223E+00					1.01E+03	
			427.88	1.733E+00	&(	1.470E+00	3.82E+01	2.96E+01 G
			600.50	1.332E+00	(	1.348E+01	2.99E+02	1.79E+01 G
			635.89	5.796E+00	?(	5.776E+00	3.40E+01	1.13E+01 G
			463.37	3.247E+00	?(	8.754E+00	8.05E+01	1.05E+01 G
I-131	I	-4.8979E-01					8.02E+00	
			364.48	-4.898E-01	?(	1.082E+00	8.99E+01	8.17E+01 G
			284.30	-5.792E+00	+	1.346E+01	9.48E+01	6.14E+00 G
			636.97	-6.074E+00	+ P	1.613E+01	1.04E+02	7.17E+00 G
Gd-153	F	-9.6226E-01					2.42E+02	
			97.50	-9.623E-01	?(	4.749E+00	1.48E+02	3.00E+01 G
			103.20	-1.315E+00	&	6.237E+00	1.42E+02	2.18E+01 G
Ga-68	C	4.7589E+00					4.71E-02	
			1077.40	4.759E+00	&(	3.387E+01	3.09E+02	3.30E+00 G
Tc-99m	I	-3.7196E-01					2.51E-01	
			140.51	-3.720E-01	?(	1.728E+00	1.39E+02	8.93E+01 G
BA-133	F	2.1037E-02					3.85E+03	
			356.00	2.104E-02	&(	2.842E+00	3.98E+03	6.20E+01 G
			302.85	-1.882E+00	&	1.064E+01	1.69E+02	1.83E+01 G
			383.84	3.156E+00	?	1.075E+01	1.01E+02	8.94E+00 GA
			80.99	-1.027E+00	+	5.233E+00	1.53E+02	3.41E+01 GA
CS-134	I	5.8664E-01					7.54E+02	
			795.87	-2.477E-01	?(	1.744E+00	2.04E+02	8.55E+01 G
			604.71	0.000E+00	&	2.511E+00	1.00E+03	9.76E+01 G
			569.32	2.041E+00	?(	4.501E+00	6.67E+01	1.54E+01 G
			801.95	5.277E+00	?(	1.471E+01	8.30E+01	8.69E+00 G
			563.24	1.573E+00	?(P	9.638E+00	2.57E+02	8.35E+00 G
CS-137	I	2.4853E+00					1.10E+04	
			661.66	2.485E+00	(P	7.693E-01	1.77E+01	8.52E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CE-139	F	-8.5641E-02					1.38E+02	
			165.85	-8.564E-02	?(	1.139E+00	3.92E+02	7.99E+01 G
Ba-140	I	-6.1976E-01					1.28E+01	
			537.26	-6.198E-01	?(P	3.616E+00	2.06E+02	2.44E+01 G
			162.66	-4.523E+00	&	1.453E+01	9.63E+01	6.22E+00 G
			304.85	-6.196E+00	+	4.487E+01	2.16E+02	4.29E+00 G
La-140	I	4.8430E-01					1.28E+01	
			1596.21	4.092E-01	?(P	4.733E-01	4.35E+01	9.54E+01 G
			487.02	6.418E-01	?(	2.173E+00	1.00E+02	4.55E+01 G
			328.76	-1.918E+00	&	9.561E+00	1.49E+02	2.03E+01 G
			815.77	0.000E+00	-	5.141E+00	1.00E+03	2.33E+01 G
CE-141	I	-6.8187E-01					3.25E+01	
			145.44	-6.819E-01	&(	3.369E+00	1.48E+02	4.82E+01 G
CE-144	I	-2.4062E+00					2.85E+02	
			133.54	-2.406E+00	?(	1.161E+01	1.45E+02	1.11E+01 G
PM-144	C	-5.5860E-01					3.63E+02	
			696.54	-5.586E-01	?(	1.499E+00	8.04E+01	9.90E+01 G
			618.06	0.000E+00	+	2.514E+00	1.00E+03	9.91E+01 G
EU-152	F	7.9771E-01					4.94E+03	
			121.78	-5.252E-01	&(	2.593E+00	1.47E+02	2.86E+01 G
			344.29	-9.375E-01	+	3.070E+00	9.71E+01	2.65E+01 G
			1112.07	-5.852E+00	&	1.894E+01	9.65E+01	1.36E+01 G
			778.92	2.655E+00	&(	5.571E+00	9.18E+01	1.29E+01 G
			964.11	1.741E+00	?(	1.100E+01	1.83E+02	1.46E+01 G
			244.69	-4.467E+00	+ P	2.536E+01	9.52E+01	7.58E+00 G
			1408.00	1.921E+00	?	3.635E+00	8.50E+01	2.10E+01 GA
EU-154	I	4.7874E-01					3.14E+03	
			123.10	4.787E-01	(	1.419E+00	8.86E+01	4.08E+01 G
			1274.54	0.000E+00	-	4.373E+00	1.00E+03	3.52E+01 G
			723.36	-2.707E+00	+	8.174E+00	9.01E+01	2.02E+01 G
			873.23	-1.061E+00	+	8.379E+00	2.22E+02	1.23E+01 G
			1004.77	-3.633E+00	+	9.710E+00	8.00E+01	1.80E+01 G
			996.33	-6.110E+00	+	1.585E+01	7.77E+01	1.06E+01 G
EU-155	I	-1.3767E+00					1.81E+03	
			105.31	-1.377E+00	(P	6.495E+00	6.90E+01	2.12E+01 G
			86.54	-9.736E-01	+	5.847E+00	1.80E+02	3.07E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Ta-182	F	1.9416E+00					1.14E+02	
			1121.30	1.733E+00	?(	5.969E+00	1.02E+02	3.49E+01 G
			1221.41	1.766E+00	(	5.028E+00	1.33E+02	2.70E+01 G
			1189.05	2.683E+00	(	6.535E+00	1.12E+02	1.62E+01 G
Hg-203	F	3.6443E-01					4.66E+01	
			279.20	3.644E-01	&(	1.068E+00	8.76E+01	8.15E+01 G
TL-208	N	3.9588E+00					6.98E+02	
			583.02	3.959E+00	(P	6.063E-01	1.07E+01	8.45E+01 G
			277.28	-5.620E+00	-	1.569E+01	8.37E+01	6.31E+00 G
			860.56	6.036E-01	-	8.521E+00	6.06E+02	1.24E+01 G
PM-146	C	4.4705E-01					2.02E+03	
			453.88	4.470E-01	&(P	1.018E+00	9.45E+01	6.50E+01 G
			747.16	-9.895E-02	%	2.708E+00	1.13E+03	3.40E+01 G
			735.72	-1.957E+00	+ P	4.877E+00	9.25E+01	2.25E+01 G
Y-88	F	1.2505E-01					1.07E+02	
			1836.06	0.000E+00	?(	5.109E-01	1.00E+03	9.92E+01 G
			898.04	2.574E-01	&(P	8.772E-01	1.44E+02	9.37E+01 G
Cd-113m		-1.8576E+03					5.33E+03	
			263.70	-1.858E+03	?(	1.339E+04	2.10E+02	6.00E-03 K
Cf-251	T	1.3720E+00					3.28E+05	
			176.60	1.372E+00	&(	3.335E+00	9.47E+01	1.70E+01 G
			227.00	0.000E+00	-	1.105E+01	1.00E+03	6.30E+00 GA
Cf-249	T	4.3186E-01					1.28E+05	
			387.95	4.319E-01	?(	1.570E+00	1.08E+02	6.60E+01 G
			333.44	-2.187E+00	+	1.096E+01	1.49E+02	1.55E+01 G
Sn-126		-4.0227E+00					3.65E+07	
			87.57	-2.001E-01	}	4.413E+00	6.58E+02	3.75E+01 GA
			64.28	-4.023E+00	(	1.478E+01	1.10E+02	9.70E+00 G
			86.94	-3.300E+00	}	1.897E+01	1.73E+02	9.04E+00 GA
PB-210	N	1.0410E+01					8.14E+03	
			46.54	1.041E+01	(	3.563E+01	1.02E+02	4.25E+00 G
PB-212	N	1.1604E+01					6.98E+02	
			238.63	1.160E+01	(P	1.302E+00	6.30E+00	4.33E+01 G
			300.03	1.755E+01	+	1.624E+01	3.09E+01	3.28E+00 GA

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PB-214	N	1.2522E+01					5.84E+05	
			351.93	1.275E+01	@(P	1.722E+00	8.60E+00	3.76E+01 G
			295.09	1.208E+01	(P	2.812E+00	1.08E+01	1.93E+01 G
			242.00	1.358E+01		9.023E+00	2.25E+01	7.43E+00 GA
BI-207	C	3.1309E-01					1.18E+04	
			1063.66	3.131E-01	?(P	1.292E+00	1.79E+02	7.45E+01 G
			569.70	-1.311E-01	+	9.609E-01	2.10E+02	9.77E+01 G
BI-212	N	2.4156E+01					6.98E+02	
			727.17	2.416E+01	@(	5.578E+00	1.63E+01	7.55E+00 G
			785.42	2.620E+01	? P	8.606E+01	9.67E+01	1.28E+00 GA
U-235	N	-2.9785E+00					2.57E+11	
			143.79	-2.979E+00	&(	1.427E+01	1.44E+02	1.10E+01 G
			205.33	-1.056E+00	+ P	1.357E+01	4.93E+02	5.01E+00 G
			163.38	-1.618E+00	+	1.836E+01	3.35E+02	5.08E+00 G
			185.72	1.951E+00		8.962E-01	1.96E+01	5.40E+01 GA
BI-214	N	1.1008E+01					5.84E+05	
			609.31	1.142E+01	(P	1.246E+00	8.24E+00	4.61E+01 G
			1120.29	4.318E+00	- P	1.604E+01	1.10E+02	1.51E+01 G
			1764.49	9.767E+00	?(P	5.390E+00	2.49E+01	1.54E+01 G
BI-210M	T	2.3585E-01					1.10E+09	
			265.83	2.359E-01	?(P	1.584E+00	1.96E+02	5.00E+01 G
			304.90	0.000E+00	-	6.778E+00	1.00E+03	2.80E+01 G
AC-228	N	1.1127E+01					2.10E+03	
			911.07	1.024E+01	(P	1.796E+00	1.31E+01	2.90E+01 G
			968.97	1.259E+01	(	2.690E+00	1.56E+01	1.75E+01 G
			338.32	1.820E+01	+	3.566E+00	1.23E+01	1.20E+01 G
			93.35	1.877E+01	+ P	8.668E+00	1.98E+01	5.56E+00 XA
TH-227	N	1.8118E+00					7.95E+03	
			256.24	-2.231E+00	?(	1.100E+01	1.98E+02	7.00E+00 G
			235.97	2.084E+00	(	1.397E+01	2.00E+02	1.23E+01 G
			50.14	4.930E+00	&(	1.759E+01	1.07E+02	8.00E+00 G
TH-229	N	3.2076E+00					2.68E+06	
			193.51	3.829E+00	?(	1.396E+01	1.47E+02	4.40E+00 G
			210.85	2.293E+00	?(	2.426E+01	4.24E+02	2.99E+00 G
TH-234	N	-5.4038E+00					1.63E+12	
			92.59	-5.404E+00	(P	2.637E+01	5.39E+01	5.58E+00 G
			63.29	2.479E+00	&	3.321E+01	3.96E+02	3.81E+00 G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

PA-231   N  -1.1973E+01                                     1.20E+07
                         302.65-1.197E+01 ?(  6.890E+01 1.72E+02 2.88E+00 G
                         300.07-1.391E+01 +   8.287E+01 1.78E+02 2.46E+00 G

PA-233   C  -2.1962E-02                                     7.82E+08
                         312.01-2.196E-02 %(P 5.359E+00 3.31E+03 3.60E+01 G
                         300.18-5.520E+00 +   3.236E+01 1.75E+02 6.20E+00 G

PA-234   N   7.7081E-01                                     1.63E+12
                         131.29-1.472E+00 ?(  7.166E+00 1.46E+02 1.80E+01 G
                         946.02-3.913E+00 +   9.688E+00 1.10E+02 1.34E+01 G
                         569.47 1.752E+00 ?(  1.011E+01 1.65E+02 8.20E+00 G
                         883.24 4.138E+00 ?(  1.316E+01 9.39E+01 9.60E+00 G
                         880.53 6.597E+00 &   1.849E+01 8.31E+01 6.00E+00 GA

PA-234M  N   6.2504E+01                                     1.63E+12
                        1001.00 6.250E+01 ?(P 1.855E+02 8.82E+01 8.37E-01 G
                         766.41-1.987E+02 +   5.267E+02 7.94E+01 2.94E-01 G

AM-241   T   1.0433E+00                                     1.58E+05
                          59.54 1.043E+00 &(  4.088E+00 1.17E+02 3.59E+01 G

Ir-192   F   4.9437E-01                                     7.40E+01
                         316.49 4.027E-01 &(  2.043E+00 1.51E+02 8.70E+01 G
                         468.06 6.485E-01 ?(  2.063E+00 9.46E+01 5.18E+01 G
                         308.44 0.000E+00 -   6.025E+00 1.00E+03 3.18E+01 G

Cs-136   F   2.1043E-01                                     1.30E+01
                         818.50 0.000E+00 &(  1.200E+00 1.00E+03 1.00E+02 G
                        1048.07 4.735E-01 &(  1.078E+00 6.86E+01 8.00E+01 G
                         340.57-4.093E-02 %   3.588E+00 2.58E+03 4.69E+01 G

Np-239   T  -5.0110E-01                                     2.36E+00
                         103.70-1.194E+00 +   5.647E+00 1.42E+02 2.40E+01 X
                         106.13-5.011E-01 &(  5.946E+00 3.54E+02 2.27E+01 G
                          99.50-1.919E+00 +   9.293E+00 1.45E+02 1.50E+01 X

Nd-147       3.3434E-01                                     1.11E+01
                         531.00 3.343E-01 ?(  5.692E+00 6.79E+02 1.30E+01 G
                          91.10 2.192E-07 %   5.768E+00 7.84E+08 2.83E+01 G
   ( - 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.
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@ - 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

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********** 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 1 Sigma %	Activity	
PB-210	46.54	210.	21.	0.011	102.29	1.041E+01	
TH-227	50.14	231.	21.	0.011	106.60	4.930E+00	
TH-234	63.29	345.	7.	0.004	396.11	2.479E+00	
Sn-126	64.28	462.	-28.	-0.016	110.17	-4.023E+00	
BA-133	80.99	1068.	-30.	-0.017	153.04	-1.027E+00	
EU-155	86.54	1167.	-27.	-0.015	180.23	-9.736E-01	
Sn-126	86.94	1068.	-27.	-0.015	172.51	-3.300E+00	
Sn-126	87.57	1000.	-7.	-0.004	658.25	-2.001E-01	
TH-234	92.59	826.	-28.	-0.016	53.94	-5.404E+00	P
Gd-153	97.50	798.	-27.	-0.015	147.99	-9.623E-01	
Np-239	99.50	771.	-27.	-0.015	145.23	-1.919E+00	
Gd-153	103.20	744.	-27.	-0.015	142.23	-1.315E+00	
Np-239	103.70	740.	-27.	-0.015	141.78	-1.194E+00	
EU-155	105.31	768.	-28.	-0.016	69.00	-1.377E+00	P
Np-239	106.13	738.	-11.	-0.006	353.83	-5.011E-01	
EU-152	121.78	213.	-14.	-0.008	146.51	-5.252E-01	
EU-154	123.10	127.	19.	0.010	88.65	4.787E-01	
PA-234	131.29	646.	-25.	-0.014	145.83	-1.472E+00	
HF-181	133.02	621.	-25.	-0.014	142.83	-6.153E-01	
CE-144	133.54	636.	-25.	-0.014	144.52	-2.406E+00	
HF-181	136.30	661.	-25.	-0.014	148.07	-4.569E+00	
Tc-99m	140.51	832.	-30.	-0.016	139.42	-3.720E-01	
CE-141	145.44	952.	-30.	-0.016	148.29	-6.819E-01	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
Ba-140	162.66	249.	-24.	-0.013	96.28	-4.523E+00		
CE-139	165.85	258.	-6.	-0.003	391.73	-8.564E-02		
Cf-251	176.60	88.	19.	0.011	94.71	1.372E+00		
TH-229	193.51	92.	13.	0.007	147.10	3.829E+00		
TH-229	210.85	116.	5.	0.003	424.11	2.293E+00		
TH-227	235.97	595.	17.	0.010	200.19	2.084E+00		
EU-152	244.69	711.	-22.	-0.012	95.21	-4.467E+00		P
TH-227	256.24	100.	-10.	-0.006	198.33	-2.231E+00		
Cd-113m	263.70	105.	-7.	-0.004	210.44	-1.858E+03		
BI-210M	265.83	101.	7.	0.004	196.20	2.359E-01		P
Hg-203	279.20	115.	18.	0.010	87.63	3.644E-01		
I-131	284.30	100.	-21.	-0.012	94.79	-5.792E+00		
TL-210	296.00	624.	-20.	-0.011	181.45	-4.277E-01		
PA-231	300.07	604.	-20.	-0.011	178.06	-1.391E+01		
PA-233	300.18	584.	-20.	-0.011	175.18	-5.520E+00		
PA-231	302.65	565.	-20.	-0.011	171.94	-1.197E+01		
BA-133	302.85	545.	-20.	-0.011	168.94	-1.882E+00		
Ba-140	304.85	525.	-15.	-0.008	215.86	-6.196E+00		
Ir-192	316.49	423.	19.	0.011	151.46	4.027E-01		
CR-51	320.08	143.	-19.	-0.011	91.94	-3.474E+00		
Cf-249	333.44	358.	-18.	-0.010	149.44	-2.187E+00		
EU-152	344.29	73.	-13.	-0.007	97.08	-9.375E-01		
HF-181	345.83	114.	-15.	-0.008	103.92	-1.910E+00		
I-131	364.48	80.	-20.	-0.011	89.93	-4.898E-01		
BA-133	383.84	88.	14.	0.008	101.05	3.156E+00		
Cf-249	387.95	102.	14.	0.008	107.76	4.319E-01		
SN-113	391.69	122.	9.	0.005	184.39	2.825E-01		
AG-108M	433.94	56.	-14.	-0.008	110.10	-3.569E-01		
PM-146	453.88	30.	12.	0.007	94.52	4.470E-01		P
Ir-192	468.06	82.	14.	0.008	94.55	6.485E-01		
RH-106	511.86	84.	75.	0.042	20.78	9.520E+00		
Nd-147	531.00	30.	2.	0.001	678.97	3.343E-01		
Ba-140	537.26	44.	-6.	-0.003	206.26	-6.198E-01		P
CS-134	563.24	33.	5.	0.003	256.51	1.573E+00		P
CS-134	569.32	23.	11.	0.006	66.66	2.041E+00		
PA-234	569.47	35.	5.	0.003	165.28	1.752E+00		
BI-207	569.70	46.	-5.	-0.003	209.96	-1.311E-01		
RH-106	621.92	353.	-16.	-0.009	95.44	-4.669E+00		P
I-131	636.97	60.	-15.	-0.008	103.76	-6.074E+00		P
AG-110M	657.76	111.	-8.	-0.005	180.04	-2.723E-01		P
PM-144	696.54	88.	-17.	-0.010	80.36	-5.586E-01		
NB-94	702.63	113.	-12.	-0.007	128.38	-3.937E-01		
SB-124	722.79	138.	-17.	-0.009	102.59	-5.058E+00		
AG-108M	722.94	121.	-17.	-0.009	96.56	-6.020E-01		
EU-154	723.36	105.	-17.	-0.009	90.11	-2.707E+00		
ZR-95	724.20	49.	12.	0.007	84.92	9.251E-01		
PM-146	735.72	42.	-13.	-0.007	92.45	-1.957E+00		P
AG-110M	763.94	12.	12.	0.006	51.53	1.778E+00		

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
NB-95	765.79	37.	11.	0.006	81.30	3.900E-01		
PA-234M	766.41	83.	-17.	-0.009	79.40	-1.987E+02		
EU-152	778.92	15.	10.	0.005	91.75	2.655E+00		
CS-134	795.87	72.	-6.	-0.003	204.12	-2.477E-01		
CS-134	801.95	51.	13.	0.007	83.01	5.277E+00		
CO-58	810.78	40.	-3.	-0.002	303.68	-1.080E-01		
MN-54	834.85	40.	-14.	-0.008	64.73	-5.289E-01		P
NB-94	871.10	11.	8.	0.005	65.41	3.195E-01		
EU-154	873.23	27.	-3.	-0.002	222.35	-1.061E+00		
PA-234	880.53	32.	10.	0.006	83.13	6.597E+00		
PA-234	883.24	42.	10.	0.006	93.91	4.138E+00		
AG-110M	884.68	69.	-13.	-0.007	91.77	-7.069E-01		
Sc-46	889.28	72.	-14.	-0.008	87.92	-5.516E-01		
Y-88	898.04	16.	6.	0.003	144.05	2.574E-01		P
AG-110M	937.49	65.	-22.	-0.012	82.82	-2.581E+00		
PA-234	946.02	40.	-13.	-0.007	110.49	-3.913E+00		
EU-152	964.11	62.	6.	0.003	183.01	1.741E+00		
EU-154	996.33	64.	-15.	-0.009	77.66	-6.110E+00		
PA-234M	1001.00	54.	12.	0.007	88.18	6.250E+01		P
EU-154	1004.77	69.	-15.	-0.009	79.96	-3.633E+00		
Cs-136	1048.07	13.	9.	0.005	68.59	4.735E-01		
RH-106	1050.36	29.	-6.	-0.003	130.24	-1.731E+01		
BI-207	1063.66	17.	5.	0.003	179.33	3.131E-01		P
Ga-68	1077.40	16.	3.	0.002	308.52	4.759E+00		
FE-59	1099.25	21.	4.	0.002	291.05	2.945E-01		
EU-152	1112.07	133.	-17.	-0.010	96.53	-5.852E+00		
ZN-65	1115.55	115.	-17.	-0.010	90.28	-1.584E+00		
Sc-46	1120.55	69.	15.	0.008	83.83	6.812E-01		
CO-60	1173.24	37.	-13.	-0.007	107.70	-6.377E-01		
NA-22	1274.53	28.	-6.	-0.004	125.33	-3.235E-01		
FE-59	1291.60	23.	-6.	-0.003	201.47	-6.768E-01		
TL-210	1313.00	17.	-6.	-0.003	166.25	-1.494E+00		
CO-60	1332.50	23.	-4.	-0.002	308.96	-1.940E-01		
EU-152	1408.00	6.	7.	0.004	85.00	1.921E+00		
SB-124	1690.98	0.	6.	0.003	40.82	8.065E-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	Time Corrected Activity Bq/Sample	Uncertainty Counting	1 Sigma	MDA Bq/Sample
BE-7	#A	5.3542E-01	5.3543E-01	6.438E+02%		1.19E+01
NA-22	#A	-3.2349E-01	-3.2349E-01	1.253E+02%		1.41E+00
K-40		1.4571E+02	1.4571E+02	6.194E+00%		7.64E+00
Sc-46	#A	-5.5158E-01	-5.5158E-01	8.792E+01%		1.63E+00
CR-51	#A	-3.4736E+00	-3.4736E+00	9.194E+01%		1.07E+01

MN-54	#A	-5.2886E-01	-5.2886E-01	6.473E+01%	1.18E+00
FE-59	#A	2.9447E-01	2.9448E-01	2.911E+02%	1.95E+00
Co-56	#	7.2412E-01	7.2412E-01	3.424E+01%	5.04E-01
CO-57	#A	0.0000E+00	0.0000E+00	7.071E+02%	8.94E-01
CO-58	#A	-1.0801E-01	-1.0801E-01	3.037E+02%	1.16E+00
CO-60	#A	-1.9402E-01	-1.9402E-01	3.090E+02%	1.32E+00
ZN-65	#A	-1.5840E+00	-1.5840E+00	9.028E+01%	4.79E+00
NB-94	#A	-3.3495E-02	-3.3495E-02	6.541E+01%	1.71E+00
ZR-95	#A	4.1418E-01	4.1418E-01	8.492E+01%	1.62E+00
NB-95	#A	3.8995E-01	3.8995E-01	8.130E+01%	1.07E+00
RU-103	#	6.0143E-01	6.0143E-01	3.967E+01%	5.33E-01
RH-106	#A	-4.6691E+00	-4.6691E+00	9.544E+01%	2.66E+01
AG-108M	#A	-3.5690E-01	-3.5690E-01	1.101E+02%	9.38E-01
AG-110M	#A	-1.2399E-01	-1.2399E-01	5.153E+01%	2.18E+00
SN-113	#A	2.8250E-01	2.8250E-01	1.844E+02%	1.78E+00
SB-124	#A	2.6389E-01	2.6389E-01	4.082E+01%	2.49E+00
SB-125	#	2.5222E+00	2.5223E+00	3.402E+01%	1.47E+00
I-131	#A	-4.8976E-01	-4.8979E-01	8.993E+01%	1.08E+00
Gd-153	#A	-9.6226E-01	-9.6226E-01	1.480E+02%	4.75E+00
Ga-68	#A	4.7161E+00	4.7589E+00	3.085E+02%	3.39E+01
Tc-99m	#A	-3.7133E-01	-3.7196E-01	1.394E+02%	1.73E+00
BA-133	#A	2.1037E-02	2.1037E-02	3.978E+03%	2.84E+00
CS-134	#A	5.8664E-01	5.8664E-01	6.666E+01%	1.74E+00
CS-137		2.4853E+00	2.4853E+00	1.770E+01%	7.69E-01
CE-139	#A	-8.5640E-02	-8.5641E-02	3.917E+02%	1.14E+00
Ba-140	#A	-6.1974E-01	-6.1976E-01	2.063E+02%	3.62E+00
La-140	#	4.8428E-01	4.8430E-01	4.353E+01%	4.73E-01
CE-141	#A	-6.8186E-01	-6.8187E-01	1.483E+02%	3.37E+00
CE-144	#A	-2.4062E+00	-2.4062E+00	1.445E+02%	1.16E+01
PM-144	#A	-5.5860E-01	-5.5860E-01	8.036E+01%	1.50E+00
EU-152	#A	7.9771E-01	7.9771E-01	8.392E+01%	2.59E+00
EU-154	#A	4.7874E-01	4.7874E-01	8.865E+01%	1.42E+00
EU-155	#A	-1.3767E+00	-1.3767E+00	6.900E+01%	6.50E+00
HF-181	#A	0.0000E+00	0.0000E+00	1.000E+03%	1.58E+00
Ta-182	A	1.9415E+00	1.9416E+00	6.732E+01%	5.97E+00
Hg-203	#A	3.6442E-01	3.6443E-01	8.763E+01%	1.07E+00
TL-208		3.9588E+00	3.9588E+00	1.066E+01%	6.06E-01
PM-146	#A	4.4705E-01	4.4705E-01	9.452E+01%	1.02E+00
Y-88	#A	1.2505E-01	1.2505E-01	1.440E+02%	5.11E-01
Cd-113m	#A	-1.8576E+03	-1.8576E+03	2.104E+02%	1.34E+04
Cd-109	#A	0.0000E+00	0.0000E+00	1.000E+03%	4.44E+01
Cf-251	#A	1.3720E+00	1.3720E+00	9.471E+01%	3.34E+00
Cf-249	#A	4.3186E-01	4.3186E-01	1.078E+02%	1.57E+00
Sn-126	#A	-4.0227E+00	-4.0227E+00	1.102E+02%	1.48E+01
PB-210	#A	1.0410E+01	1.0410E+01	1.023E+02%	3.56E+01
PB-212		1.1604E+01	1.1604E+01	6.302E+00%	1.30E+00
PB-214		1.2522E+01	1.2522E+01	6.896E+00%	1.72E+00
BI-207	#A	3.1309E-01	3.1309E-01	1.793E+02%	1.29E+00
BI-212	#	2.4156E+01	2.4156E+01	1.634E+01%	5.58E+00

U-235	A	-2.9785E+00	-2.9785E+00	1.438E+02%	1.43E+01
BI-214		1.1008E+01	1.1008E+01	8.238E+00%	1.25E+00
BI-210M	#A	2.3585E-01	2.3585E-01	1.962E+02%	1.58E+00
AC-228		1.1127E+01	1.1127E+01	1.016E+01%	1.80E+00
TH-227	#A	1.8118E+00	1.8118E+00	1.004E+02%	1.10E+01
TH-229	#A	3.2076E+00	3.2076E+00	1.471E+02%	1.40E+01
TH-234	#A	-5.4038E+00	-5.4038E+00	5.394E+01%	2.64E+01
PA-231	#A	-1.1973E+01	-1.1973E+01	1.719E+02%	6.89E+01
PA-233	#A	-2.1962E-02	-2.1962E-02	3.314E+03%	5.36E+00
PA-234	#A	7.7081E-01	7.7081E-01	7.986E+01%	7.17E+00
PA-234M	#A	6.2504E+01	6.2504E+01	8.818E+01%	1.86E+02
AM-241	#A	1.0433E+00	1.0433E+00	1.173E+02%	4.09E+00
Np-237	#A	0.0000E+00	0.0000E+00	1.000E+03%	1.39E+01
Ir-192	#A	4.9436E-01	4.9437E-01	8.927E+01%	2.04E+00
Cs-136	#A	2.1042E-01	2.1043E-01	6.859E+01%	1.20E+00
Np-239	#A	-5.0101E-01	-5.0110E-01	3.538E+02%	5.95E+00
Nd-147	#A	3.3433E-01	3.3434E-01	6.790E+02%	5.69E+00
TL-210	#A	0.0000E+00	0.0000E+00	1.000E+03%	1.57E+00
Kr-85	#A	0.0000E+00	0.0000E+00	1.000E+03%	3.64E+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 (25.1 to 1999.3 keV) 2.226E+02 Bq/Sample
Total Decayed Activity (25.1 to 1999.3 keV) 2.2256729E+02 Bq/Sample

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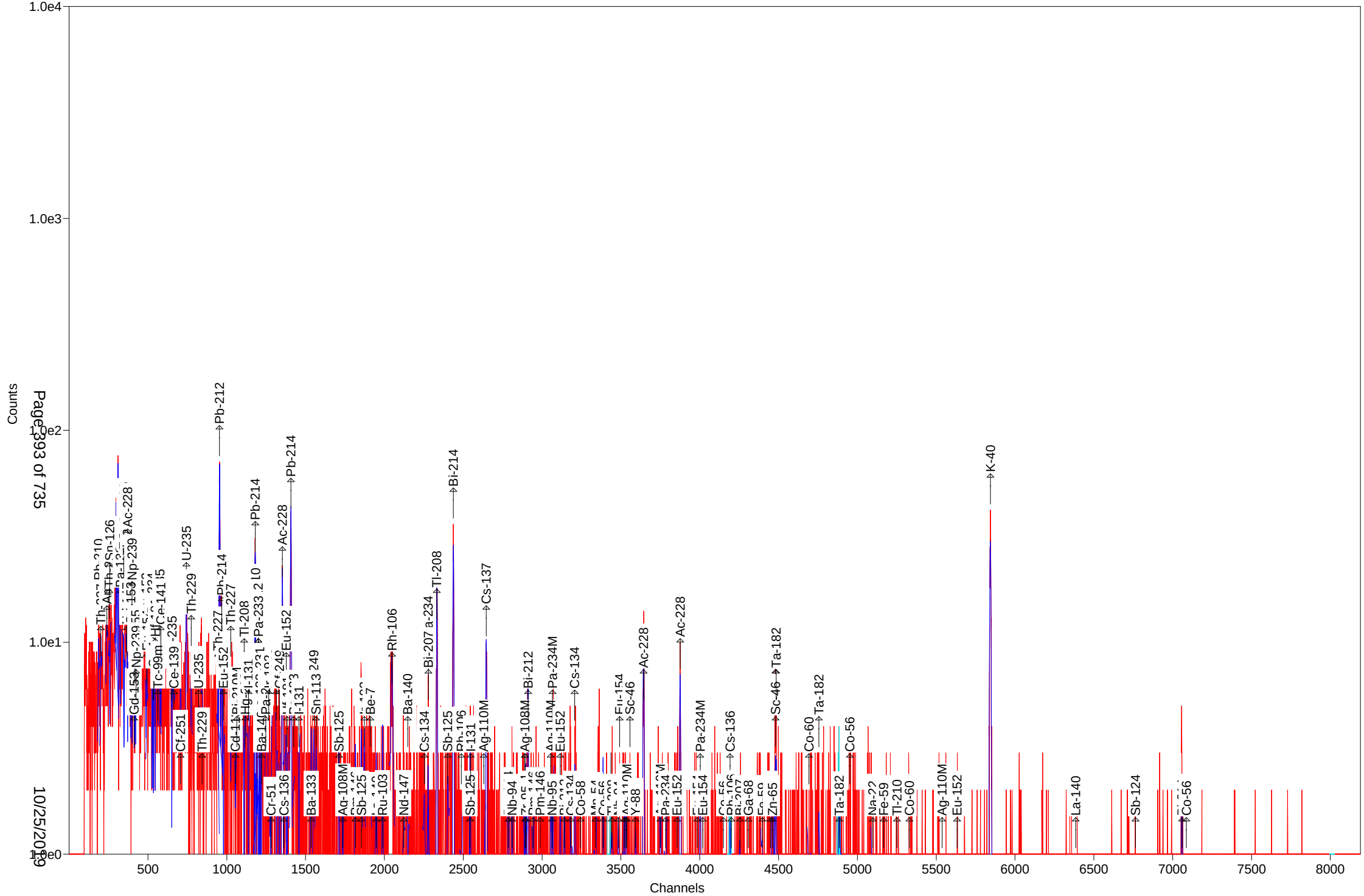
444057_Gamma_180-95857-A-5-B. 9_Gamma_20192874.spc.



Test America St. Louis Spectrum ID: 5_Gamma_20192607

Sample Description: 444057_Gamma_180-95857-A-8-B
Detector: Detector # 5
Batch ID: 444057
Work Order Number: Gamma
Lot Number: 180-95857-A-8-B

Decay to Time: 10/15/2019 11:17 Live Time: 1800 sec
Acquisition Time: 10/15/2019 11:17:53 Real Time: 1808 sec
Analysis Time: 10/15/2019 11:48 Dead Time: 0.42 %
Analysis Quantity: 1.000E+00 Sample

Efficiency Cal File: 5_Soil_TunaCan.Clb
Efficiency Cal Desc: 5_Soil_TunaCan_90099_032612
Efficiency Cal Date: 3/27/2012 17:20
Energy Cal Date: 2/28/2012 19:35
Library: Client_Long_Rev15.lib
Bkgd Correction File: 5_2019-10-06_1911.PBC

Nuclide	Activity Bq/Sample	1-Sigma Counting Uncert %	1-Sigma Counting Uncert Bq/Sample	1-Sigma Total Uncert Bq/Sample	Minimum Detectable Activity Bq/Sample
BE-7	-9.457E-01	463.6	4.384E+00	4.384E+00	1.540E+01
NA-22	-1.511E+00	57.3	8.661E-01	8.694E-01	2.823E+00
K-40	2.362E+02	6.8	1.604E+01	2.009E+01	1.166E+01
Sc-46	3.867E-01	91.8	3.548E-01	3.554E-01	2.214E+00
CR-51	-5.073E+00	90.2	4.574E+00	4.582E+00	1.704E+01
MN-54	-3.308E-01	195.4	6.464E-01	6.467E-01	2.002E+00
FE-59	-3.777E-01	161.5	6.101E-01	6.104E-01	3.945E+00
Co-56	1.145E+00	46.2	5.291E-01	5.323E-01	1.740E+00
CO-57	0.000E+00	1.#INF	2.390E-01	2.390E-01	1.156E+00
CO-58	-2.447E-01	245.5	6.005E-01	6.007E-01	2.114E+00
CO-60	6.253E-01	86.1	5.381E-01	5.390E-01	1.838E+00
ZN-65	0.000E+00	1.#INF	9.699E-01	9.699E-01	6.114E+00
NB-94	-9.708E-01	90.8	8.811E-01	8.826E-01	2.097E+00
ZR-95	1.571E+00	52.4	8.231E-01	8.271E-01	1.950E+00
NB-95	-1.062E+00	75.9	8.059E-01	8.078E-01	2.686E+00
RU-103	1.421E-01	358.8	5.097E-01	5.098E-01	1.329E+00
RH-106	4.285E+00	265.0	1.135E+01	1.136E+01	3.853E+01
AG-108M	-5.652E-02	723.0	4.087E-01	4.087E-01	1.270E+00
AG-110M	6.938E-01	40.8	2.833E-01	2.855E-01	3.013E+00
SN-113	-3.878E-02	1986.2	7.704E-01	7.704E-01	2.687E+00
SB-124	-2.653E-01	323.2	8.574E-01	8.575E-01	3.905E+00
SB-125	8.929E-01	97.3	8.684E-01	8.696E-01	4.040E+00
I-131	3.739E-01	103.9	3.884E-01	3.889E-01	1.032E+00
Gd-153	7.692E-01	115.9	8.914E-01	8.926E-01	3.565E+00
Ga-68	-2.395E+01	154.6	3.703E+01	3.705E+01	8.451E+01
Tc-99m	3.307E-01	125.9	4.165E-01	4.169E-01	1.398E+00
BA-133	-7.072E-01	167.1	1.182E+00	1.182E+00	3.986E+00
CS-134	-8.939E-02	82.2	7.347E-02	7.361E-02	2.953E+00
CS-137	-8.080E-01	104.1	8.410E-01	8.420E-01	2.516E+00
CE-139	-3.765E-01	111.3	4.189E-01	4.204E-01	1.407E+00
Ba-140	1.000E-01	116.9	1.170E-01	1.171E-01	6.207E+00
La-140	5.227E-01	100.2	5.239E-01	5.247E-01	1.697E+00
CE-141	-2.378E-01	289.0	6.874E-01	6.875E-01	1.878E+00

CE-144	0.000E+00	1.#INF	7.325E-01	7.325E-01	1.264E+01
PM-144	-9.458E-01	80.3	7.595E-01	7.610E-01	1.985E+00
EU-152	5.418E-01	239.2	1.296E+00	1.296E+00	3.387E+00
EU-154	1.704E+00	59.8	1.018E+00	1.022E+00	2.022E+00
EU-155	-1.362E+00	153.3	2.087E+00	2.088E+00	6.995E+00
HF-181	-2.491E-01	249.3	6.209E-01	6.210E-01	2.155E+00
Ta-182	2.210E+00	101.0	2.233E+00	2.236E+00	7.297E+00
Hg-203	-2.282E-02	2117.1	4.831E-01	4.831E-01	1.680E+00
TL-208	6.594E+00	11.7	7.716E-01	8.441E-01	1.160E+00
PM-146	1.364E+00	49.6	6.760E-01	6.796E-01	1.845E+00
Y-88	2.871E-01	92.0	2.641E-01	2.647E-01	9.809E-01
Cd-113m	-3.325E+03	179.3	5.962E+03	5.966E+03	2.042E+04
Cd-109	8.360E-01	1767.6	1.478E+01	1.478E+01	4.980E+01
Cf-251	-6.225E-01	311.6	1.940E+00	1.941E+00	5.331E+00
Cf-249	5.757E-01	124.2	7.151E-01	7.157E-01	2.527E+00
Sn-126	3.671E+00	122.5	4.496E+00	4.500E+00	1.510E+01
PB-210	-2.090E+00	636.4	1.330E+01	1.330E+01	3.943E+01
PB-212	1.676E+01	6.7	1.124E+00	1.562E+00	2.062E+00
PB-214	1.421E+01	8.8	1.244E+00	1.446E+00	2.218E+00
BI-207	6.146E-01	100.5	6.176E-01	6.184E-01	1.509E+00
BI-212	4.948E+00	144.9	7.169E+00	7.174E+00	2.487E+01
U-235	1.802E+00	111.8	2.014E+00	2.016E+00	1.166E+01
BI-214	1.293E+01	10.7	1.378E+00	1.533E+00	1.796E+00
BI-210M	-6.549E-01	119.8	7.844E-01	7.854E-01	2.654E+00
AC-228	1.741E+01	10.7	1.872E+00	2.072E+00	4.333E+00
TH-227	3.865E+00	94.4	3.649E+00	3.657E+00	1.353E+01
TH-229	6.980E+00	145.8	1.017E+01	1.019E+01	3.423E+01
TH-234	7.790E+00	65.3	5.091E+00	5.109E+00	1.676E+01
PA-231	-1.375E+01	193.1	2.654E+01	2.655E+01	8.934E+01
PA-233	-9.563E-01	129.2	1.235E+00	1.236E+00	3.213E+00
PA-234	4.268E-01	213.5	9.114E-01	9.117E-01	7.778E+00
PA-234M	4.118E+01	83.4	3.435E+01	3.441E+01	3.381E+02
AM-241	-1.260E+00	89.7	1.130E+00	1.132E+00	4.336E+00
Np-237	2.651E+00	165.1	4.378E+00	4.380E+00	1.464E+01
Ir-192	1.826E-01	109.9	2.007E-01	2.010E-01	1.695E+00
Cs-136	5.236E-01	106.2	5.559E-01	5.567E-01	2.508E+00
Np-239	-1.333E+00	148.0	1.974E+00	1.975E+00	6.611E+00
Nd-147	7.166E-01	522.8	3.747E+00	3.747E+00	9.806E+00
TL-210	7.626E-01	88.7	6.765E-01	6.780E-01	2.282E+00
Kr-85	0.000E+00	1.#INF	4.944E+01	4.945E+01	5.865E+02
Total	3.996E+02				

Analyst: Kellene Robbs

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Sample description
444057_Gamma_180-95857-A-8-B

Spectrum Filename: C:\User\SPC\Det5\5_Gamma_20192607.An1

Acquisition information
Start time: 10/15/2019 11:17:53 AM
Live time: 1800
Real time: 1808
Dead time: 0.42 %
Detector ID: 5

Detector system
Ge 5 SN/157

Calibration
Filename: 5_Soil_TunaCan.Clb
5_Soil_TunaCan_90099_032612

Energy Calibration
Created: 2/28/2012 7:35:48 PM
Zero offset: 0.158 keV
Gain: 0.250 keV/channel
Quadratic: 3.911E-08 keV/channel^2

Efficiency Calibration
Created: 3/27/2012 5:20:37 PM
Knee Energy: 165.85 keV
Above the Knee: Quadratic Uncertainty = 0.87 %
Log(Eff): 6.466115E-01 + (-7.830454E-01*Log(E)) + (-4.117504E-03*Log(E)^2)
Below the Knee: Quadratic Uncertainty = 1.43 %
Log(Eff): -2.462251E+01 + (9.075211E+00*Log(E)) + (-9.664422E-01*Log(E)^2)

Library Files
Main analysis library: Client_Long_Rev15.lib
Library Match Width: 0.500
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G800W064
Start channel: 150 (37.62keV)
Stop channel: 8000 (2000.81keV)
Peak rejection level: 1000.000%
Peak search sensitivity: 3
Sample Size: 1.0000E+00 +/- 0.000E+00%
Activity scaling factor: 1.0000E+00/(1.0000E+00* 1.0000E+00) = 1.0000E+00
Detection limit method: Reg. Guide 4.16 Method

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Random error: 4.0000000E+00
Systematic error: 4.0000000E+00
Fraction Limit: 0.000%
Background width: 3
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:	YES	10/15/2019 11:17:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	5_2019-10-06_1911.PBC 10/6/2019 7:11:20 PM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 23 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 0.1582

***** 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
46.54	-3.	636.43	0.78	1.788E-02	46.54	4.250	PBC<MDA	PB210
50.14	16.	109.37	0.79	2.012E-02	50.14	8.000	PBC<MDA	TH227
63.48	49.	38.78	0.52	2.721E-02	63.29	3.810	PBC<MDA	TH234
64.28	18.	122.50	0.80	2.757E-02	64.28	9.700	PBC<MDA	Sn126
74.75	144.	13.90	0.81	3.150E-02				
77.14	238.	9.44	0.82	3.221E-02				
87.24	66.	27.38	0.72	3.448E-02	86.49	13.100	8.210E+00	Np237
					86.54	30.700	3.502E+00	EU155
					86.94	9.040	1.187E+01	Sn126
					87.57	37.500	2.852E+00	Sn126
					88.04	3.790	2.816E+01	Cd109
92.62	28.	65.35	0.83	3.527E-02	92.59	5.584	PBC<MDA	TH234
97.50	10.	213.79	0.84	3.577E-02	97.50	30.000	PBC<MDA	Gd153
103.20	16.	115.89	0.84	3.612E-02	103.20	21.800	PBC<MDA	Gd153
103.70	16.	120.99	0.84	3.614E-02	103.70	24.000	PBC<MDA	Np239
121.78	8.	239.21	0.86	3.584E-02	121.78	28.580	PBC<MDA	EU152
					122.06	85.600	1.389E-01	CO57
123.10	14.	109.17	0.86	3.575E-02	123.10	40.790	PBC<MDA	EU154
129.05	49.	28.69	0.64	3.529E-02				
140.51	18.	125.95	0.88	3.411E-02	140.51	89.300	PBC<MDA	Tc99m
162.66	15.	116.94	0.90	3.113E-02	162.66	6.220	PBC<MDA	Ba140
185.72	8.	276.73	0.93	2.854E-02	185.72	54.000	PBC<MDA	U235

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
189.60	28.	28.74	1.25	2.805E-02				
193.51	15.	145.76	0.93	2.758E-02	193.51	4.400	PBC<MDA	TH229
205.33	13.	111.81	0.94	2.626E-02	205.33	5.010	PBC<MDA	U235
209.43	47.	28.03	0.74	2.584E-02				
227.00	15.	104.78	0.97	2.417E-02	227.00	6.300	PBC<MDA	Cf251
235.97	15.	219.13	0.98	2.341E-02	235.97	12.300	PBC<MDA	TH227
238.69	316.	6.78	1.07	2.319E-02	238.63	43.300	1.751E+01	PB212
242.07	49.	26.51	0.98	2.293E-02	242.00	7.430	1.591E+01	PB214
256.24	10.	142.30	1.00	2.186E-02	256.24	7.000	PBC<MDA	TH227
277.18	14.	94.93	1.02	2.048E-02	277.28	6.310	PBC<MDA	TL208
295.44	97.	14.32	1.07	1.943E-02	295.09	19.300	1.436E+01	PB214
					296.00	79.000	3.516E+00	TL210
299.88	38.	26.50	0.73	1.918E-02	300.03	3.280	3.311E+01	PB212
					300.07	2.460	4.415E+01	PA231
					300.18	6.200	1.752E+01	PA233
328.76	14.	100.24	1.07	1.778E-02	328.76	20.300	PBC<MDA	La140
333.44	2.	557.42	1.07	1.757E-02	333.44	15.510	PBC<MDA	Cf249
338.39	74.	14.69	0.78	1.736E-02	338.32	12.010	1.963E+01	AC228
352.22	161.	10.07	0.92	1.679E-02	351.93	37.600	1.413E+01	PB214
364.48	9.	103.90	1.10	1.632E-02	364.48	81.700	PBC<MDA	I131
383.84	11.	117.10	1.12	1.563E-02	383.84	8.940	PBC<MDA	BA133
387.95	11.	124.22	1.12	1.549E-02	387.95	66.000	PBC<MDA	Cf249
453.88	8.	138.20	1.18	1.360E-02	453.88	65.000	PBC<MDA	PM146
463.37	12.	97.26	1.19	1.336E-02	463.37	10.470	PBC<MDA	SB125
468.06	9.	109.93	1.20	1.325E-02	468.06	51.750	PBC<MDA	Ir192
497.05	3.	358.77	1.22	1.260E-02	497.05	90.900	PBC<MDA	RU103
511.86	88.	14.73	2.48	1.230E-02	511.86	20.000	1.988E+01	RH106
531.00	2.	522.81	1.25	1.193E-02	531.00	13.000	PBC<MDA	Nd147
563.24	5.	198.61	1.28	1.135E-02	563.24	8.350	PBC<MDA	CS134
569.32	7.	97.94	1.29	1.125E-02	569.32	15.380	PBC<MDA	CS134
					569.47	8.200	4.215E+00	PA234
					569.70	97.740	3.538E-01	BI207
569.47	3.	213.54	1.29	1.125E-02	569.32	15.380	PBC<MDA	CS134
					569.47	8.200	2.007E+00	PA234
					569.70	97.740	1.685E-01	BI207
583.33	113.	11.70	1.44	1.103E-02	583.02	84.500	6.740E+00	TL208
609.50	114.	10.65	1.51	1.063E-02	609.31	46.090	1.293E+01	BI214
618.06	10.	188.67	1.33	1.051E-02	618.06	99.100	PBC<MDA	PM144
621.92	8.	264.97	1.33	1.045E-02	621.92	9.930	PBC<MDA	RH106
657.76	4.	231.84	1.36	9.974E-03	657.76	94.640	PBC<MDA	AG110M
722.79	1.	932.74	1.42	9.217E-03	722.79	10.810	PBC<MDA	SB124
					722.94	90.840	6.636E-02	AG108M
					723.36	20.220	2.983E-01	EU154
727.17	6.	144.89	1.42	9.170E-03	727.17	7.550	PBC<MDA	BI212
735.72	7.	93.78	1.43	9.081E-03	735.72	22.500	PBC<MDA	PM146
747.16	14.	49.55	1.44	8.965E-03	747.16	34.000	PBC<MDA	PM146
756.73	14.	52.39	1.45	8.869E-03	756.73	54.460	PBC<MDA	ZR95
763.94	10.	71.99	1.45	8.799E-03	763.94	22.280	PBC<MDA	AG110M

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
766.41	11.	83.40	1.45	8.776E-03	765.79	99.790	PBC<MDA	NB95
					766.41	0.294	PBC<MDA	PA234M
785.42	5.	188.48	1.47	8.597E-03	785.42	1.280	PBC<MDA	BI212
799.60	12.	88.72	1.48	8.469E-03	799.60	98.960	PBC<MDA	TL210
818.50	10.	106.17	1.50	8.305E-03	818.50	100.000	PBC<MDA	Cs136
860.70	11.	91.53	1.53	7.963E-03	860.56	12.420	PBC<MDA	TL208
873.23	8.	88.25	1.54	7.866E-03	873.23	12.270	PBC<MDA	EU154
880.53	5.	163.71	1.54	7.812E-03	880.53	6.000	PBC<MDA	PA234
898.04	8.	92.01	1.56	7.684E-03	898.04	93.700	PBC<MDA	Y88
911.07	65.	15.70	1.59	7.591E-03	911.07	29.000	1.650E+01	AC228
964.11	2.	817.86	1.61	7.239E-03	964.11	14.605	PBC<MDA	EU152
968.84	65.	16.34	1.07	7.209E-03	968.97	17.460	2.869E+01	AC228
1001.00	-3.	380.42	1.64	7.014E-03	1001.00	0.837	PBC<MDA	PA234M
1004.77	6.	111.52	1.64	6.992E-03	1004.77	18.010	PBC<MDA	EU154
1037.84	6.	99.12	1.66	6.805E-03	1037.84	14.130	PBC<MDA	Co56
1048.07	3.	218.58	1.67	6.749E-03	1048.07	80.000	PBC<MDA	Cs136
1063.66	5.	100.49	1.68	6.666E-03	1063.66	74.500	PBC<MDA	BI207
1120.41	6.	126.92	1.72	6.381E-03	1120.29	15.100	PBC<MDA	BI214
					1120.55	99.987	PBC<MDA	Sc46
1120.55	8.	91.75	1.72	6.380E-03	1120.29	15.100	PBC<MDA	BI214
					1120.55	99.987	7.375E-01	Sc46
1121.42	8.	101.03	1.72	6.376E-03	1121.30	34.900	PBC<MDA	Ta182
1173.24	11.	86.06	1.76	6.138E-03	1173.24	99.900	PBC<MDA	CO60
1189.69	5.	224.35	1.77	6.069E-03	1189.05	16.200	PBC<MDA	Ta182
1221.46	6.	189.97	1.79	5.934E-03	1221.41	27.000	PBC<MDA	Ta182
1238.28	19.	46.22	1.80	5.866E-03	1238.28	66.070	2.688E+00	Co56
1291.60	2.	333.57	1.84	5.661E-03	1291.60	43.200	PBC<MDA	FE59
1313.00	4.	177.92	1.85	5.583E-03	1313.00	21.000	PBC<MDA	TL210
1332.50	3.	265.76	1.87	5.514E-03	1332.50	99.980	PBC<MDA	CO60
1384.30	6.	40.82	1.90	5.340E-03	1384.30	24.290	PBC<MDA	AG110M
1408.00	11.	32.35	1.91	5.264E-03	1408.00	21.005	5.278E+00	EU152
1461.10	232.	6.79	2.30	5.103E-03	1460.83	10.670	2.362E+02	K40
1596.21	1.	427.57	2.02	4.736E-03	1596.21	95.400	PBC<MDA	La140
1764.48	21.	23.99	2.11	4.351E-03	1764.49	15.400	1.735E+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	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide
298.64	74.77	128.	144.	4.568E+03	13.90	0.813	- D
308.22	77.16	132.	238.	7.381E+03	9.44	0.815	- sD
348.73	87.24	106.	61.	1.768E+03	27.07	0.825	- sD
516.01	129.05	48.	49.	1.398E+03	28.69	0.644	- s
758.37	189.60	13.	28.	9.862E+02	28.74	1.253	- s
837.74	209.43	37.	47.	1.806E+03	28.03	0.740	-

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

This section based on library: Client_Long_Rev15.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 1 Sigma %	FWHM keV
PB-210	185.69	46.54	121.	-3.	-0.002	636.43	0.783
TH-227	200.11	50.14	102.	16.	0.009	109.37	0.787s
AM-241	237.72	59.54	215.	-21.	-0.011	89.67	0.797s
TH-234	252.74	63.29	206.	6.	0.003	399.25	0.801s
Sn-126	256.71	64.28	225.	18.	0.010	122.50	0.802
BA-133	323.61	80.99	203.	-22.	-0.012	115.95	0.819s
Np-237	345.63	86.49	618.	21.	0.012	165.12	0.825s
EU-155	345.84	86.54	616.	-6.	-0.003	614.63	0.825s
Sn-126	347.43	86.94	610.	0.	0.000	1000.00	0.825
Sn-126	349.95	87.57	610.	0.	0.000	1000.00	0.826
Nd-147	364.08	91.10	610.	0.	0.000	1000.00	0.829s
TH-234	370.05	92.59	148.	28.	0.015	65.35	0.831D
AC-228	373.09	93.35	629.	-10.	-0.006	351.05	0.832
Gd-153	389.70	97.50	202.	10.	0.005	213.79	0.836s
Np-239	397.71	99.50	196.	-12.	-0.007	165.31	0.838s
Gd-153	412.52	103.20	170.	16.	0.009	115.89	0.842s
Np-239	414.52	103.70	187.	16.	0.009	120.99	0.842s
EU-155	420.98	105.31	406.	-19.	-0.010	153.25	0.844s
Np-239	424.25	106.13	416.	-20.	-0.011	148.04	0.845
EU-152	486.90	121.78	164.	8.	0.004	239.21	0.861s
CO-57	488.03	122.06	172.	0.	0.000	1000.00	0.861s
EU-154	492.18	123.10	117.	14.	0.008	109.17	0.862s
PA-234	524.99	131.29	338.	-3.	-0.002	782.30	0.871
HF-181	531.91	133.02	335.	0.	0.000	1000.00	0.872s
CE-144	533.97	133.54	335.	0.	0.000	1000.00	0.873s
HF-181	545.02	136.30	335.	0.	0.000	1000.00	0.876s
CO-57	545.72	136.47	335.	0.	0.000	1000.00	0.876s
Tc-99m	561.88	140.51	236.	18.	0.010	125.95	0.880s
CE-141	581.61	145.44	124.	-7.	-0.004	289.02	0.885s
Ba-140	650.54	162.66	144.	15.	0.008	116.94	0.902s
CE-139	663.32	165.85	170.	-17.	-0.009	111.28	0.905
Cf-251	706.34	176.60	97.	-6.	-0.003	311.60	0.916s
U-235	742.85	185.72	220.	8.	0.004	276.73	0.925s
TH-229	774.03	193.51	239.	15.	0.008	145.76	0.933s
U-235	821.35	205.33	68.	13.	0.007	111.81	0.945
TH-229	843.44	210.85	144.	-17.	-0.009	88.63	0.950s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Cf-251	908.08	227.00	77.	15.	0.009	104.78	0.966s
TH-227	943.98	235.97	545.	15.	0.008	219.13	0.975s
PB-212	954.64	238.63	55.	303.	0.168	6.71	0.978D
PB-214	968.10	242.00	59.	49.	0.027	26.51	0.981D
EU-152	978.89	244.69	623.	-18.	-0.010	199.97	0.984s
TH-227	1025.11	256.24	55.	10.	0.006	142.30	0.995s
Cd-113m	1054.97	263.70	91.	-8.	-0.004	179.32	1.002s
BI-210M	1063.50	265.83	106.	-12.	-0.007	119.78	1.005s
TL-208	1109.33	277.28	78.	14.	0.008	94.93	1.016s
PB-214	1181.99	295.44	24.	97.	0.054	14.32	1.068s
TL-210	1184.24	296.00	380.	-14.	-0.008	193.45	1.034s
PB-212	1199.76	299.88	18.	38.	0.021	26.50	0.728s
PA-231	1200.53	300.07	365.	-14.	-0.008	189.08	1.038s
PA-233	1200.97	300.18	351.	-14.	-0.008	185.38	1.038s
PA-231	1210.86	302.65	337.	-14.	-0.008	193.06	1.040s
BA-133	1211.66	302.85	330.	-15.	-0.008	174.07	1.040s
BI-210M	1219.85	304.90	313.	0.	0.000	1000.00	1.042s
PA-233	1248.32	312.01	60.	-12.	-0.006	129.18	1.049s
Ir-192	1266.25	316.49	98.	-4.	-0.002	313.88	1.053s
CR-51	1280.63	320.08	128.	-17.	-0.009	90.17	1.057s
La-140	1315.35	328.76	55.	14.	0.008	100.24	1.065s
Cf-249	1334.08	333.44	48.	2.	0.001	557.42	1.070
AC-228	1353.90	338.39	11.	74.	0.041	14.69	0.781s
Cs-136	1362.62	340.57	220.	-15.	-0.008	142.52	1.077s
EU-152	1377.49	344.29	205.	-15.	-0.008	137.34	1.080s
HF-181	1383.66	345.83	190.	-15.	-0.008	132.21	1.082s
PB-214	1409.22	352.22	23.	161.	0.089	10.07	0.921
BA-133	1424.36	356.00	235.	-13.	-0.007	167.10	1.091s
I-131	1458.32	364.48	22.	9.	0.005	103.90	1.099s
BA-133	1535.78	383.84	77.	11.	0.006	117.10	1.117s
Cf-249	1552.22	387.95	88.	11.	0.006	124.22	1.121
SB-125	1711.99	427.88	36.	-3.	-0.002	295.23	1.158s
AG-108M	1736.25	433.94	32.	-1.	-0.001	723.03	1.164s
PM-146	1816.05	453.88	33.	8.	0.005	138.20	1.182s
SB-125	1854.01	463.37	57.	12.	0.006	97.26	1.191
Ir-192	1872.79	468.06	48.	9.	0.005	109.93	1.195s
BE-7	1910.94	477.59	57.	-2.	-0.001	463.57	1.204s
HF-181	1928.56	482.00	65.	-5.	-0.003	249.28	1.208s
La-140	1948.65	487.02	44.	-12.	-0.007	93.43	1.212s
RU-103	1988.80	497.05	28.	3.	0.002	358.77	1.221s
RH-106	2048.06	511.86	40.	88.	0.049	14.73	2.485s
Kr-85	2056.53	513.98	129.	0.	0.000	1000.00	1.237s
Nd-147	2124.62	531.00	28.	2.	0.001	522.81	1.252s
Ba-140	2149.67	537.26	40.	-5.	-0.003	251.66	1.258
CS-134	2253.60	563.24	24.	5.	0.003	198.61	1.280s
CS-134	2277.94	569.32	20.	7.	0.004	97.94	1.286s
PA-234	2278.54	569.47	24.	3.	0.002	213.54	1.286s
BI-207	2279.47	569.70	27.	0.	0.000	1000.00	1.286s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
TL-208	2334.01	583.33	13.	113.	0.063	11.70	1.436
SB-125	2402.69	600.50	247.	-12.	-0.007	186.16	1.313s
SB-124	2411.61	602.73	235.	-7.	-0.004	323.17	1.315s
CS-134	2419.53	604.71	228.	0.	0.000	1000.00	1.317
BI-214	2438.70	609.50	8.	114.	0.063	10.65	1.509s
AG-108M	2457.82	614.28	228.	0.	0.000	1000.00	1.325s
PM-144	2472.94	618.06	185.	10.	0.006	188.67	1.328s
RH-106	2488.37	621.92	221.	8.	0.004	264.97	1.332s
SB-125	2544.26	635.89	30.	-7.	-0.004	163.43	1.344s
I-131	2548.61	636.97	44.	-2.	-0.001	633.58	1.345s
AG-110M	2631.76	657.76	41.	4.	0.002	231.84	1.362s
CS-137	2647.36	661.66	58.	-12.	-0.007	104.08	1.366s
PM-144	2786.90	696.54	44.	-16.	-0.009	80.30	1.395s
NB-94	2811.25	702.63	48.	-16.	-0.009	90.76	1.400s
SB-124	2891.88	722.79	43.	1.	0.001	932.74	1.417s
AG-108M	2892.48	722.94	44.	0.	0.000	1000.00	1.417s
EU-154	2894.17	723.36	44.	0.	0.000	1000.00	1.418s
ZR-95	2897.53	724.20	44.	0.	0.000	1000.00	1.418s
BI-212	2909.41	727.17	37.	6.	0.003	144.89	1.421s
PM-146	2943.61	735.72	9.	7.	0.004	93.78	1.428s
PM-146	2989.37	747.16	9.	14.	0.008	49.55	1.437s
ZR-95	3027.65	756.73	9.	14.	0.008	52.39	1.445s
AG-110M	3056.50	763.94	21.	10.	0.006	71.99	1.451s
NB-95	3063.89	765.79	72.	-17.	-0.009	75.90	1.453s
PA-234M	3066.38	766.41	36.	11.	0.006	83.40	1.453s
EU-152	3116.41	778.92	19.	-5.	-0.003	173.14	1.463s
BI-212	3142.41	785.42	19.	5.	0.003	188.48	1.468s
CS-134	3184.20	795.87	60.	-10.	-0.006	108.38	1.477s
TL-210	3199.12	799.60	46.	12.	0.006	88.72	1.480s
CS-134	3208.53	801.95	63.	-11.	-0.006	107.81	1.482s
CO-58	3243.82	810.78	39.	-4.	-0.002	245.45	1.489s
La-140	3263.80	815.77	54.	-13.	-0.007	86.18	1.493
Cs-136	3274.72	818.50	56.	10.	0.006	106.17	1.495s
MN-54	3340.10	834.85	33.	-5.	-0.003	195.42	1.508s
Co-56	3387.78	846.77	23.	-2.	-0.001	392.81	1.518s
TL-208	3442.95	860.56	19.	11.	0.006	91.53	1.529
NB-94	3485.08	871.10	29.	-6.	-0.003	130.24	1.537s
EU-154	3493.61	873.23	19.	8.	0.004	88.25	1.539s
PA-234	3522.80	880.53	31.	5.	0.003	163.71	1.544s
PA-234	3533.64	883.24	36.	0.	0.000	1000.00	1.547s
AG-110M	3539.41	884.68	36.	0.	0.000	1000.00	1.547s
Y-88	3592.83	898.04	9.	8.	0.004	92.01	1.558s
AC-228	3644.95	911.07	10.	65.	0.036	15.70	1.595
AG-110M	3750.60	937.49	19.	-5.	-0.003	201.78	1.589s
PA-234	3784.70	946.02	23.	-7.	-0.004	138.21	1.595s
EU-152	3857.05	964.11	74.	2.	0.001	817.86	1.609s
AC-228	3875.96	968.84	7.	65.	0.036	16.34	1.073s
EU-154	3985.88	996.33	41.	-7.	-0.004	140.71	1.633

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
PA-234M	4004.55	1001.00	50.	-3.	-0.002	380.42	1.636s
EU-154	4019.65	1004.77	17.	6.	0.003	111.52	1.639s
Co-56	4151.87	1037.84	5.	6.	0.003	99.12	1.664s
Cs-136	4192.77	1048.07	20.	3.	0.002	218.58	1.671s
RH-106	4201.93	1050.36	29.	-3.	-0.002	183.09	1.673s
BI-207	4255.11	1063.66	5.	5.	0.003	100.49	1.682s
Ga-68	4310.04	1077.40	30.	-8.	-0.004	154.62	1.692s
FE-59	4397.41	1099.25	25.	-7.	-0.004	161.52	1.708s
EU-152	4448.68	1112.07	57.	-7.	-0.004	159.62	1.717s
ZN-65	4462.56	1115.55	50.	0.	0.000	1000.00	1.720s
BI-214	4481.51	1120.29	27.	6.	0.003	126.92	1.723s
Sc-46	4482.57	1120.55	26.	8.	0.005	91.75	1.723s
Ta-182	4485.56	1121.30	32.	8.	0.005	101.03	1.724s
CO-60	4693.21	1173.24	15.	11.	0.006	86.06	1.760s
Ta-182	4756.42	1189.05	25.	5.	0.003	224.35	1.771s
Ta-182	4885.79	1221.41	21.	6.	0.003	189.97	1.793s
Co-56	4953.23	1238.28	11.	19.	0.010	46.22	1.804s
NA-22	5098.13	1274.53	32.	-16.	-0.009	57.33	1.828s
EU-154	5098.17	1274.54	48.	-3.	-0.002	288.57	1.828s
FE-59	5166.35	1291.60	11.	2.	0.001	333.57	1.840s
TL-210	5251.91	1313.00	11.	4.	0.002	177.92	1.854s
CO-60	5329.85	1332.50	11.	3.	0.002	265.76	1.866s
AG-110M	5536.88	1384.30	0.	6.	0.003	40.82	1.899s
EU-152	5631.62	1408.00	0.	11.	0.006	32.35	1.914s
K-40	5843.84	1461.10	4.	232.	0.129	6.79	2.298
La-140	6383.73	1596.21	6.	1.	0.001	427.57	2.024s
SB-124	6762.39	1690.98	6.	-4.	-0.002	160.96	2.076s
BI-214	7056.06	1764.49	2.	21.	0.012	23.99	2.114s
Co-56	7083.46	1771.35	34.	-7.	-0.004	117.29	2.117s
Y-88	7341.96	1836.06	0.	0.	0.000	1000.00	2.149s

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	-9.4568E-01				5.31E+01	
			477.60	-9.457E-01	?(	1.540E+01 4.64E+02 1.05E+01	G
NA-22	C	-1.5109E+00				9.50E+02	
			1274.53	-1.511E+00	?(	2.823E+00 5.73E+01 9.99E+01	G

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Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
K-40	N	2.3619E+02					4.66E+11	
			1460.83	2.362E+02	(	1.166E+01	6.79E+00	1.07E+01 G
Sc-46	F	3.8670E-01					8.38E+01	
			889.28	3.586E-02	%(	2.214E+00	1.71E+03	1.00E+02 G
			1120.55	7.375E-01	?(	2.304E+00	9.18E+01	1.00E+02 G
CR-51	F	-5.0733E+00					2.77E+01	
			320.08	-5.073E+00	?(P	1.704E+01	9.02E+01	9.94E+00 G
MN-54	C	-3.3080E-01					3.12E+02	
			834.85	-3.308E-01	?(P	2.002E+00	1.95E+02	1.00E+02 G
FE-59	F	-3.7772E-01					4.45E+01	
			1099.25	-1.062E+00	?(	3.945E+00	1.62E+02	5.65E+01 G
			1291.60	5.167E-01	&(P	4.083E+00	3.34E+02	4.32E+01 G
Co-56	C	1.1447E+00					7.73E+01	
			846.77	-1.670E-01	?(P	1.740E+00	3.93E+02	9.99E+01 G
			1238.28	2.688E+00	(P	2.629E+00	4.62E+01	6.61E+01 G
			1037.84	3.206E+00	?(P	7.726E+00	9.91E+01	1.41E+01 G
			1771.35	-6.083E+00	+	2.456E+01	1.17E+02	1.55E+01 A
CO-58	C	-2.4466E-01					7.09E+01	
			810.78	-2.447E-01	?(	2.114E+00	2.45E+02	9.95E+01 G
CO-60	F	6.2527E-01					1.93E+03	
			1332.50	2.911E-01	?(P	1.838E+00	2.66E+02	1.00E+02 G
			1173.24	9.597E-01	?(	1.881E+00	8.61E+01	9.99E+01 G
NB-94	I	-9.7081E-01					7.41E+06	
			702.63	-9.708E-01	?(	2.097E+00	9.08E+01	9.79E+01 G
			871.10	-4.351E-01	+	1.967E+00	1.30E+02	9.99E+01 G
ZR-95	I	1.5710E+00					6.40E+01	
			756.73	1.571E+00	?(P	1.950E+00	5.24E+01	5.45E+01 G
			724.20	0.000E+00	-	4.598E+00	1.00E+03	4.42E+01 G
NB-95	I	-1.0618E+00					6.40E+01	
			765.79	-1.062E+00	?(	2.686E+00	7.59E+01	9.98E+01 G
RU-103	I	1.4208E-01					3.93E+01	
			497.05	1.421E-01	?(P	1.329E+00	3.59E+02	9.09E+01 G
			610.30	1.062E+00	%	6.633E+01	1.83E+03	5.75E+00 GA

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
RH-106	I	4.2853E+00					3.74E+02	
			621.92	4.285E+00	?(	3.853E+01	2.65E+02	9.93E+00 G
			1050.36	-1.593E+01	+ P	1.470E+02	1.83E+02	1.56E+00 G
			511.86	1.988E+01	?	7.269E+00	1.47E+01	2.00E+01 GA
AG-108M	C	-5.6520E-02					1.53E+05	
			433.94	-5.652E-02	?(P	1.270E+00	7.23E+02	9.05E+01 G
			722.94	0.000E+00	&	2.231E+00	1.00E+03	9.08E+01 G
			614.28	0.000E+00	+	4.278E+00	1.00E+03	8.98E+01 G
AG-110M	F	6.9385E-01					2.50E+02	
			884.68	0.000E+00	?(	3.013E+00	1.00E+03	7.27E+01 G
			657.76	2.354E-01	?(	1.916E+00	2.32E+02	9.46E+01 G
			937.49	-1.018E+00	+	4.984E+00	2.02E+02	3.44E+01 G
			1384.30	2.570E+00	?(	3.157E+00	4.08E+01	2.43E+01 G
			763.94	2.859E+00	&(	6.867E+00	7.20E+01	2.23E+01 G
SN-113	F	-3.8785E-02					1.15E+02	
			391.69	-3.878E-02	&(	2.687E+00	1.99E+03	6.40E+01 G
SB-124	F	-2.6532E-01					6.02E+01	
			602.73	-3.559E-01	?(	3.905E+00	3.23E+02	9.83E+01 G
			1690.98	-9.450E-01	+	3.557E+00	1.61E+02	4.78E+01 G
			722.79	5.576E-01	&(	1.855E+01	9.33E+02	1.08E+01 G
SB-125	I	8.9293E-01					1.01E+03	
			427.88	-4.163E-01	?(P	4.040E+00	2.95E+02	2.96E+01 G
			600.50	-3.491E+00	+	2.194E+01	1.86E+02	1.79E+01 G
			635.89	-3.566E+00	+ P	1.361E+01	1.63E+02	1.13E+01 G
			463.37	4.594E+00	(P	1.510E+01	9.73E+01	1.05E+01 G
I-131	I	3.7385E-01					8.02E+00	
			364.48	3.739E-01	?(P	1.032E+00	1.04E+02	8.17E+01 G
			284.30	3.973E-02	% P	1.790E+01	1.68E+04	6.14E+00 G
			636.97	-1.455E+00	+ P	2.532E+01	6.34E+02	7.17E+00 G
Gd-153	F	7.6917E-01					2.42E+02	
			97.50	4.918E-01	(	3.565E+00	2.14E+02	3.00E+01 G
			103.20	1.151E+00	?(	4.485E+00	1.16E+02	2.18E+01 G
Ga-68	C	-2.3947E+01					4.71E-02	
			1077.40	-2.395E+01	?(	8.451E+01	1.55E+02	3.30E+00 G
Tc-99m	I	3.3067E-01					2.51E-01	
			140.51	3.307E-01	&(	1.398E+00	1.26E+02	8.93E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
BA-133	F	-7.0720E-01					3.85E+03	
			356.00	-7.072E-01	?(	3.986E+00	1.67E+02	6.20E+01 G
			302.85	-2.376E+00	+	1.391E+01	1.74E+02	1.83E+01 G
			383.84	4.370E+00	&	1.737E+01	1.17E+02	8.94E+00 GA
			80.99	-1.094E+00	+	3.398E+00	1.16E+02	3.41E+01 GA
CS-134	I	-8.9395E-02					7.54E+02	
			795.87	-8.021E-01	?(	2.953E+00	1.08E+02	8.55E+01 G
			604.71	0.000E+00	&	3.887E+00	1.00E+03	9.76E+01 G
			569.32	2.247E+00	&(	7.560E+00	9.79E+01	1.54E+01 G
			801.95	-8.201E+00	+	3.000E+01	1.08E+02	8.69E+00 G
			563.24	2.908E+00	&(P	1.498E+01	1.99E+02	8.35E+00 G
CS-137	I	-8.0805E-01					1.10E+04	
			661.66	-8.080E-01	?(P	2.516E+00	1.04E+02	8.52E+01 G
CE-139	F	-3.7645E-01					1.38E+02	
			165.85	-3.765E-01	(	1.407E+00	1.11E+02	7.99E+01 G
Ba-140	I	1.0004E-01					1.28E+01	
			537.26	-9.643E-01	?(	6.207E+00	2.52E+02	2.44E+01 G
			162.66	4.274E+00	?(P	1.683E+01	1.17E+02	6.22E+00 G
			304.85	-1.308E+00	&	5.843E+01	1.31E+03	4.29E+00 G
La-140	I	5.2270E-01					1.28E+01	
			1596.21	1.640E-01	?(	1.697E+00	4.28E+02	9.54E+01 G
			487.02	-1.149E+00	+ P	3.204E+00	9.34E+01	4.55E+01 G
			328.76	2.209E+00	&(	5.737E+00	1.00E+02	2.03E+01 G
			815.77	-3.643E+00	+	1.056E+01	8.62E+01	2.33E+01 G
CE-141	I	-2.3783E-01					3.25E+01	
			145.44	-2.378E-01	(	1.878E+00	2.89E+02	4.82E+01 G
PM-144	C	-9.4576E-01					3.63E+02	
			696.54	-9.458E-01	?(P	1.985E+00	8.03E+01	9.90E+01 G
			618.06	5.511E-01	+	3.523E+00	1.89E+02	9.91E+01 G
EU-152	F	5.4178E-01					4.94E+03	
			121.78	4.159E-01	*(	3.387E+00	2.39E+02	2.86E+01 G
			344.29	-1.841E+00	+	8.514E+00	1.37E+02	2.65E+01 G
			1112.07	-4.364E+00	+	2.401E+01	1.60E+02	1.36E+01 G
			778.92	-2.639E+00	+ P	1.150E+01	1.73E+02	1.29E+01 G
			964.11	7.882E-01	?(	2.256E+01	8.18E+02	1.46E+01 G
			244.69	-5.738E+00	+	3.842E+01	2.00E+02	7.58E+00 G
			1408.00	5.278E+00	& P	3.703E+00	3.23E+01	2.10E+01 GA

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-154	I	1.7042E+00					3.14E+03	
			123.10	5.499E-01	&(P	2.022E+00	1.09E+02	4.08E+01 G
			1274.54	-9.487E-01	+	9.610E+00	2.89E+02	3.52E+01 G
			723.36	0.000E+00	-	1.003E+01	1.00E+03	2.02E+01 G
			873.23	4.354E+00	?(	1.310E+01	8.83E+01	1.23E+01 G
			1004.77	2.513E+00	?(	9.755E+00	1.12E+02	1.80E+01 G
			996.33	-4.962E+00	&	2.413E+01	1.41E+02	1.06E+01 G
EU-155	I	-1.3618E+00					1.81E+03	
			105.31	-1.362E+00	(	6.995E+00	1.53E+02	2.12E+01 G
			86.54	-3.014E-01	+	6.233E+00	6.15E+02	3.07E+01 G
HF-181	F	-2.4907E-01					4.24E+01	
			482.00	-2.491E-01	?(	2.155E+00	2.49E+02	8.05E+01 G
			133.02	0.000E+00	+	3.233E+00	1.00E+03	4.33E+01 G
			345.83	-3.254E+00	+	1.449E+01	1.32E+02	1.51E+01 G
			136.30	0.000E+00	+	2.417E+01	1.00E+03	5.85E+00 G
Ta-182	F	2.2104E+00					1.14E+02	
			1121.30	2.115E+00	?(	7.297E+00	1.01E+02	3.49E+01 G
			1221.41	1.965E+00	?(	8.403E+00	1.90E+02	2.70E+01 G
			1189.05	2.825E+00	?(	1.470E+01	2.24E+02	1.62E+01 G
Hg-203	F	-2.2819E-02					4.66E+01	
			279.20	-2.282E-02	%(	1.680E+00	2.12E+03	8.15E+01 G
TL-208	N	6.5945E+00					6.98E+02	
			583.02	6.740E+00	(P	1.160E+00	1.17E+01	8.45E+01 G
			277.28	5.882E+00	?(	1.880E+01	9.49E+01	6.31E+00 G
			860.56	5.970E+00	?(	1.283E+01	9.15E+01	1.24E+01 G
PM-146	C	1.3642E+00					2.02E+03	
			453.88	5.235E-01	&(P	1.845E+00	1.38E+02	6.50E+01 G
			747.16	2.613E+00	&(	2.994E+00	4.96E+01	3.40E+01 G
			735.72	1.906E+00	?(P	4.469E+00	9.38E+01	2.25E+01 G
Y-88	F	2.8708E-01					1.07E+02	
			1836.06	0.000E+00	?(	9.809E-01	1.00E+03	9.92E+01 G
			898.04	5.910E-01	?(	1.308E+00	9.20E+01	9.37E+01 G
Cd-113m		-3.3249E+03					5.33E+03	
			263.70	-3.325E+03	?(	2.042E+04	1.79E+02	6.00E-03 K
Cd-109	F	8.3605E-01					4.53E+02	
			88.04	8.360E-01	%(	4.980E+01	1.77E+03	3.79E+00 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Cf-251	T	-6.2252E-01					3.28E+05	
			176.60	-6.225E-01	?(	5.331E+00	3.12E+02	1.70E+01 G
			227.00	5.594E+00	&	1.587E+01	1.05E+02	6.30E+00 GA
Cf-249	T	5.7566E-01					1.28E+05	
			387.95	5.992E-01	?(	2.527E+00	1.24E+02	6.60E+01 G
			333.44	4.756E-01	?(	7.111E+00	5.57E+02	1.55E+01 G
Sn-126		3.6705E+00					3.65E+07	
			87.57	0.000E+00	-	5.053E+00	1.00E+03	3.75E+01 GA
			64.28	3.671E+00	(	1.510E+01	1.22E+02	9.70E+00 G
			86.94	0.000E+00	-	2.103E+01	1.00E+03	9.04E+00 GA
PB-210	N	-2.0895E+00					8.14E+03	
			46.54	-2.090E+00	(P	3.943E+01	6.36E+02	4.25E+00 G
PB-212	N	1.6760E+01					6.98E+02	
			238.63	1.676E+01	(	2.062E+00	6.71E+00	4.33E+01 G
			300.03	3.311E+01	+	1.961E+01	2.65E+01	3.28E+00 GA
PB-214	N	1.4206E+01					5.84E+05	
			351.93	1.413E+01	(	2.218E+00	1.01E+01	3.76E+01 G
			295.09	1.436E+01	@(	3.780E+00	1.43E+01	1.93E+01 G
			242.00	1.591E+01		1.258E+01	2.65E+01	7.43E+00 GA
BI-207	C	6.1458E-01					1.18E+04	
			1063.66	6.146E-01	?(P	1.509E+00	1.00E+02	7.45E+01 G
			569.70	0.000E+00	-	1.361E+00	1.00E+03	9.77E+01 G
BI-212	N	4.9481E+00					6.98E+02	
			727.17	4.948E+00	(	2.487E+01	1.45E+02	7.55E+00 G
			785.42	2.537E+01	? P	1.162E+02	1.88E+02	1.28E+00 GA
U-235	N	1.8016E+00					2.57E+11	
			143.79	2.277E-02	%(P	1.166E+01	1.50E+04	1.10E+01 G
			205.33	5.693E+00	?(P	1.735E+01	1.12E+02	5.01E+00 G
			163.38	-6.717E-02	% P	2.168E+01	9.15E+03	5.08E+00 G
			185.72	2.757E-01	* P	2.588E+00	2.77E+02	5.40E+01 GA
BI-214	N	1.2930E+01					5.84E+05	
			609.31	1.293E+01	@(P	1.796E+00	1.07E+01	4.61E+01 G
			1120.29	3.542E+00	- P	1.557E+01	1.27E+02	1.51E+01 G
			1764.49	1.735E+01	+ P	7.812E+00	2.40E+01	1.54E+01 G
BI-210M	T	-6.5488E-01					1.10E+09	
			265.83	-6.549E-01	&(	2.654E+00	1.20E+02	5.00E+01 G
			304.90	0.000E+00	&	8.926E+00	1.00E+03	2.80E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
AC-228	N	1.7414E+01					2.10E+03	
			911.07	1.650E+01	(P	4.333E+00	1.57E+01	2.90E+01 G
			968.97	2.869E+01	+ P	6.637E+00	1.63E+01	1.75E+01 G
			338.32	1.963E+01	(	4.902E+00	1.47E+01	1.20E+01 G
			93.35	-2.866E+00	-	3.379E+01	3.51E+02	5.56E+00 XA
TH-227	N	3.8649E+00					7.95E+03	
			256.24	3.630E+00	?(	1.353E+01	1.42E+02	7.00E+00 G
			235.97	2.927E+00	?(	2.151E+01	2.19E+02	1.23E+01 G
			50.14	5.512E+00	?(	1.718E+01	1.09E+02	8.00E+00 G
TH-229	N	6.9801E+00					2.68E+06	
			193.51	6.980E+00	?(P	3.423E+01	1.46E+02	4.40E+00 G
			210.85	-1.236E+01	+ P	4.234E+01	8.86E+01	2.99E+00 G
TH-234	N	7.7897E+00					1.63E+12	
			92.59	7.790E+00	(P	1.676E+01	6.53E+01	5.58E+00 G
			63.29	3.241E+00	- P	3.741E+01	3.99E+02	3.81E+00 G
PA-231	N	-1.3748E+01					1.20E+07	
			302.65	-1.375E+01	?(	8.934E+01	1.93E+02	2.88E+00 G
			300.07	-1.700E+01	+	1.081E+02	1.89E+02	2.46E+00 G
PA-233	C	-9.5626E-01					7.82E+08	
			312.01	-9.563E-01	?(P	3.213E+00	1.29E+02	3.60E+01 G
			300.18	-6.747E+00	+	4.207E+01	1.85E+02	6.20E+00 G
PA-234	N	4.2682E-01					1.63E+12	
			131.29	-2.932E-01	?(	7.778E+00	7.82E+02	1.80E+01 G
			946.02	-4.192E+00	& P	1.424E+01	1.38E+02	1.34E+01 G
			569.47	2.007E+00	&(	1.528E+01	2.14E+02	8.20E+00 G
			883.24	0.000E+00	-	2.278E+01	1.00E+03	9.60E+00 G
			880.53	5.927E+00	?	3.397E+01	1.64E+02	6.00E+00 GA
PA-234M	N	4.1185E+01					1.63E+12	
			1001.00	-2.717E+01	?(P	3.381E+02	3.80E+02	8.37E-01 G
			766.41	2.358E+02	?(P	6.619E+02	8.34E+01	2.94E-01 G
AM-241	T	-1.2602E+00					1.58E+05	
			59.54	-1.260E+00	?(P	4.336E+00	8.97E+01	3.59E+01 G
Np-237	F	2.6513E+00					2.14E+06	
			86.49	2.651E+00	&(	1.464E+01	1.65E+02	1.31E+01 G
Ir-192	F	1.8260E-01					7.40E+01	
			316.49	-1.565E-01	?(	1.695E+00	3.14E+02	8.70E+01 G
			468.06	7.530E-01	?(	2.823E+00	1.10E+02	5.18E+01 G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          308.44 3.111E-02 %   7.807E+00 7.37E+03 3.18E+01 G

Cs-136   F   5.2357E-01                                     1.30E+01
                          818.50 6.955E-01 ?(  2.508E+00 1.06E+02 1.00E+02 G
                         1048.07 3.087E-01 ?(  2.423E+00 2.19E+02 8.00E+01 G
                          340.57-1.028E+00 +   4.932E+00 1.43E+02 4.69E+01 G

Np-239   T  -1.3331E+00                                     2.36E+00
                          103.70 1.046E+00 ?   4.255E+00 1.21E+02 2.40E+01 X
                          106.13-1.333E+00  (  6.611E+00 1.48E+02 2.27E+01 G
                           99.50-1.255E+00 +   7.010E+00 1.65E+02 1.50E+01 X

Nd-147       7.1662E-01                                     1.11E+01
                          531.00 7.166E-01 ?(  9.806E+00 5.23E+02 1.30E+01 G
                           91.10 0.000E+00 -   6.593E+00 1.00E+03 2.83E+01 G

TL-210   N   7.6260E-01                                     5.84E+05
                          799.60 7.626E-01 ?(  2.282E+00 8.87E+01 9.90E+01 G
                          296.00-5.214E-01 -   3.391E+00 1.93E+02 7.90E+01 G
                         1313.00 2.053E+00 ?   8.495E+00 1.78E+02 2.10E+01 GA
   ( - This peak used in the nuclide activity average.

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

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

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********** 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 1 Sigma %	Activity	
PB-210	46.54	121.	-3.	-0.002	636.43	-2.090E+00	P
TH-227	50.14	102.	16.	0.009	109.37	5.512E+00	
AM-241	59.54	215.	-21.	-0.011	89.67	-1.260E+00	P
BA-133	80.99	203.	-22.	-0.012	115.95	-1.094E+00	
EU-155	86.54	616.	-6.	-0.003	614.63	-3.014E-01	
Gd-153	97.50	202.	10.	0.005	213.79	4.918E-01	
Np-239	99.50	196.	-12.	-0.007	165.31	-1.255E+00	
Gd-153	103.20	170.	16.	0.009	115.89	1.151E+00	
Np-239	103.70	187.	16.	0.009	120.99	1.046E+00	
EU-155	105.31	406.	-19.	-0.010	153.25	-1.362E+00	
Np-239	106.13	416.	-20.	-0.011	148.04	-1.333E+00	
EU-152	121.78	164.	8.	0.004	239.21	4.159E-01	
EU-154	123.10	117.	14.	0.008	109.17	5.499E-01	P
PA-234	131.29	338.	-3.	-0.002	782.30	-2.932E-01	
Tc-99m	140.51	236.	18.	0.010	125.95	3.307E-01	
CE-141	145.44	124.	-7.	-0.004	289.02	-2.378E-01	
Ba-140	162.66	144.	15.	0.008	116.94	4.274E+00	P
CE-139	165.85	170.	-17.	-0.009	111.28	-3.765E-01	
Cf-251	176.60	97.	-6.	-0.003	311.60	-6.225E-01	
U-235	185.72	220.	8.	0.004	276.73	2.757E-01	P
TH-229	193.51	239.	15.	0.008	145.76	6.980E+00	P
U-235	205.33	68.	13.	0.007	111.81	5.693E+00	P
TH-229	210.85	144.	-17.	-0.009	88.63	-1.236E+01	P
Cf-251	227.00	77.	15.	0.009	104.78	5.594E+00	
TH-227	235.97	545.	15.	0.008	219.13	2.927E+00	
EU-152	244.69	623.	-18.	-0.010	199.97	-5.738E+00	
TH-227	256.24	55.	10.	0.006	142.30	3.630E+00	
Cd-113m	263.70	91.	-8.	-0.004	179.32	-3.325E+03	
BI-210M	265.83	106.	-12.	-0.007	119.78	-6.549E-01	
TL-210	296.00	380.	-14.	-0.008	193.45	-5.214E-01	
PA-231	300.07	365.	-14.	-0.008	189.08	-1.700E+01	
PA-233	300.18	351.	-14.	-0.008	185.38	-6.747E+00	
PA-231	302.65	337.	-14.	-0.008	193.06	-1.375E+01	
BA-133	302.85	330.	-15.	-0.008	174.07	-2.376E+00	
PA-233	312.01	60.	-12.	-0.006	129.18	-9.563E-01	P
Ir-192	316.49	98.	-4.	-0.002	313.88	-1.565E-01	
CR-51	320.08	128.	-17.	-0.009	90.17	-5.073E+00	P
La-140	328.76	55.	14.	0.008	100.24	2.209E+00	
Cf-249	333.44	48.	2.	0.001	557.42	4.756E-01	
Cs-136	340.57	220.	-15.	-0.008	142.52	-1.028E+00	
EU-152	344.29	205.	-15.	-0.008	137.34	-1.841E+00	
HF-181	345.83	190.	-15.	-0.008	132.21	-3.254E+00	
BA-133	356.00	235.	-13.	-0.007	167.10	-7.072E-01	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
I-131	364.48	22.	9.	0.005	103.90	3.739E-01	P
BA-133	383.84	77.	11.	0.006	117.10	4.370E+00	
Cf-249	387.95	88.	11.	0.006	124.22	5.992E-01	
SB-125	427.88	36.	-3.	-0.002	295.23	-4.163E-01	P
AG-108M	433.94	32.	-1.	-0.001	723.03	-5.652E-02	P
PM-146	453.88	33.	8.	0.005	138.20	5.235E-01	P
SB-125	463.37	57.	12.	0.006	97.26	4.594E+00	P
Ir-192	468.06	48.	9.	0.005	109.93	7.530E-01	
BE-7	477.59	57.	-2.	-0.001	463.57	-9.457E-01	
HF-181	482.00	65.	-5.	-0.003	249.28	-2.491E-01	
La-140	487.02	44.	-12.	-0.007	93.43	-1.149E+00	P
RU-103	497.05	28.	3.	0.002	358.77	1.421E-01	P
RH-106	511.86	40.	88.	0.049	14.73	1.988E+01	
Nd-147	531.00	28.	2.	0.001	522.81	7.166E-01	
Ba-140	537.26	40.	-5.	-0.003	251.66	-9.643E-01	
CS-134	563.24	24.	5.	0.003	198.61	2.908E+00	P
CS-134	569.32	20.	7.	0.004	97.94	2.247E+00	
PA-234	569.47	24.	3.	0.002	213.54	2.007E+00	
SB-125	600.50	247.	-12.	-0.007	186.16	-3.491E+00	
SB-124	602.73	235.	-7.	-0.004	323.17	-3.559E-01	
PM-144	618.06	185.	10.	0.006	188.67	5.511E-01	
RH-106	621.92	221.	8.	0.004	264.97	4.285E+00	
SB-125	635.89	30.	-7.	-0.004	163.43	-3.566E+00	P
I-131	636.97	44.	-2.	-0.001	633.58	-1.455E+00	P
AG-110M	657.76	41.	4.	0.002	231.84	2.354E-01	
CS-137	661.66	58.	-12.	-0.007	104.08	-8.080E-01	P
PM-144	696.54	44.	-16.	-0.009	80.30	-9.458E-01	P
NB-94	702.63	48.	-16.	-0.009	90.76	-9.708E-01	
SB-124	722.79	43.	1.	0.001	932.74	5.576E-01	
BI-212	727.17	37.	6.	0.003	144.89	4.948E+00	
PM-146	735.72	9.	7.	0.004	93.78	1.906E+00	P
PM-146	747.16	9.	14.	0.008	49.55	2.613E+00	
ZR-95	756.73	9.	14.	0.008	52.39	1.571E+00	P
AG-110M	763.94	21.	10.	0.006	71.99	2.859E+00	
NB-95	765.79	72.	-17.	-0.009	75.90	-1.062E+00	
PA-234M	766.41	36.	11.	0.006	83.40	2.358E+02	P
EU-152	778.92	19.	-5.	-0.003	173.14	-2.639E+00	P
BI-212	785.42	19.	5.	0.003	188.48	2.537E+01	P
CS-134	795.87	60.	-10.	-0.006	108.38	-8.021E-01	
TL-210	799.60	46.	12.	0.006	88.72	7.626E-01	
CS-134	801.95	63.	-11.	-0.006	107.81	-8.201E+00	
CO-58	810.78	39.	-4.	-0.002	245.45	-2.447E-01	
La-140	815.77	54.	-13.	-0.007	86.18	-3.643E+00	
Cs-136	818.50	56.	10.	0.006	106.17	6.955E-01	
MN-54	834.85	33.	-5.	-0.003	195.42	-3.308E-01	P
Co-56	846.77	23.	-2.	-0.001	392.81	-1.670E-01	P
NB-94	871.10	29.	-6.	-0.003	130.24	-4.351E-01	
EU-154	873.23	19.	8.	0.004	88.25	4.354E+00	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
PA-234	880.53	31.	5.	0.003	163.71	5.927E+00		
Y-88	898.04	9.	8.	0.004	92.01	5.910E-01		
AG-110M	937.49	19.	-5.	-0.003	201.78	-1.018E+00		
PA-234	946.02	23.	-7.	-0.004	138.21	-4.192E+00		P
EU-152	964.11	74.	2.	0.001	817.86	7.882E-01		
EU-154	996.33	41.	-7.	-0.004	140.71	-4.962E+00		
PA-234M	1001.00	50.	-3.	-0.002	380.42	-2.717E+01		P
EU-154	1004.77	17.	6.	0.003	111.52	2.513E+00		
Co-56	1037.84	5.	6.	0.003	99.12	3.206E+00		P
Cs-136	1048.07	20.	3.	0.002	218.58	3.087E-01		
RH-106	1050.36	29.	-3.	-0.002	183.09	-1.593E+01		P
BI-207	1063.66	5.	5.	0.003	100.49	6.146E-01		P
Ga-68	1077.40	30.	-8.	-0.004	154.62	-2.395E+01		
FE-59	1099.25	25.	-7.	-0.004	161.52	-1.062E+00		
EU-152	1112.07	57.	-7.	-0.004	159.62	-4.364E+00		
Sc-46	1120.55	26.	8.	0.005	91.75	7.375E-01		
CO-60	1173.24	15.	11.	0.006	86.06	9.597E-01		
Co-56	1238.28	11.	19.	0.010	46.22	2.688E+00		P
NA-22	1274.53	32.	-16.	-0.009	57.33	-1.511E+00		
EU-154	1274.54	48.	-3.	-0.002	288.57	-9.487E-01		
FE-59	1291.60	11.	2.	0.001	333.57	5.167E-01		P
TL-210	1313.00	11.	4.	0.002	177.92	2.053E+00		
CO-60	1332.50	11.	3.	0.002	265.76	2.911E-01		P
AG-110M	1384.30	0.	6.	0.003	40.82	2.570E+00		
EU-152	1408.00	0.	11.	0.006	32.35	5.278E+00		P
La-140	1596.21	6.	1.	0.001	427.57	1.640E-01		
SB-124	1690.98	6.	-4.	-0.002	160.96	-9.450E-01		
Co-56	1771.35	34.	-7.	-0.004	117.29	-6.083E+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	Time Corrected Activity Bq/Sample	Uncertainty Counting	1 Sigma MDA Bq/Sample
BE-7	#A	-9.4567E-01	-9.4568E-01	4.636E+02%	1.54E+01
NA-22	#A	-1.5109E+00	-1.5109E+00	5.733E+01%	2.82E+00
K-40		2.3619E+02	2.3619E+02	6.792E+00%	1.17E+01
Sc-46	#A	3.8670E-01	3.8670E-01	9.175E+01%	2.21E+00
CR-51	#A	-5.0732E+00	-5.0733E+00	9.017E+01%	1.70E+01
MN-54	#A	-3.3080E-01	-3.3080E-01	1.954E+02%	2.00E+00
FE-59	#A	-3.7772E-01	-3.7772E-01	1.615E+02%	3.94E+00
Co-56	#A	1.1447E+00	1.1447E+00	4.622E+01%	1.74E+00
CO-57	#A	0.0000E+00	0.0000E+00	7.071E+02%	1.16E+00
CO-58	#A	-2.4466E-01	-2.4466E-01	2.455E+02%	2.11E+00
CO-60	#A	6.2527E-01	6.2527E-01	8.606E+01%	1.84E+00
ZN-65	#A	0.0000E+00	0.0000E+00	1.000E+03%	6.11E+00

NB-94	#A	-9.7081E-01	-9.7081E-01	9.076E+01%	2.10E+00
ZR-95	#A	1.5709E+00	1.5710E+00	5.239E+01%	1.95E+00
NB-95	#A	-1.0618E+00	-1.0618E+00	7.590E+01%	2.69E+00
RU-103	#A	1.4208E-01	1.4208E-01	3.588E+02%	1.33E+00
RH-106	#A	4.2853E+00	4.2853E+00	2.650E+02%	3.85E+01
AG-108M	#A	-5.6520E-02	-5.6520E-02	7.230E+02%	1.27E+00
AG-110M	#A	6.9384E-01	6.9385E-01	4.082E+01%	3.01E+00
SN-113	#A	-3.8785E-02	-3.8785E-02	1.986E+03%	2.69E+00
SB-124	#A	-2.6532E-01	-2.6532E-01	3.232E+02%	3.91E+00
SB-125	#A	8.9293E-01	8.9293E-01	9.726E+01%	4.04E+00
I-131	#A	3.7383E-01	3.7385E-01	1.039E+02%	1.03E+00
Gd-153	#A	7.6917E-01	7.6917E-01	1.159E+02%	3.56E+00
Ga-68	#A	-2.3731E+01	-2.3947E+01	1.546E+02%	8.45E+01
Tc-99m	#A	3.3011E-01	3.3067E-01	1.259E+02%	1.40E+00
BA-133	#A	-7.0720E-01	-7.0720E-01	1.671E+02%	3.99E+00
CS-134	#A	-8.9395E-02	-8.9395E-02	8.218E+01%	2.95E+00
CS-137	#A	-8.0805E-01	-8.0805E-01	1.041E+02%	2.52E+00
CE-139	#A	-3.7645E-01	-3.7645E-01	1.113E+02%	1.41E+00
Ba-140	#A	1.0004E-01	1.0004E-01	1.169E+02%	6.21E+00
La-140	#A	5.2268E-01	5.2270E-01	1.002E+02%	1.70E+00
CE-141	#A	-2.3783E-01	-2.3783E-01	2.890E+02%	1.88E+00
CE-144	#A	0.0000E+00	0.0000E+00	1.000E+03%	1.26E+01
PM-144	#A	-9.4576E-01	-9.4576E-01	8.030E+01%	1.98E+00
EU-152	#A	5.4178E-01	5.4178E-01	2.392E+02%	3.39E+00
EU-154	#A	1.7042E+00	1.7042E+00	5.976E+01%	2.02E+00
EU-155	#A	-1.3618E+00	-1.3618E+00	1.533E+02%	6.99E+00
HF-181	#A	-2.4907E-01	-2.4907E-01	2.493E+02%	2.15E+00
Ta-182	#A	2.2104E+00	2.2104E+00	1.010E+02%	7.30E+00
Hg-203	#A	-2.2818E-02	-2.2819E-02	2.117E+03%	1.68E+00
TL-208		6.5945E+00	6.5945E+00	1.170E+01%	1.16E+00
PM-146	#A	1.3642E+00	1.3642E+00	4.955E+01%	1.84E+00
Y-88	#A	2.8708E-01	2.8708E-01	9.201E+01%	9.81E-01
Cd-113m	#A	-3.3249E+03	-3.3249E+03	1.793E+02%	2.04E+04
Cd-109	#A	8.3605E-01	8.3605E-01	1.768E+03%	4.98E+01
Cf-251	#A	-6.2252E-01	-6.2252E-01	3.116E+02%	5.33E+00
Cf-249	#A	5.7566E-01	5.7566E-01	1.242E+02%	2.53E+00
Sn-126	A	3.6705E+00	3.6705E+00	1.225E+02%	1.51E+01
PB-210	#A	-2.0895E+00	-2.0895E+00	6.364E+02%	3.94E+01
PB-212		1.6760E+01	1.6760E+01	6.708E+00%	2.06E+00
PB-214		1.4206E+01	1.4206E+01	8.754E+00%	2.22E+00
BI-207	#A	6.1458E-01	6.1458E-01	1.005E+02%	1.51E+00
BI-212	#A	4.9481E+00	4.9481E+00	1.449E+02%	2.49E+01
U-235	#A	1.8016E+00	1.8016E+00	1.118E+02%	1.17E+01
BI-214	#	1.2930E+01	1.2930E+01	1.065E+01%	1.80E+00
BI-210M	#A	-6.5488E-01	-6.5488E-01	1.198E+02%	2.65E+00
AC-228		1.7414E+01	1.7414E+01	1.075E+01%	4.33E+00
TH-227	#A	3.8649E+00	3.8649E+00	9.442E+01%	1.35E+01
TH-229	#A	6.9801E+00	6.9801E+00	1.458E+02%	3.42E+01
TH-234	#A	7.7897E+00	7.7897E+00	6.535E+01%	1.68E+01

PA-231 #A	-1.3748E+01	-1.3748E+01	1.931E+02%	8.93E+01
PA-233 #A	-9.5626E-01	-9.5626E-01	1.292E+02%	3.21E+00
PA-234 #A	4.2682E-01	4.2682E-01	2.135E+02%	7.78E+00
PA-234M#A	4.1185E+01	4.1185E+01	8.340E+01%	3.38E+02
AM-241 #A	-1.2602E+00	-1.2602E+00	8.967E+01%	4.34E+00
Np-237 #A	2.6513E+00	2.6513E+00	1.651E+02%	1.46E+01
Ir-192 #A	1.8260E-01	1.8260E-01	1.099E+02%	1.69E+00
Cs-136 #A	5.2355E-01	5.2357E-01	1.062E+02%	2.51E+00
Np-239 #A	-1.3329E+00	-1.3331E+00	1.480E+02%	6.61E+00
Nd-147 #A	7.1659E-01	7.1662E-01	5.228E+02%	9.81E+00
TL-210 #A	7.6260E-01	7.6260E-01	8.872E+01%	2.28E+00
Kr-85 #A	0.0000E+00	0.0000E+00	1.000E+03%	5.87E+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 (37.6 to 2000.8 keV) 3.041E+02 Bq/Sample
Total Decayed Activity (37.6 to 2000.8 keV) 3.0409888E+02 Bq/Sample

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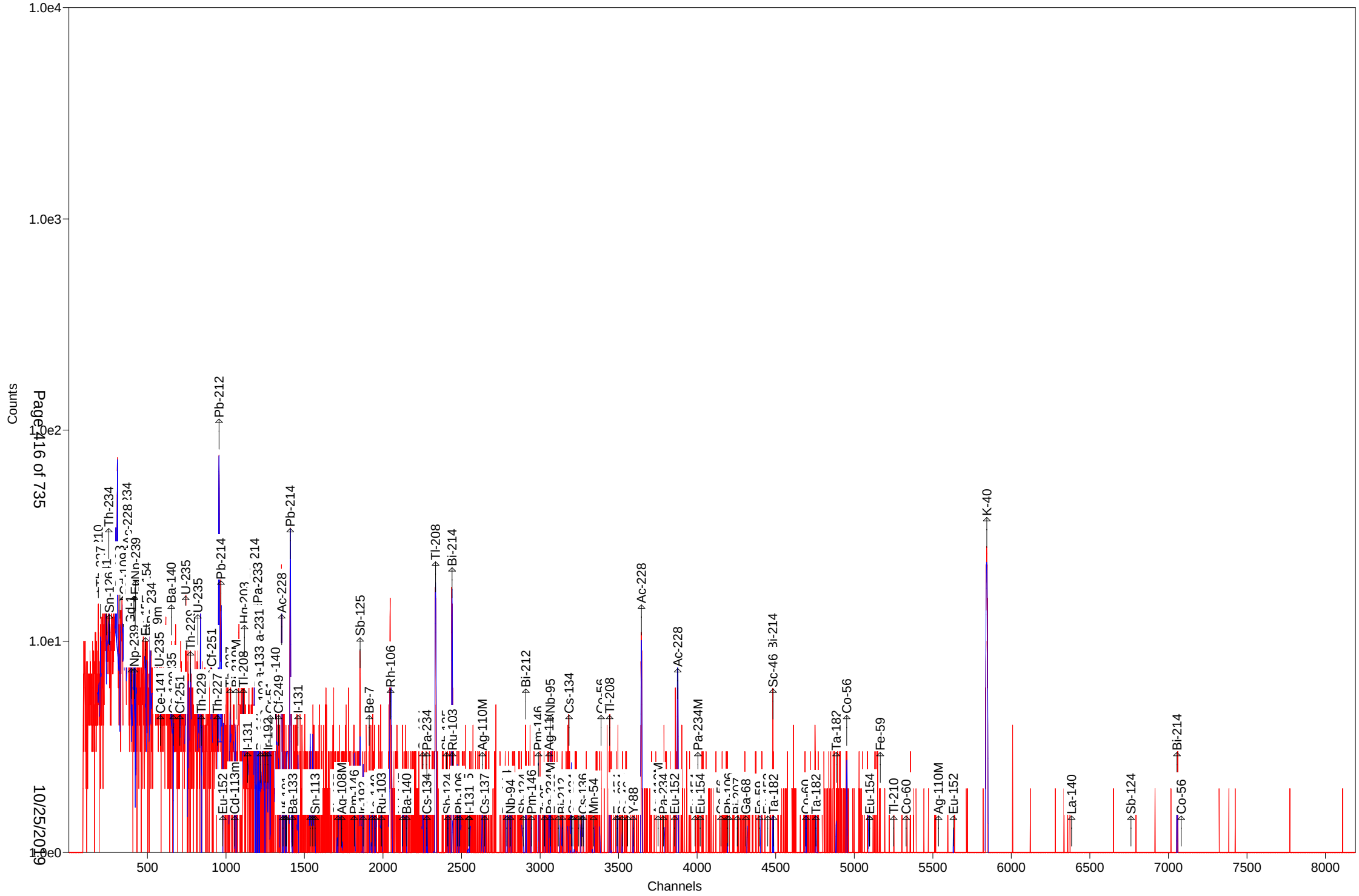
444057_Gamma_180-95857-A-8-B. 5_Gamma_20192607.spc.


Counts
Channels
1.0e4
1.0e3
1.0e2
1.0e1
1.0e0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
6500
7000
7500
8000
Pb-212
Th-234
Pb-214
Ac-228
Tl-208
Bi-214
K-40
Sb-125
Rh-106
Ac-228
Ac-228
Sc-46
Co-56
Fe-59
Bi-214
Co-56
Sb-124
La-140
Eu-152
Cd-113m
Ba-133
Sn-113
Ag-108M
Pm-146
Ru-103
Ba-140
Cs-134
Cs-137
Ag-110M
Nb-94
Mn-54
Y-88
Eu-152
Eu-154
Ga-68
Ta-182
Co-60
Tl-210
Ag-110M
Eu-152
Eu-154
Ta-182
Co-60
Pa-234M
Cs-134
Be-7
I-131
Cf-251
Th-229
U-235
Ba-140
Np-239
Ce-141
Th-227
Tl-208
Bi-212
Pm-146
Nb-95
Ag-110M
Eu-152
Eu-154
Ta-182
Co-60
Ga-68
Pb-106
Bi-207
Pa-234M
Pa-234
Pa-233
Hg-203
Cf-249
Cf-251
Sn-126
Th-234
Ac-228
Pb-214
Pb-214
Ac-228
Pb-214
Bi-214
Co-56
Sb-124
Eu-152
Eu-154
Tl-210
Co-60
Ag-110M
Eu-152
Eu-154
Ta-182
Co-60
Ta-182
Co-56
Bi-214
Co-56
Sb-124
La-140

Sample Description: 444057_Gamma_180-95857-A-9-B
Detector: Detector #12
Batch ID: 444057
Work Order Number: Gamma
Lot Number: 180-95857-A-9-B

Decay to Time: 10/15/2019 11:20 Live Time: 1800 sec
Acquisition Time: 10/15/2019 11:20:59 Real Time: 1801 sec
Analysis Time: 10/15/2019 11:51 Dead Time: 0.07 %
Analysis Quantity: 1.000E+00 Sample

Efficiency Cal File: 12_Soil_TunaCan.Clb
Efficiency Cal Desc: 12_TunaCan_108513
Efficiency Cal Date: 4/20/2018 11:53
Energy Cal Date: 4/20/2018 11:13
Library: Client_Long_Rev15.lib
Bkgd Correction File: 12_2019-10-06_1923.PBC

Nuclide	Activity Bq/Sample	1-Sigma Counting Uncert %	1-Sigma Counting Uncert Bq/Sample	1-Sigma Total Uncert Bq/Sample	Minimum Detectable Activity Bq/Sample
BE-7	2.885E+00	107.6	3.104E+00	3.107E+00	1.060E+01
NA-22	1.873E-01	188.7	3.535E-01	3.537E-01	1.292E+00
K-40	1.925E+02	6.2	1.187E+01	1.535E+01	5.395E+00
Sc-46	5.450E-01	83.8	4.565E-01	4.573E-01	1.189E+00
CR-51	3.429E+00	214.2	7.343E+00	7.345E+00	2.469E+01
MN-54	1.714E-02	2755.0	4.721E-01	4.721E-01	1.174E+00
FE-59	9.213E-02	972.1	8.956E-01	8.956E-01	2.976E+00
Co-56	5.115E-01	78.8	4.031E-01	4.040E-01	6.823E-01
CO-57	1.898E-01	166.0	3.150E-01	3.151E-01	1.068E+00
CO-58	2.783E-01	143.7	4.000E-01	4.003E-01	1.396E+00
CO-60	-2.180E-01	327.4	7.138E-01	7.139E-01	1.593E+00
ZN-65	-2.155E+00	89.2	1.923E+00	1.926E+00	6.441E+00
NB-94	-2.936E-01	208.5	6.120E-01	6.122E-01	1.445E+00
ZR-95	1.495E+00	24.3	3.625E-01	3.705E-01	6.480E-01
NB-95	3.630E-01	141.4	5.133E-01	5.137E-01	1.765E+00
RU-103	-1.160E-01	436.7	5.068E-01	5.068E-01	1.300E+00
RH-106	-1.425E+00	105.1	1.496E+00	1.498E+00	3.187E+01
AG-108M	1.403E-01	281.4	3.947E-01	3.947E-01	1.019E+00
AG-110M	6.022E-01	123.9	7.460E-01	7.466E-01	1.837E+00
SN-113	5.044E-01	122.7	6.189E-01	6.194E-01	2.101E+00
SB-124	1.958E+00	27.8	5.444E-01	5.534E-01	3.146E+00
SB-125	2.373E+00	29.7	7.048E-01	7.149E-01	3.413E+00
I-131	1.699E-01	226.0	3.840E-01	3.841E-01	9.881E-01
Gd-153	-1.160E+00	144.0	1.670E+00	1.672E+00	5.582E+00
Ga-68	7.332E-01	3525.6	2.585E+01	2.585E+01	5.889E+01
Tc-99m	8.852E-03	7374.3	6.527E-01	6.527E-01	2.198E+00
BA-133	-7.097E-01	150.5	1.068E+00	1.069E+00	3.591E+00
CS-134	2.526E+00	20.4	5.155E-01	5.313E-01	1.273E+00
CS-137	6.316E-01	92.0	5.809E-01	5.818E-01	1.959E+00
CE-139	2.130E-01	184.2	3.925E-01	3.927E-01	1.330E+00
Ba-140	8.659E-01	202.8	1.756E+00	1.756E+00	4.336E+00
La-140	9.079E-01	35.4	3.210E-01	3.244E-01	6.487E-01
CE-141	-4.393E-01	148.3	6.517E-01	6.521E-01	2.199E+00

CE-144	-3.024E+00	163.2	4.935E+00	4.937E+00	1.649E+01
PM-144	-7.449E-01	92.0	6.853E-01	6.863E-01	1.573E+00
EU-152	8.021E-01	86.0	6.896E-01	6.909E-01	3.748E+00
EU-154	1.265E+00	81.1	1.026E+00	1.028E+00	2.423E+00
EU-155	-1.153E+00	218.3	2.518E+00	2.519E+00	8.434E+00
HF-181	7.244E-01	89.5	6.487E-01	6.497E-01	1.525E+00
Ta-182	2.658E+00	78.2	2.079E+00	2.083E+00	6.948E+00
Hg-203	-3.759E-01	124.1	4.664E-01	4.668E-01	1.575E+00
TL-208	5.611E+00	9.1	5.101E-01	5.844E-01	3.453E-01
PM-146	1.301E+00	41.7	5.429E-01	5.468E-01	1.290E+00
Y-88	4.445E-02	988.3	4.393E-01	4.393E-01	1.407E+00
Cd-113m	-3.142E+03	146.9	4.614E+03	4.618E+03	1.577E+04
Cd-109	0.000E+00	1.#INF	1.453E+01	1.453E+01	4.898E+01
Cf-251	-1.880E+00	110.7	2.082E+00	2.084E+00	5.340E+00
Cf-249	5.298E-01	117.5	6.225E-01	6.231E-01	1.792E+00
Sn-126	3.195E+00	141.2	4.509E+00	4.513E+00	1.515E+01
PB-210	1.568E+01	82.0	1.285E+01	1.289E+01	3.577E+01
PB-212	1.674E+01	6.1	1.023E+00	1.345E+00	1.809E+00
PB-214	1.251E+01	9.7	1.210E+00	1.367E+00	2.264E+00
BI-207	3.291E-01	232.7	7.660E-01	7.662E-01	1.757E+00
BI-212	4.108E-01	1732.1	7.115E+00	7.115E+00	2.506E+01
U-235	2.983E+00	92.7	2.764E+00	2.768E+00	8.286E+00
BI-214	1.299E+01	11.0	1.431E+00	1.576E+00	2.221E+00
BI-210M	6.523E-01	93.0	6.067E-01	6.076E-01	2.039E+00
AC-228	1.608E+01	13.2	2.116E+00	2.268E+00	4.911E+00
TH-227	-6.359E+00	99.4	6.322E+00	6.331E+00	1.619E+01
TH-229	-8.148E+00	105.4	8.591E+00	8.602E+00	2.201E+01
TH-234	9.224E+00	44.6	4.117E+00	4.148E+00	1.729E+01
PA-231	0.000E+00	1.#INF	7.389E+00	7.389E+00	8.598E+01
PA-233	0.000E+00	1.#INF	2.166E-01	2.166E-01	7.039E+00
PA-234	2.357E+00	37.7	8.897E-01	8.979E-01	7.637E+00
PA-234M	8.203E+01	75.2	6.167E+01	6.180E+01	1.947E+02
AM-241	1.012E+00	137.3	1.389E+00	1.391E+00	4.660E+00
Np-237	0.000E+00	1.#INF	4.285E+00	4.285E+00	1.444E+01
Ir-192	1.015E-01	269.7	2.737E-01	2.738E-01	2.943E+00
Cs-136	0.000E+00	1.#INF	5.068E-02	5.068E-02	1.534E+00
Np-239	1.332E+00	154.0	2.051E+00	2.053E+00	6.867E+00
Nd-147	-4.168E+00	99.6	4.150E+00	4.157E+00	9.913E+00
TL-210	1.065E-01	377.9	4.026E-01	4.026E-01	1.954E+00
Kr-85	-1.397E+01	1027.0	1.435E+02	1.435E+02	4.943E+02
Total	4.048E+02				

Analyst: Kellene Robbs

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Sample description
444057_Gamma_180-95857-A-9-B

Spectrum Filename: C:\User\SPC\Det12\12_Gamma_20192673.An1

Acquisition information
Start time: 10/15/2019 11:20:59 AM
Live time: 1800
Real time: 1801
Dead time: 0.07 %
Detector ID: 12

Detector system
Ge12 S/N10034336

Calibration
Filename: 12_Soil_TunaCan.Clb
12_TunaCan_108513

Energy Calibration
Created: 4/20/2018 11:13:27 AM
Zero offset: 0.059 keV
Gain: 0.250 keV/channel
Quadratic: -3.735E-08 keV/channel^2

Efficiency Calibration
Created: 4/20/2018 11:53:09 AM
Type: Polynomial
Uncertainty: 1.020 %
Coefficients: -0.363508 -4.707999 0.462125
-0.051256 0.002384 -0.000043

Library Files
Main analysis library: Client_Long_Rev15.lib
Library Match Width: 0.500
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G800W064
Start channel: 100 (25.08keV)
Stop channel: 8000 (1999.13keV)
Peak rejection level: 1000.000%
Peak search sensitivity: 3
Sample Size: 1.0000E+00 +/- 0.000E+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: 4.0000000E+00
Systematic error: 4.0000000E+00
Fraction Limit: 0.000%
Background width: 3
Half lives decay limit: 12.000

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

Corrections	Status	Comments
Decay correct to date:	YES	10/15/2019 11:20:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	12_2019-10-06_1923.PBC 10/6/2019 7:23:34 PM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 24 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 0.2284

***** 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	22.	82.01	0.75	1.805E-02	46.54	4.250	PBC<MDA	PB210
50.14	16.	133.73	0.85	2.193E-02	50.14	8.000	PBC<MDA	TH227
59.54	18.	137.31	0.86	2.817E-02	59.54	35.900	PBC<MDA	AM241
63.60	33.	44.63	0.87	2.978E-02	63.29	3.810	PBC<MDA	TH234
64.59	17.	141.15	0.87	3.015E-02	64.28	9.700	PBC<MDA	Sn126
74.67	153.	14.37	0.88	3.327E-02				
77.20	261.	8.17	0.88	3.387E-02				
87.56	42.	39.21	0.89	3.575E-02	87.57	37.500	PBC<MDA	Sn126
89.91	50.	30.77	0.75	3.606E-02				
92.58	16.	116.33	0.90	3.637E-02	92.59	5.584	PBC<MDA	TH234
93.34	24.	142.94	0.90	3.645E-02	93.35	5.561	PBC<MDA	AC228
106.13	20.	153.99	0.91	3.729E-02	106.13	22.700	PBC<MDA	Np239
122.06	11.	165.99	0.93	3.724E-02	121.78	28.580	PBC<MDA	EU152
					122.06	85.600	1.898E-01	CO57
143.79	11.	158.30	0.95	3.599E-02	143.79	10.960	PBC<MDA	U235
163.38	19.	96.39	0.97	3.428E-02	163.38	5.080	PBC<MDA	U235
165.85	10.	184.25	0.97	3.405E-02	165.85	79.900	PBC<MDA	CE139
186.39	112.	16.72	0.90	3.208E-02	185.72	54.000	3.034E+00	U235
227.00	4.	413.45	1.03	2.839E-02	227.00	6.300	PBC<MDA	Cf251
235.97	15.	232.41	1.04	2.764E-02	235.97	12.300	PBC<MDA	TH227
238.55	348.	6.72	1.07	2.743E-02	238.63	43.300	1.629E+01	PB212
241.97	61.	24.65	1.05	2.716E-02	242.00	7.430	1.676E+01	PB214
244.69	16.	219.17	1.05	2.695E-02	244.69	7.580	PBC<MDA	EU152
265.83	15.	93.01	1.07	2.539E-02	265.83	50.000	PBC<MDA	BI210M
276.00	14.	108.99	1.08	2.462E-02	277.28	6.310	PBC<MDA	TL208
294.99	105.	16.54	1.44	2.350E-02	295.09	19.300	1.281E+01	PB214
296.00	8.	377.91	1.10	2.345E-02	296.00	79.000	PBC<MDA	TL210

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
299.75	46.	27.11	0.96	2.321E-02	300.03	3.280	3.333E+01	PB212
					300.07	2.460	4.444E+01	PA231
					300.18	6.200	1.764E+01	PA233
320.08	14.	214.15	1.13	2.210E-02	320.08	9.940	PBC<MDA	CR51
328.76	15.	99.47	1.13	2.165E-02	328.76	20.300	PBC<MDA	La140
333.44	5.	298.31	1.14	2.142E-02	333.44	15.510	PBC<MDA	Cf249
338.42	86.	18.59	0.73	2.118E-02	338.32	12.010	1.885E+01	AC228
345.83	14.	135.44	1.15	2.083E-02	345.83	15.070	PBC<MDA	HF181
351.73	172.	10.05	1.07	2.056E-02	351.93	37.600	1.235E+01	PB214
364.48	5.	225.98	1.17	2.001E-02	364.48	81.700	PBC<MDA	I131
383.84	10.	109.20	1.19	1.923E-02	383.84	8.940	PBC<MDA	BA133
387.95	10.	117.50	1.19	1.907E-02	387.95	66.000	PBC<MDA	Cf249
391.69	11.	122.69	1.20	1.893E-02	391.69	64.000	PBC<MDA	SN113
433.94	4.	281.37	1.24	1.751E-02	433.94	90.480	PBC<MDA	AG108M
453.88	8.	125.00	1.26	1.692E-02	453.88	65.000	PBC<MDA	PM146
463.37	12.	91.84	1.27	1.666E-02	463.37	10.470	PBC<MDA	SB125
468.06	4.	269.73	1.27	1.653E-02	468.06	51.750	PBC<MDA	Ir192
477.60	9.	107.56	1.28	1.628E-02	477.60	10.520	PBC<MDA	BE7
482.00	9.	117.17	1.28	1.617E-02	482.00	80.500	PBC<MDA	HF181
487.02	3.	473.80	1.29	1.604E-02	487.02	45.500	PBC<MDA	La140
511.86	69.	21.37	2.56	1.546E-02	511.86	20.000	1.234E+01	RH106
537.26	6.	202.79	1.34	1.491E-02	537.26	24.390	PBC<MDA	Ba140
569.32	11.	71.21	1.37	1.428E-02	569.32	15.380	PBC<MDA	CS134
					569.47	8.200	5.044E+00	PA234
					569.70	97.740	4.233E-01	BI207
569.47	6.	142.47	1.37	1.428E-02	569.32	15.380	PBC<MDA	CS134
					569.47	8.200	2.864E+00	PA234
					569.70	97.740	2.404E-01	BI207
583.17	121.	9.09	1.20	1.403E-02	583.02	84.500	5.669E+00	TL208
602.73	12.	189.38	1.40	1.369E-02	602.73	98.260	PBC<MDA	SB124
609.33	142.	11.01	1.13	1.358E-02	609.31	46.090	1.261E+01	BI214
					610.30	5.750	1.012E+02	RU103
635.89	23.	29.70	1.43	1.317E-02	635.89	11.310	8.457E+00	SB125
661.66	12.	91.97	1.45	1.279E-02	661.66	85.210	PBC<MDA	CS137
722.79	36.	27.80	1.51	1.199E-02	722.79	10.810	1.528E+01	SB124
					722.94	90.840	1.819E+00	AG108M
					723.36	20.220	8.175E+00	EU154
735.72	19.	41.73	1.52	1.184E-02	735.72	22.500	3.892E+00	PM146
756.73	17.	24.25	1.54	1.160E-02	756.73	54.460	1.495E+00	ZR95
765.79	8.	141.42	1.55	1.150E-02	765.79	99.790	PBC<MDA	NB95
					766.41	0.294	1.233E+02	PA234M
766.41	9.	117.29	1.55	1.150E-02	765.79	99.790	PBC<MDA	NB95
					766.41	0.294	1.425E+02	PA234M
778.92	8.	91.66	1.56	1.136E-02	778.92	12.940	PBC<MDA	EU152
785.42	22.	29.48	1.57	1.129E-02	785.42	1.280	8.582E+01	BI212
795.87	43.	20.41	1.58	1.119E-02	795.87	85.530	2.497E+00	CS134
810.78	6.	143.74	1.59	1.104E-02	810.78	99.460	PBC<MDA	CO58
846.77	6.	94.82	1.63	1.070E-02	846.77	99.935	PBC<MDA	Co56

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
860.36	10.	91.97	1.64	1.057E-02	860.56	12.420	PBC<MDA	TL208
873.23	10.	85.93	1.65	1.046E-02	873.23	12.270	PBC<MDA	EU154
880.53	6.	104.27	1.66	1.040E-02	880.53	6.000	PBC<MDA	PA234
883.24	6.	109.10	1.66	1.038E-02	883.24	9.600	PBC<MDA	PA234
884.68	6.	123.88	1.66	1.036E-02	884.68	72.680	PBC<MDA	AG110M
898.04	1.	988.26	1.67	1.025E-02	898.04	93.700	PBC<MDA	Y88
911.23	86.	11.78	1.60	1.015E-02	911.07	29.000	1.630E+01	AC228
943.72	17.	37.74	1.72	9.873E-03	946.02	13.400	7.138E+00	PA234
968.97	64.	17.43	1.74	9.703E-03	968.97	17.460	2.082E+01	AC228
996.33	9.	81.09	1.76	9.508E-03	996.33	10.600	PBC<MDA	EU154
1001.00	9.	94.06	1.76	9.476E-03	1001.00	0.837	PBC<MDA	PA234M
1004.77	3.	335.05	1.77	9.450E-03	1004.77	18.010	PBC<MDA	EU154
1050.36	7.	133.46	1.81	9.147E-03	1050.36	1.560	PBC<MDA	RH106
1063.66	4.	232.74	1.82	9.063E-03	1063.66	74.500	PBC<MDA	BI207
1119.74	17.	89.98	1.87	8.722E-03	1120.29	15.100	PBC<MDA	BI214
					1120.55	99.987	1.097E+00	Sc46
1120.55	17.	83.76	1.87	8.721E-03	1120.29	15.100	7.216E+00	BI214
					1120.55	99.987	1.090E+00	Sc46
					1121.30	34.900	3.124E+00	Ta182
1121.33	15.	78.21	1.87	8.716E-03	1120.55	99.987	PBC<MDA	Sc46
					1121.30	34.900	2.658E+00	Ta182
1238.28	8.	125.93	1.97	8.090E-03	1238.28	66.070	PBC<MDA	Co56
1274.53	3.	188.75	2.00	7.914E-03	1274.53	99.940	PBC<MDA	NA22
					1274.54	35.190	5.320E-01	EU154
1291.60	1.	972.11	2.02	7.834E-03	1291.60	43.200	PBC<MDA	FE59
1313.00	7.	87.32	2.04	7.735E-03	1313.00	21.000	PBC<MDA	TL210
1384.30	4.	221.56	2.10	7.423E-03	1384.30	24.290	PBC<MDA	AG110M
1460.94	263.	6.17	2.16	7.112E-03	1460.83	10.670	1.925E+02	K40
1596.21	8.	35.36	2.27	6.616E-03	1596.21	95.400	7.042E-01	La140
1764.29	24.	27.88	2.40	6.075E-03	1764.49	15.400	1.415E+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	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide	
298.23	74.63	166.	153.	4.605E+03	14.37	0.880	-	sD
308.35	77.16	96.	261.	7.705E+03	8.17	0.883	-	D
359.12	89.91	136.	33.	9.280E+02	52.15	0.896	-	D
744.86	186.39	52.	112.	3.475E+03	16.72	0.897	-	s
1352.71	338.42	37.	86.	4.077E+03	18.59	0.726	-	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: Client_Long_Rev15.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 1 Sigma %	FWHM keV
PB-210	186.15	46.63	100.	22.	0.012	82.01	0.749s
TH-227	200.18	50.14	213.	16.	0.009	133.73	0.855s
AM-241	237.74	59.54	311.	18.	0.010	137.31	0.865s
TH-234	252.74	63.29	92.	33.	0.018	44.63	0.869D
Sn-126	256.71	64.28	273.	17.	0.009	141.15	0.869s
BA-133	323.50	80.99	933.	-9.	-0.005	491.27	0.887
Np-237	345.49	86.49	647.	0.	0.000	1000.00	0.892A
EU-155	345.70	86.54	645.	-15.	-0.009	235.69	0.892D
Sn-126	349.81	87.57	609.	42.	0.023	39.21	0.893D
Cd-109	351.68	88.04	630.	0.	0.000	1000.00	0.894A
Nd-147	363.92	91.10	630.	0.	0.000	1000.00	0.897s
TH-234	369.87	92.59	169.	16.	0.009	116.33	0.898D
AC-228	372.91	93.35	576.	24.	0.013	142.94	0.899s
Gd-153	389.50	97.50	540.	-23.	-0.013	144.00	0.903s
Np-239	397.50	99.50	563.	-23.	-0.013	146.69	0.905s
Gd-153	412.29	103.20	586.	-23.	-0.013	148.99	0.909s
Np-239	414.29	103.70	609.	-23.	-0.013	151.77	0.909s
EU-155	420.73	105.31	633.	-16.	-0.009	218.34	0.911s
Np-239	424.00	106.13	478.	20.	0.011	153.99	0.912s
EU-152	486.56	121.78	220.	-21.	-0.012	100.43	0.928s
CO-57	487.69	122.06	158.	11.	0.006	165.99	0.928s
EU-154	491.84	123.10	186.	-10.	-0.006	186.02	0.929s
PA-234	524.60	131.29	360.	-23.	-0.013	120.73	0.938s
HF-181	531.51	133.02	664.	-22.	-0.012	164.26	0.939s
CE-144	533.57	133.54	642.	-22.	-0.012	163.22	0.940s
HF-181	544.61	136.30	665.	-14.	-0.008	254.54	0.943s
CO-57	545.30	136.47	679.	0.	0.000	1000.00	0.943s
U-235	574.53	143.79	145.	11.	0.006	158.30	0.950s
CE-141	581.15	145.44	199.	-14.	-0.008	148.34	0.952s
Ba-140	649.99	162.66	228.	-10.	-0.006	215.87	0.969
U-235	652.87	163.38	159.	19.	0.011	96.39	0.970
CE-139	662.76	165.85	180.	10.	0.006	184.25	0.973s
Cf-251	705.72	176.60	121.	-19.	-0.011	110.71	0.983s
U-235	742.18	185.72	191.	-13.	-0.007	145.96	0.992s
TH-229	773.32	193.51	125.	-20.	-0.011	105.44	1.000s
U-235	820.59	205.33	88.	0.	0.000	1000.00	1.012s
TH-229	842.65	210.85	147.	-6.	-0.003	402.03	1.018s
Cf-251	907.22	227.00	77.	4.	0.002	413.45	1.034
TH-227	943.09	235.97	595.	15.	0.008	232.41	1.043s
PB-212	953.73	238.63	60.	358.	0.199	6.11	1.045D
PB-214	967.18	242.00	82.	61.	0.034	24.65	1.049D

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
EU-152	977.96	244.69	633.	16.	0.009	219.17	1.051s
TH-227	1024.13	256.24	117.	-21.	-0.012	99.42	1.063s
Cd-113m	1053.96	263.70	77.	-9.	-0.005	146.86	1.070s
BI-210M	1062.48	265.83	89.	15.	0.008	93.01	1.072s
TL-208	1108.27	277.28	102.	14.	0.007	108.99	1.084
Hg-203	1115.93	279.20	134.	-14.	-0.007	124.06	1.086s
I-131	1136.32	284.30	66.	-9.	-0.005	172.13	1.091s
PB-214	1179.06	294.99	51.	105.	0.058	16.54	1.436s
TL-210	1183.11	296.00	453.	8.	0.004	377.91	1.102s
PB-212	1198.09	299.75	29.	46.	0.025	27.11	0.964s
PA-231	1199.38	300.07	461.	0.	0.000	1000.00	1.106s
PA-233	1199.82	300.18	461.	0.	0.000	1000.00	1.107s
PA-231	1209.70	302.65	461.	0.	0.000	1000.00	1.109s
BA-133	1210.50	302.85	461.	0.	0.000	1000.00	1.109s
Ba-140	1218.49	304.85	461.	0.	0.000	1000.00	1.111s
BI-210M	1218.68	304.90	461.	0.	0.000	1000.00	1.111s
Ir-192	1232.85	308.44	461.	0.	0.000	1000.00	1.115s
PA-233	1247.13	312.01	461.	0.	0.000	1000.00	1.118s
Ir-192	1265.04	316.49	461.	0.	0.000	1000.00	1.123s
CR-51	1279.41	320.08	415.	14.	0.008	214.15	1.126s
La-140	1314.10	328.76	100.	15.	0.008	99.47	1.135s
Cf-249	1332.81	333.44	120.	5.	0.003	298.31	1.139s
AC-228	1352.33	338.32	279.	-18.	-0.010	131.70	1.144
Cs-136	1361.32	340.57	261.	-18.	-0.010	127.23	1.146
EU-152	1376.18	344.29	242.	-18.	-0.010	122.46	1.150
HF-181	1382.35	345.83	185.	14.	0.008	135.44	1.151s
PB-214	1405.93	351.73	38.	172.	0.095	10.05	1.065
BA-133	1423.02	356.00	287.	-16.	-0.009	150.53	1.162
I-131	1456.95	364.48	32.	5.	0.003	225.98	1.170
BA-133	1534.35	383.84	56.	10.	0.006	109.20	1.189s
Cf-249	1550.79	387.95	66.	10.	0.006	117.50	1.193s
SN-113	1565.74	391.69	86.	11.	0.006	122.69	1.196s
SB-125	1710.45	427.88	40.	-4.	-0.002	313.58	1.232s
AG-108M	1734.69	433.94	32.	4.	0.002	281.37	1.238s
PM-146	1814.45	453.88	24.	8.	0.004	125.00	1.257s
SB-125	1852.39	463.37	51.	12.	0.006	91.84	1.266s
Ir-192	1871.16	468.06	62.	4.	0.002	269.73	1.271s
BE-7	1909.29	477.60	41.	9.	0.005	107.56	1.280s
HF-181	1926.90	482.00	50.	9.	0.005	117.17	1.284s
La-140	1946.98	487.02	69.	3.	0.001	473.80	1.289s
RU-103	1987.11	497.05	44.	-3.	-0.002	436.74	1.298s
RH-106	2046.35	511.86	73.	69.	0.038	21.37	2.563s
Nd-147	2122.88	531.00	48.	-15.	-0.008	99.57	1.331s
Ba-140	2147.92	537.26	30.	6.	0.003	202.79	1.337s
CS-134	2276.15	569.32	23.	11.	0.006	71.21	1.367
PA-234	2276.75	569.47	34.	6.	0.003	142.47	1.368
BI-207	2277.68	569.70	40.	0.	0.000	1000.00	1.368
TL-208	2331.54	583.17	0.	121.	0.067	9.09	1.197s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
SB-125	2400.87	600.50	282.	-13.	-0.007	187.00	1.397s
SB-124	2409.79	602.73	249.	12.	0.007	189.38	1.399s
BI-214	2436.17	609.33	23.	142.	0.079	11.01	1.134
RU-103	2440.06	610.30	218.	3.	0.002	648.20	1.406s
AG-108M	2455.99	614.28	221.	0.	0.000	1000.00	1.410s
PM-144	2471.12	618.06	240.	-13.	-0.007	170.87	1.414s
RH-106	2486.54	621.92	249.	-14.	-0.008	162.27	1.417s
SB-125	2542.43	635.89	11.	23.	0.013	29.70	1.430s
I-131	2546.77	636.97	33.	0.	0.000	1000.00	1.432s
AG-110M	2629.92	657.76	82.	-17.	-0.009	80.57	1.451s
CS-137	2645.51	661.66	59.	12.	0.007	91.97	1.455s
PM-144	2785.05	696.54	47.	-16.	-0.009	92.00	1.487
NB-94	2809.41	702.63	37.	-6.	-0.004	208.48	1.493s
SB-124	2890.04	722.79	31.	36.	0.020	27.80	1.512s
AG-108M	2890.65	722.94	67.	0.	0.000	1000.00	1.512s
EU-154	2892.34	723.36	67.	0.	0.000	1000.00	1.512s
ZR-95	2895.69	724.20	67.	0.	0.000	1000.00	1.513s
PM-146	2941.78	735.72	9.	19.	0.010	41.73	1.524s
PM-146	2987.55	747.16	42.	-15.	-0.008	95.22	1.535
ZR-95	3025.83	756.73	0.	17.	0.009	24.25	1.543s
AG-110M	3054.69	763.94	52.	-4.	-0.002	232.54	1.550s
NB-95	3062.08	765.79	52.	8.	0.004	141.42	1.552s
PA-234M	3064.57	766.41	47.	9.	0.005	117.29	1.552s
EU-152	3114.61	778.92	9.	8.	0.004	91.66	1.564s
BI-212	3140.62	785.42	5.	22.	0.012	29.48	1.570
CS-134	3182.43	795.87	17.	43.	0.024	20.41	1.579s
TL-210	3197.35	799.60	60.	0.	0.000	1000.00	1.583
CS-134	3206.76	801.95	43.	0.	0.000	1000.00	1.585s
CO-58	3242.06	810.78	28.	6.	0.003	143.74	1.593s
La-140	3262.05	815.77	34.	0.	0.000	1000.00	1.598s
Cs-136	3272.97	818.50	35.	0.	0.000	1000.00	1.600s
Co-56	3386.08	846.77	5.	6.	0.003	94.82	1.626s
TL-208	3441.27	860.56	15.	10.	0.005	91.97	1.638s
NB-94	3483.41	871.10	42.	-12.	-0.007	81.65	1.648s
EU-154	3491.95	873.23	32.	10.	0.006	85.93	1.650s
PA-234	3521.16	880.53	15.	6.	0.003	104.27	1.657s
PA-234	3532.00	883.24	17.	6.	0.003	109.10	1.659s
AG-110M	3537.78	884.68	23.	6.	0.003	123.88	1.660s
Sc-46	3556.17	889.28	17.	0.	0.000	1000.00	1.664s
Y-88	3591.22	898.04	20.	1.	0.001	988.26	1.672s
AC-228	3643.36	911.07	25.	70.	0.039	19.73	1.684s
AG-110M	3749.09	937.49	50.	-19.	-0.010	85.91	1.708s
PA-234	3783.21	946.02	5.	17.	0.009	37.74	1.716s
EU-152	3855.60	964.11	45.	-5.	-0.003	298.33	1.732s
AC-228	3875.05	968.97	30.	64.	0.035	17.43	1.736
EU-154	3984.54	996.33	20.	9.	0.005	81.09	1.761s
PA-234M	4003.22	1001.00	29.	9.	0.005	94.06	1.765s
EU-154	4018.33	1004.77	38.	3.	0.001	335.05	1.768s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Co-56	4150.66	1037.84	16.	-9.	-0.005	106.38	1.798s
Cs-136	4191.60	1048.07	42.	-4.	-0.002	234.52	1.807s
RH-106	4200.76	1050.36	38.	7.	0.004	133.46	1.809s
BI-207	4253.99	1063.66	16.	4.	0.002	232.74	1.820s
EU-152	4447.76	1112.07	126.	-17.	-0.010	95.69	1.863s
ZN-65	4461.66	1115.55	109.	-17.	-0.010	89.24	1.866s
BI-214	4480.63	1120.29	111.	17.	0.010	89.98	1.870
Sc-46	4481.68	1120.55	94.	17.	0.010	83.76	1.870
Ta-182	4484.69	1121.30	58.	15.	0.008	78.21	1.871
CO-60	4692.57	1173.24	21.	-1.	-0.001	792.15	1.916s
Ta-182	4755.86	1189.05	37.	-12.	-0.007	116.15	1.930
Ta-182	4885.39	1221.41	23.	-3.	-0.001	423.16	1.957
Co-56	4952.92	1238.28	17.	8.	0.004	125.93	1.972s
NA-22	5098.03	1274.53	11.	3.	0.001	188.75	2.003s
EU-154	5098.08	1274.54	14.	0.	0.000	1000.00	2.003s
FE-59	5166.35	1291.60	17.	1.	0.001	972.11	2.017s
TL-210	5252.04	1313.00	6.	7.	0.004	87.32	2.036s
CO-60	5330.11	1332.50	17.	-3.	-0.002	327.45	2.052s
AG-110M	5537.48	1384.30	11.	4.	0.002	221.56	2.096s
EU-152	5632.39	1408.00	18.	-8.	-0.004	132.88	2.115s
K-40	5843.92	1460.83	0.	263.	0.146	6.17	2.159
La-140	6386.02	1596.21	0.	8.	0.004	35.36	2.269s
SB-124	6765.58	1690.98	0.	0.	0.000	1000.00	2.345s
BI-214	7060.00	1764.49	10.	24.	0.013	27.88	2.403s

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	2.8854E+00				5.31E+01	
			477.60	2.885E+00	?(	1.060E+01 1.08E+02	1.05E+01 G
NA-22	C	1.8731E-01				9.50E+02	
			1274.53	1.873E-01	?(	1.292E+00 1.89E+02	9.99E+01 G
K-40	N	1.9254E+02				4.66E+11	
			1460.83	1.925E+02	?(	5.395E+00 6.17E+00	1.07E+01 G
Sc-46	F	5.4498E-01				8.38E+01	
			889.28	0.000E+00	?(	1.189E+00 1.00E+03	1.00E+02 G
			1120.55	1.090E+00	?(	3.053E+00 8.38E+01	1.00E+02 G

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Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CR-51	F	3.4291E+00					2.77E+01	
			320.08	3.429E+00	*(	2.469E+01	2.14E+02	9.94E+00 G
MN-54	C	1.7137E-02					3.12E+02	
			834.85	1.714E-02	%(	1.174E+00	2.76E+03	1.00E+02 G
FE-59	F	9.2133E-02					4.45E+01	
			1099.25	3.705E-02	%(	2.976E+00	3.53E+03	5.65E+01 G
			1291.60	1.642E-01	?(	3.599E+00	9.72E+02	4.32E+01 G
Co-56	C	5.1146E-01					7.73E+01	
			846.77	2.999E-01	?(	6.823E-01	9.48E+01	9.99E+01 G
			1238.28	8.315E-01	?(	2.279E+00	1.26E+02	6.61E+01 G
			1037.84	-3.834E+00	+	9.096E+00	1.06E+02	1.41E+01 G
			1771.35	-3.952E-01	%	1.787E+01	1.25E+03	1.55E+01 A
CO-57	C	1.8976E-01					2.72E+02	
			122.06	1.898E-01	*(	1.068E+00	1.66E+02	8.56E+01 G
			136.47	0.000E+00	-	1.769E+01	1.00E+03	1.07E+01 G
CO-58	C	2.7831E-01					7.09E+01	
			810.78	2.783E-01	&(	1.396E+00	1.44E+02	9.95E+01 G
CO-60	F	-2.1799E-01					1.93E+03	
			1332.50	-2.180E-01	?(	1.593E+00	3.27E+02	1.00E+02 G
			1173.24	-8.799E-02	+	1.599E+00	7.92E+02	9.99E+01 G
ZN-65	F	-2.1549E+00					2.44E+02	
			1115.55	-2.155E+00	?(	6.441E+00	8.92E+01	5.06E+01 G
NB-94	I	-2.9356E-01					7.41E+06	
			702.63	-2.936E-01	?(	1.445E+00	2.08E+02	9.79E+01 G
			871.10	-6.367E-01	+	1.746E+00	8.16E+01	9.99E+01 G
ZR-95	I	1.4947E+00					6.40E+01	
			756.73	1.495E+00	?(	6.480E-01	2.43E+01	5.45E+01 G
			724.20	0.000E+00	-	4.292E+00	1.00E+03	4.42E+01 G
NB-95	I	3.6298E-01					6.40E+01	
			765.79	3.630E-01	?(	1.765E+00	1.41E+02	9.98E+01 G
RU-103	I	-1.1604E-01					3.93E+01	
			497.05	-1.160E-01	&(	1.300E+00	4.37E+02	9.09E+01 G
			610.30	2.301E+00	?	5.090E+01	6.48E+02	5.75E+00 GA

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
RH-106	I	-1.4245E+00					3.74E+02	
			621.92	-5.828E+00	?(	3.187E+01	1.62E+02	9.93E+00 G
			1050.36	2.660E+01	&(	1.226E+02	1.33E+02	1.56E+00 G
			511.86	1.234E+01	?	7.659E+00	2.14E+01	2.00E+01 GA
AG-108M	C	1.4027E-01					1.53E+05	
			433.94	1.403E-01	&(	1.019E+00	2.81E+02	9.05E+01 G
			722.94	0.000E+00	-	2.083E+00	1.00E+03	9.08E+01 G
			614.28	0.000E+00	-	3.296E+00	1.00E+03	8.98E+01 G
AG-110M	F	6.0219E-01					2.50E+02	
			884.68	4.259E-01	?(	1.837E+00	1.24E+02	7.27E+01 G
			657.76	-7.647E-01	+	2.058E+00	8.06E+01	9.46E+01 G
			937.49	-3.056E+00	+	5.802E+00	8.59E+01	3.44E+01 G
			1384.30	1.130E+00	?(	5.669E+00	2.22E+02	2.43E+01 G
			763.94	-9.738E-01	+	7.893E+00	2.33E+02	2.23E+01 G
SN-113	F	5.0444E-01					1.15E+02	
			391.69	5.044E-01	?(	2.101E+00	1.23E+02	6.40E+01 G
SB-124	F	1.9579E+00					6.02E+01	
			602.73	4.920E-01	&(	3.146E+00	1.89E+02	9.83E+01 G
			1690.98	0.000E+00	-	1.359E+00	1.00E+03	4.78E+01 G
			722.79	1.528E+01	?(	1.234E+01	2.78E+01	1.08E+01 G
SB-125	I	2.3729E+00					1.01E+03	
			427.88	-4.242E-01	(	3.413E+00	3.14E+02	2.96E+01 G
			600.50	-2.912E+00	&	1.835E+01	1.87E+02	1.79E+01 G
			635.89	8.457E+00	(	6.864E+00	2.97E+01	1.13E+01 G
			463.37	3.708E+00	(	1.150E+01	9.18E+01	1.05E+01 G
I-131	I	1.6994E-01					8.02E+00	
			364.48	1.699E-01	?(	9.881E-01	2.26E+02	8.17E+01 G
			284.30	-3.370E+00	+	1.519E+01	1.72E+02	6.14E+00 G
			636.97	0.000E+00	-	1.737E+01	1.00E+03	7.17E+00 G
Gd-153	F	-1.1598E+00					2.42E+02	
			97.50	-1.160E+00	?(	5.582E+00	1.44E+02	3.00E+01 G
			103.20	-1.591E+00	&	7.920E+00	1.49E+02	2.18E+01 G
Ga-68	C	7.3322E-01					4.71E-02	
			1077.40	7.332E-01	%(	5.889E+01	3.53E+03	3.30E+00 G
Tc-99m	I	8.8516E-03					2.51E-01	
			140.51	8.852E-03	%(	2.198E+00	7.37E+03	8.93E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
BA-133	F	-7.0966E-01					3.85E+03	
			356.00	-7.097E-01	&(	3.591E+00	1.51E+02	6.20E+01 G
			302.85	0.000E+00	+	1.352E+01	1.00E+03	1.83E+01 G
			383.84	3.270E+00	?	1.215E+01	1.09E+02	8.94E+00 GA
			80.99	-4.148E-01	+	6.826E+00	4.91E+02	3.41E+01 GA
CS-134	I	2.5259E+00					7.54E+02	
			795.87	2.497E+00	(	1.273E+00	2.04E+01	8.55E+01 G
			604.71	5.979E-02	%	3.247E+00	1.59E+03	9.76E+01 G
			569.32	2.689E+00	?(	6.379E+00	7.12E+01	1.54E+01 G
			801.95	0.000E+00	-	1.912E+01	1.00E+03	8.69E+00 G
			563.24	3.081E-01	%	1.312E+01	1.69E+03	8.35E+00 G
CS-137	I	6.3163E-01					1.10E+04	
			661.66	6.316E-01	&(	1.959E+00	9.20E+01	8.52E+01 G
CE-139	F	2.1305E-01					1.38E+02	
			165.85	2.130E-01	?(	1.330E+00	1.84E+02	7.99E+01 G
Ba-140	I	8.6585E-01					1.28E+01	
			537.26	8.659E-01	&(	4.336E+00	2.03E+02	2.44E+01 G
			162.66	-2.600E+00	+	1.900E+01	2.16E+02	6.22E+00 G
			304.85	0.000E+00	-	5.804E+01	1.00E+03	4.29E+00 G
La-140	I	9.0788E-01					1.28E+01	
			1596.21	7.042E-01	?(	6.487E-01	3.54E+01	9.54E+01 G
			487.02	1.911E-01	-	3.163E+00	4.74E+02	4.55E+01 G
			328.76	1.865E+00	&(	6.243E+00	9.95E+01	2.03E+01 G
			815.77	0.000E+00	-	6.489E+00	1.00E+03	2.33E+01 G
CE-141	I	-4.3933E-01					3.25E+01	
			145.44	-4.393E-01	&(	2.199E+00	1.48E+02	4.82E+01 G
CE-144	I	-3.0236E+00					2.85E+02	
			133.54	-3.024E+00	&(	1.649E+01	1.63E+02	1.11E+01 G
PM-144	C	-7.4487E-01					3.63E+02	
			696.54	-7.449E-01	&(	1.573E+00	9.20E+01	9.90E+01 G
			618.06	-5.423E-01	+	3.126E+00	1.71E+02	9.91E+01 G
EU-152	F	8.0211E-01					4.94E+03	
			121.78	-1.116E+00	*(	3.748E+00	1.00E+02	2.86E+01 G
			344.29	-1.837E+00	&	7.548E+00	1.22E+02	2.65E+01 G
			1112.07	-7.960E+00	+	2.554E+01	9.57E+01	1.36E+01 G
			778.92	2.906E+00	?(	6.403E+00	9.17E+01	1.29E+01 G
			964.11	-1.953E+00	+	1.327E+01	2.98E+02	1.46E+01 G
			244.69	4.444E+00	?(	3.263E+01	2.19E+02	7.58E+00 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
			1408.00	-2.889E+00	+	8.118E+00	1.33E+02	2.10E+01 GA
EU-154	I	1.2652E+00					3.14E+03	
			123.10	-3.844E-01	&(	2.423E+00	1.86E+02	4.08E+01 G
			1274.54	0.000E+00	+	4.019E+00	1.00E+03	3.52E+01 G
			723.36	0.000E+00	+	9.364E+00	1.00E+03	2.02E+01 G
			873.23	4.301E+00	&(	1.249E+01	8.59E+01	1.23E+01 G
			1004.77	8.678E-01	?(	1.030E+01	3.35E+02	1.80E+01 G
			996.33	4.774E+00	?(	1.308E+01	8.11E+01	1.06E+01 G
EU-155	I	-1.1532E+00					1.81E+03	
			105.31	-1.153E+00	&(	8.434E+00	2.18E+02	2.12E+01 G
			86.54	-7.794E-01	&	6.155E+00	2.36E+02	3.07E+01 G
HF-181	F	7.2443E-01					4.24E+01	
			482.00	3.810E-01	?(	1.525E+00	1.17E+02	8.05E+01 G
			133.02	-7.817E-01	+	4.291E+00	1.64E+02	4.33E+01 G
			345.83	2.559E+00	(	1.168E+01	1.35E+02	1.51E+01 G
			136.30	-3.744E+00	+	3.194E+01	2.55E+02	5.85E+00 G
Ta-182	F	2.6578E+00					1.14E+02	
			1121.30	2.658E+00	(	6.948E+00	7.82E+01	3.49E+01 G
			1221.41	-6.712E-01	-	6.266E+00	4.23E+02	2.70E+01 G
			1189.05	-5.070E+00	+	1.282E+01	1.16E+02	1.62E+01 G
Hg-203	F	-3.7593E-01					4.66E+01	
			279.20	-3.759E-01	&(	1.575E+00	1.24E+02	8.15E+01 G
TL-208	N	5.6110E+00					6.98E+02	
			583.02	5.669E+00	@(	3.453E-01	9.09E+00	8.45E+01 G
			277.28	4.828E+00	&(	1.776E+01	1.09E+02	6.31E+00 G
			860.56	4.175E+00	-	8.781E+00	9.20E+01	1.24E+01 G
PM-146	C	1.3011E+00					2.02E+03	
			453.88	4.041E-01	?(	1.290E+00	1.25E+02	6.50E+01 G
			747.16	-2.093E+00	+	4.592E+00	9.52E+01	3.40E+01 G
			735.72	3.892E+00	?(	3.534E+00	4.17E+01	2.25E+01 G
Y-88	F	4.4455E-02					1.07E+02	
			1836.06	3.182E-02	%(	1.407E+00	1.98E+03	9.92E+01 G
			898.04	5.783E-02	?(	1.362E+00	9.88E+02	9.37E+01 G
Cd-113m		-3.1417E+03					5.33E+03	
			263.70	-3.142E+03	?(	1.577E+04	1.47E+02	6.00E-03 K
Cf-251	T	-1.8801E+00					3.28E+05	
			176.60	-1.880E+00	?(	5.340E+00	1.11E+02	1.70E+01 G
			227.00	1.243E+00	+	1.355E+01	4.13E+02	6.30E+00 GA

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Cf-249	T	5.2978E-01					1.28E+05	
			387.95	4.482E-01	?(	1.792E+00	1.18E+02	6.60E+01 G
			333.44	8.770E-01	?(	8.981E+00	2.98E+02	1.55E+01 G
Sn-126		3.1947E+00					3.65E+07	
			87.57	1.731E+00	}	4.878E+00	3.92E+01	3.75E+01 GA
			64.28	3.195E+00	?(	1.515E+01	1.41E+02	9.70E+00 G
			86.94	0.000E+00	}	1.056E+01	1.54E+03	9.04E+00 GA
PB-210	N	1.5675E+01					8.14E+03	
			46.54	1.568E+01	*(P	3.577E+01	8.20E+01	4.25E+00 G
PB-212	N	1.6741E+01					6.98E+02	
			238.63	1.674E+01	(P	1.809E+00	6.11E+00	4.33E+01 G
			300.03	3.333E+01	+	2.040E+01	2.71E+01	3.28E+00 GA
PB-214	N	1.2509E+01					5.84E+05	
			351.93	1.235E+01	(P	2.264E+00	1.01E+01	3.76E+01 G
			295.09	1.281E+01	(P	4.425E+00	1.65E+01	1.93E+01 G
			242.00	1.676E+01	+	1.237E+01	2.46E+01	7.43E+00 GA
BI-207	C	3.2912E-01					1.18E+04	
			1063.66	3.291E-01	?(	1.757E+00	2.33E+02	7.45E+01 G
			569.70	0.000E+00	-	1.282E+00	1.00E+03	9.77E+01 G
BI-212	N	4.1079E-01					6.98E+02	
			727.17	4.108E-01	%(	2.506E+01	1.73E+03	7.55E+00 G
			785.42	8.582E+01	?	4.910E+01	2.95E+01	1.28E+00 GA
U-235	N	2.9827E+00					2.57E+11	
			143.79	1.546E+00	?(P	8.286E+00	1.58E+02	1.10E+01 G
			205.33	0.000E+00	&	1.699E+01	1.00E+03	5.01E+00 G
			163.38	6.082E+00	&(	1.963E+01	9.64E+01	5.08E+00 G
			185.72	-4.227E-01	- P	2.149E+00	1.46E+02	5.40E+01 GA
BI-214	N	1.2994E+01					5.84E+05	
			609.31	1.261E+01	(P	2.221E+00	1.10E+01	4.61E+01 G
			1120.29	7.260E+00	-	2.188E+01	9.00E+01	1.51E+01 G
			1764.49	1.415E+01	?(	1.043E+01	2.79E+01	1.54E+01 G
BI-210M	T	6.5227E-01					1.10E+09	
			265.83	6.523E-01	?(	2.039E+00	9.30E+01	5.00E+01 G
			304.90	0.000E+00	-	8.893E+00	1.00E+03	2.80E+01 G
AC-228	N	1.6075E+01					2.10E+03	
			911.07	1.322E+01	?(	4.911E+00	1.97E+01	2.90E+01 G
			968.97	2.082E+01	(	9.189E+00	1.74E+01	1.75E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
			338.32	-3.979E+00	-	1.758E+01	1.32E+02	1.20E+01 G
			93.35	6.575E+00	-	3.140E+01	1.43E+02	5.56E+00 XA
TH-227	N	-6.3590E+00					7.95E+03	
			256.24	-6.359E+00	?(	1.619E+01	9.94E+01	7.00E+00 G
			235.97	2.441E+00	&	1.902E+01	2.32E+02	1.23E+01 G
			50.14	4.976E+00	+	2.239E+01	1.34E+02	8.00E+00 G
TH-229	N	-8.1481E+00					2.68E+06	
			193.51	-8.148E+00	(	2.201E+01	1.05E+02	4.40E+00 G
			210.85	-3.534E+00	+	3.688E+01	4.02E+02	2.99E+00 G
TH-234	N	9.2237E+00					1.63E+12	
			92.59	4.439E+00	(P	1.729E+01	1.16E+02	5.58E+00 G
			63.29	1.624E+01	(P	2.322E+01	4.46E+01	3.81E+00 G
PA-234	N	2.3574E+00					1.63E+12	
			131.29	-1.892E+00	&(	7.637E+00	1.21E+02	1.80E+01 G
			946.02	7.138E+00	&(	5.513E+00	3.77E+01	1.34E+01 G
			569.47	2.864E+00	(	1.417E+01	1.42E+02	8.20E+00 G
			883.24	3.218E+00	?(	1.220E+01	1.09E+02	9.60E+00 G
			880.53	5.129E+00	?	1.857E+01	1.04E+02	6.00E+00 GA
PA-234M	N	8.2029E+01					1.63E+12	
			1001.00	6.081E+01	?(	1.947E+02	9.41E+01	8.37E-01 G
			766.41	1.425E+02	?(	5.715E+02	1.17E+02	2.94E-01 G
AM-241	T	1.0118E+00					1.58E+05	
			59.54	1.012E+00	&(	4.660E+00	1.37E+02	3.59E+01 G
Ir-192	F	1.0148E-01					7.40E+01	
			316.49	0.000E+00	&(	2.943E+00	1.00E+03	8.70E+01 G
			468.06	2.722E-01	?(	2.555E+00	2.70E+02	5.18E+01 G
			308.44	0.000E+00	&	7.912E+00	1.00E+03	3.18E+01 G
Np-239	T	1.3321E+00					2.36E+00	
			103.70	-1.445E+00	&	7.329E+00	1.52E+02	2.40E+01 X
			106.13	1.332E+00	?(	6.867E+00	1.54E+02	2.27E+01 G
			99.50	-2.316E+00	+	1.135E+01	1.47E+02	1.50E+01 X
Nd-147		-4.1680E+00					1.11E+01	
			531.00	-4.168E+00	?(	9.913E+00	9.96E+01	1.30E+01 G
			91.10	0.000E+00	+	6.489E+00	1.00E+03	2.83E+01 G
TL-210	N	1.0652E-01					5.84E+05	
			799.60	0.000E+00	?(	1.954E+00	1.00E+03	9.90E+01 G
			296.00	2.400E-01	?(	3.056E+00	3.78E+02	7.90E+01 G
			1313.00	2.422E+00	?	4.721E+00	8.73E+01	2.10E+01 GA

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Kr-85	I -1.3974E+01					3.92E+03	
		513.98	-1.397E+01	%(	4.943E+02	1.03E+03	4.30E-01 G

(- 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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********** 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 1 Sigma %	Activity
TH-227	50.14	213.	16.	0.009	133.73	4.976E+00
AM-241	59.54	311.	18.	0.010	137.31	1.012E+00
BA-133	80.99	933.	-9.	-0.005	491.27	-4.148E-01
EU-155	86.54	645.	-15.	-0.009	235.69	-7.794E-01
Gd-153	97.50	540.	-23.	-0.013	144.00	-1.160E+00
Np-239	99.50	563.	-23.	-0.013	146.69	-2.316E+00
Gd-153	103.20	586.	-23.	-0.013	148.99	-1.591E+00
Np-239	103.70	609.	-23.	-0.013	151.77	-1.445E+00
EU-155	105.31	633.	-16.	-0.009	218.34	-1.153E+00
Np-239	106.13	478.	20.	0.011	153.99	1.332E+00
EU-152	121.78	220.	-21.	-0.012	100.43	-1.116E+00
CO-57	122.06	158.	11.	0.006	165.99	1.898E-01

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Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
EU-154	123.10	186.	-10.	-0.006	186.02	-3.844E-01		
HF-181	133.02	664.	-22.	-0.012	164.26	-7.817E-01		
CE-144	133.54	642.	-22.	-0.012	163.22	-3.024E+00		
HF-181	136.30	665.	-14.	-0.008	254.54	-3.744E+00		
U-235	143.79	145.	11.	0.006	158.30	1.546E+00		P
CE-141	145.44	199.	-14.	-0.008	148.34	-4.393E-01		
Ba-140	162.66	228.	-10.	-0.006	215.87	-2.600E+00		
U-235	163.38	159.	19.	0.011	96.39	6.082E+00		
CE-139	165.85	180.	10.	0.006	184.25	2.130E-01		
Cf-251	176.60	121.	-19.	-0.011	110.71	-1.880E+00		
U-235	185.72	191.	-13.	-0.007	145.96	-4.227E-01		P
TH-229	193.51	125.	-20.	-0.011	105.44	-8.148E+00		
TH-229	210.85	147.	-6.	-0.003	402.03	-3.534E+00		
Cf-251	227.00	77.	4.	0.002	413.45	1.243E+00		
TH-227	235.97	595.	15.	0.008	232.41	2.441E+00		
EU-152	244.69	633.	16.	0.009	219.17	4.444E+00		
TH-227	256.24	117.	-21.	-0.012	99.42	-6.359E+00		
Cd-113m	263.70	77.	-9.	-0.005	146.86	-3.142E+03		
BI-210M	265.83	89.	15.	0.008	93.01	6.523E-01		
Hg-203	279.20	134.	-14.	-0.007	124.06	-3.759E-01		
I-131	284.30	66.	-9.	-0.005	172.13	-3.370E+00		
TL-210	296.00	453.	8.	0.004	377.91	2.400E-01		
CR-51	320.08	415.	14.	0.008	214.15	3.429E+00		
Cf-249	333.44	120.	5.	0.003	298.31	8.770E-01		
Cs-136	340.57	261.	-18.	-0.010	127.23	-1.026E+00		
EU-152	344.29	242.	-18.	-0.010	122.46	-1.837E+00		
HF-181	345.83	185.	14.	0.008	135.44	2.559E+00		
BA-133	356.00	287.	-16.	-0.009	150.53	-7.097E-01		
I-131	364.48	32.	5.	0.003	225.98	1.699E-01		
BA-133	383.84	56.	10.	0.006	109.20	3.270E+00		
Cf-249	387.95	66.	10.	0.006	117.50	4.482E-01		
SN-113	391.69	86.	11.	0.006	122.69	5.044E-01		
SB-125	427.88	40.	-4.	-0.002	313.58	-4.242E-01		
AG-108M	433.94	32.	4.	0.002	281.37	1.403E-01		
SB-125	463.37	51.	12.	0.006	91.84	3.708E+00		
Ir-192	468.06	62.	4.	0.002	269.73	2.722E-01		
BE-7	477.60	41.	9.	0.005	107.56	2.885E+00		
HF-181	482.00	50.	9.	0.005	117.17	3.810E-01		
RU-103	497.05	44.	-3.	-0.002	436.74	-1.160E-01		
RH-106	511.86	73.	69.	0.038	21.37	1.234E+01		
Nd-147	531.00	48.	-15.	-0.008	99.57	-4.168E+00		
Ba-140	537.26	30.	6.	0.003	202.79	8.659E-01		
SB-125	600.50	282.	-13.	-0.007	187.00	-2.912E+00		
SB-124	602.73	249.	12.	0.007	189.38	4.920E-01		
RU-103	610.30	218.	3.	0.002	648.20	2.301E+00		
PM-144	618.06	240.	-13.	-0.007	170.87	-5.423E-01		
RH-106	621.92	249.	-14.	-0.008	162.27	-5.828E+00		
SB-125	635.89	11.	23.	0.013	29.70	8.457E+00		

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
AG-110M	657.76	82.	-17.	-0.009	80.57	-7.647E-01	
CS-137	661.66	59.	12.	0.007	91.97	6.316E-01	
PM-144	696.54	47.	-16.	-0.009	92.00	-7.449E-01	
NB-94	702.63	37.	-6.	-0.004	208.48	-2.936E-01	
SB-124	722.79	31.	36.	0.020	27.80	1.528E+01	
AG-110M	763.94	52.	-4.	-0.002	232.54	-9.738E-01	
NB-95	765.79	52.	8.	0.004	141.42	3.630E-01	
PA-234M	766.41	47.	9.	0.005	117.29	1.425E+02	
EU-152	778.92	9.	8.	0.004	91.66	2.906E+00	
BI-212	785.42	5.	22.	0.012	29.48	8.582E+01	
CO-58	810.78	28.	6.	0.003	143.74	2.783E-01	
Co-56	846.77	5.	6.	0.003	94.82	2.999E-01	
NB-94	871.10	42.	-12.	-0.007	81.65	-6.367E-01	
EU-154	873.23	32.	10.	0.006	85.93	4.301E+00	
AG-110M	884.68	23.	6.	0.003	123.88	4.259E-01	
Y-88	898.04	20.	1.	0.001	988.26	5.783E-02	
AG-110M	937.49	50.	-19.	-0.010	85.91	-3.056E+00	
EU-152	964.11	45.	-5.	-0.003	298.33	-1.953E+00	
EU-154	996.33	20.	9.	0.005	81.09	4.774E+00	
PA-234M	1001.00	29.	9.	0.005	94.06	6.081E+01	
EU-154	1004.77	38.	3.	0.001	335.05	8.678E-01	
Co-56	1037.84	16.	-9.	-0.005	106.38	-3.834E+00	
Cs-136	1048.07	42.	-4.	-0.002	234.52	-3.032E-01	
RH-106	1050.36	38.	7.	0.004	133.46	2.660E+01	
BI-207	1063.66	16.	4.	0.002	232.74	3.291E-01	
EU-152	1112.07	126.	-17.	-0.010	95.69	-7.960E+00	
ZN-65	1115.55	109.	-17.	-0.010	89.24	-2.155E+00	
Sc-46	1120.55	94.	17.	0.010	83.76	1.090E+00	
Ta-182	1121.30	58.	15.	0.008	78.21	2.658E+00	
CO-60	1173.24	21.	-1.	-0.001	792.15	-8.799E-02	
Ta-182	1189.05	37.	-12.	-0.007	116.15	-5.070E+00	
Ta-182	1221.41	23.	-3.	-0.001	423.16	-6.712E-01	
Co-56	1238.28	17.	8.	0.004	125.93	8.315E-01	
NA-22	1274.53	11.	3.	0.001	188.75	1.873E-01	
FE-59	1291.60	17.	1.	0.001	972.11	1.642E-01	
TL-210	1313.00	6.	7.	0.004	87.32	2.422E+00	
CO-60	1332.50	17.	-3.	-0.002	327.45	-2.180E-01	
AG-110M	1384.30	11.	4.	0.002	221.56	1.130E+00	
EU-152	1408.00	18.	-8.	-0.004	132.88	-2.889E+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	Time Corrected Activity Bq/Sample	Uncertainty 1 Sigma Counting	MDA Bq/Sample
BE-7	#A	2.8853E+00	2.8854E+00	1.076E+02%	1.06E+01
NA-22	#A	1.8731E-01	1.8731E-01	1.887E+02%	1.29E+00
K-40	#	1.9254E+02	1.9254E+02	6.166E+00%	5.40E+00
Sc-46	#A	5.4497E-01	5.4498E-01	8.376E+01%	1.19E+00
CR-51	#A	3.4290E+00	3.4291E+00	2.142E+02%	2.47E+01
MN-54	#A	1.7137E-02	1.7137E-02	2.755E+03%	1.17E+00
FE-59	#A	9.2132E-02	9.2133E-02	9.721E+02%	2.98E+00
Co-56	#A	5.1146E-01	5.1146E-01	7.882E+01%	6.82E-01
CO-57	#A	1.8976E-01	1.8976E-01	1.660E+02%	1.07E+00
CO-58	#A	2.7831E-01	2.7831E-01	1.437E+02%	1.40E+00
CO-60	#A	-2.1799E-01	-2.1799E-01	3.274E+02%	1.59E+00
ZN-65	#A	-2.1549E+00	-2.1549E+00	8.924E+01%	6.44E+00
NB-94	#A	-2.9356E-01	-2.9356E-01	2.085E+02%	1.45E+00
ZR-95	#	1.4947E+00	1.4947E+00	2.425E+01%	6.48E-01
NB-95	#A	3.6298E-01	3.6298E-01	1.414E+02%	1.77E+00
RU-103	#A	-1.1604E-01	-1.1604E-01	4.367E+02%	1.30E+00
RH-106	#A	-1.4245E+00	-1.4245E+00	1.051E+02%	3.19E+01
AG-108M	#A	1.4027E-01	1.4027E-01	2.814E+02%	1.02E+00
AG-110M	#A	6.0219E-01	6.0219E-01	1.239E+02%	1.84E+00
SN-113	#A	5.0444E-01	5.0444E-01	1.227E+02%	2.10E+00
SB-124	#A	1.9579E+00	1.9579E+00	2.780E+01%	3.15E+00
SB-125	#A	2.3729E+00	2.3729E+00	2.970E+01%	3.41E+00
I-131	#A	1.6993E-01	1.6994E-01	2.260E+02%	9.88E-01
Gd-153	#A	-1.1598E+00	-1.1598E+00	1.440E+02%	5.58E+00
Ga-68	#A	7.2588E-01	7.3322E-01	3.526E+03%	5.89E+01
Tc-99m	#A	8.8349E-03	8.8516E-03	7.374E+03%	2.20E+00
BA-133	#A	-7.0966E-01	-7.0966E-01	1.505E+02%	3.59E+00
CS-134	#	2.5259E+00	2.5259E+00	2.041E+01%	1.27E+00
CS-137	#A	6.3163E-01	6.3163E-01	9.197E+01%	1.96E+00
CE-139	#A	2.1305E-01	2.1305E-01	1.842E+02%	1.33E+00
Ba-140	#A	8.6582E-01	8.6585E-01	2.028E+02%	4.34E+00
La-140	#	9.0785E-01	9.0788E-01	3.536E+01%	6.49E-01
CE-141	#A	-4.3932E-01	-4.3933E-01	1.483E+02%	2.20E+00
CE-144	#A	-3.0236E+00	-3.0236E+00	1.632E+02%	1.65E+01
PM-144	#A	-7.4487E-01	-7.4487E-01	9.200E+01%	1.57E+00
EU-152	#A	8.0211E-01	8.0211E-01	8.597E+01%	3.75E+00
EU-154	#A	1.2652E+00	1.2652E+00	8.109E+01%	2.42E+00
EU-155	#A	-1.1532E+00	-1.1532E+00	2.183E+02%	8.43E+00
HF-181	#A	7.2442E-01	7.2443E-01	8.954E+01%	1.53E+00
Ta-182	#A	2.6578E+00	2.6578E+00	7.821E+01%	6.95E+00
Hg-203	#A	-3.7592E-01	-3.7593E-01	1.241E+02%	1.57E+00
TL-208		5.6110E+00	5.6110E+00	9.091E+00%	3.45E-01
PM-146	#C	1.3011E+00	1.3011E+00	4.173E+01%	1.29E+00

Y-88	#A	4.4454E-02	4.4455E-02	9.883E+02%	1.41E+00
Cd-113m	#A	-3.1417E+03	-3.1417E+03	1.469E+02%	1.58E+04
Cd-109	#A	0.0000E+00	0.0000E+00	1.000E+03%	4.90E+01
Cf-251	#A	-1.8801E+00	-1.8801E+00	1.107E+02%	5.34E+00
Cf-249	#A	5.2978E-01	5.2978E-01	1.175E+02%	1.79E+00
Sn-126	A	3.1947E+00	3.1947E+00	1.412E+02%	1.52E+01
PB-210	#A	1.5675E+01	1.5675E+01	8.201E+01%	3.58E+01
PB-212		1.6741E+01	1.6741E+01	6.111E+00%	1.81E+00
PB-214		1.2509E+01	1.2509E+01	9.677E+00%	2.26E+00
BI-207	#A	3.2912E-01	3.2912E-01	2.327E+02%	1.76E+00
BI-212	#A	4.1079E-01	4.1079E-01	1.732E+03%	2.51E+01
U-235	#A	2.9827E+00	2.9827E+00	9.267E+01%	8.29E+00
BI-214		1.2994E+01	1.2994E+01	1.101E+01%	2.22E+00
BI-210M	#A	6.5227E-01	6.5227E-01	9.301E+01%	2.04E+00
AC-228		1.6075E+01	1.6075E+01	1.316E+01%	4.91E+00
TH-227	#A	-6.3590E+00	-6.3590E+00	9.942E+01%	1.62E+01
TH-229	#A	-8.1481E+00	-8.1481E+00	1.054E+02%	2.20E+01
TH-234	A	9.2237E+00	9.2237E+00	4.463E+01%	1.73E+01
PA-231	#A	0.0000E+00	0.0000E+00	7.071E+02%	8.60E+01
PA-233	#A	0.0000E+00	0.0000E+00	7.071E+02%	7.04E+00
PA-234	A	2.3574E+00	2.3574E+00	3.774E+01%	7.64E+00
PA-234M	#A	8.2029E+01	8.2029E+01	7.517E+01%	1.95E+02
AM-241	#A	1.0118E+00	1.0118E+00	1.373E+02%	4.66E+00
Np-237	#A	0.0000E+00	0.0000E+00	1.000E+03%	1.44E+01
Ir-192	#A	1.0148E-01	1.0148E-01	2.697E+02%	2.94E+00
Cs-136	#A	0.0000E+00	0.0000E+00	1.000E+03%	1.53E+00
Np-239	#A	1.3318E+00	1.3321E+00	1.540E+02%	6.87E+00
Nd-147	#A	-4.1678E+00	-4.1680E+00	9.957E+01%	9.91E+00
TL-210	#A	1.0652E-01	1.0652E-01	3.779E+02%	1.95E+00
Kr-85	#A	-1.3974E+01	-1.3974E+01	1.027E+03%	4.94E+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 (25.1 to 1999.1 keV) 2.565E+02 Bq/Sample
Total Decayed Activity (25.1 to 1999.1 keV) 2.5646616E+02 Bq/Sample

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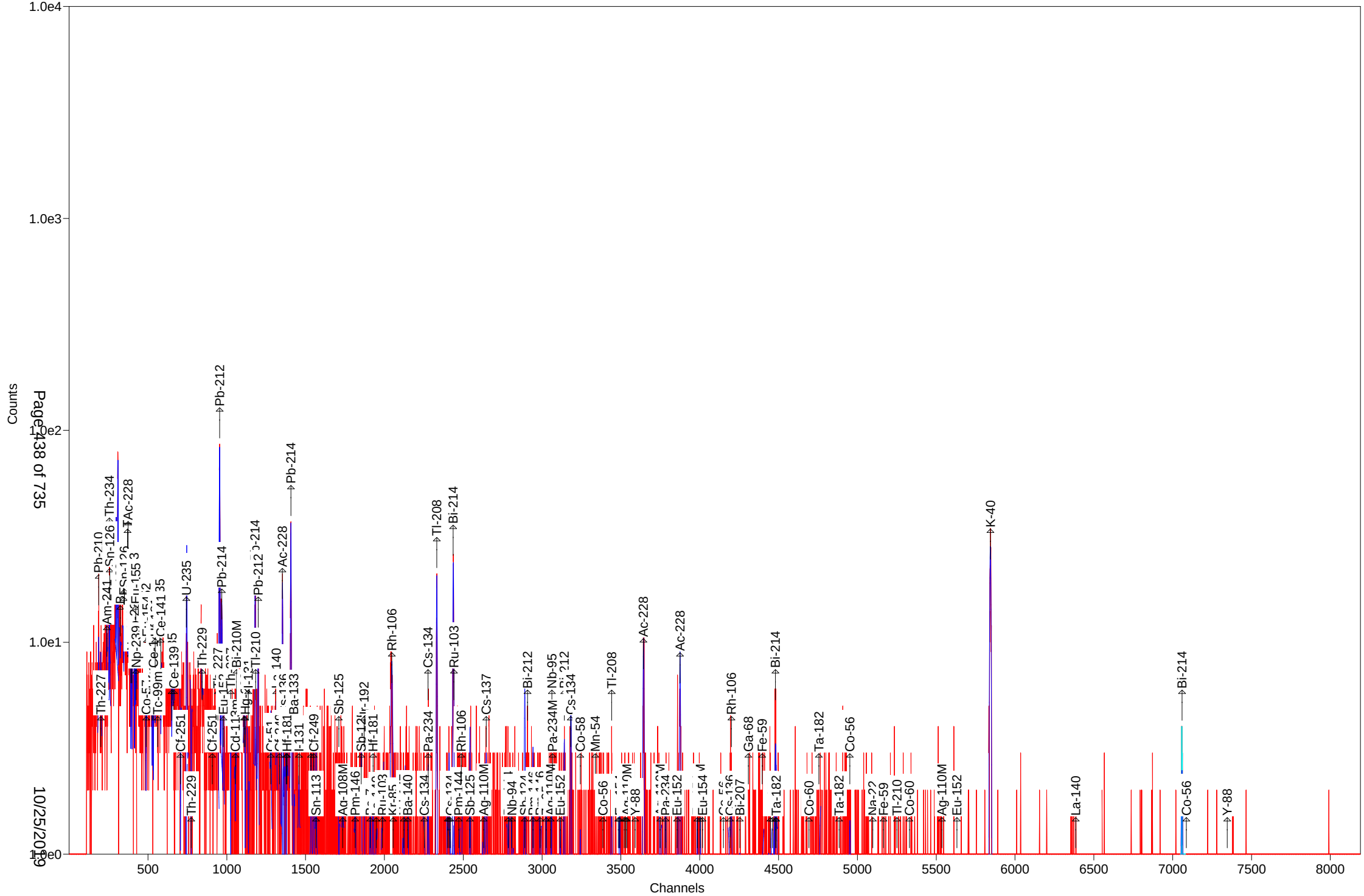
444057_Gamma_180-95857-A-9-B. 12_Gamma_20192673.spc.



Test America St. Louis Spectrum ID: 9_Gamma_20192875

Sample Description: 444057_Gamma_180-95857-A-10-B
Detector: Detector # 9
Batch ID: 444057
Work Order Number: Gamma
Lot Number: 180-95857-A-10-B

Decay to Time: 10/15/2019 11:57 Live Time: 1800 sec
Acquisition Time: 10/15/2019 11:57:17 Real Time: 1804 sec
Analysis Time: 10/15/2019 12:27 Dead Time: 0.22 %
Analysis Quantity: 1.000E+00 Sample

Efficiency Cal File: 9_Soil_TunaCan.Clb
Efficiency Cal Desc: 9_Soil_TunaCan_90099_050312
Efficiency Cal Date: 6/14/2012 10:19
Energy Cal Date: 3/1/2012 13:57
Library: Client_Long_Rev15.lib
Bkgd Correction File: 9_2019-10-06_1923.PBC

Nuclide	Activity Bq/Sample	1-Sigma Counting Uncert %	1-Sigma Counting Uncert Bq/Sample	1-Sigma Total Uncert Bq/Sample	Minimum Detectable Activity Bq/Sample
BE-7	1.683E+00	207.1	3.485E+00	3.486E+00	1.192E+01
NA-22	1.703E-02	2027.3	3.452E-01	3.452E-01	1.272E+00
K-40	2.215E+02	5.0	1.104E+01	1.583E+01	7.638E+00
Sc-46	-6.540E-01	83.9	5.488E-01	5.498E-01	1.835E+00
CR-51	-4.409E-01	605.8	2.671E+00	2.671E+00	9.247E+00
MN-54	3.502E-01	119.9	4.199E-01	4.203E-01	9.601E-01
FE-59	6.425E-01	119.0	7.647E-01	7.654E-01	1.715E+00
Co-56	1.194E+00	36.1	4.307E-01	4.350E-01	9.714E-01
CO-57	0.000E+00	1.#INF	1.790E-01	1.790E-01	9.313E-01
CO-58	-6.264E-01	80.7	5.058E-01	5.069E-01	1.689E+00
CO-60	3.351E-01	96.7	3.240E-01	3.245E-01	7.304E-01
ZN-65	0.000E+00	1.#INF	1.283E-01	1.283E-01	4.516E+00
NB-94	2.241E-01	183.5	4.113E-01	4.114E-01	1.414E+00
ZR-95	4.832E-01	134.7	6.508E-01	6.513E-01	1.889E+00
NB-95	4.452E-01	111.5	4.965E-01	4.970E-01	1.678E+00
RU-103	-3.645E-02	1011.5	3.687E-01	3.687E-01	9.127E-01
RH-106	2.717E-02	99.3	2.700E-02	2.703E-02	1.202E+01
AG-108M	8.300E-03	3609.7	2.996E-01	2.996E-01	7.507E-01
AG-110M	0.000E+00	1.#INF	1.291E-01	1.291E-01	2.045E+00
SN-113	5.607E-01	105.0	5.889E-01	5.896E-01	1.977E+00
SB-124	4.017E-01	200.2	8.044E-01	8.046E-01	2.705E+00
SB-125	1.587E+00	33.2	5.265E-01	5.327E-01	2.939E+00
I-131	-2.193E-01	182.5	4.001E-01	4.003E-01	1.002E+00
Gd-153	0.000E+00	1.#INF	2.061E-01	2.061E-01	7.965E+00
Ga-68	-3.076E+01	83.8	2.579E+01	2.584E+01	5.517E+01
Tc-99m	-3.746E-01	134.2	5.027E-01	5.031E-01	1.675E+00
BA-133	-5.982E-01	145.9	8.727E-01	8.733E-01	2.925E+00
CS-134	1.092E-02	81.1	8.854E-03	8.872E-03	2.035E+00
CS-137	-8.454E-01	79.6	6.731E-01	6.745E-01	2.227E+00
CE-139	-1.933E-01	188.1	3.636E-01	3.641E-01	1.225E+00
Ba-140	-4.459E-02	4496.7	2.005E+00	2.005E+00	3.447E+00
La-140	-3.463E-01	119.4	4.136E-01	4.140E-01	1.659E+00
CE-141	-7.039E-01	143.1	1.007E+00	1.008E+00	3.355E+00

CE-144	0.000E+00	1.#INF	1.031E+00	1.031E+00	1.272E+01
PM-144	5.527E-01	64.7	3.574E-01	3.586E-01	1.268E+00
EU-152	6.386E-01	152.8	9.758E-01	9.764E-01	2.745E+00
EU-154	6.417E-01	79.4	5.094E-01	5.105E-01	1.968E+00
EU-155	-2.550E-02	13018.8	3.320E+00	3.320E+00	1.111E+01
HF-181	0.000E+00	1.#INF	2.259E-01	2.259E-01	1.616E+00
Ta-182	1.645E+00	94.9	1.561E+00	1.563E+00	6.374E+00
Hg-203	-4.029E-01	90.6	3.649E-01	3.656E-01	1.220E+00
TL-208	5.788E+00	8.8	5.072E-01	5.894E-01	6.846E-01
PM-146	3.779E-01	51.3	1.939E-01	1.949E-01	1.301E+00
Y-88	8.489E-02	266.4	2.261E-01	2.262E-01	5.109E-01
Cd-113m	8.845E+01	4585.9	4.056E+03	4.056E+03	1.408E+04
Cd-109	0.000E+00	1.#INF	2.045E+01	2.045E+01	6.798E+01
Cf-251	-5.029E-01	309.4	1.556E+00	1.557E+00	4.041E+00
Cf-249	-6.660E-02	889.4	5.924E-01	5.924E-01	2.031E+00
Sn-126	-4.360E+00	108.3	4.722E+00	4.728E+00	1.573E+01
PB-210	2.351E+01	28.2	6.630E+00	6.772E+00	1.752E+01
PB-212	1.712E+01	4.9	8.444E-01	1.393E+00	1.250E+00
PB-214	1.212E+01	7.1	8.638E-01	1.069E+00	1.426E+00
BI-207	7.824E-02	230.1	1.800E-01	1.800E-01	1.460E+00
BI-212	2.008E+01	20.2	4.048E+00	4.181E+00	6.937E+00
U-235	-3.003E+00	136.3	4.093E+00	4.096E+00	1.364E+01
BI-214	1.377E+01	8.5	1.171E+00	1.373E+00	1.712E+00
BI-210M	4.908E-02	1148.6	5.637E-01	5.637E-01	1.425E+00
AC-228	1.774E+01	8.0	1.411E+00	1.677E+00	2.693E+00
TH-227	3.555E+00	104.5	3.714E+00	3.720E+00	9.903E+00
TH-229	-2.356E+00	311.6	7.342E+00	7.345E+00	1.816E+01
TH-234	1.543E+01	23.1	3.561E+00	3.663E+00	1.259E+01
PA-231	-1.197E+01	171.0	2.047E+01	2.048E+01	6.850E+01
PA-233	-2.196E-02	3563.5	7.826E-01	7.826E-01	5.480E+00
PA-234	-1.464E-01	110.5	1.617E-01	1.619E-01	7.600E+00
PA-234M	5.202E+01	73.9	3.843E+01	3.852E+01	1.677E+02
AM-241	-1.198E+00	104.7	1.254E+00	1.256E+00	4.180E+00
Np-237	-2.515E+00	241.8	6.082E+00	6.084E+00	2.021E+01
Ir-192	4.609E-01	63.4	2.920E-01	2.933E-01	8.935E-01
Cs-136	3.579E-01	99.3	3.554E-01	3.560E-01	1.573E+00
Np-239	1.380E+00	223.6	3.085E+00	3.086E+00	1.026E+01
Nd-147	4.146E+00	46.6	1.933E+00	1.948E+00	4.435E+00
TL-210	4.334E-02	1218.6	5.282E-01	5.282E-01	1.833E+00
Kr-85	4.343E+01	238.8	1.037E+02	1.037E+02	3.536E+02
Total	5.530E+02				

Analyst: Caleb Quinn

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Sample description
444057_Gamma_180-95857-A-10-B

Spectrum Filename: C:\User\SPC\Det9\9_Gamma_20192875.An1

Acquisition information
Start time: 10/15/2019 11:57:17 AM
Live time: 1800
Real time: 1804
Dead time: 0.22 %
Detector ID: 9

Detector system
Ge9 S/N100228730

Calibration
Filename: 9_Soil_TunaCan.Clb
9_Soil_TunaCan_90099_050312

Energy Calibration
Created: 3/1/2012 1:57:17 PM
Zero offset: 0.074 keV
Gain: 0.250 keV/channel
Quadratic: -2.269E-08 keV/channel^2

Efficiency Calibration
Created: 6/14/2012 10:19:51 AM
Knee Energy: 165.85 keV
Above the Knee: Quadratic Uncertainty = 1.30 %
Log(Eff): -8.079856E-01 + (-2.367265E-01*Log(E)) +
(-3.950640E-02*Log(E)^2)
Below the Knee: Quadratic Uncertainty = 1.42 %
Log(Eff): -2.387916E+01 + (8.875647E+00*Log(E)) +
(-9.401100E-01*Log(E)^2)

Library Files
Main analysis library: Client_Long_Rev15.lib
Library Match Width: 0.500
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G800W064
Start channel: 100 (25.08keV)
Stop channel: 8000 (1999.34keV)
Peak rejection level: 1000.000%
Peak search sensitivity: 3
Sample Size: 1.0000E+00 +/- 0.000E+00%
Activity scaling factor: 1.0000E+00/(1.0000E+00* 1.0000E+00) =
1.0000E+00
Detection limit method: Reg. Guide 4.16 Method

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Random error: 4.0000000E+00
Systematic error: 4.0000000E+00
Fraction Limit: 0.000%
Background width: 3
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:	YES	10/15/2019 11:57:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	9_2019-10-06_1923.PBC 10/6/2019 7:23:18 PM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 27 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 0.1683

***** 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
46.69	46.	28.20	0.87	2.577E-02	46.54	4.250	2.351E+01	PB210
50.14	20.	109.46	1.00	2.900E-02	50.14	8.000	PBC<MDA	TH227
63.28	48.	35.93	1.01	3.921E-02	63.29	3.810	PBC<MDA	TH234
74.78	196.	11.46	1.03	4.572E-02				
77.15	358.	7.02	1.03	4.678E-02				
84.16	66.	24.81	1.03	4.938E-02				
87.23	107.	17.98	1.04	5.029E-02	86.49	13.100	9.070E+00	Np237
					86.54	30.700	3.869E+00	EU155
					86.94	9.040	1.311E+01	Sn126
					87.57	37.500	3.150E+00	Sn126
					88.04	3.790	3.109E+01	Cd109
89.97	96.	18.48	1.04	5.098E-02				
92.69	72.	28.96	1.04	5.156E-02	92.59	5.584	1.385E+01	TH234
93.45	30.	228.11	1.04	5.171E-02	93.35	5.561	PBC<MDA	AC228
106.13	30.	223.56	1.05	5.323E-02	106.13	22.700	PBC<MDA	Np239
185.72	63.	38.95	1.13	4.403E-02	185.72	54.000	1.472E+00	U235
227.00	20.	98.96	1.17	3.858E-02	227.00	6.300	PBC<MDA	Cf251
238.39	467.	6.43	1.12	3.734E-02	238.63	43.300	1.592E+01	PB212
241.82	101.	15.02	1.18	3.697E-02	242.00	7.430	2.046E+01	PB214
256.24	10.	177.95	1.20	3.558E-02	256.24	7.000	PBC<MDA	TH227
277.44	45.	29.56	1.74	3.372E-02	277.28	6.310	1.175E+01	TL208
295.12	133.	13.85	1.02	3.231E-02	295.09	19.300	1.187E+01	PB214

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
					296.00	79.000	2.905E+00	TL210
299.98	44.	27.19	1.24	3.195E-02	300.03	3.280	2.310E+01	PB212
					300.07	2.460	3.080E+01	PA231
					300.18	6.200	1.223E+01	PA233
316.49	14.	89.07	1.25	3.080E-02	316.49	87.040	PBC<MDA	Ir192
338.16	110.	13.42	1.16	2.940E-02	338.32	12.010	1.731E+01	AC228
351.79	238.	7.78	1.09	2.861E-02	351.93	37.600	1.232E+01	PB214
391.69	17.	105.03	1.32	2.653E-02	391.69	64.000	PBC<MDA	SN113
468.06	16.	90.14	1.38	2.335E-02	468.06	51.750	PBC<MDA	Ir192
477.60	7.	207.11	1.39	2.301E-02	477.60	10.520	PBC<MDA	BE7
487.02	9.	159.15	1.40	2.269E-02	487.02	45.500	PBC<MDA	La140
511.86	66.	24.00	2.67	2.188E-02	511.86	20.000	8.335E+00	RH106
514.00	7.	238.80	1.42	2.182E-02	513.98	0.430	PBC<MDA	Kr85
531.00	21.	46.63	1.44	2.130E-02	531.00	13.000	PBC<MDA	Nd147
563.24	3.	416.00	1.47	2.040E-02	563.24	8.350	PBC<MDA	CS134
569.70	5.	230.07	1.47	2.023E-02	569.32	15.380	PBC<MDA	CS134
					569.47	8.200	1.674E+00	PA234
					569.70	97.740	1.405E-01	BI207
583.26	175.	8.76	1.43	1.988E-02	583.02	84.500	5.788E+00	TL208
600.50	14.	196.81	1.50	1.946E-02	600.50	17.860	PBC<MDA	SB125
602.73	14.	200.21	1.50	1.940E-02	602.73	98.260	PBC<MDA	SB124
604.71	4.	679.58	1.50	1.936E-02	604.71	97.620	PBC<MDA	CS134
609.38	218.	8.51	1.28	1.925E-02	609.31	46.090	1.366E+01	BI214
					610.30	5.750	1.096E+02	RU103
618.06	22.	100.78	1.51	1.904E-02	618.06	99.100	PBC<MDA	PM144
635.89	25.	33.18	1.53	1.864E-02	635.89	11.310	6.674E+00	SB125
696.54	15.	81.05	1.58	1.741E-02	696.54	99.000	PBC<MDA	PM144
702.63	7.	183.52	1.58	1.730E-02	702.63	97.900	PBC<MDA	NB94
724.20	9.	134.68	1.60	1.691E-02	724.20	44.150	PBC<MDA	ZR95
727.66	46.	20.16	1.54	1.686E-02	727.17	7.550	2.008E+01	BI212
747.16	15.	51.33	1.62	1.651E-02	747.16	34.000	PBC<MDA	PM146
756.73	5.	263.94	1.62	1.635E-02	756.73	54.460	PBC<MDA	ZR95
765.79	13.	111.52	1.63	1.621E-02	765.79	99.790	PBC<MDA	NB95
					766.41	0.294	1.512E+02	PA234M
766.41	16.	73.88	1.63	1.620E-02	765.79	99.790	PBC<MDA	NB95
					766.41	0.294	1.873E+02	PA234M
785.42	15.	91.49	1.65	1.590E-02	785.42	1.280	PBC<MDA	BI212
801.95	16.	87.05	1.66	1.565E-02	801.95	8.690	PBC<MDA	CS134
818.50	13.	99.30	1.67	1.540E-02	818.50	100.000	PBC<MDA	Cs136
834.85	10.	119.90	1.69	1.517E-02	834.85	99.980	PBC<MDA	MN54
846.77	7.	173.14	1.70	1.501E-02	846.77	99.935	PBC<MDA	Co56
860.35	38.	21.00	1.98	1.482E-02	860.56	12.420	1.157E+01	TL208
873.23	5.	232.68	1.72	1.465E-02	873.23	12.270	PBC<MDA	EU154
880.53	7.	159.69	1.72	1.456E-02	880.53	6.000	PBC<MDA	PA234
898.04	4.	266.40	1.74	1.434E-02	898.04	93.700	PBC<MDA	Y88
911.10	130.	10.78	1.68	1.418E-02	911.07	29.000	1.761E+01	AC228
946.02	6.	168.87	1.77	1.377E-02	946.02	13.400	PBC<MDA	PA234
964.11	9.	152.79	1.79	1.357E-02	964.11	14.605	PBC<MDA	EU152

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
969.08	78.	16.54	1.79	1.352E-02	968.97	17.460	1.825E+01	AC228
996.33	11.	79.38	1.81	1.323E-02	996.33	10.600	PBC<MDA	EU154
1004.77	4.	306.14	1.82	1.314E-02	1004.77	18.010	PBC<MDA	EU154
1037.84	3.	314.21	1.84	1.281E-02	1037.84	14.130	PBC<MDA	Co56
1048.07	4.	237.17	1.85	1.271E-02	1048.07	80.000	PBC<MDA	Cs136
1050.36	8.	117.12	1.85	1.269E-02	1050.36	1.560	PBC<MDA	RH106
1099.25	8.	119.02	1.89	1.224E-02	1099.25	56.500	PBC<MDA	FE59
1120.34	46.	17.85	1.90	1.206E-02	1120.29	15.100	1.411E+01	BI214
					1120.55	99.987	PBC<MDA	Sc46
1121.35	7.	189.08	1.90	1.205E-02	1120.55	99.987	PBC<MDA	Sc46
					1121.30	34.900	9.842E-01	Ta182
1188.74	12.	94.90	1.95	1.150E-02	1189.05	16.200	PBC<MDA	Ta182
1221.41	7.	198.98	1.97	1.126E-02	1221.41	27.000	PBC<MDA	Ta182
1238.28	35.	36.06	1.98	1.114E-02	1238.28	66.070	2.666E+00	Co56
1312.67	5.	198.49	2.03	1.063E-02	1313.00	21.000	PBC<MDA	TL210
1332.50	6.	96.69	2.05	1.050E-02	1332.50	99.980	PBC<MDA	CO60
1408.00	8.	109.13	2.10	1.004E-02	1408.00	21.005	PBC<MDA	EU152
1460.70	415.	4.98	1.96	9.749E-03	1460.83	10.670	2.215E+02	K40
1765.06	39.	21.16	2.31	8.350E-03	1764.49	15.400	1.697E+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	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide
298.74	74.79	153.	196.	4.277E+03	11.46	1.025	- D
308.21	77.16	136.	358.	7.647E+03	7.02	1.027	- D
336.56	84.14	100.	65.	1.326E+03	24.85	1.034	- sD
359.81	89.96	122.	93.	1.814E+03	19.85	1.040	- sD

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

This section based on library: Client_Long_Rev15.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 1 Sigma %	FWHM keV
PB-210	186.40	46.69	47.	46.	0.026	28.20	0.865
TH-227	200.20	50.14	222.	20.	0.011	109.46	1.001
AM-241	237.77	59.54	425.	-28.	-0.016	104.71	1.010s
TH-234	252.77	63.29	123.	48.	0.027	35.93	1.014D
Sn-126	256.74	64.28	525.	-30.	-0.017	108.32	1.015s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BA-133	323.56	80.99	2662.	-30.	-0.016	247.60	1.031
Np-237	345.55	86.49	2565.	-30.	-0.017	241.84	1.036s
EU-155	345.76	86.54	2535.	-30.	-0.017	240.44	1.036s
Sn-126	347.35	86.94	2506.	-30.	-0.017	238.98	1.037
Sn-126	349.87	87.57	2369.	-30.	-0.017	232.26	1.037s
Cd-109	351.75	88.04	2468.	0.	0.000	236.94	1.038A
Nd-147	363.99	91.10	2339.	-30.	-0.017	230.07	1.041s
TH-234	369.94	92.59	180.	72.	0.040	28.96	1.042D
AC-228	372.98	93.35	2253.	30.	0.016	228.11	1.043
Gd-153	389.58	97.50	2283.	0.	0.000	1000.00	1.047s
Np-239	397.58	99.50	2283.	0.	0.000	1000.00	1.049s
Gd-153	412.37	103.20	2283.	0.	0.000	1000.00	1.052s
Np-239	414.37	103.70	2283.	0.	0.000	1000.00	1.053s
Np-239	424.09	106.13	2236.	30.	0.017	223.56	1.055s
EU-152	486.67	121.78	240.	-8.	-0.004	276.13	1.070s
CO-57	487.80	122.06	248.	0.	0.000	1000.00	1.070s
EU-154	491.95	123.10	251.	-27.	-0.015	84.10	1.071s
PA-234	524.72	131.29	728.	-27.	-0.015	142.41	1.079s
HF-181	531.64	133.02	755.	-12.	-0.007	326.24	1.081s
CE-144	533.69	133.54	767.	0.	0.000	1000.00	1.081s
HF-181	544.74	136.30	767.	0.	0.000	1000.00	1.084s
CO-57	545.43	136.47	767.	0.	0.000	1000.00	1.084s
Tc-99m	561.57	140.51	783.	-30.	-0.017	134.20	1.088s
U-235	574.67	143.79	813.	-30.	-0.017	136.30	1.091s
CE-141	581.29	145.44	944.	-31.	-0.017	143.10	1.092s
Ba-140	650.15	162.66	286.	-26.	-0.014	95.66	1.108s
CE-139	662.92	165.85	300.	-13.	-0.007	188.12	1.111s
Cf-251	705.90	176.60	132.	-7.	-0.004	309.38	1.122s
U-235	742.37	185.72	154.	63.	0.035	38.95	1.130s
TH-229	773.52	193.51	160.	-8.	-0.004	311.58	1.137s
TH-229	842.87	210.85	192.	-13.	-0.007	210.52	1.153s
Cf-251	907.45	227.00	100.	20.	0.011	98.96	1.168
TH-227	943.33	235.97	903.	-22.	-0.012	194.10	1.176s
PB-212	953.97	238.63	52.	498.	0.277	4.93	1.179D
PB-214	967.43	242.00	65.	101.	0.056	15.02	1.182D
EU-152	978.21	244.69	886.	-23.	-0.013	106.33	1.185s
TH-227	1024.39	256.24	80.	10.	0.006	177.95	1.195s
TL-208	1109.17	277.44	33.	45.	0.025	29.56	1.743s
Hg-203	1116.22	279.20	151.	-20.	-0.011	90.57	1.216s
I-131	1136.61	284.30	92.	-3.	-0.002	628.64	1.221s
PB-214	1179.77	295.09	57.	132.	0.073	11.95	1.231D
TL-210	1183.41	296.00	605.	-19.	-0.011	183.20	1.231s
PB-212	1199.52	300.03	48.	44.	0.024	27.19	1.235D
PA-231	1199.68	300.07	586.	-19.	-0.011	179.77	1.235s
PA-233	1200.12	300.18	578.	-20.	-0.011	174.21	1.235s
PA-231	1210.00	302.65	558.	-20.	-0.011	170.96	1.237s
BA-133	1210.81	302.85	538.	-4.	-0.002	773.34	1.238s
Ba-140	1218.80	304.85	534.	0.	0.000	1000.00	1.240s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-210M	1218.99	304.90	534.	0.	0.000	1000.00	1.240s
Ir-192	1233.16	308.44	534.	0.	0.000	1000.00	1.243s
Ir-192	1265.35	316.49	75.	14.	0.008	89.07	1.250
CR-51	1279.73	320.08	105.	-2.	-0.001	605.85	1.253s
La-140	1314.43	328.76	575.	-24.	-0.013	142.72	1.261s
Cf-249	1333.15	333.44	551.	-24.	-0.013	139.30	1.265s
AC-228	1352.02	338.16	27.	110.	0.061	13.42	1.163
Cs-136	1361.66	340.57	527.	-24.	-0.013	135.60	1.272
EU-152	1376.53	344.29	503.	-24.	-0.013	132.17	1.275
HF-181	1382.70	345.83	478.	-24.	-0.014	128.88	1.276s
PB-214	1406.54	351.79	29.	238.	0.132	7.78	1.088
BA-133	1423.37	356.00	373.	-19.	-0.011	145.89	1.285s
I-131	1457.31	364.48	68.	-9.	-0.005	182.46	1.293s
BA-133	1534.73	383.84	157.	-18.	-0.010	100.14	1.310s
Cf-249	1551.17	387.95	176.	-2.	-0.001	889.41	1.314s
SN-113	1566.12	391.69	153.	17.	0.010	105.03	1.317s
SB-125	1710.86	427.88	61.	-10.	-0.005	167.59	1.349s
PM-146	1814.87	453.88	52.	-5.	-0.003	361.84	1.372s
SB-125	1852.82	463.37	96.	-13.	-0.007	110.14	1.380
Ir-192	1871.59	468.06	96.	16.	0.009	90.14	1.384s
BE-7	1909.73	477.60	112.	7.	0.004	207.11	1.392
HF-181	1927.34	482.00	119.	0.	0.000	1000.00	1.396s
La-140	1947.43	487.02	102.	9.	0.005	159.15	1.400s
RH-106	2046.81	511.86	91.	66.	0.036	24.00	2.672s
Kr-85	2055.27	513.98	150.	7.	0.004	238.80	1.424s
Nd-147	2123.35	531.00	17.	21.	0.011	46.63	1.438s
CS-134	2252.30	563.24	38.	3.	0.002	416.00	1.466s
CS-134	2276.64	569.32	51.	-15.	-0.009	70.84	1.471s
PA-234	2277.24	569.47	67.	0.	0.000	1000.00	1.471s
BI-207	2278.16	569.70	64.	5.	0.003	230.07	1.471s
TL-208	2332.40	583.26	15.	175.	0.097	8.76	1.432
SB-125	2401.36	600.50	360.	14.	0.008	196.81	1.497s
SB-124	2410.29	602.73	374.	14.	0.008	200.21	1.499s
CS-134	2418.21	604.71	388.	4.	0.002	679.58	1.500s
BI-214	2436.90	609.38	28.	218.	0.121	8.51	1.280
PM-144	2471.62	618.06	228.	22.	0.012	100.78	1.512s
RH-106	2487.04	621.92	67.	-12.	-0.006	160.50	1.515s
SB-125	2542.94	635.89	23.	25.	0.014	33.18	1.526s
I-131	2547.28	636.97	63.	-15.	-0.008	127.75	1.527s
AG-110M	2630.43	657.76	120.	-22.	-0.012	85.23	1.544s
CS-137	2646.03	661.66	161.	-23.	-0.013	79.62	1.548s
PM-144	2785.58	696.54	62.	15.	0.008	81.05	1.576s
NB-94	2809.93	702.63	75.	7.	0.004	183.52	1.581s
SB-124	2890.57	722.79	129.	-18.	-0.010	94.61	1.598
AG-108M	2891.17	722.94	112.	-18.	-0.010	88.39	1.598
EU-154	2892.86	723.36	94.	-13.	-0.007	107.58	1.598
ZR-95	2896.22	724.20	74.	9.	0.005	134.68	1.599s
BI-212	2910.05	727.66	8.	46.	0.026	20.16	1.538

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
PM-146	2942.31	735.72	47.	-12.	-0.007	157.09	1.608s
PM-146	2988.08	747.16	9.	15.	0.008	51.33	1.617s
ZR-95	3026.36	756.73	35.	5.	0.003	263.94	1.625s
AG-110M	3055.23	763.94	90.	-22.	-0.012	64.71	1.631s
NB-95	3062.61	765.79	98.	13.	0.007	111.52	1.632s
PA-234M	3065.10	766.41	62.	16.	0.009	73.88	1.633s
EU-152	3115.14	778.92	55.	-19.	-0.011	89.08	1.643s
BI-212	3141.15	785.42	85.	15.	0.008	91.49	1.648
CS-134	3182.96	795.87	100.	-18.	-0.010	81.12	1.656
CS-134	3207.29	801.95	89.	16.	0.009	87.05	1.661s
CO-58	3242.59	810.78	90.	-17.	-0.010	80.75	1.668s
La-140	3262.58	815.77	107.	-10.	-0.005	156.04	1.672s
Cs-136	3273.50	818.50	77.	13.	0.007	99.30	1.674s
MN-54	3338.91	834.85	25.	10.	0.005	119.90	1.687s
Co-56	3386.61	846.77	25.	7.	0.004	173.14	1.696s
TL-208	3440.94	860.35	5.	38.	0.021	21.00	1.977
NB-94	3483.94	871.10	63.	-17.	-0.010	69.23	1.715s
EU-154	3492.47	873.23	74.	5.	0.003	232.68	1.717s
PA-234	3521.68	880.53	53.	7.	0.004	159.69	1.722s
PA-234	3532.53	883.24	60.	0.	0.000	1000.00	1.724s
AG-110M	3538.30	884.68	60.	0.	0.000	1000.00	1.725s
Sc-46	3556.69	889.28	93.	-17.	-0.009	83.92	1.729s
Y-88	3591.74	898.04	26.	4.	0.002	266.40	1.736s
AC-228	3643.99	911.10	14.	130.	0.072	10.78	1.676
AG-110M	3749.60	937.49	65.	-22.	-0.012	82.82	1.766s
PA-234	3783.72	946.02	20.	6.	0.003	168.87	1.772s
EU-152	3856.11	964.11	86.	9.	0.005	152.79	1.786s
AC-228	3875.56	968.97	43.	78.	0.043	16.54	1.790s
EU-154	3985.03	996.33	32.	11.	0.006	79.38	1.810s
EU-154	4018.82	1004.77	22.	4.	0.002	306.14	1.816s
Co-56	4151.13	1037.84	22.	3.	0.002	314.21	1.841s
Cs-136	4192.07	1048.07	43.	4.	0.002	237.17	1.848s
RH-106	4201.23	1050.36	38.	8.	0.004	117.12	1.850s
Ga-68	4309.44	1077.40	48.	-20.	-0.011	83.84	1.870s
FE-59	4396.88	1099.25	16.	8.	0.004	119.02	1.886s
EU-152	4448.20	1112.07	108.	-6.	-0.003	266.95	1.895s
ZN-65	4462.09	1115.55	102.	0.	0.000	1000.00	1.897s
BI-214	4481.06	1120.29	11.	46.	0.026	17.85	1.901D
Sc-46	4482.12	1120.55	122.	-17.	-0.010	92.56	1.901
Ta-182	4485.12	1121.30	96.	7.	0.004	189.08	1.901s
CO-60	4692.96	1173.24	43.	-14.	-0.008	111.96	1.938s
Ta-182	4756.25	1189.05	23.	12.	0.007	94.90	1.949s
Ta-182	4885.75	1221.41	34.	7.	0.004	198.98	1.972
Co-56	4953.27	1238.28	24.	35.	0.020	36.06	1.984s
EU-154	5098.39	1274.54	23.	0.	0.000	1000.00	2.008
FE-59	5166.65	1291.60	28.	-14.	-0.008	91.01	2.020s
TL-210	5252.32	1313.00	17.	5.	0.003	198.49	2.034s
CO-60	5330.37	1332.50	6.	6.	0.004	96.69	2.047s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
AG-110M	5537.69	1384.30	17.	-1.	-0.001	972.11	2.082s
EU-152	5632.56	1408.00	11.	8.	0.004	109.13	2.097s
K-40	5843.52	1460.70	6.	415.	0.230	4.98	1.964
La-140	6385.95	1596.21	25.	-12.	-0.006	178.11	2.215s
SB-124	6765.35	1690.98	6.	-3.	-0.002	195.32	2.272s
BI-214	7059.65	1764.49	15.	39.	0.022	21.16	2.314s
Y-88	7346.20	1836.06	0.	0.	0.000	1000.00	2.354s

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	1.6828E+00				5.31E+01	
			477.60	1.683E+00	?(	1.192E+01 2.07E+02 1.05E+01	G
NA-22	C	1.7026E-02				9.50E+02	
			1274.53	1.703E-02	%(	1.272E+00 2.03E+03 9.99E+01	G
K-40	N	2.2155E+02				4.66E+11	
			1460.83	2.215E+02	(P	7.638E+00 4.98E+00 1.07E+01	G
Sc-46	F	-6.5398E-01				8.38E+01	
			889.28	-6.540E-01	?(	1.835E+00 8.39E+01 1.00E+02	G
			1120.55	-8.060E-01	+	2.500E+00 9.26E+01 1.00E+02	G
CR-51	F	-4.4087E-01				2.77E+01	
			320.08	-4.409E-01	?(	9.247E+00 6.06E+02 9.94E+00	G
MN-54	C	3.5022E-01				3.12E+02	
			834.85	3.502E-01	?(P	9.601E-01 1.20E+02 1.00E+02	G
FE-59	F	6.4249E-01				4.45E+01	
			1099.25	6.425E-01	?(	1.715E+00 1.19E+02 5.65E+01	G
			1291.60	-1.712E+00	+	3.286E+00 9.10E+01 4.32E+01	G
Co-56	C	1.1942E+00				7.73E+01	
			846.77	2.425E-01	*(P	9.714E-01 1.73E+02 9.99E+01	G
			1238.28	2.666E+00	@(P	1.917E+00 3.61E+01 6.61E+01	G
			1037.84	1.044E+00	?(P	7.479E+00 3.14E+02 1.41E+01	G
			1771.35	-2.156E-01	%	1.600E+01 2.09E+03 1.55E+01	A

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Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CO-58	C	-6.2644E-01					7.09E+01	
			810.78	-6.264E-01	?(	1.689E+00	8.07E+01	9.95E+01 G
CO-60	F	3.3512E-01					1.93E+03	
			1332.50	3.351E-01	?(	7.304E-01	9.67E+01	1.00E+02 G
			1173.24	-6.536E-01	+	1.585E+00	1.12E+02	9.99E+01 G
NB-94	I	2.2410E-01					7.41E+06	
			702.63	2.241E-01	?(	1.414E+00	1.84E+02	9.79E+01 G
			871.10	-6.566E-01	+	1.507E+00	6.92E+01	9.99E+01 G
ZR-95	I	4.8324E-01					6.40E+01	
			756.73	3.119E-01	?(	1.889E+00	2.64E+02	5.45E+01 G
			724.20	6.946E-01	?(	3.192E+00	1.35E+02	4.42E+01 G
NB-95	I	4.4522E-01					6.40E+01	
			765.79	4.452E-01	?(	1.678E+00	1.12E+02	9.98E+01 G
RU-103	I	-3.6450E-02					3.93E+01	
			497.05	-3.645E-02	%(	9.127E-01	1.01E+03	9.09E+01 G
			610.30	-5.026E-01	%	4.371E+01	2.56E+03	5.75E+00 GA
RH-106	I	2.7175E-02					3.74E+02	
			621.92	-3.422E+00	?(P	1.202E+01	1.60E+02	9.93E+00 G
			1050.36	2.198E+01	?(	8.839E+01	1.17E+02	1.56E+00 G
			511.86	8.335E+00	&	5.997E+00	2.40E+01	2.00E+01 GA
AG-108M	C	8.2999E-03					1.53E+05	
			433.94	8.300E-03	%(	7.507E-01	3.61E+03	9.05E+01 G
			722.94	-6.346E-01	+	1.877E+00	8.84E+01	9.08E+01 G
			614.28	3.232E-02	%	3.066E+00	2.80E+03	8.98E+01 G
SN-113	F	5.6066E-01					1.15E+02	
			391.69	5.607E-01	?(	1.977E+00	1.05E+02	6.40E+01 G
SB-124	F	4.0175E-01					6.02E+01	
			602.73	4.017E-01	?(	2.705E+00	2.00E+02	9.83E+01 G
			1690.98	-4.480E-01	+	1.941E+00	1.95E+02	4.78E+01 G
			722.79	-5.332E+00	+	1.691E+01	9.46E+01	1.08E+01 G
SB-125	I	1.5866E+00					1.01E+03	
			427.88	-7.284E-01	?(	2.939E+00	1.68E+02	2.96E+01 G
			600.50	2.201E+00	?(	1.458E+01	1.97E+02	1.79E+01 G
			635.89	6.674E+00	*(	6.559E+00	3.32E+01	1.13E+01 G
			463.37	-2.933E+00	&	1.091E+01	1.10E+02	1.05E+01 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
I-131	I -2.1929E-01					8.02E+00	
		364.48	-2.193E-01	?(	1.002E+00	1.82E+02	8.17E+01 G
		284.30	-8.188E-01	+	1.294E+01	6.29E+02	6.14E+00 G
		636.97	-6.074E+00	+ P	1.654E+01	1.28E+02	7.17E+00 G
Ga-68	C -3.0757E+01					4.71E-02	
		1077.40	-3.076E+01	?(	5.517E+01	8.38E+01	3.30E+00 G
Tc-99m	I -3.7456E-01					2.51E-01	
		140.51	-3.746E-01	?(	1.675E+00	1.34E+02	8.93E+01 G
BA-133	F -5.9820E-01					3.85E+03	
		356.00	-5.982E-01	@(	2.925E+00	1.46E+02	6.20E+01 G
		302.85	-4.059E-01	+	1.058E+01	7.73E+02	1.83E+01 G
		383.84	-4.208E+00	+	1.412E+01	1.00E+02	8.94E+00 GA
		80.99	-9.979E-01	&	8.211E+00	2.48E+02	3.41E+01 GA
CS-134	I 1.0915E-02					7.54E+02	
		795.87	-7.517E-01	(	2.035E+00	8.11E+01	8.55E+01 G
		604.71	1.208E-01	+	2.778E+00	6.80E+02	9.76E+01 G
		569.32	-2.737E+00	&	6.442E+00	7.08E+01	1.54E+01 G
		801.95	6.538E+00	&(	1.907E+01	8.71E+01	8.69E+00 G
		563.24	1.029E+00	&(P	1.023E+01	4.16E+02	8.35E+00 G
CS-137	I -8.4539E-01					1.10E+04	
		661.66	-8.454E-01	?(P	2.227E+00	7.96E+01	8.52E+01 G
CE-139	F -1.9330E-01					1.38E+02	
		165.85	-1.933E-01	?(	1.225E+00	1.88E+02	7.99E+01 G
Ba-140	I -4.4590E-02					1.28E+01	
		537.26	-4.459E-02	%(P	3.447E+00	4.50E+03	2.44E+01 G
		162.66	-4.867E+00	&	1.552E+01	9.57E+01	6.22E+00 G
		304.85	0.000E+00	+	4.524E+01	1.00E+03	4.29E+00 G
La-140	I -3.4629E-01					1.28E+01	
		1596.21	-7.467E-01	?(P	1.659E+00	1.78E+02	9.54E+01 G
		487.02	4.933E-01	(	2.676E+00	1.59E+02	4.55E+01 G
		328.76	-2.191E+00	+	1.044E+01	1.43E+02	2.03E+01 G
		815.77	-1.484E+00	&	7.882E+00	1.56E+02	2.33E+01 G
CE-141	I -7.0386E-01					3.25E+01	
		145.44	-7.039E-01	?(	3.355E+00	1.43E+02	4.82E+01 G
PM-144	C 5.5269E-01					3.63E+02	
		696.54	4.674E-01	?(	1.268E+00	8.11E+01	9.90E+01 G
		618.06	6.379E-01	?(	2.150E+00	1.01E+02	9.91E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-152	F	6.3864E-01					4.94E+03	
			121.78	-2.931E-01	&(	2.745E+00	2.76E+02	2.86E+01 G
			344.29	-1.752E+00	+	7.737E+00	1.32E+02	2.65E+01 G
			1112.07	-1.868E+00	+	1.713E+01	2.67E+02	1.36E+01 G
			778.92	-5.084E+00	+	1.000E+01	8.91E+01	1.29E+01 G
			964.11	2.462E+00	(	1.285E+01	1.53E+02	1.46E+01 G
			244.69	-4.617E+00	& P	2.824E+01	1.06E+02	7.58E+00 G
			1408.00	2.019E+00	?	4.845E+00	1.09E+02	2.10E+01 GA
EU-154	I	6.4173E-01					3.14E+03	
			123.10	-7.036E-01	*(	1.968E+00	8.41E+01	4.08E+01 G
			1274.54	0.000E+00	+	3.635E+00	1.00E+03	3.52E+01 G
			723.36	-2.143E+00	+	7.783E+00	1.08E+02	2.02E+01 G
			873.23	1.648E+00	?(	1.325E+01	2.33E+02	1.23E+01 G
			1004.77	8.381E-01	?(	5.817E+00	3.06E+02	1.80E+01 G
			996.33	4.320E+00	?(	1.152E+01	7.94E+01	1.06E+01 G
EU-155	I	-2.5498E-02					1.81E+03	
			105.31	-2.550E-02	%(P	1.111E+01	1.30E+04	2.12E+01 G
			86.54	-1.073E+00	&	8.573E+00	2.40E+02	3.07E+01 G
Ta-182	F	1.6446E+00					1.14E+02	
			1121.30	9.842E-01	?(	6.374E+00	1.89E+02	3.49E+01 G
			1221.41	1.279E+00	(	5.460E+00	1.99E+02	2.70E+01 G
			1189.05	3.677E+00	?(	7.421E+00	9.49E+01	1.62E+01 G
Hg-203	F	-4.0289E-01					4.66E+01	
			279.20	-4.029E-01	?(	1.220E+00	9.06E+01	8.15E+01 G
TL-208	N	5.7881E+00					6.98E+02	
			583.02	5.788E+00	(P	6.846E-01	8.76E+00	8.45E+01 G
			277.28	1.175E+01	+	7.697E+00	2.96E+01	6.31E+00 G
			860.56	1.157E+01	+	3.856E+00	2.10E+01	1.24E+01 G
PM-146	C	3.7787E-01					2.02E+03	
			453.88	-1.836E-01	&(P	1.301E+00	3.62E+02	6.50E+01 G
			747.16	1.451E+00	?(	1.677E+00	5.13E+01	3.40E+01 G
			735.72	-1.760E+00	+ P	5.117E+00	1.57E+02	2.25E+01 G
Y-88	F	8.4886E-02					1.07E+02	
			1836.06	0.000E+00	?(	5.109E-01	1.00E+03	9.92E+01 G
			898.04	1.748E-01	?(P	1.090E+00	2.66E+02	9.37E+01 G
Cd-113m		8.8455E+01					5.33E+03	
			263.70	8.845E+01	%(	1.408E+04	4.59E+03	6.00E-03 K

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Cf-251	T	-5.0291E-01					3.28E+05	
			176.60	-5.029E-01	?(	4.041E+00	3.09E+02	1.70E+01 G
			227.00	4.640E+00		1.127E+01	9.90E+01	6.30E+00 GA
Cf-249	T	-6.6601E-02					1.28E+05	
			387.95	-6.660E-02	&(	2.031E+00	8.89E+02	6.60E+01 G
			333.44	-2.905E+00	+	1.352E+01	1.39E+02	1.55E+01 G
Sn-126		-4.3598E+00					3.65E+07	
			87.57	-8.742E-01	}	6.749E+00	2.32E+02	3.75E+01 GA
			64.28	-4.360E+00	?(	1.573E+01	1.08E+02	9.70E+00 G
			86.94	-3.636E+00	+	2.888E+01	2.39E+02	9.04E+00 GA
PB-210	N	2.3506E+01					8.14E+03	
			46.54	2.351E+01	(	1.752E+01	2.82E+01	4.25E+00 G
PB-212	N	1.7117E+01					6.98E+02	
			238.63	1.712E+01	(P	1.250E+00	4.93E+00	4.33E+01 G
			300.03	2.310E+01	+	1.863E+01	2.72E+01	3.28E+00 GA
PB-214	N	1.2116E+01					5.84E+05	
			351.93	1.232E+01	(P	1.426E+00	7.78E+00	3.76E+01 G
			295.09	1.172E+01	(P	3.380E+00	1.20E+01	1.93E+01 G
			242.00	2.046E+01	+	8.136E+00	1.50E+01	7.43E+00 GA
BI-207	C	7.8238E-02					1.18E+04	
			1063.66	-3.426E-03	%(P	1.460E+00	1.83E+04	7.45E+01 G
			569.70	1.405E-01	?(	1.121E+00	2.30E+02	9.77E+01 G
BI-212	N	2.0081E+01					6.98E+02	
			727.17	2.008E+01	(	6.937E+00	2.02E+01	7.55E+00 G
			785.42	4.050E+01	+ P	1.244E+02	9.15E+01	1.28E+00 GA
U-235	N	-3.0028E+00					2.57E+11	
			143.79	-3.003E+00	&(	1.364E+01	1.36E+02	1.10E+01 G
			205.33	2.886E-01	% P	1.663E+01	2.31E+03	5.01E+00 G
			163.38	-1.044E-01	%	1.987E+01	5.60E+03	5.08E+00 G
			185.72	1.472E+00	+	1.415E+00	3.89E+01	5.40E+01 GA
BI-214	N	1.3769E+01					5.84E+05	
			609.31	1.366E+01	(P	1.712E+00	8.51E+00	4.61E+01 G
			1120.29	1.411E+01	(P	5.463E+00	1.79E+01	1.51E+01 G
			1764.49	1.697E+01	+ P	8.896E+00	2.12E+01	1.54E+01 G
BI-210M	T	4.9080E-02					1.10E+09	
			265.83	4.908E-02	%(P	1.425E+00	1.15E+03	5.00E+01 G
			304.90	0.000E+00	-	6.932E+00	1.00E+03	2.80E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
AC-228	N	1.7738E+01					2.10E+03	
			911.07	1.761E+01	(P	2.693E+00	1.08E+01	2.90E+01 G
			968.97	1.825E+01	?(	7.868E+00	1.65E+01	1.75E+01 G
			338.32	1.731E+01	(	4.236E+00	1.34E+01	1.20E+01 G
			93.35	5.705E+00	- P	4.326E+01	2.28E+02	5.56E+00 XA
TH-227	N	3.5555E+00					7.95E+03	
			256.24	2.231E+00	&(	9.903E+00	1.78E+02	7.00E+00 G
			235.97	-2.645E+00	+	1.714E+01	1.94E+02	1.23E+01 G
			50.14	4.714E+00	?(	1.729E+01	1.09E+02	8.00E+00 G
TH-229	N	-2.3564E+00					2.68E+06	
			193.51	-2.356E+00	?(	1.816E+01	3.12E+02	4.40E+00 G
			210.85	-5.961E+00	+	3.085E+01	2.11E+02	2.99E+00 G
TH-234	N	1.5432E+01					1.63E+12	
			92.59	1.385E+01	(P	1.259E+01	2.90E+01	5.58E+00 G
			63.29	1.775E+01	(	2.025E+01	3.59E+01	3.81E+00 G
PA-231	N	-1.1973E+01					1.20E+07	
			302.65	-1.197E+01	?(	6.850E+01	1.71E+02	2.88E+00 G
			300.07	-1.357E+01	+	8.167E+01	1.80E+02	2.46E+00 G
PA-233	C	-2.1962E-02					7.82E+08	
			312.01	-2.196E-02	%(P	5.480E+00	3.56E+03	3.60E+01 G
			300.18	-5.520E+00	+	3.218E+01	1.74E+02	6.20E+00 G
PA-234	N	-1.4644E-01					1.63E+12	
			131.29	-1.600E+00	*(	7.600E+00	1.42E+02	1.80E+01 G
			946.02	1.806E+00	?(	7.089E+00	1.69E+02	1.34E+01 G
			569.47	0.000E+00	+	1.365E+01	1.00E+03	8.20E+00 G
			883.24	0.000E+00	+	1.546E+01	1.00E+03	9.60E+00 G
			880.53	4.239E+00	?	2.336E+01	1.60E+02	6.00E+00 GA
PA-234M	N	5.2024E+01					1.63E+12	
			1001.00	4.493E+00	%(P	1.677E+02	1.05E+03	8.37E-01 G
			766.41	1.873E+02	?(	4.609E+02	7.39E+01	2.94E-01 G
AM-241	T	-1.1976E+00					1.58E+05	
			59.54	-1.198E+00	(	4.180E+00	1.05E+02	3.59E+01 G
Np-237	F	-2.5151E+00					2.14E+06	
			86.49	-2.515E+00	&(	2.021E+01	2.42E+02	1.31E+01 G
Ir-192	F	4.6089E-01					7.40E+01	
			316.49	2.987E-01	(	8.935E-01	8.91E+01	8.70E+01 G
			468.06	7.337E-01	?(	2.218E+00	9.01E+01	5.18E+01 G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          308.44 0.000E+00 &   6.162E+00 1.00E+03 3.18E+01 G

Cs-136   F   3.5792E-01                                     1.30E+01
                          818.50 4.694E-01 &(  1.573E+00 9.93E+01 1.00E+02 G
                         1048.07 2.185E-01 ?(  1.817E+00 2.37E+02 8.00E+01 G
                          340.57-9.801E-01 &   4.439E+00 1.36E+02 4.69E+01 G

Np-239   T   1.3801E+00                                     2.36E+00
                          103.70 0.000E+00 -   9.831E+00 1.00E+03 2.40E+01 X
                          106.13 1.380E+00 &(  1.026E+01 2.24E+02 2.27E+01 G
                           99.50 0.000E+00 &   1.585E+01 1.00E+03 1.50E+01 X

Nd-147       4.1457E+00                                     1.11E+01
                          531.00 4.146E+00 &(  4.435E+00 4.66E+01 1.30E+01 G
                           91.10-1.143E+00 -   8.738E+00 2.30E+02 2.83E+01 G

TL-210   N   4.3343E-02                                     5.84E+05
                          799.60 4.334E-02 %(  1.833E+00 1.22E+03 9.90E+01 G
                          296.00-4.174E-01 +   2.559E+00 1.83E+02 7.90E+01 G
                         1313.00 1.245E+00 ?   5.458E+00 1.98E+02 2.10E+01 GA

Kr-85    I   4.3426E+01                                     3.92E+03
                          513.98 4.343E+01 ?(  3.536E+02 2.39E+02 4.30E-01 G
   ( - 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
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C - Charged Particle Reaction
M - No MDA Calculation
R - Coincidence Corrected
H - Halflife limit exceeded
K - Key Line
A - Not in Average
C - Coincidence Peak

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********** 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 1 Sigma %	Activity	
TH-227	50.14	222.	20.	0.011	109.46	4.714E+00	
AM-241	59.54	425.	-28.	-0.016	104.71	-1.198E+00	
Sn-126	64.28	525.	-30.	-0.017	108.32	-4.360E+00	
BA-133	80.99	2662.	-30.	-0.016	247.60	-9.979E-01	
Np-237	86.49	2565.	-30.	-0.017	241.84	-2.515E+00	
EU-155	86.54	2535.	-30.	-0.017	240.44	-1.073E+00	
Sn-126	86.94	2506.	-30.	-0.017	238.98	-3.636E+00	
Sn-126	87.57	2369.	-30.	-0.017	232.26	-8.742E-01	
Nd-147	91.10	2339.	-30.	-0.017	230.07	-1.143E+00	
Np-239	106.13	2236.	30.	0.017	223.56	1.380E+00	
EU-152	121.78	240.	-8.	-0.004	276.13	-2.931E-01	
EU-154	123.10	251.	-27.	-0.015	84.10	-7.036E-01	
PA-234	131.29	728.	-27.	-0.015	142.41	-1.600E+00	
HF-181	133.02	755.	-12.	-0.007	326.24	-2.953E-01	
Tc-99m	140.51	783.	-30.	-0.017	134.20	-3.746E-01	
U-235	143.79	813.	-30.	-0.017	136.30	-3.003E+00	
CE-141	145.44	944.	-31.	-0.017	143.10	-7.039E-01	
Ba-140	162.66	286.	-26.	-0.014	95.66	-4.867E+00	
CE-139	165.85	300.	-13.	-0.007	188.12	-1.933E-01	
U-235	185.72	154.	63.	0.035	38.95	1.472E+00	
TH-229	193.51	160.	-8.	-0.004	311.58	-2.356E+00	
TH-229	210.85	192.	-13.	-0.007	210.52	-5.961E+00	
TH-227	235.97	903.	-22.	-0.012	194.10	-2.645E+00	
EU-152	244.69	886.	-23.	-0.013	106.33	-4.617E+00	P
TH-227	256.24	80.	10.	0.006	177.95	2.231E+00	
Hg-203	279.20	151.	-20.	-0.011	90.57	-4.029E-01	
I-131	284.30	92.	-3.	-0.002	628.64	-8.188E-01	
PA-231	300.07	586.	-19.	-0.011	179.77	-1.357E+01	
PA-233	300.18	578.	-20.	-0.011	174.21	-5.520E+00	
PA-231	302.65	558.	-20.	-0.011	170.96	-1.197E+01	
BA-133	302.85	538.	-4.	-0.002	773.34	-4.059E-01	
Ir-192	316.49	75.	14.	0.008	89.07	2.987E-01	
CR-51	320.08	105.	-2.	-0.001	605.85	-4.409E-01	
La-140	328.76	575.	-24.	-0.013	142.72	-2.191E+00	
Cf-249	333.44	551.	-24.	-0.013	139.30	-2.905E+00	
Cs-136	340.57	527.	-24.	-0.013	135.60	-9.801E-01	
EU-152	344.29	503.	-24.	-0.013	132.17	-1.752E+00	
HF-181	345.83	478.	-24.	-0.014	128.88	-3.094E+00	
BA-133	356.00	373.	-19.	-0.011	145.89	-5.982E-01	
I-131	364.48	68.	-9.	-0.005	182.46	-2.193E-01	
BA-133	383.84	157.	-18.	-0.010	100.14	-4.208E+00	

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Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
Cf-249	387.95	176.	-2.	-0.001	889.41	-6.660E-02		
SN-113	391.69	153.	17.	0.010	105.03	5.607E-01		
SB-125	427.88	61.	-10.	-0.005	167.59	-7.284E-01		
PM-146	453.88	52.	-5.	-0.003	361.84	-1.836E-01		P
SB-125	463.37	96.	-13.	-0.007	110.14	-2.933E+00		
Ir-192	468.06	96.	16.	0.009	90.14	7.337E-01		
BE-7	477.60	112.	7.	0.004	207.11	1.683E+00		
La-140	487.02	102.	9.	0.005	159.15	4.933E-01		
RH-106	511.86	91.	66.	0.036	24.00	8.335E+00		
Nd-147	531.00	17.	21.	0.011	46.63	4.146E+00		
CS-134	563.24	38.	3.	0.002	416.00	1.029E+00		P
CS-134	569.32	51.	-15.	-0.009	70.84	-2.737E+00		
BI-207	569.70	64.	5.	0.003	230.07	1.405E-01		
SB-125	600.50	360.	14.	0.008	196.81	2.201E+00		
SB-124	602.73	374.	14.	0.008	200.21	4.017E-01		
CS-134	604.71	388.	4.	0.002	679.58	1.208E-01		
PM-144	618.06	228.	22.	0.012	100.78	6.379E-01		
RH-106	621.92	67.	-12.	-0.006	160.50	-3.422E+00		P
SB-125	635.89	23.	25.	0.014	33.18	6.674E+00		
I-131	636.97	63.	-15.	-0.008	127.75	-6.074E+00		P
AG-110M	657.76	120.	-22.	-0.012	85.23	-7.076E-01		P
CS-137	661.66	161.	-23.	-0.013	79.62	-8.454E-01		P
PM-144	696.54	62.	15.	0.008	81.05	4.674E-01		
NB-94	702.63	75.	7.	0.004	183.52	2.241E-01		
SB-124	722.79	129.	-18.	-0.010	94.61	-5.332E+00		
AG-108M	722.94	112.	-18.	-0.010	88.39	-6.346E-01		
EU-154	723.36	94.	-13.	-0.007	107.58	-2.143E+00		
ZR-95	724.20	74.	9.	0.005	134.68	6.946E-01		
PM-146	735.72	47.	-12.	-0.007	157.09	-1.760E+00		P
PM-146	747.16	9.	15.	0.008	51.33	1.451E+00		
ZR-95	756.73	35.	5.	0.003	263.94	3.119E-01		
AG-110M	763.94	90.	-22.	-0.012	64.71	-3.373E+00		
NB-95	765.79	98.	13.	0.007	111.52	4.452E-01		
PA-234M	766.41	62.	16.	0.009	73.88	1.873E+02		
EU-152	778.92	55.	-19.	-0.011	89.08	-5.084E+00		
CS-134	795.87	100.	-18.	-0.010	81.12	-7.517E-01		
CS-134	801.95	89.	16.	0.009	87.05	6.538E+00		
CO-58	810.78	90.	-17.	-0.010	80.75	-6.264E-01		
La-140	815.77	107.	-10.	-0.005	156.04	-1.484E+00		
Cs-136	818.50	77.	13.	0.007	99.30	4.694E-01		
MN-54	834.85	25.	10.	0.005	119.90	3.502E-01		P
NB-94	871.10	63.	-17.	-0.010	69.23	-6.566E-01		
EU-154	873.23	74.	5.	0.003	232.68	1.648E+00		
PA-234	880.53	53.	7.	0.004	159.69	4.239E+00		
Sc-46	889.28	93.	-17.	-0.009	83.92	-6.540E-01		
Y-88	898.04	26.	4.	0.002	266.40	1.748E-01		P
AG-110M	937.49	65.	-22.	-0.012	82.82	-2.581E+00		
PA-234	946.02	20.	6.	0.003	168.87	1.806E+00		

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
EU-152	964.11	86.	9.	0.005	152.79	2.462E+00		
EU-154	996.33	32.	11.	0.006	79.38	4.320E+00		
EU-154	1004.77	22.	4.	0.002	306.14	8.381E-01		
Cs-136	1048.07	43.	4.	0.002	237.17	2.185E-01		
RH-106	1050.36	38.	8.	0.004	117.12	2.198E+01		
Ga-68	1077.40	48.	-20.	-0.011	83.84	-3.076E+01		
FE-59	1099.25	16.	8.	0.004	119.02	6.425E-01		
EU-152	1112.07	108.	-6.	-0.003	266.95	-1.868E+00		
Sc-46	1120.55	122.	-17.	-0.010	92.56	-8.060E-01		
CO-60	1173.24	43.	-14.	-0.008	111.96	-6.536E-01		
FE-59	1291.60	28.	-14.	-0.008	91.01	-1.712E+00		
CO-60	1332.50	6.	6.	0.004	96.69	3.351E-01		
AG-110M	1384.30	17.	-1.	-0.001	972.11	-2.246E-01		
EU-152	1408.00	11.	8.	0.004	109.13	2.019E+00		
La-140	1596.21	25.	-12.	-0.006	178.11	-7.467E-01	P	
SB-124	1690.98	6.	-3.	-0.002	195.32	-4.480E-01		

P - Peakbackground subtraction

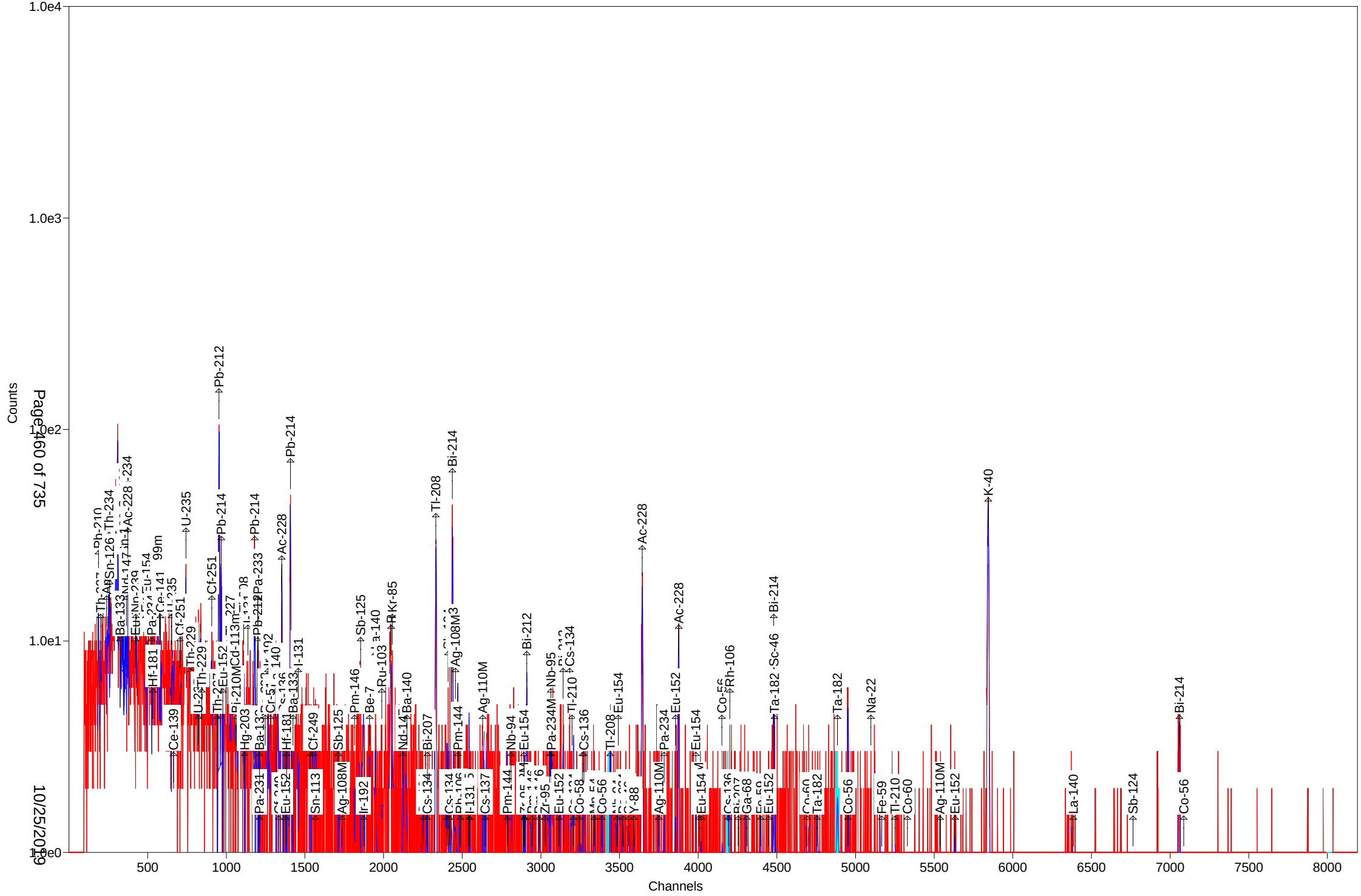
***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity Bq/Sample	Time Corrected Activity Bq/Sample	Uncertainty Counting	1 Sigma	MDA Bq/Sample
BE-7	#A	1.6828E+00	1.6828E+00	2.071E+02%		1.19E+01
NA-22	#A	1.7026E-02	1.7026E-02	2.027E+03%		1.27E+00
K-40		2.2155E+02	2.2155E+02	4.985E+00%		7.64E+00
Sc-46	#A	-6.5398E-01	-6.5398E-01	8.392E+01%		1.84E+00
CR-51	#A	-4.4087E-01	-4.4087E-01	6.058E+02%		9.25E+00
MN-54	#A	3.5022E-01	3.5022E-01	1.199E+02%		9.60E-01
FE-59	#A	6.4249E-01	6.4249E-01	1.190E+02%		1.71E+00
Co-56	#C	1.1942E+00	1.1942E+00	3.606E+01%		9.71E-01
CO-57	#A	0.0000E+00	0.0000E+00	7.071E+02%		9.31E-01
CO-58	#A	-6.2644E-01	-6.2644E-01	8.075E+01%		1.69E+00
CO-60	#A	3.3512E-01	3.3512E-01	9.669E+01%		7.30E-01
ZN-65	#A	0.0000E+00	0.0000E+00	1.000E+03%		4.52E+00
NB-94	#A	2.2410E-01	2.2410E-01	1.835E+02%		1.41E+00
ZR-95	#A	4.8324E-01	4.8324E-01	1.347E+02%		1.89E+00
NB-95	#A	4.4522E-01	4.4522E-01	1.115E+02%		1.68E+00
RU-103	#A	-3.6450E-02	-3.6450E-02	1.011E+03%		9.13E-01
RH-106	#A	2.7175E-02	2.7175E-02	9.934E+01%		1.20E+01
AG-108M	#A	8.2999E-03	8.2999E-03	3.610E+03%		7.51E-01
AG-110M	#A	0.0000E+00	0.0000E+00	1.000E+03%		2.04E+00
SN-113	#A	5.6066E-01	5.6066E-01	1.050E+02%		1.98E+00
SB-124	#A	4.0175E-01	4.0175E-01	2.002E+02%		2.71E+00
SB-125	#A	1.5866E+00	1.5866E+00	3.318E+01%		2.94E+00
I-131	#A	-2.1929E-01	-2.1929E-01	1.825E+02%		1.00E+00
Gd-153	#A	0.0000E+00	0.0000E+00	7.071E+02%		7.96E+00

Ga-68	#A	-3.0668E+01	-3.0757E+01	8.384E+01%	5.52E+01
Tc-99m	#A	-3.7436E-01	-3.7456E-01	1.342E+02%	1.67E+00
BA-133	#A	-5.9820E-01	-5.9820E-01	1.459E+02%	2.93E+00
CS-134	#A	1.0915E-02	1.0915E-02	8.112E+01%	2.04E+00
CS-137	#A	-8.4539E-01	-8.4539E-01	7.962E+01%	2.23E+00
CE-139	#A	-1.9330E-01	-1.9330E-01	1.881E+02%	1.23E+00
Ba-140	#A	-4.4589E-02	-4.4590E-02	4.497E+03%	3.45E+00
La-140	#A	-3.4628E-01	-3.4629E-01	1.194E+02%	1.66E+00
CE-141	#A	-7.0386E-01	-7.0386E-01	1.431E+02%	3.35E+00
CE-144	#A	0.0000E+00	0.0000E+00	1.000E+03%	1.27E+01
PM-144	#A	5.5269E-01	5.5269E-01	6.467E+01%	1.27E+00
EU-152	#A	6.3864E-01	6.3864E-01	1.528E+02%	2.74E+00
EU-154	#A	6.4173E-01	6.4173E-01	7.938E+01%	1.97E+00
EU-155	#A	-2.5498E-02	-2.5498E-02	1.302E+04%	1.11E+01
HF-181	#A	0.0000E+00	0.0000E+00	7.071E+02%	1.62E+00
Ta-182	A	1.6446E+00	1.6446E+00	9.490E+01%	6.37E+00
Hg-203	#A	-4.0289E-01	-4.0289E-01	9.057E+01%	1.22E+00
TL-208		5.7881E+00	5.7881E+00	8.762E+00%	6.85E-01
PM-146	#A	3.7787E-01	3.7787E-01	5.133E+01%	1.30E+00
Y-88	#A	8.4886E-02	8.4886E-02	2.664E+02%	5.11E-01
Cd-113m	#B	8.8455E+01	8.8455E+01	4.586E+03%	1.41E+04
Cd-109	#A	0.0000E+00	0.0000E+00	1.000E+03%	6.80E+01
Cf-251	A	-5.0291E-01	-5.0291E-01	3.094E+02%	4.04E+00
Cf-249	#A	-6.6601E-02	-6.6601E-02	8.894E+02%	2.03E+00
Sn-126	#A	-4.3598E+00	-4.3598E+00	1.083E+02%	1.57E+01
PB-210		2.3506E+01	2.3506E+01	2.820E+01%	1.75E+01
PB-212		1.7117E+01	1.7117E+01	4.933E+00%	1.25E+00
PB-214		1.2116E+01	1.2116E+01	7.129E+00%	1.43E+00
BI-207	#A	7.8238E-02	7.8238E-02	2.301E+02%	1.46E+00
BI-212		2.0081E+01	2.0081E+01	2.016E+01%	6.94E+00
U-235	#A	-3.0028E+00	-3.0028E+00	1.363E+02%	1.36E+01
BI-214		1.3769E+01	1.3769E+01	8.507E+00%	1.71E+00
BI-210M	#A	4.9080E-02	4.9080E-02	1.149E+03%	1.43E+00
AC-228		1.7738E+01	1.7738E+01	7.957E+00%	2.69E+00
TH-227	#A	3.5555E+00	3.5555E+00	1.045E+02%	9.90E+00
TH-229	#A	-2.3564E+00	-2.3564E+00	3.116E+02%	1.82E+01
TH-234		1.5432E+01	1.5432E+01	2.307E+01%	1.26E+01
PA-231	#A	-1.1973E+01	-1.1973E+01	1.710E+02%	6.85E+01
PA-233	#A	-2.1962E-02	-2.1962E-02	3.563E+03%	5.48E+00
PA-234	#A	-1.4644E-01	-1.4644E-01	1.105E+02%	7.60E+00
PA-234M	#A	5.2024E+01	5.2024E+01	7.388E+01%	1.68E+02
AM-241	#A	-1.1976E+00	-1.1976E+00	1.047E+02%	4.18E+00
Np-237	#A	-2.5151E+00	-2.5151E+00	2.418E+02%	2.02E+01
Ir-192	#A	4.6089E-01	4.6089E-01	6.336E+01%	8.94E-01
Cs-136	#A	3.5792E-01	3.5792E-01	9.930E+01%	1.57E+00
Np-239	#A	1.3800E+00	1.3801E+00	2.236E+02%	1.03E+01
Nd-147	#A	4.1457E+00	4.1457E+00	4.663E+01%	4.44E+00
TL-210	#A	4.3343E-02	4.3343E-02	1.219E+03%	1.83E+00
Kr-85	#A	4.3426E+01	4.3426E+01	2.388E+02%	3.54E+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 (   25.1 to  1999.3 keV)     3.471E+02  Bq/Sample
Total Decayed Activity (   25.1 to  1999.3 keV) 3.4709726E+02  Bq/Sample
```

444057_Gamma_180-95857-A-10-B. 9_Gamma_20192875.spc.



Sample Description: 444057_Gamma_180-95857-A-11-B
Detector: Detector #12
Batch ID: 444057
Work Order Number: Gamma
Lot Number: 180-95857-A-11-B

Decay to Time: 10/15/2019 11:59 Live Time: 1800 sec
Acquisition Time: 10/15/2019 11:59:19 Real Time: 1801 sec
Analysis Time: 10/15/2019 12:29 Dead Time: 0.08 %
Analysis Quantity: 1.000E+00 Sample

Efficiency Cal File: 12_Soil_TunaCan.Clb
Efficiency Cal Desc: 12_TunaCan_108513
Efficiency Cal Date: 4/20/2018 11:53
Energy Cal Date: 4/20/2018 11:13
Library: Client_Long_Rev15.lib
Bkgd Correction File: 12_2019-10-06_1923.PBC

Nuclide	Activity Bq/Sample	1-Sigma Counting Uncert %	1-Sigma Counting Uncert Bq/Sample	1-Sigma Total Uncert Bq/Sample	Minimum Detectable Activity Bq/Sample
BE-7	1.081E+00	389.6	4.212E+00	4.213E+00	1.462E+01
NA-22	4.895E-01	61.4	3.005E-01	3.015E-01	9.696E-01
K-40	1.901E+02	6.5	1.231E+01	1.561E+01	9.086E+00
Sc-46	1.141E-01	65.1	7.424E-02	7.446E-02	2.042E+00
CR-51	8.431E-02	8440.7	7.117E+00	7.117E+00	2.413E+01
MN-54	-8.569E-02	555.3	4.759E-01	4.759E-01	1.174E+00
FE-59	6.670E-01	156.9	1.047E+00	1.047E+00	2.373E+00
Co-56	7.454E-01	83.9	6.255E-01	6.267E-01	1.352E+00
CO-57	5.472E-01	94.5	5.173E-01	5.181E-01	8.918E-01
CO-58	-7.416E-01	82.9	6.149E-01	6.160E-01	2.060E+00
CO-60	3.718E-01	95.6	3.554E-01	3.559E-01	1.337E+00
ZN-65	-9.670E-01	170.7	1.651E+00	1.652E+00	5.658E+00
NB-94	4.539E-01	61.2	2.778E-01	2.787E-01	1.169E+00
ZR-95	9.436E-01	90.7	8.557E-01	8.571E-01	2.008E+00
NB-95	4.523E-01	87.2	3.942E-01	3.949E-01	1.335E+00
RU-103	1.547E-01	244.9	3.790E-01	3.791E-01	9.879E-01
RH-106	4.607E+00	194.2	8.945E+00	8.948E+00	3.025E+01
AG-108M	2.075E-01	154.1	3.197E-01	3.199E-01	1.019E+00
AG-110M	1.810E-01	122.1	2.209E-01	2.211E-01	2.505E+00
SN-113	-4.701E-01	190.4	8.950E-01	8.953E-01	3.033E+00
SB-124	-3.151E-02	90.5	2.852E-02	2.857E-02	1.422E+00
SB-125	2.215E+00	28.5	6.314E-01	6.412E-01	4.241E+00
I-131	2.039E-01	229.7	4.685E-01	4.686E-01	1.189E+00
Gd-153	9.857E-01	144.3	1.422E+00	1.423E+00	4.764E+00
Ga-68	1.969E+01	88.8	1.749E+01	1.753E+01	3.917E+01
Tc-99m	-3.585E-01	165.7	5.942E-01	5.946E-01	1.988E+00
BA-133	-7.315E-01	143.1	1.047E+00	1.048E+00	3.518E+00
CS-134	5.575E-01	102.3	5.704E-01	5.711E-01	1.921E+00
CS-137	-4.078E-01	136.9	5.585E-01	5.588E-01	1.916E+00
CE-139	3.165E-01	120.1	3.801E-01	3.804E-01	1.279E+00
Ba-140	1.736E+00	71.2	1.236E+00	1.239E+00	2.510E+00
La-140	1.724E-01	305.9	5.273E-01	5.274E-01	1.243E+00
CE-141	6.290E-01	160.9	1.012E+00	1.012E+00	3.388E+00

CE-144	2.561E+00	159.7	4.090E+00	4.092E+00	1.371E+01
PM-144	3.113E-01	150.4	4.682E-01	4.684E-01	1.149E+00
EU-152	1.297E+00	86.8	1.125E+00	1.127E+00	3.623E+00
EU-154	1.229E+00	76.3	9.381E-01	9.403E-01	1.698E+00
EU-155	0.000E+00	1.#INF	8.728E-01	8.728E-01	6.907E+00
HF-181	7.292E-01	83.6	6.100E-01	6.111E-01	1.648E+00
Ta-182	2.377E+00	82.6	1.965E+00	1.968E+00	6.594E+00
Hg-203	-5.569E-02	721.1	4.016E-01	4.016E-01	1.392E+00
TL-208	4.899E+00	10.6	5.196E-01	5.762E-01	5.727E-01
PM-146	5.051E-02	1179.0	5.955E-01	5.955E-01	1.549E+00
Y-88	2.809E-02	703.0	1.975E-01	1.975E-01	7.036E-01
Cd-113m	-6.467E+03	93.5	6.050E+03	6.061E+03	2.027E+04
Cd-109	9.542E+00	153.4	1.464E+01	1.464E+01	4.889E+01
Cf-251	1.385E+00	142.7	1.977E+00	1.978E+00	5.104E+00
Cf-249	-7.975E-01	111.9	8.923E-01	8.932E-01	2.994E+00
Sn-126	-7.972E-01	723.0	5.763E+00	5.764E+00	1.946E+01
PB-210	1.905E+01	63.6	1.212E+01	1.218E+01	3.480E+01
PB-212	1.470E+01	6.5	9.600E-01	1.228E+00	1.711E+00
PB-214	1.204E+01	8.5	1.021E+00	1.189E+00	1.993E+00
BI-207	1.152E+00	26.7	3.079E-01	3.132E-01	6.064E-01
BI-212	2.434E+01	22.5	5.480E+00	5.619E+00	1.052E+01
U-235	1.135E+00	104.5	1.187E+00	1.188E+00	1.563E+01
BI-214	1.239E+01	9.7	1.196E+00	1.352E+00	1.811E+00
BI-210M	-1.821E-01	379.9	6.916E-01	6.917E-01	2.379E+00
AC-228	1.557E+01	10.2	1.591E+00	1.776E+00	2.234E+00
TH-227	3.220E+00	104.0	3.350E+00	3.354E+00	1.202E+01
TH-229	2.009E+00	103.9	2.087E+00	2.089E+00	2.138E+01
TH-234	9.823E+00	49.3	4.844E+00	4.874E+00	1.665E+01
PA-231	3.020E+00	781.9	2.361E+01	2.361E+01	7.989E+01
PA-233	0.000E+00	1.#INF	1.678E-01	1.678E-01	6.569E+00
PA-234	1.184E+00	116.9	1.384E+00	1.386E+00	7.312E+00
PA-234M	6.071E+01	76.1	4.622E+01	4.632E+01	1.947E+02
AM-241	-1.887E-01	857.8	1.619E+00	1.619E+00	5.472E+00
Np-237	2.585E+00	163.9	4.236E+00	4.238E+00	1.416E+01
Ir-192	2.829E-01	100.1	2.833E-01	2.838E-01	2.747E+00
Cs-136	6.305E-01	103.5	6.524E-01	6.534E-01	2.205E+00
Np-239	-1.411E+00	140.3	1.980E+00	1.981E+00	6.623E+00
Nd-147	3.221E+00	96.5	3.109E+00	3.114E+00	7.522E+00
TL-210	2.769E-01	167.1	4.628E-01	4.631E-01	1.611E+00
Kr-85	-2.795E+00	5082.3	1.420E+02	1.420E+02	4.905E+02
Total	4.395E+02				

Analyst: Caleb Quinn

Sample description
444057_Gamma_180-95857-A-11-B

Spectrum Filename: C:\User\SPC\Det12\12_Gamma_20192674.An1

Acquisition information

Start time:	10/15/2019 11:59:19 AM
Live time:	1800
Real time:	1801
Dead time:	0.08 %
Detector ID:	12

Detector system
Ge12 S/N10034336

Calibration

Filename:	12_Soil_TunaCan.Clb

12_TunaCan_108513

Energy Calibration

Created:	4/20/2018 11:13:27 AM
Zero offset:	0.059 keV
Gain:	0.250 keV/channel
Quadratic:	-3.735E-08 keV/channel^2

Efficiency Calibration

Created:	4/20/2018 11:53:09 AM
Type:	Polynomial
Uncertainty:	1.020 %
Coefficients:	-0.363508 -4.707999 0.462125
	-0.051256 0.002384 -0.000043

Library Files

Main analysis library:	Client_Long_Rev15.lib
Library Match Width:	0.500
Peak stripping:	Library based

Analysis parameters

Analysis engine:	Env32 G800W064
Start channel:	100 (25.08keV)
Stop channel:	8000 (1999.13keV)
Peak rejection level:	1000.000%
Peak search sensitivity:	3
Sample Size:	1.0000E+00 +/- 0.000E+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:	4.0000000E+00
Systematic error:	4.0000000E+00
Fraction Limit:	0.000%
Background width:	3
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:	YES	10/15/2019 11:59:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	12_2019-10-06_1923.PBC 10/6/2019 7:23:34 PM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 29 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 0.1465

***** 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
46.67	26.	63.62	1.01	1.805E-02	46.54	4.250	PBC<MDA	PB210
63.62	67.	33.30	0.59	2.987E-02	63.29	3.810	PBC<MDA	TH234
					64.28	9.700	1.279E+01	Sn126
74.85	138.	15.90	0.88	3.334E-02				
77.23	183.	11.36	0.88	3.389E-02				
87.34	81.	20.95	0.89	3.571E-02	86.49	13.100	9.606E+00	Np237
					86.54	30.700	4.098E+00	EU155
					86.94	9.040	1.389E+01	Sn126
					87.57	37.500	3.341E+00	Sn126
					88.04	3.790	3.300E+01	Cd109
89.93	67.	23.94	0.90	3.606E-02				
92.57	22.	85.13	0.90	3.637E-02	92.59	5.584	PBC<MDA	TH234
93.33	24.	147.31	0.90	3.645E-02	93.35	5.561	PBC<MDA	AC228
97.50	20.	144.26	0.90	3.683E-02	97.50	30.000	PBC<MDA	Gd153
99.50	10.	276.98	0.91	3.697E-02	99.50	15.000	PBC<MDA	Np239
122.06	16.	94.54	0.93	3.724E-02	121.78	28.580	PBC<MDA	EU152
					122.06	85.600	2.811E-01	CO57
123.10	14.	95.50	0.93	3.721E-02	123.10	40.790	PBC<MDA	EU154
133.02	19.	160.33	0.94	3.673E-02	133.02	43.300	PBC<MDA	HF181
133.84	19.	159.72	0.94	3.670E-02	133.54	11.090	PBC<MDA	CE144
136.30	19.	162.55	0.94	3.652E-02	136.30	5.850	PBC<MDA	HF181
					136.47	10.680	2.681E+00	CO57
136.47	19.	165.79	0.94	3.651E-02	136.30	5.850	PBC<MDA	HF181
					136.47	10.680	2.681E+00	CO57
145.44	20.	160.89	0.95	3.586E-02	145.44	48.200	PBC<MDA	CE141
162.66	11.	147.81	0.97	3.435E-02	162.66	6.220	PBC<MDA	Ba140
165.85	16.	120.09	0.97	3.405E-02	165.85	79.900	PBC<MDA	CE139

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
177.57	14.	142.68	0.98	3.303E-02	176.60	17.000	PBC<MDA	Cf251
185.72	40.	55.48	0.99	3.215E-02	185.72	54.000	PBC<MDA	U235
205.33	18.	104.55	1.01	3.030E-02	205.33	5.010	PBC<MDA	U235
210.85	19.	103.90	1.02	2.980E-02	210.85	2.990	PBC<MDA	TH229
235.97	15.	221.00	1.04	2.764E-02	235.97	12.300	PBC<MDA	TH227
238.60	314.	6.53	1.05	2.743E-02	238.63	43.300	1.470E+01	PB212
241.87	71.	19.20	1.05	2.717E-02	242.00	7.430	1.960E+01	PB214
244.69	17.	200.29	1.05	2.695E-02	244.69	7.580	PBC<MDA	EU152
256.24	15.	104.04	1.06	2.608E-02	256.24	7.000	PBC<MDA	TH227
278.45	3.	450.92	1.08	2.462E-02	277.28	6.310	PBC<MDA	TL208
295.15	111.	13.67	0.94	2.350E-02	295.09	19.300	1.363E+01	PB214
					296.00	79.000	3.337E+00	TL210
300.31	20.	6.90	1.11	2.321E-02	300.03	3.280	PBC<MDA	PB212
					300.07	2.460	1.960E+01	PA231
					300.18	6.200	7.778E+00	PA233
302.93	4.	781.86	1.11	2.306E-02	302.65	2.880	PBC<MDA	PA231
					302.85	18.330	4.747E-01	BA133
328.76	4.	305.91	1.13	2.165E-02	328.76	20.300	PBC<MDA	La140
338.38	74.	16.33	0.80	2.118E-02	338.32	12.010	1.616E+01	AC228
351.84	156.	10.03	1.28	2.056E-02	351.93	37.600	1.123E+01	PB214
364.48	6.	229.73	1.17	2.001E-02	364.48	81.700	PBC<MDA	I131
463.37	12.	91.53	1.27	1.666E-02	463.37	10.470	PBC<MDA	SB125
468.06	12.	100.14	1.27	1.653E-02	468.06	51.750	PBC<MDA	Ir192
477.60	3.	389.61	1.28	1.628E-02	477.60	10.520	PBC<MDA	BE7
482.00	11.	104.13	1.28	1.617E-02	482.00	80.500	PBC<MDA	HF181
497.05	4.	244.95	1.30	1.580E-02	497.05	90.900	PBC<MDA	RU103
511.86	52.	28.70	2.56	1.546E-02	511.86	20.000	9.405E+00	RH106
531.00	11.	96.52	1.33	1.504E-02	531.00	13.000	PBC<MDA	Nd147
537.26	9.	71.18	1.34	1.491E-02	537.26	24.390	PBC<MDA	Ba140
569.16	4.	203.41	1.37	1.428E-02	569.32	15.380	PBC<MDA	CS134
					569.47	8.200	1.977E+00	PA234
					569.70	97.740	1.659E-01	BI207
569.32	2.	362.81	1.37	1.428E-02	569.32	15.380	PBC<MDA	CS134
					569.47	8.200	1.107E+00	PA234
					569.70	97.740	9.292E-02	BI207
583.06	107.	10.60	0.95	1.403E-02	583.02	84.500	5.006E+00	TL208
600.50	23.	28.51	1.40	1.373E-02	600.50	17.860	5.211E+00	SB125
609.37	140.	9.65	1.09	1.358E-02	609.31	46.090	1.239E+01	BI214
					610.30	5.750	9.939E+01	RU103
618.06	10.	200.27	1.41	1.344E-02	618.06	99.100	PBC<MDA	PM144
621.92	11.	194.16	1.42	1.338E-02	621.92	9.930	PBC<MDA	RH106
657.76	7.	122.06	1.45	1.284E-02	657.76	94.640	PBC<MDA	AG110M
696.54	5.	224.40	1.49	1.232E-02	696.54	99.000	PBC<MDA	PM144
702.63	12.	93.03	1.49	1.224E-02	702.63	97.900	PBC<MDA	NB94
722.79	7.	145.15	1.51	1.199E-02	722.79	10.810	PBC<MDA	SB124
					722.94	90.840	3.791E-01	AG108M
					723.36	20.220	1.704E+00	EU154
722.94	7.	154.12	1.51	1.199E-02	722.79	10.810	3.186E+00	SB124

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
					722.94	90.840	3.792E-01	AG108M
					723.36	20.220	1.704E+00	EU154
723.36	5.	258.54	1.51	1.199E-02	722.79	10.810	PBC<MDA	SB124
					722.94	90.840	2.362E-01	AG108M
					723.36	20.220	1.062E+00	EU154
727.32	40.	22.51	1.79	1.194E-02	727.17	7.550	2.434E+01	BI212
756.73	11.	90.69	1.54	1.160E-02	756.73	54.460	PBC<MDA	ZR95
765.79	9.	87.16	1.55	1.150E-02	765.79	99.790	PBC<MDA	NB95
					766.41	0.294	1.536E+02	PA234M
766.41	9.	76.13	1.55	1.150E-02	765.79	99.790	PBC<MDA	NB95
					766.41	0.294	1.537E+02	PA234M
778.92	5.	224.40	1.56	1.136E-02	778.92	12.940	PBC<MDA	EU152
795.87	10.	102.33	1.58	1.119E-02	795.87	85.530	PBC<MDA	CS134
799.60	6.	167.13	1.58	1.115E-02	799.60	98.960	PBC<MDA	TL210
818.50	12.	103.48	1.60	1.096E-02	818.50	100.000	PBC<MDA	Cs136
846.77	7.	161.52	1.63	1.070E-02	846.77	99.935	PBC<MDA	Co56
861.35	10.	91.97	1.64	1.057E-02	860.56	12.420	PBC<MDA	TL208
871.10	7.	79.54	1.65	1.048E-02	871.10	99.890	PBC<MDA	NB94
883.70	7.	142.14	1.66	1.038E-02	883.24	9.600	PBC<MDA	PA234
898.04	1.	988.26	1.67	1.025E-02	898.04	93.700	PBC<MDA	Y88
911.36	81.	12.30	1.92	1.015E-02	911.07	29.000	1.532E+01	AC228
944.57	3.	238.82	1.72	9.873E-03	946.02	13.400	PBC<MDA	PA234
964.11	10.	140.97	1.73	9.739E-03	964.11	14.605	PBC<MDA	EU152
969.33	80.	13.46	1.74	9.703E-03	968.97	17.460	2.623E+01	AC228
996.33	9.	81.09	1.76	9.508E-03	996.33	10.600	PBC<MDA	EU154
1001.00	4.	196.56	1.76	9.476E-03	1001.00	0.837	PBC<MDA	PA234M
1037.84	6.	156.94	1.80	9.228E-03	1037.84	14.130	PBC<MDA	Co56
1048.07	2.	434.05	1.81	9.162E-03	1048.07	80.000	PBC<MDA	Cs136
1063.66	14.	26.73	1.82	9.063E-03	1063.66	74.500	1.152E+00	BI207
1077.40	9.	88.84	1.83	8.978E-03	1077.40	3.300	PBC<MDA	Ga68
1099.25	6.	156.94	1.85	8.846E-03	1099.25	56.500	PBC<MDA	FE59
1120.30	13.	92.13	1.87	8.722E-03	1120.29	15.100	PBC<MDA	BI214
					1120.55	99.987	8.290E-01	Sc46
1120.55	13.	82.89	1.87	8.721E-03	1120.29	15.100	5.489E+00	BI214
					1120.55	99.987	8.291E-01	Sc46
					1121.30	34.900	2.376E+00	Ta182
1121.41	13.	82.65	1.87	8.716E-03	1120.55	99.987	PBC<MDA	Sc46
					1121.30	34.900	2.377E+00	Ta182
1173.24	8.	95.58	1.92	8.426E-03	1173.24	99.900	PBC<MDA	CO60
1221.41	1.	841.87	1.96	8.175E-03	1221.41	27.000	PBC<MDA	Ta182
1238.28	9.	112.49	1.97	8.090E-03	1238.28	66.070	PBC<MDA	Co56
1274.53	7.	61.39	2.00	7.914E-03	1274.53	99.940	PBC<MDA	NA22
					1274.54	35.190	1.390E+00	EU154
1274.54	5.	103.17	2.00	7.914E-03	1274.53	99.940	PBC<MDA	NA22
					1274.54	35.190	1.070E+00	EU154
1332.50	3.	302.33	2.05	7.647E-03	1332.50	99.980	PBC<MDA	CO60
1408.00	4.	215.06	2.12	7.324E-03	1408.00	21.005	PBC<MDA	EU152
1460.97	260.	6.48	2.00	7.112E-03	1460.83	10.670	1.901E+02	K40

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1596.21	1.	600.00	2.27	6.616E-03	1596.21	95.400	PBC<MDA	La140
1764.49	28.	24.26	2.40	6.075E-03	1764.49	15.400	1.633E+01	BI214
1771.35	3.	334.01	2.41	6.055E-03	1771.35	15.480	PBC<MDA	Co56

********** 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	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide
298.92	74.89	173.	138.	4.148E+03	15.92	0.880	- sD
308.45	77.27	119.	188.	5.549E+03	10.99	0.883	- D
359.09	89.91	125.	49.	1.366E+03	35.07	0.896	- D

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

This section based on library: Client_Long_Rev15.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 1 Sigma %	FWHM keV
PB-210	186.33	46.67	95.	26.	0.015	63.62	1.011
TH-227	200.18	50.14	268.	-18.	-0.010	128.60	0.855s
AM-241	237.74	59.54	432.	-3.	-0.002	857.81	0.865s
TH-234	252.74	63.29	109.	32.	0.018	49.78	0.868D
Sn-126	256.71	64.28	458.	-4.	-0.002	722.97	0.869s
BA-133	323.50	80.99	936.	-27.	-0.015	162.23	0.887s
Np-237	345.49	86.49	621.	22.	0.012	163.88	0.892A
EU-155	345.70	86.54	696.	-24.	-0.013	155.43	0.892s
Sn-126	347.29	86.94	662.	-11.	-0.006	344.43	0.892
Sn-126	349.81	87.57	603.	24.	0.013	77.16	0.893D
Cd-109	351.68	88.04	628.	23.	0.013	153.38	0.894A
Nd-147	363.92	91.10	651.	0.	0.000	1000.00	0.897s
TH-234	369.87	92.59	156.	22.	0.012	85.13	0.898D
AC-228	372.91	93.35	634.	24.	0.014	147.31	0.899
Gd-153	389.50	97.50	390.	20.	0.011	144.26	0.903
Np-239	397.50	99.50	410.	10.	0.006	276.98	0.905
Gd-153	412.29	103.20	420.	0.	0.000	1000.00	0.909s
Np-239	414.29	103.70	420.	0.	0.000	1000.00	0.909s
EU-155	420.73	105.31	420.	0.	0.000	1000.00	0.911s
Np-239	424.00	106.13	444.	-21.	-0.012	140.32	0.912s
EU-152	486.56	121.78	205.	-21.	-0.011	100.51	0.928s
CO-57	487.69	122.06	108.	16.	0.009	94.54	0.928s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
EU-154	491.84	123.10	88.	14.	0.008	95.50	0.929s
PA-234	524.60	131.29	329.	-8.	-0.005	316.28	0.938s
HF-181	531.51	133.02	442.	19.	0.010	160.33	0.939s
CE-144	533.57	133.54	440.	19.	0.010	159.72	0.940s
HF-181	544.61	136.30	458.	19.	0.010	162.55	0.943s
CO-57	545.30	136.47	477.	19.	0.010	165.79	0.943s
Tc-99m	561.44	140.51	555.	-20.	-0.011	165.74	0.947s
U-235	574.53	143.79	540.	-10.	-0.005	195.29	0.950
CE-141	581.15	145.44	486.	20.	0.011	160.89	0.952
Ba-140	649.99	162.66	127.	11.	0.006	147.81	0.969s
U-235	652.87	163.38	159.	-11.	-0.006	158.09	0.970s
CE-139	662.76	165.85	166.	16.	0.009	120.09	0.973s
Cf-251	705.72	176.60	110.	14.	0.008	142.68	0.983
U-235	742.18	185.72	138.	40.	0.022	55.48	0.992s
TH-229	773.32	193.51	117.	-11.	-0.006	181.26	1.000s
U-235	820.59	205.33	95.	18.	0.010	104.55	1.012
TH-229	842.65	210.85	103.	19.	0.010	103.90	1.018s
Cf-251	907.22	227.00	114.	-20.	-0.011	102.20	1.034s
TH-227	943.09	235.97	569.	15.	0.009	221.00	1.043s
PB-212	953.73	238.63	53.	314.	0.175	6.53	1.045D
PB-214	967.18	242.00	516.	15.	0.009	209.32	1.049s
EU-152	977.96	244.69	554.	17.	0.009	200.29	1.051s
TH-227	1024.13	256.24	62.	15.	0.008	104.04	1.063s
Cd-113m	1053.96	263.70	130.	-18.	-0.010	93.55	1.070s
BI-210M	1062.48	265.83	123.	-4.	-0.002	379.90	1.072s
TL-208	1108.27	277.28	90.	3.	0.002	450.92	1.084
Hg-203	1115.93	279.20	103.	-2.	-0.001	721.11	1.086s
I-131	1136.32	284.30	81.	-18.	-0.010	97.44	1.091
PB-214	1179.71	295.15	32.	111.	0.062	13.67	0.942s
TL-210	1183.11	296.00	413.	-13.	-0.007	225.30	1.102s
PB-212	1199.22	300.03	33.	20.	0.011	6.90	1.107A
PA-231	1199.38	300.07	400.	0.	0.000	1000.00	1.106
PA-233	1199.82	300.18	400.	0.	0.000	1000.00	1.107s
PA-231	1209.70	302.65	396.	4.	0.002	781.86	1.109D
BA-133	1210.50	302.85	400.	0.	0.000	1000.00	1.109s
Ba-140	1218.49	304.85	400.	0.	0.000	1000.00	1.111s
BI-210M	1218.68	304.90	400.	0.	0.000	1000.00	1.111s
Ir-192	1232.85	308.44	400.	0.	0.000	1000.00	1.115s
PA-233	1247.13	312.01	400.	0.	0.000	1000.00	1.118s
Ir-192	1265.04	316.49	400.	0.	0.000	1000.00	1.123s
La-140	1314.10	328.76	92.	4.	0.002	305.91	1.135s
Cf-249	1332.81	333.44	130.	-14.	-0.008	114.47	1.139s
AC-228	1352.55	338.38	24.	74.	0.041	16.33	0.804s
Cs-136	1361.32	340.57	294.	-20.	-0.011	126.29	1.146s
EU-152	1376.18	344.29	234.	-20.	-0.011	112.89	1.150s
HF-181	1382.35	345.83	264.	-21.	-0.012	112.74	1.151
PB-214	1406.38	351.84	29.	156.	0.087	10.03	1.281
BA-133	1423.02	356.00	276.	-17.	-0.009	143.14	1.162s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
I-131	1456.95	364.48	48.	6.	0.003	229.73	1.170
BA-133	1534.35	383.84	177.	-18.	-0.010	107.20	1.189
Cf-249	1550.79	387.95	195.	-18.	-0.010	111.88	1.193s
SN-113	1565.74	391.69	185.	-10.	-0.006	190.39	1.196s
SB-125	1710.45	427.88	64.	-2.	-0.001	786.34	1.232s
SB-125	1852.39	463.37	59.	12.	0.007	91.53	1.266s
Ir-192	1871.16	468.06	63.	12.	0.006	100.14	1.271
BE-7	1909.29	477.60	83.	3.	0.002	389.61	1.280
HF-181	1926.90	482.00	59.	11.	0.006	104.13	1.284s
RU-103	1987.11	497.05	24.	4.	0.002	244.95	1.298s
RH-106	2046.35	511.86	87.	52.	0.029	28.70	2.563s
Nd-147	2122.88	531.00	26.	11.	0.006	96.52	1.331s
Ba-140	2147.92	537.26	9.	9.	0.005	71.18	1.337s
CS-134	2251.82	563.24	35.	-4.	-0.002	331.91	1.362
CS-134	2276.15	569.32	35.	2.	0.001	362.81	1.367
PA-234	2276.75	569.47	34.	4.	0.002	203.41	1.368s
BI-207	2277.68	569.70	44.	-4.	-0.002	249.54	1.368s
TL-208	2331.10	583.06	4.	107.	0.059	10.60	0.948s
SB-125	2400.87	600.50	10.	23.	0.013	28.51	1.397s
SB-124	2409.79	602.73	46.	-9.	-0.005	108.21	1.399s
CS-134	2417.71	604.71	310.	-14.	-0.008	182.62	1.401
BI-214	2436.36	609.37	14.	140.	0.078	9.65	1.091
RU-103	2440.06	610.30	296.	-14.	-0.008	177.95	1.406s
AG-108M	2455.99	614.28	282.	-14.	-0.008	173.38	1.410s
PM-144	2471.12	618.06	189.	10.	0.005	200.27	1.414s
RH-106	2486.54	621.92	223.	11.	0.006	194.16	1.417s
SB-125	2542.43	635.89	36.	-9.	-0.005	98.48	1.430s
I-131	2546.77	636.97	51.	-4.	-0.002	246.12	1.432s
AG-110M	2629.92	657.76	33.	7.	0.004	122.06	1.451s
CS-137	2645.51	661.66	56.	-8.	-0.004	136.93	1.455s
PM-144	2785.05	696.54	23.	5.	0.003	224.40	1.487
NB-94	2809.41	702.63	23.	12.	0.006	93.03	1.493s
SB-124	2890.04	722.79	54.	7.	0.004	145.15	1.512s
AG-108M	2890.65	722.94	62.	7.	0.004	154.12	1.512
EU-154	2892.34	723.36	69.	5.	0.003	258.54	1.512
ZR-95	2895.69	724.20	74.	0.	0.000	1000.00	1.513
BI-212	2908.18	727.32	10.	40.	0.022	22.51	1.792
PM-146	2941.78	735.72	33.	-14.	-0.008	90.52	1.524s
PM-146	2987.55	747.16	28.	-5.	-0.003	228.91	1.535s
ZR-95	3025.83	756.73	19.	11.	0.006	90.69	1.543s
AG-110M	3054.69	763.94	42.	-11.	-0.006	88.61	1.550s
NB-95	3062.08	765.79	28.	9.	0.005	87.16	1.552s
PA-234M	3064.57	766.41	21.	9.	0.005	76.13	1.552s
EU-152	3114.61	778.92	23.	5.	0.003	224.40	1.564
BI-212	3140.62	785.42	37.	-11.	-0.006	118.16	1.570s
CS-134	3182.43	795.87	42.	10.	0.005	102.33	1.579
TL-210	3197.35	799.60	40.	6.	0.003	167.13	1.583s
CS-134	3206.76	801.95	68.	-13.	-0.007	93.90	1.585s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
CO-58	3242.06	810.78	66.	-15.	-0.008	82.91	1.593s
La-140	3262.05	815.77	81.	-13.	-0.007	103.04	1.598s
Cs-136	3272.97	818.50	77.	12.	0.007	103.48	1.600s
MN-54	3338.38	834.85	19.	-2.	-0.001	555.34	1.615s
Co-56	3386.08	846.77	25.	7.	0.004	161.52	1.626s
TL-208	3441.27	860.56	15.	10.	0.005	91.97	1.638
NB-94	3483.41	871.10	12.	7.	0.004	79.54	1.648s
EU-154	3491.95	873.23	26.	-6.	-0.004	118.67	1.650s
PA-234	3521.16	880.53	49.	-4.	-0.002	252.49	1.657s
PA-234	3532.00	883.24	46.	7.	0.004	142.14	1.659s
AG-110M	3537.78	884.68	45.	0.	0.000	1000.00	1.660s
Sc-46	3556.17	889.28	57.	-11.	-0.006	100.32	1.664s
Y-88	3591.22	898.04	20.	1.	0.001	988.26	1.672s
AC-228	3644.53	911.36	4.	81.	0.045	12.30	1.916
AG-110M	3749.09	937.49	35.	-8.	-0.004	166.38	1.708
PA-234	3783.21	946.02	10.	3.	0.002	238.82	1.716s
EU-152	3855.60	964.11	91.	10.	0.005	140.97	1.732s
AC-228	3875.05	968.97	18.	80.	0.044	13.46	1.736
EU-154	3984.54	996.33	20.	9.	0.005	81.09	1.761s
PA-234M	4003.22	1001.00	29.	4.	0.002	196.56	1.765s
Co-56	4150.66	1037.84	16.	6.	0.003	156.94	1.798s
Cs-136	4191.60	1048.07	25.	2.	0.001	434.05	1.807s
RH-106	4200.76	1050.36	43.	-12.	-0.006	84.42	1.809s
BI-207	4253.99	1063.66	0.	14.	0.008	26.73	1.820s
Ga-68	4308.98	1077.40	11.	9.	0.005	88.84	1.833s
FE-59	4396.44	1099.25	16.	6.	0.003	156.94	1.852s
EU-152	4447.76	1112.07	96.	-13.	-0.007	110.29	1.863s
ZN-65	4461.66	1115.55	83.	-8.	-0.004	170.73	1.866s
BI-214	4480.63	1120.29	65.	13.	0.007	92.13	1.870s
Sc-46	4481.68	1120.55	52.	13.	0.007	82.89	1.870s
Ta-182	4484.69	1121.30	51.	13.	0.007	82.65	1.871
CO-60	4692.57	1173.24	11.	8.	0.005	95.58	1.916s
Ta-182	4755.86	1189.05	43.	-15.	-0.008	104.55	1.930
Ta-182	4885.39	1221.41	23.	1.	0.001	841.87	1.957
Co-56	4952.92	1238.28	17.	9.	0.005	112.49	1.972
NA-22	5098.03	1274.53	6.	7.	0.004	61.39	2.003s
EU-154	5098.08	1274.54	13.	5.	0.003	103.17	2.003s
FE-59	5166.35	1291.60	23.	-10.	-0.005	119.90	2.017s
TL-210	5252.04	1313.00	28.	-12.	-0.007	105.15	2.036s
CO-60	5330.11	1332.50	11.	3.	0.001	302.33	2.052s
EU-152	5632.39	1408.00	12.	4.	0.002	215.06	2.115s
K-40	5844.46	1460.97	4.	260.	0.144	6.48	1.998
La-140	6386.02	1596.21	6.	1.	0.001	600.00	2.269s
SB-124	6765.58	1690.98	13.	-9.	-0.005	107.49	2.345s
BI-214	7060.00	1764.49	8.	28.	0.015	24.26	2.403s
Co-56	7087.48	1771.35	38.	3.	0.001	334.01	2.408s
Y-88	7346.69	1836.06	0.	0.	0.000	1000.00	2.459s

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

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***** 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	1.0811E+00					5.31E+01	
			477.60	1.081E+00	?(	1.462E+01	3.90E+02 1.05E+01	G
NA-22	C	4.8950E-01					9.50E+02	
			1274.53	4.895E-01	?(	9.696E-01	6.14E+01 9.99E+01	G
K-40	N	1.9010E+02					4.66E+11	
			1460.83	1.901E+02	(	9.086E+00	6.48E+00 1.07E+01	G
Sc-46	F	1.1410E-01					8.38E+01	
			889.28	-6.009E-01	?(	2.042E+00	1.00E+02 1.00E+02	G
			1120.55	8.291E-01	?(	2.307E+00	8.29E+01 1.00E+02	G
CR-51	F	8.4313E-02					2.77E+01	
			320.08	8.431E-02	%(	2.413E+01	8.44E+03 9.94E+00	G
MN-54	C	-8.5687E-02					3.12E+02	
			834.85	-8.569E-02	?(	1.174E+00	5.55E+02 1.00E+02	G
FE-59	F	6.6697E-01					4.45E+01	
			1099.25	6.670E-01	?(	2.373E+00	1.57E+02 5.65E+01	G
			1291.60	-1.587E+00	+	4.087E+00	1.20E+02 4.32E+01	G
Co-56	C	7.4542E-01					7.73E+01	
			846.77	3.638E-01	&(	1.352E+00	1.62E+02 9.99E+01	G
			1238.28	9.354E-01	?(	2.279E+00	1.12E+02 6.61E+01	G
			1037.84	2.556E+00	?(	9.096E+00	1.57E+02 1.41E+01	G
			1771.35	1.581E+00	?	1.871E+01	3.34E+02 1.55E+01	A
CO-57	C	5.4724E-01					2.72E+02	
			122.06	2.811E-01	(	8.918E-01	9.45E+01 8.56E+01	G
			136.47	2.681E+00	?(	1.489E+01	1.66E+02 1.07E+01	G
CO-58	C	-7.4160E-01					7.09E+01	
			810.78	-7.416E-01	?(	2.060E+00	8.29E+01 9.95E+01	G
CO-60	F	3.7180E-01					1.93E+03	
			1332.50	1.938E-01	?(	1.337E+00	3.02E+02 1.00E+02	G
			1173.24	5.500E-01	?(	1.183E+00	9.56E+01 9.99E+01	G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
ZN-65	F	-9.6705E-01					2.44E+02	
			1115.55	-9.670E-01	&(	5.658E+00	1.71E+02	5.06E+01 G
NB-94	I	4.5389E-01					7.41E+06	
			702.63	5.380E-01	&(	1.169E+00	9.30E+01	9.79E+01 G
			871.10	3.714E-01	?(	1.000E+00	7.95E+01	9.99E+01 G
ZR-95	I	9.4362E-01					6.40E+01	
			756.73	9.436E-01	&(	2.008E+00	9.07E+01	5.45E+01 G
			724.20	0.000E+00	&	4.496E+00	1.00E+03	4.42E+01 G
NB-95	I	4.5226E-01					6.40E+01	
			765.79	4.523E-01	&(	1.335E+00	8.72E+01	9.98E+01 G
RU-103	I	1.5472E-01					3.93E+01	
			497.05	1.547E-01	?(	9.879E-01	2.45E+02	9.09E+01 G
			610.30	-9.848E+00	+	5.901E+01	1.78E+02	5.75E+00 GA
RH-106	I	4.6072E+00					3.74E+02	
			621.92	4.607E+00	&(	3.025E+01	1.94E+02	9.93E+00 G
			1050.36	-4.542E+01	+	1.291E+02	8.44E+01	1.56E+00 G
			511.86	9.405E+00	?	8.283E+00	2.87E+01	2.00E+01 GA
AG-108M	C	2.0746E-01					1.53E+05	
			433.94	3.507E-02	&(	1.019E+00	1.11E+03	9.05E+01 G
			722.94	3.792E-01	&(	2.008E+00	1.54E+02	9.08E+01 G
			614.28	-6.350E-01	+	3.708E+00	1.73E+02	8.98E+01 G
AG-110M	F	1.8095E-01					2.50E+02	
			884.68	0.000E+00	?(	2.505E+00	1.00E+03	7.27E+01 G
			657.76	3.199E-01	?(	1.347E+00	1.22E+02	9.46E+01 G
			937.49	-1.301E+00	+	4.926E+00	1.66E+02	3.44E+01 G
			1384.30	-1.027E-01	%	5.669E+00	2.37E+03	2.43E+01 G
			763.94	-2.380E+00	&	7.121E+00	8.86E+01	2.23E+01 G
SN-113	F	-4.7009E-01					1.15E+02	
			391.69	-4.701E-01	?(	3.033E+00	1.90E+02	6.40E+01 G
SB-124	F	-3.1508E-02					6.02E+01	
			602.73	-3.854E-01	?(	1.422E+00	1.08E+02	9.83E+01 G
			1690.98	-1.599E+00	+	3.559E+00	1.07E+02	4.78E+01 G
			722.79	3.185E+00	?(	1.590E+01	1.45E+02	1.08E+01 G
SB-125	I	2.2146E+00					1.01E+03	
			427.88	-2.121E-01	?(	4.241E+00	7.86E+02	2.96E+01 G
			600.50	5.211E+00	(	3.953E+00	2.85E+01	1.79E+01 G
			635.89	-3.420E+00	+	1.147E+01	9.85E+01	1.13E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
			463.37	3.964E+00	?(	1.223E+01	9.15E+01	1.05E+01 G
I-131	I	2.0392E-01					8.02E+00	
			364.48	2.039E-01	&(	1.189E+00	2.30E+02	8.17E+01 G
			284.30	-6.657E+00	+	1.669E+01	9.74E+01	6.14E+00 G
			636.97	-2.455E+00	+	2.111E+01	2.46E+02	7.17E+00 G
Gd-153	F	9.8565E-01					2.42E+02	
			97.50	9.857E-01	&(	4.764E+00	1.44E+02	3.00E+01 G
			103.20	0.000E+00	&	6.733E+00	1.00E+03	2.18E+01 G
Ga-68	C	1.9693E+01					4.71E-02	
			1077.40	1.969E+01	?(	3.917E+01	8.88E+01	3.30E+00 G
Tc-99m	I	-3.5854E-01					2.51E-01	
			140.51	-3.585E-01	&(	1.988E+00	1.66E+02	8.93E+01 G
BA-133	F	-7.3150E-01					3.85E+03	
			356.00	-7.315E-01	&(	3.518E+00	1.43E+02	6.20E+01 G
			302.85	0.000E+00	&	1.261E+01	1.00E+03	1.83E+01 G
			383.84	-5.820E+00	+	2.093E+01	1.07E+02	8.94E+00 GA
			80.99	-1.264E+00	+	6.836E+00	1.62E+02	3.41E+01 GA
CS-134	I	5.5745E-01					7.54E+02	
			795.87	5.516E-01	(	1.921E+00	1.02E+02	8.55E+01 G
			604.71	-5.740E-01	+	3.529E+00	1.83E+02	9.76E+01 G
			569.32	5.902E-01	(	7.626E+00	3.63E+02	1.54E+01 G
			801.95	-7.470E+00	+	2.364E+01	9.39E+01	8.69E+00 G
			563.24	-1.695E+00	+	1.393E+01	3.32E+02	8.35E+00 G
CS-137	I	-4.0784E-01					1.10E+04	
			661.66	-4.078E-01	&(	1.916E+00	1.37E+02	8.52E+01 G
CE-139	F	3.1650E-01					1.38E+02	
			165.85	3.165E-01	&(	1.279E+00	1.20E+02	7.99E+01 G
Ba-140	I	1.7362E+00					1.28E+01	
			537.26	1.450E+00	?(	2.510E+00	7.12E+01	2.44E+01 G
			162.66	2.860E+00	?(	1.434E+01	1.48E+02	6.22E+00 G
			304.85	0.000E+00	-	5.417E+01	1.00E+03	4.29E+00 G
La-140	I	1.7238E-01					1.28E+01	
			1596.21	8.802E-02	?(	1.243E+00	6.00E+02	9.54E+01 G
			487.02	-4.561E-02	%	3.506E+00	2.20E+03	4.55E+01 G
			328.76	5.688E-01	?(	6.008E+00	3.06E+02	2.03E+01 G
			815.77	-2.789E+00	+	9.704E+00	1.03E+02	2.33E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CE-141	I	6.2895E-01					3.25E+01	
			145.44	6.290E-01	?(	3.388E+00	1.61E+02	4.82E+01 G
CE-144	I	2.5609E+00					2.85E+02	
			133.54	2.561E+00	?(	1.371E+01	1.60E+02	1.11E+01 G
PM-144	C	3.1130E-01					3.63E+02	
			696.54	2.126E-01	?(	1.149E+00	2.24E+02	9.90E+01 G
			618.06	4.099E-01	?(	2.784E+00	2.00E+02	9.91E+01 G
EU-152	F	1.2972E+00					4.94E+03	
			121.78	-1.077E+00	*(	3.623E+00	1.01E+02	2.86E+01 G
			344.29	-1.964E+00	+	7.429E+00	1.13E+02	2.65E+01 G
			1112.07	-6.017E+00	+	2.242E+01	1.10E+02	1.36E+01 G
			778.92	1.763E+00	?(	9.529E+00	2.24E+02	1.29E+01 G
			964.11	3.841E+00	?(	1.844E+01	1.41E+02	1.46E+01 G
			244.69	4.554E+00	?(	3.056E+01	2.00E+02	7.58E+00 G
			1408.00	1.445E+00	&	6.808E+00	2.15E+02	2.10E+01 GA
EU-154	I	1.2293E+00					3.14E+03	
			123.10	5.286E-01	?(	1.698E+00	9.55E+01	4.08E+01 G
			1274.54	1.070E+00	?(	3.845E+00	1.03E+02	3.52E+01 G
			723.36	1.062E+00	&(	9.517E+00	2.59E+02	2.02E+01 G
			873.23	-2.813E+00	+	1.155E+01	1.19E+02	1.23E+01 G
			1004.77	1.088E-01	%	9.711E+00	2.47E+03	1.80E+01 G
			996.33	4.774E+00	?(	1.308E+01	8.11E+01	1.06E+01 G
HF-181	F	7.2922E-01					4.24E+01	
			482.00	4.666E-01	?(	1.648E+00	1.04E+02	8.05E+01 G
			133.02	6.550E-01	?(	3.519E+00	1.60E+02	4.33E+01 G
			345.83	-3.680E+00	&	1.389E+01	1.13E+02	1.51E+01 G
			136.30	4.893E+00	?(	2.664E+01	1.63E+02	5.85E+00 G
Ta-182	F	2.3772E+00					1.14E+02	
			1121.30	2.377E+00	(	6.594E+00	8.26E+01	3.49E+01 G
			1221.41	3.356E-01	-	6.266E+00	8.42E+02	2.70E+01 G
			1189.05	-6.029E+00	+	1.363E+01	1.05E+02	1.62E+01 G
Hg-203	F	-5.5692E-02					4.66E+01	
			279.20	-5.569E-02	&(	1.392E+00	7.21E+02	8.15E+01 G
TL-208	N	4.8992E+00					6.98E+02	
			583.02	5.006E+00	(	5.727E-01	1.06E+01	8.45E+01 G
			277.28	1.073E+00	&	1.678E+01	4.51E+02	6.31E+00 G
			860.56	4.175E+00	?(	8.781E+00	9.20E+01	1.24E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PM-146	C	5.0509E-02					2.02E+03	
			453.88	5.051E-02	%(	1.549E+00	1.18E+03	6.50E+01 G
			747.16	-6.977E-01	+	3.819E+00	2.29E+02	3.40E+01 G
			735.72	-2.923E+00	+	6.119E+00	9.05E+01	2.25E+01 G
Y-88	F	2.8089E-02					1.07E+02	
			1836.06	0.000E+00	?(	7.036E-01	1.00E+03	9.92E+01 G
			898.04	5.783E-02	?(	1.362E+00	9.88E+02	9.37E+01 G
Cd-113m		-6.4669E+03					5.33E+03	
			263.70	-6.467E+03	&(	2.027E+04	9.35E+01	6.00E-03 K
Cd-109	F	9.5418E+00					4.53E+02	
								Derived Ave Activity
			88.04	9.542E+00	}(	4.889E+01	1.53E+02	3.79E+00 G
Cf-251	T	1.3853E+00					3.28E+05	
			176.60	1.385E+00	&(	5.104E+00	1.43E+02	1.70E+01 G
			227.00	-6.214E+00	+	1.628E+01	1.02E+02	6.30E+00 GA
Cf-249	T	-7.9753E-01					1.28E+05	
			387.95	-7.975E-01	?(	2.994E+00	1.12E+02	6.60E+01 G
			333.44	-2.425E+00	+	9.356E+00	1.14E+02	1.55E+01 G
Sn-126		-7.9718E-01					3.65E+07	
			87.57	1.004E+00	}	4.856E+00	7.72E+01	3.75E+01 GA
			64.28	-7.972E-01	?(	1.946E+01	7.23E+02	9.70E+00 G
			86.94	-1.827E+00	}	2.112E+01	3.44E+02	9.04E+00 GA
PB-210	N	1.9055E+01					8.14E+03	
			46.54	1.905E+01	(P	3.480E+01	6.36E+01	4.25E+00 G
PB-212	N	1.4696E+01					6.98E+02	
			238.63	1.470E+01	(P	1.711E+00	6.53E+00	4.33E+01 G
			300.03	1.470E+01	}	2.157E+01	6.90E+00	3.28E+00 GA
PB-214	N	1.2041E+01					5.84E+05	
			351.93	1.123E+01	(P	1.993E+00	1.00E+01	3.76E+01 G
			295.09	1.363E+01	(P	3.549E+00	1.37E+01	1.93E+01 G
			242.00	4.256E+00	-	2.989E+01	2.09E+02	7.43E+00 GA
BI-207	C	1.1519E+00					1.18E+04	
			1063.66	1.152E+00	?(	6.064E-01	2.67E+01	7.45E+01 G
			569.70	-1.527E-01	-	1.337E+00	2.50E+02	9.77E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
BI-212	N	2.4339E+01					6.98E+02	
			727.17	2.434E+01	(	1.052E+01	2.25E+01	7.55E+00 G
			785.42	-4.355E+01	-	1.198E+02	1.18E+02	1.28E+00 GA
U-235	N	1.1351E+00					2.57E+11	
			143.79	-1.347E+00	?(P	1.563E+01	1.95E+02	1.10E+01 G
			205.33	6.564E+00	&(	1.764E+01	1.05E+02	5.01E+00 G
			163.38	-3.668E+00	+	1.964E+01	1.58E+02	5.08E+00 G
			185.72	1.289E+00	P	1.837E+00	5.55E+01	5.40E+01 GA
BI-214	N	1.2385E+01					5.84E+05	
			609.31	1.239E+01	(P	1.811E+00	9.65E+00	4.61E+01 G
			1120.29	5.488E+00	-	1.703E+01	9.21E+01	1.51E+01 G
			1764.49	1.633E+01	+	9.677E+00	2.43E+01	1.54E+01 G
BI-210M	T	-1.8206E-01					1.10E+09	
			265.83	-1.821E-01	(	2.379E+00	3.80E+02	5.00E+01 G
			304.90	0.000E+00	+	8.300E+00	1.00E+03	2.80E+01 G
AC-228	N	1.5569E+01					2.10E+03	
			911.07	1.532E+01	(	2.234E+00	1.23E+01	2.90E+01 G
			968.97	2.623E+01	+	7.372E+00	1.35E+01	1.75E+01 G
			338.32	1.616E+01	(	5.577E+00	1.63E+01	1.20E+01 G
			93.35	6.686E+00	-	3.289E+01	1.47E+02	5.56E+00 XA
TH-227	N	3.2198E+00					7.95E+03	
			256.24	4.463E+00	?(	1.202E+01	1.04E+02	7.00E+00 G
			235.97	2.512E+00	?(	1.861E+01	2.21E+02	1.23E+01 G
			50.14	-5.797E+00	&	2.501E+01	1.29E+02	8.00E+00 G
TH-229	N	2.0085E+00					2.68E+06	
			193.51	-4.557E+00	&(	2.138E+01	1.81E+02	4.40E+00 G
			210.85	1.167E+01	?(	3.113E+01	1.04E+02	2.99E+00 G
TH-234	N	9.8233E+00					1.63E+12	
			92.59	5.892E+00	(P	1.665E+01	8.51E+01	5.58E+00 G
			63.29	1.559E+01	(P	2.513E+01	4.98E+01	3.81E+00 G
PA-231	N	3.0198E+00					1.20E+07	
			302.65	3.020E+00	&(	7.989E+01	7.82E+02	2.88E+00 G
			300.07	0.000E+00	-	9.334E+01	1.00E+03	2.46E+00 G
PA-234	N	1.1841E+00					1.63E+12	
			131.29	-6.840E-01	&(	7.312E+00	3.16E+02	1.80E+01 G
			946.02	1.260E+00	&(	7.326E+00	2.39E+02	1.34E+01 G
			569.47	1.977E+00	?(	1.415E+01	2.03E+02	8.20E+00 G
			883.24	3.904E+00	?(	1.914E+01	1.42E+02	9.60E+00 G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          880.53-3.561E+00 +   3.145E+01 2.52E+02 6.00E+00 GA

PA-234M  N   6.0710E+01                                      1.63E+12
                         1001.00 2.806E+01 ?(  1.947E+02 1.97E+02 8.37E-01 G
                          766.41 1.537E+02 &(  3.927E+02 7.61E+01 2.94E-01 G

AM-241   T  -1.8870E-01                                      1.58E+05
                           59.54-1.887E-01 *(  5.472E+00 8.58E+02 3.59E+01 G

Np-237   F   2.5846E+00                                      2.14E+06
                                                           Derived Ave Activity
                           86.49 2.585E+00 }(  1.416E+01 1.64E+02 1.31E+01 G

Ir-192   F   2.8290E-01                                      7.40E+01
                          316.49 0.000E+00 ?(  2.747E+00 1.00E+03 8.70E+01 G
                          468.06 7.587E-01 ?(  2.570E+00 1.00E+02 5.18E+01 G
                          308.44 0.000E+00 -   7.384E+00 1.00E+03 3.18E+01 G

Cs-136   F   6.3047E-01                                      1.30E+01
                          818.50 6.305E-01 ?(  2.205E+00 1.03E+02 1.00E+02 G
                         1048.07 1.263E-01 -   1.983E+00 4.34E+02 8.00E+01 G
                          340.57-1.097E+00 +   4.643E+00 1.26E+02 4.69E+01 G

Np-239   T  -1.4108E+00                                      2.36E+00
                          103.70 0.000E+00 &   6.112E+00 1.00E+03 2.40E+01 X
                          106.13-1.411E+00 &(  6.623E+00 1.40E+02 2.27E+01 G
                           99.50 1.042E+00 ?   9.720E+00 2.77E+02 1.50E+01 X

Nd-147       3.2207E+00                                      1.11E+01
                          531.00 3.221E+00 ?(  7.522E+00 9.65E+01 1.30E+01 G
                           91.10 0.000E+00 -   6.594E+00 1.00E+03 2.83E+01 G

TL-210   N   2.7692E-01                                      5.84E+05
                          799.60 2.769E-01 ?(  1.611E+00 1.67E+02 9.90E+01 G
                          296.00-3.855E-01 +   2.921E+00 2.25E+02 7.90E+01 G
                         1313.00-4.218E+00 +   9.411E+00 1.05E+02 2.10E+01 GA

Kr-85    I  -2.7949E+00                                      3.92E+03
                          513.98-2.795E+00 &(  4.905E+02 5.08E+03 4.30E-01 G
   ( - 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.
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$ - 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

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********** 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 1 Sigma %	Activity	
TH-227	50.14	268.	-18.	-0.010	128.60	-5.797E+00	
AM-241	59.54	432.	-3.	-0.002	857.81	-1.887E-01	
BA-133	80.99	936.	-27.	-0.015	162.23	-1.264E+00	
EU-155	86.54	696.	-24.	-0.013	155.43	-1.231E+00	
Gd-153	97.50	390.	20.	0.011	144.26	9.857E-01	
Np-239	99.50	410.	10.	0.006	276.98	1.042E+00	
Np-239	106.13	444.	-21.	-0.012	140.32	-1.411E+00	
EU-152	121.78	205.	-21.	-0.011	100.51	-1.077E+00	
CO-57	122.06	108.	16.	0.009	94.54	2.811E-01	
EU-154	123.10	88.	14.	0.008	95.50	5.286E-01	
HF-181	133.02	442.	19.	0.010	160.33	6.550E-01	
HF-181	136.30	458.	19.	0.010	162.55	4.893E+00	
CO-57	136.47	477.	19.	0.010	165.79	2.681E+00	
Tc-99m	140.51	555.	-20.	-0.011	165.74	-3.585E-01	
U-235	143.79	540.	-10.	-0.005	195.29	-1.347E+00	P
CE-141	145.44	486.	20.	0.011	160.89	6.290E-01	
Ba-140	162.66	127.	11.	0.006	147.81	2.860E+00	
U-235	163.38	159.	-11.	-0.006	158.09	-3.668E+00	
CE-139	165.85	166.	16.	0.009	120.09	3.165E-01	
U-235	185.72	138.	40.	0.022	55.48	1.289E+00	P
TH-229	193.51	117.	-11.	-0.006	181.26	-4.557E+00	
U-235	205.33	95.	18.	0.010	104.55	6.564E+00	
TH-229	210.85	103.	19.	0.010	103.90	1.167E+01	
TH-227	235.97	569.	15.	0.009	221.00	2.512E+00	
EU-152	244.69	554.	17.	0.009	200.29	4.554E+00	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
TH-227	256.24	62.	15.	0.008	104.04	4.463E+00	
Cd-113m	263.70	130.	-18.	-0.010	93.55	-6.467E+03	
BI-210M	265.83	123.	-4.	-0.002	379.90	-1.821E-01	
Hg-203	279.20	103.	-2.	-0.001	721.11	-5.569E-02	
I-131	284.30	81.	-18.	-0.010	97.44	-6.657E+00	
TL-210	296.00	413.	-13.	-0.007	225.30	-3.855E-01	
La-140	328.76	92.	4.	0.002	305.91	5.688E-01	
Cf-249	333.44	130.	-14.	-0.008	114.47	-2.425E+00	
Cs-136	340.57	294.	-20.	-0.011	126.29	-1.097E+00	
EU-152	344.29	234.	-20.	-0.011	112.89	-1.964E+00	
HF-181	345.83	264.	-21.	-0.012	112.74	-3.680E+00	
BA-133	356.00	276.	-17.	-0.009	143.14	-7.315E-01	
I-131	364.48	48.	6.	0.003	229.73	2.039E-01	
BA-133	383.84	177.	-18.	-0.010	107.20	-5.820E+00	
Cf-249	387.95	195.	-18.	-0.010	111.88	-7.975E-01	
SN-113	391.69	185.	-10.	-0.006	190.39	-4.701E-01	
SB-125	427.88	64.	-2.	-0.001	786.34	-2.121E-01	
SB-125	463.37	59.	12.	0.007	91.53	3.964E+00	
Ir-192	468.06	63.	12.	0.006	100.14	7.587E-01	
BE-7	477.60	83.	3.	0.002	389.61	1.081E+00	
HF-181	482.00	59.	11.	0.006	104.13	4.666E-01	
RU-103	497.05	24.	4.	0.002	244.95	1.547E-01	
RH-106	511.86	87.	52.	0.029	28.70	9.405E+00	
Nd-147	531.00	26.	11.	0.006	96.52	3.221E+00	
Ba-140	537.26	9.	9.	0.005	71.18	1.450E+00	
CS-134	563.24	35.	-4.	-0.002	331.91	-1.695E+00	
CS-134	569.32	35.	2.	0.001	362.81	5.902E-01	
SB-125	600.50	10.	23.	0.013	28.51	5.211E+00	
SB-124	602.73	46.	-9.	-0.005	108.21	-3.854E-01	
CS-134	604.71	310.	-14.	-0.008	182.62	-5.740E-01	
RU-103	610.30	296.	-14.	-0.008	177.95	-9.848E+00	
AG-108M	614.28	282.	-14.	-0.008	173.38	-6.350E-01	
PM-144	618.06	189.	10.	0.005	200.27	4.099E-01	
RH-106	621.92	223.	11.	0.006	194.16	4.607E+00	
SB-125	635.89	36.	-9.	-0.005	98.48	-3.420E+00	
I-131	636.97	51.	-4.	-0.002	246.12	-2.455E+00	
AG-110M	657.76	33.	7.	0.004	122.06	3.199E-01	
CS-137	661.66	56.	-8.	-0.004	136.93	-4.078E-01	
PM-144	696.54	23.	5.	0.003	224.40	2.126E-01	
NB-94	702.63	23.	12.	0.006	93.03	5.380E-01	
SB-124	722.79	54.	7.	0.004	145.15	3.185E+00	
AG-108M	722.94	62.	7.	0.004	154.12	3.792E-01	
EU-154	723.36	69.	5.	0.003	258.54	1.062E+00	
PM-146	735.72	33.	-14.	-0.008	90.52	-2.923E+00	
PM-146	747.16	28.	-5.	-0.003	228.91	-6.977E-01	
ZR-95	756.73	19.	11.	0.006	90.69	9.436E-01	
AG-110M	763.94	42.	-11.	-0.006	88.61	-2.380E+00	
NB-95	765.79	28.	9.	0.005	87.16	4.523E-01	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
PA-234M	766.41	21.	9.	0.005	76.13	1.537E+02	
EU-152	778.92	23.	5.	0.003	224.40	1.763E+00	
CS-134	795.87	42.	10.	0.005	102.33	5.516E-01	
TL-210	799.60	40.	6.	0.003	167.13	2.769E-01	
CS-134	801.95	68.	-13.	-0.007	93.90	-7.470E+00	
CO-58	810.78	66.	-15.	-0.008	82.91	-7.416E-01	
La-140	815.77	81.	-13.	-0.007	103.04	-2.789E+00	
Cs-136	818.50	77.	12.	0.007	103.48	6.305E-01	
MN-54	834.85	19.	-2.	-0.001	555.34	-8.569E-02	
Co-56	846.77	25.	7.	0.004	161.52	3.638E-01	
NB-94	871.10	12.	7.	0.004	79.54	3.714E-01	
EU-154	873.23	26.	-6.	-0.004	118.67	-2.813E+00	
Sc-46	889.28	57.	-11.	-0.006	100.32	-6.009E-01	
Y-88	898.04	20.	1.	0.001	988.26	5.783E-02	
AG-110M	937.49	35.	-8.	-0.004	166.38	-1.301E+00	
EU-152	964.11	91.	10.	0.005	140.97	3.841E+00	
EU-154	996.33	20.	9.	0.005	81.09	4.774E+00	
PA-234M	1001.00	29.	4.	0.002	196.56	2.806E+01	
Co-56	1037.84	16.	6.	0.003	156.94	2.556E+00	
Cs-136	1048.07	25.	2.	0.001	434.05	1.263E-01	
RH-106	1050.36	43.	-12.	-0.006	84.42	-4.542E+01	
Ga-68	1077.40	11.	9.	0.005	88.84	1.969E+01	
FE-59	1099.25	16.	6.	0.003	156.94	6.670E-01	
EU-152	1112.07	96.	-13.	-0.007	110.29	-6.017E+00	
ZN-65	1115.55	83.	-8.	-0.004	170.73	-9.670E-01	
Sc-46	1120.55	52.	13.	0.007	82.89	8.291E-01	
Ta-182	1121.30	51.	13.	0.007	82.65	2.377E+00	
CO-60	1173.24	11.	8.	0.005	95.58	5.500E-01	
Ta-182	1189.05	43.	-15.	-0.008	104.55	-6.029E+00	
Ta-182	1221.41	23.	1.	0.001	841.87	3.356E-01	
Co-56	1238.28	17.	9.	0.005	112.49	9.354E-01	
NA-22	1274.53	6.	7.	0.004	61.39	4.895E-01	
EU-154	1274.54	13.	5.	0.003	103.17	1.070E+00	
FE-59	1291.60	23.	-10.	-0.005	119.90	-1.587E+00	
TL-210	1313.00	28.	-12.	-0.007	105.15	-4.218E+00	
CO-60	1332.50	11.	3.	0.001	302.33	1.938E-01	
EU-152	1408.00	12.	4.	0.002	215.06	1.445E+00	
La-140	1596.21	6.	1.	0.001	600.00	8.802E-02	
SB-124	1690.98	13.	-9.	-0.005	107.49	-1.599E+00	
Co-56	1771.35	38.	3.	0.001	334.01	1.581E+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	Time Corrected Activity Bq/Sample	Uncertainty 1 Sigma Counting	MDA Bq/Sample
BE-7	#A	1.0811E+00	1.0811E+00	3.896E+02%	1.46E+01
NA-22	#A	4.8950E-01	4.8950E-01	6.139E+01%	9.70E-01
K-40		1.9010E+02	1.9010E+02	6.476E+00%	9.09E+00
Sc-46	#A	1.1410E-01	1.1410E-01	6.507E+01%	2.04E+00
CR-51	#A	8.4313E-02	8.4313E-02	8.441E+03%	2.41E+01
MN-54	#A	-8.5687E-02	-8.5687E-02	5.553E+02%	1.17E+00
FE-59	#A	6.6697E-01	6.6697E-01	1.569E+02%	2.37E+00
Co-56	#A	7.4542E-01	7.4542E-01	8.391E+01%	1.35E+00
CO-57	#A	5.4724E-01	5.4724E-01	9.454E+01%	8.92E-01
CO-58	#A	-7.4160E-01	-7.4160E-01	8.291E+01%	2.06E+00
CO-60	#A	3.7180E-01	3.7180E-01	9.558E+01%	1.34E+00
ZN-65	#A	-9.6705E-01	-9.6705E-01	1.707E+02%	5.66E+00
NB-94	#A	4.5389E-01	4.5389E-01	6.120E+01%	1.17E+00
ZR-95	#A	9.4362E-01	9.4362E-01	9.069E+01%	2.01E+00
NB-95	#A	4.5226E-01	4.5226E-01	8.716E+01%	1.34E+00
RU-103	#A	1.5472E-01	1.5472E-01	2.449E+02%	9.88E-01
RH-106	#A	4.6072E+00	4.6072E+00	1.942E+02%	3.03E+01
AG-108M	#A	2.0746E-01	2.0746E-01	1.541E+02%	1.02E+00
AG-110M	#A	1.8095E-01	1.8095E-01	1.221E+02%	2.51E+00
SN-113	#A	-4.7009E-01	-4.7009E-01	1.904E+02%	3.03E+00
SB-124	#A	-3.1508E-02	-3.1508E-02	9.052E+01%	1.42E+00
SB-125	#A	2.2146E+00	2.2146E+00	2.851E+01%	4.24E+00
I-131	#A	2.0392E-01	2.0392E-01	2.297E+02%	1.19E+00
Gd-153	#A	9.8565E-01	9.8565E-01	1.443E+02%	4.76E+00
Ga-68	#A	1.9630E+01	1.9693E+01	8.884E+01%	3.92E+01
Tc-99m	#A	-3.5832E-01	-3.5854E-01	1.657E+02%	1.99E+00
BA-133	#A	-7.3150E-01	-7.3150E-01	1.431E+02%	3.52E+00
CS-134	#A	5.5745E-01	5.5745E-01	1.023E+02%	1.92E+00
CS-137	#A	-4.0784E-01	-4.0784E-01	1.369E+02%	1.92E+00
CE-139	#A	3.1650E-01	3.1650E-01	1.201E+02%	1.28E+00
Ba-140	#A	1.7362E+00	1.7362E+00	7.118E+01%	2.51E+00
La-140	#A	1.7237E-01	1.7238E-01	3.059E+02%	1.24E+00
CE-141	#A	6.2895E-01	6.2895E-01	1.609E+02%	3.39E+00
CE-144	#A	2.5609E+00	2.5609E+00	1.597E+02%	1.37E+01
PM-144	#A	3.1130E-01	3.1130E-01	1.504E+02%	1.15E+00
EU-152	#A	1.2972E+00	1.2972E+00	8.676E+01%	3.62E+00
EU-154	#A	1.2293E+00	1.2293E+00	7.632E+01%	1.70E+00
EU-155	#A	0.0000E+00	0.0000E+00	1.000E+03%	6.91E+00
HF-181	#A	7.2922E-01	7.2922E-01	8.365E+01%	1.65E+00
Ta-182	#A	2.3772E+00	2.3772E+00	8.265E+01%	6.59E+00
Hg-203	#A	-5.5692E-02	-5.5692E-02	7.211E+02%	1.39E+00
TL-208		4.8992E+00	4.8992E+00	1.060E+01%	5.73E-01
PM-146	#A	5.0509E-02	5.0509E-02	1.179E+03%	1.55E+00

Y-88 #A	2.8089E-02	2.8089E-02	7.030E+02%		7.04E-01
Cd-113m#A	-6.4669E+03	-6.4669E+03	9.355E+01%		2.03E+04
Cd-109 #A	9.5418E+00	9.5418E+00	1.534E+02%		4.89E+01
Cf-251 A	1.3853E+00	1.3853E+00	1.427E+02%		5.10E+00
Cf-249 #A	-7.9753E-01	-7.9753E-01	1.119E+02%		2.99E+00
Sn-126 #A	-7.9718E-01	-7.9718E-01	7.230E+02%		1.95E+01
PB-210 A	1.9055E+01	1.9055E+01	6.362E+01%		3.48E+01
PB-212	1.4696E+01	1.4696E+01	6.532E+00%		1.71E+00
PB-214	1.2041E+01	1.2041E+01	8.477E+00%		1.99E+00
BI-207 #	1.1519E+00	1.1519E+00	2.673E+01%		6.06E-01
BI-212	2.4339E+01	2.4339E+01	2.251E+01%		1.05E+01
U-235 #A	1.1351E+00	1.1351E+00	1.045E+02%		1.56E+01
BI-214	1.2385E+01	1.2385E+01	9.654E+00%		1.81E+00
BI-210M#A	-1.8206E-01	-1.8206E-01	3.799E+02%		2.38E+00
AC-228	1.5569E+01	1.5569E+01	1.022E+01%		2.23E+00
TH-227 #A	3.2198E+00	3.2198E+00	1.040E+02%		1.20E+01
TH-229 #A	2.0085E+00	2.0085E+00	1.039E+02%		2.14E+01
TH-234 A	9.8233E+00	9.8233E+00	4.931E+01%		1.67E+01
PA-231 A	3.0198E+00	3.0198E+00	7.819E+02%		7.99E+01
PA-233 #A	0.0000E+00	0.0000E+00	7.071E+02%		6.57E+00
PA-234 #A	1.1841E+00	1.1841E+00	1.169E+02%		7.31E+00
PA-234M#A	6.0710E+01	6.0710E+01	7.613E+01%		1.95E+02
AM-241 #A	-1.8870E-01	-1.8870E-01	8.578E+02%		5.47E+00
Np-237 #A	2.5846E+00	2.5846E+00	1.639E+02%		1.42E+01
Ir-192 #A	2.8290E-01	2.8290E-01	1.001E+02%		2.75E+00
Cs-136 #A	6.3047E-01	6.3047E-01	1.035E+02%		2.20E+00
Np-239 #A	-1.4107E+00	-1.4108E+00	1.403E+02%		6.62E+00
Nd-147 #A	3.2207E+00	3.2207E+00	9.652E+01%		7.52E+00
TL-210 #A	2.7692E-01	2.7692E-01	1.671E+02%		1.61E+00
Kr-85 #A	-2.7949E+00	-2.7949E+00	5.082E+03%		4.91E+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 (25.1 to 1999.1 keV) 2.931E+02 Bq/Sample
Total Decayed Activity (25.1 to 1999.1 keV) 2.9308154E+02 Bq/Sample

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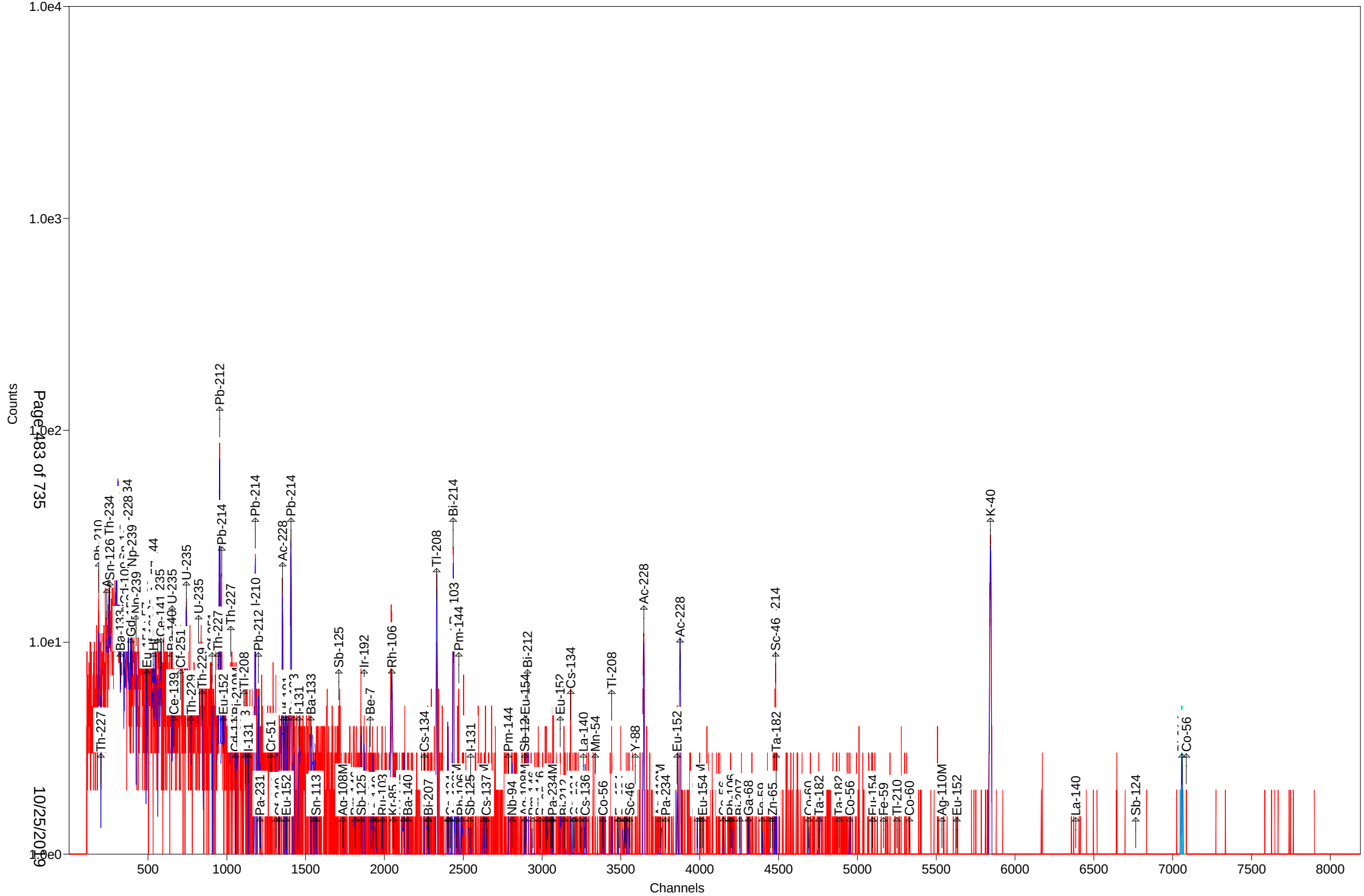
444057_Gamma_180-95857-A-11-B. 12_Gamma_20192674.spc.



Test America St. Louis Spectrum ID: 5_Gamma_20192608

Sample Description: 444057_Gamma_180-95857-A-12-B
Detector: Detector # 5
Batch ID: 444057
Work Order Number: Gamma
Lot Number: 180-95857-A-12-B

Decay to Time: 10/15/2019 11:55 Live Time: 1800 sec
Acquisition Time: 10/15/2019 11:55:28 Real Time: 1807 sec
Analysis Time: 10/15/2019 12:26 Dead Time: 0.37 %
Analysis Quantity: 1.000E+00 Sample

Efficiency Cal File: 5_Soil_TunaCan.Clb
Efficiency Cal Desc: 5_Soil_TunaCan_90099_032612
Efficiency Cal Date: 3/27/2012 17:20
Energy Cal Date: 2/28/2012 19:35
Library: Client_Long_Rev15.lib
Bkgd Correction File: 5_2019-10-06_1911.PBC

Nuclide	Activity Bq/Sample	1-Sigma Counting Uncert %	1-Sigma Counting Uncert Bq/Sample	1-Sigma Total Uncert Bq/Sample	Minimum Detectable Activity Bq/Sample
BE-7	3.794E+00	96.2	3.648E+00	3.653E+00	1.240E+01
NA-22	5.179E-01	96.8	5.014E-01	5.021E-01	1.741E+00
K-40	2.041E+02	7.1	1.443E+01	1.781E+01	7.519E+00
Sc-46	-8.648E-01	99.4	8.599E-01	8.610E-01	2.906E+00
CR-51	-1.070E+00	497.0	5.317E+00	5.317E+00	1.361E+01
MN-54	4.628E-01	123.2	5.703E-01	5.708E-01	1.379E+00
FE-59	3.816E-01	50.4	1.922E-01	1.932E-01	4.282E+00
Co-56	2.348E-01	83.3	1.956E-01	1.960E-01	1.888E+00
CO-57	3.029E-01	139.9	4.237E-01	4.240E-01	1.104E+00
CO-58	7.755E-01	47.9	3.712E-01	3.734E-01	1.148E+00
CO-60	-1.086E+00	59.7	6.482E-01	6.505E-01	2.464E+00
ZN-65	0.000E+00	1.#INF	8.399E-01	8.399E-01	6.226E+00
NB-94	4.409E-01	134.7	5.940E-01	5.945E-01	1.467E+00
ZR-95	-7.760E-02	497.8	3.862E-01	3.863E-01	3.080E+00
NB-95	-5.072E-01	142.9	7.247E-01	7.252E-01	2.486E+00
RU-103	-7.741E-01	50.8	3.933E-01	3.953E-01	1.824E+00
RH-106	4.292E+00	249.7	1.072E+01	1.072E+01	3.642E+01
AG-108M	2.719E-01	119.8	3.257E-01	3.259E-01	1.031E+00
AG-110M	4.555E-01	121.8	5.549E-01	5.554E-01	2.936E+00
SN-113	4.418E-01	115.3	5.095E-01	5.100E-01	1.749E+00
SB-124	1.043E+00	82.5	8.609E-01	8.626E-01	3.538E+00
SB-125	7.259E-01	146.2	1.061E+00	1.062E+00	4.238E+00
I-131	-5.997E-01	120.4	7.219E-01	7.226E-01	1.558E+00
Gd-153	8.649E-01	92.0	7.955E-01	7.973E-01	3.179E+00
Ga-68	2.980E+00	857.3	2.555E+01	2.555E+01	6.187E+01
Tc-99m	3.444E-02	1258.3	4.334E-01	4.334E-01	1.477E+00
BA-133	-6.125E-01	177.9	1.089E+00	1.090E+00	3.685E+00
CS-134	8.336E-01	77.8	6.484E-01	6.498E-01	2.283E+00
CS-137	1.990E-01	324.9	6.466E-01	6.467E-01	2.262E+00
CE-139	-1.480E-02	2716.6	4.019E-01	4.019E-01	1.383E+00
Ba-140	0.000E+00	1.#INF	2.727E-01	2.727E-01	5.278E+00
La-140	1.202E+00	35.4	4.249E-01	4.296E-01	9.063E-01
CE-141	2.637E-01	246.4	6.499E-01	6.501E-01	2.212E+00

CE-144	-3.054E+00	135.1	4.126E+00	4.129E+00	1.381E+01
PM-144	3.839E-02	1478.2	5.675E-01	5.675E-01	1.460E+00
EU-152	-7.865E-01	125.9	9.906E-01	9.914E-01	3.339E+00
EU-154	1.547E+00	86.9	1.345E+00	1.347E+00	2.336E+00
EU-155	-1.258E+00	154.8	1.948E+00	1.949E+00	6.539E+00
HF-181	5.243E-01	139.5	7.312E-01	7.316E-01	1.801E+00
Ta-182	2.580E+00	78.9	2.036E+00	2.040E+00	7.915E+00
Hg-203	-4.887E-01	97.3	4.755E-01	4.764E-01	1.600E+00
TL-208	6.650E+00	11.4	7.558E-01	8.309E-01	1.100E+00
PM-146	5.235E-01	130.0	6.803E-01	6.808E-01	1.739E+00
Y-88	-2.662E-01	304.1	8.096E-01	8.097E-01	1.880E+00
Cd-113m	5.204E+03	109.3	5.688E+03	5.698E+03	1.925E+04
Cd-109	2.489E+00	576.1	1.434E+01	1.434E+01	4.828E+01
Cf-251	-1.981E+00	104.6	2.072E+00	2.080E+00	5.585E+00
Cf-249	5.189E-01	116.4	6.039E-01	6.045E-01	2.059E+00
Sn-126	-3.532E+00	130.1	4.594E+00	4.598E+00	1.544E+01
PB-210	-1.359E+00	980.4	1.332E+01	1.332E+01	3.943E+01
PB-212	1.842E+01	6.3	1.154E+00	1.659E+00	1.991E+00
PB-214	1.305E+01	8.3	1.078E+00	1.274E+00	1.577E+00
BI-207	-4.870E-01	200.2	9.749E-01	9.752E-01	2.346E+00
BI-212	8.693E+00	106.5	9.260E+00	9.271E+00	3.142E+01
U-235	-2.746E+00	188.3	5.169E+00	5.171E+00	9.053E+00
BI-214	1.187E+01	12.5	1.486E+00	1.609E+00	2.372E+00
BI-210M	-8.780E-01	99.6	8.742E-01	8.757E-01	2.934E+00
AC-228	1.713E+01	12.2	2.084E+00	2.260E+00	1.860E+00
TH-227	3.524E+00	107.2	3.776E+00	3.782E+00	1.310E+01
TH-229	-5.029E+00	155.2	7.804E+00	7.814E+00	2.225E+01
TH-234	5.959E+00	60.4	3.596E+00	3.612E+00	3.266E+01
PA-231	0.000E+00	1.#INF	3.509E+00	3.509E+00	8.504E+01
PA-233	-1.150E+00	124.9	1.436E+00	1.438E+00	7.119E+00
PA-234	8.362E-01	89.1	7.451E-01	7.464E-01	8.008E+00
PA-234M	8.069E+01	89.2	7.198E+01	7.209E+01	2.721E+02
AM-241	3.281E-01	398.3	1.307E+00	1.307E+00	3.773E+00
Np-237	0.000E+00	1.#INF	4.442E+00	4.442E+00	1.485E+01
Ir-192	4.030E-01	102.7	4.139E-01	4.146E-01	1.401E+00
Cs-136	1.686E-01	344.8	5.812E-01	5.813E-01	2.064E+00
Np-239	-5.382E-01	320.2	1.724E+00	1.724E+00	5.827E+00
Nd-147	-5.837E+00	93.3	5.445E+00	5.456E+00	1.347E+01
TL-210	-8.354E-01	84.2	7.034E-01	7.050E-01	2.364E+00
Kr-85	1.200E+02	111.8	1.340E+02	1.342E+02	4.544E+02
Total	5.725E+03				

Analyst: Caleb Quinn

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Sample description
444057_Gamma_180-95857-A-12-B

Spectrum Filename: C:\User\SPC\Det5\5_Gamma_20192608.An1

Acquisition information
Start time: 10/15/2019 11:55:28 AM
Live time: 1800
Real time: 1807
Dead time: 0.37 %
Detector ID: 5

Detector system
Ge 5 SN/157

Calibration
Filename: 5_Soil_TunaCan.Clb
5_Soil_TunaCan_90099_032612

Energy Calibration
Created: 2/28/2012 7:35:48 PM
Zero offset: 0.158 keV
Gain: 0.250 keV/channel
Quadratic: 3.911E-08 keV/channel^2

Efficiency Calibration
Created: 3/27/2012 5:20:37 PM
Knee Energy: 165.85 keV
Above the Knee: Quadratic Uncertainty = 0.87 %
Log(Eff): 6.466115E-01 + (-7.830454E-01*Log(E)) + (-4.117504E-03*Log(E)^2)
Below the Knee: Quadratic Uncertainty = 1.43 %
Log(Eff): -2.462251E+01 + (9.075211E+00*Log(E)) + (-9.664422E-01*Log(E)^2)

Library Files
Main analysis library: Client_Long_Rev15.lib
Library Match Width: 0.500
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G800W064
Start channel: 150 (37.62keV)
Stop channel: 8000 (2000.81keV)
Peak rejection level: 1000.000%
Peak search sensitivity: 3
Sample Size: 1.0000E+00 +/- 0.000E+00%
Activity scaling factor: 1.0000E+00/(1.0000E+00* 1.0000E+00) = 1.0000E+00
Detection limit method: Reg. Guide 4.16 Method

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Random error: 4.0000000E+00
Systematic error: 4.0000000E+00
Fraction Limit: 0.000%
Background width: 3
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:	YES	10/15/2019 11:55:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	5_2019-10-06_1911.PBC 10/6/2019 7:11:20 PM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 21 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 0.1003

***** 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
46.54	-2.	980.39	0.78	1.788E-02	46.54	4.250	PBC<MDA	PB210
59.54	5.	398.30	0.80	2.533E-02	59.54	35.900	PBC<MDA	AM241
63.29	35.	60.35	0.80	2.712E-02	63.29	3.810	PBC<MDA	TH234
74.73	119.	15.36	0.81	3.150E-02				
77.05	233.	9.38	0.81	3.219E-02				
80.81	18.	67.48	0.44	3.316E-02	80.99	34.060	8.679E-01	BA133
87.35	23.	75.45	0.83	3.454E-02	87.57	37.500	PBC<MDA	Sn126
87.90	6.	576.08	0.83	3.462E-02	88.04	3.790	PBC<MDA	Cd109
89.95	65.	21.67	1.02	3.492E-02				
92.59	-10.	341.62	0.83	3.527E-02	92.59	5.584	PBC<MDA	TH234
93.13	58.	28.80	0.83	3.536E-02	93.35	5.561	1.646E+01	AC228
97.50	17.	107.79	0.84	3.577E-02	97.50	30.000	PBC<MDA	Gd153
99.50	3.	558.59	0.84	3.592E-02	99.50	15.000	PBC<MDA	Np239
103.20	12.	149.07	0.84	3.612E-02	103.20	21.800	PBC<MDA	Gd153
136.47	19.	139.87	0.88	3.457E-02	136.30	5.850	PBC<MDA	HF181
					136.47	10.680	2.900E+00	CO57
145.44	8.	246.45	0.88	3.351E-02	145.44	48.200	PBC<MDA	CE141
185.72	51.	33.44	0.93	2.854E-02	185.72	54.000	1.834E+00	U235
227.00	5.	279.28	0.97	2.417E-02	227.00	6.300	PBC<MDA	Cf251
235.97	15.	227.27	0.98	2.341E-02	235.97	12.300	PBC<MDA	TH227
238.64	328.	7.46	0.81	2.319E-02	238.63	43.300	1.815E+01	PB212
242.05	47.	28.13	0.98	2.293E-02	242.00	7.430	1.534E+01	PB214

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
256.24	13.	107.16	1.00	2.186E-02	256.24	7.000	PBC<MDA	TH227
263.70	12.	109.29	1.00	2.135E-02	263.70	0.006	PBC<MDA	Cd113m
277.40	11.	78.89	1.02	2.048E-02	277.28	6.310	PBC<MDA	TL208
295.22	99.	13.46	0.93	1.944E-02	295.09	19.300	1.460E+01	PB214
					296.00	79.000	3.577E+00	TL210
316.49	12.	102.70	1.05	1.835E-02	316.49	87.040	PBC<MDA	Ir192
328.76	12.	108.53	1.07	1.778E-02	328.76	20.300	PBC<MDA	La140
338.22	47.	23.21	1.00	1.736E-02	338.32	12.010	1.252E+01	AC228
345.83	12.	139.47	1.08	1.705E-02	345.83	15.070	PBC<MDA	HF181
351.89	139.	9.59	1.03	1.680E-02	351.93	37.600	1.225E+01	PB214
387.95	10.	116.38	1.12	1.549E-02	387.95	66.000	PBC<MDA	Cf249
391.69	8.	115.33	1.12	1.537E-02	391.69	64.000	PBC<MDA	SN113
433.94	8.	119.77	1.16	1.411E-02	433.94	90.480	PBC<MDA	AG108M
453.87	8.	129.95	1.18	1.360E-02	453.88	65.000	PBC<MDA	PM146
477.60	9.	96.16	1.20	1.303E-02	477.60	10.520	PBC<MDA	BE7
482.00	3.	362.22	1.21	1.293E-02	482.00	80.500	PBC<MDA	HF181
487.02	4.	205.34	1.21	1.282E-02	487.02	45.500	PBC<MDA	La140
511.86	27.	46.39	2.48	1.230E-02	511.86	20.000	PBC<MDA	RH106
513.98	11.	111.75	1.24	1.226E-02	513.98	0.430	PBC<MDA	Kr85
563.24	4.	226.86	1.28	1.135E-02	563.24	8.350	PBC<MDA	CS134
569.32	9.	77.78	1.29	1.125E-02	569.32	15.380	PBC<MDA	CS134
					569.47	8.200	5.420E+00	PA234
					569.70	97.740	4.549E-01	BI207
583.34	112.	11.37	1.49	1.103E-02	583.02	84.500	6.650E+00	TL208
600.50	9.	211.53	1.31	1.076E-02	600.50	17.860	PBC<MDA	SB125
602.73	9.	216.33	1.32	1.073E-02	602.73	98.260	PBC<MDA	SB124
604.71	9.	221.03	1.32	1.070E-02	604.71	97.620	PBC<MDA	CS134
609.44	105.	12.52	1.06	1.063E-02	609.31	46.090	1.187E+01	BI214
					610.30	5.750	9.529E+01	RU103
621.92	8.	249.72	1.33	1.045E-02	621.92	9.930	PBC<MDA	RH106
635.89	3.	187.36	1.34	1.026E-02	635.89	11.310	PBC<MDA	SB125
661.66	3.	324.90	1.37	9.924E-03	661.66	85.210	PBC<MDA	CS137
702.63	7.	134.72	1.40	9.438E-03	702.63	97.900	PBC<MDA	NB94
722.79	11.	82.54	1.42	9.217E-03	722.79	10.810	PBC<MDA	SB124
					722.94	90.840	7.311E-01	AG108M
					723.36	20.220	3.286E+00	EU154
722.94	3.	312.42	1.42	9.215E-03	722.79	10.810	PBC<MDA	SB124
					722.94	90.840	2.090E-01	AG108M
					723.36	20.220	9.396E-01	EU154
727.17	11.	106.52	1.42	9.170E-03	727.17	7.550	PBC<MDA	BI212
766.41	11.	89.21	1.45	8.776E-03	765.79	99.790	PBC<MDA	NB95
					766.41	0.294	PBC<MDA	PA234M
795.87	7.	123.72	1.48	8.503E-03	795.87	85.530	PBC<MDA	CS134
801.95	3.	295.33	1.48	8.448E-03	801.95	8.690	PBC<MDA	CS134
810.78	12.	47.87	1.49	8.371E-03	810.78	99.460	PBC<MDA	CO58
815.77	5.	133.16	1.49	8.328E-03	815.77	23.280	PBC<MDA	La140
818.50	3.	344.78	1.50	8.305E-03	818.50	100.000	PBC<MDA	Cs136
834.85	7.	123.23	1.51	8.168E-03	834.85	99.980	PBC<MDA	MN54

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
860.37	31.	23.09	1.53	7.963E-03	860.56	12.420	1.760E+01	TL208
873.23	5.	110.90	1.54	7.866E-03	873.23	12.270	PBC<MDA	EU154
880.53	8.	92.13	1.54	7.812E-03	880.53	6.000	PBC<MDA	PA234
883.24	6.	137.43	1.55	7.791E-03	883.24	9.600	PBC<MDA	PA234
911.19	68.	12.17	0.96	7.591E-03	911.07	29.000	1.713E+01	AC228
937.49	6.	121.84	1.59	7.411E-03	937.49	34.360	PBC<MDA	AG110M
946.02	4.	190.04	1.60	7.355E-03	946.02	13.400	PBC<MDA	PA234
968.89	11.	87.75	1.61	7.209E-03	968.97	17.460	PBC<MDA	AC228
996.33	8.	86.94	1.63	7.042E-03	996.33	10.600	PBC<MDA	EU154
1001.00	3.	292.33	1.64	7.014E-03	1001.00	0.837	PBC<MDA	PA234M
1037.84	2.	489.61	1.66	6.805E-03	1037.84	14.130	PBC<MDA	Co56
1077.40	1.	857.32	1.69	6.594E-03	1077.40	3.300	PBC<MDA	Ga68
1120.27	3.	301.31	1.72	6.381E-03	1120.29	15.100	PBC<MDA	BI214
					1120.55	99.987	PBC<MDA	Sc46
1121.28	12.	78.92	1.72	6.376E-03	1120.55	99.987	PBC<MDA	Sc46
					1121.30	34.900	2.991E+00	Ta182
1188.44	3.	289.64	1.77	6.069E-03	1189.05	16.200	PBC<MDA	Ta182
1238.28	10.	94.45	1.80	5.866E-03	1238.28	66.070	PBC<MDA	Co56
1274.53	5.	96.82	1.83	5.725E-03	1274.53	99.940	PBC<MDA	NA22
					1274.54	35.190	1.471E+00	EU154
1291.60	13.	50.38	1.84	5.661E-03	1291.60	43.200	PBC<MDA	FE59
1313.00	4.	177.92	1.85	5.583E-03	1313.00	21.000	PBC<MDA	TL210
1384.30	2.	324.35	1.90	5.340E-03	1384.30	24.290	PBC<MDA	AG110M
1461.04	200.	7.07	1.92	5.103E-03	1460.83	10.670	2.041E+02	K40
1596.21	8.	35.36	2.02	4.736E-03	1596.21	95.400	9.838E-01	La140
1763.97	8.	87.21	2.11	4.351E-03	1764.49	15.400	PBC<MDA	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	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide
298.54	74.77	109.	119.	3.792E+03	15.36	0.813	- D
307.86	77.09	121.	233.	7.226E+03	9.38	0.815	- D
322.88	80.81	53.	18.	5.328E+02	67.48	0.437	- sM
358.60	89.95	91.	40.	1.132E+03	37.69	0.828	- sD

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: Client_Long_Rev15.lib

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********** 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 1 Sigma %	FWHM keV
PB-210	185.69	46.54	121.	-2.	-0.001	980.39	0.783
TH-227	200.11	50.14	108.	-6.	-0.003	294.39	0.787s
AM-241	237.72	59.54	161.	5.	0.003	398.30	0.797s
TH-234	252.74	63.29	149.	35.	0.019	60.35	0.801s
Sn-126	256.71	64.28	236.	-17.	-0.009	130.08	0.802
BA-133	323.61	80.99	174.	-3.	-0.002	562.85	0.819
Np-237	345.63	86.49	636.	0.	0.000	169.04	0.825A
EU-155	345.84	86.54	664.	-23.	-0.013	162.69	0.825s
Sn-126	347.43	86.94	614.	-23.	-0.013	156.50	0.825
Sn-126	349.95	87.57	548.	23.	0.013	75.45	0.826D
Cd-109	351.83	88.04	571.	6.	0.003	576.08	0.826A
Nd-147	364.08	91.10	586.	0.	0.000	1000.00	0.829s
TH-234	370.05	92.59	589.	-10.	-0.006	341.62	0.831s
AC-228	373.09	93.35	112.	58.	0.032	28.80	0.832D
Gd-153	389.70	97.50	159.	17.	0.009	107.79	0.836s
Np-239	397.71	99.50	176.	3.	0.002	558.59	0.838s
Gd-153	412.52	103.20	154.	12.	0.007	149.07	0.842s
Np-239	414.52	103.70	166.	0.	0.000	1000.00	0.842s
EU-155	420.98	105.31	353.	-17.	-0.010	154.85	0.844s
Np-239	424.25	106.13	321.	-8.	-0.004	320.25	0.845
EU-152	486.90	121.78	160.	-14.	-0.008	125.94	0.861s
PA-234	524.99	131.29	359.	-21.	-0.012	128.30	0.871s
HF-181	531.91	133.02	381.	-21.	-0.012	131.66	0.872s
CE-144	533.97	133.54	402.	-21.	-0.012	135.11	0.873s
HF-181	545.02	136.30	423.	-17.	-0.009	176.61	0.876s
CO-57	545.72	136.47	354.	19.	0.011	139.87	0.876s
U-235	574.99	143.79	152.	-18.	-0.010	188.26	0.883s
CE-141	581.61	145.44	175.	8.	0.004	246.45	0.885s
Ba-140	650.54	162.66	174.	-9.	-0.005	377.64	0.902
Cf-251	706.34	176.60	107.	-18.	-0.010	104.62	0.916
U-235	742.85	185.72	78.	51.	0.028	33.44	0.925s
TH-229	774.03	193.51	97.	-11.	-0.006	155.17	0.933s
U-235	821.35	205.33	108.	-12.	-0.007	144.19	0.945s
TH-229	843.44	210.85	131.	-13.	-0.007	133.36	0.950s
Cf-251	908.08	227.00	60.	5.	0.003	279.28	0.966s
TH-227	943.98	235.97	557.	15.	0.008	227.27	0.975s
PB-212	954.64	238.63	51.	333.	0.185	6.26	0.978D
PB-214	968.10	242.00	64.	47.	0.026	28.13	0.981D
EU-152	978.89	244.69	613.	-16.	-0.009	214.81	0.984s
TH-227	1025.11	256.24	51.	13.	0.007	107.16	0.995s
Cd-113m	1054.97	263.70	80.	12.	0.007	109.29	1.002
BI-210M	1063.50	265.83	131.	-17.	-0.009	99.56	1.005s
TL-208	1109.78	277.40	22.	11.	0.006	78.89	1.018
Hg-203	1117.00	279.20	94.	-15.	-0.008	97.30	1.017

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
I-131	1137.41	284.30	70.	-3.	-0.002	531.32	1.022s
PB-214	1181.10	295.22	23.	99.	0.055	13.46	0.927
TL-210	1184.24	296.00	331.	-14.	-0.008	186.61	1.034s
PB-212	1200.37	300.03	310.	-6.	-0.003	435.52	1.038s
PA-231	1200.53	300.07	304.	0.	0.000	1000.00	1.038s
PA-233	1200.97	300.18	304.	0.	0.000	1000.00	1.038s
PA-231	1210.86	302.65	304.	0.	0.000	1000.00	1.040s
BA-133	1211.66	302.85	304.	0.	0.000	1000.00	1.040
Ba-140	1219.66	304.85	304.	0.	0.000	1000.00	1.042
BI-210M	1219.85	304.90	304.	0.	0.000	1000.00	1.042
Ir-192	1234.03	308.44	304.	0.	0.000	1000.00	1.046s
PA-233	1248.32	312.01	317.	-14.	-0.008	124.87	1.049
Ir-192	1266.25	316.49	65.	12.	0.006	102.70	1.053s
CR-51	1280.63	320.08	79.	-3.	-0.002	497.02	1.057s
La-140	1315.35	328.76	48.	12.	0.007	108.53	1.065s
AC-228	1353.20	338.22	24.	47.	0.026	23.21	0.999
Cs-136	1362.62	340.57	157.	-2.	-0.001	888.82	1.077s
EU-152	1377.49	344.29	155.	0.	0.000	1000.00	1.080s
HF-181	1383.66	345.83	132.	12.	0.007	139.47	1.082s
PB-214	1407.91	351.89	11.	139.	0.077	9.59	1.030
BA-133	1424.36	356.00	199.	-11.	-0.006	177.88	1.091
I-131	1458.32	364.48	55.	-14.	-0.008	120.38	1.099s
BA-133	1535.78	383.84	95.	-11.	-0.006	128.89	1.117
Cf-249	1552.22	387.95	57.	10.	0.005	116.38	1.121s
SN-113	1567.19	391.69	37.	8.	0.004	115.33	1.125s
SB-125	1711.99	427.88	40.	-5.	-0.003	335.58	1.158s
AG-108M	1736.25	433.94	20.	8.	0.004	119.77	1.164s
PM-146	1816.05	453.88	29.	8.	0.005	129.95	1.182s
Ir-192	1872.79	468.06	48.	-13.	-0.007	107.97	1.195s
BE-7	1910.94	477.59	36.	9.	0.005	96.16	1.204s
HF-181	1928.56	482.00	44.	3.	0.001	362.22	1.208s
La-140	1948.65	487.02	16.	4.	0.002	205.34	1.212s
RU-103	1988.80	497.05	56.	-16.	-0.009	50.81	1.221s
RH-106	2048.06	511.86	67.	27.	0.015	46.39	2.485s
Kr-85	2056.53	513.98	75.	11.	0.006	111.75	1.237s
Nd-147	2124.62	531.00	56.	-16.	-0.009	93.29	1.252s
Ba-140	2149.67	537.26	28.	0.	0.000	1000.00	1.258s
CS-134	2253.60	563.24	20.	4.	0.002	226.86	1.280s
CS-134	2277.94	569.32	20.	9.	0.005	77.78	1.286s
PA-234	2278.54	569.47	38.	-7.	-0.004	127.50	1.286s
TL-208	2334.04	583.34	11.	112.	0.062	11.37	1.491
SB-125	2402.69	600.50	182.	9.	0.005	211.53	1.313s
SB-124	2411.61	602.73	191.	9.	0.005	216.33	1.315s
CS-134	2419.53	604.71	200.	9.	0.005	221.03	1.317
BI-214	2438.46	609.44	15.	105.	0.058	12.52	1.061
RU-103	2441.89	610.30	209.	6.	0.003	370.20	1.322s
AG-108M	2457.82	614.28	215.	0.	0.000	1000.00	1.325s
PM-144	2472.94	618.06	215.	0.	0.000	1000.00	1.328s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
RH-106	2488.37	621.92	196.	8.	0.004	249.72	1.332s
SB-125	2544.26	635.89	13.	3.	0.002	187.36	1.344s
I-131	2548.61	636.97	24.	-1.	0.000	719.25	1.345s
AG-110M	2631.76	657.76	48.	-13.	-0.007	83.00	1.362s
CS-137	2647.36	661.66	46.	3.	0.002	324.90	1.366s
NB-94	2811.25	702.63	22.	7.	0.004	134.72	1.400s
SB-124	2891.88	722.79	36.	11.	0.006	82.54	1.417s
AG-108M	2892.48	722.94	47.	3.	0.002	312.42	1.417s
EU-154	2894.17	723.36	70.	-14.	-0.008	89.11	1.418s
ZR-95	2897.53	724.20	48.	-11.	-0.006	92.43	1.418s
BI-212	2909.41	727.17	61.	11.	0.006	106.52	1.421
PM-146	2943.61	735.72	35.	-12.	-0.006	26.73	1.428s
PM-146	2989.37	747.16	35.	-13.	-0.007	98.96	1.437s
ZR-95	3027.65	756.73	27.	-1.	0.000	497.75	1.445s
AG-110M	3056.50	763.94	43.	-5.	-0.003	203.29	1.451s
NB-95	3063.89	765.79	61.	-8.	-0.004	142.89	1.453s
PA-234M	3066.38	766.41	42.	11.	0.006	89.21	1.453s
EU-152	3116.41	778.92	33.	-13.	-0.007	73.89	1.463
BI-212	3142.41	785.42	38.	-14.	-0.008	72.44	1.468
CS-134	3184.20	795.87	34.	7.	0.004	123.72	1.477s
TL-210	3199.12	799.60	50.	-13.	-0.007	84.20	1.480s
CS-134	3208.53	801.95	50.	3.	0.002	295.33	1.482s
CO-58	3243.82	810.78	10.	12.	0.006	47.87	1.489s
La-140	3263.80	815.77	21.	5.	0.003	133.16	1.493s
Cs-136	3274.72	818.50	36.	3.	0.001	344.78	1.495s
MN-54	3340.10	834.85	14.	7.	0.004	123.23	1.508s
Co-56	3387.78	846.77	28.	-10.	-0.006	83.31	1.518s
TL-208	3442.95	860.56	5.	31.	0.017	23.09	1.529s
NB-94	3485.08	871.10	18.	-2.	-0.001	402.77	1.537s
EU-154	3493.61	873.23	14.	5.	0.003	110.90	1.539s
PA-234	3522.80	880.53	21.	8.	0.004	92.13	1.544s
PA-234	3533.64	883.24	28.	6.	0.003	137.43	1.547s
AG-110M	3539.41	884.68	34.	0.	0.000	1000.00	1.547s
Sc-46	3557.79	889.28	66.	-12.	-0.007	99.43	1.551s
Y-88	3592.83	898.04	28.	-13.	-0.007	88.96	1.558s
AC-228	3645.41	911.19	0.	68.	0.038	12.17	0.964s
AG-110M	3750.60	937.49	9.	6.	0.003	121.84	1.589s
PA-234	3784.70	946.02	9.	4.	0.002	190.04	1.595s
EU-152	3857.05	964.11	88.	-6.	-0.003	244.27	1.609s
AC-228	3876.48	968.97	37.	11.	0.006	87.75	1.612
EU-154	3985.88	996.33	20.	8.	0.004	86.94	1.633s
PA-234M	4004.55	1001.00	31.	3.	0.002	292.33	1.636s
EU-154	4019.65	1004.77	46.	-10.	-0.005	103.96	1.639s
Co-56	4151.87	1037.84	15.	2.	0.001	489.61	1.664s
Cs-136	4192.77	1048.07	18.	-6.	-0.003	108.01	1.671s
RH-106	4201.93	1050.36	39.	-12.	-0.006	75.22	1.673s
BI-207	4255.11	1063.66	15.	-4.	-0.002	200.17	1.682s
Ga-68	4310.04	1077.40	15.	1.	0.001	857.32	1.692s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
FE-59	4397.41	1099.25	30.	-10.	-0.006	124.50	1.708s
ZN-65	4462.56	1115.55	52.	0.	0.000	1000.00	1.720s
BI-214	4481.51	1120.29	53.	3.	0.002	301.31	1.723s
Sc-46	4482.57	1120.55	56.	-3.	-0.001	400.39	1.723s
Ta-182	4485.56	1121.30	39.	12.	0.007	78.92	1.724s
CO-60	4693.21	1173.24	25.	-13.	-0.007	88.99	1.760s
Ta-182	4756.42	1189.05	15.	3.	0.002	289.64	1.771s
Ta-182	4885.79	1221.41	21.	-4.	-0.002	246.99	1.793s
Co-56	4953.23	1238.28	17.	10.	0.006	94.45	1.804
NA-22	5098.13	1274.53	11.	5.	0.003	96.82	1.828s
EU-154	5098.17	1274.54	16.	0.	0.000	1000.00	1.828s
FE-59	5166.35	1291.60	5.	13.	0.007	50.38	1.840s
TL-210	5251.91	1313.00	11.	4.	0.002	177.92	1.854s
CO-60	5329.85	1332.50	22.	-11.	-0.006	59.68	1.866s
AG-110M	5536.88	1384.30	5.	2.	0.001	324.35	1.899s
K-40	5843.58	1461.04	0.	200.	0.111	7.07	1.919
La-140	6383.73	1596.21	0.	8.	0.004	35.36	2.024s
SB-124	6762.39	1690.98	6.	-3.	-0.001	218.12	2.076s
BI-214	7056.06	1764.49	22.	8.	0.005	87.21	2.114s
Co-56	7083.46	1771.35	10.	0.	0.000	1000.00	2.117s
Y-88	7341.96	1836.06	6.	-2.	-0.001	304.14	2.149s

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	3.7940E+00					5.31E+01	
			477.60	3.794E+00	(	1.240E+01	9.62E+01	1.05E+01 G
NA-22	C	5.1787E-01					9.50E+02	
			1274.53	5.179E-01	?(	1.741E+00	9.68E+01	9.99E+01 G
K-40	N	2.0406E+02					4.66E+11	
			1460.83	2.041E+02	(	7.519E+00	7.07E+00	1.07E+01 G
Sc-46	F	-8.6478E-01					8.38E+01	
			889.28	-8.648E-01	?(	2.906E+00	9.94E+01	1.00E+02 G
			1120.55	-2.322E-01	+	3.264E+00	4.00E+02	1.00E+02 G
CR-51	F	-1.0698E+00					2.77E+01	
			320.08	-1.070E+00	?(P	1.361E+01	4.97E+02	9.94E+00 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
MN-54	C	4.6283E-01					3.12E+02	
			834.85	4.628E-01	?(P	1.379E+00	1.23E+02	1.00E+02 G
FE-59	F	3.8158E-01					4.45E+01	
			1099.25	-1.517E+00	?(	4.282E+00	1.24E+02	5.65E+01 G
			1291.60	2.864E+00	?(P	3.074E+00	5.04E+01	4.32E+01 G
Co-56	C	2.3477E-01					7.73E+01	
			846.77	-6.950E-01	?(P	1.888E+00	8.33E+01	9.99E+01 G
			1238.28	1.473E+00	?(P	3.109E+00	9.44E+01	6.61E+01 G
			1037.84	1.021E+00	?(P	1.208E+01	4.90E+02	1.41E+01 G
			1771.35	0.000E+00	-	1.464E+01	1.00E+03	1.55E+01 A
CO-57	C	3.0293E-01					2.72E+02	
			122.06	-2.114E-02	%(	1.104E+00	1.52E+03	8.56E+01 G
			136.47	2.900E+00	?(	1.360E+01	1.40E+02	1.07E+01 G
CO-58	C	7.7555E-01					7.09E+01	
			810.78	7.755E-01	&(	1.148E+00	4.79E+01	9.95E+01 G
CO-60	F	-1.0860E+00					1.93E+03	
			1332.50	-1.086E+00	?(P	2.464E+00	5.97E+01	1.00E+02 G
			1173.24	-1.178E+00	+	2.357E+00	8.90E+01	9.99E+01 G
NB-94	I	4.4093E-01					7.41E+06	
			702.63	4.409E-01	?(	1.467E+00	1.35E+02	9.79E+01 G
			871.10	-1.058E-01	-	1.567E+00	4.03E+02	9.99E+01 G
ZR-95	I	-7.7598E-02					6.40E+01	
			756.73	-7.760E-02	?(P	3.080E+00	4.98E+02	5.45E+01 G
			724.20	-1.535E+00	+	4.796E+00	9.24E+01	4.42E+01 G
NB-95	I	-5.0718E-01					6.40E+01	
			765.79	-5.072E-01	?(	2.486E+00	1.43E+02	9.98E+01 G
RU-103	I	-7.7414E-01					3.93E+01	
			497.05	-7.741E-01	?(P	1.824E+00	5.08E+01	9.09E+01 G
			610.30	5.064E+00	+	6.383E+01	3.70E+02	5.75E+00 GA
RH-106	I	4.2924E+00					3.74E+02	
			621.92	4.292E+00	?(	3.642E+01	2.50E+02	9.93E+00 G
			1050.36	-6.087E+01	& P	1.672E+02	7.52E+01	1.56E+00 G
			511.86	6.172E+00	?	9.206E+00	4.64E+01	2.00E+01 GA
AG-108M	C	2.7191E-01					1.53E+05	
			433.94	3.350E-01	?(P	1.031E+00	1.20E+02	9.05E+01 G
			722.94	2.090E-01	?(	2.297E+00	3.12E+02	9.08E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
			614.28	0.000E+00	-	4.159E+00	1.00E+03	8.98E+01 G
AG-110M	F	4.5547E-01					2.50E+02	
			884.68	0.000E+00	?(	2.936E+00	1.00E+03	7.27E+01 G
			657.76	-7.377E-01	+	2.056E+00	8.30E+01	9.46E+01 G
			937.49	1.236E+00	?(	3.697E+00	1.22E+02	3.44E+01 G
			1384.30	7.138E-01	?(	5.770E+00	3.24E+02	2.43E+01 G
			763.94	-1.322E+00	+	9.394E+00	2.03E+02	2.23E+01 G
SN-113	F	4.4179E-01					1.15E+02	
			391.69	4.418E-01	?(	1.749E+00	1.15E+02	6.40E+01 G
SB-124	F	1.0430E+00					6.02E+01	
			602.73	4.819E-01	?(	3.538E+00	2.16E+02	9.83E+01 G
			1690.98	-6.873E-01	+	3.557E+00	2.18E+02	4.78E+01 G
			722.79	6.143E+00	?(	1.707E+01	8.25E+01	1.08E+01 G
SB-125	I	7.2587E-01					1.01E+03	
			427.88	-6.792E-01	?(P	4.238E+00	3.36E+02	2.96E+01 G
			600.50	2.639E+00	*(	1.895E+01	2.12E+02	1.79E+01 G
			635.89	1.382E+00	?(P	9.377E+00	1.87E+02	1.13E+01 G
			463.37	-5.703E-02	% P	1.825E+01	7.55E+03	1.05E+01 G
I-131	I	-5.9970E-01					8.02E+00	
			364.48	-5.997E-01	?(P	1.558E+00	1.20E+02	8.17E+01 G
			284.30	-1.464E+00	+ P	1.884E+01	5.31E+02	6.14E+00 G
			636.97	-5.727E-01	+ P	1.923E+01	7.19E+02	7.17E+00 G
Gd-153	F	8.6489E-01					2.42E+02	
			97.50	8.781E-01	&(	3.179E+00	1.08E+02	3.00E+01 G
			103.20	8.467E-01	*(	4.272E+00	1.49E+02	2.18E+01 G
Ga-68	C	2.9803E+00					4.71E-02	
			1077.40	2.980E+00	?(	6.187E+01	8.57E+02	3.30E+00 G
Tc-99m	I	3.4444E-02					2.51E-01	
			140.51	3.444E-02	&(	1.477E+00	1.26E+03	8.93E+01 G
BA-133	F	-6.1245E-01					3.85E+03	
			356.00	-6.125E-01	(	3.685E+00	1.78E+02	6.20E+01 G
			302.85	0.000E+00	+	1.337E+01	1.00E+03	1.83E+01 G
			383.84	-4.373E+00	+	1.913E+01	1.29E+02	8.94E+00 GA
			80.99	-1.638E-01	+	3.156E+00	5.63E+02	3.41E+01 GA
CS-134	I	8.3361E-01					7.54E+02	
			795.87	5.348E-01	?(	2.283E+00	1.24E+02	8.55E+01 G
			604.71	4.871E-01	(	3.652E+00	2.21E+02	9.76E+01 G
			569.32	2.889E+00	&(	7.560E+00	7.78E+01	1.54E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
			801.95	2.600E+00	?(	2.693E+01	2.95E+02	8.69E+00 G
			563.24	2.322E+00	?(P	1.381E+01	2.27E+02	8.35E+00 G
CS-137	I	1.9902E-01					1.10E+04	
			661.66	1.990E-01	?(P	2.262E+00	3.25E+02	8.52E+01 G
CE-139	F	-1.4795E-02					1.38E+02	
			165.85	-1.480E-02	%(	1.383E+00	2.72E+03	7.99E+01 G
La-140	I	1.2017E+00					1.28E+01	
			1596.21	9.838E-01	?(	9.063E-01	3.54E+01	9.54E+01 G
			487.02	3.754E-01	& P	2.037E+00	2.05E+02	4.55E+01 G
			328.76	1.898E+00	?(	5.369E+00	1.09E+02	2.03E+01 G
			815.77	1.487E+00	?(	6.938E+00	1.33E+02	2.33E+01 G
CE-141	I	2.6372E-01					3.25E+01	
			145.44	2.637E-01	?(	2.212E+00	2.46E+02	4.82E+01 G
CE-144	I	-3.0536E+00					2.85E+02	
			133.54	-3.054E+00	?(	1.381E+01	1.35E+02	1.11E+01 G
PM-144	C	3.8392E-02					3.63E+02	
			696.54	3.839E-02	%(P	1.460E+00	1.48E+03	9.90E+01 G
			618.06	0.000E+00	-	3.790E+00	1.00E+03	9.91E+01 G
EU-152	F	-7.8651E-01					4.94E+03	
			121.78	-7.865E-01	?(	3.339E+00	1.26E+02	2.86E+01 G
			344.29	0.000E+00	+	7.440E+00	1.00E+03	2.65E+01 G
			1112.07	1.624E-01	%	2.298E+01	3.98E+03	1.36E+01 G
			778.92	-6.606E+00	+ P	1.468E+01	7.39E+01	1.29E+01 G
			964.11	-2.890E+00	+	2.433E+01	2.44E+02	1.46E+01 G
			244.69	-5.296E+00	+	3.811E+01	2.15E+02	7.58E+00 G
			1408.00	-2.485E-01	% P	3.703E+00	1.32E+03	2.10E+01 GA
EU-154	I	1.5468E+00					3.14E+03	
			123.10	-3.272E-02	&(P	2.336E+00	3.99E+03	4.08E+01 G
			1274.54	0.000E+00	+	5.888E+00	1.00E+03	3.52E+01 G
			723.36	-4.158E+00	+	1.245E+01	8.91E+01	2.02E+01 G
			873.23	2.974E+00	?(	1.154E+01	1.11E+02	1.23E+01 G
			1004.77	-4.265E+00	&	1.509E+01	1.04E+02	1.80E+01 G
			996.33	5.973E+00	?(	1.766E+01	8.69E+01	1.06E+01 G
EU-155	I	-1.2582E+00					1.81E+03	
			105.31	-1.258E+00	?(	6.539E+00	1.55E+02	2.12E+01 G
			86.54	-1.190E+00	&	6.469E+00	1.63E+02	3.07E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
HF-181	F	5.2425E-01					4.24E+01	
			482.00	1.408E-01	?(	1.801E+00	3.62E+02	8.05E+01 G
			133.02	-7.805E-01	+	3.439E+00	1.32E+02	4.33E+01 G
			345.83	2.572E+00	(	1.215E+01	1.39E+02	1.51E+01 G
			136.30	-4.567E+00	+	2.706E+01	1.77E+02	5.85E+00 G
Ta-182	F	2.5800E+00					1.14E+02	
			1121.30	2.991E+00	?(	7.915E+00	7.89E+01	3.49E+01 G
			1221.41	-1.503E+00	-	8.403E+00	2.47E+02	2.70E+01 G
			1189.05	1.695E+00	?(	1.173E+01	2.90E+02	1.62E+01 G
Hg-203	F	-4.8874E-01					4.66E+01	
			279.20	-4.887E-01	?(	1.600E+00	9.73E+01	8.15E+01 G
TL-208	N	6.6501E+00					6.98E+02	
			583.02	6.650E+00	(P	1.100E+00	1.14E+01	8.45E+01 G
			277.28	4.872E+00	-	1.049E+01	7.89E+01	6.31E+00 G
			860.56	1.760E+01	+	7.177E+00	2.31E+01	1.24E+01 G
PM-146	C	5.2352E-01					2.02E+03	
			453.88	5.235E-01	?(P	1.739E+00	1.30E+02	6.50E+01 G
			747.16	-2.309E+00	+	5.495E+00	9.90E+01	3.40E+01 G
			735.72	-3.175E+00	+ P	8.198E+00	2.67E+01	2.25E+01 G
Y-88	F	-2.6619E-01					1.07E+02	
			1836.06	-2.662E-01	?(	1.880E+00	3.04E+02	9.92E+01 G
			898.04	-1.024E+00	+	2.112E+00	8.90E+01	9.37E+01 G
Cd-113m		5.2042E+03					5.33E+03	
			263.70	5.204E+03	(	1.925E+04	1.09E+02	6.00E-03 K
Cd-109	F	2.4894E+00					4.53E+02	
							Derived Ave Activity	
			88.04	2.489E+00	}(	4.828E+01	5.76E+02	3.79E+00 G
Cf-251	T	-1.9807E+00					3.28E+05	
			176.60	-1.981E+00	&(	5.585E+00	1.05E+02	1.70E+01 G
			227.00	1.824E+00	?	1.416E+01	2.79E+02	6.30E+00 GA
Cf-249	T	5.1889E-01					1.28E+05	
			387.95	5.189E-01	?(	2.059E+00	1.16E+02	6.60E+01 G
			333.44	6.795E-02	%	7.111E+00	3.88E+03	1.55E+01 G
Sn-126		-3.5320E+00					3.65E+07	
			87.57	9.704E-01	}	4.795E+00	7.54E+01	3.75E+01 GA
			64.28	-3.532E+00	(	1.544E+01	1.30E+02	9.70E+00 G
			86.94	-4.034E+00	}	2.110E+01	1.56E+02	9.04E+00 GA

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

PB-210   N  -1.3585E+00                                     8.14E+03
                          46.54-1.359E+00  (P 3.943E+01 9.80E+02 4.25E+00 G

PB-212   N   1.8422E+01                                     6.98E+02
                         238.63 1.842E+01  (  1.991E+00 6.26E+00 4.33E+01 G
                         300.03-5.069E+00 -   7.481E+01 4.36E+02 3.28E+00 GA

PB-214   N   1.3050E+01                                     5.84E+05
                         351.93 1.225E+01  (  1.577E+00 9.59E+00 3.76E+01 G
                         295.09 1.460E+01  (  3.733E+00 1.35E+01 1.93E+01 G
                         242.00 1.534E+01     1.304E+01 2.81E+01 7.43E+00 GA

BI-207   C  -4.8702E-01                                     1.18E+04
                        1063.66-4.870E-01 ?(P 2.346E+00 2.00E+02 7.45E+01 G
                         569.70-6.025E-09 &   1.448E+00 6.61E+09 9.77E+01 G

BI-212   N   8.6927E+00                                     6.98E+02
                         727.17 8.693E+00  (  3.142E+01 1.07E+02 7.55E+00 G
                         785.42-6.887E+01 + P 1.580E+02 7.24E+01 1.28E+00 GA

U-235    N  -2.7457E+00                                     2.57E+11
                         143.79-2.746E+00 &(P 9.053E+00 1.88E+02 1.10E+01 G
                         205.33-5.017E+00 + P 2.158E+01 1.44E+02 5.01E+00 G
                         163.38-6.717E-02 % P 2.319E+01 1.81E+04 5.08E+00 G
                         185.72 1.834E+00 @ P 1.583E+00 3.34E+01 5.40E+01 GA

BI-214   N   1.1872E+01                                     5.84E+05
                         609.31 1.187E+01  (P 2.372E+00 1.25E+01 4.61E+01 G
                        1120.29 1.996E+00 - P 2.104E+01 3.01E+02 1.51E+01 G
                        1764.49 6.846E+00 - P 2.026E+01 8.72E+01 1.54E+01 G

BI-210M  T  -8.7801E-01                                     1.10E+09
                         265.83-8.780E-01 ?(  2.934E+00 9.96E+01 5.00E+01 G
                         304.90 0.000E+00 +   8.801E+00 1.00E+03 2.80E+01 G

AC-228   N   1.7128E+01                                     2.10E+03
                         911.07 1.713E+01  (P 1.860E+00 1.22E+01 2.90E+01 G
                         968.97 4.654E+00 - P 1.379E+01 8.77E+01 1.75E+01 G
                         338.32 1.252E+01 -   6.805E+00 2.32E+01 1.20E+01 G
                          93.35 1.646E+01     1.468E+01 2.88E+01 5.56E+00 XA

TH-227   N   3.5235E+00                                     7.95E+03
                         256.24 4.701E+00  (  1.310E+01 1.07E+02 7.00E+00 G
                         235.97 2.853E+00 ?(  2.175E+01 2.27E+02 1.23E+01 G
                          50.14-2.071E+00 -   1.765E+01 2.94E+02 8.00E+00 G
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Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-229	N	-5.0291E+00					2.68E+06	
			193.51	-5.029E+00	&(P	2.225E+01	1.55E+02	4.40E+00 G
			210.85	-9.326E+00	+ P	4.051E+01	1.33E+02	2.99E+00 G
TH-234	N	5.9591E+00					1.63E+12	
			92.59	-2.824E+00	(P	3.266E+01	3.42E+02	5.58E+00 G
			63.29	1.883E+01	*(P	3.203E+01	6.04E+01	3.81E+00 G
PA-233	C	-1.1502E+00					7.82E+08	
			312.01	-1.150E+00	?(P	7.119E+00	1.25E+02	3.60E+01 G
			300.18	0.000E+00	+	3.924E+01	1.00E+03	6.20E+00 G
PA-234	N	8.3619E-01					1.63E+12	
			131.29	-1.865E+00	(	8.008E+00	1.28E+02	1.80E+01 G
			946.02	2.008E+00	?(P	9.597E+00	1.90E+02	1.34E+01 G
			569.47	-4.316E+00	&	1.897E+01	1.28E+02	8.20E+00 G
			883.24	4.264E+00	?(	2.041E+01	1.37E+02	9.60E+00 G
			880.53	8.999E+00	?	2.832E+01	9.21E+01	6.00E+00 GA
PA-234M	N	8.0687E+01					1.63E+12	
			1001.00	2.621E+01	?(P	2.721E+02	2.92E+02	8.37E-01 G
			766.41	2.358E+02	&(P	7.100E+02	8.92E+01	2.94E-01 G
AM-241	T	3.2809E-01					1.58E+05	
			59.54	3.281E-01	&(P	3.773E+00	3.98E+02	3.59E+01 G
Ir-192	F	4.0300E-01					7.40E+01	
			316.49	4.030E-01	?(	1.401E+00	1.03E+02	8.70E+01 G
			468.06	-1.053E+00	+	2.835E+00	1.08E+02	5.18E+01 G
			308.44	0.000E+00	-	7.836E+00	1.00E+03	3.18E+01 G
Cs-136	F	1.6856E-01					1.30E+01	
			818.50	1.686E-01	?(	2.064E+00	3.45E+02	1.00E+02 G
			1048.07	-6.174E-01	+	2.313E+00	1.08E+02	8.00E+01 G
			340.57	-1.372E-01	+	4.192E+00	8.89E+02	4.69E+01 G
Np-239	T	-5.3818E-01					2.36E+00	
			103.70	0.000E+00	&	4.020E+00	1.00E+03	2.40E+01 X
			106.13	-5.382E-01	?(	5.827E+00	3.20E+02	2.27E+01 G
			99.50	3.476E-01	&	6.648E+00	5.59E+02	1.50E+01 X
Nd-147		-5.8366E+00					1.11E+01	
			531.00	-5.837E+00	?(	1.347E+01	9.33E+01	1.30E+01 G
			91.10	0.000E+00	+	6.465E+00	1.00E+03	2.83E+01 G

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

TL-210   N  -8.3538E-01                                      5.84E+05
                          799.60-8.354E-01 ?(  2.364E+00 8.42E+01 9.90E+01 G
                          296.00-5.048E-01 +   3.170E+00 1.87E+02 7.90E+01 G
                         1313.00 2.053E+00 ?   8.495E+00 1.78E+02 2.10E+01 GA

Kr-85    I   1.1995E+02                                      3.92E+03
                          513.98 1.200E+02 ?(  4.544E+02 1.12E+02 4.30E-01 G
   ( - 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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********** 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 1 Sigma %	Activity	
PB-210	46.54	121.	-2.	-0.001	980.39	-1.359E+00	P
TH-227	50.14	108.	-6.	-0.003	294.39	-2.071E+00	
AM-241	59.54	161.	5.	0.003	398.30	3.281E-01	P
TH-234	63.29	149.	35.	0.019	60.35	1.883E+01	P
BA-133	80.99	174.	-3.	-0.002	562.85	-1.638E-01	
EU-155	86.54	664.	-23.	-0.013	162.69	-1.190E+00	
TH-234	92.59	589.	-10.	-0.006	341.62	-2.824E+00	P

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Gd-153	97.50	159.	17.	0.009	107.79	8.781E-01	
Np-239	99.50	176.	3.	0.002	558.59	3.476E-01	
Gd-153	103.20	154.	12.	0.007	149.07	8.467E-01	
EU-155	105.31	353.	-17.	-0.010	154.85	-1.258E+00	
Np-239	106.13	321.	-8.	-0.004	320.25	-5.382E-01	
EU-152	121.78	160.	-14.	-0.008	125.94	-7.865E-01	
PA-234	131.29	359.	-21.	-0.012	128.30	-1.865E+00	
HF-181	133.02	381.	-21.	-0.012	131.66	-7.805E-01	
CE-144	133.54	402.	-21.	-0.012	135.11	-3.054E+00	
HF-181	136.30	423.	-17.	-0.009	176.61	-4.567E+00	
CO-57	136.47	354.	19.	0.011	139.87	2.900E+00	
U-235	143.79	152.	-18.	-0.010	188.26	-2.746E+00	P
CE-141	145.44	175.	8.	0.004	246.45	2.637E-01	
Ba-140	162.66	174.	-9.	-0.005	377.64	-2.613E+00	P
Cf-251	176.60	107.	-18.	-0.010	104.62	-1.981E+00	
U-235	185.72	78.	51.	0.028	33.44	1.834E+00	P
TH-229	193.51	97.	-11.	-0.006	155.17	-5.029E+00	P
U-235	205.33	108.	-12.	-0.007	144.19	-5.017E+00	P
TH-229	210.85	131.	-13.	-0.007	133.36	-9.326E+00	P
Cf-251	227.00	60.	5.	0.003	279.28	1.824E+00	
TH-227	235.97	557.	15.	0.008	227.27	2.853E+00	
EU-152	244.69	613.	-16.	-0.009	214.81	-5.296E+00	
TH-227	256.24	51.	13.	0.007	107.16	4.701E+00	
Cd-113m	263.70	80.	12.	0.007	109.29	5.204E+03	
BI-210M	265.83	131.	-17.	-0.009	99.56	-8.780E-01	
Hg-203	279.20	94.	-15.	-0.008	97.30	-4.887E-01	
I-131	284.30	70.	-3.	-0.002	531.32	-1.464E+00	P
TL-210	296.00	331.	-14.	-0.008	186.61	-5.048E-01	
PA-233	312.01	317.	-14.	-0.008	124.87	-1.150E+00	P
Ir-192	316.49	65.	12.	0.006	102.70	4.030E-01	
CR-51	320.08	79.	-3.	-0.002	497.02	-1.070E+00	P
Cs-136	340.57	157.	-2.	-0.001	888.82	-1.372E-01	
HF-181	345.83	132.	12.	0.007	139.47	2.572E+00	
BA-133	356.00	199.	-11.	-0.006	177.88	-6.125E-01	
I-131	364.48	55.	-14.	-0.008	120.38	-5.997E-01	P
BA-133	383.84	95.	-11.	-0.006	128.89	-4.373E+00	
Cf-249	387.95	57.	10.	0.005	116.38	5.189E-01	
SN-113	391.69	37.	8.	0.004	115.33	4.418E-01	
SB-125	427.88	40.	-5.	-0.003	335.58	-6.792E-01	P
AG-108M	433.94	20.	8.	0.004	119.77	3.350E-01	P
Ir-192	468.06	48.	-13.	-0.007	107.97	-1.053E+00	
BE-7	477.59	36.	9.	0.005	96.16	3.794E+00	
HF-181	482.00	44.	3.	0.001	362.22	1.408E-01	
RU-103	497.05	56.	-16.	-0.009	50.81	-7.741E-01	P
RH-106	511.86	67.	27.	0.015	46.39	6.172E+00	
Kr-85	513.98	75.	11.	0.006	111.75	1.200E+02	
Nd-147	531.00	56.	-16.	-0.009	93.29	-5.837E+00	
CS-134	563.24	20.	4.	0.002	226.86	2.322E+00	P

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
CS-134	569.32	20.	9.	0.005	77.78	2.889E+00		
PA-234	569.47	38.	-7.	-0.004	127.50	-4.316E+00		
SB-125	600.50	182.	9.	0.005	211.53	2.639E+00		
SB-124	602.73	191.	9.	0.005	216.33	4.819E-01		
CS-134	604.71	200.	9.	0.005	221.03	4.871E-01		
RU-103	610.30	209.	6.	0.003	370.20	5.064E+00		
RH-106	621.92	196.	8.	0.004	249.72	4.292E+00		
SB-125	635.89	13.	3.	0.002	187.36	1.382E+00		P
I-131	636.97	24.	-1.	0.000	719.25	-5.727E-01		P
AG-110M	657.76	48.	-13.	-0.007	83.00	-7.377E-01		
CS-137	661.66	46.	3.	0.002	324.90	1.990E-01		P
NB-94	702.63	22.	7.	0.004	134.72	4.409E-01		
SB-124	722.79	36.	11.	0.006	82.54	6.143E+00		
AG-108M	722.94	47.	3.	0.002	312.42	2.090E-01		
EU-154	723.36	70.	-14.	-0.008	89.11	-4.158E+00		
ZR-95	724.20	48.	-11.	-0.006	92.43	-1.535E+00		
ZR-95	756.73	27.	-1.	0.000	497.75	-7.760E-02		P
AG-110M	763.94	43.	-5.	-0.003	203.29	-1.322E+00		
NB-95	765.79	61.	-8.	-0.004	142.89	-5.072E-01		
PA-234M	766.41	42.	11.	0.006	89.21	2.358E+02		P
EU-152	778.92	33.	-13.	-0.007	73.89	-6.606E+00		P
CS-134	795.87	34.	7.	0.004	123.72	5.348E-01		
TL-210	799.60	50.	-13.	-0.007	84.20	-8.354E-01		
CS-134	801.95	50.	3.	0.002	295.33	2.600E+00		
CO-58	810.78	10.	12.	0.006	47.87	7.755E-01		
Cs-136	818.50	36.	3.	0.001	344.78	1.686E-01		
MN-54	834.85	14.	7.	0.004	123.23	4.628E-01		P
Co-56	846.77	28.	-10.	-0.006	83.31	-6.950E-01		P
NB-94	871.10	18.	-2.	-0.001	402.77	-1.058E-01		
EU-154	873.23	14.	5.	0.003	110.90	2.974E+00		
PA-234	880.53	21.	8.	0.004	92.13	8.999E+00		
PA-234	883.24	28.	6.	0.003	137.43	4.264E+00		
Sc-46	889.28	66.	-12.	-0.007	99.43	-8.648E-01		
Y-88	898.04	28.	-13.	-0.007	88.96	-1.024E+00		
AG-110M	937.49	9.	6.	0.003	121.84	1.236E+00		
PA-234	946.02	9.	4.	0.002	190.04	2.008E+00		P
EU-152	964.11	88.	-6.	-0.003	244.27	-2.890E+00		
EU-154	996.33	20.	8.	0.004	86.94	5.973E+00		
PA-234M	1001.00	31.	3.	0.002	292.33	2.621E+01		P
EU-154	1004.77	46.	-10.	-0.005	103.96	-4.265E+00		
Co-56	1037.84	15.	2.	0.001	489.61	1.021E+00		P
Cs-136	1048.07	18.	-6.	-0.003	108.01	-6.174E-01		
RH-106	1050.36	39.	-12.	-0.006	75.22	-6.087E+01		P
BI-207	1063.66	15.	-4.	-0.002	200.17	-4.870E-01		P
Ga-68	1077.40	15.	1.	0.001	857.32	2.980E+00		
FE-59	1099.25	30.	-10.	-0.006	124.50	-1.517E+00		
Sc-46	1120.55	56.	-3.	-0.001	400.39	-2.322E-01		
CO-60	1173.24	25.	-13.	-0.007	88.99	-1.178E+00		

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Co-56	1238.28	17.	10.	0.006	94.45	1.473E+00	P
NA-22	1274.53	11.	5.	0.003	96.82	5.179E-01	
FE-59	1291.60	5.	13.	0.007	50.38	2.864E+00	P
TL-210	1313.00	11.	4.	0.002	177.92	2.053E+00	
CO-60	1332.50	22.	-11.	-0.006	59.68	-1.086E+00	P
AG-110M	1384.30	5.	2.	0.001	324.35	7.138E-01	
SB-124	1690.98	6.	-3.	-0.001	218.12	-6.873E-01	
Y-88	1836.06	6.	-2.	-0.001	304.14	-2.662E-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 *****

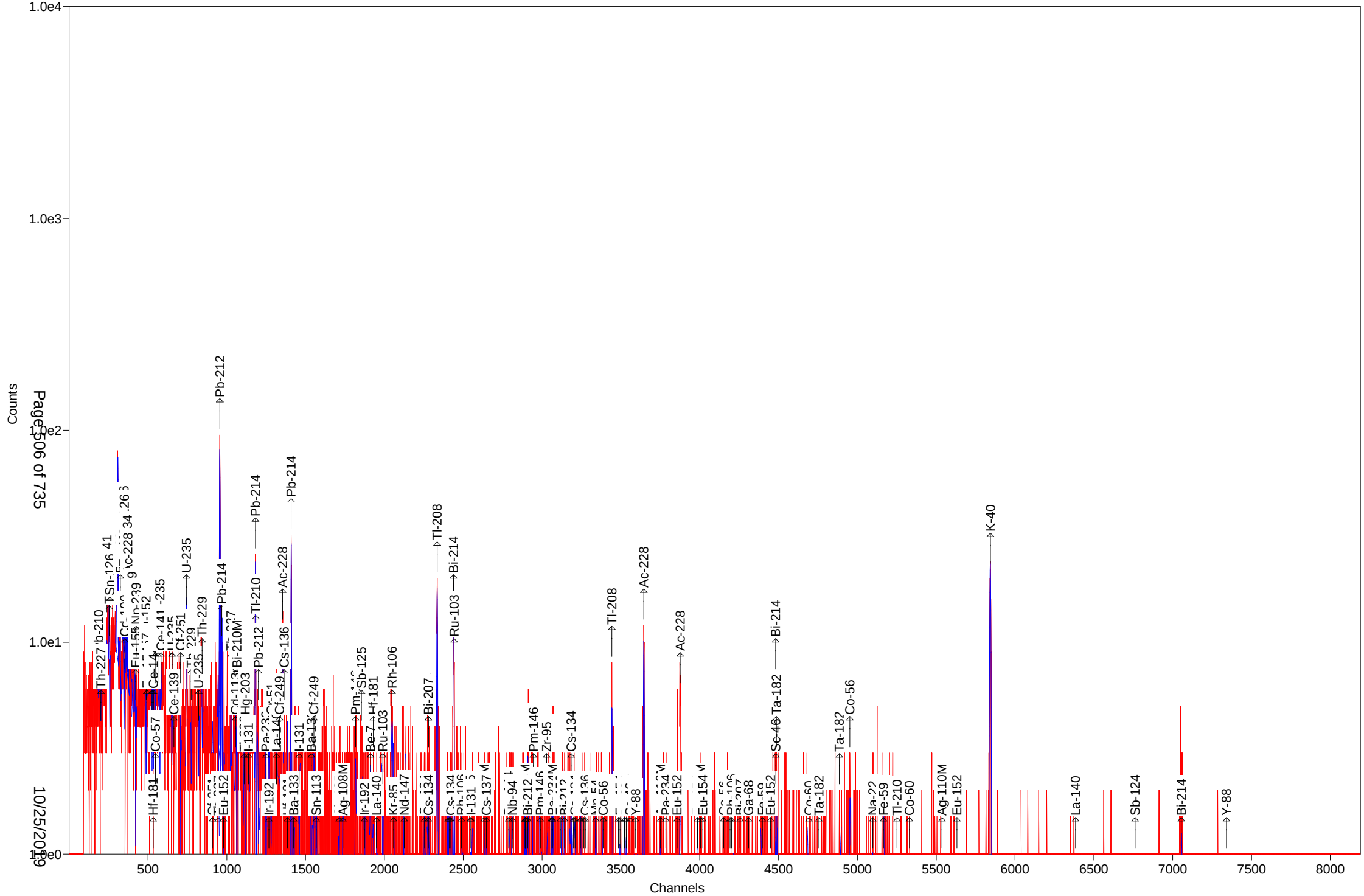
Nuclide		Time of Count Activity Bq/Sample	Time Corrected Activity Bq/Sample	Uncertainty Counting 1 Sigma	MDA Bq/Sample
BE-7	#A	3.7940E+00	3.7940E+00	9.616E+01%	1.24E+01
NA-22	#A	5.1787E-01	5.1787E-01	9.682E+01%	1.74E+00
K-40		2.0406E+02	2.0406E+02	7.071E+00%	7.52E+00
Sc-46	#A	-8.6478E-01	-8.6478E-01	9.943E+01%	2.91E+00
CR-51	#A	-1.0698E+00	-1.0698E+00	4.970E+02%	1.36E+01
MN-54	#A	4.6283E-01	4.6283E-01	1.232E+02%	1.38E+00
FE-59	#A	3.8158E-01	3.8158E-01	5.038E+01%	4.28E+00
Co-56	#A	2.3477E-01	2.3477E-01	8.331E+01%	1.89E+00
CO-57	#A	3.0293E-01	3.0293E-01	1.399E+02%	1.10E+00
CO-58	#A	7.7554E-01	7.7555E-01	4.787E+01%	1.15E+00
CO-60	#A	-1.0860E+00	-1.0860E+00	5.968E+01%	2.46E+00
ZN-65	#A	0.0000E+00	0.0000E+00	1.000E+03%	6.23E+00
NB-94	#A	4.4093E-01	4.4093E-01	1.347E+02%	1.47E+00
ZR-95	#A	-7.7598E-02	-7.7598E-02	4.978E+02%	3.08E+00
NB-95	#A	-5.0718E-01	-5.0718E-01	1.429E+02%	2.49E+00
RU-103	#A	-7.7413E-01	-7.7414E-01	5.081E+01%	1.82E+00
RH-106	#A	4.2924E+00	4.2924E+00	2.497E+02%	3.64E+01
AG-108M	#A	2.7191E-01	2.7191E-01	1.198E+02%	1.03E+00
AG-110M	#A	4.5547E-01	4.5547E-01	1.218E+02%	2.94E+00
SN-113	#A	4.4179E-01	4.4179E-01	1.153E+02%	1.75E+00
SB-124	#A	1.0430E+00	1.0430E+00	8.254E+01%	3.54E+00
SB-125	#A	7.2587E-01	7.2587E-01	1.462E+02%	4.24E+00
I-131	#A	-5.9968E-01	-5.9970E-01	1.204E+02%	1.56E+00
Gd-153	#A	8.6489E-01	8.6489E-01	9.198E+01%	3.18E+00
Ga-68	#A	2.9662E+00	2.9803E+00	8.573E+02%	6.19E+01
Tc-99m	#A	3.4413E-02	3.4444E-02	1.258E+03%	1.48E+00
BA-133	#A	-6.1245E-01	-6.1245E-01	1.779E+02%	3.69E+00
CS-134	#A	8.3360E-01	8.3361E-01	7.778E+01%	2.28E+00
CS-137	#A	1.9902E-01	1.9902E-01	3.249E+02%	2.26E+00
CE-139	#A	-1.4795E-02	-1.4795E-02	2.717E+03%	1.38E+00
Ba-140	#A	0.0000E+00	0.0000E+00	7.071E+02%	5.28E+00
La-140	#	1.2017E+00	1.2017E+00	3.536E+01%	9.06E-01

CE-141 #A	2.6372E-01	2.6372E-01	2.464E+02%	2.21E+00
CE-144 #A	-3.0536E+00	-3.0536E+00	1.351E+02%	1.38E+01
PM-144 #A	3.8392E-02	3.8392E-02	1.478E+03%	1.46E+00
EU-152 #A	-7.8651E-01	-7.8651E-01	1.259E+02%	3.34E+00
EU-154 #A	1.5468E+00	1.5468E+00	8.694E+01%	2.34E+00
EU-155 #A	-1.2582E+00	-1.2582E+00	1.548E+02%	6.54E+00
HF-181 #A	5.2425E-01	5.2425E-01	1.395E+02%	1.80E+00
Ta-182 #A	2.5800E+00	2.5800E+00	7.892E+01%	7.91E+00
Hg-203 #A	-4.8874E-01	-4.8874E-01	9.730E+01%	1.60E+00
TL-208	6.6501E+00	6.6501E+00	1.137E+01%	1.10E+00
PM-146 #A	5.2352E-01	5.2352E-01	1.300E+02%	1.74E+00
Y-88 #A	-2.6619E-01	-2.6619E-01	3.041E+02%	1.88E+00
Cd-113m#A	5.2042E+03	5.2042E+03	1.093E+02%	1.93E+04
Cd-109 #A	2.4894E+00	2.4894E+00	5.761E+02%	4.83E+01
Cf-251 #A	-1.9807E+00	-1.9807E+00	1.046E+02%	5.58E+00
Cf-249 #A	5.1889E-01	5.1889E-01	1.164E+02%	2.06E+00
Sn-126 #A	-3.5320E+00	-3.5320E+00	1.301E+02%	1.54E+01
PB-210 #A	-1.3585E+00	-1.3585E+00	9.804E+02%	3.94E+01
PB-212	1.8422E+01	1.8422E+01	6.263E+00%	1.99E+00
PB-214	1.3050E+01	1.3050E+01	8.264E+00%	1.58E+00
BI-207 #A	-4.8702E-01	-4.8702E-01	2.002E+02%	2.35E+00
BI-212 A	8.6927E+00	8.6927E+00	1.065E+02%	3.14E+01
U-235 #A	-2.7457E+00	-2.7457E+00	1.883E+02%	9.05E+00
BI-214	1.1872E+01	1.1872E+01	1.252E+01%	2.37E+00
BI-210M#A	-8.7801E-01	-8.7801E-01	9.956E+01%	2.93E+00
AC-228	1.7128E+01	1.7128E+01	1.217E+01%	1.86E+00
TH-227 #A	3.5235E+00	3.5235E+00	1.072E+02%	1.31E+01
TH-229 #A	-5.0291E+00	-5.0291E+00	1.552E+02%	2.22E+01
TH-234 #A	5.9591E+00	5.9591E+00	6.035E+01%	3.27E+01
PA-231 #A	0.0000E+00	0.0000E+00	7.071E+02%	8.50E+01
PA-233 #A	-1.1502E+00	-1.1502E+00	1.249E+02%	7.12E+00
PA-234 #A	8.3619E-01	8.3619E-01	8.911E+01%	8.01E+00
PA-234M#A	8.0687E+01	8.0687E+01	8.921E+01%	2.72E+02
AM-241 #A	3.2809E-01	3.2809E-01	3.983E+02%	3.77E+00
Np-237 #A	0.0000E+00	0.0000E+00	1.000E+03%	1.48E+01
Ir-192 #A	4.0300E-01	4.0300E-01	1.027E+02%	1.40E+00
Cs-136 #A	1.6856E-01	1.6856E-01	3.448E+02%	2.06E+00
Np-239 #A	-5.3813E-01	-5.3818E-01	3.202E+02%	5.83E+00
Nd-147 #A	-5.8365E+00	-5.8366E+00	9.329E+01%	1.35E+01
TL-210 #A	-8.3538E-01	-8.3538E-01	8.420E+01%	2.36E+00
Kr-85 #A	1.1995E+02	1.1995E+02	1.118E+02%	4.54E+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 (   37.6 to  2000.8 keV)     2.712E+02  Bq/Sample
Total Decayed Activity (   37.6 to  2000.8 keV) 2.7117758E+02  Bq/Sample
```

444057_Gamma_180-95857-A-12-B. 5_Gamma_20192608.spc.



Test America St. Louis Spectrum ID: 8_Gamma_20191612

Sample Description: 444057_Gamma_180-95857-A-13-B
Detector: Detector # 8
Batch ID: 444057
Work Order Number: Gamma
Lot Number: 180-95857-A-13-B

Decay to Time: 10/15/2019 11:56 Live Time: 1800 sec
Acquisition Time: 10/15/2019 11:56:15 Real Time: 1844 sec
Analysis Time: 10/15/2019 12:27 Dead Time: 2.40 %
Analysis Quantity: 1.000E+00 Sample

Efficiency Cal File: 8_Soil_TunaCan.Clb
Efficiency Cal Desc: 8_Soil_TunaCan_90099_032712
Efficiency Cal Date: 3/28/2012 10:35
Energy Cal Date: 2/28/2012 10:34
Library: Client_Long_Rev15.lib
Bkgd Correction File: 8_2019-10-06_1931.PBC

Nuclide	Activity Bq/Sample	1-Sigma Counting Uncert %	1-Sigma Counting Uncert Bq/Sample	1-Sigma Total Uncert Bq/Sample	Minimum Detectable Activity Bq/Sample
BE-7	-2.412E+00	105.5	2.545E+00	2.548E+00	1.520E+01
NA-22	1.335E-01	210.7	2.813E-01	2.814E-01	1.079E+00
K-40	1.687E+02	7.2	1.214E+01	1.489E+01	9.370E+00
Sc-46	6.041E-01	75.9	4.584E-01	4.595E-01	2.624E+00
CR-51	3.262E+00	119.4	3.896E+00	3.900E+00	1.317E+01
MN-54	-1.861E-02	3079.0	5.729E-01	5.729E-01	1.408E+00
FE-59	-2.495E-01	431.6	1.077E+00	1.077E+00	2.590E+00
Co-56	-5.542E-01	40.9	2.266E-01	2.284E-01	1.295E+00
CO-57	-1.011E-01	252.2	2.550E-01	2.551E-01	8.725E-01
CO-58	4.015E-01	114.6	4.602E-01	4.607E-01	1.584E+00
CO-60	-1.310E+00	77.4	1.014E+00	1.017E+00	2.376E+00
ZN-65	-1.617E-02	2565.8	4.148E-01	4.148E-01	5.128E+00
NB-94	-6.806E-02	671.9	4.573E-01	4.573E-01	1.359E+00
ZR-95	5.331E-01	82.0	4.373E-01	4.382E-01	1.901E+00
NB-95	0.000E+00	1.#INF	1.274E-01	1.274E-01	2.140E+00
RU-103	-2.283E-01	217.2	4.960E-01	4.961E-01	1.205E+00
RH-106	3.788E+00	180.0	6.817E+00	6.820E+00	2.325E+01
AG-108M	2.341E-01	167.2	3.914E-01	3.916E-01	9.586E-01
AG-110M	-5.717E-02	94.5	5.400E-02	5.408E-02	4.052E+00
SN-113	-7.457E-01	110.2	8.218E-01	8.227E-01	2.764E+00
SB-124	3.483E-01	254.9	8.880E-01	8.882E-01	3.015E+00
SB-125	5.140E-01	112.4	5.776E-01	5.782E-01	3.802E+00
I-131	-4.289E-02	103.6	4.444E-02	4.450E-02	1.170E+00
Gd-153	1.157E+00	140.3	1.623E+00	1.625E+00	6.194E+00
Ga-68	-7.360E+00	332.8	2.449E+01	2.449E+01	5.777E+01
Tc-99m	-4.246E-01	145.4	6.174E-01	6.179E-01	2.060E+00
BA-133	-6.421E-01	156.4	1.004E+00	1.005E+00	3.382E+00
CS-134	1.500E+00	27.8	4.172E-01	4.243E-01	9.608E-01
CS-137	2.706E+00	18.4	4.969E-01	5.165E-01	9.335E-01
CE-139	3.053E-01	103.5	3.160E-01	3.174E-01	1.062E+00
Ba-140	6.347E-01	265.0	1.682E+00	1.682E+00	4.200E+00
La-140	5.954E-01	106.1	6.319E-01	6.327E-01	1.409E+00
CE-141	-7.638E-01	149.8	1.144E+00	1.145E+00	3.819E+00

CE-144	-2.796E+00	147.8	4.134E+00	4.136E+00	1.382E+01
PM-144	-7.266E-01	95.2	6.919E-01	6.929E-01	1.594E+00
EU-152	1.540E+00	92.3	1.421E+00	1.423E+00	2.529E+00
EU-154	1.402E+00	87.1	1.222E+00	1.224E+00	1.698E+00
EU-155	1.596E+00	156.7	2.501E+00	2.503E+00	8.345E+00
HF-181	0.000E+00	1.#INF	6.222E-02	6.222E-02	2.075E+00
Ta-182	1.364E-01	563.5	7.684E-01	7.684E-01	6.078E+00
Hg-203	-4.869E-01	91.6	4.460E-01	4.469E-01	1.494E+00
TL-208	3.174E+00	26.9	8.543E-01	8.700E-01	1.699E+00
PM-146	1.402E-01	280.1	3.926E-01	3.927E-01	1.016E+00
Y-88	0.000E+00	1.#INF	1.570E-01	1.570E-01	8.180E-01
Cd-113m	1.824E+02	2328.1	4.246E+03	4.246E+03	1.495E+04
Cd-109	0.000E+00	1.#INF	1.587E+01	1.587E+01	5.291E+01
Cf-251	6.297E-02	2580.0	1.625E+00	1.625E+00	4.298E+00
Cf-249	8.914E-01	98.4	8.769E-01	8.781E-01	2.140E+00
Sn-126	-4.945E+00	109.7	5.427E+00	5.433E+00	1.810E+01
PB-210	-1.662E+01	68.2	1.133E+01	1.137E+01	5.754E+01
PB-212	1.505E+01	6.1	9.147E-01	1.336E+00	1.315E+00
PB-214	1.121E+01	9.1	1.020E+00	1.174E+00	1.945E+00
BI-207	7.242E-01	36.4	2.639E-01	2.664E-01	6.780E-01
BI-212	2.184E+01	21.7	4.734E+00	4.868E+00	7.791E+00
U-235	-1.301E+00	83.6	1.088E+00	1.090E+00	1.685E+01
BI-214	4.167E+00	20.9	8.689E-01	8.954E-01	4.276E+00
BI-210M	5.867E-01	102.0	5.985E-01	5.995E-01	1.493E+00
AC-228	1.198E+01	10.2	1.217E+00	1.362E+00	1.527E+00
TH-227	3.792E+00	99.5	3.775E+00	3.782E+00	1.110E+01
TH-229	5.835E+00	101.7	5.933E+00	5.952E+00	1.781E+01
TH-234	3.816E+00	43.5	1.660E+00	1.674E+00	3.487E+01
PA-231	3.230E-06	697519788.8	2.253E+01	2.253E+01	7.654E+01
PA-233	0.000E+00	1.#INF	1.700E-01	1.700E-01	4.175E+00
PA-234	-1.895E-01	130.3	2.470E-01	2.472E-01	8.110E+00
PA-234M	-8.587E+01	68.5	5.878E+01	5.894E+01	3.092E+02
AM-241	-1.952E+00	49.5	9.664E-01	9.717E-01	5.463E+00
Np-237	0.000E+00	1.#INF	4.829E+00	4.829E+00	1.609E+01
Ir-192	8.336E-02	433.0	3.610E-01	3.610E-01	1.746E+00
Cs-136	5.941E-01	66.3	3.939E-01	3.953E-01	1.288E+00
Np-239	1.490E+00	161.4	2.406E+00	2.408E+00	8.026E+00
Nd-147	-4.128E+00	94.9	3.917E+00	3.924E+00	9.380E+00
TL-210	9.064E-03	4562.9	4.136E-01	4.136E-01	1.508E+00
Kr-85	9.159E+01	130.0	1.191E+02	1.192E+02	4.047E+02
Total	5.495E+02				

Analyst: Caleb Quinn

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Sample description
444057_Gamma_180-95857-A-13-B

Spectrum Filename: C:\User\SPC\Det8\8_Gamma_20191612.An1

Acquisition information
Start time: 10/15/2019 11:56:15 AM
Live time: 1800
Real time: 1844
Dead time: 2.40 %
Detector ID: 8

Detector system
Ge 8 SN/174

Calibration
Filename: 8_Soil_TunaCan.Clb
8_Soil_TunaCan_90099_032712

Energy Calibration
Created: 2/28/2012 10:34:41 AM
Zero offset: 0.052 keV
Gain: 0.250 keV/channel
Quadratic: 5.282E-10 keV/channel^2

Efficiency Calibration
Created: 3/28/2012 10:35:20 AM
Knee Energy: 165.85 keV
Above the Knee: Quadratic Uncertainty = 1.39 %
Log(Eff): -1.098764E-01 + (-4.958544E-01*Log(E)) +
(-2.572270E-02*Log(E)^2)
Below the Knee: Quadratic Uncertainty = 1.71 %
Log(Eff): -2.525301E+01 + (9.398253E+00*Log(E)) +
(-1.000034E+00*Log(E)^2)

Library Files
Main analysis library: Client_Long_Rev15.lib
Library Match Width: 0.500
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G800W064
Start channel: 150 (37.55keV)
Stop channel: 8000 (1999.97keV)
Peak rejection level: 1000.000%
Peak search sensitivity: 3
Sample Size: 1.0000E+00 +/- 0.000E+00%
Activity scaling factor: 1.0000E+00/(1.0000E+00* 1.0000E+00) =
1.0000E+00
Detection limit method: Reg. Guide 4.16 Method

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Random error: 4.0000000E+00
Systematic error: 4.0000000E+00
Fraction Limit: 0.000%
Background width: 3
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:	YES	10/15/2019 11:56:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	8_2019-10-06_1931.PBC 10/6/2019 7:31:35 PM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 28 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 0.1283

***** 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
50.14	10.	235.86	1.01	2.267E-02	50.14	8.000	PBC<MDA	TH227
63.21	35.	43.50	1.03	3.093E-02	63.29	3.810	PBC<MDA	TH234
74.90	152.	12.80	1.03	3.620E-02				
77.19	218.	9.90	1.04	3.702E-02				
87.21	111.	15.05	1.01	3.975E-02	86.49	13.100	1.189E+01	Np237
					86.54	30.700	5.072E+00	EU155
					86.94	9.040	1.719E+01	Sn126
					87.57	37.500	4.129E+00	Sn126
					88.04	3.790	4.076E+01	Cd109
93.14	123.	18.43	1.15	4.080E-02	92.59	5.584	PBC<MDA	TH234
					93.35	5.561	3.010E+01	AC228
97.50	28.	150.17	1.05	4.133E-02	97.50	30.000	PBC<MDA	Gd153
99.50	28.	147.53	1.05	4.151E-02	99.50	15.000	PBC<MDA	Np239
103.20	17.	237.03	1.06	4.176E-02	103.20	21.800	PBC<MDA	Gd153
					103.70	24.000	9.503E-01	Np239
105.31	25.	156.74	1.06	4.185E-02	105.31	21.200	PBC<MDA	EU155
106.13	25.	161.45	1.06	4.187E-02	106.13	22.700	PBC<MDA	Np239
121.78	17.	92.27	1.07	4.148E-02	121.78	28.580	PBC<MDA	EU152
					122.06	85.600	2.733E-01	CO57
123.10	8.	188.75	1.07	4.138E-02	123.10	40.790	PBC<MDA	EU154
163.38	16.	103.94	1.10	3.580E-02	163.38	5.080	PBC<MDA	U235
165.85	16.	103.50	1.10	3.629E-02	165.85	79.900	PBC<MDA	CE139

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
185.72	41.	50.96	1.12	3.329E-02	185.72	54.000	PBC<MDA	U235
193.51	6.	306.08	1.13	3.226E-02	193.51	4.400	PBC<MDA	TH229
210.85	18.	101.69	1.14	3.020E-02	210.85	2.990	PBC<MDA	TH229
238.64	300.	6.98	1.07	2.744E-02	238.63	43.300	1.404E+01	PB212
242.02	57.	20.62	1.16	2.714E-02	242.00	7.430	1.574E+01	PB214
244.69	10.	310.29	1.16	2.691E-02	244.69	7.580	PBC<MDA	EU152
256.24	15.	99.55	1.17	2.596E-02	256.24	7.000	PBC<MDA	TH227
265.83	13.	102.02	1.18	2.523E-02	265.83	50.000	PBC<MDA	BI210M
278.11	16.	80.83	1.19	2.440E-02	277.28	6.310	PBC<MDA	TL208
284.30	11.	130.34	1.19	2.393E-02	284.30	6.140	PBC<MDA	I131
295.12	102.	14.46	0.85	2.324E-02	295.09	19.300	1.269E+01	PB214
					296.00	79.000	3.108E+00	TL210
308.44	4.	433.01	1.21	2.244E-02	308.44	31.750	PBC<MDA	Ir192
320.08	13.	119.43	1.22	2.179E-02	320.08	9.940	PBC<MDA	CR51
328.76	13.	166.22	1.23	2.133E-02	328.76	20.300	PBC<MDA	La140
333.44	14.	161.33	1.23	2.110E-02	333.44	15.510	PBC<MDA	Cf249
338.28	52.	19.63	1.23	2.085E-02	338.32	12.010	1.144E+01	AC228
340.53	14.	163.24	1.23	2.074E-02	340.57	46.900	PBC<MDA	Cs136
344.29	5.	463.36	1.24	2.057E-02	344.29	26.500	PBC<MDA	EU152
351.88	160.	10.58	0.47	2.021E-02	351.93	37.600	1.168E+01	PB214
383.84	12.	106.20	1.27	1.885E-02	383.84	8.940	PBC<MDA	BA133
387.95	12.	112.62	1.27	1.869E-02	387.95	66.000	PBC<MDA	Cf249
433.94	2.	669.81	1.30	1.708E-02	433.94	90.480	PBC<MDA	AG108M
453.88	3.	280.13	1.32	1.647E-02	453.88	65.000	PBC<MDA	PM146
463.37	9.	137.44	1.32	1.620E-02	463.37	10.470	PBC<MDA	SB125
487.02	11.	110.56	1.34	1.555E-02	487.02	45.500	PBC<MDA	La140
511.86	53.	23.19	2.61	1.494E-02	511.86	20.000	9.857E+00	RH106
513.98	11.	130.02	1.36	1.489E-02	513.98	0.430	PBC<MDA	Kr85
537.26	4.	264.97	1.37	1.436E-02	537.26	24.390	PBC<MDA	Ba140
569.32	9.	75.96	1.40	1.369E-02	569.32	15.380	PBC<MDA	CS134
					569.47	8.200	4.290E+00	PA234
					569.70	97.740	PBC<MDA	BI207
583.00	35.	42.83	1.40	1.342E-02	583.02	84.500	1.710E+00	TL208
600.50	7.	274.55	1.42	1.310E-02	600.50	17.860	PBC<MDA	SB125
602.73	8.	254.94	1.42	1.306E-02	602.73	98.260	PBC<MDA	SB124
604.62	9.	241.79	1.42	1.303E-02	604.71	97.620	PBC<MDA	CS134
609.27	125.	10.15	1.22	1.294E-02	609.31	46.090	1.167E+01	BI214
					610.30	5.750	9.368E+01	RU103
614.28	9.	167.21	1.43	1.286E-02	614.28	89.850	PBC<MDA	AG108M
618.06	9.	173.74	1.43	1.279E-02	618.06	99.100	PBC<MDA	PM144
621.92	9.	179.97	1.43	1.273E-02	621.92	9.930	PBC<MDA	RH106
661.77	50.	18.36	1.33	1.209E-02	661.66	85.210	2.706E+00	CS137
724.20	12.	82.03	1.50	1.121E-02	724.20	44.150	PBC<MDA	ZR95
727.00	33.	21.68	1.01	1.118E-02	727.17	7.550	2.184E+01	BI212
766.41	12.	87.03	1.53	1.070E-02	765.79	99.790	PBC<MDA	NB95
					766.41	0.294	PBC<MDA	PA234M
778.92	6.	121.84	1.53	1.055E-02	778.92	12.940	PBC<MDA	EU152
795.51	22.	27.82	1.54	1.036E-02	795.87	85.530	1.358E+00	CS134

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
810.78	7.	114.63	1.55	1.020E-02	810.78	99.460	PBC<MDA	CO58
818.62	8.	89.76	1.56	1.012E-02	818.50	100.000	PBC<MDA	Cs136
860.27	26.	26.91	1.59	9.703E-03	860.56	12.420	1.187E+01	TL208
873.23	11.	87.14	1.59	9.584E-03	873.23	12.270	PBC<MDA	EU154
889.28	11.	117.83	1.60	9.438E-03	889.28	99.984	PBC<MDA	Sc46
911.06	53.	13.74	1.10	9.247E-03	911.07	29.000	1.098E+01	AC228
946.02	4.	218.66	1.64	8.957E-03	946.02	13.400	PBC<MDA	PA234
964.11	6.	173.66	1.65	8.814E-03	964.11	14.605	PBC<MDA	EU152
969.03	39.	18.85	1.82	8.776E-03	968.97	17.460	1.402E+01	AC228
1047.92	8.	69.63	1.70	8.209E-03	1048.07	80.000	PBC<MDA	Cs136
1063.66	8.	36.45	1.71	8.106E-03	1063.66	74.500	7.242E-01	BI207
1112.07	5.	198.13	1.74	7.803E-03	1112.07	13.644	PBC<MDA	EU152
1119.86	8.	101.07	1.74	7.754E-03	1120.29	15.100	PBC<MDA	BI214
					1120.55	99.987	PBC<MDA	Sc46
1120.55	8.	95.68	1.74	7.752E-03	1120.29	15.100	PBC<MDA	BI214
					1120.55	99.987	5.520E-01	Sc46
					1121.30	34.900	1.582E+00	Ta182
1221.12	1.	563.47	1.80	7.199E-03	1221.41	27.000	PBC<MDA	Ta182
1274.53	2.	210.71	1.83	6.939E-03	1274.53	99.940	PBC<MDA	NA22
					1274.54	35.190	3.792E-01	EU154
1313.00	4.	152.39	1.85	6.763E-03	1313.00	21.000	PBC<MDA	TL210
1384.30	6.	101.72	1.88	6.460E-03	1384.30	24.290	PBC<MDA	AG110M
1408.00	8.	35.36	1.90	6.366E-03	1408.00	21.005	3.324E+00	EU152
1460.66	200.	7.19	1.38	6.165E-03	1460.83	10.670	1.687E+02	K40
1596.21	2.	248.05	1.99	5.706E-03	1596.21	95.400	PBC<MDA	La140
1764.04	23.	20.85	2.81	5.226E-03	1764.49	15.400	1.588E+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	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide	
299.40	74.89	113.	152.	4.195E+03	12.80	1.034	-	D
308.59	77.19	124.	218.	5.891E+03	9.90	1.036	-	D

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

This section based on library: Client_Long_Rev15.lib

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********** 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 1 Sigma %	FWHM keV
PB-210	185.96	46.54	337.	-25.	-0.014	68.15	1.012
TH-227	200.36	50.14	294.	10.	0.006	235.86	1.015s
AM-241	237.95	59.54	451.	-36.	-0.020	49.50	1.022s
TH-234	252.96	63.29	101.	35.	0.020	43.50	1.025D
Sn-126	256.93	64.28	431.	-27.	-0.015	109.74	1.026s
BA-133	323.77	80.99	827.	-28.	-0.016	145.41	1.039s
Np-237	345.77	86.49	1003.	0.	0.000	164.63	1.043A
EU-155	345.98	86.54	975.	-27.	-0.015	162.40	1.043
Sn-126	347.57	86.94	948.	-27.	-0.015	160.07	1.044
Sn-126	350.09	87.57	803.	-7.	-0.004	599.94	1.044s
Cd-109	351.97	88.04	920.	0.	0.000	157.66	1.044A
Nd-147	364.21	91.10	796.	0.	0.000	1000.00	1.047s
TH-234	370.17	92.59	903.	-20.	-0.011	207.03	1.048s
AC-228	373.21	93.35	873.	28.	0.015	153.03	1.049s
Gd-153	389.81	97.50	846.	28.	0.015	150.17	1.052s
Np-239	397.81	99.50	818.	28.	0.015	147.53	1.053s
Gd-153	412.62	103.20	818.	17.	0.010	237.03	1.056
EU-155	421.07	105.31	785.	25.	0.014	156.74	1.058
Np-239	424.34	106.13	834.	25.	0.014	161.45	1.058
EU-152	486.94	121.78	121.	17.	0.010	92.27	1.071s
CO-57	488.06	122.06	129.	-6.	-0.004	252.25	1.071s
EU-154	492.22	123.10	110.	8.	0.004	188.75	1.072s
PA-234	525.00	131.29	498.	-22.	-0.012	141.93	1.078s
HF-181	531.92	133.02	520.	-23.	-0.013	144.86	1.079s
CE-144	533.98	133.54	543.	-23.	-0.013	147.84	1.080s
CO-57	545.72	136.47	567.	0.	0.000	1000.00	1.082s
Tc-99m	561.86	140.51	709.	-26.	-0.015	145.41	1.085s
U-235	574.97	143.79	741.	-32.	-0.018	131.01	1.087
CE-141	581.59	145.44	727.	-26.	-0.014	149.82	1.089s
Ba-140	650.47	162.66	180.	-12.	-0.007	160.73	1.102s
U-235	653.35	163.38	136.	16.	0.009	103.94	1.102s
CE-139	663.24	165.85	128.	16.	0.009	103.50	1.104
U-235	742.71	185.72	115.	41.	0.023	50.96	1.119s
TH-229	773.87	193.51	84.	6.	0.003	306.08	1.125s
U-235	821.17	205.33	94.	-16.	-0.009	129.14	1.134s
TH-229	843.24	210.85	84.	18.	0.010	101.69	1.138s
Cf-251	907.84	227.00	80.	-9.	-0.005	197.41	1.151
TH-227	943.73	235.97	546.	-8.	-0.004	441.12	1.157
PB-212	954.37	238.63	30.	322.	0.179	6.08	1.159D
PB-214	967.84	242.00	41.	57.	0.032	20.62	1.162D
EU-152	978.62	244.69	526.	10.	0.006	310.29	1.164
TH-227	1024.81	256.24	52.	15.	0.008	99.55	1.172s
BI-210M	1063.18	265.83	45.	13.	0.007	102.02	1.179s
TL-208	1108.99	277.28	73.	16.	0.009	80.83	1.188

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Hg-203	1116.66	279.20	117.	-17.	-0.010	91.60	1.189
I-131	1137.05	284.30	53.	11.	0.006	130.34	1.193s
PB-214	1180.22	295.09	34.	83.	0.046	14.79	1.201D
TL-210	1183.86	296.00	432.	-16.	-0.009	183.31	1.202s
PB-212	1199.98	300.03	395.	-17.	-0.009	49.92	1.205s
PA-231	1200.14	300.07	378.	-16.	-0.009	171.39	1.205s
PA-233	1200.58	300.18	362.	-8.	-0.005	332.72	1.205s
Ir-192	1233.62	308.44	148.	4.	0.002	433.01	1.211s
PA-233	1247.91	312.01	152.	0.	0.000	1000.00	1.214s
Ir-192	1265.82	316.49	152.	0.	0.000	1000.00	1.217s
CR-51	1280.20	320.08	109.	13.	0.007	119.43	1.219s
La-140	1314.91	328.76	218.	13.	0.007	166.22	1.226s
Cf-249	1333.63	333.44	231.	14.	0.008	161.33	1.229s
AC-228	1353.15	338.32	25.	52.	0.029	19.63	1.233D
Cs-136	1362.15	340.57	239.	14.	0.008	163.24	1.234s
EU-152	1377.01	344.29	252.	5.	0.003	463.36	1.237s
PB-214	1407.39	351.88	26.	160.	0.089	10.58	0.471s
BA-133	1423.87	356.00	245.	-14.	-0.008	156.37	1.245s
I-131	1457.81	364.48	45.	-11.	-0.006	161.09	1.252s
BA-133	1535.24	383.84	80.	12.	0.007	106.20	1.266s
Cf-249	1551.68	387.95	92.	12.	0.007	112.62	1.269s
SN-113	1566.64	391.69	146.	-16.	-0.009	110.21	1.271s
SB-125	1711.39	427.88	48.	-10.	-0.006	139.28	1.297s
AG-108M	1735.64	433.94	26.	2.	0.001	669.81	1.301s
PM-146	1815.41	453.88	13.	3.	0.002	280.13	1.315s
SB-125	1853.36	463.37	72.	9.	0.005	137.44	1.322s
Ir-192	1872.14	468.06	76.	-2.	-0.001	498.80	1.325s
BE-7	1910.28	477.60	84.	-7.	-0.004	105.50	1.332s
HF-181	1927.89	482.00	91.	0.	0.000	1000.00	1.335s
La-140	1947.98	487.02	71.	11.	0.006	110.56	1.339s
RU-103	1988.12	497.05	35.	-6.	-0.003	217.25	1.346
RH-106	2047.36	511.86	49.	53.	0.029	23.19	2.606s
Kr-85	2055.83	513.98	89.	11.	0.006	130.02	1.357s
Nd-147	2123.91	531.00	39.	-14.	-0.008	94.90	1.369s
Ba-140	2148.95	537.26	26.	4.	0.002	264.97	1.373
CS-134	2252.86	563.24	26.	-2.	-0.001	590.33	1.391s
CS-134	2277.20	569.32	17.	9.	0.005	75.96	1.395
BI-207	2278.73	569.70	35.	-7.	-0.004	181.58	1.396s
TL-208	2332.01	583.02	47.	35.	0.019	42.83	1.405s
SB-125	2401.92	600.50	198.	7.	0.004	274.55	1.416s
SB-124	2410.85	602.73	206.	8.	0.004	254.94	1.418s
CS-134	2418.76	604.71	209.	9.	0.005	241.79	1.419s
BI-214	2437.17	609.31	86.	4.	0.002	315.09	1.422
RU-103	2441.12	610.30	90.	9.	0.005	160.40	1.423s
AG-108M	2457.05	614.28	99.	9.	0.005	167.21	1.426s
PM-144	2472.18	618.06	107.	9.	0.005	173.74	1.428s
RH-106	2487.60	621.92	116.	9.	0.005	179.97	1.431s
SB-125	2543.49	635.89	35.	-9.	-0.005	101.90	1.440s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
I-131	2547.83	636.97	50.	-3.	-0.001	379.97	1.441s
AG-110M	2630.98	657.76	85.	-9.	-0.005	148.66	1.455s
CS-137	2647.03	661.77	10.	50.	0.028	18.36	1.326
PM-144	2786.11	696.54	42.	-15.	-0.008	95.22	1.480s
NB-94	2810.46	702.63	28.	-1.	-0.001	671.94	1.484s
SB-124	2891.09	722.79	87.	-14.	-0.008	99.40	1.497
AG-108M	2891.70	722.94	73.	-14.	-0.008	91.79	1.498s
EU-154	2893.39	723.36	59.	-3.	-0.002	336.18	1.498s
ZR-95	2896.74	724.20	40.	12.	0.006	82.03	1.498s
BI-212	2907.95	727.00	4.	33.	0.018	21.68	1.005s
PM-146	2942.83	735.72	52.	-18.	-0.010	51.69	1.506s
ZR-95	3026.87	756.73	14.	-1.	-0.001	800.00	1.519s
AG-110M	3055.73	763.94	56.	-12.	-0.007	88.90	1.524s
NB-95	3063.11	765.79	68.	0.	0.000	1000.00	1.525s
PA-234M	3065.60	766.41	51.	12.	0.007	87.03	1.526s
EU-152	3115.64	778.92	9.	6.	0.003	121.84	1.534
BI-212	3141.64	785.42	28.	-4.	-0.002	93.73	1.538s
CS-134	3183.44	795.87	7.	22.	0.012	27.82	1.544s
CS-134	3207.77	801.95	48.	-9.	-0.005	110.42	1.548
CO-58	3243.06	810.78	32.	7.	0.004	114.63	1.554
La-140	3263.04	815.77	44.	-8.	-0.004	129.61	1.557s
Cs-136	3273.97	818.50	20.	8.	0.004	89.76	1.559s
Co-56	3387.05	846.77	19.	-10.	-0.005	40.90	1.577s
TL-208	3442.23	860.56	5.	26.	0.014	26.91	1.585s
NB-94	3484.36	871.10	49.	-16.	-0.009	68.31	1.592s
EU-154	3492.89	873.23	40.	11.	0.006	87.14	1.593s
PA-234	3522.10	880.53	75.	-15.	-0.008	87.15	1.598s
PA-234	3532.94	883.24	89.	-15.	-0.008	94.54	1.599s
AG-110M	3538.71	884.68	104.	-9.	-0.005	159.22	1.600s
Sc-46	3557.10	889.28	81.	11.	0.006	117.83	1.603s
AC-228	3644.21	911.06	0.	53.	0.029	13.74	1.100s
AG-110M	3749.96	937.49	35.	-13.	-0.007	103.82	1.633s
PA-234	3784.07	946.02	15.	4.	0.002	218.66	1.638s
EU-152	3856.43	964.11	47.	6.	0.003	173.66	1.649s
AC-228	3876.11	969.03	3.	39.	0.021	18.85	1.821
EU-154	3985.31	996.33	42.	-12.	-0.006	84.31	1.668s
PA-234M	4003.99	1001.00	63.	-11.	-0.006	68.46	1.671s
EU-154	4019.10	1004.77	73.	-2.	-0.001	606.90	1.673s
Co-56	4151.36	1037.84	20.	-3.	-0.002	249.04	1.693s
Cs-136	4192.29	1048.07	13.	8.	0.005	69.63	1.698s
RH-106	4201.45	1050.36	28.	-5.	-0.003	160.93	1.700s
BI-207	4254.65	1063.66	0.	8.	0.004	36.45	1.708s
Ga-68	4309.61	1077.40	20.	-3.	-0.002	332.78	1.716s
FE-59	4397.02	1099.25	15.	-2.	-0.001	431.57	1.728s
EU-152	4448.32	1112.07	47.	5.	0.003	198.13	1.736s
BI-214	4481.17	1120.29	28.	8.	0.004	101.07	1.740
Sc-46	4482.22	1120.55	23.	8.	0.004	95.68	1.740
CO-60	4692.97	1173.24	22.	-5.	-0.003	160.60	1.770s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Ta-182	4756.23	1189.05	15.	-3.	-0.002	289.64	1.779s
Ta-182	4885.67	1221.41	11.	1.	0.001	563.47	1.797s
NA-22	5098.16	1274.53	5.	2.	0.001	210.71	1.826s
EU-154	5098.20	1274.54	7.	0.	0.000	1000.00	1.826s
FE-59	5166.43	1291.60	11.	-3.	-0.002	424.75	1.835s
TL-210	5252.05	1313.00	5.	4.	0.002	152.39	1.847s
CO-60	5330.06	1332.50	31.	-16.	-0.009	77.44	1.857s
AG-110M	5537.25	1384.30	5.	6.	0.003	101.72	1.884s
EU-152	5632.07	1408.00	0.	8.	0.004	35.36	1.896s
K-40	5842.70	1460.66	3.	200.	0.111	7.19	1.380s
La-140	6384.93	1596.21	6.	2.	0.001	248.05	1.990s
SB-124	6764.03	1690.98	6.	-3.	-0.001	532.85	2.034s
BI-214	7056.26	1764.04	0.	23.	0.013	20.85	2.812s
Co-56	7085.51	1771.35	23.	0.	0.000	1000.00	2.070s
Y-88	7344.36	1836.06	0.	0.	0.000	1000.00	2.098s

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	-2.4121E+00				5.31E+01	
			477.60	-2.412E+00	?(P	1.520E+01 1.05E+02	1.05E+01 G
NA-22	C	1.3351E-01				9.50E+02	
			1274.53	1.335E-01	?(	1.079E+00 2.11E+02	9.99E+01 G
K-40	N	1.6871E+02				4.66E+11	
			1460.83	1.687E+02	(P	9.370E+00 7.19E+00	1.07E+01 G
Sc-46	F	6.0408E-01				8.38E+01	
			889.28	6.562E-01	?(	2.624E+00 1.18E+02	1.00E+02 G
			1120.55	5.520E-01	?(	1.806E+00 9.57E+01	1.00E+02 G
CR-51	F	3.2618E+00				2.77E+01	
			320.08	3.262E+00	?(	1.317E+01 1.19E+02	9.94E+00 G
MN-54	C	-1.8607E-02				3.12E+02	
			834.85	-1.861E-02	%(	1.408E+00 3.08E+03	1.00E+02 G
FE-59	F	-2.4954E-01				4.45E+01	
			1099.25	-2.495E-01	?(	2.590E+00 4.32E+02	5.65E+01 G
			1291.60	-5.219E-01	+ P	3.377E+00 4.25E+02	4.32E+01 G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

Co-56    C  -5.5418E-01                                     7.73E+01
                          846.77-5.542E-01 ?(P 1.295E+00 4.09E+01 9.99E+01 G
                         1238.28 1.197E-01 % P 3.182E+00 1.17E+03 6.61E+01 G
                         1037.84-1.445E+00 + P 1.120E+01 2.49E+02 1.41E+01 G
                         1771.35 0.000E+00 +   1.727E+01 1.00E+03 1.55E+01  A

CO-57    C  -1.0110E-01                                     2.72E+02
                          122.06-1.011E-01 ?(  8.725E-01 2.52E+02 8.56E+01 G
                          136.47 0.000E+00 +   1.479E+01 1.00E+03 1.07E+01 G

CO-58    C   4.0148E-01                                     7.09E+01
                          810.78 4.015E-01 &(  1.584E+00 1.15E+02 9.95E+01 G

CO-60    F  -1.3099E+00                                     1.93E+03
                         1332.50-1.310E+00 ?(P 2.376E+00 7.74E+01 1.00E+02 G
                         1173.24-3.843E-01 + P 1.839E+00 1.61E+02 9.99E+01 G

ZN-65    F  -1.6167E-02                                     2.44E+02
                         1115.55-1.617E-02 %(P 5.128E+00 2.57E+03 5.06E+01 G

NB-94    I  -6.8055E-02                                     7.41E+06
                          702.63-6.806E-02 ?(P 1.359E+00 6.72E+02 9.79E+01 G
                          871.10-9.064E-01 +   2.052E+00 6.83E+01 9.99E+01 G

ZR-95    I   5.3308E-01                                     6.40E+01
                          756.73-9.436E-02 ?(  1.901E+00 8.00E+02 5.45E+01 G
                          724.20 1.307E+00 ?(  3.604E+00 8.20E+01 4.42E+01 G

RU-103   I  -2.2830E-01                                     3.93E+01
                          497.05-2.283E-01 ?(P 1.205E+00 2.17E+02 9.09E+01 G
                          610.30 6.405E+00 ?   3.510E+01 1.60E+02 5.75E+00 GA

RH-106   I   3.7879E+00                                     3.74E+02
                          621.92 3.788E+00 ?(  2.325E+01 1.80E+02 9.93E+00 G
                         1050.36-2.101E+01 +   1.186E+02 1.61E+02 1.56E+00 G
                          511.86 9.857E+00 &   6.571E+00 2.32E+01 2.00E+01 GA

AG-108M  C   2.3407E-01                                     1.53E+05
                          433.94 5.652E-02 ?(P 9.586E-01 6.70E+02 9.05E+01 G
                          722.94-7.501E-01 +   2.317E+00 9.18E+01 9.08E+01 G
                          614.28 4.129E-01 ?(  2.357E+00 1.67E+02 8.98E+01 G

AG-110M  F  -5.7167E-02                                     2.50E+02
                          884.68-7.467E-01 ?(  4.052E+00 1.59E+02 7.27E+01 G
                          657.76-4.348E-01 +   2.207E+00 1.49E+02 9.46E+01 G
                          937.49-2.329E+00 &   5.424E+00 1.04E+02 3.44E+01 G
                         1384.30 2.006E+00 ?(  4.769E+00 1.02E+02 2.43E+01 G
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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          763.94-2.906E+00 +   8.702E+00 8.89E+01 2.23E+01 G

SN-113   F  -7.4571E-01                                     1.15E+02
                          391.69-7.457E-01 ?(  2.764E+00 1.10E+02 6.40E+01 G

SB-124   F   3.4830E-01                                     6.02E+01
                          602.73 3.483E-01 ?(P 3.015E+00 2.55E+02 9.83E+01 G
                         1690.98-5.781E-01 + P 2.964E+00 5.33E+02 4.78E+01 G
                          722.79-6.302E+00 &   2.111E+01 9.94E+01 1.08E+01 G

SB-125   I   5.1398E-01                                     1.01E+03
                          427.88-1.086E+00 &(  3.802E+00 1.39E+02 2.96E+01 G
                          600.50 1.739E+00 &(P 1.623E+01 2.75E+02 1.79E+01 G
                          635.89-3.407E+00 +   1.185E+01 1.02E+02 1.13E+01 G
                          463.37 2.948E+00 &(  1.384E+01 1.37E+02 1.05E+01 G

I-131    I  -4.2895E-02                                     8.02E+00
                          364.48-3.638E-01 ?(P 1.170E+00 1.61E+02 8.17E+01 G
                          284.30 4.227E+00 ?(P 1.383E+01 1.30E+02 6.14E+00 G
                          636.97-1.656E+00 +   2.215E+01 3.80E+02 7.17E+00 G

Gd-153   F   1.1570E+00                                     2.42E+02
                           97.50 1.237E+00  (  6.194E+00 1.50E+02 3.00E+01 G
                          103.20 1.047E+00 ?(  8.298E+00 2.37E+02 2.18E+01 G

Ga-68    C  -7.3597E+00                                     4.71E-02
                         1077.40-7.360E+00 ?(  5.777E+01 3.33E+02 3.30E+00 G

Tc-99m   I  -4.2458E-01                                     2.51E-01
                          140.51-4.246E-01 ?(  2.060E+00 1.45E+02 8.93E+01 G

BA-133   F  -6.4215E-01                                     3.85E+03
                          356.00-6.421E-01 ?(  3.382E+00 1.56E+02 6.20E+01 G
                          302.85-5.078E-07 %   1.203E+01 6.98E+08 1.83E+01 G
                          383.84 4.079E+00 & P 1.464E+01 1.06E+02 8.94E+00 GA
                           80.99-1.205E+00 +   5.839E+00 1.45E+02 3.41E+01 GA

CS-134   I   1.4996E+00                                     7.54E+02
                          795.87 1.358E+00 ?(  9.608E-01 2.78E+01 8.55E+01 G
                          604.71 3.734E-01 -   3.064E+00 2.42E+02 9.76E+01 G
                          569.32 2.287E+00  (  5.835E+00 7.60E+01 1.54E+01 G
                          801.95-5.789E+00 -   2.180E+01 1.10E+02 8.69E+00 G
                          563.24-1.015E+00 - P 1.278E+01 5.90E+02 8.35E+00 G

CS-137   I   2.7062E+00                                     1.10E+04
                          661.66 2.706E+00  (P 9.335E-01 1.84E+01 8.52E+01 G
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Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CE-139	F	3.0535E-01					1.38E+02	
			165.85	3.053E-01	?(	1.062E+00	1.03E+02	7.99E+01 G
Ba-140	I	6.3468E-01					1.28E+01	
			537.26	6.347E-01	?(	4.200E+00	2.65E+02	2.44E+01 G
			162.66	-2.983E+00	+	1.622E+01	1.61E+02	6.22E+00 G
			304.85	2.181E-06	%	5.168E+01	6.98E+08	4.29E+00 G
La-140	I	5.9538E-01					1.28E+01	
			1596.21	2.381E-01	?(	1.409E+00	2.48E+02	9.54E+01 G
			487.02	8.803E-01	?(P	3.299E+00	1.11E+02	4.55E+01 G
			328.76	1.636E+00	(P	9.177E+00	1.66E+02	2.03E+01 G
			815.77	-1.763E+00	+	7.863E+00	1.30E+02	2.33E+01 G
CE-141	I	-7.6383E-01					3.25E+01	
			145.44	-7.638E-01	?(	3.819E+00	1.50E+02	4.82E+01 G
CE-144	I	-2.7960E+00					2.85E+02	
			133.54	-2.796E+00	?(	1.382E+01	1.48E+02	1.11E+01 G
PM-144	C	-7.2660E-01					3.63E+02	
			696.54	-7.266E-01	&(	1.594E+00	9.52E+01	9.90E+01 G
			618.06	3.769E-01	+	2.234E+00	1.74E+02	9.91E+01 G
EU-152	F	1.5400E+00					4.94E+03	
			121.78	8.182E-01	?(	2.529E+00	9.23E+01	2.86E+01 G
			344.29	4.964E-01	?(	7.819E+00	4.63E+02	2.65E+01 G
			1112.07	2.620E+00	?(	1.808E+01	1.98E+02	1.36E+01 G
			778.92	2.306E+00	&(	6.895E+00	1.22E+02	1.29E+01 G
			964.11	2.474E+00	?(	1.491E+01	1.74E+02	1.46E+01 G
			244.69	2.860E+00	&(	2.983E+01	3.10E+02	7.58E+00 G
			1408.00	3.324E+00	?	3.062E+00	3.54E+01	2.10E+01 GA
EU-154	I	1.4025E+00					3.14E+03	
			123.10	2.633E-01	&(	1.698E+00	1.89E+02	4.08E+01 G
			1274.54	0.000E+00	-	3.421E+00	1.00E+03	3.52E+01 G
			723.36	-8.037E-01	+	9.445E+00	3.36E+02	2.02E+01 G
			873.23	5.189E+00	?(	1.526E+01	8.71E+01	1.23E+01 G
			1004.77	-7.250E-01	&	1.538E+01	6.07E+02	1.80E+01 G
			996.33	-7.092E+00	+	2.012E+01	8.43E+01	1.06E+01 G
EU-155	I	1.5956E+00					1.81E+03	
			105.31	1.596E+00	(	8.345E+00	1.57E+02	2.12E+01 G
			86.54	-1.251E+00	+	6.773E+00	1.62E+02	3.07E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Ta-182	F	1.3636E-01					1.14E+02	
			1121.30	-5.297E-02	%(	6.078E+00	3.17E+03	3.49E+01 G
			1221.41	3.811E-01	?(	5.125E+00	5.63E+02	2.70E+01 G
			1189.05	-1.396E+00	+	9.662E+00	2.90E+02	1.62E+01 G
Hg-203	F	-4.8689E-01					4.66E+01	
			279.20	-4.869E-01	?(	1.494E+00	9.16E+01	8.15E+01 G
TL-208	N	3.1743E+00					6.98E+02	
			583.02	1.710E+00	?(P	1.699E+00	4.28E+01	8.45E+01 G
			277.28	5.671E+00	&(P	1.532E+01	8.08E+01	6.31E+00 G
			860.56	1.187E+01	?(P	6.172E+00	2.69E+01	1.24E+01 G
PM-146	C	1.4017E-01					2.02E+03	
			453.88	1.402E-01	?(P	1.016E+00	2.80E+02	6.50E+01 G
			747.16	7.256E-02	% P	3.785E+00	2.12E+03	3.40E+01 G
			735.72	-4.039E+00	& P	8.106E+00	5.17E+01	2.25E+01 G
Cd-113m		1.8238E+02					5.33E+03	
			263.70	1.824E+02	%(	1.495E+04	2.33E+03	6.00E-03 K
Cf-251	T	6.2969E-02					3.28E+05	
			176.60	6.297E-02	%(	4.298E+00	2.58E+03	1.70E+01 G
			227.00	-2.782E+00	+	1.372E+01	1.97E+02	6.30E+00 GA
Cf-249	T	8.9144E-01					1.28E+05	
			387.95	5.617E-01	?(	2.140E+00	1.13E+02	6.60E+01 G
			333.44	2.295E+00	?(	1.248E+01	1.61E+02	1.55E+01 G
Sn-126		-4.9452E+00					3.65E+07	
			87.57	-2.490E-01	}	5.012E+00	6.00E+02	3.75E+01 GA
			64.28	-4.945E+00	?(	1.810E+01	1.10E+02	9.70E+00 G
			86.94	-4.242E+00	}	2.263E+01	1.60E+02	9.04E+00 GA
PB-210	N	-1.6622E+01					8.14E+03	
			46.54	-1.662E+01	&(P	5.754E+01	6.82E+01	4.25E+00 G
PB-212	N	1.5054E+01					6.98E+02	
			238.63	1.505E+01	(P	1.315E+00	6.08E+00	4.33E+01 G
			300.03	-1.242E+01	- P	7.041E+01	4.99E+01	3.28E+00 GA
PB-214	N	1.1213E+01					5.84E+05	
			351.93	1.168E+01	(P	1.945E+00	1.06E+01	3.76E+01 G
			295.09	1.031E+01	(P	3.691E+00	1.48E+01	1.93E+01 G
			242.00	1.574E+01	+	8.952E+00	2.06E+01	7.43E+00 GA

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
BI-207	C	7.2420E-01					1.18E+04	
			1063.66	7.242E-01	?(P	6.780E-01	3.64E+01	7.45E+01 G
			569.70	-2.903E-01	- P	1.258E+00	1.82E+02	9.77E+01 G
BI-212	N	2.1836E+01					6.98E+02	
			727.17	2.184E+01	(	7.791E+00	2.17E+01	7.55E+00 G
			785.42	-1.747E+01	- P	1.138E+02	9.37E+01	1.28E+00 GA
U-235	N	-1.3011E+00					2.57E+11	
			143.79	-4.216E+00	(P	1.685E+01	1.31E+02	1.10E+01 G
			205.33	-5.829E+00	+ P	1.725E+01	1.29E+02	5.01E+00 G
			163.38	4.988E+00	&(P	1.741E+01	1.04E+02	5.08E+00 G
			185.72	1.259E+00	* P	1.630E+00	5.10E+01	5.40E+01 GA
BI-214	N	4.1670E+00					5.84E+05	
			609.31	3.937E-01	?(P	4.276E+00	3.15E+02	4.61E+01 G
			1120.29	3.740E+00	?(P	1.293E+01	1.01E+02	1.51E+01 G
			1764.49	1.588E+01	(	5.088E+00	2.09E+01	1.54E+01 G
BI-210M	T	5.8668E-01					1.10E+09	
			265.83	5.867E-01	?(P	1.493E+00	1.02E+02	5.00E+01 G
			304.90	-3.342E-07	%	7.919E+00	6.98E+08	2.80E+01 G
AC-228	N	1.1982E+01					2.10E+03	
			911.07	1.098E+01	(	1.527E+00	1.37E+01	2.90E+01 G
			968.97	1.402E+01	(	4.067E+00	1.88E+01	1.75E+01 G
			338.32	1.144E+01	(	5.814E+00	1.96E+01	1.20E+01 G
			93.35	6.735E+00	-	3.436E+01	1.53E+02	5.56E+00 XA
TH-227	N	3.7923E+00					7.95E+03	
			256.24	4.493E+00	(	1.110E+01	9.95E+01	7.00E+00 G
			235.97	-1.226E+00	-	1.820E+01	4.41E+02	1.23E+01 G
			50.14	3.180E+00	(	2.533E+01	2.36E+02	8.00E+00 G
TH-229	N	5.8346E+00					2.68E+06	
			193.51	2.218E+00	(	1.781E+01	3.06E+02	4.40E+00 G
			210.85	1.116E+01	?(	2.794E+01	1.02E+02	2.99E+00 G
TH-234	N	3.8160E+00					1.63E+12	
			92.59	-4.993E+00	&(P	3.487E+01	2.07E+02	5.58E+00 G
			63.29	1.673E+01	(P	2.331E+01	4.35E+01	3.81E+00 G
PA-231	N	3.2304E-06					1.20E+07	
			302.65	3.230E-06	%(	7.654E+01	6.98E+08	2.88E+00 G
			300.07	-1.597E+01	+	9.193E+01	1.71E+02	2.46E+00 G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

PA-234   N  -1.8953E-01                                     1.63E+12
                         131.29-1.709E+00 &(  8.110E+00 1.42E+02 1.80E+01 G
                         946.02 1.852E+00 ?(  9.609E+00 2.19E+02 1.34E+01 G
                         569.47 1.650E-01 %   1.325E+01 2.20E+03 8.20E+00 G
                         883.24-8.968E+00 +   2.851E+01 9.45E+01 9.60E+00 G
                         880.53-1.430E+01 +   4.181E+01 8.72E+01 6.00E+00 GA

PA-234M  N  -8.5871E+01                                     1.63E+12
                        1001.00-8.587E+01 ?(P 3.092E+02 6.85E+01 8.37E-01 G
                         766.41 2.175E+02 + P 6.369E+02 8.70E+01 2.94E-01 G

AM-241   T  -1.9521E+00                                     1.58E+05
                          59.54-1.952E+00 &(P 5.463E+00 4.95E+01 3.59E+01 G

Ir-192   F   8.3363E-02                                     7.40E+01
                         316.49 0.000E+00 ?(  1.746E+00 1.00E+03 8.70E+01 G
                         468.06-1.671E-01 +   2.905E+00 4.99E+02 5.18E+01 G
                         308.44 3.119E-01 &(  4.632E+00 4.33E+02 3.18E+01 G

Cs-136   F   5.9414E-01                                     1.30E+01
                         818.50 4.207E-01 ?(  1.288E+00 8.98E+01 1.00E+02 G
                        1048.07 7.050E-01 ?(  1.632E+00 6.96E+01 8.00E+01 G
                         340.57 7.749E-01 &(  4.265E+00 1.63E+02 4.69E+01 G

Np-239   T   1.4902E+00                                     2.36E+00
                         103.70-1.293E-01 %   7.657E+00 1.76E+03 2.40E+01 X
                         106.13 1.490E+00  (  8.026E+00 1.61E+02 2.27E+01 G
                          99.50 2.467E+00 ?   1.213E+01 1.48E+02 1.50E+01 X

Nd-147      -4.1279E+00                                     1.11E+01
                         531.00-4.128E+00 ?(  9.380E+00 9.49E+01 1.30E+01 G
                          91.10 0.000E+00 +   6.507E+00 1.00E+03 2.83E+01 G

TL-210   N   9.0645E-03                                     5.84E+05
                         799.60 9.064E-03 %(  1.508E+00 4.56E+03 9.90E+01 G
                         296.00-4.909E-01 +   3.020E+00 1.83E+02 7.90E+01 G
                        1313.00 1.434E+00 ?   5.270E+00 1.52E+02 2.10E+01 GA

Kr-85    I   9.1587E+01                                     3.92E+03
                         513.98 9.159E+01 ?(  4.047E+02 1.30E+02 4.30E-01 G
   ( - 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.
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@ - 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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********** 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 1 Sigma %	Activity	
PB-210	46.54	337.	-25.	-0.014	68.15	-1.662E+01	P
TH-227	50.14	294.	10.	0.006	235.86	3.180E+00	
AM-241	59.54	451.	-36.	-0.020	49.50	-1.952E+00	P
Sn-126	64.28	431.	-27.	-0.015	109.74	-4.945E+00	
BA-133	80.99	827.	-28.	-0.016	145.41	-1.205E+00	
Sn-126	86.94	948.	-27.	-0.015	160.07	-4.242E+00	
Sn-126	87.57	803.	-7.	-0.004	599.94	-2.490E-01	
Gd-153	97.50	846.	28.	0.015	150.17	1.237E+00	
Gd-153	103.20	818.	17.	0.010	237.03	1.047E+00	
EU-152	121.78	121.	17.	0.010	92.27	8.182E-01	
CO-57	122.06	129.	-6.	-0.004	252.25	-1.011E-01	
EU-154	123.10	110.	8.	0.004	188.75	2.633E-01	
PA-234	131.29	498.	-22.	-0.012	141.93	-1.709E+00	
HF-181	133.02	520.	-23.	-0.013	144.86	-7.148E-01	
CE-144	133.54	543.	-23.	-0.013	147.84	-2.796E+00	
Tc-99m	140.51	709.	-26.	-0.015	145.41	-4.246E-01	
U-235	143.79	741.	-32.	-0.018	131.01	-4.216E+00	P
CE-141	145.44	727.	-26.	-0.014	149.82	-7.638E-01	
Ba-140	162.66	180.	-12.	-0.007	160.73	-2.983E+00	
U-235	163.38	136.	16.	0.009	103.94	4.988E+00	P
CE-139	165.85	128.	16.	0.009	103.50	3.053E-01	
U-235	185.72	115.	41.	0.023	50.96	1.259E+00	P
TH-229	193.51	84.	6.	0.003	306.08	2.218E+00	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
U-235	205.33	94.	-16.	-0.009	129.14	-5.829E+00	P
TH-229	210.85	84.	18.	0.010	101.69	1.116E+01	
Cf-251	227.00	80.	-9.	-0.005	197.41	-2.782E+00	
TH-227	235.97	546.	-8.	-0.004	441.12	-1.226E+00	
EU-152	244.69	526.	10.	0.006	310.29	2.860E+00	
TH-227	256.24	52.	15.	0.008	99.55	4.493E+00	
BI-210M	265.83	45.	13.	0.007	102.02	5.867E-01	P
Hg-203	279.20	117.	-17.	-0.010	91.60	-4.869E-01	
I-131	284.30	53.	11.	0.006	130.34	4.227E+00	P
TL-210	296.00	432.	-16.	-0.009	183.31	-4.909E-01	
PA-231	300.07	378.	-16.	-0.009	171.39	-1.597E+01	
PA-233	300.18	362.	-8.	-0.005	332.72	-3.179E+00	
Ir-192	308.44	148.	4.	0.002	433.01	3.119E-01	
CR-51	320.08	109.	13.	0.007	119.43	3.262E+00	
La-140	328.76	218.	13.	0.007	166.22	1.636E+00	P
Cf-249	333.44	231.	14.	0.008	161.33	2.295E+00	
EU-152	344.29	252.	5.	0.003	463.36	4.964E-01	
BA-133	356.00	245.	-14.	-0.008	156.37	-6.421E-01	
I-131	364.48	45.	-11.	-0.006	161.09	-3.638E-01	P
BA-133	383.84	80.	12.	0.007	106.20	4.079E+00	P
Cf-249	387.95	92.	12.	0.007	112.62	5.617E-01	
SN-113	391.69	146.	-16.	-0.009	110.21	-7.457E-01	
SB-125	427.88	48.	-10.	-0.006	139.28	-1.086E+00	
AG-108M	433.94	26.	2.	0.001	669.81	5.652E-02	P
PM-146	453.88	13.	3.	0.002	280.13	1.402E-01	P
SB-125	463.37	72.	9.	0.005	137.44	2.948E+00	
Ir-192	468.06	76.	-2.	-0.001	498.80	-1.671E-01	
BE-7	477.60	84.	-7.	-0.004	105.50	-2.412E+00	P
La-140	487.02	71.	11.	0.006	110.56	8.803E-01	P
RU-103	497.05	35.	-6.	-0.003	217.25	-2.283E-01	P
RH-106	511.86	49.	53.	0.029	23.19	9.857E+00	
Kr-85	513.98	89.	11.	0.006	130.02	9.159E+01	
Nd-147	531.00	39.	-14.	-0.008	94.90	-4.128E+00	
Ba-140	537.26	26.	4.	0.002	264.97	6.347E-01	
SB-125	600.50	198.	7.	0.004	274.55	1.739E+00	P
SB-124	602.73	206.	8.	0.004	254.94	3.483E-01	P
RU-103	610.30	90.	9.	0.005	160.40	6.405E+00	
AG-108M	614.28	99.	9.	0.005	167.21	4.129E-01	
PM-144	618.06	107.	9.	0.005	173.74	3.769E-01	
RH-106	621.92	116.	9.	0.005	179.97	3.788E+00	
SB-125	635.89	35.	-9.	-0.005	101.90	-3.407E+00	
I-131	636.97	50.	-3.	-0.001	379.97	-1.656E+00	
AG-110M	657.76	85.	-9.	-0.005	148.66	-4.348E-01	
PM-144	696.54	42.	-15.	-0.008	95.22	-7.266E-01	
NB-94	702.63	28.	-1.	-0.001	671.94	-6.806E-02	P
SB-124	722.79	87.	-14.	-0.008	99.40	-6.302E+00	
AG-108M	722.94	73.	-14.	-0.008	91.79	-7.501E-01	
EU-154	723.36	59.	-3.	-0.002	336.18	-8.037E-01	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
ZR-95	724.20	40.	12.	0.006	82.03	1.307E+00		
PM-146	735.72	52.	-18.	-0.010	51.69	-4.039E+00		P
ZR-95	756.73	14.	-1.	-0.001	800.00	-9.436E-02		
AG-110M	763.94	56.	-12.	-0.007	88.90	-2.906E+00		
PA-234M	766.41	51.	12.	0.007	87.03	2.175E+02		P
EU-152	778.92	9.	6.	0.003	121.84	2.306E+00		
CO-58	810.78	32.	7.	0.004	114.63	4.015E-01		
La-140	815.77	44.	-8.	-0.004	129.61	-1.763E+00		
Co-56	846.77	19.	-10.	-0.005	40.90	-5.542E-01		P
NB-94	871.10	49.	-16.	-0.009	68.31	-9.064E-01		
EU-154	873.23	40.	11.	0.006	87.14	5.189E+00		
PA-234	880.53	75.	-15.	-0.008	87.15	-1.430E+01		
PA-234	883.24	89.	-15.	-0.008	94.54	-8.968E+00		
AG-110M	884.68	104.	-9.	-0.005	159.22	-7.467E-01		
Sc-46	889.28	81.	11.	0.006	117.83	6.562E-01		
AG-110M	937.49	35.	-13.	-0.007	103.82	-2.329E+00		
PA-234	946.02	15.	4.	0.002	218.66	1.852E+00		
EU-152	964.11	47.	6.	0.003	173.66	2.474E+00		
EU-154	996.33	42.	-12.	-0.006	84.31	-7.092E+00		
PA-234M	1001.00	63.	-11.	-0.006	68.46	-8.587E+01		P
EU-154	1004.77	73.	-2.	-0.001	606.90	-7.250E-01		
Co-56	1037.84	20.	-3.	-0.002	249.04	-1.445E+00		P
RH-106	1050.36	28.	-5.	-0.003	160.93	-2.101E+01		
Ga-68	1077.40	20.	-3.	-0.002	332.78	-7.360E+00		
FE-59	1099.25	15.	-2.	-0.001	431.57	-2.495E-01		
EU-152	1112.07	47.	5.	0.003	198.13	2.620E+00		
Sc-46	1120.55	23.	8.	0.004	95.68	5.520E-01		
CO-60	1173.24	22.	-5.	-0.003	160.60	-3.843E-01		P
NA-22	1274.53	5.	2.	0.001	210.71	1.335E-01		
FE-59	1291.60	11.	-3.	-0.002	424.75	-5.219E-01		P
TL-210	1313.00	5.	4.	0.002	152.39	1.434E+00		
CO-60	1332.50	31.	-16.	-0.009	77.44	-1.310E+00		P
AG-110M	1384.30	5.	6.	0.003	101.72	2.006E+00		
EU-152	1408.00	0.	8.	0.004	35.36	3.324E+00		
La-140	1596.21	6.	2.	0.001	248.05	2.381E-01		
SB-124	1690.98	6.	-3.	-0.001	532.85	-5.781E-01		P

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	Time Corrected Activity Bq/Sample	Uncertainty Counting	1 Sigma MDA Bq/Sample
BE-7	#A	-2.4121E+00	-2.4121E+00	1.055E+02%	1.52E+01
NA-22	#A	1.3351E-01	1.3351E-01	2.107E+02%	1.08E+00
K-40		1.6871E+02	1.6871E+02	7.194E+00%	9.37E+00
Sc-46	#A	6.0408E-01	6.0408E-01	7.589E+01%	2.62E+00

(Page 19 of 21)

CR-51	#A	3.2618E+00	3.2618E+00	1.194E+02%	1.32E+01
MN-54	#A	-1.8607E-02	-1.8607E-02	3.079E+03%	1.41E+00
FE-59	#A	-2.4954E-01	-2.4954E-01	4.316E+02%	2.59E+00
Co-56	#A	-5.5418E-01	-5.5418E-01	4.090E+01%	1.30E+00
CO-57	#A	-1.0110E-01	-1.0110E-01	2.522E+02%	8.72E-01
CO-58	#A	4.0148E-01	4.0148E-01	1.146E+02%	1.58E+00
CO-60	#A	-1.3099E+00	-1.3099E+00	7.744E+01%	2.38E+00
ZN-65	#A	-1.6167E-02	-1.6167E-02	2.566E+03%	5.13E+00
NB-94	#A	-6.8055E-02	-6.8055E-02	6.719E+02%	1.36E+00
ZR-95	#A	5.3308E-01	5.3308E-01	8.203E+01%	1.90E+00
NB-95	#A	0.0000E+00	0.0000E+00	1.000E+03%	2.14E+00
RU-103	#A	-2.2830E-01	-2.2830E-01	2.172E+02%	1.21E+00
RH-106	#A	3.7879E+00	3.7879E+00	1.800E+02%	2.32E+01
AG-108M	#A	2.3407E-01	2.3407E-01	1.672E+02%	9.59E-01
AG-110M	#A	-5.7167E-02	-5.7167E-02	9.447E+01%	4.05E+00
SN-113	#A	-7.4571E-01	-7.4571E-01	1.102E+02%	2.76E+00
SB-124	#A	3.4830E-01	3.4830E-01	2.549E+02%	3.01E+00
SB-125	#A	5.1398E-01	5.1398E-01	1.124E+02%	3.80E+00
I-131	#A	-4.2894E-02	-4.2895E-02	1.036E+02%	1.17E+00
Gd-153	#A	1.1570E+00	1.1570E+00	1.403E+02%	6.19E+00
Ga-68	#A	-7.3409E+00	-7.3597E+00	3.328E+02%	5.78E+01
Tc-99m	#A	-4.2438E-01	-4.2458E-01	1.454E+02%	2.06E+00
BA-133	#A	-6.4215E-01	-6.4215E-01	1.564E+02%	3.38E+00
CS-134		1.4996E+00	1.4996E+00	2.782E+01%	9.61E-01
CS-137		2.7062E+00	2.7062E+00	1.836E+01%	9.33E-01
CE-139	#A	3.0535E-01	3.0535E-01	1.035E+02%	1.06E+00
Ba-140	#A	6.3468E-01	6.3468E-01	2.650E+02%	4.20E+00
La-140	#A	5.9538E-01	5.9538E-01	1.061E+02%	1.41E+00
CE-141	#A	-7.6382E-01	-7.6383E-01	1.498E+02%	3.82E+00
CE-144	#A	-2.7960E+00	-2.7960E+00	1.478E+02%	1.38E+01
PM-144	#A	-7.2660E-01	-7.2660E-01	9.522E+01%	1.59E+00
EU-152	#A	1.5400E+00	1.5400E+00	9.227E+01%	2.53E+00
EU-154	#A	1.4025E+00	1.4025E+00	8.714E+01%	1.70E+00
EU-155	A	1.5956E+00	1.5956E+00	1.567E+02%	8.34E+00
HF-181	#A	0.0000E+00	0.0000E+00	1.000E+03%	2.08E+00
Ta-182	#A	1.3636E-01	1.3636E-01	5.635E+02%	6.08E+00
Hg-203	#A	-4.8688E-01	-4.8689E-01	9.160E+01%	1.49E+00
TL-208	#	3.1743E+00	3.1743E+00	2.691E+01%	1.70E+00
PM-146	#A	1.4017E-01	1.4017E-01	2.801E+02%	1.02E+00
Y-88	#A	0.0000E+00	0.0000E+00	1.000E+03%	8.18E-01
Cd-113m	#B	1.8238E+02	1.8238E+02	2.328E+03%	1.50E+04
Cd-109	#A	0.0000E+00	0.0000E+00	1.000E+03%	5.29E+01
Cf-251	#A	6.2969E-02	6.2969E-02	2.580E+03%	4.30E+00
Cf-249	#A	8.9144E-01	8.9144E-01	9.837E+01%	2.14E+00
Sn-126	#A	-4.9452E+00	-4.9452E+00	1.097E+02%	1.81E+01
PB-210	#A	-1.6622E+01	-1.6622E+01	6.815E+01%	5.75E+01
PB-212		1.5054E+01	1.5054E+01	6.076E+00%	1.31E+00
PB-214		1.1213E+01	1.1213E+01	9.093E+00%	1.95E+00
BI-207	#	7.2420E-01	7.2420E-01	3.645E+01%	6.78E-01

BI-212	2.1836E+01	2.1836E+01	2.168E+01%	7.79E+00
U-235 #A	-1.3011E+00	-1.3011E+00	8.362E+01%	1.68E+01
BI-214 A	4.1670E+00	4.1670E+00	2.085E+01%	4.28E+00
BI-210M#A	5.8668E-01	5.8668E-01	1.020E+02%	1.49E+00
AC-228	1.1982E+01	1.1982E+01	1.016E+01%	1.53E+00
TH-227 #A	3.7923E+00	3.7923E+00	9.955E+01%	1.11E+01
TH-229 #A	5.8346E+00	5.8346E+00	1.017E+02%	1.78E+01
TH-234 A	3.8160E+00	3.8160E+00	4.350E+01%	3.49E+01
PA-231 #A	3.2304E-06	3.2304E-06	6.975E+08%	7.65E+01
PA-233 #A	0.0000E+00	0.0000E+00	1.000E+03%	4.18E+00
PA-234 #A	-1.8953E-01	-1.8953E-01	1.303E+02%	8.11E+00
PA-234M#A	-8.5871E+01	-8.5871E+01	6.846E+01%	3.09E+02
AM-241 #A	-1.9521E+00	-1.9521E+00	4.950E+01%	5.46E+00
Np-237 #A	0.0000E+00	0.0000E+00	1.000E+03%	1.61E+01
Ir-192 #A	8.3363E-02	8.3363E-02	4.330E+02%	1.75E+00
Cs-136 #A	5.9413E-01	5.9414E-01	6.629E+01%	1.29E+00
Np-239 A	1.4901E+00	1.4902E+00	1.614E+02%	8.03E+00
Nd-147 #A	-4.1278E+00	-4.1279E+00	9.490E+01%	9.38E+00
TL-210 #A	9.0645E-03	9.0645E-03	4.563E+03%	1.51E+00
Kr-85 #A	9.1587E+01	9.1587E+01	1.300E+02%	4.05E+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 (37.5 to 2000.0 keV) 2.362E+02 Bq/Sample
Total Decayed Activity (37.5 to 2000.0 keV) 2.3617203E+02 Bq/Sample

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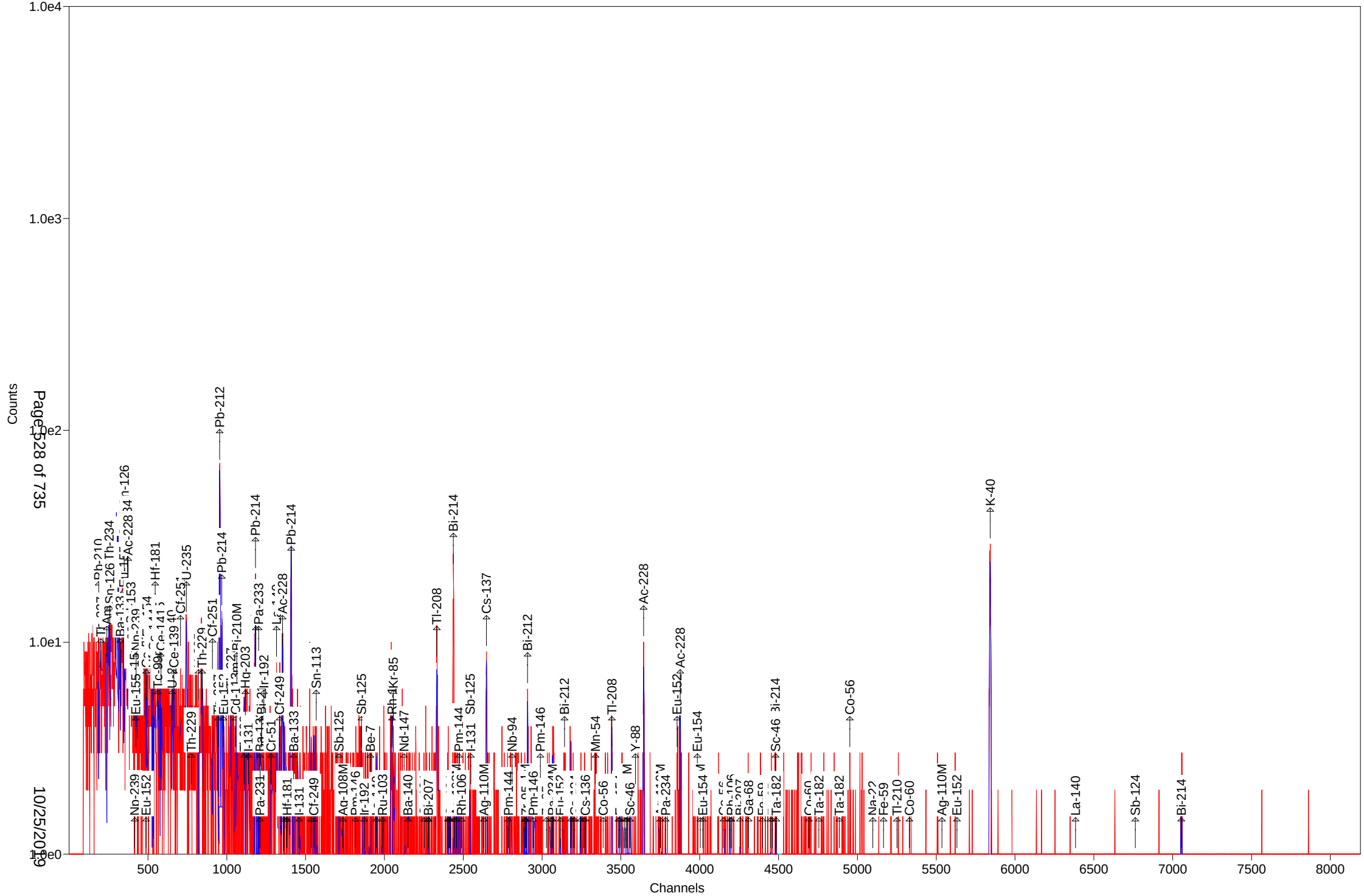
444057_Gamma_180-95857-A-13-B. 8_Gamma_20191612.spc.


Counts
Channels
1.0e4
1.0e3
1.0e2
1.0e1
1.0e0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
6500
7000
7500
8000
Pb-212
Pb-214
Bi-214
K-40
Cs-137
Ac-228
Tl-208
Bi-212
Eu-152
Co-56
Sb-125
Sn-113
Cf-251
Th-229
U-235
Hf-181
Eu-154
Ag-110M
La-140
Sb-124
Eu-152
Co-60
Fe-59
Na-22
Ta-182
Sc-46
Mn-54
Co-56
Y-88
Nb-94
Pm-144
Pm-146
Be-7
Ru-103
Rh-106
Nd-147
Ba-140
Cd-113m
Hg-203
Pa-233
Pa-231
Pa-234
Ga-68
Cr-51
Ba-133
Cf-249
Ac-228
Ce-139
Ce-141
Tc-99
Eu-155
Nb-239
Th-234
Pb-210
Ba-133
Ac-228
Sn-126
Ba-133
Eu-152
Eu-154
Ag-110M
Co-60
Na-22
Fe-59
Tl-210
Sb-124
Bi-214
Pb-214
Pb-212
Tl-208
Bi-212
Ac-228
Eu-152
Co-56
Sb-125
Sn-113
Cs-137
Bi-214
K-40
Pb-214
Pb-214
Pb-214

Test America St. Louis Spectrum ID: 9_Gamma_20192876

Sample Description: 444057_Gamma_180-95857-A-14-B
Detector: Detector # 9
Batch ID: 444057
Work Order Number: Gamma
Lot Number: 180-95857-A-14-B

Decay to Time: 10/15/2019 12:43 Live Time: 1800 sec
Acquisition Time: 10/15/2019 12:45:56 Real Time: 1804 sec
Analysis Time: 10/15/2019 13:16 Dead Time: 0.21 %
Analysis Quantity: 1.000E+00 Sample

Efficiency Cal File: 9_Soil_TunaCan.Clb
Efficiency Cal Desc: 9_Soil_TunaCan_90099_050312
Efficiency Cal Date: 6/14/2012 10:19
Energy Cal Date: 3/1/2012 13:57
Library: Client_Long_Rev15.lib
Bkgd Correction File: 9_2019-10-06_1923.PBC

Nuclide	Activity Bq/Sample	1-Sigma Counting Uncert %	1-Sigma Counting Uncert Bq/Sample	1-Sigma Total Uncert Bq/Sample	Minimum Detectable Activity Bq/Sample
BE-7	3.142E+00	95.5	3.001E+00	3.005E+00	1.011E+01
NA-22	-4.767E-01	87.0	4.149E-01	4.156E-01	1.405E+00
K-40	1.697E+02	5.7	9.711E+00	1.303E+01	7.638E+00
Sc-46	4.005E-01	105.5	4.226E-01	4.231E-01	1.435E+00
CR-51	-3.188E+00	92.9	2.963E+00	2.967E+00	9.928E+00
MN-54	2.403E-01	172.7	4.151E-01	4.153E-01	9.602E-01
FE-59	8.721E-01	50.0	4.363E-01	4.385E-01	1.715E+00
Co-56	2.425E-01	136.7	3.316E-01	3.319E-01	7.791E-01
CO-57	2.451E-01	96.0	2.352E-01	2.356E-01	7.870E-01
CO-58	1.440E-01	229.1	3.300E-01	3.301E-01	1.159E+00
CO-60	-3.528E-01	171.9	6.064E-01	6.067E-01	1.317E+00
ZN-65	-1.263E+00	107.4	1.357E+00	1.359E+00	4.576E+00
NB-94	-3.802E-01	114.1	4.337E-01	4.341E-01	1.470E+00
ZR-95	-1.871E-01	467.1	8.741E-01	8.741E-01	2.008E+00
NB-95	2.405E-01	176.7	4.249E-01	4.251E-01	1.461E+00
RU-103	2.995E-01	91.8	2.751E-01	2.755E-01	6.671E-01
RH-106	4.124E+00	183.0	7.548E+00	7.551E+00	2.540E+01
AG-108M	1.786E-01	107.0	1.910E-01	1.912E-01	9.384E-01
AG-110M	1.313E-01	248.1	3.256E-01	3.257E-01	2.565E+00
SN-113	-6.867E-01	104.4	7.172E-01	7.181E-01	2.400E+00
SB-124	5.586E-01	37.8	2.111E-01	2.131E-01	2.583E+00
SB-125	-1.717E-02	101.2	1.737E-02	1.739E-02	2.939E+00
I-131	6.277E-01	91.3	5.729E-01	5.738E-01	7.474E-01
Gd-153	-1.084E+00	166.4	1.803E+00	1.804E+00	6.001E+00
Ga-68	9.719E+00	156.9	1.525E+01	1.526E+01	3.458E+01
Tc-99m	0.000E+00	1.#INF	6.927E-02	6.927E-02	1.537E+00
BA-133	-2.682E-01	295.2	7.917E-01	7.918E-01	2.677E+00
CS-134	4.754E-01	79.3	3.772E-01	3.780E-01	1.266E+00
CS-137	1.945E+00	18.7	3.641E-01	3.779E-01	6.794E-01
CE-139	6.117E-02	491.8	3.008E-01	3.009E-01	1.026E+00
Ba-140	1.238E+00	96.0	1.188E+00	1.190E+00	2.875E+00
La-140	6.268E-01	43.5	2.728E-01	2.748E-01	4.733E-01
CE-141	-6.592E-01	139.9	9.219E-01	9.225E-01	3.073E+00

CE-144	0.000E+00	1.#INF	1.266E+00	1.266E+00	1.173E+01
PM-144	3.950E-01	74.0	2.923E-01	2.930E-01	9.758E-01
EU-152	1.174E+00	72.1	8.466E-01	8.488E-01	2.223E+00
EU-154	5.039E-01	63.8	3.216E-01	3.227E-01	1.829E+00
EU-155	-5.758E-01	147.7	8.502E-01	8.508E-01	8.588E+00
HF-181	3.514E-01	120.4	4.230E-01	4.234E-01	1.434E+00
Ta-182	1.747E+00	90.5	1.581E+00	1.583E+00	5.320E+00
Hg-203	-2.337E-01	142.5	3.330E-01	3.332E-01	1.128E+00
TL-208	3.705E+00	12.3	4.561E-01	4.950E-01	7.232E-01
PM-146	4.470E-01	94.5	4.226E-01	4.232E-01	1.018E+00
Y-88	-2.311E-01	195.3	4.513E-01	4.515E-01	1.001E+00
Cd-113m	-3.848E+03	111.1	4.275E+03	4.282E+03	1.441E+04
Cd-109	0.000E+00	1.#INF	1.486E+01	1.486E+01	4.948E+01
Cf-251	1.030E+00	141.6	1.459E+00	1.461E+00	3.764E+00
Cf-249	-3.589E-01	171.9	6.170E-01	6.173E-01	2.088E+00
Sn-126	-6.516E-01	700.5	4.565E+00	4.565E+00	1.540E+01
PB-210	2.638E+01	31.1	8.212E+00	8.357E+00	1.969E+01
PB-212	1.282E+01	6.0	7.643E-01	1.128E+00	1.335E+00
PB-214	1.109E+01	7.6	8.404E-01	1.019E+00	1.524E+00
BI-207	1.939E-01	179.3	3.477E-01	3.478E-01	1.292E+00
BI-212	5.953E+00	76.0	4.526E+00	4.537E+00	1.512E+01
U-235	3.858E-01	414.0	1.597E+00	1.597E+00	1.222E+01
BI-214	1.286E+01	8.4	1.085E+00	1.275E+00	1.429E+00
BI-210M	-5.231E-02	1362.9	7.129E-01	7.129E-01	1.824E+00
AC-228	1.394E+01	10.1	1.405E+00	1.575E+00	2.272E+00
TH-227	2.717E+00	97.1	2.640E+00	2.645E+00	9.667E+00
TH-229	4.021E+00	134.1	5.394E+00	5.403E+00	1.558E+01
TH-234	-6.063E+00	58.1	3.521E+00	3.537E+00	3.239E+01
PA-231	0.000E+00	1.#INF	5.082E+00	5.082E+00	6.268E+01
PA-233	-2.196E-02	3233.5	7.101E-01	7.101E-01	5.123E+00
PA-234	-6.330E-02	110.5	6.994E-02	7.002E-02	6.926E+00
PA-234M	4.390E+01	90.5	3.972E+01	3.978E+01	1.349E+02
AM-241	-1.112E+00	131.6	1.463E+00	1.464E+00	4.881E+00
Np-237	0.000E+00	1.#INF	4.306E+00	4.306E+00	1.434E+01
Ir-192	4.710E-01	91.6	4.312E-01	4.321E-01	1.941E+00
Cs-136	4.968E-01	66.6	3.309E-01	3.321E-01	1.289E+00
Np-239	1.401E+00	170.7	2.392E+00	2.393E+00	7.962E+00
Nd-147	-2.140E+00	135.6	2.902E+00	2.905E+00	6.998E+00
TL-210	8.888E-02	397.8	3.535E-01	3.536E-01	1.247E+00
Kr-85	0.000E+00	1.#INF	2.901E+01	2.901E+01	3.705E+02
Total	3.413E+02				

Analyst: Caleb Quinn

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Sample description
444057_Gamma_180-95857-A-14-B

Spectrum Filename: C:\User\SPC\Det9\9_Gamma_20192876.An1

Acquisition information
Start time: 10/15/2019 12:45:56 PM
Live time: 1800
Real time: 1804
Dead time: 0.21 %
Detector ID: 9

Detector system
Ge9 S/N100228730

Calibration
Filename: 9_Soil_TunaCan.Clb
9_Soil_TunaCan_90099_050312

Energy Calibration
Created: 3/1/2012 1:57:17 PM
Zero offset: 0.074 keV
Gain: 0.250 keV/channel
Quadratic: -2.269E-08 keV/channel^2

Efficiency Calibration
Created: 6/14/2012 10:19:51 AM
Knee Energy: 165.85 keV
Above the Knee: Quadratic Uncertainty = 1.30 %
Log(Eff): -8.079856E-01 + (-2.367265E-01*Log(E)) +
(-3.950640E-02*Log(E)^2)
Below the Knee: Quadratic Uncertainty = 1.42 %
Log(Eff): -2.387916E+01 + (8.875647E+00*Log(E)) +
(-9.401100E-01*Log(E)^2)

Library Files
Main analysis library: Client_Long_Rev15.lib
Library Match Width: 0.500
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G800W064
Start channel: 100 (25.08keV)
Stop channel: 8000 (1999.34keV)
Peak rejection level: 1000.000%
Peak search sensitivity: 3
Sample Size: 1.0000E+00 +/- 0.000E+00%
Activity scaling factor: 1.0000E+00/(1.0000E+00* 1.0000E+00) =
1.0000E+00
Detection limit method: Reg. Guide 4.16 Method

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Random error: 4.0000000E+00
Systematic error: 4.0000000E+00
Fraction Limit: 0.000%
Background width: 3
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:	YES	10/15/2019 12:43:00 PM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	9_2019-10-06_1923.PBC 10/6/2019 7:23:18 PM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 24 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 0.1607

***** 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	52.	31.13	0.77	2.577E-02	46.54	4.250	2.638E+01	PB210
55.67	15.	61.13	0.68	3.363E-02				
63.10	74.	27.42	0.79	3.909E-02	63.29	3.810	2.739E+01	TH234
74.74	158.	11.79	1.03	4.571E-02				
77.13	254.	8.83	1.03	4.678E-02				
87.18	102.	18.46	1.04	5.028E-02	86.49	13.100	8.611E+00	Np237
					86.54	30.700	3.673E+00	EU155
					86.94	9.040	1.245E+01	Sn126
					87.57	37.500	2.990E+00	Sn126
					88.04	3.790	2.951E+01	Cd109
89.94	55.	29.52	1.04	5.098E-02				
93.36	70.	24.51	1.04	5.171E-02	93.35	5.561	1.356E+01	AC228
106.13	30.	170.69	1.05	5.323E-02	106.13	22.700	PBC<MDA	Np239
121.78	20.	90.62	1.07	5.305E-02	121.78	28.580	PBC<MDA	EU152
					122.06	85.600	2.451E-01	CO57
122.06	20.	95.96	1.07	5.303E-02	121.78	28.580	PBC<MDA	EU152
					122.06	85.600	2.451E-01	CO57
162.66	22.	96.01	1.11	4.690E-02	162.66	6.220	PBC<MDA	Ba140
163.38	5.	413.99	1.11	4.676E-02	163.38	5.080	PBC<MDA	U235
165.85	4.	491.76	1.11	4.736E-02	165.85	79.900	PBC<MDA	CE139
176.60	14.	141.64	1.12	4.549E-02	176.60	17.000	PBC<MDA	Cf251
185.72	84.	24.98	1.13	4.403E-02	185.72	54.000	1.971E+00	U235

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
193.51	6.	353.82	1.14	4.287E-02	193.51	4.400	PBC<MDA	TH229
210.85	16.	134.14	1.15	4.052E-02	210.85	2.990	PBC<MDA	TH229
235.97	16.	218.58	1.18	3.760E-02	235.97	12.300	PBC<MDA	TH227
238.49	347.	7.84	1.18	3.733E-02	238.63	43.300	1.194E+01	PB212
241.87	89.	17.09	1.18	3.697E-02	242.00	7.430	1.798E+01	PB214
256.24	18.	97.15	1.20	3.558E-02	256.24	7.000	PBC<MDA	TH227
277.86	51.	28.31	1.55	3.372E-02	277.28	6.310	1.332E+01	TL208
284.30	17.	95.41	1.22	3.315E-02	284.30	6.140	PBC<MDA	I131
295.21	118.	15.57	0.76	3.231E-02	295.09	19.300	1.047E+01	PB214
					296.00	79.000	2.564E+00	TL210
316.49	18.	151.55	1.25	3.080E-02	316.49	87.040	PBC<MDA	Ir192
328.76	18.	150.43	1.26	2.999E-02	328.76	20.300	PBC<MDA	La140
337.99	91.	16.36	1.42	2.942E-02	338.32	12.010	1.437E+01	AC228
340.57	18.	150.92	1.27	2.927E-02	340.57	46.900	PBC<MDA	Cs136
351.75	225.	8.36	1.00	2.861E-02	351.93	37.600	1.162E+01	PB214
364.48	13.	91.28	1.29	2.791E-02	364.48	81.700	PBC<MDA	I131
453.88	12.	94.52	1.37	2.388E-02	453.88	65.000	PBC<MDA	PM146
468.06	14.	102.77	1.38	2.335E-02	468.06	51.750	PBC<MDA	Ir192
477.60	14.	95.51	1.39	2.301E-02	477.60	10.520	PBC<MDA	BE7
482.00	12.	120.37	1.40	2.286E-02	482.00	80.500	PBC<MDA	HF181
497.05	11.	91.84	1.41	2.236E-02	497.05	90.900	PBC<MDA	RU103
511.86	102.	14.80	2.67	2.188E-02	511.86	20.000	1.295E+01	RH106
537.26	5.	232.71	1.44	2.112E-02	537.26	24.390	PBC<MDA	Ba140
569.70	4.	354.55	1.47	2.023E-02	569.32	15.380	PBC<MDA	CS134
					569.47	8.200	1.228E+00	PA234
					569.70	97.740	1.030E-01	BI207
583.02	112.	12.31	1.45	1.989E-02	583.02	84.500	3.705E+00	TL208
609.33	193.	8.44	1.15	1.925E-02	609.31	46.090	1.211E+01	BI214
					610.30	5.750	9.720E+01	RU103
621.92	14.	183.02	1.51	1.896E-02	621.92	9.930	PBC<MDA	RH106
635.89	7.	113.39	1.53	1.864E-02	635.89	11.310	PBC<MDA	SB125
636.97	1.	618.32	1.53	1.862E-02	636.97	7.170	PBC<MDA	I131
661.39	54.	18.72	1.60	1.810E-02	661.66	85.210	1.945E+00	CS137
696.54	12.	74.00	1.58	1.741E-02	696.54	99.000	PBC<MDA	PM144
722.79	15.	75.87	1.60	1.693E-02	722.79	10.810	PBC<MDA	SB124
					722.94	90.840	5.309E-01	AG108M
					723.36	20.220	2.386E+00	EU154
722.94	11.	106.98	1.60	1.693E-02	722.79	10.810	3.481E+00	SB124
					722.94	90.840	4.143E-01	AG108M
					723.36	20.220	1.862E+00	EU154
727.17	14.	76.03	1.60	1.686E-02	727.17	7.550	PBC<MDA	BI212
765.79	7.	176.70	1.63	1.621E-02	765.79	99.790	PBC<MDA	NB95
					766.41	0.294	8.167E+01	PA234M
778.92	8.	112.15	1.64	1.600E-02	778.92	12.940	PBC<MDA	EU152
785.42	10.	94.56	1.65	1.590E-02	785.42	1.280	PBC<MDA	BI212
795.87	12.	79.35	1.66	1.574E-02	795.87	85.530	PBC<MDA	CS134
799.60	2.	397.77	1.66	1.568E-02	799.60	98.960	PBC<MDA	TL210
810.78	4.	229.13	1.67	1.551E-02	810.78	99.460	PBC<MDA	CO58

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
818.50	12.	90.96	1.67	1.540E-02	818.50	100.000	PBC<MDA	Cs136
834.85	7.	172.72	1.69	1.517E-02	834.85	99.980	PBC<MDA	MN54
846.37	7.	136.74	1.70	1.501E-02	846.77	99.935	PBC<MDA	Co56
860.31	41.	15.62	0.52	1.482E-02	860.56	12.420	1.237E+01	TL208
889.28	10.	105.51	1.73	1.445E-02	889.28	99.984	PBC<MDA	Sc46
910.91	102.	11.80	0.75	1.418E-02	911.07	29.000	1.376E+01	AC228
946.02	6.	168.87	1.77	1.377E-02	946.02	13.400	PBC<MDA	PA234
968.83	18.	77.18	1.79	1.352E-02	968.97	17.460	PBC<MDA	AC228
996.33	5.	134.52	1.81	1.323E-02	996.33	10.600	PBC<MDA	EU154
1001.00	9.	90.48	1.81	1.318E-02	1001.00	0.837	PBC<MDA	PA234M
1004.77	9.	100.77	1.82	1.314E-02	1004.77	18.010	PBC<MDA	EU154
1048.07	8.	94.23	1.85	1.271E-02	1048.07	80.000	PBC<MDA	Cs136
1063.66	5.	179.33	1.86	1.257E-02	1063.66	74.500	PBC<MDA	BI207
1077.40	6.	156.94	1.87	1.244E-02	1077.40	3.300	PBC<MDA	Ga68
1099.20	4.	232.74	1.89	1.224E-02	1099.25	56.500	PBC<MDA	FE59
1120.44	46.	17.25	1.90	1.206E-02	1120.29	15.100	1.395E+01	BI214
					1120.55	99.987	PBC<MDA	Sc46
1121.45	13.	90.48	1.90	1.205E-02	1120.55	99.987	PBC<MDA	Sc46
					1121.30	34.900	1.747E+00	Ta182
1189.05	1.	841.87	1.95	1.150E-02	1189.05	16.200	PBC<MDA	Ta182
1291.43	13.	50.03	2.02	1.077E-02	1291.60	43.200	PBC<MDA	FE59
1313.00	7.	87.39	2.03	1.063E-02	1313.00	21.000	PBC<MDA	TL210
1384.30	2.	248.05	2.08	1.018E-02	1384.30	24.290	PBC<MDA	AG110M
1408.00	6.	96.69	2.10	1.004E-02	1408.00	21.005	PBC<MDA	EU152
1460.73	318.	5.72	2.08	9.749E-03	1460.83	10.670	1.697E+02	K40
1596.21	6.	43.53	2.22	9.069E-03	1596.21	95.400	PBC<MDA	La140
1690.98	7.	37.80	2.27	8.649E-03	1690.98	47.790	PBC<MDA	SB124
1764.45	32.	20.87	2.31	8.350E-03	1764.49	15.400	1.402E+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 Centroid Channel	Energy	Background Counts	Net Area Counts	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide
222.31	55.67	30.	15.	4.361E+02	61.13	0.677	- s
252.76	63.10	110.	64.	1.637E+03	26.34	1.014	- D
298.58	74.75	94.	158.	3.458E+03	11.79	1.025	- D
308.14	77.14	125.	254.	5.436E+03	8.83	1.027	- D
359.40	89.94	110.	61.	1.197E+03	27.53	1.040	- sD

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

This section based on library: Client_Long_Rev15.lib

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********** 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 1 Sigma %	FWHM keV
PB-210	186.17	46.63	60.	52.	0.029	31.13	0.770
TH-227	200.20	50.14	280.	-21.	-0.012	112.40	1.001s
AM-241	237.77	59.54	585.	-26.	-0.015	131.57	1.010s
TH-234	252.77	63.29	528.	-27.	-0.015	122.60	1.014
Sn-126	256.74	64.28	503.	-5.	-0.003	700.51	1.015s
BA-133	323.56	80.99	937.	-30.	-0.017	145.56	1.031s
Np-237	345.55	86.49	1279.	0.	0.000	185.36	1.036A
EU-155	345.76	86.54	1434.	-30.	-0.017	177.38	1.036
Sn-126	347.35	86.94	1332.	-30.	-0.017	170.99	1.037
Sn-126	349.87	87.57	1220.	-30.	-0.017	163.60	1.037
Cd-109	351.75	88.04	1296.	0.	0.000	168.49	1.038A
Nd-147	363.99	91.10	1225.	-30.	-0.017	163.39	1.041s
TH-234	369.94	92.59	1256.	-31.	-0.017	58.08	1.042s
AC-228	372.98	93.35	113.	70.	0.039	24.51	1.043D
Gd-153	389.58	97.50	1286.	-31.	-0.017	166.37	1.047s
Np-239	397.58	99.50	1316.	-31.	-0.017	168.02	1.049s
Gd-153	412.37	103.20	1347.	-31.	-0.017	169.41	1.052s
EU-155	420.82	105.31	1356.	-12.	-0.006	147.67	1.054s
Np-239	424.09	106.13	1336.	30.	0.017	170.69	1.055s
EU-152	486.67	121.78	155.	20.	0.011	90.62	1.070s
CO-57	487.80	122.06	175.	20.	0.011	95.96	1.070s
EU-154	491.95	123.10	216.	-23.	-0.013	91.68	1.071s
PA-234	524.72	131.29	602.	-25.	-0.014	142.54	1.079s
HF-181	531.64	133.02	627.	-23.	-0.013	152.63	1.081s
CE-144	533.69	133.54	650.	0.	0.000	1000.00	1.081s
HF-181	544.74	136.30	650.	0.	0.000	1000.00	1.084s
CO-57	545.43	136.47	650.	0.	0.000	1000.00	1.084s
Tc-99m	561.57	140.51	650.	0.	0.000	1000.00	1.088s
U-235	574.67	143.79	650.	0.	0.000	1000.00	1.091
CE-141	581.29	145.44	789.	-29.	-0.016	139.86	1.092
Ba-140	650.15	162.66	208.	22.	0.012	96.01	1.108s
U-235	653.03	163.38	230.	5.	0.003	413.99	1.109s
CE-139	662.92	165.85	208.	4.	0.002	491.76	1.111s
Cf-251	705.90	176.60	114.	14.	0.008	141.64	1.122s
U-235	742.37	185.72	103.	84.	0.047	24.98	1.130s
TH-229	773.52	193.51	116.	6.	0.003	353.82	1.137s
U-235	820.80	205.33	117.	-2.	-0.001	899.06	1.148s
TH-229	842.87	210.85	116.	16.	0.009	134.14	1.153s
Cf-251	907.45	227.00	148.	-25.	-0.014	98.51	1.168s
TH-227	943.33	235.97	631.	16.	0.009	218.58	1.176s
PB-212	953.97	238.63	60.	373.	0.207	5.96	1.179D
PB-214	967.43	242.00	71.	89.	0.049	17.09	1.182D
EU-152	978.21	244.69	718.	-16.	-0.009	137.17	1.185s
TH-227	1024.39	256.24	76.	18.	0.010	97.15	1.195s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Cd-113m	1054.23	263.70	123.	-15.	-0.008	111.10	1.202s
TL-208	1110.87	277.86	35.	51.	0.028	28.31	1.550s
Hg-203	1116.22	279.20	128.	-12.	-0.006	142.49	1.216s
I-131	1136.61	284.30	64.	17.	0.009	95.41	1.221s
PB-214	1179.77	295.09	45.	113.	0.063	12.64	1.231D
TL-210	1183.41	296.00	522.	-18.	-0.010	179.42	1.231s
PB-212	1199.52	300.03	482.	-17.	-0.010	179.48	1.235s
PA-231	1199.68	300.07	465.	0.	0.000	1000.00	1.235s
PA-233	1200.12	300.18	465.	0.	0.000	1000.00	1.235s
PA-231	1210.00	302.65	465.	0.	0.000	1000.00	1.237
BA-133	1210.81	302.85	465.	0.	0.000	1000.00	1.238
Ba-140	1218.80	304.85	465.	0.	0.000	1000.00	1.240s
BI-210M	1218.99	304.90	465.	0.	0.000	1000.00	1.240s
Ir-192	1233.16	308.44	465.	0.	0.000	1000.00	1.243s
Ir-192	1265.35	316.49	381.	18.	0.010	151.55	1.250
CR-51	1279.73	320.08	122.	-17.	-0.010	92.94	1.253s
La-140	1314.43	328.76	361.	18.	0.010	150.43	1.261
AC-228	1351.32	337.99	32.	91.	0.051	16.36	1.417
Cs-136	1361.66	340.57	363.	18.	0.010	150.92	1.272s
EU-152	1376.53	344.29	381.	0.	0.000	1000.00	1.275s
HF-181	1382.70	345.83	296.	-19.	-0.011	127.73	1.276s
PB-214	1406.37	351.75	33.	225.	0.125	8.36	1.005
BA-133	1423.37	356.00	310.	-8.	-0.005	295.17	1.285s
I-131	1457.31	364.48	36.	13.	0.007	91.28	1.293s
BA-133	1534.73	383.84	167.	-19.	-0.010	100.06	1.310s
Cf-249	1551.17	387.95	186.	-11.	-0.006	171.95	1.314
SN-113	1566.12	391.69	230.	-21.	-0.012	104.45	1.317s
SB-125	1710.86	427.88	61.	-10.	-0.005	167.59	1.349s
AG-108M	1735.10	433.94	56.	-2.	-0.001	659.85	1.354s
PM-146	1814.87	453.88	30.	12.	0.007	94.52	1.372s
SB-125	1852.82	463.37	104.	-7.	-0.004	209.47	1.380s
Ir-192	1871.59	468.06	90.	14.	0.007	102.77	1.384s
BE-7	1909.73	477.60	79.	14.	0.008	95.51	1.392s
HF-181	1927.34	482.00	92.	12.	0.006	120.37	1.396s
La-140	1947.43	487.02	141.	-16.	-0.009	106.87	1.400
RU-103	1987.56	497.05	22.	11.	0.006	91.84	1.409s
RH-106	2046.81	511.86	63.	102.	0.057	14.80	2.672s
Kr-85	2055.27	513.98	165.	0.	0.000	1000.00	1.424s
Nd-147	2123.35	531.00	48.	-11.	-0.006	135.62	1.438
Ba-140	2148.39	537.26	26.	5.	0.003	232.71	1.444
CS-134	2252.30	563.24	57.	-13.	-0.007	85.83	1.466s
CS-134	2276.64	569.32	61.	-18.	-0.010	64.12	1.471s
PA-234	2277.24	569.47	79.	-6.	-0.003	205.89	1.471s
BI-207	2278.16	569.70	83.	4.	0.002	354.55	1.471s
TL-208	2331.43	583.02	17.	112.	0.062	12.31	1.448s
SB-125	2401.36	600.50	356.	-15.	-0.008	183.13	1.497s
CS-134	2418.21	604.71	338.	0.	0.000	1000.00	1.500
BI-214	2436.69	609.33	19.	193.	0.107	8.44	1.147s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
RU-103	2440.56	610.30	338.	0.	0.000	1000.00	1.505s
AG-108M	2456.49	614.28	338.	0.	0.000	1000.00	1.508s
PM-144	2471.62	618.06	411.	-19.	-0.011	153.08	1.512s
RH-106	2487.04	621.92	320.	14.	0.008	183.02	1.515s
SB-125	2542.94	635.89	28.	7.	0.004	113.39	1.526s
I-131	2547.28	636.97	40.	1.	0.001	618.32	1.527s
AG-110M	2630.43	657.76	93.	-6.	-0.004	140.63	1.544s
CS-137	2644.96	661.39	12.	54.	0.030	18.72	1.597
PM-144	2785.58	696.54	35.	12.	0.007	74.00	1.576s
NB-94	2809.93	702.63	82.	-12.	-0.006	114.07	1.581s
SB-124	2890.57	722.79	55.	15.	0.008	75.87	1.598s
AG-108M	2891.17	722.94	70.	11.	0.006	106.98	1.598s
EU-154	2892.86	723.36	81.	0.	0.000	1000.00	1.598s
ZR-95	2896.22	724.20	131.	-24.	-0.013	69.74	1.599s
BI-212	2908.11	727.17	47.	14.	0.008	76.03	1.601
PM-146	2942.31	735.72	38.	-5.	-0.003	221.75	1.608s
PM-146	2988.08	747.16	42.	-10.	-0.006	141.07	1.617s
ZR-95	3026.36	756.73	40.	-3.	-0.002	467.06	1.625
AG-110M	3055.23	763.94	60.	-16.	-0.009	72.89	1.631s
NB-95	3062.61	765.79	73.	7.	0.004	176.70	1.632s
EU-152	3115.14	778.92	15.	8.	0.004	112.15	1.643s
BI-212	3141.15	785.42	36.	10.	0.005	94.56	1.648
CS-134	3182.96	795.87	36.	12.	0.006	79.35	1.656s
TL-210	3197.88	799.60	48.	2.	0.001	397.77	1.659s
CS-134	3207.29	801.95	59.	-8.	-0.004	140.31	1.661s
CO-58	3242.59	810.78	40.	4.	0.002	229.13	1.668s
La-140	3262.58	815.77	58.	-14.	-0.008	80.14	1.672s
Cs-136	3273.50	818.50	50.	12.	0.006	90.96	1.674s
MN-54	3338.91	834.85	25.	7.	0.004	172.72	1.687s
Co-56	3386.61	846.77	15.	7.	0.004	136.74	1.696s
TL-208	3440.78	860.31	0.	41.	0.023	15.62	0.521s
NB-94	3483.94	871.10	35.	-10.	-0.006	89.44	1.715s
EU-154	3492.47	873.23	54.	-6.	-0.004	169.32	1.717s
PA-234	3521.68	880.53	75.	-16.	-0.009	81.10	1.722s
PA-234	3532.53	883.24	91.	-7.	-0.004	200.96	1.724s
AG-110M	3538.30	884.68	97.	0.	0.000	1000.00	1.725s
Sc-46	3556.69	889.28	55.	10.	0.006	105.51	1.729s
Y-88	3591.74	898.04	21.	-5.	-0.003	189.75	1.736s
AC-228	3643.23	910.91	9.	102.	0.057	11.80	0.754s
AG-110M	3749.60	937.49	30.	-4.	-0.002	305.16	1.766s
PA-234	3783.72	946.02	20.	6.	0.003	168.87	1.772s
EU-152	3856.11	964.11	132.	-14.	-0.008	117.80	1.786s
AC-228	3875.56	968.97	84.	18.	0.010	77.18	1.790
EU-154	3985.03	996.33	21.	5.	0.003	134.52	1.810s
PA-234M	4003.71	1001.00	27.	9.	0.005	90.48	1.814s
EU-154	4018.82	1004.77	36.	9.	0.005	100.77	1.816s
Co-56	4151.13	1037.84	27.	-7.	-0.004	114.43	1.841s
Cs-136	4192.07	1048.07	27.	8.	0.005	94.23	1.848s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-207	4254.46	1063.66	17.	5.	0.003	179.33	1.860s
Ga-68	4309.44	1077.40	16.	6.	0.003	156.94	1.870s
FE-59	4396.88	1099.25	16.	4.	0.002	232.74	1.886s
EU-152	4448.20	1112.07	121.	-16.	-0.009	99.56	1.895s
ZN-65	4462.09	1115.55	105.	-14.	-0.008	107.44	1.897s
BI-214	4481.06	1120.29	8.	46.	0.025	17.25	1.901D
Ta-182	4485.12	1121.30	65.	13.	0.007	90.48	1.901s
CO-60	4692.96	1173.24	32.	-11.	-0.006	120.72	1.938s
Ta-182	4756.25	1189.05	23.	1.	0.001	841.87	1.949
Ta-182	4885.75	1221.41	23.	-4.	-0.002	308.96	1.972s
Co-56	4953.27	1238.28	52.	-10.	-0.006	53.98	1.984s
NA-22	5098.35	1274.53	28.	-9.	-0.005	87.04	2.008s
EU-154	5098.39	1274.54	38.	0.	0.000	1000.00	2.008s
FE-59	5166.65	1291.60	6.	13.	0.007	50.03	2.020s
TL-210	5252.32	1313.00	6.	7.	0.004	87.39	2.034s
CO-60	5330.37	1332.50	23.	-7.	-0.004	171.90	2.047s
AG-110M	5537.69	1384.30	6.	2.	0.001	248.05	2.082s
EU-152	5632.56	1408.00	6.	6.	0.004	96.69	2.097s
K-40	5843.63	1460.73	6.	318.	0.177	5.72	2.075
La-140	6385.95	1596.21	1.	6.	0.004	43.53	2.215s
SB-124	6765.35	1690.98	0.	7.	0.004	37.80	2.272s
BI-214	7059.65	1764.49	7.	32.	0.018	20.87	2.314s
Co-56	7087.11	1771.35	48.	-4.	-0.002	270.84	2.318s
Y-88	7346.20	1836.06	6.	-3.	-0.002	195.32	2.354s

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	3.1420E+00				5.31E+01	
			477.60	3.142E+00	&(	1.011E+01 9.55E+01	1.05E+01 G
NA-22	C	-4.7672E-01				9.50E+02	
			1274.53	-4.767E-01	?(	1.405E+00 8.70E+01	9.99E+01 G
K-40	N	1.6974E+02				4.66E+11	
			1460.83	1.697E+02	(P	7.638E+00 5.72E+00	1.07E+01 G
Sc-46	F	4.0049E-01				8.38E+01	
			889.28	4.005E-01	?(	1.435E+00 1.06E+02	1.00E+02 G
			1120.55	8.788E-08	%	2.173E+00 7.07E+08	1.00E+02 G

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Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CR-51	F	-3.1877E+00					2.77E+01	
			320.08	-3.188E+00	(	9.928E+00	9.29E+01	9.94E+00 G
MN-54	C	2.4033E-01					3.12E+02	
			834.85	2.403E-01	?(P	9.602E-01	1.73E+02	1.00E+02 G
FE-59	F	8.7206E-01					4.45E+01	
			1099.25	3.213E-01	?(	1.715E+00	2.33E+02	5.65E+01 G
			1291.60	1.592E+00	?(	1.649E+00	5.00E+01	4.32E+01 G
Co-56	C	2.4252E-01					7.73E+01	
			846.77	2.425E-01	?(P	7.791E-01	1.37E+02	9.99E+01 G
			1238.28	-7.568E-01	+ P	2.742E+00	5.40E+01	6.61E+01 G
			1037.84	-2.127E+00	+ P	8.254E+00	1.14E+02	1.41E+01 G
			1771.35	-1.584E+00	+	1.504E+01	2.71E+02	1.55E+01 A
CO-57	C	2.4514E-01					2.72E+02	
			122.06	2.451E-01	?(	7.870E-01	9.60E+01	8.56E+01 G
			136.47	0.000E+00	-	1.227E+01	1.00E+03	1.07E+01 G
CO-58	C	1.4401E-01					7.09E+01	
			810.78	1.440E-01	?(	1.159E+00	2.29E+02	9.95E+01 G
CO-60	F	-3.5276E-01					1.93E+03	
			1332.50	-3.528E-01	?(	1.317E+00	1.72E+02	1.00E+02 G
			1173.24	-5.261E-01	+	1.390E+00	1.21E+02	9.99E+01 G
ZN-65	F	-1.2632E+00					2.44E+02	
			1115.55	-1.263E+00	&(	4.576E+00	1.07E+02	5.06E+01 G
NB-94	I	-3.8019E-01					7.41E+06	
			702.63	-3.802E-01	?(	1.470E+00	1.14E+02	9.79E+01 G
			871.10	-3.788E-01	&	1.147E+00	8.94E+01	9.99E+01 G
ZR-95	I	-1.8714E-01					6.40E+01	
			756.73	-1.871E-01	?(	2.008E+00	4.67E+02	5.45E+01 G
			724.20	-1.803E+00	&	4.166E+00	6.97E+01	4.42E+01 G
NB-95	I	2.4047E-01					6.40E+01	
			765.79	2.405E-01	?(	1.461E+00	1.77E+02	9.98E+01 G
RU-103	I	2.9951E-01					3.93E+01	
			497.05	2.995E-01	&(	6.671E-01	9.18E+01	9.09E+01 G
			610.30	0.000E+00	-	4.442E+01	1.00E+03	5.75E+00 GA

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
RH-106	I	4.1244E+00					3.74E+02	
			621.92	4.124E+00	&(P	2.540E+01	1.83E+02	9.93E+00 G
			1050.36	-1.871E+00	%	8.570E+01	1.27E+03	1.56E+00 G
			511.86	1.295E+01	?	5.039E+00	1.48E+01	2.00E+01 GA
AG-108M	C	1.7856E-01					1.53E+05	
			433.94	-5.810E-02	?(	9.384E-01	6.60E+02	9.05E+01 G
			722.94	4.143E-01	(	1.502E+00	1.07E+02	9.08E+01 G
			614.28	0.000E+00	-	2.856E+00	1.00E+03	8.98E+01 G
AG-110M	F	1.3128E-01					2.50E+02	
			884.68	0.000E+00	?(	2.565E+00	1.00E+03	7.27E+01 G
			657.76	-2.077E-01	+ P	1.542E+00	1.41E+02	9.46E+01 G
			937.49	-4.663E-01	+	3.291E+00	3.05E+02	3.44E+01 G
			1384.30	5.241E-01	?(	3.100E+00	2.48E+02	2.43E+01 G
			763.94	-2.457E+00	+	5.960E+00	7.29E+01	2.23E+01 G
SN-113	F	-6.8668E-01					1.15E+02	
			391.69	-6.867E-01	?(	2.400E+00	1.04E+02	6.40E+01 G
SB-124	F	5.5857E-01					6.02E+01	
			602.73	-5.670E-02	&(	2.583E+00	1.34E+03	9.83E+01 G
			1690.98	9.409E-01	?(	9.906E-01	3.78E+01	4.78E+01 G
			722.79	4.461E+00	(	1.130E+01	7.59E+01	1.08E+01 G
SB-125	I	-1.7166E-02					1.01E+03	
			427.88	-7.284E-01	?(	2.939E+00	1.68E+02	2.96E+01 G
			600.50	-2.353E+00	+	1.449E+01	1.83E+02	1.79E+01 G
			635.89	1.844E+00	?(	7.210E+00	1.13E+02	1.13E+01 G
			463.37	-1.579E+00	+	1.133E+01	2.09E+02	1.05E+01 G
I-131	I	6.2767E-01					8.02E+00	
			364.48	3.286E-01	(	7.474E-01	9.13E+01	8.17E+01 G
			284.30	4.634E+00	?(	1.092E+01	9.54E+01	6.14E+00 G
			636.97	6.047E-01	?(P	1.332E+01	6.18E+02	7.17E+00 G
Gd-153	F	-1.0835E+00					2.42E+02	
			97.50	-1.084E+00	?(	6.001E+00	1.66E+02	3.00E+01 G
			103.20	-1.481E+00	+	8.349E+00	1.69E+02	2.18E+01 G
Ga-68	C	9.7194E+00					4.71E-02	
			1077.40	9.719E+00	?(	3.458E+01	1.57E+02	3.30E+00 G
BA-133	F	-2.6822E-01					3.85E+03	
			356.00	-2.682E-01	&(	2.677E+00	2.95E+02	6.20E+01 G
			302.85	0.000E+00	+	9.853E+00	1.00E+03	1.83E+01 G
			383.84	-4.337E+00	+	1.454E+01	1.00E+02	8.94E+00 GA

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
			80.99	-1.013E+00	&	4.909E+00	1.46E+02	3.41E+01 GA
CS-134	I	4.7539E-01					7.54E+02	
			795.87	4.754E-01	?(	1.266E+00	7.93E+01	8.55E+01 G
			604.71	0.000E+00	-	2.599E+00	1.00E+03	9.76E+01 G
			569.32	-3.291E+00	+	6.961E+00	6.41E+01	1.54E+01 G
			801.95	-3.269E+00	+	1.573E+01	1.40E+02	8.69E+00 G
			563.24	-4.080E+00	+ P	1.231E+01	8.58E+01	8.35E+00 G
CS-137	I	1.9449E+00					1.10E+04	
			661.66	1.945E+00	(P	6.794E-01	1.87E+01	8.52E+01 G
CE-139	F	6.1172E-02					1.38E+02	
			165.85	6.117E-02	?(	1.026E+00	4.92E+02	7.99E+01 G
Ba-140	I	1.2376E+00					1.28E+01	
			537.26	4.947E-01	?(P	2.875E+00	2.33E+02	2.44E+01 G
			162.66	4.151E+00	?(	1.332E+01	9.60E+01	6.22E+00 G
			304.85	0.000E+00	-	4.229E+01	1.00E+03	4.29E+00 G
La-140	I	6.2678E-01					1.28E+01	
			1596.21	4.092E-01	?(P	4.733E-01	4.35E+01	9.54E+01 G
			487.02	-8.690E-01	-	3.122E+00	1.07E+02	4.55E+01 G
			328.76	1.649E+00	&(	8.321E+00	1.50E+02	2.03E+01 G
			815.77	-2.201E+00	-	5.904E+00	8.01E+01	2.33E+01 G
CE-141	I	-6.5915E-01					3.25E+01	
			145.44	-6.592E-01	?(	3.073E+00	1.40E+02	4.82E+01 G
PM-144	C	3.9499E-01					3.63E+02	
			696.54	3.950E-01	?(	9.758E-01	7.40E+01	9.90E+01 G
			618.06	-5.579E-01	-	2.862E+00	1.53E+02	9.91E+01 G
EU-152	F	1.1742E+00					4.94E+03	
			121.78	7.338E-01	?(	2.223E+00	9.06E+01	2.86E+01 G
			344.29	0.000E+00	-	6.761E+00	1.00E+03	2.65E+01 G
			1112.07	-5.418E+00	+	1.812E+01	9.96E+01	1.36E+01 G
			778.92	2.147E+00	?(	5.571E+00	1.12E+02	1.29E+01 G
			964.11	-3.971E+00	+	1.578E+01	1.18E+02	1.46E+01 G
			244.69	-3.240E+00	+ P	2.548E+01	1.37E+02	7.58E+00 G
			1408.00	1.668E+00	?	3.635E+00	9.67E+01	2.10E+01 GA
EU-154	I	5.0389E-01					3.14E+03	
			123.10	-5.979E-01	?(	1.829E+00	9.17E+01	4.08E+01 G
			1274.54	0.000E+00	+	4.542E+00	1.00E+03	3.52E+01 G
			723.36	0.000E+00	+	7.249E+00	1.00E+03	2.02E+01 G
			873.23	-1.957E+00	+	1.145E+01	1.69E+02	1.23E+01 G
			1004.77	2.097E+00	?(	7.205E+00	1.01E+02	1.80E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
			996.33	2.037E+00	?(	9.602E+00	1.35E+02	1.06E+01 G
EU-155	I	-5.7575E-01					1.81E+03	
			105.31	-5.758E-01	*(P	8.588E+00	1.48E+02	2.12E+01 G
			86.54	-1.096E+00	&	6.472E+00	1.77E+02	3.07E+01 G
HF-181	F	3.5143E-01					4.24E+01	
			482.00	3.514E-01	?(	1.434E+00	1.20E+02	8.05E+01 G
			133.02	-5.782E-01	&	2.948E+00	1.53E+02	4.33E+01 G
			345.83	-2.463E+00	+	1.054E+01	1.28E+02	1.51E+01 G
			136.30	0.000E+00	-	2.240E+01	1.00E+03	5.85E+00 G
Ta-182	F	1.7469E+00					1.14E+02	
			1121.30	1.747E+00	?(	5.320E+00	9.05E+01	3.49E+01 G
			1221.41	-6.700E-01	-	4.549E+00	3.09E+02	2.70E+01 G
			1189.05	3.975E-01	-	7.422E+00	8.42E+02	1.62E+01 G
Hg-203	F	-2.3368E-01					4.66E+01	
			279.20	-2.337E-01	?(	1.128E+00	1.42E+02	8.15E+01 G
TL-208	N	3.7054E+00					6.98E+02	
			583.02	3.705E+00	(P	7.232E-01	1.23E+01	8.45E+01 G
			277.28	1.332E+01	+	7.905E+00	2.83E+01	6.31E+00 G
			860.56	1.237E+01	+	2.224E+00	1.56E+01	1.24E+01 G
PM-146	C	4.4705E-01					2.02E+03	
			453.88	4.470E-01	(P	1.018E+00	9.45E+01	6.50E+01 G
			747.16	-9.895E-01	+	3.257E+00	1.41E+02	3.40E+01 G
			735.72	-6.758E-01	+ P	4.622E+00	2.22E+02	2.25E+01 G
Y-88	F	-2.3106E-01					1.07E+02	
			1836.06	-2.311E-01	?(	1.001E+00	1.95E+02	9.92E+01 G
			898.04	-1.974E-01	+ P	9.902E-01	1.90E+02	9.37E+01 G
Cd-113m		-3.8478E+03					5.33E+03	
			263.70	-3.848E+03	&(	1.441E+04	1.11E+02	6.00E-03 K
Cf-251	T	1.0298E+00					3.28E+05	
			176.60	1.030E+00	*(	3.764E+00	1.42E+02	1.70E+01 G
			227.00	-5.645E+00	+	1.358E+01	9.85E+01	6.30E+00 GA
Cf-249	T	-3.5885E-01					1.28E+05	
			387.95	-3.589E-01	&(	2.088E+00	1.72E+02	6.60E+01 G
			333.44	2.927E-01	%	1.126E+01	1.14E+03	1.55E+01 G
Sn-126		-6.5165E-01					3.65E+07	
			87.57	-8.933E-01	}	4.866E+00	1.64E+02	3.75E+01 GA
			64.28	-6.516E-01	?(	1.540E+01	7.01E+02	9.70E+00 G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          86.94-3.716E+00 }   2.115E+01 1.71E+02 9.04E+00 GA

PB-210   N   2.6381E+01                                     8.14E+03
                          46.54 2.638E+01  (  1.969E+01 3.11E+01 4.25E+00 G

PB-212   N   1.2820E+01                                     6.98E+02
                         238.63 1.282E+01  (P 1.335E+00 5.96E+00 4.33E+01 G
                         300.03-9.258E+00 -   5.570E+01 1.79E+02 3.28E+00 GA

PB-214   N   1.1088E+01                                     5.84E+05
                         351.93 1.162E+01  (P 1.524E+00 8.36E+00 3.76E+01 G
                         295.09 1.005E+01  (P 3.013E+00 1.26E+01 1.93E+01 G
                         242.00 1.798E+01 +   8.493E+00 1.71E+01 7.43E+00 GA

BI-207   C   1.9388E-01                                     1.18E+04
                        1063.66 3.131E-01 &(P 1.292E+00 1.79E+02 7.45E+01 G
                         569.70 1.030E-01 ?(  1.267E+00 3.55E+02 9.77E+01 G

BI-212   N   5.9533E+00                                     6.98E+02
                         727.17 5.953E+00  (  1.512E+01 7.60E+01 7.55E+00 G
                         785.42 2.620E+01   P 8.409E+01 9.46E+01 1.28E+00 GA

U-235    N   3.8577E-01                                     2.57E+11
                         143.79 0.000E+00 ?(  1.222E+01 1.00E+03 1.10E+01 G
                         205.33-5.182E-01 + P 1.428E+01 8.99E+02 5.01E+00 G
                         163.38 1.218E+00 &(  1.716E+01 4.14E+02 5.08E+00 G
                         185.72 1.971E+00 *   1.167E+00 2.50E+01 5.40E+01 GA

BI-214   N   1.2857E+01                                     5.84E+05
                         609.31 1.211E+01  (P 1.429E+00 8.44E+00 4.61E+01 G
                        1120.29 1.395E+01  (P 4.827E+00 1.73E+01 1.51E+01 G
                        1764.49 1.402E+01 ?(P 6.324E+00 2.09E+01 1.54E+01 G

BI-210M  T  -5.2311E-02                                     1.10E+09
                         265.83-5.231E-02 %(P 1.824E+00 1.36E+03 5.00E+01 G
                         304.90 0.000E+00 +   6.480E+00 1.00E+03 2.80E+01 G

AC-228   N   1.3936E+01                                     2.10E+03
                         911.07 1.376E+01  (P 2.272E+00 1.18E+01 2.90E+01 G
                         968.97 4.144E+00 -   1.066E+01 7.72E+01 1.75E+01 G
                         338.32 1.437E+01  (  4.552E+00 1.64E+01 1.20E+01 G
                          93.35 1.356E+01   P 1.009E+01 2.45E+01 5.56E+00 XA

TH-227   N   2.7174E+00                                     7.95E+03
                         256.24 4.040E+00 &(  9.667E+00 9.71E+01 7.00E+00 G
                         235.97 1.965E+00 &(  1.439E+01 2.19E+02 1.23E+01 G
                          50.14-5.137E+00 +   1.932E+01 1.12E+02 8.00E+00 G
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Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-229	N	4.0209E+00					2.68E+06	
			193.51	1.767E+00	&(	1.558E+01	3.54E+02	4.40E+00 G
			210.85	7.337E+00	?(	2.426E+01	1.34E+02	2.99E+00 G
TH-234	N	-6.0628E+00					1.63E+12	
			92.59	-6.063E+00	&(P	3.239E+01	5.81E+01	5.58E+00 G
			63.29	-9.981E+00	+	4.083E+01	1.23E+02	3.81E+00 G
PA-233	C	-2.1962E-02					7.82E+08	
			312.01	-2.196E-02	%(P	5.123E+00	3.23E+03	3.60E+01 G
			300.18	0.000E+00	+	2.895E+01	1.00E+03	6.20E+00 G
PA-234	N	-6.3298E-02					1.63E+12	
			131.29	-1.455E+00	?(	6.926E+00	1.43E+02	1.80E+01 G
			946.02	1.806E+00	?(	7.089E+00	1.69E+02	1.34E+01 G
			569.47	-2.085E+00	+	1.478E+01	2.06E+02	8.20E+00 G
			883.24	-2.717E+00	+	1.874E+01	2.01E+02	9.60E+00 G
			880.53	-1.008E+01	+	2.733E+01	8.11E+01	6.00E+00 GA
PA-234M	N	4.3896E+01					1.63E+12	
			1001.00	4.390E+01	?(P	1.349E+02	9.05E+01	8.37E-01 G
			766.41	-1.167E+01	%	4.832E+02	1.18E+03	2.94E-01 G
AM-241	T	-1.1116E+00					1.58E+05	
			59.54	-1.112E+00	?(	4.881E+00	1.32E+02	3.59E+01 G
Ir-192	F	4.7102E-01					7.40E+01	
			316.49	3.821E-01	?(	1.941E+00	1.52E+02	8.70E+01 G
			468.06	6.206E-01	(	2.151E+00	1.03E+02	5.18E+01 G
			308.44	0.000E+00	&	5.760E+00	1.00E+03	3.18E+01 G
Cs-136	F	4.9681E-01					1.30E+01	
			818.50	4.199E-01	&(	1.289E+00	9.10E+01	1.00E+02 G
			1048.07	4.553E-01	&(	1.463E+00	9.42E+01	8.00E+01 G
			340.57	7.316E-01	(	3.703E+00	1.51E+02	4.69E+01 G
Np-239	T	1.4013E+00					2.36E+00	
			103.70	-1.867E-01	%	7.667E+00	1.23E+03	2.40E+01 X
			106.13	1.401E+00	&(	7.962E+00	1.71E+02	2.27E+01 G
			99.50	-2.161E+00	+	1.209E+01	1.68E+02	1.50E+01 X
Nd-147		-2.1400E+00					1.11E+01	
			531.00	-2.140E+00	?(	6.998E+00	1.36E+02	1.30E+01 G
			91.10	-1.168E+00	+	6.352E+00	1.63E+02	2.83E+01 G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TL-210   N   8.8882E-02                                      5.84E+05
                          799.60 8.888E-02 ?(  1.247E+00 3.98E+02 9.90E+01 G
                          296.00-3.960E-01 +   2.380E+00 1.79E+02 7.90E+01 G
                         1313.00 1.762E+00 ?   3.436E+00 8.74E+01 2.10E+01 GA
   ( - 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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********** 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 1 Sigma %	Activity	
TH-227	50.14	280.	-21.	-0.012	112.40	-5.137E+00	
AM-241	59.54	585.	-26.	-0.015	131.57	-1.112E+00	
TH-234	63.29	528.	-27.	-0.015	122.60	-9.981E+00	
Sn-126	64.28	503.	-5.	-0.003	700.51	-6.516E-01	
BA-133	80.99	937.	-30.	-0.017	145.56	-1.013E+00	
EU-155	86.54	1434.	-30.	-0.017	177.38	-1.096E+00	
Sn-126	86.94	1332.	-30.	-0.017	170.99	-3.716E+00	
Sn-126	87.57	1220.	-30.	-0.017	163.60	-8.933E-01	
Nd-147	91.10	1225.	-30.	-0.017	163.39	-1.168E+00	
TH-234	92.59	1256.	-31.	-0.017	58.08	-6.063E+00	P

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Gd-153	97.50	1286.	-31.	-0.017	166.37	-1.084E+00	
Np-239	99.50	1316.	-31.	-0.017	168.02	-2.161E+00	
Gd-153	103.20	1347.	-31.	-0.017	169.41	-1.481E+00	
EU-155	105.31	1356.	-12.	-0.006	147.67	-5.758E-01	P
Np-239	106.13	1336.	30.	0.017	170.69	1.401E+00	
EU-152	121.78	155.	20.	0.011	90.62	7.338E-01	
CO-57	122.06	175.	20.	0.011	95.96	2.451E-01	
EU-154	123.10	216.	-23.	-0.013	91.68	-5.979E-01	
PA-234	131.29	602.	-25.	-0.014	142.54	-1.455E+00	
HF-181	133.02	627.	-23.	-0.013	152.63	-5.782E-01	
CE-141	145.44	789.	-29.	-0.016	139.86	-6.592E-01	
Ba-140	162.66	208.	22.	0.012	96.01	4.151E+00	
U-235	163.38	230.	5.	0.003	413.99	1.218E+00	
CE-139	165.85	208.	4.	0.002	491.76	6.117E-02	
Cf-251	176.60	114.	14.	0.008	141.64	1.030E+00	
U-235	185.72	103.	84.	0.047	24.98	1.971E+00	
TH-229	193.51	116.	6.	0.003	353.82	1.767E+00	
U-235	205.33	117.	-2.	-0.001	899.06	-5.182E-01	P
TH-229	210.85	116.	16.	0.009	134.14	7.337E+00	
Cf-251	227.00	148.	-25.	-0.014	98.51	-5.645E+00	
TH-227	235.97	631.	16.	0.009	218.58	1.965E+00	
EU-152	244.69	718.	-16.	-0.009	137.17	-3.240E+00	P
TH-227	256.24	76.	18.	0.010	97.15	4.040E+00	
Cd-113m	263.70	123.	-15.	-0.008	111.10	-3.848E+03	
Hg-203	279.20	128.	-12.	-0.006	142.49	-2.337E-01	
I-131	284.30	64.	17.	0.009	95.41	4.634E+00	
TL-210	296.00	522.	-18.	-0.010	179.42	-3.960E-01	
Ir-192	316.49	381.	18.	0.010	151.55	3.821E-01	
CR-51	320.08	122.	-17.	-0.010	92.94	-3.188E+00	
Cs-136	340.57	363.	18.	0.010	150.92	7.316E-01	
HF-181	345.83	296.	-19.	-0.011	127.73	-2.463E+00	
BA-133	356.00	310.	-8.	-0.005	295.17	-2.682E-01	
I-131	364.48	36.	13.	0.007	91.28	3.286E-01	
BA-133	383.84	167.	-19.	-0.010	100.06	-4.337E+00	
Cf-249	387.95	186.	-11.	-0.006	171.95	-3.589E-01	
SN-113	391.69	230.	-21.	-0.012	104.45	-6.867E-01	
SB-125	427.88	61.	-10.	-0.005	167.59	-7.284E-01	
AG-108M	433.94	56.	-2.	-0.001	659.85	-5.810E-02	
PM-146	453.88	30.	12.	0.007	94.52	4.470E-01	P
SB-125	463.37	104.	-7.	-0.004	209.47	-1.579E+00	
Ir-192	468.06	90.	14.	0.007	102.77	6.206E-01	
BE-7	477.60	79.	14.	0.008	95.51	3.142E+00	
HF-181	482.00	92.	12.	0.006	120.37	3.514E-01	
RU-103	497.05	22.	11.	0.006	91.84	2.995E-01	
RH-106	511.86	63.	102.	0.057	14.80	1.295E+01	
Nd-147	531.00	48.	-11.	-0.006	135.62	-2.140E+00	
Ba-140	537.26	26.	5.	0.003	232.71	4.947E-01	P
CS-134	563.24	57.	-13.	-0.007	85.83	-4.080E+00	P

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
CS-134	569.32	61.	-18.	-0.010	64.12	-3.291E+00	
PA-234	569.47	79.	-6.	-0.003	205.89	-2.085E+00	
BI-207	569.70	83.	4.	0.002	354.55	1.030E-01	
SB-125	600.50	356.	-15.	-0.008	183.13	-2.353E+00	
PM-144	618.06	411.	-19.	-0.011	153.08	-5.579E-01	
RH-106	621.92	320.	14.	0.008	183.02	4.124E+00	P
SB-125	635.89	28.	7.	0.004	113.39	1.844E+00	
I-131	636.97	40.	1.	0.001	618.32	6.047E-01	P
AG-110M	657.76	93.	-6.	-0.004	140.63	-2.077E-01	P
PM-144	696.54	35.	12.	0.007	74.00	3.950E-01	
NB-94	702.63	82.	-12.	-0.006	114.07	-3.802E-01	
SB-124	722.79	55.	15.	0.008	75.87	4.461E+00	
AG-108M	722.94	70.	11.	0.006	106.98	4.143E-01	
ZR-95	724.20	131.	-24.	-0.013	69.74	-1.803E+00	
PM-146	735.72	38.	-5.	-0.003	221.75	-6.758E-01	P
PM-146	747.16	42.	-10.	-0.006	141.07	-9.895E-01	
ZR-95	756.73	40.	-3.	-0.002	467.06	-1.871E-01	
AG-110M	763.94	60.	-16.	-0.009	72.89	-2.457E+00	
NB-95	765.79	73.	7.	0.004	176.70	2.405E-01	
EU-152	778.92	15.	8.	0.004	112.15	2.147E+00	
CS-134	795.87	36.	12.	0.006	79.35	4.754E-01	
TL-210	799.60	48.	2.	0.001	397.77	8.888E-02	
CS-134	801.95	59.	-8.	-0.004	140.31	-3.269E+00	
CO-58	810.78	40.	4.	0.002	229.13	1.440E-01	
Cs-136	818.50	50.	12.	0.006	90.96	4.199E-01	
MN-54	834.85	25.	7.	0.004	172.72	2.403E-01	P
NB-94	871.10	35.	-10.	-0.006	89.44	-3.788E-01	
EU-154	873.23	54.	-6.	-0.004	169.32	-1.957E+00	
PA-234	880.53	75.	-16.	-0.009	81.10	-1.008E+01	
PA-234	883.24	91.	-7.	-0.004	200.96	-2.717E+00	
Sc-46	889.28	55.	10.	0.006	105.51	4.005E-01	
Y-88	898.04	21.	-5.	-0.003	189.75	-1.974E-01	P
AG-110M	937.49	30.	-4.	-0.002	305.16	-4.663E-01	
PA-234	946.02	20.	6.	0.003	168.87	1.806E+00	
EU-152	964.11	132.	-14.	-0.008	117.80	-3.971E+00	
EU-154	996.33	21.	5.	0.003	134.52	2.037E+00	
PA-234M	1001.00	27.	9.	0.005	90.48	4.390E+01	P
EU-154	1004.77	36.	9.	0.005	100.77	2.097E+00	
Cs-136	1048.07	27.	8.	0.005	94.23	4.553E-01	
BI-207	1063.66	17.	5.	0.003	179.33	3.131E-01	P
Ga-68	1077.40	16.	6.	0.003	156.94	9.719E+00	
EU-152	1112.07	121.	-16.	-0.009	99.56	-5.418E+00	
ZN-65	1115.55	105.	-14.	-0.008	107.44	-1.263E+00	
CO-60	1173.24	32.	-11.	-0.006	120.72	-5.261E-01	
NA-22	1274.53	28.	-9.	-0.005	87.04	-4.767E-01	
TL-210	1313.00	6.	7.	0.004	87.39	1.762E+00	
CO-60	1332.50	23.	-7.	-0.004	171.90	-3.528E-01	
AG-110M	1384.30	6.	2.	0.001	248.05	5.241E-01	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
EU-152	1408.00	6.	6.	0.004	96.69	1.668E+00	
SB-124	1690.98	0.	7.	0.004	37.80	9.409E-01	
Y-88	1836.06	6.	-3.	-0.002	195.32	-2.311E-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	Time Corrected Activity Bq/Sample	Uncertainty Counting 1 Sigma	MDA Bq/Sample
BE-7	#A	3.1419E+00	3.1420E+00	9.551E+01%	1.01E+01
NA-22	#A	-4.7671E-01	-4.7672E-01	8.704E+01%	1.41E+00
K-40		1.6974E+02	1.6974E+02	5.721E+00%	7.64E+00
Sc-46	#A	4.0048E-01	4.0049E-01	1.055E+02%	1.44E+00
CR-51	#A	-3.1876E+00	-3.1877E+00	9.294E+01%	9.93E+00
MN-54	#A	2.4033E-01	2.4033E-01	1.727E+02%	9.60E-01
FE-59	#A	8.7203E-01	8.7206E-01	5.003E+01%	1.71E+00
Co-56	#A	2.4252E-01	2.4252E-01	1.367E+02%	7.79E-01
CO-57	#A	2.4514E-01	2.4514E-01	9.596E+01%	7.87E-01
CO-58	#A	1.4401E-01	1.4401E-01	2.291E+02%	1.16E+00
CO-60	#A	-3.5276E-01	-3.5276E-01	1.719E+02%	1.32E+00
ZN-65	#A	-1.2632E+00	-1.2632E+00	1.074E+02%	4.58E+00
NB-94	#A	-3.8019E-01	-3.8019E-01	1.141E+02%	1.47E+00
ZR-95	#A	-1.8714E-01	-1.8714E-01	4.671E+02%	2.01E+00
NB-95	#A	2.4047E-01	2.4047E-01	1.767E+02%	1.46E+00
RU-103	#A	2.9950E-01	2.9951E-01	9.184E+01%	6.67E-01
RH-106	#A	4.1244E+00	4.1244E+00	1.830E+02%	2.54E+01
AG-108M	#A	1.7856E-01	1.7856E-01	1.070E+02%	9.38E-01
AG-110M	#A	1.3128E-01	1.3128E-01	2.481E+02%	2.57E+00
SN-113	#A	-6.8667E-01	-6.8668E-01	1.044E+02%	2.40E+00
SB-124	#A	5.5856E-01	5.5857E-01	3.780E+01%	2.58E+00
SB-125	#A	-1.7166E-02	-1.7166E-02	1.012E+02%	2.94E+00
I-131	#A	6.2756E-01	6.2767E-01	9.128E+01%	7.47E-01
Gd-153	#A	-1.0835E+00	-1.0835E+00	1.664E+02%	6.00E+00
Ga-68	#A	9.4322E+00	9.7194E+00	1.569E+02%	3.46E+01
Tc-99m	#A	0.0000E+00	0.0000E+00	1.000E+03%	1.54E+00
BA-133	#A	-2.6822E-01	-2.6822E-01	2.952E+02%	2.68E+00
CS-134	#A	4.7539E-01	4.7539E-01	7.935E+01%	1.27E+00
CS-137		1.9449E+00	1.9449E+00	1.872E+01%	6.79E-01
CE-139	#A	6.1172E-02	6.1172E-02	4.918E+02%	1.03E+00
Ba-140	#A	1.2374E+00	1.2376E+00	9.601E+01%	2.88E+00
La-140	#	6.2671E-01	6.2678E-01	4.353E+01%	4.73E-01
CE-141	#A	-6.5913E-01	-6.5915E-01	1.399E+02%	3.07E+00
CE-144	#A	0.0000E+00	0.0000E+00	1.000E+03%	1.17E+01
PM-144	#A	3.9499E-01	3.9499E-01	7.400E+01%	9.76E-01
EU-152	#A	1.1742E+00	1.1742E+00	7.210E+01%	2.22E+00
EU-154	#A	5.0389E-01	5.0389E-01	6.382E+01%	1.83E+00

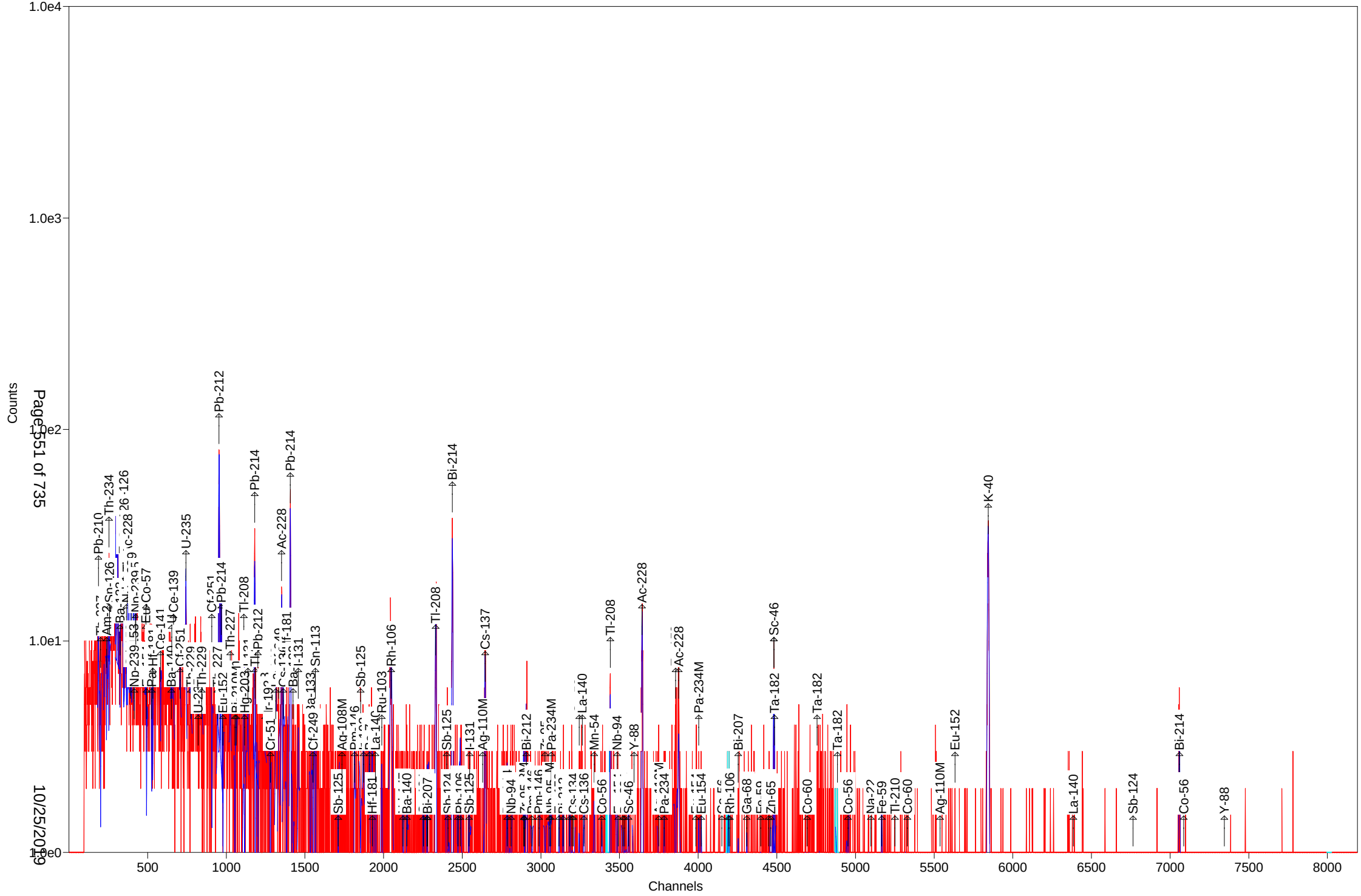
EU-155	#A	-5.7575E-01	-5.7575E-01	1.477E+02%	8.59E+00
HF-181	#A	3.5142E-01	3.5143E-01	1.204E+02%	1.43E+00
Ta-182	A	1.7469E+00	1.7469E+00	9.048E+01%	5.32E+00
Hg-203	#A	-2.3367E-01	-2.3368E-01	1.425E+02%	1.13E+00
TL-208		3.7054E+00	3.7054E+00	1.231E+01%	7.23E-01
PM-146	#A	4.4705E-01	4.4705E-01	9.452E+01%	1.02E+00
Y-88	#A	-2.3105E-01	-2.3106E-01	1.953E+02%	1.00E+00
Cd-113m	#A	-3.8478E+03	-3.8478E+03	1.111E+02%	1.44E+04
Cd-109	#A	0.0000E+00	0.0000E+00	1.000E+03%	4.95E+01
Cf-251	#A	1.0298E+00	1.0298E+00	1.416E+02%	3.76E+00
Cf-249	#A	-3.5885E-01	-3.5885E-01	1.719E+02%	2.09E+00
Sn-126	#A	-6.5165E-01	-6.5165E-01	7.005E+02%	1.54E+01
PB-210		2.6381E+01	2.6381E+01	3.113E+01%	1.97E+01
PB-212		1.2820E+01	1.2820E+01	5.961E+00%	1.34E+00
PB-214		1.1088E+01	1.1088E+01	7.579E+00%	1.52E+00
BI-207	#A	1.9388E-01	1.9388E-01	1.793E+02%	1.29E+00
BI-212	A	5.9533E+00	5.9533E+00	7.603E+01%	1.51E+01
U-235	#A	3.8577E-01	3.8577E-01	4.140E+02%	1.22E+01
BI-214		1.2857E+01	1.2857E+01	8.442E+00%	1.43E+00
BI-210M	#A	-5.2311E-02	-5.2311E-02	1.363E+03%	1.82E+00
AC-228		1.3936E+01	1.3936E+01	1.008E+01%	2.27E+00
TH-227	#A	2.7174E+00	2.7174E+00	9.715E+01%	9.67E+00
TH-229	#A	4.0209E+00	4.0209E+00	1.341E+02%	1.56E+01
TH-234	#A	-6.0628E+00	-6.0628E+00	5.808E+01%	3.24E+01
PA-231	#A	0.0000E+00	0.0000E+00	7.071E+02%	6.27E+01
PA-233	#A	-2.1962E-02	-2.1962E-02	3.233E+03%	5.12E+00
PA-234	#A	-6.3298E-02	-6.3298E-02	1.105E+02%	6.93E+00
PA-234M	#A	4.3896E+01	4.3896E+01	9.048E+01%	1.35E+02
AM-241	#A	-1.1116E+00	-1.1116E+00	1.316E+02%	4.88E+00
Np-237	#A	0.0000E+00	0.0000E+00	1.000E+03%	1.43E+01
Ir-192	#A	4.7101E-01	4.7102E-01	9.156E+01%	1.94E+00
Cs-136	#A	4.9675E-01	4.9681E-01	6.661E+01%	1.29E+00
Np-239	#A	1.4004E+00	1.4013E+00	1.707E+02%	7.96E+00
Nd-147	#A	-2.1397E+00	-2.1400E+00	1.356E+02%	7.00E+00
TL-210	#A	8.8882E-02	8.8882E-02	3.978E+02%	1.25E+00
Kr-85	#A	0.0000E+00	0.0000E+00	1.000E+03%	3.71E+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 (25.1 to 1999.3 keV) 2.525E+02 Bq/Sample
Total Decayed Activity (25.1 to 1999.3 keV) 2.5247417E+02 Bq/Sample

444057_Gamma_180-95857-A-14-B. 9_Gamma_20192876.spc.



Daily Checks

Test America
St. Louis
Background Check

Spectrum: 5_20191015001_BG
Description: Background Contamination Check
Acquired: 10/15/2019 12:17:19 AM
Detector: Detector # 5
Background Evaluation Criteria:
1) Place instrument out of service if Countrate exceeds Control Limits.
2) Investigate high countrate and take corrective action as necessary if Countrate exceeds Tolerance Limits.

	Target	L_Ctrl	L_Tol	Measured	H_Tol	H_Ctrl	Results
Bkgd Countrate	1.45	1.30	1.35	1.48	1.55	1.60	PASS

Analyst: Justin Banner Reviewer: kody Saulters

Test America
St. Louis
Quality Control Check

Spectrum: 5_20191015002_QCAsLeft
Description: Quality control Check (QC Source 'A') Post Stabilization
Acquired: 10/15/2019 1:13:39 AM
Detector: Detector # 5
Quality Control Evaluation Criteria:
1) Notify Supervisor if 'AS FOUND' parameters exceed Tolerance or Control Limits.
2) Place out of service if 'AS LEFT' parameters exceed Tolerance or Control Limits.

	Target	L_Ctrl	L_Tol	Measured	H_Tol	H_Ctrl	Results
QA-60							
Channel	238.00	236.00	237.00	237.90	239.00	240.00	PASS
Energy	59.54	59.04	59.29	59.60	59.79	60.04	PASS
FWHM	0.74	0.00	0.00	0.84	1.84	1.94	PASS
ActivityDiff	636.60	-5.00	-4.00	0.48	4.00	5.00	PASS
QA-662							
FWHM	1.36	0.00	0.00	1.44	3.06	3.16	PASS
ActivityDiff	596.80	-5.00	-4.00	1.27	4.00	5.00	PASS
QA-1332							
Channel	5330.00	5327.00	5328.00	5330.30	5332.00	5333.00	PASS
Energy	1332.51	1331.76	1332.01	1332.63	1333.01	1333.26	PASS
FWHM	1.90	0.00	0.00	1.89	4.10	4.20	PASS
ActivityDiff	1164.20	-5.00	-4.00	-0.82	4.00	5.00	PASS

Analyst: Justin Banner Reviewer: kody Saulters

Test America
St. Louis
Background Check

Spectrum: 8_20191015001_BG
Description: Background Contamination Check
Acquired: 10/15/2019 1:58:22 AM
Detector: Detector # 8
Background Evaluation Criteria:
1) Place instrument out of service if Countrate exceeds Control Limits.
2) Investigate high countrate and take corrective action as necessary if Countrate exceeds Tolerance Limits.

	Target	L_Ctrl	L_Tol	Measured	H_Tol	H_Ctrl	Results
Bkgd Countrate	1.56	1.39	1.45	1.61	1.68	1.74	PASS

Analyst: Justin Banner Reviewer: kody Saulters

Test America
St. Louis
Quality Control Check

Spectrum: 8_20191015002_QCAsLeft
Description: Quality control Check (QC Source 'D') Post Stabilization
Acquired: 10/15/2019 3:57:12 AM
Detector: Detector # 8
Quality Control Evaluation Criteria:
1) Notify Supervisor if 'AS FOUND' parameters exceed Tolerance or Control Limits.
2) Place out of service if 'AS LEFT' parameters exceed Tolerance or Control Limits.

	Target	L_Ctrl	L_Tol	Measured	H_Tol	H_Ctrl	Results
QA-60							
Channel	238.00	236.00	237.00	237.90	239.00	240.00	PASS
Energy	59.54	59.04	59.29	59.54	59.79	60.04	PASS
FWHM	1.10	0.00	0.00	0.92	2.20	2.30	PASS
ActivityDiff	650.60	-5.00	-4.00	0.37	4.00	5.00	PASS
QA-662							
FWHM	1.53	0.00	0.00	1.42	3.23	3.33	PASS
ActivityDiff	609.90	-5.00	-4.00	2.64	4.00	5.00	PASS
QA-1332							
Channel	5330.00	5327.00	5328.00	5329.50	5332.00	5333.00	PASS
Energy	1332.51	1331.76	1332.01	1332.37	1333.01	1333.26	PASS
FWHM	1.90	0.00	0.00	1.86	4.10	4.20	PASS
ActivityDiff	1189.70	-5.00	-4.00	-0.26	4.00	5.00	PASS

Analyst: Justin Banner Reviewer: kody Saulters

Test America
St. Louis
Quality Control Check

Spectrum: 9_20191015001_QCAsLeft
Description: Quality control Check (QC Source 'E') Post Stabilization
Acquired: 10/15/2019 12:40:09 AM
Detector: Detector # 9
Quality Control Evaluation Criteria:
1) Notify Supervisor if 'AS FOUND' parameters exceed Tolerance or Control Limits.
2) Place out of service if 'AS LEFT' parameters exceed Tolerance or Control Limits.

	Target	L_Ctrl	L_Tol	Measured	H_Tol	H_Ctrl	Results
QA-60							
Channel	238.00	236.00	237.00	237.80	239.00	240.00	PASS
Energy	59.54	59.04	59.29	59.56	59.79	60.04	PASS
FWHM	1.08	0.00	0.00	0.94	2.18	2.28	PASS
ActivityDiff	649.44	-5.00	-4.00	-1.14	4.00	5.00	PASS
QA-662							
FWHM	1.62	0.00	0.00	1.52	3.32	3.42	PASS
ActivityDiff	607.56	-5.00	-4.00	1.43	4.00	5.00	PASS
QA-1332							
Channel	5330.00	5327.00	5328.00	5330.20	5332.00	5333.00	PASS
Energy	1332.51	1331.76	1332.01	1332.47	1333.01	1333.26	PASS
FWHM	2.12	0.00	0.00	2.00	4.32	4.42	PASS
ActivityDiff	1191.31	-5.00	-4.00	0.14	4.00	5.00	PASS

Analyst: Justin Banner Reviewer: kody Saulters

Test America
St. Louis
Background Check

Spectrum: 9_20191015002_BG
Description: Background Contamination Check
Acquired: 10/15/2019 12:59:22 AM
Detector: Detector # 9
Background Evaluation Criteria:
1) Place instrument out of service if Countrate exceeds Control Limits.
2) Investigate high countrate and take corrective action as necessary if Countrate exceeds Tolerance Limits.

	Target	L_Ctrl	L_Tol	Measured	H_Tol	H_Ctrl	Results
Bkgd Countrate	1.89	1.53	1.65	1.86	2.14	2.26	PASS

Analyst: Justin Banner Reviewer: kody Saulters

Test America
St. Louis
Quality Control Check

Spectrum: 12_20191015001_QCAsLeft
Description: Quality control Check (QC Source 'H') Post Stabilization
Acquired: 10/15/2019 12:43:49 AM
Detector: Detector #12
Quality Control Evaluation Criteria:
1) Notify Supervisor if 'AS FOUND' parameters exceed Tolerance or Control Limits.
2) Place out of service if 'AS LEFT' parameters exceed Tolerance or Control Limits.

	Target	L_Ctrl	L_Tol	Measured	H_Tol	H_Ctrl	Results
QA-60							
Channel	238.00	236.00	237.00	238.00	239.00	240.00	PASS
Energy	59.54	59.04	59.29	59.61	59.79	60.04	PASS
FWHM	0.90	0.00	0.00	0.84	2.00	2.10	PASS
ActivityDiff	691.00	-5.00	-4.00	2.03	4.00	5.00	PASS
QA-662							
FWHM	1.48	0.00	0.00	1.50	3.18	3.28	PASS
ActivityDiff	659.00	-5.00	-4.00	0.97	4.00	5.00	PASS
QA-1332							
Channel	5330.00	5327.00	5328.00	5330.50	5332.00	5333.00	PASS
Energy	1332.51	1331.76	1332.01	1332.60	1333.01	1333.26	PASS
FWHM	2.00	0.00	0.00	1.93	4.20	4.30	PASS
ActivityDiff	1274.00	-5.00	-4.00	3.60	4.00	5.00	PASS

Analyst: Justin Banner Reviewer: kody Saulters

Test America
St. Louis
Background Check

Spectrum: 12_20191015002_BG
Description: Background Contamination Check
Acquired: 10/15/2019 1:09:32 AM
Detector: Detector #12
Background Evaluation Criteria:
1) Place instrument out of service if Countrate exceeds Control Limits.
2) Investigate high countrate and take corrective action as necessary if Countrate exceeds Tolerance Limits.

	Target	L_Ctrl	L_Tol	Measured	H_Tol	H_Ctrl	Results
Bkgd Countrate	2.00	1.89	1.93	1.99	2.07	2.10	PASS

Analyst: Justin Banner Reviewer: kody Saulters

Test America
St. Louis
Background Check

Spectrum: 14_20191014001_BG
Description: Background Contamination Check
Acquired: 10/14/2019 12:18:53 AM
Detector: Detector #14
Background Evaluation Criteria:
1) Place instrument out of service if Countrate exceeds Control Limits.
2) Investigate high countrate and take corrective action as necessary if Countrate exceeds Tolerance Limits.

	Target	L_Ctrl	L_Tol	Measured	H_Tol	H_Ctrl	Results
Bkgd Countrate	1.80	1.66	1.71	1.76	1.90	1.94	PASS

Analyst: Justin Banner Reviewer: kody Saulters

```
ERROR: undefinedfilename
OFFENDING COMMAND: C:\Users\STLCOU~1\AppData\Local\Temp\PDFCreator\Spool\550A5E0F6CA144989

STACK:
```

Test America
St. Louis
Quality Control Check

Spectrum: 14_20191014002_QCAsLeft
Description: Quality control Check (QC Source 'E') Post Stabilization
Acquired: 10/14/2019 1:38:45 AM
Detector: Detector #14
Quality Control Evaluation Criteria:
1) Notify Supervisor if 'AS FOUND' parameters exceed Tolerance or Control Limits.
2) Place out of service if 'AS LEFT' parameters exceed Tolerance or Control Limits.

	Target	L_Ctrl	L_Tol	Measured	H_Tol	H_Ctrl	Results
QA-60							
Channel	238.00	236.00	237.00	237.90	239.00	240.00	PASS
Energy	59.54	59.04	59.29	59.64	59.79	60.04	PASS
FWHM	0.76	0.00	0.00	0.89	1.86	1.96	PASS
ActivityDiff	671.90	-5.00	-4.00	-2.57	4.00	5.00	PASS
QA-662							
FWHM	1.35	0.00	0.00	1.45	3.05	3.15	PASS
ActivityDiff	628.85	-5.00	-4.00	-0.71	4.00	5.00	PASS
QA-1332							
Channel	5330.00	5327.00	5328.00	5330.50	5332.00	5333.00	PASS
Energy	1332.51	1331.76	1332.01	1332.66	1333.01	1333.26	PASS
FWHM	1.91	0.00	0.00	1.94	4.11	4.21	PASS
ActivityDiff	1224.59	-5.00	-4.00	-1.76	4.00	5.00	PASS

Analyst: Justin Banner Reviewer: kody Saulters

Test America
St. Louis
Background Check

Spectrum: 16_20191014001_BG
Description: Background Contamination Check
Acquired: 10/14/2019 12:24:13 AM
Detector: Detector #16
Background Evaluation Criteria:
1) Place instrument out of service if Countrate exceeds Control Limits.
2) Investigate high countrate and take corrective action as necessary if Countrate exceeds Tolerance Limits.

	Target	L_Ctrl	L_Tol	Measured	H_Tol	H_Ctrl	Results
Bkgd Countrate	2.68	2.51	2.56	2.72	2.80	2.86	PASS

Analyst: Justin Banner Reviewer: kody Saulters

Test America
St. Louis
Quality Control Check

Spectrum: 16_20191014005_QCAsLeft
Description: Quality control Check (QC Source 'G') Post Stabilization
Acquired: 10/14/2019 4:22:09 AM
Detector: Detector #16
Quality Control Evaluation Criteria:
1) Notify Supervisor if 'AS FOUND' parameters exceed Tolerance or Control Limits.
2) Place out of service if 'AS LEFT' parameters exceed Tolerance or Control Limits.

	Target	L_Ctrl	L_Tol	Measured	H_Tol	H_Ctrl	Results
QA-60							
Channel	238.00	236.00	237.00	237.90	239.00	240.00	PASS
Energy	59.54	59.04	59.29	59.57	59.79	60.04	PASS
FWHM	0.96	0.00	0.00	1.02	2.06	2.16	PASS
ActivityDiff	602.10	-5.00	-4.00	2.86	4.00	5.00	PASS
QA-662							
FWHM	1.53	0.00	0.00	1.76	3.23	3.33	PASS
ActivityDiff	571.13	-5.00	-4.00	-0.12	4.00	5.00	PASS
QA-1332							
Channel	5330.00	5327.00	5328.00	5330.80	5332.00	5333.00	PASS
Energy	1332.51	1331.76	1332.01	1332.80	1333.01	1333.26	PASS
FWHM	2.09	0.00	0.00	2.76	4.29	4.39	PASS
ActivityDiff	1139.05	-5.00	-4.00	2.27	4.00	5.00	PASS

Analyst: Justin Banner Reviewer: kody Saulters

Test America
St. Louis
Background Check

Spectrum: 17_20191014001_BG
Description: Background Contamination Check
Acquired: 10/14/2019 12:37:16 AM
Detector: Detector #17
Background Evaluation Criteria:
1) Place instrument out of service if Countrate exceeds Control Limits.
2) Investigate high countrate and take corrective action as necessary if Countrate exceeds Tolerance Limits.

	Target	L_Ctrl	L_Tol	Measured	H_Tol	H_Ctrl	Results
Bkgd Countrate	2.32	2.18	2.23	2.30	2.42	2.46	PASS

Analyst: Justin Banner Reviewer: kody Saulters

Test America
St. Louis
Quality Control Check

Spectrum: 17_20191014002_QCAsLeft
Description: Quality control Check (QC Source 'H') Post Stabilization
Acquired: 10/14/2019 2:11:48 AM
Detector: Detector #17
Quality Control Evaluation Criteria:
1) Notify Supervisor if 'AS FOUND' parameters exceed Tolerance or Control Limits.
2) Place out of service if 'AS LEFT' parameters exceed Tolerance or Control Limits.

	Target	L_Ctrl	L_Tol	Measured	H_Tol	H_Ctrl	Results
QA-60							
Channel	238.00	236.00	237.00	237.90	239.00	240.00	PASS
Energy	59.54	59.04	59.29	59.62	59.79	60.04	PASS
FWHM	0.77	0.00	0.00	1.08	1.87	1.97	PASS
ActivityDiff	691.00	-5.00	-4.00	-1.50	4.00	5.00	PASS
QA-662							
FWHM	1.37	0.00	0.00	1.57	3.07	3.17	PASS
ActivityDiff	659.00	-5.00	-4.00	-1.88	4.00	5.00	PASS
QA-1332							
Channel	5330.00	5327.00	5328.00	5329.70	5332.00	5333.00	PASS
Energy	1332.51	1331.76	1332.01	1332.53	1333.01	1333.26	PASS
FWHM	1.88	0.00	0.00	1.99	4.08	4.18	PASS
ActivityDiff	1274.00	-5.00	-4.00	-3.40	4.00	5.00	PASS

Analyst: Justin Banner Reviewer: kody Saulters

Test America
St. Louis
Background Check

Spectrum: 17_20191021001_BG
Description: Background Contamination Check
Acquired: 10/21/2019 12:18:43 AM
Detector: Detector #17
Background Evaluation Criteria:
1) Place instrument out of service if Countrate exceeds Control Limits.
2) Investigate high countrate and take corrective action as necessary if Countrate exceeds Tolerance Limits.

	Target	L_Ctrl	L_Tol	Measured	H_Tol	H_Ctrl	Results
Bkgd Countrate	2.32	2.18	2.23	2.39	2.42	2.46	PASS

Analyst: Justin Banner Reviewer: kody Saulters

Test America
St. Louis
Quality Control Check

Spectrum: 17_20191021003_QCAsLeft
Description: Quality control Check (QC Source 'H') Post Stabilization
Acquired: 10/21/2019 2:29:48 AM
Detector: Detector #17
Quality Control Evaluation Criteria:
1) Notify Supervisor if 'AS FOUND' parameters exceed Tolerance or Control Limits.
2) Place out of service if 'AS LEFT' parameters exceed Tolerance or Control Limits.

	Target	L_Ctrl	L_Tol	Measured	H_Tol	H_Ctrl	Results
QA-60							
Channel	238.00	236.00	237.00	237.90	239.00	240.00	PASS
Energy	59.54	59.04	59.29	59.62	59.79	60.04	PASS
FWHM	0.77	0.00	0.00	1.13	1.87	1.97	PASS
ActivityDiff	691.00	-5.00	-4.00	1.74	4.00	5.00	PASS
QA-662							
FWHM	1.37	0.00	0.00	1.62	3.07	3.17	PASS
ActivityDiff	659.00	-5.00	-4.00	0.07	4.00	5.00	PASS
QA-1332							
Channel	5330.00	5327.00	5328.00	5329.70	5332.00	5333.00	PASS
Energy	1332.51	1331.76	1332.01	1332.54	1333.01	1333.26	PASS
FWHM	1.88	0.00	0.00	2.00	4.08	4.18	PASS
ActivityDiff	1274.00	-5.00	-4.00	0.19	4.00	5.00	PASS

Analyst: Justin Banner Reviewer: kody Saulters

Initial Calibrations

Gamma Verification per Geometry

Detector: Ge5

Geometry: Tunacan

Reference date 1/1/2012

Calibration Standard: 90099

Standard volume g / vial 1550

Standard volume transferred in g / geometry 317.8

lab ID# of cal standard Rad12-0007

Isotope	Certified Activity gammas/sec	Geometry Activity gammas/sec	γ abundance	Bq/sample	Count Results	%recovery
Pb-210	3094	634	0.0425	14926	14353	96.2
Am-241	2037	418	0.3590	1163	1230.2	105.7
Cd-109	2881	591	0.0361	16363	16101	98.4
Co-57	1511	310	0.8560	362	347.72	96.1
Ce-139	2139	439	0.7990	549	538.4	98.1
Hg-203	4651	954	0.8146	1171	1208.4	103.2
Sn-113	3015	618	0.6400	966	972.07	100.6
Cs-137	1938	397	0.8510	467	462.35	99.0
Y-88	7264	1489	0.9370	1589	1559.3	98.1
Co-60	3580	734	0.9997	734	722.51	98.4
Co-60	3581	734	0.9999	734	739.67	100.7
Y-88	7690	1577	0.9920	1589	1613.8	101.5

Reviewed By: Jody Watson

Date: 3/27/2012

Calibration Data from file: 5_Soil_TunaCan.Clb
Energy Calibration Date: 3/27/2012 Time: 5:20:02 PM
Efficiency Calibration Date: 3/27/2012 Time: 5:20:37 PM

Calibration Description:
5_Soil_TunaCan_90099_032612

Energy Calibration Fit
Energy = 0.1351 +0.249831*Channel +2.72022e-008*Channel**2
FWHM (ch) = 2.8138 +0.001050*Channel -2.57606e-008*Channel**2

Energy/FWHM Table

Channel	Energy(keV)	Fit(keV)	Delta	FWHM(keV)	Fit(keV)	Delta
186.01	46.54	46.61	-0.15%	0.74	0.75	-1.17%
237.86	59.54	59.56	-0.04%	0.74	0.77	-4.07%
351.46	88.03	87.95	0.10%	0.80	0.79	1.28%
487.52	122.06	121.94	0.10%	0.85	0.83	2.66%
663.26	165.85	165.85	0.00%	0.88	0.87	0.98%
1116.90	279.17	279.20	-0.01%	0.97	0.99	-2.35%
1567.36	391.69	391.78	-0.02%	1.12	1.10	1.78%
2647.45	661.66	661.74	-0.01%	1.38	1.35	1.91%
3592.51	898.02	898.01	0.00%	1.55	1.56	-1.11%
4692.96	1173.24	1173.18	0.00%	1.77	1.79	-1.18%
5329.72	1332.50	1332.44	0.00%	1.93	1.92	0.31%
7342.77	1836.01	1836.05	-0.00%	2.29	2.29	0.24%

Efficiency Calibration Fit
Knee Energy = 165.85 keV
Above the Knee: Quadratic Uncertainty = 0.8682 %
Ln(Eff) = 0.6466 -0.783045*Ln(Eng) -0.0041175*(Ln(Eng))**2
Below the Knee: Quadratic Uncertainty = 1.4296 %
Ln(Eff) = -24.6225 +9.075211*Ln(Eng) -0.966442*(Ln(Eng))**2

Efficiency Table

Energy	Efficiency	Fit	Delta
46.54	1.7205E-002	1.7882E-002	-3.93%
59.54	2.6619E-002	2.5335E-002	4.82%
88.03	3.4045E-002	3.4617E-002	-1.68%
122.06	3.4394E-002	3.5819E-002	-4.15%
165.85	========== Knee ==========		
165.85	3.0704E-002	3.1331E-002	-2.04%
279.17	2.1030E-002	2.0365E-002	3.17%
391.69	1.5475E-002	1.5370E-002	0.68%
661.66	9.8486E-003	9.9244E-003	-0.77%
898.02	7.5404E-003	7.6837E-003	-1.90%
1173.24	6.0360E-003	6.1381E-003	-1.69%
1332.50	5.5560E-003	5.5144E-003	0.75%
1836.01	4.2722E-003	4.2078E-003	1.51%

Calibration Certificate Table

Isotope	Energy	Pct	Halflife	Activity	GPS	Error	Date & Time
Pb-210	46.54	4.25	8.15E+003	14918.00	634.00	4.10%	1/1/2012 11:00:00 AM
Am-241	59.54	35.70	1.58E+005	1170.90	418.00	3.50%	1/1/2012 11:00:00 AM
Cd-109	88.03	3.61	4.63E+002	16371.00	591.00	4.70%	1/1/2012 11:00:00 AM
Co-57	122.06	85.60	2.72E+002	362.15	310.00	4.10%	1/1/2012 11:00:00 AM
Ce-139	165.85	79.90	1.38E+002	549.44	439.00	3.90%	1/1/2012 11:00:00 AM
Hg-203	279.17	81.50	4.66E+001	1170.60	954.00	3.80%	1/1/2012 11:00:00 AM
Sn-113	391.69	64.00	1.15E+002	965.63	618.00	3.90%	1/1/2012 11:00:00 AM
Cs-137	661.66	85.21	1.10E+004	465.91	397.00	4.00%	1/1/2012 11:00:00 AM
Y-88	898.02	93.70	1.07E+002	1589.10	1489.00	3.90%	1/1/2012 11:00:00 AM
Co-60	1173.24	99.90	1.93E+003	734.73	734.00	4.00%	1/1/2012 11:00:00 AM
Co-60	1332.50	99.98	1.93E+003	734.15	734.00	4.00%	1/1/2012 11:00:00 AM
Y-88	1836.01	99.20	1.07E+002	1589.70	1577.00	4.00%	1/1/2012 11:00:00 AM

```
     ORTEC g v - i (1087) Env32  G53W4.25  3/27/2012 5:22:03 PM
TestAmerica                      Spectrum name: 5_TunaCan_20120810.An1

Sample description
     5_TunaCan_90099_032612


Spectrum Filename: C:\User\SPC\Det5\5_TunaCan_20120810.An1

Acquisition information
       Start time:                 3/26/2012 3:05:42 PM
       Live time:               3600
       Real time:               3652
       Dead time:                  1.44 %
       Detector ID:                   5

Detector system
     Ge 5 SN/157


Calibration
       Filename:                   5_Soil_TunaCan.Clb
     5_Soil_TunaCan_90099_032612


       Energy Calibration
            Created:               3/27/2012 5:20:02 PM
            Zero offset:           0.135 keV
            Gain:                  0.250 keV/channel
            Quadratic:             2.720E-08 keV/channel^2

       Efficiency Calibration
            Created:               3/27/2012 5:20:37 PM
            Knee Energy:         165.85 keV
            Above the Knee:        Quadratic        Uncertainty =   0.87 %
            Log(Eff):              6.466115E-01 + (-7.830454E-01*Log(E) ) +
                                   ( -4.117504E-03*Log(E)^2 )
            Below the Knee:        Quadratic        Uncertainty =   1.43 %
            Log(Eff):             -2.462251E+01 + ( 9.075211E+00*Log(E) ) +
                                   ( -9.664422E-01*Log(E)^2 )

Library Files
       Main analysis library:      DET_EnergyStandardMix & Pb.Lib
       Library Match Width:        0.500
       Peak stripping:             Library based

Analysis parameters
       Analysis engine:            Env32   G53W4.25
       Start channel:            150 (    37.61keV )
       Stop channel:            8000 (  2000.53keV )
       Peak rejection level:      10.000%
       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 (1087) Env32 G53W4.25 3/27/2012 5:22:03 PM
TestAmerica Spectrum name: 5_TunaCan_20120810.An1

Random error:	4.0000000E+00
Systematic error:	4.0000000E+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:	YES	1/1/2012 11:00:00 AM
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: 5.00E+01%
Energy Calibration
Normalized diff: 0.0527

***** 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	Nuc
46.61	38986.	0.74	0.74	1.793E-02	46.54	4.250	1.435E+04	Pb210
59.56	40041.	0.74	0.74	2.535E-02	59.54	35.700	1.230E+03	AM241
70.85	1493.	9.22	0.78	3.019E-02				
72.87	2354.	5.96	0.78	3.089E-02				
87.95	63754.	0.53	0.80	3.460E-02	88.03	3.610	1.610E+04	CD109
121.94	30888.	0.76	0.85	3.583E-02	122.06	85.600	3.477E+02	CO57
136.41	3768.	3.80	0.89	3.457E-02				
165.85	31597.	0.74	0.88	3.066E-02	165.85	79.900	5.384E+02	Ce139
279.20	20358.	0.87	0.97	2.036E-02	279.17	81.500	1.208E+03	Hg203
391.78	20611.	0.93	1.12	1.537E-02	391.69	64.000	9.721E+02	SN113
661.74	14000.	1.10	1.38	9.923E-03	661.66	85.210	4.623E+02	CS137
898.01	23228.	0.82	1.55	7.684E-03	898.02	93.700	1.559E+03	Y898
1173.18	15468.	0.93	1.77	6.138E-03	1173.24	99.900	7.225E+02	Co1173
1332.44	14238.	0.98	1.93	5.515E-03	1332.50	99.982	7.397E+02	Co1332
1836.04	13938.	0.87	2.30	4.208E-03	1836.01	99.200	1.614E+03	Y1836

********** 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	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide
291.16	72.88	8722.	2253.	7.295E+04	7.09	0.801	-
545.44	136.41	5274.	3768.	1.090E+05	3.80	0.888	-

ORTEC g v - i (1087) Env32 G53W4.25 3/27/2012 5:22:03 PM
TestAmerica Spectrum name: 5_TunaCan_20120810.An1

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

This section based on library: DET_EnergyStandardMix & Pb.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 1 Sigma %	FWHM keV
Pb-210	186.01	46.61	12895.	38986.	10.829	0.74	0.743
AM-241	237.86	59.56	13293.	40041.	11.122	0.74	0.735
CD-109	351.46	87.95	12894.	63754.	17.710	0.53	0.805
CO-57	487.52	121.94	6935.	30888.	8.580	0.76	0.852
Ce-139	663.26	165.85	5616.	31597.	8.777	0.74	0.883
Hg-203	1116.90	279.20	2848.	20358.	5.655	0.87	0.966
SN-113	1567.36	391.78	3046.	20611.	5.725	0.93	1.119
CS-137	2647.45	661.74	1982.	14000.	3.889	1.10	1.380
Y-898	3592.51	898.01	1944.	23228.	6.452	0.82	1.547
Co-1173	4692.96	1173.18	847.	15468.	4.297	0.93	1.774
Co-1332	5329.75	1332.44	693.	14238.	3.955	0.98	1.927
Y-1836	7342.72	1836.04	102.	13938.	3.872	0.87	2.295

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	Peak Energy keV	Peak Activity Bq	Code	MDA Value Bq			COMMENTS
Pb-210	N	1.4353E+04						8.15E+03	
			46.54	1.435E+04	(	1.958E+02	7.44E-01	4.25E+00	G
AM-241		1.2302E+03						1.58E+05	
			59.54	1.230E+03	(	1.659E+01	7.44E-01	3.57E+01	G
CD-109		1.6101E+04						4.63E+02	
			88.03	1.610E+04	(	1.343E+02	5.28E-01	3.61E+00	G
CO-57		3.4772E+02						2.72E+02	
			122.06	3.477E+02	(	4.399E+00	7.60E-01	8.56E+01	G

ORTEC g v - i (1087) Env32 G53W4.25 3/27/2012 5:22:03 PM
TestAmerica Spectrum name: 5_TunaCan_20120810.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Ce-139	5.3840E+02					1.38E+02	
		165.85	5.384E+02	(	5.997E+00	7.36E-01	7.99E+01 G
Hg-203	1.2084E+03					4.66E+01	
		279.17	1.208E+03	(	1.492E+01	8.69E-01	8.15E+01 G
SN-113	9.7207E+02					1.15E+02	
		391.69	9.721E+02	(	1.226E+01	9.31E-01	6.40E+01 G
CS-137	4.6235E+02					1.10E+04	
		661.66	4.623E+02	(	6.941E+00	1.10E+00	8.52E+01 G
Y-898	1.5593E+03					1.07E+02	
		898.02	1.559E+03	(	1.397E+01	8.19E-01	9.37E+01 G
Co-1173	7.2251E+02					1.93E+03	
		1173.24	7.225E+02	(	6.463E+00	9.30E-01	9.99E+01 G
Co-1332	7.3967E+02					1.93E+03	
		1332.50	7.397E+02	(	6.515E+00	9.82E-01	1.00E+02 G
Y-1836	1.6138E+03					1.07E+02	
		1836.01	1.614E+03	(	5.776E+00	8.71E-01	9.92E+01 G

(- 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

Peak Codes:
G - Gamma Ray
X - X-Ray
P - Positron Decay
S - Single-Escape

ORTEC g v - i (1087) Env32 G53W4.25 3/27/2012 5:22:03 PM
TestAmerica Spectrum name: 5_TunaCan_20120810.An1

P - Photon Reaction
C - Charged Particle Reaction
M - No MDA Calculation
R - Coincidence Corrected
H - Halflife limit exceeded
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 1 Sigma %	Activity

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	Time Corrected Activity Bq	Uncertainty 1 Sigma Counting	MDA
Pb-210	1.4250E+04	1.4353E+04	7.439E-01%	1.96E+02
AM-241	1.2297E+03	1.2302E+03	7.442E-01%	1.66E+01
CD-109	1.4172E+04	1.6101E+04	5.277E-01%	1.34E+02
CO-57	2.7983E+02	3.4772E+02	7.604E-01%	4.40E+00
Ce-139	3.5061E+02	5.3840E+02	7.359E-01%	6.00E+00
Hg-203	3.4071E+02	1.2084E+03	8.687E-01%	1.49E+01
SN-113	5.8200E+02	9.7207E+02	9.315E-01%	1.23E+01
CS-137	4.5987E+02	4.6235E+02	1.097E+00%	6.94E+00
Y-898	8.9620E+02	1.5593E+03	8.189E-01%	1.40E+01
Co-1173	7.0069E+02	7.2251E+02	9.300E-01%	6.46E+00
Co-1332	7.1733E+02	7.3967E+02	9.821E-01%	6.52E+00
Y-1836	9.2756E+02	1.6138E+03	8.711E-01%	5.78E+00

< - 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 (37.6 to 2000.5 keV) 3.491E+04 Bq
Total Decayed Activity (37.6 to 2000.5 keV) 3.9848164E+04 Bq

Analyzed by: _____
Admin

Reviewed by: _____
Supervisor

Laboratory: TestAmerica

Gamma Verification per Geometry

Detector:	Ge8
Geometry:	Tunacan
Reference date	1/1/2012
Calibration Standard:	90099
Standard volume g / vial	1550
Standard volume transferred in g / geometry	317.8
lab ID# of cal standard	6699

Isotope	Certified Activity gammas/sec	Geometry Activity gammas/sec	γ abundance	Bq/sample	Count Results	%recovery
Pb-210	3094	634	0.0425	14926	14960	100.2
Am-241	2037	418	0.3590	1163	1240.5	106.6
Cd-109	2881	591	0.0361	16363	16066	98.2
Co-57	1511	310	0.8560	362	345.12	95.4
Ce-139	2139	439	0.7990	549	536.34	97.7
Hg-203	4651	954	0.8146	1171	1218.2	104.1
Sn-113	3015	618	0.6400	966	967.15	100.1
Cs-137	1938	397	0.8510	467	465.86	99.8
Y-88	7264	1489	0.9370	1589	1552.1	97.6
Co-60	3580	734	0.9997	734	724.48	98.7
Co-60	3581	734	0.9999	734	729.98	99.4
Y-88	7690	1577	0.9920	1589	1627.2	102.4

Reviewed By: Jody Watson

Date: 3/28/2012

Calibration Data from file: 8_Soil_TunaCan.Clb
Energy Calibration Date: 3/28/2012 Time: 10:35:07 AM
Efficiency Calibration Date: 3/28/2012 Time: 10:35:20 AM

Calibration Description:
8_Soil_TunaCan_90099_032712

Energy Calibration Fit
Energy = 0.0505 +0.250025*Channel +8.06699e-010*Channel**2
FWHM (ch) = 3.6351 +0.000832*Channel -2.49195e-008*Channel**2

Energy/FWHM Table

Channel	Energy(keV)	Fit(keV)	Delta	FWHM(keV)	Fit(keV)	Delta
185.74	46.54	46.49	0.11%	0.94	0.95	-0.61%
237.86	59.54	59.52	0.03%	0.95	0.96	-1.36%
351.89	88.03	88.03	-0.00%	0.97	0.98	-1.63%
488.04	122.06	122.07	-0.01%	1.01	1.01	0.12%
663.26	165.85	165.88	-0.02%	1.07	1.04	2.17%
1116.59	279.17	279.23	-0.02%	1.15	1.13	1.73%
1566.40	391.69	391.69	-0.00%	1.22	1.22	0.24%
2645.92	661.66	661.60	0.01%	1.39	1.42	-1.95%
3591.62	898.02	898.05	-0.00%	1.61	1.58	2.16%
4692.17	1173.24	1173.23	0.00%	1.74	1.75	-0.61%
5329.14	1332.50	1332.49	0.00%	1.82	1.84	-1.05%
7342.97	1836.01	1836.02	-0.00%	2.11	2.10	0.42%

Efficiency Calibration Fit
Knee Energy = 165.85 keV
Above the Knee: Quadratic Uncertainty = 1.3942 %
Ln(Eff) = -0.1099 -0.495854*Ln(Eng) -0.0257227*(Ln(Eng))**2
Below the Knee: Quadratic Uncertainty = 1.7131 %
Ln(Eff) = -25.2530 +9.398253*Ln(Eng) -1.00003*(Ln(Eng))**2

Efficiency Table

Energy	Efficiency	Fit	Delta
46.54	1.9170E-002	2.0055E-002	-4.62%
59.54	3.0526E-002	2.8813E-002	5.61%
88.03	3.9175E-002	3.9918E-002	-1.90%
122.06	3.9509E-002	4.1457E-002	-4.93%
165.85	========== Knee ==========		
165.85	3.5429E-002	3.6291E-002	-2.43%
279.17	2.5270E-002	2.4275E-002	3.94%
391.69	1.8582E-002	1.8550E-002	0.17%
661.66	1.2089E-002	1.2090E-002	-0.01%
898.02	9.1435E-003	9.3604E-003	-2.37%
1173.24	7.3487E-003	7.4527E-003	-1.42%
1332.50	6.6398E-003	6.6776E-003	-0.57%
1836.01	5.1654E-003	5.0457E-003	2.32%

Calibration Certificate Table

Isotope	Energy	Pct	Halflife	Activity	GPS	Error	Date & Time
Pb-210	46.54	4.25	8.15E+003	14918.00	634.00	4.10%	1/1/2012 11:00:00 AM
Am-241	59.54	35.70	1.58E+005	1170.90	418.00	3.50%	1/1/2012 11:00:00 AM
Cd-109	88.03	3.61	4.63E+002	16371.00	591.00	4.70%	1/1/2012 11:00:00 AM
Co-57	122.06	85.60	2.72E+002	362.15	310.00	4.10%	1/1/2012 11:00:00 AM
Ce-139	165.85	79.90	1.38E+002	549.44	439.00	3.90%	1/1/2012 11:00:00 AM
Hg-203	279.17	81.50	4.66E+001	1170.60	954.00	3.80%	1/1/2012 11:00:00 AM
Sn-113	391.69	64.00	1.15E+002	965.63	618.00	3.90%	1/1/2012 11:00:00 AM
Cs-137	661.66	85.21	1.10E+004	465.91	397.00	4.00%	1/1/2012 11:00:00 AM
Y-88	898.02	93.70	1.07E+002	1589.10	1489.00	3.90%	1/1/2012 11:00:00 AM
Co-60	1173.24	99.90	1.93E+003	734.73	734.00	4.00%	1/1/2012 11:00:00 AM
Co-60	1332.50	99.98	1.93E+003	734.15	734.00	4.00%	1/1/2012 11:00:00 AM
Y-88	1836.01	99.20	1.07E+002	1589.70	1577.00	4.00%	1/1/2012 11:00:00 AM

```
     ORTEC g v - i (1087) Env32  G53W4.25  3/28/2012 10:36:01 AM
TestAmerica                      Spectrum name: 8_TunaCan_20120676.An1

Sample description
     8_TunaCan_90099_032712


Spectrum Filename: C:\User\SPC\Det8\8_TunaCan_20120676.An1

Acquisition information
       Start time:                 3/27/2012 10:58:29 AM
       Live time:               3600
       Real time:               3655
       Dead time:                  1.49 %
       Detector ID:                   8

Detector system
     Ge 8 SN/174


Calibration
       Filename:                   8_Soil_TunaCan.Clb
     8_Soil_TunaCan_90099_032712


       Energy Calibration
            Created:               3/28/2012 10:35:07 AM
            Zero offset:           0.050 keV
            Gain:                  0.250 keV/channel
            Quadratic:             8.067E-10 keV/channel^2

       Efficiency Calibration
            Created:               3/28/2012 10:35:20 AM
            Knee Energy:         165.85 keV
            Above the Knee:        Quadratic        Uncertainty =   1.39 %
            Log(Eff):             -1.098764E-01 + (-4.958544E-01*Log(E) ) +
                                   ( -2.572270E-02*Log(E)^2 )
            Below the Knee:        Quadratic        Uncertainty =   1.71 %
            Log(Eff):             -2.525301E+01 + ( 9.398253E+00*Log(E) ) +
                                   ( -1.000034E+00*Log(E)^2 )

Library Files
       Main analysis library:      DET_EnergyStandardMix & Pb.Lib
       Library Match Width:        0.500
       Peak stripping:             Library based

Analysis parameters
       Analysis engine:            Env32   G53W4.25
       Start channel:            150 (    37.55keV )
       Stop channel:            8000 (  2000.30keV )
       Peak rejection level:      10.000%
       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 (1087) Env32 G53W4.25 3/28/2012 10:36:01 AM
TestAmerica Spectrum name: 8_TunaCan_20120676.An1

Random error:	4.0000000E+00
Systematic error:	4.0000000E+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:	YES	1/1/2012 11:00:00 AM
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: 5.00E+01%
Energy Calibration
Normalized diff: 0.0205

***** 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	Nuc
46.54	43426.	0.60	0.95	2.002E-02	46.54	4.250	1.426E+04	Pb210
59.52	45918.	0.77	0.95	2.880E-02	59.54	35.700	1.240E+03	AM241
72.86	2434.	6.68	0.97	3.542E-02				
88.03	73269.	0.53	0.97	3.992E-02	88.03	3.610	1.607E+04	CD109
122.07	35407.	0.77	1.01	4.146E-02	122.06	85.600	3.451E+02	CO57
136.51	4312.	4.44	1.06	3.999E-02				
165.88	36308.	0.76	1.07	3.629E-02	165.85	79.900	5.363E+02	Ce139
279.23	24162.	0.88	1.15	2.427E-02	279.17	81.500	1.218E+03	Hg203
391.69	24625.	0.77	1.22	1.855E-02	391.69	64.000	9.671E+02	SN113
661.60	17184.	1.10	1.39	1.209E-02	661.66	85.210	4.659E+02	CS137
898.05	28015.	0.71	1.61	9.360E-03	898.02	93.700	1.552E+03	Y898
1173.23	18826.	0.79	1.74	7.453E-03	1173.24	99.900	7.245E+02	Co1173
1332.49	17010.	0.84	1.82	6.678E-03	1332.50	99.982	7.300E+02	Co1332
1836.02	16762.	0.79	2.11	5.046E-03	1836.01	99.200	1.627E+03	Y1836

********** 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	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide	
291.19	72.85	12003.	2434.	6.872E+04	6.68	0.969	-	D
545.78	136.51	8432.	4312.	1.078E+05	4.44	1.059	-	

ORTEC g v - i (1087) Env32 G53W4.25 3/28/2012 10:36:01 AM
TestAmerica Spectrum name: 8_TunaCan_20120676.An1

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

This section based on library: DET_EnergyStandardMix & Pb.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 1 Sigma %	FWHM keV
Pb-210	185.74	46.49	17505.	45568.	12.658	0.76	0.942
AM-241	237.86	59.52	18397.	45918.	12.755	0.77	0.945
CD-109	351.89	88.03	17370.	73269.	20.353	0.53	0.966
CO-57	488.04	122.07	9639.	35407.	9.835	0.77	1.010
Ce-139	663.26	165.88	8356.	36308.	10.085	0.76	1.067
Hg-203	1116.59	279.23	4382.	24162.	6.712	0.88	1.153
SN-113	1566.40	391.69	2677.	24625.	6.840	0.77	1.223
CS-137	2645.92	661.60	3145.	17184.	4.773	1.10	1.389
Y-898	3591.62	898.05	1881.	28015.	7.782	0.71	1.611
Co-1173	4692.17	1173.23	650.	18826.	5.229	0.79	1.738
Co-1332	5329.14	1332.49	576.	17010.	4.725	0.84	1.822
Y-1836	7342.97	1836.02	111.	16762.	4.656	0.79	2.110

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	Peak Energy keV	Peak Activity Bq	Code	MDA Value Bq			COMMENTS
Pb-210	N	1.4960E+04					8.15E+03		
			46.54	1.496E+04	(	2.033E+02	7.55E-01	4.25E+00	G
AM-241		1.2405E+03					1.58E+05		
			59.54	1.240E+03	(	1.715E+01	7.72E-01	3.57E+01	G
CD-109		1.6066E+04					4.63E+02		
			88.03	1.607E+04	(	1.353E+02	5.26E-01	3.61E+00	G
CO-57		3.4512E+02					2.72E+02		
			122.06	3.451E+02	(	4.486E+00	7.68E-01	8.56E+01	G

ORTEC g v - i (1087) Env32 G53W4.25 3/28/2012 10:36:01 AM
TestAmerica Spectrum name: 8_TunaCan_20120676.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Ce-139	5.3634E+02					1.38E+02	
		165.85	5.363E+02	(	6.333E+00	7.56E-01	7.99E+01 G
Hg-203	1.2182E+03					4.66E+01	
		279.17	1.218E+03	(	1.569E+01	8.81E-01	8.15E+01 G
SN-113	9.6715E+02					1.15E+02	
		391.69	9.671E+02	(	9.575E+00	7.73E-01	6.40E+01 G
CS-137	4.6586E+02					1.10E+04	
		661.66	4.659E+02	(	7.158E+00	1.10E+00	8.52E+01 G
Y-898	1.5521E+03					1.07E+02	
		898.02	1.552E+03	(	1.135E+01	7.10E-01	9.37E+01 G
Co-1173	7.2448E+02					1.93E+03	
		1173.24	7.245E+02	(	4.676E+00	7.93E-01	9.99E+01 G
Co-1332	7.2998E+02					1.93E+03	
		1332.50	7.300E+02	(	4.916E+00	8.45E-01	1.00E+02 G
Y-1836	1.6272E+03					1.07E+02	
		1836.01	1.627E+03	(	5.029E+00	7.91E-01	9.92E+01 G

(- 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

Peak Codes:
G - Gamma Ray
X - X-Ray
P - Positron Decay
S - Single-Escape

ORTEC g v - i (1087) Env32 G53W4.25 3/28/2012 10:36:01 AM
TestAmerica Spectrum name: 8_TunaCan_20120676.An1

P - Photon Reaction
C - Charged Particle Reaction
M - No MDA Calculation
R - Coincidence Corrected
H - Halflife limit exceeded
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 1 Sigma %	Activity

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	Time Corrected Activity Bq	Uncertainty 1 Sigma Counting	MDA
Pb-210	1.4851E+04	1.4960E+04	7.555E-01%	2.03E+02
AM-241	1.2400E+03	1.2405E+03	7.719E-01%	1.71E+01
CD-109	1.4124E+04	1.6066E+04	5.260E-01%	1.35E+02
CO-57	2.7715E+02	3.4512E+02	7.681E-01%	4.49E+00
Ce-139	3.4782E+02	5.3634E+02	7.558E-01%	6.33E+00
Hg-203	3.3925E+02	1.2182E+03	8.812E-01%	1.57E+01
SN-113	5.7617E+02	9.6715E+02	7.729E-01%	9.58E+00
CS-137	4.6334E+02	4.6586E+02	1.105E+00%	7.16E+00
Y-898	8.8728E+02	1.5521E+03	7.104E-01%	1.13E+01
Co-1173	7.0239E+02	7.2448E+02	7.931E-01%	4.68E+00
Co-1332	7.0772E+02	7.2998E+02	8.450E-01%	4.92E+00
Y-1836	9.3024E+02	1.6272E+03	7.905E-01%	5.03E+00

< - 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 (82.3 to 2000.3 keV) 3.545E+04 Bq
Total Decayed Activity (82.3 to 2000.3 keV) 4.0432598E+04 Bq

Analyzed by: _____
Admin

Reviewed by: _____
Supervisor

Laboratory: TestAmerica

Gamma Verification per Geometry

Detector:	Ge9
Geometry:	Tunacan
Reference date	1/1/2012
Calibration Standard:	90099
Standard volume g / vial	1550
Standard volume transferred in g / geometry	317.8
lab ID# of cal standard	6699

Isotope	Certified Activity gammas/sec	Geometry Activity gammas/sec	γ abundance	Bq/sample	Count Results	%recovery
Pb-210	3094	634	0.0425	14926	14240	95.4
Am-241	2037	418	0.3590	1163	1244.5	107.0
Cd-109	2881	591	0.0361	16363	15902	97.2
Co-57	1511	310	0.8560	362	347.48	96.0
Ce-139	2139	439	0.7990	549	535.87	97.6
Hg-203	4651	954	0.8146	1171	1216.7	103.9
Sn-113	3015	618	0.6400	966	970.65	100.5
Cs-137	1938	397	0.8510	467	466.58	99.9
Y-88	7264	1489	0.9370	1589	1552.5	97.7
Co-60	3580	734	0.9997	734	727.12	99.0
Co-60	3581	734	0.9999	734	719.75	98.0
Y-88	7690	1577	0.9920	1589	1638.8	103.1

Reviewed By: Jody Watson

Date: 6/14/2012

Calibration Data from file: 9_Soil_TunaCan.Clb
Energy Calibration Date: 6/14/2012 Time: 10:19:40 AM
Efficiency Calibration Date: 6/14/2012 Time: 10:19:51 AM

Calibration Description:
9_Soil_TunaCan_90099_050312

Energy Calibration Fit
Energy = 0.0875 +0.250109*Channel -2.0385e-008*Channel**2
FWHM (ch) = 4.1690 +0.000934*Channel -2.36522e-008*Channel**2

Energy/FWHM Table

Channel	Energy(keV)	Fit(keV)	Delta	FWHM(keV)	Fit(keV)	Delta
185.85	46.54	46.57	-0.06%	1.07	1.09	-1.37%
237.85	59.54	59.58	-0.06%	1.08	1.10	-1.96%
351.79	88.03	88.07	-0.05%	1.12	1.12	-0.18%
487.79	122.06	122.08	-0.02%	1.14	1.16	-1.17%
662.64	165.85	165.81	0.02%	1.23	1.19	2.51%
1115.53	279.17	279.07	0.04%	1.30	1.30	0.44%
1565.74	391.69	391.64	0.01%	1.43	1.39	2.81%
2645.81	661.66	661.69	-0.00%	1.60	1.62	-0.83%
3591.21	898.02	898.02	0.00%	1.80	1.80	-0.02%
4692.44	1173.24	1173.26	-0.00%	2.01	2.01	0.18%
5329.80	1332.50	1332.54	-0.00%	2.09	2.12	-1.38%
7344.77	1836.01	1835.98	0.00%	2.45	2.44	0.55%

Efficiency Calibration Fit
Knee Energy = 165.85 keV
Above the Knee: Quadratic Uncertainty = 1.3038 %
Ln(Eff) = -0.8080 -0.236727*Ln(Eng) -0.0395064*(Ln(Eng))**2
Below the Knee: Quadratic Uncertainty = 1.4241 %
Ln(Eff) = -23.8792 +8.875647*Ln(Eng) -0.94011*(Ln(Eng))**2

Efficiency Table

Energy	Efficiency	Fit	Delta
46.54	2.4596E-002	2.5767E-002	-4.76%
59.54	3.8891E-002	3.6589E-002	5.92%
88.03	4.9059E-002	5.0504E-002	-2.95%
122.06	5.0886E-002	5.3031E-002	-4.22%
165.85	========== Knee ==========		
165.85	4.6197E-002	4.7361E-002	-2.52%
279.17	3.4900E-002	3.3566E-002	3.82%
391.69	2.6668E-002	2.6526E-002	0.53%
661.66	1.8125E-002	1.8099E-002	0.14%
898.02	1.4012E-002	1.4341E-002	-2.34%
1173.24	1.1507E-002	1.1627E-002	-1.05%
1332.50	1.0296E-002	1.0501E-002	-2.00%
1836.01	8.3305E-003	8.0796E-003	3.01%

Calibration Certificate Table

Isotope	Energy	Pct	Halflife	Activity	GPS	Error	Date & Time
Pb-210	46.54	4.25	8.15E+003	14918.00	634.00	4.10%	1/1/2012 11:00:00 AM
Am-241	59.54	35.70	1.58E+005	1170.90	418.00	3.50%	1/1/2012 11:00:00 AM
Cd-109	88.03	3.61	4.63E+002	16371.00	591.00	4.70%	1/1/2012 11:00:00 AM
Co-57	122.06	85.60	2.72E+002	362.15	310.00	4.10%	1/1/2012 11:00:00 AM
Ce-139	165.85	79.90	1.38E+002	549.44	439.00	3.90%	1/1/2012 11:00:00 AM
Hg-203	279.17	81.50	4.66E+001	1170.60	954.00	3.80%	1/1/2012 11:00:00 AM
Sn-113	391.69	64.00	1.15E+002	965.63	618.00	3.90%	1/1/2012 11:00:00 AM
Cs-137	661.66	85.21	1.10E+004	465.91	397.00	4.00%	1/1/2012 11:00:00 AM
Y-88	898.02	93.70	1.07E+002	1589.10	1489.00	3.90%	1/1/2012 11:00:00 AM
Co-60	1173.24	99.90	1.93E+003	734.73	734.00	4.00%	1/1/2012 11:00:00 AM
Co-60	1332.50	99.98	1.93E+003	734.15	734.00	4.00%	1/1/2012 11:00:00 AM
Y-88	1836.01	99.20	1.07E+002	1589.70	1577.00	4.00%	1/1/2012 11:00:00 AM

```
     ORTEC g v - i (1087) Env32  G53W4.25  6/14/2012 10:20:07 AM
TestAmerica, Inc                Spectrum name: 9_TunaCan_20120147.An1

Sample description
     9_TunaCan_90099_050312


Spectrum Filename: C:\User\SPC\Det9\9_TunaCan_20120147.An1

Acquisition information
       Start time:                 5/3/2012 1:37:42 PM
       Live time:               3600
       Real time:               3661
       Dead time:                  1.65 %
       Detector ID:                    9

Detector system
     Ge 9 SN/100113


Calibration
       Filename:                   9_Soil_TunaCan.Clb
     9_Soil_TunaCan_90099_050312


       Energy Calibration
            Created:               6/14/2012 10:19:40 AM
            Zero offset:           0.088 keV
            Gain:                  0.250 keV/channel
            Quadratic:            -2.039E-08 keV/channel^2

       Efficiency Calibration
            Created:               6/14/2012 10:19:51 AM
            Knee Energy:         165.85 keV
            Above the Knee:        Quadratic        Uncertainty =   1.30 %
            Log(Eff):             -8.079856E-01 + (-2.367265E-01*Log(E) ) +
                                   ( -3.950640E-02*Log(E)^2 )
            Below the Knee:        Quadratic        Uncertainty =   1.42 %
            Log(Eff):             -2.387916E+01 + ( 8.875647E+00*Log(E) ) +
                                   ( -9.401100E-01*Log(E)^2 )

Library Files
       Main analysis library:      DET_EnergyStandardMix & Pb.Lib
       Library Match Width:        0.500
       Peak stripping:             Library based

Analysis parameters
       Analysis engine:            Env32   G53W4.25
       Start channel:            150 (    37.60keV )
       Stop channel:            8000 (  1999.66keV )
       Peak rejection level:      10.000%
       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 (1087) Env32 G53W4.25 6/14/2012 10:20:07 AM
TestAmerica, Inc Spectrum name: 9_TunaCan_20120147.An1

Random error:	4.0000000E+00
Systematic error:	4.0000000E+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:	YES	1/1/2012 11:00:00 AM
Decay during acquisition:	YES	
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: 5.00E+01%
Energy Calibration
Normalized diff: 0.0265

***** 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	Nuc
46.57	55553.	0.67	1.07	2.579E-02	46.54	4.250	1.424E+04	Pb210
59.56	58492.	0.66	1.08	3.660E-02	59.54	35.700	1.245E+03	AM241
88.07	86792.	0.48	1.12	5.052E-02	88.03	3.610	1.590E+04	CD109
122.08	41484.	0.73	1.14	5.303E-02	122.06	85.600	3.475E+02	CO57
136.48	5266.	4.55	1.22	5.150E-02				
165.81	39272.	0.74	1.23	4.626E-02	165.85	79.900	5.359E+02	Ce139
279.06	19221.	1.24	1.30	3.358E-02	279.17	81.500	1.217E+03	Hg203
391.64	28263.	0.86	1.43	2.653E-02	391.69	64.000	9.707E+02	SN113
661.69	25703.	0.90	1.61	1.810E-02	661.66	85.210	4.666E+02	CS137
898.02	33728.	0.69	1.80	1.434E-02	898.02	93.700	1.552E+03	Y898
1173.24	29087.	0.72	2.01	1.163E-02	1173.24	99.900	7.271E+02	Co1173
1332.54	26026.	0.70	2.09	1.050E-02	1332.50	99.982	7.198E+02	Co1332
1835.94	21237.	0.73	2.46	8.080E-03	1836.01	99.200	1.639E+03	Y1836

********** 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	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide
545.34	136.48	10776.	5266.	1.023E+05	4.55	1.225	-

ORTEC g v - i (1087) Env32 G53W4.25 6/14/2012 10:20:07 AM
TestAmerica, Inc Spectrum name: 9_TunaCan_20120147.An1

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

This section based on library: DET_EnergyStandardMix & Pb.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 1 Sigma %	FWHM keV
Pb-210	185.85	46.57	18837.	55553.	15.431	0.67	1.071
AM-241	237.79	59.56	19448.	58492.	16.248	0.66	1.078
CD-109	351.79	88.07	19261.	86792.	24.109	0.48	1.122
CO-57	487.79	122.08	11232.	41484.	11.523	0.73	1.142
Ce-139	662.64	165.81	9084.	39272.	10.909	0.74	1.225
Hg-203	1115.51	279.06	6250.	19221.	5.339	1.24	1.302
SN-113	1565.73	391.64	4864.	28263.	7.851	0.86	1.434
CS-137	2645.81	661.69	4037.	25703.	7.140	0.90	1.605
Y-898	3591.21	898.02	2958.	33728.	9.369	0.69	1.803
Co-1173	4692.36	1173.24	1710.	29087.	8.080	0.72	2.014
Co-1332	5329.80	1332.54	1048.	26026.	7.229	0.70	2.088
Y-1836	7344.62	1835.94	304.	21237.	5.899	0.73	2.457

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	Peak Energy keV	Peak Activity Bq	Code	MDA Value Bq			COMMENTS
Pb-210	N	1.4240E+04					8.15E+03		
			46.54	1.424E+04	(	1.646E+02	6.67E-01	4.25E+00	G
AM-241		1.2445E+03					1.58E+05		
			59.54	1.245E+03	(	1.388E+01	6.60E-01	3.57E+01	G
CD-109		1.5902E+04					4.63E+02		
			88.03	1.590E+04	(	1.190E+02	4.84E-01	3.61E+00	G
CO-57		3.4748E+02					2.72E+02		
			122.06	3.475E+02	(	4.159E+00	7.31E-01	8.56E+01	G

ORTEC g v - i (1087) Env32 G53W4.25 6/14/2012 10:20:07 AM
TestAmerica, Inc Spectrum name: 9_TunaCan_20120147.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Ce-139	5.3587E+02					1.38E+02	
		165.85	5.359E+02	(	6.097E+00	7.41E-01	7.99E+01 G
Hg-203	1.2167E+03					4.66E+01	
		279.17	1.217E+03	(	2.349E+01	1.24E+00	8.15E+01 G
SN-113	9.7065E+02					1.15E+02	
		391.69	9.707E+02	(	1.125E+01	8.60E-01	6.40E+01 G
CS-137	4.6658E+02					1.10E+04	
		661.66	4.666E+02	(	5.424E+00	8.98E-01	8.52E+01 G
Y-898	1.5525E+03					1.07E+02	
		898.02	1.552E+03	(	1.179E+01	6.92E-01	9.37E+01 G
Co-1173	7.2712E+02					1.93E+03	
		1173.24	7.271E+02	(	4.884E+00	7.20E-01	9.99E+01 G
Co-1332	7.1975E+02					1.93E+03	
		1332.50	7.198E+02	(	4.248E+00	6.98E-01	1.00E+02 G
Y-1836	1.6388E+03					1.07E+02	
		1836.01	1.639E+03	(	6.479E+00	7.29E-01	9.92E+01 G

(- 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

Peak Codes:
G - Gamma Ray
X - X-Ray
P - Positron Decay
S - Single-Escape

ORTEC g v - i (1087) Env32 G53W4.25 6/14/2012 10:20:07 AM
TestAmerica, Inc Spectrum name: 9_TunaCan_20120147.An1

P - Photon Reaction
C - Charged Particle Reaction
M - No MDA Calculation
R - Coincidence Corrected
H - Halflife limit exceeded
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 1 Sigma %	Activity

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	Time Corrected Activity Bq	Uncertainty 1 Sigma Counting	MDA
Pb-210	1.4091E+04	1.4240E+04	6.667E-01%	1.65E+02
AM-241	1.2439E+03	1.2445E+03	6.605E-01%	1.39E+01
CD-109	1.3223E+04	1.5902E+04	4.843E-01%	1.19E+02
CO-57	2.5385E+02	3.4748E+02	7.313E-01%	4.16E+00
Ce-139	2.8828E+02	5.3587E+02	7.410E-01%	6.10E+00
Hg-203	1.9517E+02	1.2167E+03	1.239E+00%	2.35E+01
SN-113	4.6244E+02	9.7065E+02	8.599E-01%	1.13E+01
CS-137	4.6297E+02	4.6658E+02	8.981E-01%	5.42E+00
Y-898	6.9723E+02	1.5525E+03	6.917E-01%	1.18E+01
Co-1173	6.9559E+02	7.2712E+02	7.204E-01%	4.88E+00
Co-1332	6.8854E+02	7.1975E+02	6.982E-01%	4.25E+00
Y-1836	7.3602E+02	1.6388E+03	7.291E-01%	6.48E+00

< - 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 (37.6 to 1999.7 keV) 3.304E+04 Bq
Total Decayed Activity (37.6 to 1999.7 keV) 3.9561668E+04 Bq

Analyzed by: _____
admin

Reviewed by: _____
Supervisor

Laboratory: TestAmerica, Inc

Gamma Verification per Geometry

Detector: **Ge12**
Geometry: **Tuna Can**
Reference date: **1/1/2018**
Calibration Standard: **108513**
Standard volume g / vial: **1550**
Standard volume transferred in g / geometry: **342.2**
lab ID# of cal standard: **#1402359 / Tuna Can_2018_00001**

Isotope	Certified Activity - Bq	Geometry Activity - Bq	Count Results	%recovery
Pb-210	72410	15986	16000	100.1
Am-241	5770	1274	1261	99.0
Cd-109	79700	17596	18250	103.7
Co-57	1809	399	393.1	98.4
Ce-139	2723	601	585.9	97.5
Hg-203	5868	1296	1312	101.3
Sn-113	4658	1028	1059	103.0
Cs-137	2283	504	509.8	101.1
Y-88	7810	1724	1705	98.9
Co-60	3574	789	776.5	98.4
Co-60	3574	789	765.4	97.0
Y-88	7810	1724	1769	102.6

Reviewed By: Jody Watson

Date: 4/23/2018

Calibration Data from file: 12_Soil_TunaCan.Clb
Energy Calibration Date: 4/20/2018 Time: 11:53:01 AM
Efficiency Calibration Date: 4/20/2018 Time: 11:53:09 AM

Calibration Description:
12_TunaCan_108513

Energy Calibration Fit
Energy = 0.0591 +0.250183*Channel -3.73476e-008*Channel**2
FWHM (ch) = 3.2115 +0.001032*Channel -1.75096e-008*Channel**2

Energy/FWHM Table

Channel	Energy(keV)	Fit(keV)	Delta	FWHM(keV)	Fit(keV)	Delta
185.95	46.54	46.58	-0.09%	0.84	0.85	-1.23%
237.82	59.54	59.56	-0.03%	0.86	0.86	-0.65%
351.66	88.03	88.03	-0.01%	0.89	0.89	-0.96%
487.75	122.06	122.08	-0.01%	0.92	0.93	-0.62%
662.97	165.85	165.91	-0.03%	0.97	0.97	0.22%
1115.42	279.17	279.07	0.04%	1.11	1.09	2.13%
1565.35	391.69	391.59	0.02%	1.20	1.20	0.60%
2645.53	661.66	661.66	-0.00%	1.49	1.45	2.30%
3591.22	898.02	898.04	-0.00%	1.66	1.67	-0.91%
4692.62	1173.24	1173.25	-0.00%	1.85	1.92	-3.60%
5330.40	1332.50	1332.57	-0.01%	2.09	2.05	1.92%
7346.34	1836.01	1835.97	0.00%	2.46	2.46	0.18%

Efficiency Calibration Fit
Polynomial Uncertainty = 1.0201 %
Coefficients:
-0.363508 -4.707999 0.462125 -0.051256 0.002384 -0.000043

Efficiency Table

Energy	Efficiency	Fit	Delta
46.54	1.8052E-002	1.7999E-002	0.29%
59.54	2.7878E-002	2.8172E-002	-1.06%
88.03	3.7143E-002	3.5814E-002	3.58%
122.06	3.6658E-002	3.7240E-002	-1.59%
165.85	3.3189E-002	3.4052E-002	-2.60%
279.17	2.4853E-002	2.4494E-002	1.45%
391.69	1.9499E-002	1.8934E-002	2.90%
661.66	1.2936E-002	1.2789E-002	1.13%
898.02	1.0139E-002	1.0253E-002	-1.13%
1173.24	8.2922E-003	8.4265E-003	-1.62%
1332.50	7.4182E-003	7.6470E-003	-3.08%
1836.01	6.0193E-003	5.8663E-003	2.54%

Calibration Certificate Table

Isotope	Energy	Pct	Halflife	Activity	GPS	Error	Date & Time
Pb-210	46.50	4.25	8.11E+003	15986.00	679.41	4.20%	1/1/2018 11:00:00 AM
Am-241	59.50	35.70	1.58E+005	1273.90	454.78	3.60%	1/1/2018 11:00:00 AM
Cd-109	88.00	3.61	4.61E+002	17596.00	635.22	4.10%	1/1/2018 11:00:00 AM
Co-57	122.10	85.60	2.72E+002	399.38	341.87	3.40%	1/1/2018 11:00:00 AM
Ce-139	165.90	79.90	1.38E+002	601.20	480.36	3.60%	1/1/2018 11:00:00 AM
Hg-203	279.20	81.50	4.66E+001	1295.50	1055.83	3.50%	1/1/2018 11:00:00 AM
Sn-113	391.70	64.00	1.15E+002	1028.40	658.18	3.90%	1/1/2018 11:00:00 AM
Cs-137	661.70	85.21	1.10E+004	504.03	429.48	4.10%	1/1/2018 11:00:00 AM
Y-88	898.00	93.70	1.07E+002	1724.30	1615.67	3.70%	1/1/2018 11:00:00 AM
Co-60	1173.20	99.90	1.93E+003	789.05	788.26	3.90%	1/1/2018 11:00:00 AM
Co-60	1332.50	99.98	1.93E+003	789.05	788.89	3.90%	1/1/2018 11:00:00 AM
Y-88	1836.10	99.20	1.07E+002	1724.30	1710.51	3.70%	1/1/2018 11:00:00 AM

Test America St. Louis Spectrum ID: 12_TunaCan_20180005

Sample Description: 12_TunaCan_108513
Detector: Detector #12
Batch ID: 12
Work Order Number: TunaCan
Lot Number: 108513

Decay to Time: 1/1/2018 11:00 Live Time: 3600 sec
Acquisition Time: 4/18/2018 13:54:19 Real Time: 3652 sec
Analysis Time: 4/20/2018 11:55 Dead Time: 1.41 %
Analysis Quantity: 1.000E+00 Sample

Efficiency Cal File: 12_Soil_TunaCan.Clb
Efficiency Cal Desc: 12_TunaCan_108513
Efficiency Cal Date: 4/20/2018 11:53
Energy Cal Date: 4/20/2018 11:13
Library: DET_EnergyStandardMix & Pb.lib
Bkgd Correction File: 12_2017-05-07_0806.PBC

Nuclide	Activity Bq/Sample	1-Sigma Counting Uncert %	1-Sigma Counting Uncert Bq/Sample	1-Sigma Total Uncert Bq/Sample	Minimum Detectable Activity Bq/Sample
Pb-210	1.600E+04	0.6	9.485E+01	1.031E+03	1.853E+02
AM-241	1.261E+03	0.7	9.223E+00	8.039E+01	1.659E+01
CD-109	1.825E+04	0.4	7.598E+01	1.135E+03	1.134E+02
CO-57	3.931E+02	0.8	3.042E+00	2.279E+01	5.110E+00
Ce-139	5.859E+02	0.7	4.357E+00	3.335E+01	6.791E+00
Hg-203	1.312E+03	1.1	1.414E+01	7.659E+01	2.206E+01
SN-113	1.059E+03	0.9	9.013E+00	6.310E+01	1.205E+01
CS-137	5.098E+02	0.9	4.734E+00	2.665E+01	6.233E+00
Y-898	1.705E+03	0.8	1.331E+01	8.765E+01	1.505E+01
Co-1173	7.765E+02	0.9	6.740E+00	3.922E+01	6.891E+00
Co-1332	7.654E+02	0.8	6.419E+00	3.866E+01	6.071E+00
Y-1836	1.769E+03	0.8	1.413E+01	1.018E+02	8.211E+00
Total	4.438E+04				

Analyst: Jody Watson

Sample description
12_TunaCan_108513

Spectrum Filename: C:\User\SPC\Det12\12_TunaCan_20180005.An1

Acquisition information

Start time:	4/18/2018 1:54:19 PM
Live time:	3600
Real time:	3652
Dead time:	1.41 %
Detector ID:	12

Detector system
Ge12 S/N10034336

Calibration
Filename: 12_Soil_TunaCan.Clb
12_TunaCan_108513

Energy Calibration

Created:	4/20/2018 11:13:27 AM
Zero offset:	0.059 keV
Gain:	0.250 keV/channel
Quadratic:	-3.735E-08 keV/channel^2

Efficiency Calibration

Created:	4/20/2018 11:53:09 AM
Type:	Polynomial
Uncertainty:	1.020 %
Coefficients:	-0.363508 -4.707999 0.462125
	-0.051256 0.002384 -0.000043

Library Files

Main analysis library:	DET_EnergyStandardMix & Pb.lib
Library Match Width:	0.500
Peak stripping:	Library based

Analysis parameters

Analysis engine:	Env32 G800W064
Start channel:	100 (25.08keV)
Stop channel:	8000 (1999.13keV)
Peak rejection level:	1000.000%
Peak search sensitivity:	3
Sample Size:	1.0000E+00 +/- 0.000E+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:	4.0000000E+00
Systematic error:	4.0000000E+00
Fraction Limit:	0.000%
Background width:	3
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:	YES	1/1/2018 11:00:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	12_2017-05-07_0806.PBC 5/7/2017 8:06:54 AM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 12 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 0.0332

***** 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
27.87	601.	9.86	0.70	3.939E-03				
33.44	3191.	3.58	0.84	8.062E-03				
36.78	534.	21.42	0.84	1.059E-02				
38.00	764.	15.14	0.84	1.151E-02				
46.62	43669.	0.59	0.85	1.805E-02	46.54	4.250	1.600E+04	Pb210
49.75	200.	71.91	0.85	2.153E-02				
59.56	45621.	0.73	0.86	2.818E-02	59.54	35.700	1.261E+03	AM241
70.78	903.	16.81	0.88	3.227E-02				
72.97	1715.	8.94	0.88	3.286E-02				
74.88	161.	95.77	0.88	3.334E-02				
77.23	29.	497.10	0.88	3.389E-02				
82.47	1429.	10.54	0.89	3.493E-02				
84.79	2014.	7.84	0.89	3.532E-02				
88.06	72330.	0.42	0.89	3.581E-02	88.03	3.610	1.825E+04	CD109
90.37	144.	87.05	0.90	3.612E-02				
122.08	34326.	0.77	0.92	3.724E-02	122.06	85.600	3.931E+02	CO57
136.51	4200.	4.35	0.96	3.651E-02				
165.91	33460.	0.74	0.97	3.405E-02	165.85	79.900	5.859E+02	Ce139
206.00	117.	63.94	0.45	3.024E-02				
238.46	443.	25.54	0.90	2.744E-02				
255.00	1168.	12.03	0.88	2.617E-02				
279.07	19187.	1.08	1.11	2.450E-02	279.17	81.500	1.312E+03	Hg203
286.67	107.	74.95	0.64	2.401E-02				
351.85	322.	30.50	1.33	2.056E-02				
391.59	24235.	0.85	1.20	1.894E-02	391.69	64.000	1.059E+03	SN113
500.18	113.	56.68	0.53	1.573E-02				
583.01	248.	32.33	0.89	1.403E-02				

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
601.08	176.	44.64	0.64	1.372E-02				
643.04	164.	48.09	0.69	1.306E-02				
661.66	19866.	0.93	1.49	1.279E-02	661.66	85.210	5.098E+02	CS137
695.58	154.	52.24	0.30	1.233E-02				
712.59	169.	39.74	0.69	1.212E-02				
814.18	641.	15.80	1.86	1.101E-02				
890.80	44.	76.23	0.45	1.031E-02				
898.03	29383.	0.78	1.66	1.025E-02	898.02	93.700	1.705E+03	Y898
924.59	170.	51.69	2.08	1.004E-02				
1059.91	148.	40.90	0.51	9.087E-03				
1173.24	22640.	0.87	1.85	8.426E-03	1173.24	99.900	7.765E+02	Co1173
1217.40	45.	61.22	0.33	8.195E-03				
1271.51	36.	60.60	1.04	7.928E-03				
1301.67	34.	60.56	0.43	7.787E-03				
1332.57	20270.	0.84	2.09	7.647E-03	1332.50	99.982	7.654E+02	Co1332
1491.52	180.	28.09	0.33	6.994E-03				
1835.92	18468.	0.80	2.47	5.867E-03	1836.01	99.200	1.769E+03	Y1836

********** 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	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide	
111.16	27.87	1248.	601.	1.526E+05	9.86	0.703	-	s
133.41	33.32	4927.	3191.	3.959E+05	3.58	0.838	-	sD
146.77	36.66	6263.	534.	5.040E+04	21.42	0.841	-	sD
151.64	37.88	6317.	764.	6.642E+04	15.14	0.842	-	sD
198.79	49.71	10292.	213.	9.912E+03	67.59	0.855	-	sc
282.69	70.80	11078.	903.	2.799E+04	16.81	0.876	-	D
291.44	72.99	10900.	1715.	5.219E+04	8.94	0.878	-	D
299.07	74.90	11841.	161.	4.837E+03	95.77	0.880	-	c
308.48	77.26	10683.	29.	8.685E+02	497.10	0.883	-	c
329.43	82.44	10620.	1431.	4.097E+04	10.52	0.888	-	D
338.70	84.76	11438.	2016.	5.707E+04	7.83	0.890	-	sD
361.04	90.35	7839.	145.	4.014E+03	86.78	0.896	-	sc
545.45	136.51	7622.	4200.	1.150E+05	4.35	0.964	-	
823.26	206.00	2348.	117.	3.869E+03	63.94	0.454	-	s
953.03	238.46	3718.	443.	1.615E+04	25.54	0.897	-	s
1019.19	255.00	4459.	1168.	4.464E+04	12.03	0.878	-	
1145.82	286.67	2108.	107.	4.456E+03	74.95	0.636	-	s
1406.43	351.85	2440.	322.	1.569E+04	30.50	1.334	-	
1999.63	500.18	1252.	113.	7.164E+03	56.68	0.530	-	s
2330.90	583.01	1545.	248.	1.767E+04	32.33	0.894	-	s
2403.19	601.08	1564.	176.	1.283E+04	44.64	0.638	-	s
2571.03	643.04	1587.	164.	1.258E+04	48.09	0.694	-	s
2781.20	695.58	1652.	154.	1.250E+04	52.24	0.304	-	s
2849.27	712.59	1184.	169.	1.395E+04	39.74	0.695	-	s

Channel	Energy	Background	Net area	Eff*Area	Uncert	FWHM	Suspected	
3255.67	814.18	1648.	641.	5.823E+04	15.80	1.859	-	s
3562.26	890.80	503.	44.	4.283E+03	76.23	0.452	-	sc
3697.47	924.59	1556.	170.	1.690E+04	51.69	2.082	-	s
4239.01	1059.91	879.	148.	1.629E+04	40.90	0.508	-	s
4869.35	1217.40	238.	45.	5.491E+03	61.22	0.330	-	s
5085.97	1271.51	165.	36.	4.541E+03	60.60	1.043	-	s
5206.71	1301.67	156.	34.	4.366E+03	60.56	0.434	-	s
5966.81	1491.52	462.	180.	2.581E+04	28.09	0.329	-	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: DET_EnergyStandardMix & Pb.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 1 Sigma %	FWHM keV
Pb-210	185.79	46.54	11653.	43669.	12.130	0.59	0.851D
AM-241	237.82	59.56	16449.	45621.	12.672	0.73	0.859
CD-109	351.65	88.03	9195.	72330.	20.092	0.42	0.894D
CO-57	487.75	122.08	9060.	34326.	9.535	0.77	0.923
Ce-139	662.97	165.91	6830.	33460.	9.295	0.74	0.975
Hg-203	1115.42	279.07	4712.	19187.	5.330	1.08	1.109
SN-113	1565.35	391.59	3432.	24235.	6.732	0.85	1.204
CS-137	2645.53	661.66	2656.	19866.	5.518	0.93	1.489
Y-898	3591.19	898.03	3033.	29383.	8.162	0.78	1.658
Co-1173	4692.59	1173.24	1810.	22640.	6.289	0.87	1.852
Co-1332	5330.41	1332.57	1150.	20270.	5.631	0.84	2.092
Y-1836	7346.14	1835.92	317.	18468.	5.130	0.80	2.475

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
Pb-210	N	1.6003E+04				8.15E+03	
			46.54	1.600E+04	(P	1.853E+02 5.93E-01 4.25E+00 G	

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
AM-241	1.2606E+03					1.58E+05	
		59.54	1.261E+03	(	1.659E+01	7.32E-01	3.57E+01 G
CD-109	1.8246E+04					4.63E+02	
		88.03	1.825E+04	(	1.134E+02	4.16E-01	3.61E+00 G
CO-57	3.9307E+02					2.72E+02	
		122.06	3.931E+02	(	5.110E+00	7.74E-01	8.56E+01 G
Ce-139	5.8589E+02					1.38E+02	
		165.85	5.859E+02	(	6.791E+00	7.44E-01	7.99E+01 G
Hg-203	1.3123E+03					4.66E+01	
		279.17	1.312E+03	(	2.206E+01	1.08E+00	8.15E+01 G
SN-113	1.0590E+03					1.15E+02	
		391.69	1.059E+03	(	1.205E+01	8.51E-01	6.40E+01 G
CS-137	5.0981E+02					1.10E+04	
		661.66	5.098E+02	(	6.233E+00	9.29E-01	8.52E+01 G
Y-898	1.7049E+03					1.07E+02	
		898.02	1.705E+03	(	1.505E+01	7.81E-01	9.37E+01 G
Co-1173	7.7646E+02					1.93E+03	
		1173.24	7.765E+02	(	6.891E+00	8.68E-01	9.99E+01 G
Co-1332	7.6541E+02					1.93E+03	
		1332.50	7.654E+02	(	6.071E+00	8.39E-01	1.00E+02 G
Y-1836	1.7690E+03					1.07E+02	
		1836.01	1.769E+03	(	8.211E+00	7.99E-01	9.92E+01 G

(- 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 1 Sigma %	Activity

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	Time Corrected Activity Bq/Sample	Uncertainty 1 Sigma Counting	MDA Bq/Sample
Pb-210	1.5857E+04	1.6003E+04	5.927E-01%	1.85E+02
AM-241	1.2600E+03	1.2606E+03	7.317E-01%	1.66E+01
CD-109	1.5540E+04	1.8246E+04	4.164E-01%	1.13E+02
CO-57	2.9911E+02	3.9307E+02	7.739E-01%	5.11E+00
Ce-139	3.4161E+02	5.8589E+02	7.437E-01%	6.79E+00
Hg-203	2.6699E+02	1.3123E+03	1.078E+00%	2.21E+01
SN-113	5.5555E+02	1.0590E+03	8.510E-01%	1.20E+01
CS-137	5.0637E+02	5.0981E+02	9.286E-01%	6.23E+00
Y-898	8.4955E+02	1.7049E+03	7.808E-01%	1.50E+01
Co-1173	7.4709E+02	7.7646E+02	8.681E-01%	6.89E+00
Co-1332	7.3646E+02	7.6541E+02	8.386E-01%	6.07E+00
Y-1836	8.8152E+02	1.7690E+03	7.985E-01%	8.21E+00

< - 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 (25.1 to 1999.1 keV) 3.784E+04 Bq/Sample
Total Decayed Activity (25.1 to 1999.1 keV) 4.4384840E+04 Bq/Sample

Gamma Verification per Geometry

Detector: Ge14

Geometry: 1L Marn

Reference date 1/1/2012

Calibration Standard: 90062

Standard volume g / vial 1

Standard volume transferred in g / geometry 1

lab ID# of cal standard 6707

Isotope	Certified Activity gammas/sec	Geometry Activity gammas/sec	Abundance	Activity Bq/L	Count Results	%recovery
Am-241	1821	1821	0.359	**5072.4**	5099.7	100.5
Cd-109	2602	2602	0.0361	**72077.6**	70211	97.4
Co-57	1364	1364	0.856	**1593.5**	1591.3	99.9
Ce-139	1932	1932	0.799	**2418.0**	2382.7	98.5
Hg-203	4200	4200	0.8146	**5155.9**	5295.7	102.7
Sn-113	2722	2722	0.64	**4253.1**	4241.5	99.7
Cs-137	1750	1750	0.851	**2056.4**	2032.3	98.8
Mn-54	3114	3114	0.9998	**3114.6**	3210.8	103.1
Y-88	6559	6559	0.937	**7000.0**	6624.4	94.6
Zn-65	3134	3134	0.506	**6193.7**	6501.5	105.0
Co-60	3233	3233	0.99974	**3233.8**	3130	96.8
Co-60	3233	3233	0.99986	**3233.5**	3161.8	97.8
Y-88	6944	6944	0.992	**7000.0**	7104.9	101.5

Reviewed By: Rachael Schneider

Date: 3/15/2012

Calibration Data from file: 14_Liquid_Marinelli 1L.Clb
Energy Calibration Date: 3/14/2012 Time: 4:58:19 PM
Efficiency Calibration Date: 3/14/2012 Time: 4:58:47 PM

Calibration Description:
14_1LMarinelli_90062_030612

Energy Calibration Fit
Energy = 0.1952 +0.250028*Channel -1.58918e-008*Channel**2
FWHM (ch) = 2.9497 +0.000953*Channel -2.15433e-008*Channel**2

Energy/FWHM Table

Channel	Energy(keV)	Fit(keV)	Delta	FWHM(keV)	Fit(keV)	Delta
237.80	59.54	59.65	-0.19%	0.77	0.79	-3.71%
351.28	88.03	88.02	0.01%	0.82	0.82	-0.46%
487.13	122.06	121.99	0.06%	0.84	0.85	-1.44%
662.38	165.85	165.80	0.03%	0.93	0.89	3.74%
1115.87	279.17	279.18	-0.00%	1.01	1.00	0.86%
1565.85	391.69	391.66	0.01%	1.12	1.10	1.65%
2646.08	661.66	661.68	-0.00%	1.33	1.33	-0.08%
3338.98	834.85	834.86	-0.00%	1.46	1.47	-0.99%
3591.90	898.02	898.06	-0.00%	1.53	1.52	0.21%
4462.13	1115.55	1115.54	0.00%	1.68	1.69	-0.54%
4693.00	1173.24	1173.23	0.00%	1.73	1.74	-0.64%
5330.38	1332.50	1332.49	0.00%	1.87	1.85	0.68%
7345.88	1836.01	1836.01	-0.00%	2.20	2.20	0.11%

Efficiency Calibration Fit
Knee Energy = 165.85 keV
Above the Knee: Quadratic Uncertainty = 1.6436 %
Ln(Eff) = -1.4280 -0.041364*Ln(Eng) -0.0595801*(Ln(Eng))**2
Below the Knee: Quadratic Uncertainty = 0.0669 %
Ln(Eff) = -13.8330 +4.786779*Ln(Eng) -0.529374*(Ln(Eng))**2

Efficiency Table

Energy	Efficiency	Fit	Delta
59.54	4.4501E-002	4.4511E-002	-0.02%
88.03	4.9213E-002	4.9141E-002	0.15%
122.06	4.7083E-002	4.7143E-002	-0.13%
165.85	========== Knee ==========		
165.85	4.0337E-002	4.0931E-002	-1.47%
279.17	2.9507E-002	2.8704E-002	2.72%
391.69	2.2339E-002	2.2397E-002	-0.26%
661.66	1.4693E-002	1.4848E-002	-1.05%
834.85	1.2525E-002	1.2245E-002	2.23%
898.02	1.0895E-002	1.1511E-002	-5.65%
1115.55	1.0017E-002	9.5425E-003	4.74%
1173.24	8.8285E-003	9.1281E-003	-3.39%
1332.50	7.9683E-003	8.1493E-003	-2.27%
1836.01	6.1643E-003	6.0723E-003	1.49%

Calibration Certificate Table

Isotope	Energy	Pct	Halflife	Activity	GPS	Error	Date & Time
Am-241	59.54	35.70	1.58E+005	5100.80	1821.00	3.50%	1/1/2012 11:00:00 AM
Cd-109	88.03	3.61	4.63E+002	72078.00	2602.00	4.70%	1/1/2012 11:00:00 AM
Co-57	122.06	85.60	2.72E+002	1593.50	1364.00	4.10%	1/1/2012 11:00:00 AM
Ce-139	165.85	79.90	1.38E+002	2418.00	1932.00	3.90%	1/1/2012 11:00:00 AM
Hg-203	279.17	81.50	4.66E+001	5153.40	4200.00	3.80%	1/1/2012 11:00:00 AM
Sn-113	391.69	64.00	1.15E+002	4253.10	2722.00	3.90%	1/1/2012 11:00:00 AM
Cs-137	661.66	85.21	1.10E+004	2053.70	1750.00	4.00%	1/1/2012 11:00:00 AM
Mn-54	834.85	99.98	3.12E+002	3114.60	3114.00	3.30%	1/1/2012 11:00:00 AM
Y-88	898.02	93.70	1.07E+002	7000.00	6559.00	3.90%	1/1/2012 11:00:00 AM
Zn-65	1115.55	50.60	2.44E+002	6193.70	3134.00	3.50%	1/1/2012 11:00:00 AM
Co-60	1173.24	99.90	1.93E+003	3236.20	3233.00	4.00%	1/1/2012 11:00:00 AM
Co-60	1332.50	99.98	1.93E+003	3233.60	3233.00	4.00%	1/1/2012 11:00:00 AM
Y-88	1836.01	99.20	1.07E+002	7000.00	6944.00	4.00%	1/1/2012 11:00:00 AM

14_Marn1L_20120214

```
     ORTEC g v - i (1087) Env32  G53W4.25  3/14/2012 5:01:08 PM    Page  1
TestAmerica, Inc.               Spectrum name: 14_Marn1L_20120214.An1

Sample description
     14_Marn1L_90062_030612


Spectrum Filename: C:\User\Cal\Spectra\Det14\14_Marn1L_20120214.An1

Acquisition information
       Start time:                 3/6/2012 11:06:57 PM
       Live time:               3600
       Real time:               4175
       Dead time:                 13.77 %
       Detector ID:                   14

Detector system
     Ge14 SN/11080670


Calibration
       Filename:                   14_Liquid_Marinelli 1L.Clb
     14_1LMarinelli_90062_030612


       Energy Calibration
            Created:               3/14/2012 4:58:19 PM
            Zero offset:           0.195 keV
            Gain:                  0.250 keV/channel
            Quadratic:            -1.589E-08 keV/channel^2

       Efficiency Calibration
            Created:               3/14/2012 4:58:47 PM
            Knee Energy:         165.85 keV
            Above the Knee:        Quadratic        Uncertainty =   1.64 %
            Log(Eff):             -1.428037E+00 + (-4.136370E-02*Log(E) ) +
                                   ( -5.958012E-02*Log(E)^2 )
            Below the Knee:        Quadratic        Uncertainty =   0.07 %
            Log(Eff):             -1.383299E+01 + ( 4.786779E+00*Log(E) ) +
                                   ( -5.293738E-01*Log(E)^2 )

Library Files
       Main analysis library:      DET_EnergyStandardMix & Mn, Zn.L
       Library Match Width:        0.500
       Peak stripping:             Library based

Analysis parameters
       Analysis engine:            Env32   G53W4.25
       Start channel:            150 (    37.70keV )
       Stop channel:            8000 (  1999.40keV )
       Peak rejection level:      10.000%
       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 (1087) Env32  G53W4.25  3/14/2012 5:01:08 PM    Page  2
TestAmerica, Inc.               Spectrum name: 14_Marn1L_20120214.An1
                                      Page 1
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```
       Random error:                4.0000000E+00
       Systematic error:            4.0000000E+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:         YES       1/1/2012 11:00:00 AM
       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: 5.00E+01%
       Energy Calibration
            Normalized diff:       0.0292
```

***** 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	Nuc
38.07	21654.	2.26	0.75	3.259E-02				
49.67	9700.	5.85	1.48	4.025E-02				
59.65	291645.	0.29	0.77	4.455E-02	59.54	35.700	5.100E+03	AM241
70.89	11685.	3.35	0.80	4.746E-02				
72.96	19771.	1.98	0.81	4.782E-02				
82.52	8416.	4.51	0.82	4.888E-02				
85.00	10172.	3.72	0.82	4.903E-02				
88.04	416870.	0.17	0.82	4.914E-02	88.03	3.610	7.201E+04	CD109
121.99	195618.	0.35	0.84	4.715E-02	122.06	85.600	1.591E+03	CO57
136.40	24070.	1.86	0.86	4.530E-02				
165.80	201696.	0.34	0.93	4.092E-02	165.85	79.900	2.383E+03	Ce139
199.08	5460.	6.64	0.97	3.628E-02				
255.08	6879.	4.87	1.03	3.060E-02				
279.18	168439.	0.32	1.01	2.870E-02	279.17	81.500	5.296E+03	Hg203
391.66	147525.	0.33	1.12	2.240E-02	391.69	64.000	4.242E+03	SN113
511.09	8266.	3.88	2.16	1.825E-02				
661.68	92186.	0.51	1.33	1.485E-02	661.66	85.210	2.032E+03	CS137
813.92	2750.	5.30	1.46	1.251E-02				
834.87	121393.	0.31	1.47	1.224E-02	834.85	99.980	3.185E+03	Mn54
898.06	168004.	0.33	1.53	1.151E-02	898.02	93.700	6.624E+03	Y898
1115.54	93846.	0.44	1.68	9.543E-03	1115.55	50.600	6.502E+03	Zn65
1173.23	100357.	0.37	1.73	9.128E-03	1173.24	99.900	3.130E+03	Co1173
1324.84	3723.	5.11	3.11	8.192E-03				
1332.49	90580.	0.40	1.87	8.149E-03	1332.50	99.982	3.162E+03	Co1332
1836.01	100634.	0.33	2.20	6.072E-03	1836.01	99.200	7.105E+03	Y1836

********** 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	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide
151.47	38.07	68514.	21654.	6.644E+05	2.26	0.749	- s
197.90	49.67	98774.	9700.	2.410E+05	5.85	1.481	- s

282.79	70.90	72030.	10225.	2.154E+05	4.40	0.796	-	D

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TestAmerica, Inc. Spectrum name: 14_Marn1L_20120214.An1

Channel	Energy	Background	Net area	Eff*Area	Uncert	FWHM	Suspected
291.07	72.97	66878.	18325.	3.832E+05	2.42	0.793	- D
329.18	82.50	76800.	5506.	1.126E+05	8.82	1.048	- sD
339.19	84.98	66692.	10172.	4.523E+04	3.72	0.818	- lD
544.79	136.40	50098.	24070.	5.313E+05	1.86	0.859	-
795.47	199.08	36038.	5460.	1.505E+05	6.64	0.972	- s
1019.50	255.08	28728.	6879.	2.248E+05	4.87	1.025	-
2043.63	511.09	21035.	8266.	4.528E+05	3.88	2.156	- s
3255.08	813.89	12208.	3401.	2.718E+05	7.58	1.641	- s
5299.75	1324.84	4748.	3723.	4.544E+05	5.11	3.107	- 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: DET_EnergyStandardMix & Mn, Zn.L

********** 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 1 Sigma %	FWHM keV
AM-241	237.80	59.65	116745.	291645.	81.013	0.29	0.765
CD-109	351.28	88.02	93268.	406468.	112.908	0.22	0.817
CO-57	487.13	121.99	67906.	195618.	54.338	0.35	0.840
Ce-139	662.38	165.80	56766.	201696.	56.027	0.34	0.928
Hg-203	1115.87	279.18	28497.	168439.	46.789	0.32	1.005
SN-113	1565.85	391.66	20811.	147525.	40.979	0.33	1.116
CS-137	2646.08	661.68	22769.	92186.	25.607	0.51	1.329
Mn-54	3338.98	834.86	14954.	122362.	33.989	0.37	1.458
Y-898	3591.89	898.06	20498.	168004.	46.668	0.33	1.527
Zn-65	4462.13	1115.54	10931.	93846.	26.068	0.44	1.683
Co-1173	4693.00	1173.23	6251.	100357.	27.877	0.37	1.725
Co-1332	5330.38	1332.49	5298.	90580.	25.161	0.40	1.866
Y-1836	7345.86	1836.01	1482.	100634.	27.954	0.33	2.198

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	Peak Energy keV	Peak Activity Bq	Code	MDA Value Bq	COMMENTS
AM-241		5.0997E+03				1.58E+05	
			59.54	5.100E+03	(	2.789E+01 2.95E-01 3.57E+01	G

ORTEC g v - i (1087) Env32 G53W4.25 3/14/2012 5:01:08 PM Page 4
TestAmerica, Inc. Spectrum name: 14_Marn1L_20120214.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak MDA	Comments

```
CD-109       7.0211E+04                                        4.63E+02
                           88.03 7.021E+04  (  2.463E+02 2.15E-01 3.61E+00 G

CO-57        1.5913E+03                                        2.72E+02
                          122.06 1.591E+03  (  9.901E+00 3.54E-01 8.56E+01 G

Ce-139       2.3827E+03                                        1.38E+02
                          165.85 2.383E+03  (  1.315E+01 3.35E-01 7.99E+01 G

Hg-203       5.2957E+03                                        4.66E+01
                          279.17 5.296E+03  (  2.482E+01 3.18E-01 8.15E+01 G

SN-113       4.2415E+03                                        1.15E+02
                          391.69 4.242E+03  (  1.941E+01 3.33E-01 6.40E+01 G

CS-137       2.0323E+03                                        1.10E+04
                          661.66 2.032E+03  (  1.556E+01 5.10E-01 8.52E+01 G

Mn-54        3.2108E+03                                        3.12E+02
                          834.85 3.211E+03  (  1.502E+01 3.74E-01 1.00E+02 G

Y-898        6.6244E+03                                        1.07E+02
                          898.02 6.624E+03  (  2.641E+01 3.30E-01 9.37E+01 G

Zn-65    F   6.5015E+03                                        2.44E+02
                         1115.55 6.502E+03  (  3.394E+01 4.44E-01 5.06E+01 G

Co-1173      3.1300E+03                                        1.93E+03
                         1173.24 3.130E+03  (  1.158E+01 3.73E-01 9.99E+01 G

Co-1332      3.1618E+03                                        1.93E+03
                         1332.50 3.162E+03  (  1.193E+01 3.99E-01 1.00E+02 G

Y-1836       7.1049E+03                                        1.07E+02
                         1836.01 7.105E+03  (  1.286E+01 3.32E-01 9.92E+01 G
   ( - 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
                                       Page 4
```

```
  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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*************** 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  1 Sigma %
_____________________________________________________________________________
  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   *****
         Time of Count  Time Corrected  Uncertainty  1 Sigma
Nuclide     Activity       Activity       Counting                    MDA
               Bq             Bq

_____________________________________________________________________________
AM-241       5.0982E+03    5.0997E+03    2.948E-01%                 2.79E+01
CD-109       6.3647E+04    7.0211E+04    2.150E-01%                 2.46E+02
CO-57        1.3465E+03    1.5913E+03    3.536E-01%                 9.90E+00
Ce-139       1.7132E+03    2.3827E+03    3.352E-01%                 1.31E+01
Hg-203       2.0000E+03    5.2957E+03    3.181E-01%                 2.48E+01
SN-113       2.8588E+03    4.2415E+03    3.329E-01%                 1.94E+01
CS-137       2.0240E+03    2.0323E+03    5.102E-01%                 1.56E+01
Mn-54        2.7764E+03    3.2108E+03    3.741E-01%                 1.50E+01
Y-898        4.3268E+03    6.6244E+03    3.304E-01%                 2.64E+01
Zn-65        5.3988E+03    6.5015E+03    4.445E-01%                 3.39E+01
Co-1173      3.0570E+03    3.1300E+03    3.728E-01%                 1.16E+01
Co-1332      3.0881E+03    3.1618E+03    3.985E-01%                 1.19E+01
Y-1836       4.6406E+03    7.1049E+03    3.322E-01%                 1.29E+01
  < - 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 (   37.7 to  1999.4 keV)     1.020E+05  Bq
Total Decayed Activity (   37.7 to  1999.4 keV) 1.2058714E+05  Bq
```

Gamma Verification per Geometry

Detector: Ge16

Geometry: 1L Marn

Reference date 1/1/2012

Calibration Standard: 90062

Standard volume g / vial 1

Standard volume transferred in g / geometry 1

lab ID# of cal standard 6707

Isotope	Certified Activity gammas/sec	Geometry Activity gammas/sec	Abundance	Activity Bq/L	Count Results	%recovery
Am-241	1821	1821	0.359	**5072.4**	5015.2	98.9
Cd-109	2602	2602	0.0361	**72077.6**	69098	95.9
Co-57	1364	1364	0.856	**1593.5**	1601.3	100.5
Ce-139	1932	1932	0.799	**2418.0**	2391.1	98.9
Hg-203	4200	4200	0.8146	**5155.9**	5262.6	102.1
Sn-113	2722	2722	0.64	**4253.1**	4232.8	99.5
Cs-137	1750	1750	0.851	**2056.4**	2036.7	99.0
Mn-54	3114	3114	0.9998	**3114.6**	3232.6	103.8
Y-88	6559	6559	0.937	**7000.0**	6514.5	93.1
Zn-65	3134	3134	0.506	**6193.7**	6635.9	107.1
Co-60	3233	3233	0.99974	**3233.8**	3077.5	95.2
Co-60	3233	3233	0.99986	**3233.5**	3114.5	96.3
Y-88	6944	6944	0.992	**7000.0**	7137.4	102.0

Reviewed By: Rachael Schneider

Date: 4/3/2012

Calibration Data from file: 16_Liquid_Marinelli 1L.Clb
Energy Calibration Date: 4/2/2012 Time: 6:09:11 PM
Efficiency Calibration Date: 4/2/2012 Time: 6:09:24 PM

Calibration Description:
16_1Lmarn_90062_032712

Energy Calibration Fit
Energy = -0.0068 +0.250063*Channel -1.97784e-008*Channel**2
FWHM (ch) = 3.8412 +0.000871*Channel -1.25435e-008*Channel**2

Energy/FWHM Table

Channel	Energy(keV)	Fit(keV)	Delta	FWHM(keV)	Fit(keV)	Delta
238.12	59.54	59.54	0.01%	1.01	1.01	-0.57%
352.22	88.03	88.07	-0.04%	1.03	1.04	-0.82%
488.32	122.06	122.10	-0.03%	1.08	1.07	1.06%
663.48	165.85	165.90	-0.03%	1.12	1.10	1.25%
1116.17	279.17	279.08	0.03%	1.19	1.20	-0.51%
1566.25	391.69	391.60	0.02%	1.29	1.29	-0.31%
2646.59	661.66	661.67	-0.00%	1.52	1.51	0.19%
3339.48	834.85	834.85	-0.00%	1.65	1.65	0.11%
3592.25	898.02	898.03	-0.00%	1.69	1.70	-0.64%
4462.73	1115.55	1115.56	-0.00%	1.86	1.87	-0.63%
4693.62	1173.24	1173.26	-0.00%	1.90	1.91	-0.62%
5331.05	1332.50	1332.53	-0.00%	2.07	2.03	1.76%
7346.38	1836.01	1835.98	0.00%	2.38	2.39	-0.34%

Efficiency Calibration Fit
Knee Energy = 165.85 keV
Above the Knee: Quadratic Uncertainty = 2.4245 %
Ln(Eff) = -2.3147 +0.284801*Ln(Eng) -0.0811499*(Ln(Eng))**2
Below the Knee: Quadratic Uncertainty = 0.2610 %
Ln(Eff) = -12.6035 +4.382261*Ln(Eng) -0.488912*(Ln(Eng))**2

Efficiency Table

Energy	Efficiency	Fit	Delta
59.54	5.7326E-002	5.7274E-002	0.09%
88.03	6.1456E-002	6.1813E-002	-0.58%
122.06	5.9034E-002	5.8742E-002	0.49%
165.85	========== Knee ==========		
165.85	5.0286E-002	5.0846E-002	-1.11%
279.17	3.8262E-002	3.7455E-002	2.11%
391.69	2.9847E-002	2.9986E-002	-0.47%
661.66	2.0315E-002	2.0485E-002	-0.84%
834.85	1.7702E-002	1.7055E-002	3.66%
898.02	1.4961E-002	1.6073E-002	-7.43%
1115.55	1.4365E-002	1.3406E-002	6.67%
1173.24	1.2209E-002	1.2839E-002	-5.16%
1332.50	1.1066E-002	1.1489E-002	-3.82%
1836.01	8.7552E-003	8.5852E-003	1.94%

Calibration Certificate Table

Isotope	Energy	Pct	Halflife	Activity	GPS	Error	Date & Time
Am-241	59.54	35.70	1.58E+005	5100.80	1821.00	3.50%	1/1/2012 11:00:00 AM
Cd-109	88.03	3.61	4.63E+002	72078.00	2602.00	4.70%	1/1/2012 11:00:00 AM
Co-57	122.06	85.60	2.72E+002	1593.50	1364.00	4.10%	1/1/2012 11:00:00 AM
Ce-139	165.85	79.90	1.38E+002	2418.00	1932.00	3.90%	1/1/2012 11:00:00 AM
Hg-203	279.17	81.50	4.66E+001	5153.40	4200.00	3.80%	1/1/2012 11:00:00 AM
Sn-113	391.69	64.00	1.15E+002	4253.10	2722.00	3.90%	1/1/2012 11:00:00 AM
Cs-137	661.66	85.21	1.10E+004	2053.70	1750.00	4.00%	1/1/2012 11:00:00 AM
Mn-54	834.85	99.98	3.12E+002	3114.60	3114.00	3.30%	1/1/2012 11:00:00 AM
Y-88	898.02	93.70	1.07E+002	7000.00	6559.00	3.90%	1/1/2012 11:00:00 AM
Zn-65	1115.55	50.60	2.44E+002	6193.70	3134.00	3.50%	1/1/2012 11:00:00 AM
Co-60	1173.24	99.90	1.93E+003	3236.20	3233.00	4.00%	1/1/2012 11:00:00 AM
Co-60	1332.50	99.98	1.93E+003	3233.60	3233.00	4.00%	1/1/2012 11:00:00 AM
Y-88	1836.01	99.20	1.07E+002	7000.00	6944.00	4.00%	1/1/2012 11:00:00 AM

```
     ORTEC g v - i (1087) Env32  G53W4.25  4/2/2012 6:09:53 PM     Page  1
TestAmerica, Inc.               Spectrum name: 16_Marn1L_20120257.An1

Sample description
     16_Marn1L_90062_032712


Spectrum Filename: C:\User\SPC\Det16\16_Marn1L_20120257.An1

Acquisition information
       Start time:                 3/27/2012 3:43:12 PM
       Live time:               3600
       Real time:               4253
       Dead time:                 15.35 %
       Detector ID:                   16

Detector system
     Ge16 SN/11012217


Calibration
       Filename:                   16_Liquid_Marinelli 1L.Clb
     16_1Lmarn_90062_032712


       Energy Calibration
            Created:               4/2/2012 6:09:11 PM
            Zero offset:          -0.007 keV
            Gain:                  0.250 keV/channel
            Quadratic:            -1.978E-08 keV/channel^2

       Efficiency Calibration
            Created:               4/2/2012 6:09:24 PM
            Knee Energy:         165.85 keV
            Above the Knee:        Quadratic        Uncertainty =   2.42 %
            Log(Eff):             -2.314705E+00 + ( 2.848008E-01*Log(E) ) +
                                   ( -8.114986E-02*Log(E)^2 )
            Below the Knee:        Quadratic        Uncertainty =   0.26 %
            Log(Eff):             -1.260350E+01 + ( 4.382261E+00*Log(E) ) +
                                   ( -4.889120E-01*Log(E)^2 )

Library Files
       Main analysis library:      DET_EnergyStandardMix & Mn, Zn.L
       Library Match Width:        0.500
       Peak stripping:             Library based

Analysis parameters
       Analysis engine:            Env32   G53W4.25
       Start channel:            150 (    37.50keV )
       Stop channel:            8000 (  1999.23keV )
       Peak rejection level:      10.000%
       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 (1087) Env32  G53W4.25  4/2/2012 6:09:53 PM     Page  2
TestAmerica, Inc.               Spectrum name: 16_Marn1L_20120257.An1
                                      Page 1
```

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       Random error:                4.0000000E+00
       Systematic error:            4.0000000E+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:         YES       1/1/2012 11:00:00 AM
       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: 5.00E+01%
       Energy Calibration
            Normalized diff:       0.0239
```

***** 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	Nuc
37.83	30994.	1.94	1.11	4.347E-02				
49.52	16296.	4.51	1.90	5.246E-02				
56.55	9875.	5.10	1.01	5.605E-02				
59.58	372591.	0.20	1.01	5.727E-02	59.54	35.700	5.064E+03	AM241
70.84	10335.	4.30	1.02	6.035E-02				
72.96	17658.	2.60	1.02	6.071E-02				
82.50	10170.	4.38	1.03	6.167E-02				
84.88	12549.	3.45	1.03	6.176E-02				
88.08	502632.	0.16	1.04	6.181E-02	88.03	3.610	7.120E+04	CD109
122.10	232662.	0.34	1.08	5.874E-02	122.06	85.600	1.601E+03	CO57
136.54	29103.	1.83	1.06	5.635E-02				
165.90	226558.	0.31	1.12	5.084E-02	165.85	79.900	2.391E+03	Ce139
199.13	7237.	5.62	1.32	4.590E-02				
255.07	7532.	5.00	1.12	3.962E-02				
279.08	160585.	0.38	1.19	3.746E-02	279.17	81.500	5.263E+03	Hg203
391.60	174011.	0.36	1.29	2.999E-02	391.69	64.000	4.233E+03	SN113
511.03	14656.	2.70	2.70	2.485E-02				
661.67	127292.	0.48	1.52	2.049E-02	661.66	85.210	2.037E+03	CS137
834.85	163887.	0.33	1.65	1.706E-02	834.85	99.980	3.233E+03	Mn54
898.03	201661.	0.29	1.69	1.607E-02	898.02	93.700	6.515E+03	Y898
1115.56	126897.	0.38	1.86	1.341E-02	1115.55	50.600	6.636E+03	Zn65
1173.26	137755.	0.35	1.90	1.284E-02	1173.24	99.900	3.077E+03	Co1173
1324.86	3898.	4.83	2.78	1.155E-02				
1332.53	124857.	0.33	2.07	1.149E-02	1332.50	99.982	3.114E+03	Co1332
1835.98	124938.	0.31	2.38	8.585E-03	1836.01	99.200	7.137E+03	Y1836

********** 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	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide
151.30	37.83	85759.	30994.	7.130E+05	1.94	1.111	- s
198.06	49.52	136436.	16296.	3.106E+05	4.51	1.898	- s

226.17	56.51	121941.	9875.-	9.845E+03	5.10	1.010	-	D

Channel	Energy	Background	Net area	Eff*Area	Uncert	FWHM	Suspected	
283.31	70.84	93409.	10335.	1.712E+05	4.30	1.022	-	D
291.81	72.96	96786.	17658.	2.908E+05	2.60	1.024	-	D
329.95	82.48	94240.	10170.	8.117E+04	4.38	1.032	-	lD
339.46	84.86	87407.	12549.	3.048E+04	3.45	1.034	-	lD
546.08	136.54	63267.	29103.	5.165E+05	1.83	1.064	-	
796.39	199.13	43208.	7237.	1.577E+05	5.62	1.316	-	
1020.15	255.07	35111.	7532.	1.901E+05	5.00	1.125	-	
2043.98	511.03	26576.	14656.	5.897E+05	2.70	2.704	-	s
5300.35	1324.86	5255.	3898.	3.376E+05	4.83	2.783	-	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: DET_EnergyStandardMix & Mn, Zn.L

********** 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 1 Sigma %	FWHM keV
AM-241	238.12	59.54	164069.	369020.	102.506	0.29	1.006
CD-109	352.22	88.07	125895.	487826.	135.507	0.21	1.028
CO-57	488.32	122.10	84352.	232662.	64.628	0.34	1.078
Ce-139	663.48	165.90	60532.	226558.	62.933	0.31	1.118
Hg-203	1116.16	279.08	41732.	160585.	44.607	0.38	1.194
SN-113	1566.24	391.60	35115.	174011.	48.336	0.36	1.290
CS-137	2646.59	661.67	34986.	127292.	35.359	0.48	1.518
Mn-54	3339.48	834.85	20555.	163887.	45.524	0.33	1.654
Y-898	3592.25	898.03	23155.	201661.	56.017	0.29	1.691
Zn-65	4462.73	1115.56	13927.	126897.	35.249	0.38	1.858
Co-1173	4693.62	1173.26	10843.	137755.	38.265	0.35	1.901
Co-1332	5331.05	1332.53	6246.	124857.	34.682	0.33	2.068
Y-1836	7346.37	1835.98	2517.	124938.	34.705	0.31	2.381

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	Peak Energy keV	Peak Activity Bq	Code	MDA Value Bq	COMMENTS
AM-241		5.0152E+03				1.58E+05	
			59.54	5.015E+03	(	2.569E+01 2.89E-01 3.57E+01	G

```
CD-109       6.9098E+04                                        4.63E+02
                          88.03 6.910E+04  (  2.346E+02 2.10E-01 3.61E+00 G

CO-57        1.6013E+03                                        2.72E+02
                         122.06 1.601E+03  (  9.333E+00 3.40E-01 8.56E+01 G

Ce-139       2.3911E+03                                        1.38E+02
                         165.85 2.391E+03  (  1.213E+01 3.12E-01 7.99E+01 G

Hg-203       5.2626E+03                                        4.66E+01
                         279.17 5.263E+03  (  3.129E+01 3.78E-01 8.15E+01 G

SN-113       4.2328E+03                                        1.15E+02
                         391.69 4.233E+03  (  2.131E+01 3.56E-01 6.40E+01 G

CS-137       2.0367E+03                                        1.10E+04
                         661.66 2.037E+03  (  1.399E+01 4.79E-01 8.52E+01 G

Mn-54        3.2326E+03                                        3.12E+02
                         834.85 3.233E+03  (  1.323E+01 3.31E-01 1.00E+02 G

Y-898        6.5145E+03                                        1.07E+02
                         898.02 6.515E+03  (  2.299E+01 2.94E-01 9.37E+01 G

Zn-65    F   6.6359E+03                                        2.44E+02
                        1115.55 6.636E+03  (  2.890E+01 3.77E-01 5.06E+01 G

Co-1173      3.0775E+03                                        1.93E+03
                        1173.24 3.077E+03  (  1.090E+01 3.45E-01 9.99E+01 G

Co-1332      3.1145E+03                                        1.93E+03
                        1332.50 3.114E+03  (  9.254E+00 3.29E-01 1.00E+02 G

Y-1836       7.1374E+03                                        1.07E+02
                        1836.01 7.137E+03  (  1.351E+01 3.08E-01 9.92E+01 G
   ( - 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
                                       Page 4
```

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
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 1 Sigma %	Activity

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	Time Corrected Activity Bq	Uncertainty Counting 1 Sigma	MDA
AM-241	5.0133E+03	5.0152E+03	2.887E-01%	2.57E+01
CD-109	6.0726E+04	6.9098E+04	2.105E-01%	2.35E+02
CO-57	1.2853E+03	1.6013E+03	3.401E-01%	9.33E+00
Ce-139	1.5491E+03	2.3911E+03	3.118E-01%	1.21E+01
Hg-203	1.4613E+03	5.2626E+03	3.784E-01%	3.13E+01
SN-113	2.5187E+03	4.2328E+03	3.564E-01%	2.13E+01
CS-137	2.0256E+03	2.0367E+03	4.793E-01%	1.40E+01
Mn-54	2.6697E+03	3.2326E+03	3.309E-01%	1.32E+01
Y-898	3.7194E+03	6.5145E+03	2.943E-01%	2.30E+01
Zn-65	5.1962E+03	6.6359E+03	3.771E-01%	2.89E+01
Co-1173	2.9835E+03	3.0775E+03	3.453E-01%	1.09E+01
Co-1332	3.0193E+03	3.1145E+03	3.288E-01%	9.25E+00

Y-1836	4.0750E+03	7.1374E+03	3.084E-01%	1.35E+01

< - 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 (78.0 to 1999.2 keV) 9.624E+04 Bq
Total Decayed Activity (78.0 to 1999.2 keV) 1.1935008E+05 Bq

Gamma Verification per Geometry

Detector: Ge17

Geometry: 1L Marn

Reference date 1/1/2012

Calibration Standard: 90062

Standard volume g / vial 1

Standard volume transferred in g / geometry 1

lab ID# of cal standard 6707

Isotope	Certified Activity gammas/sec	Geometry Activity gammas/sec	Abundance	Activity Bq/L	Count Results	%recovery
Am-241	1821	1821	0.359	**5072.4**	5112.5	100.8
Cd-109	2602	2602	0.0361	**72077.6**	71031	98.5
Co-57	1364	1364	0.856	**1593.5**	1613.4	101.3
Ce-139	1932	1932	0.799	**2418.0**	2392	98.9
Hg-203	4200	4200	0.8146	**5155.9**	5257.5	102.0
Sn-113	2722	2722	0.64	**4253.1**	4231.2	99.5
Cs-137	1750	1750	0.851	**2056.4**	2042.9	99.3
Mn-54	3114	3114	0.9998	**3114.6**	3228.2	103.6
Y-88	6559	6559	0.937	**7000.0**	6547.6	93.5
Zn-65	3134	3134	0.506	**6193.7**	6547.5	105.7
Co-60	3233	3233	0.99974	**3233.8**	3100.4	95.9
Co-60	3233	3233	0.99986	**3233.5**	3131	96.8
Y-88	6944	6944	0.992	**7000.0**	7133.8	101.9

Reviewed By: Elizabeth M. Hoerchler

Date: 3/8/2012

Calibration Data from file: 17_Liquid_Marinelli 1L.Clb
Energy Calibration Date: 3/7/2012 Time: 11:47:12 AM
Efficiency Calibration Date: 3/7/2012 Time: 11:47:27 AM

Calibration Description:
17_1L marn_90062_030512

Energy Calibration Fit
Energy = 0.1347 +0.250093*Channel -2.1148e-008*Channel**2
FWHM (ch) = 2.9716 +0.000920*Channel -1.82029e-008*Channel**2

Energy/FWHM Table

Channel	Energy(keV)	Fit(keV)	Delta	FWHM(keV)	Fit(keV)	Delta
237.91	59.54	59.63	-0.16%	0.80	0.80	0.12%
351.76	88.03	88.11	-0.09%	0.81	0.82	-1.28%
487.42	122.06	122.03	0.02%	0.86	0.85	0.15%
662.29	165.85	165.76	0.05%	0.91	0.89	1.82%
1115.54	279.17	279.10	0.03%	1.00	0.99	0.87%
1565.73	391.69	391.66	0.01%	1.10	1.09	0.88%
2645.69	661.66	661.66	0.00%	1.28	1.32	-2.99%
3338.60	834.85	834.86	-0.00%	1.38	1.46	-5.41%
3591.45	898.02	898.06	-0.00%	1.55	1.51	2.83%
4461.68	1115.55	1115.55	-0.00%	1.71	1.68	1.99%
4692.56	1173.24	1173.25	-0.00%	1.74	1.72	1.25%
5329.94	1332.50	1332.52	-0.00%	1.84	1.84	-0.14%
7345.24	1836.01	1835.99	0.00%	2.17	2.19	-0.50%

Efficiency Calibration Fit
Knee Energy = 165.85 keV
Above the Knee: Quadratic Uncertainty = 2.0885 %
Ln(Eff) = -2.0941 +0.178816*Ln(Eng) -0.0728314*(Ln(Eng))**2
Below the Knee: Quadratic Uncertainty = 0.6563 %
Ln(Eff) = -12.0102 +4.016685*Ln(Eng) -0.443977*(Ln(Eng))**2

Efficiency Table

Energy	Efficiency	Fit	Delta
59.54	4.9398E-002	4.9285E-002	0.23%
88.03	5.2818E-002	5.3594E-002	-1.47%
122.06	5.2447E-002	5.1796E-002	1.24%
165.85	========== Knee ==========		
165.85	4.5346E-002	4.5833E-002	-1.07%
279.17	3.4160E-002	3.3471E-002	2.02%
391.69	2.6577E-002	2.6711E-002	-0.50%
661.66	1.8130E-002	1.8226E-002	-0.53%
834.85	1.5743E-002	1.5188E-002	3.53%
898.02	1.3397E-002	1.4321E-002	-6.89%
1115.55	1.2652E-002	1.1968E-002	5.41%
1173.24	1.0986E-002	1.1467E-002	-4.38%
1332.50	9.9524E-003	1.0279E-002	-3.28%
1836.01	7.8699E-003	7.7211E-003	1.89%

Calibration Certificate Table

Isotope	Energy	Pct	Halflife	Activity	GPS	Error	Date & Time
Am-241	59.54	35.70	1.58E+005	5100.80	1821.00	3.50%	1/1/2012 11:00:00 AM
Cd-109	88.03	3.61	4.63E+002	72078.00	2602.00	4.70%	1/1/2012 11:00:00 AM
Co-57	122.06	85.60	2.72E+002	1593.50	1364.00	4.10%	1/1/2012 11:00:00 AM
Ce-139	165.85	79.90	1.38E+002	2418.00	1932.00	3.90%	1/1/2012 11:00:00 AM
Hg-203	279.17	81.50	4.66E+001	5153.40	4200.00	3.80%	1/1/2012 11:00:00 AM
Sn-113	391.69	64.00	1.15E+002	4253.10	2722.00	3.90%	1/1/2012 11:00:00 AM
Cs-137	661.66	85.21	1.10E+004	2053.70	1750.00	4.00%	1/1/2012 11:00:00 AM
Mn-54	834.85	99.98	3.12E+002	3114.60	3114.00	3.30%	1/1/2012 11:00:00 AM
Y-88	898.02	93.70	1.07E+002	7000.00	6559.00	3.90%	1/1/2012 11:00:00 AM
Zn-65	1115.55	50.60	2.44E+002	6193.70	3134.00	3.50%	1/1/2012 11:00:00 AM
Co-60	1173.24	99.90	1.93E+003	3236.20	3233.00	4.00%	1/1/2012 11:00:00 AM
Co-60	1332.50	99.98	1.93E+003	3233.60	3233.00	4.00%	1/1/2012 11:00:00 AM
Y-88	1836.01	99.20	1.07E+002	7000.00	6944.00	4.00%	1/1/2012 11:00:00 AM

17_1LMarn_20120191

```
     ORTEC g v - i (1087) Env32  G53W4.25  3/7/2012 11:48:20 AM    Page  1
TestAmerica, Inc.                Spectrum name: 17_1LMarn_20120191.An1

Sample description
     17_1LMarn_90062_030512


Spectrum Filename: C:\User\SPC\Det17\17_1LMarn_20120191.An1

Acquisition information
       Start time:                 3/5/2012 2:23:43 PM
       Live time:               3600
       Real time:               4296
       Dead time:                 16.19 %
       Detector ID:                   17

Detector system
     Ge17 SN/11080671


Calibration
       Filename:                   17_Liquid_Marinelli 1L.Clb
     17_1L marn_90062_030512


       Energy Calibration
            Created:               3/7/2012 11:47:12 AM
            Zero offset:           0.135 keV
            Gain:                  0.250 keV/channel
            Quadratic:            -2.115E-08 keV/channel^2

       Efficiency Calibration
            Created:               3/7/2012 11:47:27 AM
            Knee Energy:         165.85 keV
            Above the Knee:        Quadratic        Uncertainty =   2.09 %
            Log(Eff):             -2.094103E+00 + ( 1.788156E-01*Log(E) ) +
                                   ( -7.283143E-02*Log(E)^2 )
            Below the Knee:        Quadratic        Uncertainty =   0.66 %
            Log(Eff):             -1.201018E+01 + ( 4.016685E+00*Log(E) ) +
                                   ( -4.439774E-01*Log(E)^2 )

Library Files
       Main analysis library:      DET_EnergyStandardMix & Mn, Zn.L
       Library Match Width:        0.500
       Peak stripping:             Library based

Analysis parameters
       Analysis engine:            Env32   G53W4.25
       Start channel:            150 (    37.65keV )
       Stop channel:            8000 (  1999.53keV )
       Peak rejection level:      10.000%
       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

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TestAmerica, Inc.                Spectrum name: 17_1LMarn_20120191.An1
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       Random error:                4.0000000E+00
       Systematic error:            4.0000000E+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:         YES       1/1/2012 11:00:00 AM
       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: 5.00E+01%
       Energy Calibration
            Normalized diff:       0.0383
```

***** 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	Nuc
38.01	28332.	1.83	0.82	3.787E-02				
49.65	10470.	5.54	1.42	4.526E-02				
59.63	323741.	0.27	0.80	4.932E-02	59.54	35.700	5.112E+03	AM241
70.90	13184.	3.06	0.81	5.203E-02				
73.01	22392.	1.88	0.81	5.237E-02				
82.52	6082.	6.51	0.82	5.335E-02				
88.11	449400.	0.21	0.83	5.360E-02	88.03	3.610	7.103E+04	CD109
122.03	218662.	0.35	0.90	5.180E-02	122.06	85.600	1.613E+03	CO57
136.42	26924.	1.83	0.87	5.010E-02				
165.76	228303.	0.31	0.93	4.603E-02	165.85	79.900	2.392E+03	Ce139
198.99	6240.	5.78	1.08	4.125E-02				
255.05	7674.	4.40	1.06	3.545E-02				
279.10	198991.	0.30	1.05	3.348E-02	279.17	81.500	5.258E+03	Hg203
391.66	176956.	0.32	1.13	2.671E-02	391.69	64.000	4.231E+03	SN113
510.97	13673.	2.59	2.45	2.212E-02				
661.66	113755.	0.46	1.36	1.823E-02	661.66	85.210	2.043E+03	CS137
813.91	2992.	9.03	1.66	1.550E-02				
834.86	153063.	0.34	1.50	1.519E-02	834.85	99.980	3.228E+03	Mn54
898.06	208430.	0.28	1.55	1.432E-02	898.02	93.700	6.548E+03	Y898
1115.55	118990.	0.39	1.71	1.197E-02	1115.55	50.600	6.548E+03	Zn65
1173.24	124948.	0.35	1.74	1.147E-02	1173.24	99.900	3.100E+03	Co1173
1324.83	3875.	5.01	2.78	1.033E-02				
1332.52	113188.	0.35	1.84	1.028E-02	1332.50	99.982	3.131E+03	Co1332
1835.98	129623.	0.30	2.18	7.721E-03	1836.01	99.200	7.134E+03	Y1836

********** 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	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide	
151.45	38.01	68392.	28332.	7.482E+05	1.83	0.816	-	s
197.99	49.65	103012.	10470.	2.313E+05	5.54	1.416	-	s
282.92	70.89	76458.	11270.	2.166E+05	4.12	0.818	-	D

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TestAmerica, Inc. Spectrum name: 17_1LMarn_20120191.An1

Channel	Energy	Background	Net area	Eff*Area	Uncert	FWHM	Suspected	
291.38	73.00	78615.	19753.	3.772E+05	2.49	0.799	-	D
329.30	82.49	80588.	7080.	1.327E+05	7.05	1.043	-	s
544.96	136.42	58536.	26924.	5.374E+05	1.83	0.869	-	
795.19	198.99	37191.	6240.	1.513E+05	5.78	1.080	-	
1019.36	255.05	30402.	7674.	2.165E+05	4.40	1.059	-	
2042.93	510.97	23019.	13673.	6.182E+05	2.59	2.451	-	s
3254.77	813.91	13996.	2992.	1.930E+05	9.03	1.661	-	
5299.18	1324.83	5645.	3875.	3.751E+05	5.01	2.776	-	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: DET_EnergyStandardMix & Mn, Zn.L

********** 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 1 Sigma %	FWHM keV
AM-241	237.91	59.63	117664.	323741.	89.928	0.27	0.802
CD-109	351.76	88.11	113683.	449400.	124.833	0.21	0.828
CO-57	487.42	122.03	82520.	218662.	60.739	0.35	0.901
Ce-139	662.29	165.76	62517.	228303.	63.417	0.31	0.935
Hg-203	1115.56	279.10	34927.	198991.	55.275	0.30	1.051
SN-113	1565.73	391.66	28892.	176956.	49.155	0.32	1.130
CS-137	2645.69	661.66	26757.	113755.	31.599	0.46	1.357
Mn-54	3338.59	834.86	18685.	153063.	42.518	0.34	1.501
Y-898	3591.45	898.06	21083.	208430.	57.897	0.28	1.554
Zn-65	4461.67	1115.55	13488.	118990.	33.053	0.39	1.713
Co-1173	4692.55	1173.24	9210.	124948.	34.708	0.35	1.744
Co-1332	5329.94	1332.52	6347.	113188.	31.441	0.35	1.836
Y-1836	7345.22	1835.98	2492.	129623.	36.006	0.30	2.176

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	Peak Energy keV	Peak Activity Bq	Code	MDA Value Bq	COMMENTS
AM-241		5.1125E+03				1.58E+05	
			59.54	5.112E+03	(	2.529E+01 2.68E-01 3.57E+01	G

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TestAmerica, Inc. Spectrum name: 17_1LMarn_20120191.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak MDA	Comments
CD-109	7.1031E+04				4.63E+02	

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                                88.03 7.103E+04  (  2.488E+02 2.14E-01 3.61E+00 G

CO-57        1.6134E+03                                       2.72E+02
                               122.06 1.613E+03  (  9.897E+00 3.51E-01 8.56E+01 G

Ce-139       2.3920E+03                                       1.38E+02
                               165.85 2.392E+03  (  1.224E+01 3.13E-01 7.99E+01 G

Hg-203       5.2575E+03                                       4.66E+01
                               279.17 5.258E+03  (  2.308E+01 2.97E-01 8.15E+01 G

SN-113       4.2312E+03                                       1.15E+02
                               391.69 4.231E+03  (  1.900E+01 3.23E-01 6.40E+01 G

CS-137       2.0429E+03                                       1.10E+04
                               661.66 2.043E+03  (  1.374E+01 4.57E-01 8.52E+01 G

Mn-54        3.2282E+03                                       3.12E+02
                               834.85 3.228E+03  (  1.349E+01 3.36E-01 1.00E+02 G

Y-898        6.5476E+03                                       1.07E+02
                               898.02 6.548E+03  (  2.134E+01 2.81E-01 9.37E+01 G

Zn-65    F   6.5475E+03                                       2.44E+02
                              1115.55 6.548E+03  (  2.993E+01 3.94E-01 5.06E+01 G

Co-1173      3.1004E+03                                       1.93E+03
                              1173.24 3.100E+03  (  1.116E+01 3.53E-01 9.99E+01 G

Co-1332      3.1310E+03                                       1.93E+03
                              1332.50 3.131E+03  (  1.034E+01 3.50E-01 1.00E+02 G

Y-1836       7.1338E+03                                       1.07E+02
                              1836.01 7.134E+03  (  1.295E+01 3.02E-01 9.92E+01 G
   ( - 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
                                       Page 4
```

17_1LMarn_20120191

P - Photon Reaction
C - Charged Particle Reaction
M - No MDA Calculation
R - Coincidence Corrected
H - Halflife limit exceeded
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 1 Sigma %	Activity

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	Time Corrected Activity Bq	Uncertainty 1 Sigma Counting	MDA
AM-241	5.1110E+03	5.1125E+03	2.684E-01%	2.53E+01
CD-109	6.4522E+04	7.1031E+04	2.138E-01%	2.49E+02
CO-57	1.3699E+03	1.6134E+03	3.513E-01%	9.90E+00
Ce-139	1.7317E+03	2.3920E+03	3.127E-01%	1.22E+01
Hg-203	2.0263E+03	5.2575E+03	2.974E-01%	2.31E+01
SN-113	2.8753E+03	4.2312E+03	3.228E-01%	1.90E+01
CS-137	2.0346E+03	2.0429E+03	4.566E-01%	1.37E+01
Mn-54	2.7999E+03	3.2282E+03	3.364E-01%	1.35E+01
Y-898	4.3147E+03	6.5476E+03	2.806E-01%	2.13E+01
Zn-65	5.4581E+03	6.5475E+03	3.943E-01%	2.99E+01
Co-1173	3.0297E+03	3.1004E+03	3.525E-01%	1.12E+01
Co-1332	3.0595E+03	3.1310E+03	3.496E-01%	1.03E+01
Y-1836	4.7010E+03	7.1338E+03	3.016E-01%	1.30E+01

< - 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

ORTEC g v - i (1087) Env32 G53W4.25 3/7/2012 11:48:20 AM Page 6
TestAmerica, Inc. Spectrum name: 17_1LMarn_20120191.An1

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

Total Activity (37.6 to 1999.5 keV) 1.030E+05 Bq
Total Decayed Activity (37.6 to 1999.5 keV) 1.2136901E+05 Bq

Initial Calibration Verifications

2nd Source Verification

Detector:	Ge5
Geometry:	Tunacan
Reference date	1/1/2010
Source:	81427-334
Standard volume g / vial	1550
Standard volume transferred in g / geometry	318.5
lab ID# of cal standard	6665

Isotope	Certified Activity gammas/sec	Geometry Activity	γ abundance	Bq/sample	Count Results	%recovery
Am-241	2034	418	0.359	1164	1160.9	99.7
Cs-137	1926	396	0.851	465	442.36	95.1
Co-60	3611	742	0.99974	742	700.21	94.3
Co-60	3612	742	0.999856	742	701.86	94.6

Reviewed By: Jody Watson

Date: 3/27/2012

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     ORTEC g v - i (3263) Env32  G53W4.25  3/28/2012 7:35:49 AM    Page  1
TestAmerica                     Spectrum name: 5_TunaCan2nd_20120813.An1

Sample description
     5_TunaCan2nd_Rad10_032712


Spectrum Filename: C:\User\SPC\Det5\5_TunaCan2nd_20120813.An1

Acquisition information
       Start time:                 3/27/2012 10:12:05 AM
       Live time:               7200
       Real time:               7250
       Dead time:                  0.69 %
       Detector ID:                    5

Detector system
     Ge 5 SN/157


Calibration
       Filename:                   5_Soil_TunaCan.Clb
     5_Soil_TunaCan_90099_032612


       Energy Calibration
            Created:               3/27/2012 5:20:02 PM
            Zero offset:           0.135 keV
            Gain:                  0.250 keV/channel
            Quadratic:             2.720E-08 keV/channel^2

       Efficiency Calibration
            Created:               3/27/2012 5:20:37 PM
            Knee Energy:         165.85 keV
            Above the Knee:        Quadratic        Uncertainty =   0.87 %
            Log(Eff):              6.466115E-01 + (-7.830454E-01*Log(E) ) +
                                   ( -4.117504E-03*Log(E)^2 )
            Below the Knee:        Quadratic        Uncertainty =   1.43 %
            Log(Eff):             -2.462251E+01 + ( 9.075211E+00*Log(E) ) +
                                   ( -9.664422E-01*Log(E)^2 )

Library Files
       Main analysis library:      DET_EnergyStandardMix & Pb.Lib
       Library Match Width:        0.500
       Peak stripping:             Library based

Analysis parameters
       Analysis engine:            Env32   G53W4.25
       Start channel:            150 (    37.61keV )
       Stop channel:            8000 (  2000.53keV )
       Peak rejection level:    1000.000%
       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 (3263) Env32  G53W4.25  3/28/2012 7:35:49 AM    Page  2
TestAmerica                     Spectrum name: 5_TunaCan2nd_20120813.An1
                                      Page 1
```

Random error: 4.0000000E+00
Systematic error: 4.0000000E+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:	YES	1/1/2010 11:00:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	5_2012-02-26_0305.PBC 2/26/2012 3:05:30 AM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 12 cutoff: 5.00E+01%
Energy Calibration
Normalized diff: 33.1557

***** 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
36.81	1005.	12.08	0.62	1.151E-02				
46.61	72616.	0.49	0.73	1.792E-02	46.54	4.250	1.421E+04	Pb210
49.73	1326.	15.18	0.68	1.987E-02				
59.57	75329.	0.49	0.74	2.535E-02	59.54	35.700	1.161E+03	AM241
87.94	40851.	0.68	0.80	3.460E-02	88.03	3.610	1.542E+04	CD109
96.44	148.	47.31	0.80	3.568E-02				
99.01	160.	48.52	0.81	3.589E-02				
105.59	109.	69.79	0.52	3.619E-02				
121.94	9225.	1.66	0.84	3.583E-02	122.06	85.600	3.348E+02	CO57
129.89	126.	62.97	0.30	3.522E-02				
136.43	1263.	7.42	0.90	3.457E-02				
165.86	1574.	6.14	0.84	3.133E-02	165.85	79.900	5.319E+02	Ce139
238.72	327.	27.04	0.86	2.319E-02				
247.25	57.	84.47	0.31	2.252E-02				
259.02	93.	60.17	0.97	2.167E-02				
260.46	98.	58.62	0.97	2.157E-02				
322.65	45.	91.14	0.46	1.806E-02				
351.63	256.	27.79	1.06	1.681E-02				
391.95	494.	16.33	1.15	1.536E-02	391.69	64.000	9.501E+02	SN113
407.02	43.	90.43	0.56	1.489E-02				
412.80	202.	35.90	0.77	1.471E-02				
420.83	123.	52.91	0.72	1.448E-02				
510.72	188.	44.32	0.50	1.232E-02				
542.81	148.	28.69	0.36	1.171E-02				
583.30	161.	33.50	0.69	1.103E-02				
661.70	25605.	0.71	1.39	9.924E-03	661.66	85.210	4.424E+02	CS137
762.61	129.	36.06	0.79	8.812E-03				
796.90	151.	38.71	0.30	8.493E-03				
886.67	129.	46.77	0.30	7.766E-03				
897.77	428.	19.21	1.38	7.686E-03	898.02	93.700	1.665E+03	Y898
932.49	230.	35.52	0.82	7.445E-03				

1008.65	104.	56.29	0.28	6.970E-03				
1173.15	23044.	0.73	1.79	6.138E-03	1173.24	99.900	7.002E+02	Co1173
1332.39	20769.	0.71	1.87	5.515E-03	1332.50	99.982	7.019E+02	Co1332
1836.05	245.	7.47	1.56	4.208E-03	1836.01	99.200	1.642E+03	Y1836

********** 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	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide
146.78	36.81	4847.	1005.	8.731E+04	12.08	0.625	-
198.52	49.73	12365.	1326.	6.673E+04	15.18	0.681	- s
385.40	96.42	1874.	90.	2.532E+03	71.31	0.588	- sc
395.68	98.99	2103.	121.	3.381E+03	58.44	0.394	- s

ORTEC g v - i (3263) Env32 G53W4.25 3/28/2012 7:35:49 AM Page 3
TestAmerica Spectrum name: 5_TunaCan2nd_20120813.An1

Channel	Energy	Background	Net area	Eff*Area	Uncert	FWHM	Suspected
422.09	105.59	2271.	109.	3.012E+03	69.79	0.518	- sc
519.32	129.89	2194.	126.	3.592E+03	62.97	0.298	- s
545.51	136.43	2377.	1263.	3.654E+04	7.42	0.900	- s
954.90	238.72	2247.	327.	1.410E+04	27.04	0.863	- sM
989.00	247.25	1031.	57.	2.516E+03	84.47	0.312	- sc
1036.13	259.01	1532.	93.	4.309E+03	60.17	0.968	- D
1041.90	260.46	1588.	98.	4.525E+03	58.62	0.970	- D
1290.76	322.65	744.	45.	2.473E+03	91.14	0.455	- c
1406.70	351.63	1442.	256.	1.523E+04	27.79	1.058	- s
1628.36	407.02	667.	43.	2.866E+03	90.43	0.562	- sc
1651.47	412.80	1438.	202.	1.370E+04	35.90	0.775	- s
1683.60	420.83	1291.	123.	8.472E+03	52.91	0.720	- s
2043.25	510.72	1553.	188.	1.523E+04	44.32	0.503	- s
2171.67	542.81	587.	148.	1.267E+04	28.69	0.362	- s
2333.63	583.30	785.	161.	1.460E+04	33.50	0.694	- s
3050.97	762.61	614.	129.	1.468E+04	36.06	0.794	- s
3188.11	796.90	856.	151.	1.782E+04	38.71	0.295	- s
3547.15	886.67	963.	129.	1.665E+04	46.77	0.296	- s
3730.41	932.49	1438.	230.	3.096E+04	35.52	0.818	- s
4035.01	1008.65	864.	104.	1.490E+04	56.29	0.275	- 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: DET_EnergyStandardMix & Pb.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 1 Sigma %	FWHM keV
Pb-210	186.01	46.61	16470.	72552.	10.077	0.49	0.733
AM-241	237.88	59.57	15419.	75329.	10.462	0.49	0.735
CD-109	351.46	87.94	8772.	40851.	5.674	0.68	0.804
CO-57	487.54	121.94	3880.	9225.	1.281	1.66	0.838
Ce-139	663.30	165.86	2329.	1574.	0.219	6.14	0.840
SN-113	1568.04	391.95	1640.	494.	0.069	16.33	1.153
CS-137	2647.28	661.70	1362.	25582.	3.553	0.71	1.394
Y-898	3591.55	897.77	1410.	428.	0.060	19.21	1.376

Co-1173	4692.83	1173.15	788.	23044.	3.201	0.73	1.786
Co-1332	5329.55	1332.39	98.	20769.	2.885	0.71	1.870
Y-1836	7342.76	1836.05	15.	245.	0.034	7.47	1.556s

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

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TestAmerica Spectrum name: 5_TunaCan2nd_20120813.An1

***** 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
Pb-210	N	1.4212E+04				8.15E+03	
			46.54	1.421E+04	(P	1.177E+02 4.91E-01 4.25E+00	G
AM-241		1.1609E+03				1.58E+05	
			59.54	1.161E+03	(	8.959E+00 4.87E-01 3.57E+01	G
CD-109		1.5419E+04				4.63E+02	
			88.03	1.542E+04	(	1.658E+02 6.81E-01 3.61E+00	G
CO-57		3.3478E+02				2.72E+02	
			122.06	3.348E+02	(	1.063E+01 1.66E+00 8.56E+01	G
Ce-139		5.3191E+02				1.38E+02	
			165.85	5.319E+02	(	7.689E+01 6.14E+00 7.99E+01	G
Hg-203		-6.5193E-03				4.66E+01	
			279.17	-6.519E-03	%(	1.788E+00 8.22E+03 8.15E+01	G
SN-113		9.5011E+02				1.15E+02	
			391.69	9.501E+02	(	3.682E+02 1.63E+01 6.40E+01	G
CS-137		4.4236E+02				1.10E+04	
			661.66	4.424E+02	(P	3.020E+00 7.12E-01 8.52E+01	G
Y-898		1.6655E+03				1.07E+02	
			898.02	1.665E+03	(	6.908E+02 1.92E+01 9.37E+01	G
Co-1173		7.0021E+02				1.93E+03	
			1173.24	7.002E+02	(	4.056E+00 7.32E-01 9.99E+01	G
Co-1332		7.0186E+02				1.93E+03	
			1332.50	7.019E+02	(	1.651E+00 7.07E-01 1.00E+02	G
Y-1836		1.6424E+03				1.07E+02	
			1836.01	1.642E+03	(	1.392E+02 7.47E+00 9.92E+01	G

(- 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 1 Sigma %	Activity

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	Time Corrected Activity Bq/Sample	Uncertainty Counting	1 Sigma	MDA Bq/Sample
Pb-210	1.3259E+04	1.4212E+04	4.918E-01%		1.18E+02
AM-241	1.1568E+03	1.1609E+03	4.867E-01%		8.96E+00
CD-109	4.5403E+03	1.5419E+04	6.810E-01%		1.66E+02
CO-57	4.1787E+01	3.3478E+02	1.660E+00%		1.06E+01
Ce-139	8.7347E+00	5.3191E+02	6.138E+00%		7.69E+01
Hg-203 #A	-6.5193E-03	>12 Halflives	8.2197E+03%	1.7882E+00	
SN-113	6.9747E+00	9.5011E+02	1.633E+01%		3.68E+02
CS-137	4.2015E+02	4.4236E+02	7.122E-01%		3.02E+00
Y-898	8.2662E+00	1.6655E+03	1.921E+01%		6.91E+02
Co-1173	5.2196E+02	7.0021E+02	7.316E-01%		4.06E+00
Co-1332	5.2320E+02	7.0186E+02	7.069E-01%		1.65E+00
Y-1836	8.1520E+00	1.6424E+03	7.471E+00%		1.39E+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 (  279.0 to  2000.5 keV)     2.050E+04  Bq/Sample
Total Decayed Activity (  279.0 to  2000.5 keV) 3.7761527E+04  Bq/Sample
```

2nd Source Verification

Detector:	Ge8
Geometry:	Tunacan
Reference date	1/1/2010
Source:	81427-334
Standard volume g / vial	1550
Standard volume transferred in g / geometry	318.5
lab ID# of cal standard	6665

Isotope	Certified Activity gammas/sec	Geometry Activity	γ abundance	Bq/sample	Count Results	%recovery
Am-241	2034	418	0.359	1164	1175.4	101.0
Cs-137	1926	396	0.851	465	446.61	96.0
Co-60	3611	742	0.99974	742	697.22	93.9
Co-60	3612	742	0.999856	742	691.92	93.2

Reviewed By: Jody Watson

Date: 3/29/2012

```
     ORTEC g v - i (3263) Env32  G53W4.25  3/29/2012 7:45:38 AM    Page  1
TestAmerica                     Spectrum name: 8_TunaCan2nd_20120697.An1

Sample description
     8_TunaCan_81427-334_2ndsource_032912


Spectrum Filename: C:\User\SPC\Det8\8_TunaCan2nd_20120697.An1

Acquisition information
       Start time:                 3/29/2012 1:58:04 AM
       Live time:               3600
       Real time:               3622
       Dead time:                  0.61 %
       Detector ID:                    8

Detector system
     Ge 8 SN/174


Calibration
       Filename:                   8_Soil_TunaCan.Clb
     8_Soil_TunaCan_90099_032712


       Energy Calibration
            Created:               3/28/2012 10:35:07 AM
            Zero offset:           0.050 keV
            Gain:                  0.250 keV/channel
            Quadratic:             8.067E-10 keV/channel^2

       Efficiency Calibration
            Created:               3/28/2012 10:35:20 AM
            Knee Energy:         165.85 keV
            Above the Knee:        Quadratic        Uncertainty =   1.39 %
            Log(Eff):             -1.098764E-01 + (-4.958544E-01*Log(E) ) +
                                   ( -2.572270E-02*Log(E)^2 )
            Below the Knee:        Quadratic        Uncertainty =   1.71 %
            Log(Eff):             -2.525301E+01 + ( 9.398253E+00*Log(E) ) +
                                   ( -1.000034E+00*Log(E)^2 )

Library Files
       Main analysis library:      DET_EnergyStandardMix & Pb.Lib
       Library Match Width:        0.500
       Peak stripping:             Library based

Analysis parameters
       Analysis engine:            Env32   G53W4.25
       Start channel:            150 (    37.55keV )
       Stop channel:            8000 (  2000.30keV )
       Peak rejection level:    1000.000%
       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 (3263) Env32  G53W4.25  3/29/2012 7:45:38 AM    Page  2
TestAmerica                     Spectrum name: 8_TunaCan2nd_20120697.An1
                                      Page 1
```

Random error: 4.0000000E+00
Systematic error: 4.0000000E+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:	YES	1/1/2010 11:00:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	8_2012-03-02_0402.PBC 3/2/2012 4:02:11 AM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 12 cutoff: 5.00E+01%
Energy Calibration
Normalized diff: 27.9595

***** 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
36.61	594.	17.47	1.15	1.254E-02				
46.53	38495.	0.62	0.95	2.001E-02	46.54	4.250	1.345E+04	Pb210
49.81	542.	25.92	1.04	2.243E-02				
59.48	43371.	0.71	0.98	2.878E-02	59.54	35.700	1.175E+03	AM241
84.86	327.	26.82	0.98	3.922E-02				
88.03	22911.	0.76	0.98	3.992E-02	88.03	3.610	1.504E+04	CD109
122.06	5318.	2.55	1.03	4.146E-02	122.06	85.600	3.349E+02	CO57
136.54	691.	14.03	0.89	3.998E-02				
165.93	1033.	8.62	1.19	3.628E-02	165.85	79.900	6.077E+02	Ce139
177.05	71.	70.08	0.69	3.453E-02				
185.74	128.	40.98	0.85	3.329E-02				
227.93	52.	65.04	0.45	2.844E-02				
270.79	87.	50.41	0.41	2.486E-02				
278.94	44.	131.33	1.13	2.428E-02	279.17	81.500	HL>Cutoff	Hg203
302.52	63.	54.81	0.69	2.279E-02				
370.09	35.	84.23	0.41	1.941E-02				
391.61	316.	17.91	0.81	1.855E-02	391.69	64.000	1.016E+03	SN113
409.22	93.	50.95	0.41	1.791E-02				
428.24	88.	46.51	0.39	1.726E-02				
564.57	72.	45.26	0.57	1.378E-02				
591.73	73.	42.60	0.61	1.326E-02				
661.62	15734.	0.88	1.38	1.209E-02	661.66	85.210	4.466E+02	CS137
720.39	41.	72.89	0.46	1.126E-02				
831.73	36.	50.61	0.44	9.986E-03				
897.91	396.	17.93	1.52	9.360E-03	898.02	93.700	2.554E+03	Y898
1092.31	69.	44.41	0.50	7.924E-03				
1173.30	13922.	0.92	1.73	7.452E-03	1173.24	99.900	6.972E+02	Co1173
1332.56	12390.	0.92	1.75	6.677E-03	1332.50	99.982	6.919E+02	Co1332
1836.18	152.	9.00	1.63	5.046E-03	1836.01	99.200	1.724E+03	Y1836

8_TunaCan2nd_20120697

********** 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	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide
146.23	36.61	3218.	594.	4.742E+04	17.47	1.147	- s
199.01	49.81	6400.	542.	2.416E+04	25.92	1.039	- sM
339.16	84.85	3491.	236.	6.026E+03	42.58	0.697	- sM

ORTEC g v - i (3263) Env32 G53W4.25 3/29/2012 7:45:38 AM Page 3
TestAmerica Spectrum name: 8_TunaCan2nd_20120697.An1

Channel	Energy	Background	Net area	Eff*Area	Uncert	FWHM	Suspected
545.91	136.54	2178.	691.	1.728E+04	14.03	0.888	-
707.94	177.05	893.	71.	2.046E+03	70.08	0.693	- sM
742.68	185.74	978.	128.	3.835E+03	40.98	0.847	- sM
911.43	227.93	546.	52.	1.829E+03	65.04	0.445	- sc
1082.86	270.79	683.	87.	3.486E+03	50.41	0.413	- sM
1209.76	302.52	484.	63.	2.765E+03	54.81	0.692	- s
1480.00	370.09	385.	35.	1.803E+03	84.23	0.412	- sc
1636.49	409.22	685.	93.	5.212E+03	50.95	0.407	- s
1712.56	428.24	565.	88.	5.117E+03	46.51	0.393	- s
2257.86	564.57	330.	72.	5.224E+03	45.26	0.565	- s
2366.45	591.73	298.	73.	5.505E+03	42.60	0.613	- s
2881.06	720.39	284.	41.	3.640E+03	72.89	0.464	- s
3326.37	831.73	148.	36.	3.605E+03	50.61	0.439	- s
4368.55	1092.31	290.	69.	8.708E+03	44.41	0.495	- 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: DET_EnergyStandardMix & Pb.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 1 Sigma %	FWHM keV
Pb-210	185.71	46.48	12173.	40702.	11.306	0.74	0.992
AM-241	237.70	59.48	10649.	43371.	12.047	0.71	0.984
CD-109	351.85	88.02	4506.	23196.	6.443	0.88	1.056
CO-57	487.99	122.06	2908.	5318.	1.477	2.55	1.026
Ce-139	663.47	165.93	1722.	1033.	0.287	8.62	1.189s
Hg-203	1115.46	278.94	1642.	44.	0.012	131.33	1.133
SN-113	1566.07	391.61	822.	316.	0.088	17.91	0.806s
CS-137	2646.01	661.62	665.	15731.	4.370	0.88	1.379
Y-898	3591.03	897.91	871.	396.	0.110	17.93	1.524
Co-1173	4692.46	1173.30	374.	13922.	3.867	0.92	1.726
Co-1332	5329.42	1332.56	82.	12390.	3.442	0.92	1.753
Y-1836	7343.62	1836.18	6.	152.	0.042	9.00	1.626s

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

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TestAmerica Spectrum name: 8_TunaCan2nd_20120697.An1
Page 3

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

Pb-210   N   1.4221E+04                                      8.15E+03
                            46.54 1.422E+04  (  1.806E+02 7.43E-01 4.25E+00 G

AM-241       1.1754E+03                                      1.58E+05
                            59.54 1.175E+03  (  1.311E+01 7.10E-01 3.57E+01 G

CD-109       1.5223E+04                                      4.63E+02
                            88.03 1.522E+04  (  2.071E+02 8.83E-01 3.61E+00 G

CO-57        3.3494E+02                                      2.72E+02
                           122.06 3.349E+02  (  1.600E+01 2.55E+00 8.56E+01 G

Ce-139       6.0766E+02                                      1.38E+02
                           165.85 6.077E+02 *(  1.153E+02 8.62E+00 7.99E+01 G

Hg-203       6.1671E-01                                      4.66E+01
                           279.17 6.167E-01  (  2.689E+00 1.31E+02 8.15E+01 G

SN-113       1.0157E+03                                      1.15E+02
                           391.69 1.016E+03  (  4.390E+02 1.79E+01 6.40E+01 G

CS-137       4.4661E+02                                      1.10E+04
                           661.66 4.466E+02  (P 3.489E+00 8.85E-01 8.52E+01 G

Y-898        2.5543E+03                                      1.07E+02
                           898.02 2.554E+03  (  9.046E+02 1.79E+01 9.37E+01 G

Co-1173      6.9722E+02                                      1.93E+03
                          1173.24 6.972E+02  (  4.649E+00 9.19E-01 9.99E+01 G

Co-1332      6.9192E+02                                      1.93E+03
                          1332.50 6.919E+02  (  2.515E+00 9.18E-01 1.00E+02 G

Y-1836       1.7236E+03                                      1.07E+02
                          1836.01 1.724E+03  (  1.542E+02 9.00E+00 9.92E+01 G
   ( - 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 1 Sigma %	Activity

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	Time Corrected Activity Bq/Sample	Uncertainty Counting	1 Sigma	MDA Bq/Sample
Pb-210	1.3265E+04	1.4221E+04	7.429E-01%		1.81E+02
AM-241	1.1712E+03	1.1754E+03	7.101E-01%		1.31E+01
CD-109	4.4713E+03	1.5223E+04	8.832E-01%		2.07E+02
CO-57	4.1631E+01	3.3494E+02	2.551E+00%		1.60E+01
Ce-139 #	9.8959E+00	6.0766E+02	8.616E+00%		1.15E+02
Hg-203 A	6.1671E-01	>12 Halflives	1.3133E+02%	2.6892E+00	
SN-113	7.3819E+00	1.0157E+03	1.791E+01%		4.39E+02
CS-137	4.2415E+02	4.4661E+02	8.848E-01%		3.49E+00
Y-898	1.2542E+01	2.5543E+03	1.793E+01%		9.05E+02
Co-1173	5.1942E+02	6.9722E+02	9.185E-01%		4.65E+00
Co-1332	5.1548E+02	6.9192E+02	9.176E-01%		2.52E+00
Y-1836	8.4633E+00	1.7236E+03	8.997E+00%		1.54E+02

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- 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 (37.6 to 2000.3 keV) 2.045E+04 Bq/Sample
Total Decayed Activity (37.6 to 2000.3 keV) 3.8690848E+04 Bq/Sample

2nd Source Verification

Detector:	Ge9
Geometry:	Tunacan
Reference date	1/1/2010
Source:	81427-334
Standard volume g / vial	1550
Standard volume transferred in g / geometry	318.5
lab ID# of cal standard	6665

Isotope	Certified Activity gammas/sec	Geometry Activity	γ abundance	Bq/sample	Count Results	%recovery
Am-241	2034	418	0.359	1164	1169.4	100.4
Cs-137	1926	396	0.851	465	444.52	95.6
Co-60	3611	742	0.99974	742	687.72	92.7
Co-60	3612	742	0.999856	742	692.56	93.3

Reviewed By: Jody Watson

Date: 6/14/2012

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     ORTEC g v - i (3263) Env32  G53W4.25  6/14/2012 1:20:45 PM    Page  1
TestAmerica, Inc                Spectrum name: 9_TunaCan_20120371.An1

Sample description
     9_TunaCan_90099_061412


Spectrum Filename: C:\User\SPC\Det9\9_TunaCan_20120371.An1

Acquisition information
       Start time:                 6/14/2012 10:54:15 AM
       Live time:               3600
       Real time:               3629
       Dead time:                  0.81 %
       Detector ID:                    9

Detector system
     Ge 9 SN/100113


Calibration
       Filename:                   9_Soil_TunaCan.Clb
     9_Soil_TunaCan_90099_050312


       Energy Calibration
            Created:               6/14/2012 10:19:40 AM
            Zero offset:           0.088 keV
            Gain:                  0.250 keV/channel
            Quadratic:            -2.039E-08 keV/channel^2

       Efficiency Calibration
            Created:               6/14/2012 10:19:51 AM
            Knee Energy:         165.85 keV
            Above the Knee:        Quadratic        Uncertainty =   1.30 %
            Log(Eff):             -8.079856E-01 + (-2.367265E-01*Log(E) ) +
                                   ( -3.950640E-02*Log(E)^2 )
            Below the Knee:        Quadratic        Uncertainty =   1.42 %
            Log(Eff):             -2.387916E+01 + ( 8.875647E+00*Log(E) ) +
                                   ( -9.401100E-01*Log(E)^2 )

Library Files
       Main analysis library:      DET_EnergyStandardMix & Pb.Lib
       Library Match Width:        0.500
       Peak stripping:             Library based

Analysis parameters
       Analysis engine:            Env32   G53W4.25
       Start channel:            150 (    37.60keV )
       Stop channel:            8000 (  1999.66keV )
       Peak rejection level:    1000.000%
       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 (3263) Env32  G53W4.25  6/14/2012 1:20:45 PM    Page  2
TestAmerica, Inc                Spectrum name: 9_TunaCan_20120371.An1
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Random error: 4.0000000E+00
Systematic error: 4.0000000E+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:	YES	1/1/2010 11:00:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	9_2012-05-27_0502.PBC 5/27/2012 5:02:59 AM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 11 cutoff: 5.00E+01%
Energy Calibration
Normalized diff: 0.0390

***** 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
36.54	860.	12.66	1.34	1.634E-02				
46.62	48876.	0.54	1.09	2.580E-02	46.54	4.250	1.338E+04	Pb210
50.03	116.	122.12	1.09	2.886E-02				
59.57	54776.	0.62	1.11	3.661E-02	59.54	35.700	1.169E+03	AM241
63.90	47.	193.18	0.35	3.962E-02				
88.09	26880.	0.87	1.14	5.052E-02	88.03	3.610	1.566E+04	CD109
122.10	5522.	2.86	1.15	5.303E-02	122.06	85.600	3.312E+02	CO57
136.38	729.	11.64	1.25	5.151E-02				
165.67	814.	10.74	1.30	4.629E-02	165.85	79.900	5.417E+02	Ce139
295.46	252.	33.13	0.56	3.229E-02				
316.16	66.	75.82	0.25	3.082E-02				
356.41	45.	97.50	1.36	2.835E-02				
358.68	42.	110.02	1.37	2.822E-02				
379.76	37.	75.05	0.46	2.711E-02				
391.75	310.	24.80	1.08	2.652E-02	391.69	64.000	1.113E+03	SN113
454.98	83.	53.05	0.37	2.383E-02				
568.66	103.	37.41	0.47	2.026E-02				
626.42	84.	49.00	0.45	1.885E-02				
661.66	23324.	0.76	1.61	1.810E-02	661.66	85.210	4.445E+02	CS137
821.54	239.	27.43	0.39	1.536E-02				
876.16	66.	52.19	0.61	1.462E-02				
898.25	346.	23.61	1.52	1.434E-02	898.02	93.700	2.406E+03	Y898
937.90	34.	79.64	0.44	1.387E-02				
1071.41	38.	61.01	0.57	1.249E-02				
1085.31	68.	35.74	1.00	1.237E-02				
1098.64	14.	140.33	0.47	1.225E-02				
1173.23	20836.	0.81	2.05	1.163E-02	1173.24	99.900	6.877E+02	Co1173
1332.49	18966.	0.75	2.11	1.050E-02	1332.50	99.982	6.926E+02	Co1332
1835.90	150.	10.23	1.72	8.080E-03	1836.01	99.200	1.745E+03	Y1836

9_TunaCan_20120371

********** 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	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide
145.76	36.54	3297.	860.	5.262E+04	12.66	1.336	- s
199.48	49.98	8660.	956.	3.313E+04	18.50	0.958	- sM
255.13	63.90	2893.	47.	1.186E+03	193.18	0.347	- sc
544.97	136.38	1941.	729.	1.415E+04	11.64	1.247	-

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TestAmerica, Inc Spectrum name: 9_TunaCan_20120371.An1

Channel	Energy	Background	Net area	Eff*Area	Uncert	FWHM	Suspected
1181.07	295.46	1550.	252.	7.804E+03	33.13	0.562	- s
1263.87	316.16	856.	66.	2.136E+03	75.82	0.245	- sc
1424.84	356.47	930.	45.	1.579E+03	97.50	1.363	- sc
1433.89	358.73	1025.	42.	1.473E+03	110.02	1.365	- sc
1518.22	379.76	367.	37.	1.365E+03	75.05	0.460	- sc
1819.03	454.98	702.	83.	3.496E+03	53.05	0.375	- s
2273.73	568.66	433.	103.	5.068E+03	37.41	0.468	- s
2504.73	626.42	460.	84.	4.455E+03	49.00	0.451	- s
3285.25	821.54	812.	239.	1.556E+04	27.43	0.391	- s
3503.76	876.16	400.	66.	4.538E+03	52.19	0.608	- s
3750.76	937.90	332.	34.	2.488E+03	79.64	0.436	- sc
4284.91	1071.41	226.	38.	3.015E+03	61.01	0.571	- s
4340.51	1085.31	224.	68.	5.498E+03	35.74	1.000	- s
4393.86	1098.64	186.	14.	1.143E+03	140.33	0.472	- sc

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: DET_EnergyStandardMix & Pb.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 1 Sigma %	FWHM keV
Pb-210	185.86	46.57	13300.	51041.	14.178	0.65	1.116
AM-241	237.82	59.57	11784.	54776.	15.216	0.62	1.111
CD-109	351.87	88.09	5995.	26880.	7.467	0.87	1.137
CO-57	487.85	122.10	3767.	5522.	1.534	2.86	1.155
Ce-139	662.09	165.67	1864.	814.	0.226	10.74	1.299
Hg-203	1120.44	280.29	2362.	-52.	-0.014	133.84	1.296s
SN-113	1565.85	391.67	1962.	266.	0.074	24.38	1.393
CS-137	2645.72	661.66	1258.	23324.	6.479	0.76	1.614
Y-898	3592.12	898.25	1148.	346.	0.096	23.61	1.524s
Co-1173	4692.30	1173.23	840.	20836.	5.788	0.81	2.049
Co-1332	5329.58	1332.49	131.	18966.	5.268	0.75	2.109
Y-1836	7344.43	1835.90	14.	150.	0.042	10.23	1.719s

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

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

Pb-210   N   1.3971E+04                                     8.15E+03
                            46.54 1.397E+04  (  1.478E+02 6.46E-01 4.25E+00 G

AM-241       1.1694E+03                                     1.58E+05
                            59.54 1.169E+03  (  1.086E+01 6.16E-01 3.57E+01 G

CD-109       1.5657E+04                                     4.63E+02
                            88.03 1.566E+04  (  2.117E+02 8.71E-01 3.61E+00 G

CO-57        3.3118E+02                                     2.72E+02
                           122.06 3.312E+02  (  1.731E+01 2.86E+00 8.56E+01 G

Ce-139       5.4173E+02                                     1.38E+02
                           165.85 5.417E+02  (  1.357E+02 1.07E+01 7.99E+01 G

Hg-203      -5.2429E-01                                     4.66E+01
                           279.17-5.243E-01 ?(  2.327E+00 1.34E+02 8.15E+01 G

SN-113       9.5260E+02                                     1.15E+02
                           391.69 9.526E+02 ?(  7.503E+02 2.44E+01 6.40E+01 G

CS-137       4.4452E+02                                     1.10E+04
                           661.66 4.445E+02  (  3.202E+00 7.63E-01 8.52E+01 G

Y-898        2.4057E+03                                     1.07E+02
                           898.02 2.406E+03 @(  1.118E+03 2.36E+01 9.37E+01 G

Co-1173      6.8772E+02                                     1.93E+03
                          1173.24 6.877E+02  (  4.547E+00 8.09E-01 9.99E+01 G

Co-1332      6.9256E+02                                     1.93E+03
                          1332.50 6.926E+02  (  2.044E+00 7.49E-01 1.00E+02 G

Y-1836       1.7452E+03                                     1.07E+02
                          1836.01 1.745E+03  (  2.388E+02 1.02E+01 9.92E+01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
```



```
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
```

```
      library energy centroid for positive identification.
  P - Peakbackground subtraction
  } - Peak is too close to another for the activity
      to be found directly.

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

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


*************** D I S C A R D E D  I S O T O P E  P E A K S ***************
Nuclide Centroid  Background  Net Area   Intensity   Uncert   Activity
          Energy   Counts     Counts     Cts/Sec  1 Sigma %
_____________________________________________________________________________
Hg-203     280.29      2362.       -52.    -0.014   133.84   0.000E+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   *****
        Time of Count  Time Corrected  Uncertainty  1 Sigma
Nuclide     Activity       Activity       Counting                    MDA
               Bq/Sample     Bq/Sample                                 Bq/Sample

_____________________________________________________________________________
Pb-210       1.2947E+04    1.3971E+04    6.459E-01%                 1.48E+02
AM-241       1.1648E+03    1.1694E+03    6.156E-01%                 1.09E+01
CD-109       4.0954E+03    1.5657E+04    8.713E-01%                 2.12E+02
CO-57        3.3792E+01    3.3118E+02    2.862E+00%                 1.73E+01
Ce-139       5.9752E+00    5.4173E+02    1.074E+01%                 1.36E+02
Hg-203 #A   -5.2429E-01 >12 Halflives   1.3384E+02%   2.3272E+00
SN-113 #     4.3447E+00    9.5260E+02    2.438E+01%                 7.50E+02
CS-137       4.2011E+02    4.4452E+02    7.635E-01%                 3.20E+00
Y-898  #     7.1422E+00    2.4057E+03    2.361E+01%                 1.12E+03
Co-1173      4.9827E+02    6.8772E+02    8.087E-01%                 4.55E+00
Co-1332      5.0178E+02    6.9256E+02    7.487E-01%                 2.04E+00
Y-1836       5.1813E+00    1.7452E+03    1.023E+01%                 2.39E+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 (  379.7 to  1999.7 keV)     1.968E+04  Bq/Sample
Total Decayed Activity (  379.7 to  1999.7 keV) 3.8598309E+04  Bq/Sample
```

2nd Source Verification

Detector: **Ge12**
Geometry: **Tunacan**
Reference date: **10/1/2006**
Calibration Standard: **74139-334**
Standard volume g / vial: **1550**
Standard volume transferred in g / geometry: **341.9**
lab ID# of cal standard: **1282974**

Isotope	Certified Activity gammas/sec	Geometry Activity	γ abundance	Bq/sample	Count Results	%recovery
Am-241	2034	449	0.359	1250	1288	103.1
Cs-137	1926	425	0.851	499	509.9	102.1
Co-60	3612	797	0.999856	797	833.8	104.6

Reviewed By: Jody Watson

Date: 4/24/2018

Test America St. Louis Spectrum ID: 12_TunaCan_20180012

Sample Description: 12_TunaCan_ICV
Detector: Detector #12
Batch ID: 12
Work Order Number: TunaCan
Lot Number: ICV

Decay to Time: 10/1/2006 11:00 Live Time: 5000 sec
Acquisition Time: 4/24/2018 09:26:18 Real Time: 5018 sec
Analysis Time: 4/24/2018 10:50 Dead Time: 0.36 %
Analysis Quantity: 1.000E+00 Sample

Efficiency Cal File: 12_Soil_TunaCan.Clb
Efficiency Cal Desc: 12_TunaCan_108513
Efficiency Cal Date: 4/20/2018 11:53
Energy Cal Date: 4/20/2018 11:13
Library: DET_EnergyStandardMix & Pb.lib
Bkgd Correction File: 12_2017-05-07_0806.PBC

Nuclide	Activity Bq/Sample	1-Sigma Counting Uncert %	1-Sigma Counting Uncert Bq/Sample	1-Sigma Total Uncert Bq/Sample	Minimum Detectable Activity Bq/Sample
Pb-210	1.634E+04	0.6	9.464E+01	1.053E+03	1.764E+02
AM-241	1.288E+03	0.4	5.772E+00	8.177E+01	8.914E+00
CD-109	2.726E+04	25.0	6.823E+03	7.030E+03	1.764E+04
CO-57	1.000E+100	153.6	5.398E-01	5.402E-01	1.425E+00
Ce-139	1.000E+100	106.9	5.267E-01	5.274E-01	1.390E+00
Hg-203	1.000E+100	297.5	6.855E-01	6.856E-01	1.730E+00
SN-113	1.000E+100	692.4	1.143E+00	1.143E+00	2.762E+00
CS-137	5.099E+02	0.8	3.904E+00	2.652E+01	3.285E+00
Y-898	1.000E+100	140.9	1.086E+00	1.086E+00	2.342E+00
Co-1173	8.106E+02	1.3	1.069E+01	4.173E+01	9.187E+00
Co-1332	8.338E+02	1.3	1.078E+01	4.290E+01	6.803E+00
Y-1836	1.000E+100	127.2	4.662E-01	4.667E-01	9.202E-01
Total	6.000E+100				

Analyst: Jody Watson

(Page 1 of 7)

Sample description
12_TunaCan_ICV

Spectrum Filename: C:\User\SPC\Det12\12_TunaCan_20180012.An1

Acquisition information

Start time:	4/24/2018 9:26:18 AM
Live time:	5000
Real time:	5018
Dead time:	0.36 %
Detector ID:	12

Detector system
Ge12 S/N10034336

Calibration

Filename:	12_Soil_TunaCan.Clb

12_TunaCan_108513

Energy Calibration

Created:	4/20/2018 11:13:27 AM
Zero offset:	0.059 keV
Gain:	0.250 keV/channel
Quadratic:	-3.735E-08 keV/channel^2

Efficiency Calibration

Created:	4/20/2018 11:53:09 AM
Type:	Polynomial
Uncertainty:	1.020 %
Coefficients:	-0.363508 -4.707999 0.462125
	-0.051256 0.002384 -0.000043

Library Files

Main analysis library:	DET_EnergyStandardMix & Pb.lib
Library Match Width:	0.500
Peak stripping:	Library based

Analysis parameters

Analysis engine:	Env32 G800W064
Start channel:	100 (25.08keV)
Stop channel:	8000 (1999.13keV)
Peak rejection level:	1000.000%
Peak search sensitivity:	3
Sample Size:	1.0000E+00 +/- 0.000E+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:	4.0000000E+00
Systematic error:	4.0000000E+00
Fraction Limit:	0.000%
Background width:	3
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:	YES	10/1/2006 11:00:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	12_2017-05-07_0806.PBC 5/7/2017 8:06:54 AM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 7 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 25.3541

***** 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
28.13	58.	46.71	0.75	4.137E-03				
32.13	394.	18.65	0.81	7.163E-03				
36.69	330.	25.31	0.84	1.059E-02				
46.66	43625.	0.58	0.85	1.811E-02	46.54	4.250	1.634E+04	Pb210
49.83	321.	44.33	0.85	2.160E-02				
59.65	63562.	0.45	0.86	2.820E-02	59.54	35.700	1.288E+03	AM241
70.53	127.	49.58	1.39	3.219E-02				
74.86	220.	28.10	0.88	3.333E-02				
77.21	369.	16.72	0.88	3.387E-02				
87.68	350.	23.71	0.81	3.578E-02	88.03	3.610	3.034E+04	CD109
93.18	213.	27.98	1.16	3.644E-02				
165.85	67.	106.94	0.97	3.405E-02	165.85	79.900	HL>Cutoff	Ce139
238.54	388.	19.10	0.88	2.744E-02				
279.17	23.	297.48	1.09	2.449E-02	279.17	81.500	HL>Cutoff	Hg203
307.48	44.	92.73	0.49	2.278E-02				
312.92	63.	62.15	0.30	2.248E-02				
320.20	50.	55.24	0.61	2.209E-02				
355.42	79.	51.62	0.51	2.040E-02				
384.05	22.	98.42	0.50	1.922E-02				
428.92	42.	63.02	0.59	1.766E-02				
454.01	126.	41.89	2.09	1.692E-02				
493.21	76.	56.00	0.64	1.589E-02				
583.05	231.	19.93	1.19	1.403E-02				
609.57	255.	15.76	1.66	1.358E-02				
661.72	21282.	0.77	1.42	1.279E-02	661.66	85.210	5.099E+02	CS137
898.02	37.	140.94	1.67	1.025E-02	898.02	93.700	HL>Cutoff	Y898
1173.31	7459.	1.32	1.92	8.426E-03	1173.24	99.900	8.106E+02	Co1173

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1332.58	6951.	1.30	1.98	7.647E-03	1332.50	99.982	8.318E+02	Co1332

********** 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	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide	
112.21	28.13	314.	58.	1.406E+04	46.71	0.750	-	s
128.21	32.13	1577.	394.	5.496E+04	18.65	0.810	-	
146.44	36.67	3332.	330.	3.120E+04	25.31	0.841	-	sD
199.29	49.79	9113.	333.	1.539E+04	40.96	0.855	-	sD
281.70	70.53	1447.	127.	3.956E+03	49.58	1.387	-	s
299.02	74.84	1784.	220.	6.587E+03	28.10	0.880	-	D
308.40	77.19	1706.	369.	1.088E+04	16.72	0.883	-	sD
372.24	93.18	1248.	213.	5.837E+03	27.98	1.163	-	sM
953.35	238.54	1339.	388.	1.414E+04	19.10	0.882	-	s
1229.01	307.48	572.	44.	1.931E+03	92.73	0.491	-	sc
1250.75	312.92	513.	63.	2.788E+03	62.15	0.295	-	s
1279.88	320.20	329.	50.	2.263E+03	55.24	0.611	-	s
1420.71	355.42	528.	79.	3.873E+03	51.62	0.511	-	s
1535.20	384.00	232.	22.	1.118E+03	98.42	0.497	-	sc
1714.62	428.92	312.	42.	2.406E+03	63.02	0.590	-	s
1814.96	454.01	760.	126.	7.448E+03	41.89	2.094	-	s
1971.76	493.21	502.	76.	4.813E+03	56.00	0.640	-	s
2331.07	583.05	403.	231.	1.644E+04	19.93	1.194	-	
2437.14	609.57	326.	255.	1.877E+04	15.76	1.660	-	

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: DET_EnergyStandardMix & Pb.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 1 Sigma %	FWHM keV
Pb-210	185.79	46.54	10103.	43625.	8.725	0.58	0.851D
AM-241	237.76	59.54	8808.	63562.	12.712	0.45	0.865D
CD-109	350.62	87.77	1861.	315.	0.063	25.03	0.760s
CO-57	487.68	122.06	2320.	-56.	-0.011	153.64	0.928
Ce-139	662.74	165.85	1600.	67.	0.013	106.94	0.973s
Hg-203	1115.81	279.17	1331.	23.	0.005	297.48	1.086s
SN-113	1565.74	391.69	1248.	-10.	-0.002	692.39	1.196s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
CS-137	2645.75	661.72	832.	21282.	4.256	0.77	1.422
Y-898	3591.15	898.02	555.	37.	0.007	140.94	1.672s
Co-1173	4692.85	1173.31	308.	7459.	1.492	1.32	1.921
Co-1332	5330.42	1332.58	135.	6968.	1.394	1.29	1.978
Y-1836	7346.49	1836.01	27.	-11.	-0.002	127.17	2.459s

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
Pb-210	N	1.6338E+04				8.15E+03	
			46.54	1.634E+04	(P	1.764E+02 5.79E-01 4.25E+00	G
AM-241		1.2876E+03				1.58E+05	
			59.54	1.288E+03	(	8.914E+00 4.48E-01 3.57E+01	G
CD-109		2.7262E+04				4.63E+02	
			88.03	2.726E+04	*(	1.764E+04 2.50E+01 3.61E+00	G
CO-57		-3.5134E-01				2.72E+02	
			122.06	-3.513E-01	(	1.425E+00 1.54E+02 8.56E+01	G
Ce-139		4.9250E-01				1.38E+02	
			165.85	4.925E-01	?(	1.390E+00 1.07E+02 7.99E+01	G
Hg-203		2.3043E-01				4.66E+01	
			279.17	2.304E-01	&(	1.730E+00 2.97E+02 8.15E+01	G
SN-113		-1.6505E-01				1.15E+02	
			391.69	-1.650E-01	&(	2.762E+00 6.92E+02 6.40E+01	G
CS-137		5.0987E+02				1.10E+04	
			661.66	5.099E+02	(	3.285E+00 7.66E-01 8.52E+01	G
Y-898		7.7025E-01				1.07E+02	
			898.02	7.703E-01	&(	2.342E+00 1.41E+02 9.37E+01	G
Co-1173		8.1058E+02				1.93E+03	
			1173.24	8.106E+02	(	9.187E+00 1.32E+00 9.99E+01	G
Co-1332		8.3376E+02				1.93E+03	
			1332.50	8.338E+02	(	6.803E+00 1.29E+00 1.00E+02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Y-1836	-3.6659E-01					1.07E+02	
		1836.01	-3.666E-01	?(	9.202E-01	1.27E+02	9.92E+01 G

(- 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 1 Sigma %	Activity
CO-57	122.06	2320.	-56.	-0.011	153.64	0.000E+00
Ce-139	165.85	1600.	67.	0.013	106.94	0.000E+00
Hg-203	279.17	1331.	23.	0.005	297.48	0.000E+00
SN-113	391.69	1248.	-10.	-0.002	692.39	0.000E+00
Y-898	898.02	555.	37.	0.007	140.94	0.000E+00
Y-1836	1836.01	27.	-11.	-0.002	127.17	0.000E+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	Time Corrected Activity Bq/Sample	Uncertainty 1 Sigma Counting	MDA Bq/Sample
Pb-210	1.1406E+04	1.6338E+04	5.793E-01%	1.76E+02
AM-241	1.2640E+03	1.2876E+03	4.483E-01%	8.91E+00
CD-109 #	4.8702E+01	2.7262E+04	2.503E+01%	1.76E+04
CO-57 #A	-3.5134E-01	>12 Halflives	1.536E+02%	1.43E+00
Ce-139 #A	4.9250E-01	>12 Halflives	1.069E+02%	1.39E+00
Hg-203 #A	2.3043E-01	>12 Halflives	2.975E+02%	1.73E+00
SN-113 #A	-1.6505E-01	>12 Halflives	6.924E+02%	2.76E+00
CS-137	3.9058E+02	5.0987E+02	7.657E-01%	3.29E+00
Y-898 #A	7.7025E-01	>12 Halflives	1.409E+02%	2.34E+00
Co-1173	1.7721E+02	8.1058E+02	1.318E+00%	9.19E+00
Co-1332	1.8227E+02	8.3376E+02	1.293E+00%	6.80E+00
Y-1836 #A	-3.6659E-01	>12 Halflives	1.272E+02%	9.20E-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 (25.1 to 1999.1 keV) 1.347E+04 Bq/Sample
Total Decayed Activity (25.1 to 1999.1 keV) 4.7041629E+04 Bq/Sample

(Page 7 of 7)

Second Source Verification

Detector:	Ge14
Geometry:	1L Marn
Reference date	1/1/2011
Calibration Standard:	83924-334
Standard volume g / vial	1
Standard volume transferred in g / geometry	1
lab ID# of cal standard	6707

Isotope	Certified Activity gammas/sec	Geometry Activity gammas/sec	Abundance	Activity Bq/L	Count Results	%recovery
Am-241	1830	1830	0.359	**5097.5**	4967.3	97.4
Cs-137	1705	1705	0.851	**2003.5**	1968.3	98.2
Co-60	3293	3293	0.99974	**3293.9**	3103.7	94.2
Co-60	3294	3294	0.99986	**3294.5**	3166.5	96.1

Reviewed By: Megan McAfee

Date: 4/24/2012

```
     ORTEC g v - i (3263) Env32  G53W4.25  4/17/2012 11:26:44 AM   Page  1
TestAmerica, Inc.               Spectrum name: 14_Marn1L2nd_20120346.An1

Sample description
     14_Marn1L_83924-334_2nd_041212


Spectrum Filename: C:\User\SPC\Det14\14_Marn1L2nd_20120346.An1

Acquisition information
       Start time:                 4/12/2012 3:08:24 AM
       Live time:               3600
       Real time:               3857
       Dead time:                  6.67 %
       Detector ID:                   14

Detector system
     Ge14 SN/11080670


Calibration
       Filename:                   14_Liquid_Marinelli 1L.Clb
     14_1LMarinelli_90062_030612


       Energy Calibration
            Created:               3/14/2012 4:58:19 PM
            Zero offset:           0.195 keV
            Gain:                  0.250 keV/channel
            Quadratic:            -1.589E-08 keV/channel^2

       Efficiency Calibration
            Created:               3/14/2012 4:58:47 PM
            Knee Energy:         165.85 keV
            Above the Knee:        Quadratic        Uncertainty =   1.64 %
            Log(Eff):             -1.428037E+00 + (-4.136370E-02*Log(E) ) +
                                   ( -5.958012E-02*Log(E)^2 )
            Below the Knee:        Quadratic        Uncertainty =   0.07 %
            Log(Eff):             -1.383299E+01 + ( 4.786779E+00*Log(E) ) +
                                   ( -5.293738E-01*Log(E)^2 )

Library Files
       Main analysis library:      DET_EnergyStandardMix & Mn, Zn.L
       Library Match Width:        0.500
       Peak stripping:             Library based

Analysis parameters
       Analysis engine:            Env32   G53W4.25
       Start channel:            150 (    37.70keV )
       Stop channel:            8000 (  1999.40keV )
       Peak rejection level:    1000.000%
       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 (3263) Env32  G53W4.25  4/17/2012 11:26:44 AM   Page  2
TestAmerica, Inc.               Spectrum name: 14_Marn1L2nd_20120346.An1
                                      Page 1
```

Random error: 4.0000000E+00
Systematic error: 4.0000000E+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:	YES	1/1/2011 11:00:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	14_2012-04-01_0328.PBC 4/1/2012 3:28:19 AM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 13 cutoff: 5.00E+01%
Energy Calibration
Normalized diff: 0.0572

***** 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
36.52	2151.	9.38	0.77	3.130E-02				
37.98	2880.	7.52	0.77	3.250E-02				
48.78	4817.	6.60	0.78	3.976E-02				
49.91	7782.	4.43	0.78	4.037E-02				
59.64	291261.	0.25	0.75	4.455E-02	59.54	35.700	5.102E+03	AM241
78.34	604.	39.20	0.40	4.853E-02				
88.01	222992.	0.28	0.79	4.914E-02	88.03	3.610	7.026E+04	CD109
105.28	316.	47.04	0.70	4.871E-02				
111.69	119.	98.40	0.44	4.821E-02				
121.97	70281.	0.55	0.82	4.715E-02	122.06	85.600	1.590E+03	CO57
130.99	336.	49.79	0.58	4.603E-02				
136.39	8488.	2.60	0.85	4.530E-02				
165.77	26682.	1.10	0.89	4.093E-02	165.85	79.900	2.377E+03	Ce139
199.09	806.	25.82	0.99	3.627E-02				
236.18	363.	55.45	0.54	3.228E-02				
279.22	628.	29.93	0.98	2.870E-02	279.17	81.500	7.674E+03	Hg203
310.46	356.	48.90	0.73	2.659E-02				
328.88	369.	43.27	0.36	2.550E-02				
365.21	256.	52.80	0.53	2.360E-02				
391.64	13213.	2.00	1.13	2.240E-02	391.69	64.000	4.256E+03	SN113
426.40	227.	77.87	0.36	2.100E-02				
444.14	192.	60.53	0.26	2.036E-02				
469.82	353.	38.19	0.74	1.949E-02				
511.03	2129.	5.83	1.20	1.826E-02				
515.49	168.	62.96	1.21	1.813E-02				
519.01	165.	54.74	1.21	1.804E-02				
524.70	177.	48.12	1.21	1.788E-02				
528.12	183.	52.86	1.22	1.779E-02				
564.55	182.	57.58	0.49	1.687E-02				
598.46	136.	67.06	0.56	1.610E-02				
661.62	86475.	0.39	1.32	1.485E-02	661.66	85.210	1.955E+03	CS137

706.30	187.	52.42	0.35	1.407E-02				
726.37	83.	63.44	0.32	1.375E-02				
834.79	47232.	0.58	1.44	1.225E-02	834.85	99.980	3.019E+03	Mn54
876.24	196.	47.00	0.56	1.175E-02				
897.97	12441.	1.84	1.49	1.151E-02	898.02	93.700	6.661E+03	Y898
934.37	235.	46.78	0.26	1.113E-02				
957.07	131.	78.82	0.51	1.090E-02				
1066.08	224.	58.92	0.49	9.929E-03				
1108.85	81.	73.40	0.58	9.593E-03				
1115.47	30186.	0.90	1.72	9.543E-03	1115.55	50.600	6.527E+03	Zn65
1173.16	88330.	0.39	1.70	9.129E-03	1173.24	99.900	3.183E+03	Co1173
1239.13	132.	41.44	0.54	8.696E-03				
1290.41	49.	53.90	0.32	8.387E-03				
1332.41	79724.	0.37	1.85	8.150E-03	1332.50	99.982	3.215E+03	Co1332
1606.25	86.	38.76	0.59	6.875E-03				
1625.37	39.	42.90	0.68	6.801E-03				
1835.92	7412.	1.27	2.30	6.073E-03	1836.01	99.200	7.106E+03	Y1836
1939.28	15.	54.93	0.67	5.768E-03				

********** 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	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide	
145.29	36.49	19301.	2151.	6.872E+04	9.38	0.772	-	D
151.14	37.96	22005.	2880.	8.860E+04	7.52	0.773	-	D

ORTEC g v - i (3263) Env32 G53W4.25 4/17/2012 11:26:44 AM Page 3
TestAmerica, Inc. Spectrum name: 14_Marn1L2nd_20120346.An1

Channel	Energy	Background	Net area	Eff*Area	Uncert	FWHM	Suspected	
194.30	48.77	48065.	4817.	1.212E+05	6.60	0.784	-	D
198.83	49.90	55460.	7782.	1.928E+05	4.43	0.785	-	D
312.55	78.34	22222.	604.	1.246E+04	39.20	0.403	-	s
420.32	105.28	9313.	316.	6.480E+03	47.04	0.697	-	
445.93	111.69	6796.	119.	2.468E+03	98.40	0.445	-	c
523.13	130.99	9770.	336.	7.303E+03	49.79	0.585	-	s
544.75	136.39	12105.	8488.	1.874E+05	2.60	0.855	-	
795.54	199.09	12158.	806.	2.223E+04	25.82	0.993	-	
943.91	236.18	11470.	363.	1.124E+04	55.45	0.542	-	s
1241.00	310.46	8168.	356.	1.339E+04	48.90	0.726	-	s
1314.69	328.88	7180.	369.	1.447E+04	43.27	0.361	-	s
1460.01	365.21	5703.	256.	1.086E+04	52.80	0.530	-	s
1704.83	426.40	7755.	227.	1.081E+04	77.87	0.358	-	s
1775.77	444.14	4682.	192.	9.416E+03	60.53	0.257	-	s
1878.51	469.82	5629.	353.	1.811E+04	38.19	0.745	-	s
2043.01	510.94	7840.	2882.	1.578E+05	6.78	2.130	-	s
2060.86	515.40	2340.	90.	4.945E+03	80.11	0.346	-	sc
2074.92	518.92	2312.	91.	5.026E+03	78.77	0.401	-	sc
2097.65	524.60	2580.	123.	6.878E+03	63.72	0.716	-	s
2111.32	528.01	2916.	159.	8.936E+03	54.28	0.408	-	s
2257.47	564.55	3600.	182.	1.079E+04	57.58	0.487	-	s
2393.16	598.46	3053.	136.	8.424E+03	67.06	0.561	-	s
2824.62	706.30	2986.	187.	1.331E+04	52.42	0.347	-	s
2904.92	726.37	1345.	83.	6.035E+03	63.44	0.319	-	sc
3504.56	876.24	2926.	196.	1.668E+04	47.00	0.558	-	s
3737.15	934.37	3753.	235.	2.115E+04	46.78	0.260	-	s
3828.01	957.07	3510.	131.	1.202E+04	78.82	0.514	-	sc
4264.20	1066.08	3804.	224.	2.251E+04	58.92	0.495	-	s
4435.38	1108.85	1480.	81.	8.444E+03	73.40	0.578	-	sc
4956.75	1239.13	660.	132.	1.518E+04	41.44	0.537	-	s
5161.96	1290.41	247.	49.	5.882E+03	53.90	0.322	-	s

6426.11	1606.25	277.	86.	1.246E+04	38.76	0.587	-	s
6502.66	1625.37	101.	39.	5.686E+03	42.90	0.682	-	s
7759.31	1939.28	26.	15.	2.658E+03	54.93	0.670	-	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: DET_EnergyStandardMix & Mn, Zn.L

********** 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 1 Sigma %	FWHM keV
AM-241	237.77	59.64	59483.	291261.	80.906	0.25	0.748
CD-109	351.21	88.01	38124.	222992.	61.942	0.28	0.788
CO-57	487.07	121.97	19554.	70281.	19.522	0.55	0.818
Ce-139	662.25	165.77	14453.	26682.	7.412	1.10	0.888
Hg-203	1116.04	279.22	9453.	628.	0.174	29.93	0.982s
SN-113	1565.75	391.64	10900.	13213.	3.670	2.00	1.126
CS-137	2645.83	661.62	6160.	86475.	24.021	0.39	1.322
Mn-54	3338.72	834.79	5919.	47232.	13.120	0.58	1.440
Y-898	3591.53	897.97	7492.	12441.	3.456	1.84	1.488
Zn-65	4461.87	1115.47	6228.	30186.	8.385	0.90	1.722
Co-1173	4692.72	1173.16	3873.	88330.	24.536	0.39	1.704
Co-1332	5330.07	1332.41	974.	79724.	22.146	0.37	1.851
Y-1836	7345.51	1835.92	184.	7412.	2.059	1.27	2.304

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
AM-241		5.1019E+03				1.58E+05	
			59.54	5.102E+03	(	1.996E+01 2.45E-01 3.57E+01	G
CD-109		7.0262E+04				4.63E+02	
			88.03	7.026E+04	(	2.875E+02 2.77E-01 3.61E+00	G
CO-57		1.5904E+03				2.72E+02	
			122.06	1.590E+03	(	1.481E+01 5.54E-01 8.56E+01	G
Ce-139		2.3767E+03				1.38E+02	
			165.85	2.377E+03	(	5.014E+01 1.10E+00 7.99E+01	G
Hg-203		7.6741E+03				4.66E+01	
			279.17	7.674E+03	*(	5.573E+03 2.99E+01 8.15E+01	G
SN-113		4.2555E+03				1.15E+02	

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                                391.69 4.256E+03  (  1.576E+02 2.00E+00 6.40E+01 G

CS-137       1.9553E+03                                          1.10E+04
                                661.66 1.955E+03  (  8.331E+00 3.93E-01 8.52E+01 G
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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

Mn-54        3.0193E+03                                          3.12E+02
                                834.85 3.019E+03  (  2.309E+01 5.83E-01 1.00E+02 G

Y-898        6.6610E+03                                          1.07E+02
                                898.02 6.661E+03  (  2.174E+02 1.84E+00 9.37E+01 G

Zn-65    F   6.5273E+03                                          2.44E+02
                               1115.55 6.527E+03  (  8.011E+01 9.00E-01 5.06E+01 G

Co-1173      3.1829E+03                                          1.93E+03
                               1173.24 3.183E+03  (  1.055E+01 3.89E-01 9.99E+01 G

Co-1332      3.2153E+03                                          1.93E+03
                               1332.50 3.215E+03  (  5.975E+00 3.69E-01 1.00E+02 G

Y-1836       7.1063E+03                                          1.07E+02
                               1836.01 7.106E+03  (  6.328E+01 1.27E+00 9.92E+01 G
   ( - 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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********** 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 1 Sigma %	Activity

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	Time Corrected Activity Bq/Sample	Uncertainty Counting 1 Sigma	MDA Bq/Sample
AM-241	5.0915E+03	5.1019E+03	2.450E-01%	2.00E+01
CD-109	3.4917E+04	7.0262E+04	2.771E-01%	2.88E+02
CO-57	4.8377E+02	1.5904E+03	5.543E-01%	1.48E+01
Ce-139	2.2663E+02	2.3767E+03	1.105E+00%	5.01E+01
Hg-203 #	7.4529E+00	7.6741E+03	2.993E+01%	5.57E+03
SN-113	2.5605E+02	4.2555E+03	1.996E+00%	1.58E+02
CS-137	1.8986E+03	1.9553E+03	3.925E-01%	8.33E+00
Mn-54	1.0717E+03	3.0193E+03	5.831E-01%	2.31E+01
Y-898	3.2040E+02	6.6610E+03	1.840E+00%	2.17E+02
Zn-65	1.7366E+03	6.5273E+03	8.998E-01%	8.01E+01
Co-1173	2.6906E+03	3.1829E+03	3.889E-01%	1.05E+01
Co-1332	2.7180E+03	3.2153E+03	3.687E-01%	5.98E+00
Y-1836	3.4182E+02	7.1063E+03	1.270E+00%	6.33E+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 (59.5 to 1999.4 keV) 5.176E+04 Bq/Sample
Total Decayed Activity (59.5 to 1999.4 keV) 1.2292753E+05 Bq/Sample

Second Source Verification

Detector: Ge16

Geometry: 1L Marn

Reference date 1/1/2011

Calibration Standard: 83924-334

Standard volume g / vial 1

Standard volume transferred in g / geometry 1

lab ID# of cal standard 1L Marn_00002

Isotope	Certified Activity gammas/sec	Geometry Activity gammas/sec	Abundance	Activity Bq/L	Count Results	%recovery
Am-241	1830	1830	0.359	**5097.5**	5095.2	100.0
Cs-137	1705	1705	0.851	**2003.5**	2003.6	100.0
Co-60	3293	3293	0.99974	**3293.9**	3267.4	99.2
Co-60	3294	3294	0.99986	**3294.5**	3265.3	99.1

Reviewed By: Jody Watson

Date: _____

16_1Lmarn2nd_20120385

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     ORTEC g v - i (3263) Env32  G53W4.25  4/24/2012 10:47:24 AM   Page  1
TestAmerica, Inc.               Spectrum name: 16_1Lmarn2nd_20120385.An1

Sample description
     16_1Lmarn2nd_Rad11_042412


Spectrum Filename: C:\User\SPC\Det16\16_1Lmarn2nd_20120385.An1

Acquisition information
       Start time:                 4/24/2012 8:11:06 AM
       Live time:               3600
       Real time:               3890
       Dead time:                  7.46 %
       Detector ID:                   16

Detector system
     Ge16 SN/11012217


Calibration
       Filename:                   16_Liquid_Marinelli 1L.Clb
     16_1Lmarn_90062_032712


       Energy Calibration
            Created:               4/2/2012 6:09:11 PM
            Zero offset:          -0.007 keV
            Gain:                  0.250 keV/channel
            Quadratic:            -1.978E-08 keV/channel^2

       Efficiency Calibration
            Created:               4/2/2012 6:09:24 PM
            Knee Energy:         165.85 keV
            Above the Knee:        Quadratic        Uncertainty =   2.42 %
            Log(Eff):             -2.314705E+00 + ( 2.848008E-01*Log(E) ) +
                                   ( -8.114986E-02*Log(E)^2 )
            Below the Knee:        Quadratic        Uncertainty =   0.26 %
            Log(Eff):             -1.260350E+01 + ( 4.382261E+00*Log(E) ) +
                                   ( -4.889120E-01*Log(E)^2 )

Library Files
       Main analysis library:      DET_EnergyStandardMix & Mn, Zn.L
       Library Match Width:        0.500
       Peak stripping:             Library based

Analysis parameters
       Analysis engine:            Env32   G53W4.25
       Start channel:            150 (    37.50keV )
       Stop channel:            8000 (  1999.23keV )
       Peak rejection level:    1000.000%
       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 (3263) Env32  G53W4.25  4/24/2012 10:47:24 AM   Page  2
TestAmerica, Inc.               Spectrum name: 16_1Lmarn2nd_20120385.An1
                                      Page 1
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Random error: 4.0000000E+00
Systematic error: 4.0000000E+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:	YES	1/1/2011 11:00:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	16_2012-04-01_0336.PBC 4/1/2012 3:36:15 AM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 13 cutoff: 5.00E+01%
Energy Calibration
Normalized diff: 0.0381

***** 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
36.24	2633.	9.05	0.99	4.192E-02				
37.73	3600.	7.28	0.99	4.339E-02				
43.01	1744.	21.30	1.21	4.796E-02				
49.63	17367.	3.62	1.81	5.253E-02				
59.52	364868.	0.24	0.99	5.727E-02	59.54	35.700	4.967E+03	AM241
77.86	1704.	22.69	0.64	6.133E-02				
88.04	270447.	0.27	1.00	6.181E-02	88.03	3.610	6.899E+04	CD109
101.18	167.	75.80	0.36	6.126E-02				
122.08	84451.	0.56	1.05	5.874E-02	122.06	85.600	1.582E+03	CO57
136.49	10430.	2.77	1.05	5.636E-02				
165.86	30802.	1.11	1.08	5.084E-02	165.85	79.900	2.349E+03	Ce139
199.00	1287.	18.47	1.49	4.592E-02				
220.46	244.	83.67	0.48	4.326E-02				
244.11	344.	44.21	0.74	4.070E-02				
278.61	580.	31.95	0.72	3.750E-02				
279.17	24.	799.67	1.20	3.745E-02	279.17	81.500	PBC<MDA	Hg203
294.17	181.	85.14	0.40	3.623E-02				
391.55	16351.	1.89	1.29	2.999E-02	391.69	64.000	4.234E+03	SN113
511.07	3625.	7.09	2.38	2.485E-02				
525.22	222.	43.75	0.56	2.436E-02				
661.61	120063.	0.30	1.51	2.049E-02	661.66	85.210	1.969E+03	CS137
666.12	109.	104.95	1.52	2.038E-02				
701.63	181.	58.10	0.60	1.958E-02				
730.08	88.	91.86	0.38	1.898E-02				
789.34	114.	59.03	0.66	1.784E-02				
834.78	63972.	0.55	1.65	1.706E-02	834.85	99.980	3.017E+03	Mn54
897.97	15428.	1.54	1.68	1.607E-02	898.02	93.700	6.404E+03	Y898
924.86	512.	35.84	0.38	1.569E-02				
935.31	113.	59.08	0.52	1.554E-02				
949.83	207.	52.10	0.44	1.535E-02				
971.39	360.	55.06	0.41	1.506E-02				

1002.30	88.	72.53	0.57	1.468E-02				
1030.28	135.	51.42	0.52	1.434E-02				
1087.52	232.	68.18	0.32	1.370E-02				
1115.47	41218.	0.80	1.85	1.341E-02	1115.55	50.600	6.568E+03	Zn65
1129.46	314.	46.37	0.69	1.327E-02				
1173.16	120613.	0.34	1.91	1.284E-02	1173.24	99.900	3.104E+03	Co1173
1234.16	56.	63.47	0.30	1.229E-02				
1274.33	249.	24.48	1.10	1.195E-02				
1332.42	110205.	0.32	2.04	1.149E-02	1332.50	99.982	3.166E+03	Co1332
1429.54	129.	51.29	0.35	1.079E-02				
1767.54	116.	44.61	0.50	8.895E-03				
1835.87	9468.	1.18	2.26	8.586E-03	1836.01	99.200	6.951E+03	Y1836

********** 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	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide	
144.94	36.24	27063.	2633.	6.282E+04	9.05	0.992	-	D
150.93	37.74	32518.	3600.	8.298E+04	7.28	0.993	-	D

ORTEC g v - i (3263) Env32 G53W4.25 4/24/2012 10:47:24 AM Page 3
TestAmerica, Inc. Spectrum name: 16_1Lmarn2nd_20120385.An1

Channel	Energy	Background	Net area	Eff*Area	Uncert	FWHM	Suspected	
172.01	43.01	42984.	1744.	3.635E+04	21.30	1.213	-	s
198.51	49.63	98747.	17367.	3.306E+05	3.62	1.807	-	s
311.38	77.86	42218.	1704.	2.778E+04	22.69	0.645	-	s
404.67	101.18	7929.	167.	2.726E+03	75.80	0.363	-	sc
545.88	136.49	18327.	10430.	1.851E+05	2.77	1.054	-	
795.88	199.00	15056.	1287.	2.803E+04	18.47	1.487	-	s
881.71	220.46	13032.	244.	5.629E+03	83.67	0.481	-	sc
976.30	244.11	8528.	344.	8.445E+03	44.21	0.740	-	s
1176.53	294.17	7856.	181.	4.995E+03	85.14	0.404	-	sc
2044.14	511.07	12100.	3625.	1.459E+05	7.09	2.382	-	s
2100.73	525.22	3668.	222.	9.092E+03	43.75	0.563	-	s
2664.36	666.11	4888.	226.	1.106E+04	58.38	0.353	-	sM
2806.46	701.63	3626.	181.	9.246E+03	58.10	0.599	-	s
2920.30	730.08	2608.	88.	4.664E+03	91.86	0.378	-	sc
3157.38	789.34	2031.	114.	6.381E+03	59.03	0.661	-	s
3699.64	924.86	7354.	512.	3.260E+04	35.84	0.380	-	s
3741.42	935.31	2172.	113.	7.269E+03	59.08	0.524	-	s
3799.55	949.83	4039.	207.	1.350E+04	52.10	0.442	-	s
3885.79	971.39	7512.	360.	2.386E+04	55.06	0.413	-	s
4009.51	1002.30	1847.	88.	6.007E+03	72.53	0.566	-	sc
4121.46	1030.28	1997.	135.	9.390E+03	51.42	0.518	-	s
4350.52	1087.52	5328.	232.	1.696E+04	68.18	0.319	-	s
4518.33	1129.46	4033.	314.	2.365E+04	46.37	0.690	-	s
4937.37	1234.16	483.	56.	4.557E+03	63.47	0.298	-	s
5098.12	1274.33	833.	249.	2.085E+04	24.48	1.102	-	s
5719.34	1429.54	687.	129.	1.194E+04	51.29	0.347	-	s
7072.37	1767.54	366.	116.	1.304E+04	44.61	0.496	-	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: DET_EnergyStandardMix & Mn, Zn.L

********** 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 1 Sigma %	FWHM keV
AM-241	238.06	59.52	90566.	364868.	101.352	0.24	0.985
CD-109	352.11	88.04	53425.	270447.	75.124	0.27	1.004
CO-57	488.24	122.08	28256.	84451.	23.459	0.56	1.045
Ce-139	663.35	165.86	18928.	30802.	8.556	1.11	1.077
Hg-203	1116.52	279.17	18155.	24.	0.007	799.67	1.200s
SN-113	1566.04	391.55	14418.	16351.	4.542	1.89	1.286
CS-137	2646.33	661.60	11242.	120008.	33.336	0.37	1.500

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TestAmerica, Inc. Spectrum name: 16_1Lmarn2nd_20120385.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Mn-54	3339.17	834.78	9796.	63972.	17.770	0.55	1.647
Y-898	3592.03	897.97	8456.	15428.	4.285	1.54	1.683
Zn-65	4462.34	1115.47	8938.	41218.	11.450	0.80	1.851
Co-1173	4693.23	1173.16	5375.	120613.	33.504	0.34	1.908
Co-1332	5330.61	1332.42	1667.	110205.	30.613	0.32	2.035
Y-1836	7345.92	1835.87	410.	9468.	2.630	1.18	2.257

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
AM-241		4.9673E+03				1.58E+05	
			59.54	4.967E+03	(	1.913E+01 2.41E-01 3.57E+01	G
CD-109		6.8995E+04				4.63E+02	
			88.03	6.899E+04	(	2.755E+02 2.69E-01 3.61E+00	G
CO-57		1.5822E+03				2.72E+02	
			122.06	1.582E+03	(	1.473E+01 5.63E-01 8.56E+01	G
Ce-139		2.3487E+03				1.38E+02	
			165.85	2.349E+03	(	4.909E+01 1.11E+00 7.99E+01	G
Hg-203		2.6780E+02				4.66E+01	
			279.17	2.678E+02	?(	7.085E+03 8.00E+02 8.15E+01	G
SN-113		4.2336E+03				1.15E+02	
			391.69	4.234E+03	(	1.456E+02 1.89E+00 6.40E+01	G
CS-137		1.9683E+03				1.10E+04	
			661.66	1.968E+03	(	8.148E+00 3.66E-01 8.52E+01	G
Mn-54		3.0166E+03				3.12E+02	
			834.85	3.017E+03	(	2.188E+01 5.51E-01 1.00E+02	G
Y-898		6.4044E+03				1.07E+02	
			898.02	6.404E+03	(	1.790E+02 1.54E+00 9.37E+01	G

```
Zn-65    F   6.5677E+03                                        2.44E+02
                         1115.55 6.568E+03  (  7.063E+01 7.98E-01 5.06E+01 G
```

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     ORTEC g v - i (3263) Env32  G53W4.25  4/24/2012 10:47:24 AM   Page  5
 TestAmerica, Inc.              Spectrum name: 16_1Lmarn2nd_20120385.An1

 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

Co-1173      3.1037E+03                                        1.93E+03
                         1173.24 3.104E+03  (  8.862E+00 3.37E-01 9.99E+01 G

Co-1332      3.1665E+03                                        1.93E+03
                         1332.50 3.166E+03  (  5.544E+00 3.18E-01 1.00E+02 G

Y-1836       6.9509E+03                                        1.07E+02
                         1836.01 6.951E+03  (  7.122E+01 1.18E+00 9.92E+01 G
   ( - This peak used in the nuclide activity average.

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

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

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


 *************** D I S C A R D E D  I S O T O P E  P E A K S ***************
 Nuclide Centroid  Background  Net Area   Intensity   Uncert   Activity
           Energy   Counts     Counts     Cts/Sec  1 Sigma %
 ____________________________________________________________________________
   P - Peakbackground subtraction
```

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     ORTEC g v - i (3263) Env32  G53W4.25  4/24/2012 10:47:24 AM   Page  6
 TestAmerica, Inc.              Spectrum name: 16_1Lmarn2nd_20120385.An1


 *****   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   *****
         Time of Count  Time Corrected  Uncertainty  1 Sigma
```

16_1Lmarn2nd_20120385

Nuclide	Activity Bq/Sample	Activity Bq/Sample	Counting	MDA Bq/Sample
AM-241	4.9569E+03	4.9673E+03	2.409E-01%	1.91E+01
CD-109	3.3666E+04	6.8995E+04	2.688E-01%	2.75E+02
CO-57	4.6653E+02	1.5822E+03	5.626E-01%	1.47E+01
Ce-139	2.1061E+02	2.3487E+03	1.106E+00%	4.91E+01
Hg-203 #A	2.1691E-01	2.6780E+02	7.997E+02%	7.08E+03
SN-113	2.3667E+02	4.2336E+03	1.891E+00%	1.46E+02
CS-137	1.9097E+03	1.9683E+03	3.662E-01%	8.15E+00
Mn-54	1.0421E+03	3.0166E+03	5.513E-01%	2.19E+01
Y-898	2.8454E+02	6.4044E+03	1.538E+00%	1.79E+02
Zn-65	1.6878E+03	6.5677E+03	7.982E-01%	7.06E+01
Co-1173	2.6122E+03	3.1037E+03	3.372E-01%	8.86E+00
Co-1332	2.6650E+03	3.1665E+03	3.182E-01%	5.54E+00
Y-1836	3.0883E+02	6.9509E+03	1.183E+00%	7.12E+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 (43.0 to 1999.2 keV) 5.005E+04 Bq/Sample
Total Decayed Activity (43.0 to 1999.2 keV) 1.1330478E+05 Bq/Sample

Second Source Verification

Detector:	Ge17
Geometry:	1L Marn
Reference date	1/1/2011
Calibration Standard:	83924-334
Standard volume g / vial	1
Standard volume transferred in g / geometry	1
lab ID# of cal standard	6675

Isotope	Certified Activity gammas/sec	Geometry Activity gammas/sec	Abundance	Activity Bq/L	Count Results	%recovery
Am-241	1830	1830	0.359	**5097.5**	5027.9	98.6
Cs-137	1705	1705	0.851	**2003.5**	1932.9	96.5
Co-60	3293	3293	0.99974	**3293.9**	3091.2	93.8
Co-60	3294	3294	0.99986	**3294.5**	3117.6	94.6

Reviewed By: Rachael Schneider

Date: 3/13/2012

17_1Lmarn2nd_20120209

```
     ORTEC g v - i (3263) Env32  G53W4.25  3/12/2012 2:00:02 PM    Page  1
TestAmerica, Inc.               Spectrum name: 17_1Lmarn2nd_20120209.An1

Sample description
     17_Marn1L_83924-334_2ndsource_030712


Spectrum Filename: C:\User\SPC\Det17\17_1Lmarn2nd_20120209.An1

Acquisition information
       Start time:                 3/7/2012 11:01:01 PM
       Live time:               3600
       Real time:               3890
       Dead time:                  7.45 %
       Detector ID:                   17

Detector system
     Ge17 SN/11080671


Calibration
       Filename:                   17_Liquid_Marinelli 1L.Clb
     17_1L marn_90062_030512


       Energy Calibration
            Created:               3/7/2012 11:47:12 AM
            Zero offset:           0.135 keV
            Gain:                  0.250 keV/channel
            Quadratic:            -2.115E-08 keV/channel^2

       Efficiency Calibration
            Created:               3/7/2012 11:47:27 AM
            Knee Energy:         165.85 keV
            Above the Knee:        Quadratic        Uncertainty =   2.09 %
            Log(Eff):             -2.094103E+00 + ( 1.788156E-01*Log(E) ) +
                                   ( -7.283143E-02*Log(E)^2 )
            Below the Knee:        Quadratic        Uncertainty =   0.66 %
            Log(Eff):             -1.201018E+01 + ( 4.016685E+00*Log(E) ) +
                                   ( -4.439774E-01*Log(E)^2 )

Library Files
       Main analysis library:      DET_EnergyStandardMix & Mn, Zn.L
       Library Match Width:        0.500
       Peak stripping:             Library based

Analysis parameters
       Analysis engine:            Env32   G53W4.25
       Start channel:            150 (    37.65keV )
       Stop channel:            8000 (  1999.53keV )
       Peak rejection level:    1000.000%
       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 (3263) Env32  G53W4.25  3/12/2012 2:00:02 PM    Page  2
TestAmerica, Inc.               Spectrum name: 17_1Lmarn2nd_20120209.An1
                                      Page 1
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Random error: 4.0000000E+00
Systematic error: 4.0000000E+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:	YES	1/1/2011 11:00:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	17_2012-02-26_0520.PBC 2/26/2012 5:20:29 AM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 13 cutoff: 5.00E+01%
Energy Calibration
Normalized diff: 0.0396

***** 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
36.45	2365.	8.54	0.78	3.661E-02				
37.91	3372.	6.46	0.78	3.779E-02				
42.41	470.	48.38	0.49	4.106E-02				
49.72	9114.	3.85	0.79	4.524E-02				
51.72	3571.	9.79	0.79	4.620E-02				
59.59	317872.	0.25	0.78	4.930E-02	59.54	35.700	5.028E+03	AM241
75.26	183.	110.61	0.81	5.266E-02				
78.24	841.	28.10	0.81	5.300E-02				
88.07	259579.	0.25	0.82	5.359E-02	88.03	3.610	7.114E+04	CD109
122.01	83297.	0.52	0.87	5.180E-02	122.06	85.600	1.568E+03	CO57
136.38	9862.	2.54	0.87	5.011E-02				
165.72	35094.	0.98	0.92	4.604E-02	165.85	79.900	2.338E+03	Ce139
170.83	203.	73.00	0.47	4.507E-02				
183.81	150.	108.32	0.46	4.321E-02				
198.94	1448.	14.51	1.05	4.125E-02				
254.89	675.	21.65	0.76	3.546E-02				
279.09	1160.	18.10	0.89	3.348E-02	279.17	81.500	7.210E+03	Hg203
391.64	18754.	1.41	1.13	2.671E-02	391.69	64.000	4.098E+03	SN113
421.79	353.	37.95	0.39	2.537E-02				
510.92	3542.	6.09	1.97	2.212E-02				
661.63	105165.	0.37	1.35	1.823E-02	661.66	85.210	1.933E+03	CS137
673.47	274.	46.60	0.48	1.798E-02				
703.46	162.	53.59	0.73	1.738E-02				
739.87	151.	60.97	0.72	1.671E-02				
834.84	62790.	0.58	1.48	1.519E-02	834.85	99.980	2.993E+03	Mn54
880.57	163.	47.88	0.73	1.455E-02				
898.06	18825.	1.30	1.53	1.432E-02	898.02	93.700	6.445E+03	Y898
1115.54	41217.	0.72	1.70	1.197E-02	1115.55	50.600	6.432E+03	Zn65
1165.48	173.	44.94	0.62	1.153E-02				
1173.22	109141.	0.34	1.73	1.147E-02	1173.24	99.900	3.091E+03	Co1173
1208.90	97.	39.52	0.75	1.118E-02				

1264.54	37.	74.18	0.33	1.075E-02				
1282.13	132.	41.80	0.39	1.063E-02				
1332.49	98744.	0.33	1.80	1.028E-02	1332.50	99.982	3.118E+03	Co1332
1353.89	62.	62.45	0.43	1.014E-02				
1364.68	83.	52.15	0.46	1.007E-02				
1731.88	50.	45.85	0.33	8.143E-03				
1835.98	11538.	1.07	2.13	7.721E-03	1836.01	99.200	6.921E+03	Y1836

********** 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	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide
145.21	36.44	19211.	2365.	6.462E+04	8.54	0.776	- D
151.07	37.91	22047.	3372.	8.924E+04	6.46	0.778	- D

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TestAmerica, Inc. Spectrum name: 17_1Lmarn2nd_20120209.An1

Channel	Energy	Background	Net area	Eff*Area	Uncert	FWHM	Suspected
169.05	42.41	21991.	470.	1.146E+04	48.38	0.492	- s
197.80	49.60	73487.	10257.	2.267E+05	4.81	1.585	- s
205.80	51.60	54339.	232.	5.021E+03	159.00	0.308	- sc
300.00	75.16	25922.	68.	1.282E+03	377.33	0.000	- sc
311.92	78.14	27362.	920.	1.736E+04	29.53	0.710	-
544.81	136.38	15138.	9862.	1.968E+05	2.54	0.865	-
682.56	170.83	8160.	203.	4.504E+03	73.00	0.467	- c
734.46	183.81	9286.	150.	3.475E+03	108.32	0.457	- c
794.99	198.94	12803.	1448.	3.510E+04	14.51	1.048	- s
1018.72	254.89	7762.	675.	1.904E+04	21.65	0.759	-
1686.21	421.79	5864.	353.	1.391E+04	37.95	0.386	- s
2042.75	510.92	9566.	3542.	1.602E+05	6.09	1.970	- s
2692.97	673.47	4580.	274.	1.524E+04	46.60	0.480	- s
2812.91	703.46	2777.	162.	9.338E+03	53.59	0.726	- s
2958.58	739.87	2952.	151.	9.054E+03	60.97	0.723	- s
3521.48	880.57	2551.	163.	1.123E+04	47.88	0.732	- s
4661.47	1165.48	1769.	173.	1.503E+04	44.94	0.617	- s
4835.24	1208.90	549.	97.	8.678E+03	39.52	0.747	- s
5057.91	1264.54	301.	37.	3.409E+03	74.18	0.331	- sc
5128.29	1282.13	694.	132.	1.237E+04	41.80	0.392	- s
5415.49	1353.89	392.	62.	6.116E+03	62.45	0.430	- s
5458.66	1364.68	417.	83.	8.278E+03	52.15	0.460	- s
6928.47	1731.88	145.	50.	6.181E+03	45.85	0.334	- 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: DET_EnergyStandardMix & Mn, Zn.L

********** 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 1 Sigma %	FWHM keV
AM-241	237.76	59.59	73101.	317872.	88.298	0.25	0.778
CD-109	351.63	88.07	39287.	259579.	72.105	0.25	0.824
CO-57	487.32	122.01	24057.	83297.	23.138	0.52	0.871
Ce-139	662.14	165.72	18515.	35094.	9.748	0.98	0.916
Hg-203	1115.50	279.09	11200.	1160.	0.322	18.10	0.891s

SN-113	1565.63	391.64	11029.	18754.	5.209	1.41	1.132
CS-137	2645.58	661.63	8458.	105165.	29.212	0.37	1.349
Mn-54	3338.50	834.84	10383.	62790.	17.442	0.58	1.482
Y-898	3591.45	898.06	8260.	18825.	5.229	1.30	1.526
Zn-65	4461.62	1115.54	7078.	41217.	11.449	0.72	1.701
Co-1173	4692.44	1173.22	4383.	109141.	30.317	0.34	1.729
Co-1332	5329.83	1332.49	1452.	98744.	27.429	0.33	1.799

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TestAmerica, Inc. Spectrum name: 17_1Lmarn2nd_20120209.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Y-1836	7345.18	1835.98	416.	11538.	3.205	1.07	2.125

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
AM-241		5.0279E+03				1.58E+05		
			59.54	5.028E+03	(	1.997E+01	2.46E-01	3.57E+01 G
CD-109		7.1144E+04				4.63E+02		
			88.03	7.114E+04	(	2.539E+02	2.47E-01	3.61E+00 G
CO-57		1.5684E+03				2.72E+02		
			122.06	1.568E+03	(	1.366E+01	5.20E-01	8.56E+01 G
Ce-139		2.3385E+03				1.38E+02		
			165.85	2.338E+03	(	4.243E+01	9.81E-01	7.99E+01 G
Hg-203		7.2096E+03				4.66E+01		
			279.17	7.210E+03	*(	3.082E+03	1.81E+01	8.15E+01 G
SN-113		4.0978E+03				1.15E+02		
			391.69	4.098E+03	(	1.075E+02	1.41E+00	6.40E+01 G
CS-137		1.9329E+03				1.10E+04		
			661.66	1.933E+03	(	7.927E+00	3.67E-01	8.52E+01 G
Mn-54		2.9929E+03				3.12E+02		
			834.85	2.993E+03	(	2.276E+01	5.82E-01	1.00E+02 G
Y-898		6.4454E+03				1.07E+02		
			898.02	6.445E+03	(	1.459E+02	1.30E+00	9.37E+01 G
Zn-65	F	6.4315E+03				2.44E+02		
			1115.55	6.432E+03	(	6.160E+01	7.21E-01	5.06E+01 G
Co-1173		3.0912E+03				1.93E+03		
			1173.24	3.091E+03	(	8.814E+00	3.44E-01	9.99E+01 G
Co-1332		3.1176E+03				1.93E+03		
			1332.50	3.118E+03	(	5.693E+00	3.34E-01	1.00E+02 G

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

Y-1836       6.9209E+03                                        1.07E+02
                         1836.01 6.921E+03  (  5.864E+01 1.07E+00 9.92E+01 G
   ( - This peak used in the nuclide activity average.

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

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

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


 *************** D I S C A R D E D  I S O T O P E  P E A K S ***************
 Nuclide Centroid  Background  Net Area   Intensity   Uncert   Activity
           Energy   Counts     Counts     Cts/Sec  1 Sigma %
 ____________________________________________________________________________
   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   *****
          Time of Count  Time Corrected  Uncertainty  1 Sigma
 Nuclide     Activity       Activity       Counting                   MDA
                Bq/Sample     Bq/Sample                                 Bq/Sample

 ____________________________________________________________________________
 AM-241       5.0184E+03    5.0279E+03    2.458E-01%                2.00E+01
 CD-109       3.7269E+04    7.1144E+04    2.467E-01%                2.54E+02
 CO-57        5.2187E+02    1.5684E+03    5.199E-01%                1.37E+01
 Ce-139       2.6620E+02    2.3385E+03    9.805E-01%                4.24E+01
```



```
 Hg-203 #     1.1810E+01    7.2096E+03    1.810E+01%                3.08E+03
 SN-113       3.0473E+02    4.0978E+03    1.413E+00%                1.08E+02
```

CS-137	1.8810E+03	1.9329E+03	3.669E-01%	7.93E+00
Mn-54	1.1486E+03	2.9929E+03	5.824E-01%	2.28E+01
Y-898	3.8969E+02	6.4454E+03	1.303E+00%	1.46E+02
Zn-65	1.8907E+03	6.4315E+03	7.214E-01%	6.16E+01
Co-1173	2.6464E+03	3.0912E+03	3.444E-01%	8.81E+00
Co-1332	2.6690E+03	3.1176E+03	3.338E-01%	5.69E+00
Y-1836	4.1844E+02	6.9209E+03	1.071E+00%	5.86E+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 (   42.4 to  1999.5 keV)     5.444E+04  Bq/Sample
Total Decayed Activity (   42.4 to  1999.5 keV) 1.2231852E+05  Bq/Sample
```

Monthly Backgrounds

Test America
St. Louis
Background Check

Spectrum: 5_20191005013_BGLong
Description: Background Long PBC Count
Acquired: 10/5/2019 11:05:47 PM
Detector: Detector # 5
Background Evaluation Criteria:
1) Place instrument out of service if Countrate exceeds Control Limits.
2) Investigate high countrate and take corrective action as necessary if Countrate exceeds Tolerance Limits.

	Target	L_Ctrl	L_Tol	Measured	H_Tol	H_Ctrl	Results
Bkgd Countrate	1.45	1.30	1.35	1.42	1.55	1.60	PASS

Analyst: Shiloh Smith Reviewer: Kellene Robbs

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Sample description
Background Long PBC Count

Spectrum Filename: C:\User\SPC\Det5\5_20191005013_BGLong.An1

Acquisition information

Start time:	10/5/2019 11:05:47 PM
Live time:	72000
Real time:	72284
Dead time:	0.39 %
Detector ID:	5

Detector system
Ge 5 SN/157

Calibration

Filename:	5_QC.Clb

Ge5_QC

Energy Calibration

Created:	2/28/2012 7:35:48 PM
Zero offset:	0.158 keV
Gain:	0.250 keV/channel
Quadratic:	3.911E-08 keV/channel^2

Efficiency Calibration

Created:	1/6/2011 8:03:22 AM
Knee Energy:	0.00 keV
Above the Knee:	Interpolative Uncertainty = 0.00 %
Below the Knee:	Interpolative Uncertainty = 0.00 %

Library Files

Main analysis library:	DET_Long Background PBC.lib
Library Match Width:	0.500
Peak stripping:	Library based

Analysis parameters

Analysis engine:	Env32 G800W064
Start channel:	150 (37.62keV)
Stop channel:	8000 (2000.81keV)
Peak rejection level:	30.000%
Peak search sensitivity:	3
Sample Size:	1.0000E+00 +/- 0.000E+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:	4.0000000E+00
Systematic error:	4.0000000E+00
Fraction Limit:	0.000%
Background width:	3

(Page 2 of 7)

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. 14 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 0.0904

***** 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. DPS	Nuc
46.60	514.	11.19	0.73	5.683E-02	46.54	4.250	2.962E+00	PB210
59.59	185.	21.55	0.49	7.427E-02	59.54	35.900	9.655E-02	AM241
63.39	559.	8.65	0.76	7.937E-02	63.29	3.810	2.571E+00	TH234
75.01	171.	20.26	0.81	9.492E-02				
77.19	132.	25.70	0.82	9.784E-02				
92.62	860.	6.44	1.01	1.129E-01	92.59	5.584	1.895E+00	TH234
					93.35	5.561	1.902E+00	AC228
143.76	150.	29.17	1.94	1.085E-01	143.79	10.960	1.758E-01	U235
					145.44	48.200	4.018E-02	CE141
185.83	361.	15.74	0.84	9.605E-02	185.72	54.000	9.660E-02	U235
					185.99	3.280	1.591E+00	Ra226
511.23	1808.	4.78	2.31	3.834E-02	511.86	20.000	3.278E+00	RH106
609.58	131.	24.27	1.36	3.199E-02	609.31	46.090	1.234E-01	BI214
					610.30	5.750	9.910E-01	RU103
661.86	259.	16.82	1.48	2.860E-02	661.66	85.210	1.474E-01	CS137
1000.07	115.	20.25	0.86	1.860E-02	1001.00	0.837	1.024E+01	PA234M
1119.28	93.	23.39	2.54	1.646E-02	1120.29	15.100	5.196E-01	BI214
					1120.55	99.987	7.849E-02	Sc46
					1121.30	34.900	2.250E-01	Ta182
1766.37	83.	16.88	2.72	1.105E-02	1764.49	15.400	6.773E-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	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide
299.69	74.98	513.	171.	1.800E+03	20.26	0.813	- D
308.38	77.15	509.	132.	1.349E+03	25.70	0.815	- sD
2045.51	511.23	574.	1808.	4.715E+04	4.78	2.310	- 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: DET_Long Background 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 1 Sigma %	FWHM keV
PB-210	185.93	46.60	763.	514.	0.007	11.19	0.731s
AM-241	237.94	59.59	497.	185.	0.003	21.55	0.493s
TH-234	253.16	63.39	561.	559.	0.008	8.65	0.757s
TH-234	370.18	92.62	632.	860.	0.012	6.44	1.010s
U-235	574.91	143.76	508.	150.	0.002	29.17	1.943s
U-235	742.85	185.72	653.	325.	0.005	10.46	0.925D
BI-214	2439.01	609.58	240.	131.	0.002	24.27	1.365
CS-137	2648.15	661.86	280.	259.	0.004	16.82	1.479s
PA-234M	4000.83	1000.07	88.	115.	0.002	20.25	0.856s
BI-214	4477.48	1119.28	76.	93.	0.001	23.39	2.540s
BI-214	7063.57	1766.37	17.	83.	0.001	16.88	2.718s

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 DPS	Peak Energy keV	Peak Activity DPS	Peak Code	Peak MDA Value DPS	COMMENTS
CS-137	I	1.4740E-01				1.10E+04	
			661.66	1.474E-01	@(	4.601E-02 1.68E+01	8.52E+01 G
PB-210	N	2.9616E+00				8.14E+03	
			46.54	2.962E+00	@(	7.566E-01 1.12E+01	4.25E+00 G

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

BI-214   N   1.2339E-01                                      5.84E+05
                          609.31 1.234E-01 ?(  7.055E-02 2.43E+01 4.61E+01 G
                         1120.29 5.196E-01 &   2.421E-01 2.34E+01 1.51E+01 G
                         1764.49 6.773E-01 &   1.789E-01 1.69E+01 1.54E+01 G

TH-234   N   2.5711E+00                                      1.63E+12
                           63.29 2.571E+00 *(  5.204E-01 8.65E+00 3.81E+00 G
                           92.59 1.895E+00 -   2.641E-01 6.44E+00 5.58E+00 G

PA-234M  N   1.0244E+01                                      1.63E+12
                         1001.00 1.024E+01 &(  4.145E+00 2.03E+01 8.37E-01 G
                          766.41 0.000E+00 &   7.633E+00 9.02E+01 2.94E-01 G

U-235    N   1.7576E-01                                      2.57E+11
                          185.72 8.700E-02 }   3.260E-02 1.05E+01 5.40E+01 GA
                          143.79 1.758E-01 *(  1.258E-01 2.92E+01 1.10E+01 G
                          205.33 0.000E+00 %   2.028E-01 4.09E+01 5.01E+00 G
                          163.38 0.000E+00 %   1.862E-01 2.56E+02 5.08E+00 G

AM-241   T   9.6547E-02                                      1.58E+05
                           59.54 9.655E-02  (  5.557E-02 2.16E+01 3.59E+01 G
   ( - 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
```

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M - No MDA Calculation
R - Coincidence Corrected
H - Halflife limit exceeded
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 1 Sigma %	Activity

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 DPS	Uncertainty 1 Sigma Counting	MDA
BE-7	<	2.6197E-01		
NA-22	<	1.4477E-02		
K-40	<	3.9311E-01		
Sc-46	<	1.5768E-02		
CR-51	<	1.2518E-01		
MN-54	<	2.4995E-02		
FE-59	<	5.3942E-02		
Co-56	<	2.6088E-02		
CO-57	<	8.9763E-03		
CO-58	<	2.3428E-02		
CO-60	<	3.1976E-02		
ZN-65	<	4.7530E-02		
NB-94	<	2.6190E-02		
ZR-95	<	3.8214E-02		
NB-95	<	2.7442E-02		
RU-103	<	1.6317E-02		
RH-106	<	2.0243E-01		
AG-108M	<	1.5486E-02		
AG-110M	<	2.4611E-02		
SN-113	<	2.4116E-02		
SB-124	<	1.3372E-02		
SB-125	<	5.0767E-02		
I-131	<	1.6940E-02		
BA-133	<	3.1711E-02		
CS-134	<	2.8969E-02		
CS-137	#	1.4740E-01	1.6825E+01%	4.601E-02
CE-139	<	1.1582E-02		
Ba-140	<	7.5442E-02		
La-140	<	3.1494E-02		
CE-141	<	1.2784E-02		
CE-144	<	1.1868E-01		
PM-144	<	2.4582E-02		
EU-152	<	9.3326E-02		
EU-154	<	3.3727E-01		

EU-155	<	3.8788E-02		
HF-181	<	3.1793E-02		
Ta-182	<	1.3060E-01		
Hg-203	<	1.6978E-02		
TL-208	<	2.5751E-02		
pm-146	<	6.4296E-02		
y-88	<	2.8781E-02		
PB-210	#	2.9616E+00	1.1187E+01%	7.566E-01
PB-212	<	2.4971E-02		
PB-214	<	5.8114E-02		
BI-207	<	3.0300E-02		
BI-212	<	3.9139E-01		
BI-214	#	1.2339E-01	2.4272E+01%	7.055E-02
BI-210M	<	2.2460E-02		
RA-224	<	2.7434E-01		
AC-228	<	9.3257E-02		
TH-227	<	8.8975E-02		
TH-229	<	2.3361E-01		
TH-234	#	2.5711E+00	8.6485E+00%	5.204E-01
PA-231	<	6.9884E-01		
PA-233	<	3.4113E-02		
PA-234	<	6.2991E-02		
PA-234M		1.0244E+01	2.0254E+01%	4.145E+00
U-235	#	1.7576E-01	2.9166E+01%	1.258E-01
AM-241		9.6547E-02	2.1554E+01%	5.557E-02
Np-237	<	9.9956E-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 (37.6 to 2000.8 keV) 1.632E+01 DPS

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Test America
St. Louis
Background Check

Spectrum: 8_20191005015_BGLong
Description: Background Long PBC Count
Acquired: 10/5/2019 11:01:15 PM
Detector: Detector # 8
Background Evaluation Criteria:
1) Place instrument out of service if Countrate exceeds Control Limits.
2) Investigate high countrate and take corrective action as necessary if Countrate exceeds Tolerance Limits.

	Target	L_Ctrl	L_Tol	Measured	H_Tol	H_Ctrl	Results
Bkgd Countrate	1.56	1.39	1.45	1.59	1.68	1.74	PASS

Analyst: Shiloh Smith Reviewer: Kellene Robbs

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Sample description
Background Long PBC Count

Spectrum Filename: C:\User\SPC\Det8\8_20191005015_BGLong.An1

Acquisition information
Start time: 10/5/2019 11:01:15 PM
Live time: 72000
Real time: 73778
Dead time: 2.41 %
Detector ID: 8

Detector system
Ge 8 SN/174

Calibration
Filename: 8_QC.Clb
Ge8_QC

Energy Calibration
Created: 2/28/2012 10:34:41 AM
Zero offset: 0.052 keV
Gain: 0.250 keV/channel
Quadratic: 5.282E-10 keV/channel^2

Efficiency Calibration
Created: 1/6/2011 8:07:20 AM
Knee Energy: 0.00 keV
Above the Knee: Interpolative Uncertainty = 0.00 %
Below the Knee: Interpolative Uncertainty = 0.00 %

Library Files
Main analysis library: DET_Long Background PBC.lib
Library Match Width: 0.500
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G800W064
Start channel: 150 (37.55keV)
Stop channel: 8000 (1999.97keV)
Peak rejection level: 30.000%
Peak search sensitivity: 3
Sample Size: 1.0000E+00 +/- 0.000E+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: 4.0000000E+00
Systematic error: 4.0000000E+00
Fraction Limit: 0.000%
Background width: 3

(Page 2 of 8)

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. 22 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 0.1174

***** 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. DPS	Nuc
59.49	390.	10.42	1.02	8.681E-02	59.54	35.900	1.736E-01	AM241
63.30	1022.	4.86	1.03	9.243E-02	63.29	3.810	4.030E+00	TH234
92.62	1918.	4.55	1.19	1.295E-01	92.59	5.584	3.683E+00	TH234
					93.35	5.561	3.696E+00	AC228
143.90	249.	19.12	0.71	1.247E-01	143.79	10.960	2.532E-01	U235
185.73	1049.	5.73	0.98	1.108E-01	185.72	54.000	2.436E-01	U235
					185.99	3.280	4.014E+00	Ra226
238.67	256.	17.87	1.02	9.638E-02	238.63	43.300	8.519E-02	PB212
351.73	185.	20.14	0.89	6.563E-02	351.93	37.600	1.042E-01	PB214
510.87	1442.	6.16	2.30	4.531E-02	511.86	20.000	2.213E+00	RH106
569.30	106.	27.20	1.85	4.064E-02	569.70	97.740	3.712E-02	BI207
					569.32	15.380	2.357E-01	CS134
					569.47	8.200	4.423E-01	PA234
583.12	150.	20.13	0.97	3.958E-02	583.02	84.500	6.243E-02	TL208
609.64	174.	26.28	1.25	3.750E-02	609.31	46.090	1.394E-01	BI214
					610.30	5.750	1.120E+00	RU103
661.56	219.	14.62	1.72	3.334E-02	661.66	85.210	1.072E-01	CS137
1000.75	132.	22.79	0.59	2.158E-02	1001.00	0.837	1.018E+01	PA234M
1173.27	86.	26.16	1.34	1.834E-02	1173.24	99.900	6.520E-02	CO60
1332.94	163.	13.76	1.64	1.637E-02	1332.50	99.980	1.383E-01	CO60
1460.46	130.	16.40	0.96	1.543E-02	1460.83	10.670	1.093E+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	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide
2043.40	510.87	702.	1442.	3.182E+04	6.16	2.300	-

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

This section based on library: DET_Long Background 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 1 Sigma %	FWHM keV
AM-241	237.95	59.54	683.	390.	0.005	10.75	1.022D
TH-234	252.96	63.29	721.	1022.	0.014	4.86	1.025D
TH-234	370.28	92.62	1217.	1918.	0.027	4.55	1.191
U-235	575.44	143.90	607.	249.	0.003	19.12	0.714s
U-235	742.71	185.72	669.	1091.	0.015	19.25	0.984A
PB-212	954.54	238.67	525.	256.	0.004	17.87	1.017
PB-214	1406.80	351.73	328.	185.	0.003	20.14	0.892s
BI-207	2277.11	569.30	190.	106.	0.001	27.20	1.847s
TL-208	2332.39	583.12	177.	150.	0.002	20.13	0.972s
BI-214	2438.47	609.64	346.	174.	0.002	26.28	1.255
CS-137	2646.17	661.56	187.	219.	0.003	14.62	1.720s
PA-234M	4003.02	1000.75	123.	132.	0.002	22.79	0.589s
CO-60	4693.10	1173.27	84.	86.	0.001	26.16	1.344s
CO-60	5331.80	1332.94	51.	163.	0.002	13.76	1.641s
K-40	5841.90	1460.46	50.	130.	0.002	16.40	0.956s

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

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

Name	Nuclide Code	Average Activity DPS	Peak Energy keV	Peak Activity DPS	Peak Code	MDA Value DPS	COMMENTS
K-40	N	1.0927E+00				4.66E+11	
			1460.83	1.093E+00	(	2.995E-01 1.64E+01 1.07E+01 G	

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Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CO-60	F	1.3830E-01					1.93E+03	
			1332.50	1.383E-01	*(	3.053E-02	1.38E+01	1.00E+02 G
			1173.24	6.520E-02	-	3.444E-02	2.62E+01	9.99E+01 G
CS-137	I	1.0722E-01					1.10E+04	
			661.66	1.072E-01	(	3.245E-02	1.46E+01	8.52E+01 G
TL-208	N	6.2425E-02					6.98E+02	
			583.02	6.243E-02	(	2.685E-02	2.01E+01	8.45E+01 G
			277.28	0.000E+00	&	1.524E-01	1.52E+02	6.31E+00 G
			860.56	0.000E+00	%	1.786E-01	5.46E+01	1.24E+01 G
PB-212	N	8.5193E-02					6.98E+02	
			238.63	8.519E-02	(	3.643E-02	1.79E+01	4.33E+01 G
			300.03	0.000E+00	%	3.260E-01	7.39E+01	3.28E+00 GA
PB-214	N	1.0421E-01					5.84E+05	
			351.93	1.042E-01	(	4.906E-02	2.01E+01	3.76E+01 G
			295.09	0.000E+00	%	5.597E-02	3.52E+01	1.93E+01 G
			242.00	0.000E+00		2.079E-01	0.00E+00	7.43E+00 GA
BI-207	C	3.7122E-02					1.18E+04	
			569.70	3.712E-02	(	2.340E-02	2.72E+01	9.77E+01 G
			1063.66	0.000E+00	%	3.668E-02	2.52E+02	7.45E+01 G
BI-214	N	1.3944E-01					5.84E+05	
			609.31	1.394E-01	(	7.189E-02	2.63E+01	4.61E+01 G
			1120.29	0.000E+00	%	1.689E-01	4.56E+01	1.51E+01 G
			1764.49	0.000E+00	%	2.461E-01	1.00E+03	1.54E+01 G
TH-234	N	3.8238E+00					1.63E+12	
			63.29	4.030E+00	(	5.040E-01	4.86E+00	3.81E+00 G
			92.59	3.683E+00	(	3.175E-01	4.55E+00	5.58E+00 G
PA-234M	N	1.0177E+01					1.63E+12	
			1001.00	1.018E+01	(	4.178E+00	2.28E+01	8.37E-01 G
			766.41	0.000E+00	%	6.635E+00	4.79E+01	2.94E-01 G
U-235	N	2.5324E-01					2.57E+11	
			185.72	2.532E-01	}	2.861E-02	1.93E+01	5.40E+01 GA
			143.79	2.532E-01	@(	1.193E-01	1.91E+01	1.10E+01 G
			205.33	0.000E+00	%	1.764E-01	3.95E+01	5.01E+00 G
			163.38	0.000E+00	%	1.736E-01	4.46E+01	5.08E+00 G
AM-241	T	1.7356E-01					1.58E+05	
			59.54	1.736E-01	?(	5.543E-02	1.07E+01	3.59E+01 G

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```
  ( - This peak used in the nuclide activity average.

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

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

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


*************** D I S C A R D E D  I S O T O P E  P E A K S ***************
Nuclide Centroid  Background  Net Area   Intensity   Uncert   Activity
          Energy   Counts     Counts     Cts/Sec  1 Sigma %
_____________________________________________________________________________
  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   *****
        Time of Count   Uncertainty  1 Sigma
Nuclide    Activity        Counting                    MDA
              DPS
_____________________________________________________________________________
BE-7    <    1.4039E-01
NA-22   <    3.7350E-02
K-40         1.0927E+00   1.6404E+01%               2.995E-01
Sc-46   <    2.4897E-02
CR-51   <    1.0919E-01
MN-54   <    2.2331E-02
FE-59   <    4.9463E-02
Co-56   <    2.0949E-02
CO-57   <    1.1850E-02
CO-58   <    2.4885E-02
```

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CO-60		1.3830E-01	1.3759E+01%	3.053E-02
ZN-65	<	5.3551E-02		
NB-94	<	1.9827E-02		
ZR-95	<	3.7020E-02		
NB-95	<	2.9132E-02		
RU-103	<	1.6788E-02		
RH-106	<	2.9891E-01		
AG-108M	<	1.5456E-02		
AG-110M	<	1.7406E-02		
SN-113	<	2.4161E-02		
SB-124	<	2.0000E-02		
SB-125	<	5.3128E-02		
I-131	<	1.6374E-02		
BA-133	<	3.8327E-02		
CS-134	<	2.3580E-02		
CS-137	#	1.0722E-01	1.4620E+01%	3.245E-02
CE-139	<	1.0864E-02		
Ba-140	<	6.7534E-02		
La-140	<	2.9746E-02		
CE-141	<	1.3152E-02		
CE-144	<	8.7434E-02		
PM-144	<	2.2774E-02		
EU-152	<	6.5862E-02		
EU-154	<	2.6403E-01		
EU-155	<	3.8599E-02		
HF-181	<	2.0632E-02		
Ta-182	<	9.8678E-02		
Hg-203	<	1.4473E-02		
TL-208		6.2425E-02	2.0131E+01%	2.685E-02
pm-146	<	5.4441E-02		
y-88	<	2.1008E-02		
PB-210	<	4.0673E-01		
PB-212		8.5193E-02	1.7873E+01%	3.643E-02
PB-214		1.0421E-01	2.0136E+01%	4.906E-02
BI-207		3.7122E-02	2.7199E+01%	2.340E-02
BI-212	<	3.8241E-01		
BI-214		1.3944E-01	2.6282E+01%	7.189E-02
BI-210M	<	1.8907E-02		
RA-224	<	3.7417E-01		
AC-228	<	1.0308E-01		
TH-227	<	1.2174E-01		
TH-229	<	2.0905E-01		
TH-234		3.8238E+00	3.3261E+00%	5.040E-01
PA-231	<	3.7421E-01		
PA-233	<	3.0256E-02		
PA-234	<	5.4607E-02		
PA-234M		1.0177E+01	2.2786E+01%	4.178E+00
U-235		2.5324E-01	1.9115E+01%	1.193E-01
AM-241	#	1.7356E-01	1.0749E+01%	5.543E-02

Np-237 < 1.0271E-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 (   37.5 to  2000.0 keV)     1.619E+01  DPS
```

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Test America
St. Louis
Background Check

Spectrum: 9_20191005003_BGLong
Description: Background Long PBC Count
Acquired: 10/5/2019 11:20:47 PM
Detector: Detector # 9
Background Evaluation Criteria:
1) Place instrument out of service if Countrate exceeds Control Limits.
2) Investigate high countrate and take corrective action as necessary if Countrate exceeds Tolerance Limits.

	Target	L_Ctrl	L_Tol	Measured	H_Tol	H_Ctrl	Results
Bkgd Countrate	1.89	1.53	1.65	1.79	2.14	2.26	PASS

Analyst: Shiloh Smith Reviewer: kody Saulters

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Test America
St. Louis
Background Check

Spectrum: 12_20191005015_BGLong
Description: Background Long PBC Count
Acquired: 10/5/2019 11:22:44 PM
Detector: Detector #12
Background Evaluation Criteria:
1) Place instrument out of service if Countrate exceeds Control Limits.
2) Investigate high countrate and take corrective action as necessary if Countrate exceeds Tolerance Limits.

	Target	L_Ctrl	L_Tol	Measured	H_Tol	H_Ctrl	Results
Bkgd Countrate	2.00	1.89	1.93	1.97	2.07	2.10	PASS

Analyst: Shiloh Smith Reviewer: kody Saulters

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Test America
St. Louis
Background Check

Spectrum: 14_20191005009_BGLong
Description: Background Long PBC Count
Acquired: 10/5/2019 11:21:47 PM
Detector: Detector #14
Background Evaluation Criteria:
1) Place instrument out of service if Countrate exceeds Control Limits.
2) Investigate high countrate and take corrective action as necessary if Countrate exceeds Tolerance Limits.

	Target	L_Ctrl	L_Tol	Measured	H_Tol	H_Ctrl	Results
Bkgd Countrate	1.80	1.66	1.71	1.79	1.90	1.94	PASS

Analyst: Shiloh Smith Reviewer: kody Saulters

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Sample description
Background Long PBC Count

Spectrum Filename: C:\User\SPC\Det14\14_20191005009_BGLong.An1

Acquisition information
Start time: 10/5/2019 11:21:47 PM
Live time: 72000
Real time: 72029
Dead time: 0.04 %
Detector ID: 14

Detector system
Ge14 SN/11080670

Calibration
Filename: 14_QC.Clb
14_QC_79670-334_SOURCE E_042211

Energy Calibration
Created: 2/28/2012 10:48:23 AM
Zero offset: 0.130 keV
Gain: 0.250 keV/channel
Quadratic: -2.050E-08 keV/channel^2

Efficiency Calibration
Created: 5/1/2011 8:43:09 AM
Knee Energy: 0.00 keV
Above the Knee: Interpolative Uncertainty = 0.00 %
Below the Knee: Interpolative Uncertainty = 0.00 %

Library Files
Main analysis library: DET_Long Background PBC.lib
Library Match Width: 0.500
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G800W064
Start channel: 150 (37.64keV)
Stop channel: 8000 (1999.51keV)
Peak rejection level: 30.000%
Peak search sensitivity: 3
Sample Size: 1.0000E+00 +/- 0.000E+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: 4.0000000E+00
Systematic error: 4.0000000E+00
Fraction Limit: 0.000%
Background width: 3

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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. 19 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 0.3366

***** 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. DPS	Nuc
46.62	770.	7.92	0.88	6.133E-02	46.54	4.250	4.108E+00	PB210
63.32	567.	9.15	0.82	8.541E-02	63.29	3.810	2.422E+00	TH234
75.08	237.	17.99	0.78	1.023E-01				
77.15	197.	20.52	0.78	1.053E-01				
84.69	253.	22.70	0.91	1.158E-01				
92.68	949.	7.49	1.14	1.215E-01	92.59	5.584	1.943E+00	TH234
					93.35	5.561	1.950E+00	AC228
185.43	578.	10.79	1.02	1.072E-01	185.72	54.000	1.387E-01	U235
238.29	304.	13.45	0.92	9.398E-02	238.63	43.300	1.039E-01	PB212
294.99	250.	20.43	1.17	7.975E-02	295.09	19.300	2.258E-01	PB214
351.67	344.	11.49	0.86	6.553E-02	351.93	37.600	1.939E-01	PB214
510.61	1922.	4.43	2.74	4.543E-02	511.86	20.000	2.945E+00	RH106
582.99	182.	17.57	1.25	3.931E-02	583.02	84.500	7.611E-02	TL208
608.91	296.	16.50	1.51	3.708E-02	609.31	46.090	2.404E-01	BI214
					610.30	5.750	1.931E+00	RU103
1119.71	94.	23.11	1.98	1.998E-02	1120.29	15.100	4.328E-01	BI214
					1120.55	99.987	6.538E-02	Sc46
					1121.30	34.900	1.875E-01	Ta182
1460.66	155.	17.52	2.30	1.557E-02	1460.83	10.670	1.298E+00	K40
1765.00	142.	15.88	0.58	1.327E-02	1764.49	15.400	9.651E-01	BI214

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********** 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	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide
299.70	75.04	789.	237.	2.314E+03	17.99	0.778	- D
308.00	77.12	715.	197.	1.866E+03	20.52	0.780	- D
338.13	84.41	962.	253.	2.184E+03	22.70	0.913	- s
2041.56	510.61	580.	1922.	4.231E+04	4.43	2.742	- 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: DET_Long Background 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 1 Sigma %	FWHM keV
PB-210	185.90	46.62	842.	770.	0.011	7.92	0.879s
TH-234	252.67	63.32	750.	567.	0.008	9.15	0.823s
TH-234	370.10	92.68	1120.	949.	0.013	7.49	1.140s
U-235	740.99	185.43	864.	578.	0.008	10.79	1.016s
PB-212	952.37	238.29	456.	304.	0.004	13.45	0.923
PB-214	1179.15	294.99	567.	250.	0.003	20.43	1.168s
PB-214	1405.85	351.67	317.	344.	0.005	11.49	0.855s
TL-208	2331.09	582.99	210.	182.	0.003	17.57	1.251s
BI-214	2434.77	608.91	404.	296.	0.004	16.50	1.514
BI-214	4478.40	1119.71	84.	94.	0.001	23.11	1.979
K-40	5842.89	1460.66	72.	155.	0.002	17.52	2.296s
BI-214	7061.12	1765.00	44.	142.	0.002	15.88	0.583s

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 DPS	Peak Energy keV	Peak Activity DPS	Peak Code	Peak MDA Value DPS	COMMENTS
K-40	N	1.2983E+00				4.66E+11	
			1460.83	1.298E+00	*(	3.524E-01 1.75E+01 1.07E+01	G

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

TL-208   N   7.6107E-02                                      6.98E+02
                          583.02 7.611E-02 @(  2.937E-02 1.76E+01 8.45E+01 G
                          277.28 0.000E+00 &   1.739E-01 1.00E+03 6.31E+00 G
                          860.56 0.000E+00 &   1.727E-01 1.11E+02 1.24E+01 G

PB-210   N   4.1083E+00                                      8.14E+03
                           46.54 4.108E+00  (  7.366E-01 7.92E+00 4.25E+00 G

PB-212   N   1.0385E-01                                      6.98E+02
                          238.63 1.039E-01  (  3.492E-02 1.35E+01 4.33E+01 G
                          300.03 0.000E+00 %   3.472E-01 1.42E+02 3.28E+00 GA

PB-214   N   2.0473E-01                                      5.84E+05
                          351.93 1.939E-01 *(  4.837E-02 1.15E+01 3.76E+01 G
                          295.09 2.258E-01 *(  1.026E-01 2.04E+01 1.93E+01 G
                          242.00 0.000E+00     2.136E-01 0.00E+00 7.43E+00 GA

BI-214   N   2.4040E-01                                      5.84E+05
                          609.31 2.404E-01  (  7.833E-02 1.65E+01 4.61E+01 G
                         1120.29 4.328E-01 +   2.091E-01 2.31E+01 1.51E+01 G
                         1764.49 9.651E-01 +   2.285E-01 1.59E+01 1.54E+01 G

TH-234   N   2.4220E+00                                      1.63E+12
                           63.29 2.422E+00  (  5.565E-01 9.15E+00 3.81E+00 G
                           92.59 1.943E+00 -   3.249E-01 7.49E+00 5.58E+00 G

U-235    N   1.3868E-01                                      2.57E+11
                          185.72 1.387E-01 *   3.353E-02 1.08E+01 5.40E+01 GA
                          143.79 0.000E+00 %   9.240E-02 3.51E+01 1.10E+01 G
                          205.33 0.000E+00 %   2.127E-01 1.00E+03 5.01E+00 G
                          163.38 0.000E+00 &   2.008E-01 6.60E+01 5.08E+00 G
   ( - 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 1 Sigma %	Activity

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 DPS	Uncertainty 1 Sigma Counting	MDA
BE-7	<	2.3812E-01		
NA-22	<	3.9741E-02		
K-40	#	1.2983E+00	1.7520E+01%	3.524E-01
Sc-46	<	3.4989E-02		
CR-51	<	1.1931E-01		
MN-54	<	2.0674E-02		
FE-59	<	4.1976E-02		
Co-56	<	2.1967E-02		
CO-57	<	1.5954E-02		
CO-58	<	1.4451E-02		
CO-60	<	2.8517E-02		
ZN-65	<	8.2435E-02		
NB-94	<	2.2678E-02		
ZR-95	<	3.9446E-02		
NB-95	<	3.8306E-02		
RU-103	<	1.4201E-02		
RH-106	<	1.9419E-01		
AG-108M	<	1.4406E-02		
AG-110M	<	3.1054E-02		
SN-113	<	1.9735E-02		
SB-124	<	2.7210E-02		
SB-125	<	4.5161E-02		
I-131	<	1.6091E-02		
BA-133	<	3.3514E-02		

CS-134	<	1.9502E-02		
CS-137	<	2.4652E-02		
CE-139	<	1.6522E-02		
Ba-140	<	5.5906E-02		
La-140	<	2.7610E-02		
CE-141	<	2.1011E-02		
CE-144	<	9.4954E-02		
PM-144	<	2.3107E-02		
EU-152	<	5.7197E-02		
EU-154	<	1.8386E-01		
EU-155	<	3.7052E-02		
HF-181	<	2.3457E-02		
Ta-182	<	9.0584E-02		
Hg-203	<	2.4089E-02		
TL-208	#	7.6107E-02	1.7565E+01%	2.937E-02
pm-146	<	5.6706E-02		
y-88	<	2.4123E-02		
PB-210	#	4.1083E+00	7.9243E+00%	7.366E-01
PB-212		1.0385E-01	1.3451E+01%	3.492E-02
PB-214	#	2.0473E-01	1.1493E+01%	4.837E-02
BI-207	<	3.1504E-02		
BI-212	<	4.9338E-01		
BI-214		2.4040E-01	1.6505E+01%	7.833E-02
BI-210M	<	2.1536E-02		
RA-224	<	4.1307E-01		
AC-228	<	1.1150E-01		
TH-227	<	1.1214E-01		
TH-229	<	2.2733E-01		
TH-234	#	2.4220E+00	9.1475E+00%	5.565E-01
PA-231	<	4.7334E-01		
PA-233	<	3.0638E-02		
PA-234	<	7.1750E-02		
PA-234M	<	2.7232E+00		
Ra-226	<	6.4906E-01		
U-235	#	1.3868E-01	1.0794E+01%	3.353E-02
AM-241	<	3.3398E-02		
Np-237	<	6.1511E-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

TestAmerica Inc Spectrum name: 14_20191005009_BGLong.An1

---------- S U M M A R Y ----------
Total Activity (37.6 to 1999.5 keV) 8.592E+00 DPS

(Page 8 of 8)

Test America
St. Louis
Background Check

Spectrum: 16_20191005009_BGLong
Description: Background Long PBC Count
Acquired: 10/5/2019 11:24:33 PM
Detector: Detector #16
Background Evaluation Criteria:
1) Place instrument out of service if Countrate exceeds Control Limits.
2) Investigate high countrate and take corrective action as necessary if Countrate exceeds Tolerance Limits.

	Target	L_Ctrl	L_Tol	Measured	H_Tol	H_Ctrl	Results
Bkgd Countrate	2.68	2.51	2.56	2.66	2.80	2.86	PASS

Analyst: Shiloh Smith Reviewer:

(Page 1 of 8)

Sample description
Background Long PBC Count

Spectrum Filename: C:\User\SPC\Det16\16_20191005009_BGLong.An1

Acquisition information
Start time: 10/5/2019 11:24:33 PM
Live time: 72000
Real time: 72092
Dead time: 0.13 %
Detector ID: 16

Detector system
Ge16 SN/11012217

Calibration
Filename: 16_QC.Clb
16_QC-G_081311

Energy Calibration
Created: 2/28/2012 9:35:31 AM
Zero offset: 0.050 keV
Gain: 0.250 keV/channel
Quadratic: -2.285E-08 keV/channel^2

Efficiency Calibration
Created: 8/14/2011 1:15:14 PM
Knee Energy: 0.00 keV
Above the Knee: Interpolative Uncertainty = 0.00 %
Below the Knee: Interpolative Uncertainty = 0.00 %

Library Files
Main analysis library: DET_Long Background PBC.lib
Library Match Width: 0.500
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G800W064
Start channel: 150 (37.57keV)
Stop channel: 8000 (1999.64keV)
Peak rejection level: 30.000%
Peak search sensitivity: 3
Sample Size: 1.0000E+00 +/- 0.000E+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: 4.0000000E+00
Systematic error: 4.0000000E+00
Fraction Limit: 0.000%
Background width: 3

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. 27 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 0.1936

***** 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. DPS	Nuc
46.46	1624.	5.49	1.00	7.061E-02	46.54	4.250	7.505E+00	PB210
59.49	229.	21.27	0.97	8.946E-02	59.54	35.900	9.885E-02	AM241
63.25	956.	6.22	0.97	9.489E-02	63.29	3.810	3.670E+00	TH234
72.70	198.	27.40	0.98	1.086E-01				
74.89	488.	11.76	0.99	1.117E-01				
77.19	355.	15.76	0.99	1.151E-01				
84.34	454.	16.94	1.33	1.255E-01				
89.49	153.	29.32	1.00	1.309E-01				
92.60	1365.	4.74	1.00	1.312E-01	92.59	5.584	2.587E+00	TH234
					93.35	5.561	2.596E+00	AC228
143.98	195.	29.45	1.03	1.260E-01	143.79	10.960	1.959E-01	U235
185.72	690.	10.67	0.88	1.130E-01	185.72	54.000	1.569E-01	U235
					185.99	3.280	2.585E+00	Ra226
198.44	218.	26.69	1.69	1.096E-01				
238.55	536.	10.31	1.19	9.904E-02	238.63	43.300	1.736E-01	PB212
241.95	154.	27.55	1.14	9.813E-02	242.00	7.430	2.931E-01	PB214
					240.99	4.100	5.296E-01	RA224
295.46	240.	24.87	1.28	8.399E-02	295.09	19.300	2.054E-01	PB214
351.73	546.	10.55	1.36	6.911E-02	351.93	37.600	2.920E-01	PB214
511.22	2537.	4.61	2.58	4.932E-02	511.86	20.000	3.576E+00	RH106
583.47	209.	20.74	2.44	4.377E-02	583.02	84.500	7.860E-02	TL208
609.45	496.	13.35	1.61	4.173E-02	609.31	46.090	3.581E-01	BI214
					610.30	5.750	2.875E+00	RU103
911.49	224.	20.08	4.03	2.646E-02	911.16	29.000	4.055E-01	AC228
1001.06	123.	27.06	2.50	2.469E-02	1001.00	0.837	8.255E+00	PA234M
1275.26	92.	29.30	0.50	1.985E-02	1274.53	99.940	6.419E-02	NA22
					1274.54	35.190	1.823E-01	EU154

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1461.37	316.	10.72	2.62	1.797E-02	1460.83	10.670	2.287E+00	K40
1765.38	204.	16.29	2.70	1.550E-02	1764.49	15.400	1.187E+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 Channel	Centroid Energy	Background Counts	Net Area Counts	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide
290.45	72.68	1378.	198.	1.827E+03	27.40	0.984	- sD
299.20	74.87	1403.	488.	4.366E+03	11.76	0.986	- D
308.40	77.17	1385.	355.	3.083E+03	15.76	0.988	- D
337.00	84.34	1560.	454.	3.619E+03	16.94	1.334	- sM
357.57	89.52	925.	153.	6.899E+02	29.32	0.999	- sD
793.19	198.44	947.	218.	1.985E+03	26.69	1.691	- s
2043.98	511.22	1192.	2537.	5.145E+04	4.61	2.584	- M

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: DET_Long Background 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 1 Sigma %	FWHM keV
PB-210	185.54	46.46	1517.	1624.	0.023	5.49	1.000s
AM-241	237.83	59.54	1069.	229.	0.003	21.29	0.971D
TH-234	252.82	63.29	1288.	956.	0.013	6.22	0.975D
TH-234	369.98	92.59	1791.	1173.	0.016	5.88	1.002D
AC-228	373.02	93.35	2571.	302.	0.004	24.44	1.003D
U-235	575.46	143.98	1034.	195.	0.003	29.45	1.032
U-235	742.34	185.72	1232.	661.	0.009	7.93	0.881D
PB-212	953.91	238.63	837.	546.	0.008	8.62	1.136D
PB-214	967.37	242.00	821.	154.	0.002	27.55	1.139D
PB-214	1181.16	295.46	831.	240.	0.003	24.87	1.275
PB-214	1406.16	351.73	665.	546.	0.008	10.55	1.358
TL-208	2332.96	583.47	387.	209.	0.003	20.74	2.438s
BI-214	2436.87	609.45	667.	496.	0.007	13.35	1.615s
AC-228	3645.05	911.49	300.	224.	0.003	20.08	4.029s
PA-234M	4003.41	1001.06	203.	123.	0.002	27.06	2.496s
NA-22	5100.55	1275.26	130.	92.	0.001	29.30	0.501s
K-40	5845.32	1461.37	134.	316.	0.004	10.72	2.616
BI-214	7062.16	1765.38	90.	204.	0.003	16.29	2.697

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 DPS	Peak Energy keV	Peak Activity DPS	Code	MDA Value DPS		COMMENTS
NA-22	C	6.4192E-02					9.50E+02	
			1274.53	6.419E-02	(	3.915E-02	2.93E+01	9.99E+01 G
K-40	N	2.2869E+00					4.66E+11	
			1460.83	2.287E+00	(	4.109E-01	1.07E+01	1.07E+01 G
TL-208	N	7.8604E-02					6.98E+02	
			583.02	7.860E-02	*(	3.543E-02	2.07E+01	8.45E+01 G
			277.28	0.000E+00	%	1.912E-01	1.58E+02	6.31E+00 G
			860.56	0.000E+00	%	2.258E-01	1.39E+02	1.24E+01 G
PB-210	N	7.5051E+00					8.14E+03	
			46.54	7.505E+00	@(	8.512E-01	5.49E+00	4.25E+00 G
PB-212	N	1.7702E-01					6.98E+02	
			238.63	1.770E-01	(	4.454E-02	8.62E+00	4.33E+01 G
			300.03	0.000E+00	%	3.920E-01	8.12E+01	3.28E+00 GA
PB-214	N	2.9204E-01					5.84E+05	
			351.93	2.920E-01	(	6.573E-02	1.05E+01	3.76E+01 G
			295.09	2.054E-01	-	1.173E-01	2.49E+01	1.93E+01 G
			242.00	2.931E-01		2.595E-01	2.75E+01	7.43E+00 GA
BI-214	N	3.5807E-01					5.84E+05	
			609.31	3.581E-01	*(	8.884E-02	1.34E+01	4.61E+01 G
			1120.29	0.000E+00	%	2.340E-01	1.95E+02	1.51E+01 G
			1764.49	1.187E+00	+	2.730E-01	1.63E+01	1.54E+01 G
AC-228	N	4.0551E-01					2.10E+03	
			911.16	4.055E-01	*(	1.510E-01	2.01E+01	2.90E+01 G
			968.97	0.000E+00	&	1.824E-01	3.27E+02	1.75E+01 G
			338.32	0.000E+00	%	1.231E-01	5.24E+01	1.20E+01 G
			93.35	5.744E-01	?	4.547E-01	2.44E+01	5.56E+00 XA
TH-234	N	3.6702E+00					1.63E+12	
			63.29	3.670E+00	(	6.524E-01	6.22E+00	3.81E+00 G
			92.59	2.224E+00	-	3.790E-01	5.88E+00	5.58E+00 G

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

PA-234M  N   8.2554E+00                                     1.63E+12
                         1001.00 8.255E+00 ?(  4.646E+00 2.71E+01 8.37E-01 G
                          766.41 0.000E+00 &   7.523E+00 3.91E+01 2.94E-01 G

U-235    N   1.9594E-01                                     2.57E+11
                          185.72 1.504E-01 }   3.785E-02 7.93E+00 5.40E+01 GA
                          143.79 1.959E-01 ?(  1.533E-01 2.94E+01 1.10E+01 G
                          205.33 0.000E+00 &   2.335E-01 2.01E+02 5.01E+00 G
                          163.38 0.000E+00 %   2.262E-01 4.42E+01 5.08E+00 G

AM-241   T   9.8744E-02                                     1.58E+05
                           59.54 9.874E-02  (  6.702E-02 2.13E+01 3.59E+01 G
   ( - 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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********** 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 1 Sigma %	Activity

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 DPS	Uncertainty 1 Sigma Counting	MDA
BE-7	<	2.1689E-01		
NA-22		6.4192E-02	2.9305E+01%	3.915E-02
K-40		2.2869E+00	1.0715E+01%	4.109E-01
Sc-46	<	1.4891E-02		
CR-51	<	1.3754E-01		
MN-54	<	2.3517E-02		
FE-59	<	5.1856E-02		
Co-56	<	3.0529E-02		
CO-57	<	1.3564E-02		
CO-58	<	4.4418E-02		
CO-60	<	2.9645E-02		
ZN-65	<	4.0258E-02		
NB-94	<	2.4166E-02		
ZR-95	<	4.0839E-02		
NB-95	<	3.9370E-02		
RU-103	<	2.0595E-02		
RH-106	<	2.0466E-01		
AG-108M	<	1.8319E-02		
AG-110M	<	2.0324E-02		
SN-113	<	2.8105E-02		
SB-124	<	3.8094E-02		
SB-125	<	6.0362E-02		
I-131	<	1.7091E-02		
BA-133	<	3.9002E-02		
CS-134	<	3.8483E-02		
CS-137	<	4.1467E-02		
CE-139	<	1.3823E-02		
Ba-140	<	7.3660E-02		
La-140	<	3.1666E-02		
CE-141	<	3.9955E-02		
CE-144	<	7.5274E-02		
PM-144	<	2.5734E-02		
EU-152	<	5.1888E-02		
EU-154	<	2.1444E-01		
EU-155	<	5.2621E-02		
HF-181	<	3.2241E-02		

Ta-182	<	1.3669E-01		
Hg-203	<	1.4940E-02		
TL-208	#	7.8604E-02	2.0740E+01%	3.543E-02
pm-146	<	6.3635E-02		
y-88	<	3.0872E-02		
PB-210	#	7.5051E+00	5.4878E+00%	8.512E-01
PB-212		1.7702E-01	8.6211E+00%	4.454E-02
PB-214		2.9204E-01	1.0548E+01%	6.573E-02
BI-207	<	2.6102E-02		
BI-212	<	4.4426E-01		
BI-214		3.5807E-01	1.3353E+01%	8.884E-02
BI-210M	<	2.2997E-02		
RA-224	<	5.2496E-01		
AC-228	#	4.0551E-01	2.0084E+01%	1.510E-01
TH-227	<	1.2782E-01		
TH-229	<	2.6244E-01		
TH-234		3.6702E+00	6.2163E+00%	6.524E-01
PA-231	<	3.2564E-01		
PA-233	<	3.6839E-02		
PA-234	<	1.0538E-01		
PA-234M	#	8.2554E+00	2.7060E+01%	4.646E+00
U-235		1.9594E-01	2.9446E+01%	1.533E-01
AM-241		9.8744E-02	2.1290E+01%	6.702E-02
Np-237	<	1.5411E-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 (37.6 to 1999.6 keV) 2.339E+01 DPS

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Test America
St. Louis
Background Check

Spectrum: 17_20191005003_BGLong
Description: Background Long PBC Count
Acquired: 10/5/2019 11:26:45 PM
Detector: Detector #17
Background Evaluation Criteria:
1) Place instrument out of service if Countrate exceeds Control Limits.
2) Investigate high countrate and take corrective action as necessary if Countrate exceeds Tolerance Limits.

	Target	L_Ctrl	L_Tol	Measured	H_Tol	H_Ctrl	Results
Bkgd Countrate	2.32	2.18	2.23	2.35	2.42	2.46	PASS

Analyst: Shiloh Smith Reviewer: kody Saulters

(Page 1 of 7)

Sample description
Background Long PBC Count

Spectrum Filename: C:\User\SPC\Det17\17_20191005003_BGLong.An1

Acquisition information
Start time: 10/5/2019 11:26:45 PM
Live time: 72000
Real time: 72241
Dead time: 0.33 %
Detector ID: 17

Detector system
Ge17 SN/11080671

Calibration
Filename: 17_QC.Clb
17_QC_83725-334_SOURCE H_042211

Energy Calibration
Created: 2/29/2012 10:33:23 AM
Zero offset: 0.108 keV
Gain: 0.250 keV/channel
Quadratic: -2.584E-08 keV/channel^2

Efficiency Calibration
Created: 5/1/2011 11:17:56 AM
Knee Energy: 0.00 keV
Above the Knee: Interpolative Uncertainty = 0.00 %
Below the Knee: Interpolative Uncertainty = 0.00 %

Library Files
Main analysis library: DET_Long Background PBC.lib
Library Match Width: 0.500
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G800W064
Start channel: 150 (37.63keV)
Stop channel: 8000 (1999.54keV)
Peak rejection level: 30.000%
Peak search sensitivity: 3
Sample Size: 1.0000E+00 +/- 0.000E+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: 4.0000000E+00
Systematic error: 4.0000000E+00
Fraction Limit: 0.000%
Background width: 3

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. 14 cutoff: 5.00E+01 %
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. DPS	Nuc
46.57	1014.	7.78	1.36	5.944E-02	46.54	4.250	5.578E+00	PB210
63.28	896.	8.77	1.24	8.035E-02	63.29	3.810	4.064E+00	TH234
75.09	232.	25.63	1.31	9.514E-02				
92.68	1491.	5.96	1.47	1.119E-01	92.59	5.584	3.315E+00	TH234
					93.35	5.561	3.326E+00	AC228
185.64	988.	7.72	1.60	9.858E-02	185.72	54.000	2.578E-01	U235
					185.99	3.280	4.247E+00	Ra226
238.71	402.	15.59	1.08	8.652E-02	238.63	43.300	1.491E-01	PB212
295.05	201.	25.97	1.27	7.373E-02	295.09	19.300	1.965E-01	PB214
351.94	392.	12.89	1.89	6.080E-02	351.93	37.600	2.381E-01	PB214
609.20	426.	11.57	1.96	3.710E-02	609.31	46.090	3.460E-01	BI214
					610.30	5.750	2.779E+00	RU103
1001.67	86.	29.63	1.65	2.198E-02	1001.00	0.837	6.493E+00	PA234M
1460.67	279.	10.86	2.03	1.608E-02	1460.83	10.670	2.255E+00	K40
1764.60	111.	21.32	2.26	1.381E-02	1764.49	15.400	7.228E-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 Centroid Channel	Energy	Background Counts	Net Area Counts	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide	
299.78	75.09	1172.	232.	2.444E+03	25.63	1.305	-	s

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

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This section based on library: DET_Long Background 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 1 Sigma %	FWHM keV
PB-210	185.74	46.57	1490.	1014.	0.014	7.78	1.356s
TH-234	252.55	63.28	1510.	896.	0.012	8.77	1.245s
TH-234	370.10	92.68	1669.	1491.	0.021	5.96	1.470s
Ra-226	741.77	185.64	1159.	988.	0.014	7.72	1.597s
PB-212	953.98	238.71	921.	402.	0.006	15.59	1.079s
PB-214	1179.27	295.05	691.	201.	0.003	25.97	1.270s
PB-214	1406.78	351.94	540.	392.	0.005	12.89	1.892s
BI-214	2435.65	609.20	429.	426.	0.006	11.57	1.961s
PA-234M	4005.72	1001.67	130.	86.	0.001	29.63	1.645
K-40	5842.61	1460.67	103.	279.	0.004	10.86	2.027s
BI-214	7059.30	1764.60	72.	111.	0.002	21.32	2.258s

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	Nuclide Code	Average Activity DPS	Peak Energy keV	Peak Activity DPS	Peak Code	MDA Value DPS		COMMENTS
K-40	N	2.2551E+00					4.66E+11	
			1460.83	2.255E+00	(	4.053E-01	1.09E+01 1.07E+01	G
PB-210	N	5.5782E+00					8.14E+03	
			46.54	5.578E+00	*(	1.004E+00	7.78E+00 4.25E+00	G
PB-212	N	1.4906E-01					6.98E+02	
			238.63	1.491E-01	*(	5.342E-02	1.56E+01 4.33E+01	G
			300.03	0.000E+00	%	4.034E-01	6.94E+01 3.28E+00	GA
PB-214	N	2.2403E-01					5.84E+05	
			351.93	2.381E-01	*(	6.743E-02	1.29E+01 3.76E+01	G
			295.09	1.965E-01	*(	1.222E-01	2.60E+01 1.93E+01	G
			242.00	0.000E+00		2.653E-01	0.00E+00 7.43E+00	GA
BI-214	N	3.4603E-01					5.84E+05	
			609.31	3.460E-01	*(	8.060E-02	1.16E+01 4.61E+01	G
			1120.29	0.000E+00	%	2.100E-01	4.57E+01 1.51E+01	G
			1764.49	7.228E-01	+	2.766E-01	2.13E+01 1.54E+01	G

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

TH-234   N   4.0643E+00                                      1.63E+12
                           63.29 4.064E+00 *(  8.337E-01 8.77E+00 3.81E+00 G
                           92.59 3.315E+00 -   4.292E-01 5.96E+00 5.58E+00 G

PA-234M  N   6.4933E+00                                      1.63E+12
                         1001.00 6.493E+00 ?(  4.216E+00 2.96E+01 8.37E-01 G
                          766.41 0.000E+00 &   8.283E+00 5.26E+02 2.94E-01 G

Ra-226       4.2473E+00                                      5.84E+05
                          185.99 4.247E+00 *(  6.936E-01 7.72E+00 3.28E+00 G
   ( - This peak used in the nuclide activity average.

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

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

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


 *************** D I S C A R D E D  I S O T O P E  P E A K S ***************
 Nuclide Centroid  Background  Net Area   Intensity   Uncert   Activity
           Energy   Counts     Counts     Cts/Sec  1 Sigma %
_____________________________________________________________________________
   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 DPS	Uncertainty 1 Sigma Counting	MDA
BE-7	<	1.5887E-01		
NA-22	<	2.6604E-02		
K-40	#	2.2551E+00	1.0860E+01%	4.053E-01
Sc-46	<	2.5089E-02		
CR-51	<	1.4397E-01		
MN-54	<	2.4520E-02		
FE-59	<	5.2745E-02		
Co-56	<	2.5610E-02		
CO-57	<	1.8044E-02		
CO-58	<	3.1148E-02		
CO-60	<	2.9723E-02		
ZN-65	<	8.6728E-02		
NB-94	<	2.7810E-02		
ZR-95	<	3.9850E-02		
NB-95	<	3.7378E-02		
RU-103	<	1.7454E-02		
RH-106	<	1.9027E-01		
AG-108M	<	1.6643E-02		
AG-110M	<	3.1711E-02		
SN-113	<	2.4993E-02		
SB-124	<	2.0399E-02		
SB-125	<	5.0452E-02		
I-131	<	1.9471E-02		
BA-133	<	3.7469E-02		
CS-134	<	3.7135E-02		
CS-137	<	2.5510E-02		
CE-139	<	2.0151E-02		
Ba-140	<	6.7188E-02		
La-140	<	3.1209E-02		
CE-141	<	2.9984E-02		
CE-144	<	1.2474E-01		
PM-144	<	2.6150E-02		
EU-152	<	6.9118E-02		
EU-154	<	2.4820E-01		
EU-155	<	4.2510E-02		
HF-181	<	1.9482E-02		
Ta-182	<	1.5356E-01		
Hg-203	<	2.2563E-02		
TL-208	<	2.5691E-02		
pm-146	<	6.4932E-02		
y-88	<	2.9928E-02		
PB-210	#	5.5782E+00	7.7834E+00%	1.004E+00
PB-212	#	1.4906E-01	1.5592E+01%	5.342E-02

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PB-214 #	2.2403E-01	1.2887E+01%		6.743E-02
BI-207 <	3.7562E-02			
BI-212 <	4.4566E-01			
BI-214 #	3.4603E-01	1.1567E+01%		8.060E-02
BI-210M <	2.5365E-02			
RA-224 <	4.6101E-01			
AC-228 <	1.3932E-01			
TH-227 <	1.3511E-01			
TH-229 <	2.8768E-01			
TH-234 #	4.0643E+00	8.7745E+00%		8.337E-01
PA-231 <	8.3686E-01			
PA-233 <	3.7885E-02			
PA-234 <	8.9437E-02			
PA-234M#	6.4933E+00	2.9630E+01%		4.216E+00
Ra-226 #	4.2473E+00	7.7197E+00%		6.936E-01
U-235 <	1.1547E-01			
AM-241 <	8.1863E-02			
Np-237 <	1.3923E-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 (37.6 to 1999.5 keV) 2.336E+01 DPS

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Run Logs

Gamma Spectroscopy Run Log

Detector: GV5

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
03/26/12 15:05		IC 160-12297/1		12297			JLW
03/27/12 10:12		ICV 160-12297/2		12297			JLW
10/05/19 23:05		ICB 160-445738/1		445738			JLW
10/15/19 00:17		CCB 160-446102/1		446102			KLS
10/15/19 00:52		CCV 160-446102/2		446102			
10/15/19 01:13		CCV 160-446102/3		446102			KLS
10/15/19 02:27	60	ZZZZZ		446102			
10/15/19 03:37	60	ZZZZZ		446102			
10/15/19 04:59	60	ZZZZZ		446102			
10/15/19 06:41	60	ZZZZZ		446102			
10/15/19 07:44	60	ZZZZZ		446102			
10/15/19 08:51	60	ZZZZZ		446102			
10/15/19 10:04	30	LCS 160-444057/2-A		446102	444057	901.1	KLS
10/15/19 10:42	30	180-95857-3	WBF-BS-BG11-11.5/13.5-20190917 ~ WBF-BG-11	446102	444057	901.1	KLS
10/15/19 11:17	30	180-95857-8	WBF-BS-BG12-1.5/3.5-20190917 ~ WBF-BG-12	446102	444057	901.1	KLS
10/15/19 11:55	30	180-95857-12	WBF-BS-BG12-21.5/23.5-20190917 ~ WBF-BG-12	446102	444057	901.1	KLS
10/15/19 12:47	30	ZZZZZ		446102			
10/15/19 13:27	60	ZZZZZ		446102			
10/15/19 15:04	60	ZZZZZ		446102			
10/15/19 17:34	60	ZZZZZ		446102			
10/15/19 18:51	60	ZZZZZ		446102			
10/15/19 20:19	60	ZZZZZ		446102			
10/15/19 22:37	60	ZZZZZ		446102			

Detector: GV8

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
03/27/12 10:58		IC 160-12311/1		12311			JLW
03/29/12 01:58		ICV 160-12311/2		12311			JLW
10/05/19 23:01		ICB 160-445728/1		445728			JLW
10/15/19 01:58		CCB 160-446103/1		446103			KLS
10/15/19 03:35		CCV 160-446103/2		446103			
10/15/19 03:57		CCV 160-446103/3		446103			KLS
10/15/19 04:27	60	ZZZZZ		446103			
10/15/19 06:42	60	ZZZZZ		446103			
10/15/19 07:47	60	ZZZZZ		446103			
10/15/19 08:52	60	ZZZZZ		446103			
10/15/19 10:05	30	180-95857-1	WBF-BS-BG11-1.5/3.5-20190917 ~ WBF-BG-11	446103	444057	901.1	KLS
10/15/19 10:43	30	180-95857-4	WBF-BS-BG11-16.5/18.5-20190917 ~ WBF-BG-11	446103	444057	901.1	KLS
10/15/19 11:16	30	180-95857-3 DU	WBF-BS-BG11-11.5/13.5-20190917 ~ WBF-BG-11 DU	446103	444057	901.1	KLS
10/15/19 11:56	30	180-95857-13	WBF-BS-BG12-0.0/0.5-20190917 ~ WBF-BG-12	446103	444057	901.1	KLS
10/15/19 12:49	30	ZZZZZ		446103			
10/15/19 13:28	60	ZZZZZ		446103			
10/15/19 15:01		ZZZZZ		446103			
10/15/19 17:35	60	ZZZZZ		446103			

Gamma Spectroscopy Run Log

Detector: GV8 (Continued)

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
10/15/19 18:46	60	ZZZZZ		446103			
10/15/19 20:18	60	ZZZZZ		446103			
10/15/19 22:36	60	ZZZZZ		446103			

Detector: GV9

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
05/03/12 13:37		IC 160-12326/1		12326			JLW
06/14/12 10:54		ICV 160-12326/2		12326			JLW
10/05/19 23:20		ICB 160-445724/1		445724			JLW
10/15/19 00:19		CCV 160-446101/1		446101			
10/15/19 00:40		CCV 160-446101/2		446101			KLS
10/15/19 00:59		CCB 160-446101/3		446101			KLS
10/15/19 02:26	60	ZZZZZ		446101			
10/15/19 03:35	60	ZZZZZ		446101			
10/15/19 04:55	60	ZZZZZ		446101			
10/15/19 06:42	60	ZZZZZ		446101			
10/15/19 07:51	60	ZZZZZ		446101			
10/15/19 08:54	60	ZZZZZ		446101			
10/15/19 10:02	60	ZZZZZ		446101			
10/15/19 11:04	30	180-95857-5	WBF-BS-BG11-0.0/0.5-20 190917 ~ WBF-BG-11	446101	444057	901.1	KLS
10/15/19 11:57	30	180-95857-10	WBF-BS-BG12-11.5/13.5- 20190917 ~ WBF-BG-12	446101	444057	901.1	KLS
10/15/19 12:45	30	180-95857-14	WBF-BS-DUP03-201909 7 ~ NA	446101	444057	901.1	KLS
10/15/19 13:24	30	ZZZZZ		446101			
10/15/19 15:03	60	ZZZZZ		446101			
10/15/19 17:33	60	ZZZZZ		446101			
10/15/19 18:42	60	ZZZZZ		446101			
10/15/19 20:16	60	ZZZZZ		446101			
10/15/19 22:36	60	ZZZZZ		446101			

Detector: GV12

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
04/18/18 13:54		IC 160-364854/1		364854			JLW
04/24/18 09:26		ICV 160-364854/2		364854			JLW
10/05/19 23:22		ICB 160-445725/1		445725			JLW
10/15/19 00:23		CCV 160-446100/1		446100			
10/15/19 00:43		CCV 160-446100/2		446100			KLS
10/15/19 01:09		CCB 160-446100/3		446100			KLS
10/15/19 02:29	60	ZZZZZ		446100			
10/15/19 03:37	60	ZZZZZ		446100			
10/15/19 04:56	60	ZZZZZ		446100			
10/15/19 06:45	60	ZZZZZ		446100			
10/15/19 07:49	60	ZZZZZ		446100			
10/15/19 08:53	60	ZZZZZ		446100			
10/15/19 10:06	30	MB 160-444057/1-A		446100	444057	901.1	KLS
10/15/19 10:44	30	180-95857-2	WBF-BS-BG11-6.5/8.5-20 190917 ~ WBF-BG-11	446100	444057	901.1	KLS

Gamma Spectroscopy Run Log

Detector: GV12 (Continued)

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
10/15/19 11:20	30	180-95857-9	WBF-BS-BG12-6.5/8.5-20 190917 ~ WBF-BG-12	446100	444057	901.1	KLS
10/15/19 11:59	30	180-95857-11	WBF-BS-BG12-16.5/18.5- 20190917 ~ WBF-BG-12	446100	444057	901.1	KLS
10/15/19 12:48	30	ZZZZZ		446100			
10/15/19 13:26	60	ZZZZZ		446100			
10/15/19 15:05	60	ZZZZZ		446100			
10/15/19 17:39	60	ZZZZZ		446100			
10/15/19 18:46	60	ZZZZZ		446100			
10/15/19 20:19	60	ZZZZZ		446100			
10/15/19 22:38	60	ZZZZZ		446100			

Detector: GV14

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
03/06/12 23:06		IC 160-12355/1		12355			JLW
04/12/12 03:08		ICV 160-12355/2		12355			JLW
10/05/19 23:21		ICB 160-445731/1		445731			JLW
10/14/19 00:18		CCB 160-445992/1		445992			KLS
10/14/19 01:17		CCV 160-445992/2		445992			
10/14/19 01:38		CCV 160-445992/3		445992			KLS
10/14/19 02:10	120	ZZZZZ		445992			
10/14/19 06:18	30	ZZZZZ		445992			
10/14/19 07:02	120	180-95857-6	WBF-BS-FB09-20190917 ~ WBF-BG-11	445992	443730	901.1	KLS
10/14/19 09:18	120	ZZZZZ		445992			
10/14/19 11:24	120	ZZZZZ		445992			
10/14/19 15:48	60	ZZZZZ		445992			
10/14/19 16:56	60	ZZZZZ		445992			
10/14/19 22:12	60	ZZZZZ		445992			
10/14/19 23:21	60	ZZZZZ		445992			

Detector: GV16

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
03/27/12 15:43		IC 160-11759/1		11759			JLW
04/24/12 08:11		ICV 160-11759/2		11759			JLW
10/05/19 23:24		ICB 160-446459/1		446459			JLW
10/14/19 00:24		CCB 160-445993/1		445993			KLS
10/14/19 01:10		CCV 160-445993/2		445993			
10/14/19 01:32		CCV 160-445993/3		445993			
10/14/19 01:52		CCV 160-445993/4		445993			
10/14/19 02:52		CCV 160-445993/5		445993			
10/14/19 03:12		CCV 160-445993/6		445993			
10/14/19 04:01		CCV 160-445993/7		445993			
10/14/19 04:22		CCV 160-445993/8		445993			KLS
10/14/19 06:22	120	MB 160-443730/1-A		445993	443730	901.1	KLS
10/14/19 09:18	120	ZZZZZ		445993			
10/14/19 11:25		ZZZZZ		445993			
10/14/19 15:50	60	ZZZZZ		445993			
10/14/19 17:01	60	ZZZZZ		445993			
10/14/19 18:54		ZZZZZ		445993			

Gamma Spectroscopy Run Log

Detector: GV16 (Continued)

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
10/14/19 22:14	60	ZZZZZ		445993			
10/14/19 23:24	60	ZZZZZ		445993			

Detector: GV17

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
03/05/12 14:23		IC 160-11760/1		11760			JLW
03/07/12 23:01		ICV 160-11760/2		11760			JLW
10/05/19 09:03		ZZZZZ		445733			
10/05/19 23:26		ICB 160-445733/1		445733			JLW
10/14/19 00:37		CCB 160-445994/1		445994			KLS
10/14/19 01:50		CCV 160-445994/2		445994			
10/14/19 02:11		CCV 160-445994/3		445994			KLS
10/14/19 04:06	120	ZZZZZ		445994			
10/14/19 06:23	120	LCS 160-443730/2-A		445994	443730	901.1	KLS
10/14/19 09:20	120	180-95857-7	WBF-BS-EB03-20190917 ~ WBF-BG-11	445994	443730	901.1	KLS
10/14/19 11:26	120	ZZZZZ		445994			
10/14/19 15:54	60	ZZZZZ		445994			
10/14/19 17:03	60	ZZZZZ		445994			
10/14/19 18:45	60	ZZZZZ		445994			
10/14/19 22:10	60	ZZZZZ		445994			
10/14/19 23:26	60	ZZZZZ		445994			
10/21/19 00:18		CCB 160-447046/1		447046			KLS
10/21/19 01:03		CCV 160-447046/2		447046			
10/21/19 01:24		CCV 160-447046/3		447046			
10/21/19 02:09		CCV 160-447046/4		447046			
10/21/19 02:29		CCV 160-447046/5		447046			KLS
10/21/19 03:37	120	ZZZZZ		447046			
10/21/19 06:23	120	ZZZZZ		447046			
10/21/19 08:49	120	180-95857-6 DU	WBF-BS-FB09-20190917 ~ WBF-BG-11 DU	447046	443730	901.1	KLS
10/21/19 11:16		ZZZZZ		447046			

Radiological
Pre-Preparation Data

Subcontract Data

Shipping and Receiving Documents

TVA Environmental Investigations

Tennessee Valley Authority

COOLER No.:	1	of	3
COC No:	WBF_BS_20190917_1B		
1 of 1 Pages			
Task Desc:	WBF_BS		

Rev 1 BB 10/2/19

Chain-of-Custody / Analytical Request Document

Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed and accurate

Required Ship to Lab:

Lab Name:	TestAmerica Pittsburgh
Lab Address:	301 Alpha Drive Pittsburgh, PA 15238

Lab Manager Contact Information

Lab PM:	Gail Lage
Phone/Fax:	615-301-5741/615-726-3404
Lab Email:	Gail.Lage@testamericainc.com

Required Project Information:

Site ID #:	Watts Bar Fossil Plant			
Project #:				
Site Address	933 Old Ferry Road			
City	Spring City	State, Zip:	TN	37381
Site PM Name:	Roy Quinn			
Phone/Fax:	423-751-3753			
Site PM Email:	jrquinn@tva.gov			

Required Sampler Information

Sampler:	Joe Ottolino		
Sampling Company:	Stantec		
Address	601 Grassmere Park Suite 22		
City/State	Nashville/TN	Phone:	(615) 885-1144
Sampling Team Number:	1		
Send EDD/Hard Copy to:	tva_deliverables@envstd.com		

Analysis Turnaround Time

☐ CALENDAR DAYS ☑ WORKING DAYS

TAT if different from Below _____

☐ 24 Hours
☐ 3 Business Days
5 Business Days
✓ 10 Business Days

180-95857 Chain of Custody

ITEMS #	SAMPLE ID Samples IDs MUST BE UNIQUE	SAMPLE LOCATION	Sample Depth: Depth Unit / Select Unit: Start Depth	End Depth	MATRIX CODE	G= GRAB C=COMP	SAMPLE TYPE	SAMPLE DATE	SAMPLE TIME	# OF CONTAINERS	Comments/ Lab Sample I.D.	MS/MSD	Analysis: BACKGROUNDSOIL_RAD	BACKGROUNDSOIL_BLANKS_RAD
1	WBF-BS-BG11-1.5/3.5-20190917	WBF-BG-11	1.5	3.5	BS	G	N	9/17/2019	0832	2	NA	☐	X	
2	WBF-BS-BG11-6.5/8.5-20190917	WBF-BG-11	6.5	8.5	BS	G	N	9/17/2019	0848	2	NA	☐	X	
3	WBF-BS-BG11-11.5/13.5-20190917	WBF-BG-11	11.5	13.5	BS	G	N	9/17/2019	0908	2	NA	X	X	
4	WBF-BS-BG11-16.5/18.5-20190917	WBF-BG-11	16.5	18.5	BS	G	N	9/17/2019	0928	2	NA	☐	X	
5	WBF-BS-BG11-0.0/0.5-20190917	WBF-BG-11	0	0.5	BS	G	N	9/17/2019	1004	2	NA	☐	X	
6	WBF-BS-FB09-20190917	WBF-BG-11	--	--	AQ	G	FB	9/17/2019	0957	3	NA	☐		X
7	WBF-BS-EB03-20190917	WBF-BG-11	--	--	AQ	G	EB	9/17/2019	1012	3	NA	☐		X
8	WBF-BS-BG12-1.5/3.5-20190917	WBF-BG-12	1.5	3.5	BS	G	N	9/17/2019	1318	2	NA	☐	X	
9	WBF-BS-BG12-6.5/8.5-20190917	WBF-BG-12	6.5	8.5	BS	G	N	9/17/2019	1330	2	NA	☐	X	
10	WBF-BS-BG12-11.5/13.5-20190917	WBF-BG-12	11.5	13.5	BS	G	N	9/17/2019	1352	2	NA	☐	X	
11	WBF-BS-BG12-16.5/18.5-20190917	WBF-BG-12	16.5	18.5	BS	G	N	9/17/2019	1406	2	NA	☐	X	
12	WBF-BS-BG12-21.5/23.5-20190917	WBF-BG-12	21.5	23.5	BS	G	N	9/17/2019	1431	2	NA	☐	X	
13	WBF-BS-BG12-0.0/0.5-20190917	WBF-BG-12	0	0.5	BS	G	N	9/17/2019	1450	2	NA	☐	X	
14	WBF-BS-DUP03-20190917	--	--	--	BS	G	~~N~~ FD	9/17/2019	--	2	NA		X	

JO 9/17/2019

Additional Comments/Special Instructions:

Additional volume collected should be used for laboratory duplicate analysis.

JO 9/17/2019

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
Joe Ottolino / Stantec BB 10/2/19	9/17/2019	17:00	Craig Millhollin / Stantec	9/17/2019	17:00
JO 9/17/2019					

Sample Receipt Conditions

☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
ature in °C	ple on Ice?	ple Intact?	Blank?

SHIPPING METHOD:	SAMPLER NAME AND SIGNATURE
Fedex JO	Joe Ottolino

Dep: Wgt: 10.00 LBS SPECIAL: HANDLING: DV: 0.00 TOTAL:

Svcs: PRIORITY OVERNIGHT Master 1155 5314 4255 TRCK: 1155 5314 4277

Svcs: PRIORITY OVERNIGHT Master 1155 5314 4255 TRCK: 1155 5314 4314

Svcs: PRIORITY OVERNIGHT Master 1155 5314 4255 TRCK: 1155 5314 4325

10/25/2019

TVA Environmental Investigations

Tennessee Valley Authority

COOLER No.:	2	of	3
COC No:	WBF_BS_20190917_1B		
1 of 1 Pages			
Task Desc:	WBF_BS		

Rev 1 BJ 10/21/19

10/25/2019

Chain-of-Custody / Analytical Request Document

Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed and accurate

Required Ship to Lab:

Lab Name:	TestAmerica Pittsburgh
Lab Address:	301 Alpha Drive Pittsburgh, PA 15238

Lab Manager Contact Information

Lab PM:	Gail Lage
Phone/Fax:	615-301-5741/615-726-3404
Lab Email:	Gail.Lage@testamericainc.com

Required Project Information:

Site ID #:	Watts Bar Fossil Plant			
Project #:				
Site Address	933 Old Ferry Road			
City	Spring City	State, Zip:	TN	37381
Site PM Name:	Roy Quinn			
Phone/Fax:	423-751-3753			
Site PM Email:	jrquinn@tva.gov			

Required Sampler Information

Sampler:	Joe Ottolino		
Sampling Company:	Stantec		
Address	601 Grassmere Park Suite 22		
City/State	Nashville/TN	Phone:	(615) 885-1144
Sampling Team Number:	1		
Send EDD/Hard Copy to:	tva_deliverables@enystd.com		

Analysis Turnaround Time

☐ CALENDAR DAYS ☐ WORKING DAYS

TAT if different from Below _____

☐ 24 Hours
☐ 3 Business Days
☐ 5 Business Days
☑ **10 Business Days**

ITEMS #	SAMPLE ID Samples IDs MUST BE UNIQUE	SAMPLE LOCATION	Sample Depth: Depth Unit / Select Unit: Start Depth	End Depth	MATRIX CODE	G= GRAB C=COMP	SAMPLE TYPE	SAMPLE DATE	SAMPLE TIME	# OF CONTAINERS	Comments/ Lab Sample I.D.	MS/MSD	Analysis: BACKGROUNDSOIL_RAD	BACKGROUNDSOIL_BLANKS_RAD	Filtered: N	N	Preserve: None	HNO3
1	WBF-BS-BG11-1.5/3.5-20190917	WBF-BG-11	1.5	3.5	BS	G	N	9/17/2019	0832	2	NA	☐	X					
2	WBF-BS-BG11-6.5/8.5-20190917	WBF-BG-11	6.5	8.5	BS	G	N	9/17/2019	0848	2	NA	☐	X					
3	WBF-BS-BG11-11.5/13.5-20190917	WBF-BG-11	11.5	13.5	BS	G	N	9/17/2019	0908	2	NA	X	X					
4	WBF-BS-BG11-16.5/18.5-20190917	WBF-BG-11	16.5	18.5	BS	G	N	9/17/2019	0928	2	NA	☐	X					
5	WBF-BS-BG11-0.0/0.5-20190917	WBF-BG-11	0	0.5	BS	G	N	9/17/2019	1004	2	NA	☐	X					
6	WBF-BS-FB09-20190917	WBF-BG-11	--	--	AQ	G	FB	9/17/2019	0957	3	NA	☐		X				
7	WBF-BS-EB03-20190917	WBF-BG-11	--	--	AQ	G	EB	9/17/2019	1012	3	NA	☐		X				
8	WBF-BS-BG12-1.5/3.5-20190917	WBF-BG-12	1.5	3.5	BS	G	N	9/17/2019	1318	2	NA	☐	X					
9	WBF-BS-BG12-6.5/8.5-20190917	WBF-BG-12	6.5	8.5	BS	G	N	9/17/2019	1330	2	NA	☐	X					
10	WBF-BS-BG12-11.5/13.5-20190917	WBF-BG-12	11.5	13.5	BS	G	N	9/17/2019	1352	2	NA	☐	X					
11	WBF-BS-BG12-16.5/18.5-20190917	WBF-BG-12	16.5	18.5	BS	G	N	9/17/2019	1406	2	NA	☐	X					
12	WBF-BS-BG12-21.5/23.5-20190917	WBF-BG-12	21.5	23.5	BS	G	N	9/17/2019	1431	2	NA	☐	X					
13	WBF-BS-BG12-0.0/0.5-20190917	WBF-BG-12	0	0.5	BS	G	N	9/17/2019	1450	2	NA	☐	X					
14	WBF-BS-DUP03-20190917	--	--	--	BS	G	~~N~~ FD	9/17/2019	--	2	NA		X					

JO 9/17/2019

Additional Comments/Special Instructions:

Additional volume collected should be used for laboratory duplicate analysis.

JO 9/17/2019

RELINQISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
Joe Ottolino / Stantec BJ 10/21/19	9/17/2019	17:00	Craig Millhollin / Stantec	9/17/2019	17:00
JO 9/17/2019					

Sample Receipt Conditions

Temperature in °C	Sample on Ice?	Sample Intact?	Trip Blank?
☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No

SHIPPING METHOD:	SAMPLER NAME AND SIGNATURE
Fedex JO	Joe Ottolino 9/17/2019

Form TVA 30067A

TVA Environmental Investigations

Tennessee Valley Authority

Chain-of-Custody / Analytical Request Document

Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed and accurate

COOLER No.:	3 of 3
COC No:	WBF_BS_20190917_1B
1 of 1 Pages	
Task Desc:	WBF_BS

Rec'd BJ 10/2/19

10/25/2019

Required Ship to Lab:

Lab Name:	TestAmerica Pittsburgh
Lab Address:	301 Alpha Drive Pittsburgh, PA 15238

Lab Manager Contact Information

Lab PM:	Gail Lage
Phone/Fax:	615-301-5741/615-726-3404
Lab Email:	Gail.Lage@testamericainc.com

Required Project Information:

Site ID #:	Watts Bar Fossil Plant			
Project #:				
Site Address	933 Old Ferry Road			
City	Spring City	State, Zip:	TN	37381
Site PM Name:	Roy Quinn			
Phone/Fax:	423-751-3753			
Site PM Email:	jrquinn@tva.gov			

Required Sampler Information

Sampler:	Joe Ottolino		
Sampling Company:	Stantec		
Address	601 Grassmere Park Suite 22		
City/State	Nashville/TN	Phone:	(615) 885-1144
Sampling Team Number:	1		
Send EDD/Hard Copy to:	tva_deliverables@envstd.com		

Analysis Turnaround Time

☐ CALENDAR DAYS ☑ WORKING DAYS

TAT if different from Below _____

☐ 24 Hours
☐ 3 Business Days
☐ 5 Business Days
☑ **10 Business Days**

ITEMS #	SAMPLE ID Samples IDs MUST BE UNIQUE	SAMPLE LOCATION	Sample Depth: Depth Unit / Select Unit: Start Depth	End Depth	MATRIX CODE	G= GRAB C=COMP	SAMPLE TYPE	SAMPLE DATE	SAMPLE TIME	# OF CONTAINERS	Comments/ Lab Sample I.D.	MS/MSD	Analysis: BACKGROUNDSOIL_RAD	BACKGROUNDSOIL_BLANKS_RAD	Preserve: None	HNO3	Filtered: N	N
1	WBF-BS-BG11-1.5/3.5-20190917	WBF-BG-11	1.5	3.5	BS	G	N	9/17/2019	0832	2	NA	☐	X					
2	WBF-BS-BG11-6.5/8.5-20190917	WBF-BG-11	6.5	8.5	BS	G	N	9/17/2019	0848	2	NA	☐	X					
3	WBF-BS-BG11-11.5/13.5-20190917	WBF-BG-11	11.5	13.5	BS	G	N	9/17/2019	0908	2	NA	X	X					
4	WBF-BS-BG11-16.5/18.5-20190917	WBF-BG-11	16.5	18.5	BS	G	N	9/17/2019	0928	2	NA	☐	X					
5	WBF-BS-BG11-0.0/0.5-20190917	WBF-BG-11	0	0.5	BS	G	N	9/17/2019	1004	2	NA	☐	X					
6	WBF-BS-FB09-20190917	WBF-BG-11	--	--	AQ	G	FB	9/17/2019	0957	3	NA	☐		X				
7	WBF-BS-EB03-20190917	WBF-BG-11	--	--	AQ	G	EB	9/17/2019	1012	3	NA	☐		X				
8	WBF-BS-BG12-1.5/3.5-20190917	WBF-BG-12	1.5	3.5	BS	G	N	9/17/2019	1318	2	NA	☐	X					
9	WBF-BS-BG12-6.5/8.5-20190917	WBF-BG-12	6.5	8.5	BS	G	N	9/17/2019	1330	2	NA	☐	X					
10	WBF-BS-BG12-11.5/13.5-20190917	WBF-BG-12	11.5	13.5	BS	G	N	9/17/2019	1352	2	NA	☐	X					
11	WBF-BS-BG12-16.5/18.5-20190917	WBF-BG-12	16.5	18.5	BS	G	N	9/17/2019	1406	2	NA	☐	X					
12	WBF-BS-BG12-21.5/23.5-20190917	WBF-BG-12	21.5	23.5	BS	G	N	9/17/2019	1431	2	NA	☐	X					
13	WBF-BS-BG12-0.0/0.5-20190917	WBF-BG-12	0	0.5	BS	G	N	9/17/2019	1450	2	NA	☐	X					
14	WBF-BS-DUP03-20190917	--	--	--	BS	G	~~N~~ FD	9/17/2019	--	2	NA		X					

JO 9/17/2019

Additional Comments/Special Instructions:

Additional volume collected should be used for laboratory duplicate analysis.

JO 9/17/2019

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
Joe Ottolino / Stantec 10/2/19 BJ	9/17/2019	17:00	Craig Millhollin / Stantec	9/17/2019	17:00
JO 9/17/2019				9/18/19	9:00

Sample Receipt Conditions

Temperature in °C	Sample on Ice?	Sample Intact?	Trip Blank?
☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No

SHIPPING METHOD:	SAMPLER NAME AND SIGNATURE
Fedex JO	Joe Ottolino 9/17/2019

Form TVA 30067A

TVA Environmental Investigations

Tennessee Valley Authority

Chain-of-Custody / Analytical Request Document

Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed and accurate

COOLER No.:	1	of	3
COC No:	WBF_BS_20190917_1B		
1 of 1 Pages			
Task Desc:	WBF_BS		

Required Ship to Lab:		Required Project Information:		Required Sampler Information	
Lab Name:	TestAmerica Pittsburgh	Site ID #:	Watts Bar Fossil Plant	Sampler:	Joe Ottolino
Lab Address:	301 Alpha Drive	Project #:		Sampling Company:	Stantec
	Pittsburgh, PA 15238	Site Address	933 Old Ferry Road	Address	601 Grassmere Park Suite 22
		City	Spring City State, Zip: TN 37381	City/State	Nashville/TN Phone: (615) 885-1144
Lab Manager Contact Information		Site PM Name:	Roy Quinn		
Lab PM:	Gail Lage	Phone/Fax:	423-751-3753	Sampling Team Number:	1
Phone/Fax:	615-301-5741/615-726-3404	Site PM Email:	jrquinn@tva.gov	Send EDD/Hard Copy to:	tva_deliverables@envstd.com
Lab Email:	Gail.Lage@testamericainc.com				

Analysis Turnaround Time

☐ CALENDAR DAYS ☑ WORKING DAYS

TAT if different from Below _____

☐ 24 Hours
☐ 3 Business Days
☐ 5 Business Days
☑ **10 Business Days**

180-95857 Chain of Custody

ITEMS #	SAMPLE ID Samples IDs MUST BE UNIQUE	SAMPLE LOCATION	Sample Depth: Depth Unit	Sample Depth: Select Unit	MATRIX CODE	G= GRAB C=COMP	SAMPLE TYPE	SAMPLE DATE	SAMPLE TIME	# OF CONTAINERS	Comments/ Lab Sample I.D.	MS/MSD	Analysis: BACKGROUNDSOIL_RAD	Analysis: BACKGROUNDSOIL_BLANKS_RAD
1	WBF-BS-BG11-1.5/3.5-20190917	WBF-BG-11	1.5	3.5	BS	G	N	9/17/2019	0832	2	NA	☐	X	
2	WBF-BS-BG11-6.5/8.5-20190917	WBF-BG-11	6.5	8.5	BS	G	N	9/17/2019	0848	2	NA	☐	X	
3	WBF-BS-BG11-11.5/13.5-20190917	WBF-BG-11	11.5	13.5	BS	G	N	9/17/2019	0908	2	NA	X	X	
4	WBF-BS-BG11-16.5/18.5-20190917	WBF-BG-11	16.5	18.5	BS	G	N	9/17/2019	0928	2	NA	☐	X	
5	WBF-BS-BG11-0.0/0.5-20190917	WBF-BG-11	0	0.5	BS	G	N	9/17/2019	1004	2	NA	☐	X	
6	WBF-BS-FB09-20190917	WBF-BG-11	--	--	AQ	G	FB	9/17/2019	0957	3	NA	☐		X
7	WBF-BS-EB03-20190917	WBF-BG-11	--	--	AQ	G	EB	9/17/2019	1012	3	NA	☐		X
8	WBF-BS-BG12-1.5/3.5-20190917	WBF-BG-12	1.5	3.5	BS	G	N	9/17/2019	1318	2	NA	☐	X	
9	WBF-BS-BG12-6.5/8.5-20190917	WBF-BG-12	6.5	8.5	BS	G	N	9/17/2019	1330	2	NA	☐	X	
10	WBF-BS-BG12-11.5/13.5-20190917	WBF-BG-12	11.5	13.5	BS	G	N	9/17/2019	1352	2	NA	☐	X	
11	WBF-BS-BG12-16.5/18.5-20190917	WBF-BG-12	16.5	18.5	BS	G	N	9/17/2019	1406	2	NA	☐	X	
12	WBF-BS-BG12-21.5/23.5-20190917	WBF-BG-12	21.5	23.5	BS	G	N	9/17/2019	1431	2	NA	☐	X	
13	WBF-BS-BG12-0.0/0.5-20190917	WBF-BG-12	0	0.5	BS	G	N	9/17/2019	1450	2	NA	☐	X	
14	WBF-BS-DUP03-20190917	--	--	--	BS	G	N	9/17/2019	--	2	NA		X	

JO 9/17/2019

Additional Comments/Special Instructions:

Additional volume collected should be used for laboratory duplicate analysis.

JO 9/17/2019

RELINQISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
Joe Ottolino / Stantec	9/17/2019	17:00	Craig Millhollin / Stantec	9/17/2019	17:00

JO 9/17/2019

Sample Receipt Conditions: ☐ Yes ☐ No

SHIPPING METHOD:	SAMPLER NAME AND SIGNATURE
Fedex	Joe Ottolino

JO

Wgt: 10.00 LBS DV: 0.00 SPECIAL: HANDLING: TOTAL: Dep:

Svcs: PRIORITY OVERNIGHT Master 1155 5314 4255 TRCK: 1155 5314 4277

Wgt: 10.00 LBS DV: 0.00 SPEC HAND TOTA Dep:

Svcs: PRIORITY OVERNIGHT Master 1155 5314 4255 TRCK: 1155 5314 4314

Wgt: 10.00 LBS DV: 0.00 SPECIAL: 0.00 HANDLING: 0.00 TOTAL: 0.00

Svcs: PRIORITY OVERNIGHT Master 1155 5314 4255 TRCK: 1155 5314 4325

TVA Environmental Investigations

Tennessee Valley Authority

COOLER No.:	2	of	3
COC No:	WBF_BS_20190917_1B		
1 of 1 Pages			
Task Desc:	WBF_BS		

Chain-of-Custody / Analytical Request Document

Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed and accurate

Required Ship to Lab:		Required Project Information:		Required Sampler Information	
Lab Name:	TestAmerica Pittsburgh	Site ID #:	Watts Bar Fossil Plant	Sampler:	Joe Ottolino
Lab Address:	301 Alpha Drive	Project #:		Sampling Company:	Stantec
	Pittsburgh, PA 15238	Site Address	933 Old Ferry Road	Address	601 Grassmere Park Suite 22
		City	Spring City State, Zip: TN 37381	City/State	Nashville/TN Phone: (615) 885-1144
Lab Manager Contact Information		Site PM Name:	Roy Quinn		
Lab PM:	Gail Lage	Phone/Fax:	423-751-3753	Sampling Team Number:	1
Phone/Fax:	615-301-5741/615-726-3404	Site PM Email:	jrquinn@tva.gov	Send EDD/Hard Copy to:	tva_deliverables@envstd.com
Lab Email:	Gail.Lage@testamericainc.com				

Analysis Turnaround Time

☐ CALENDAR DAYS ☑ WORKING DAYS

TAT if different from Below _____

☐ 24 Hours
☐ 3 Business Days
☐ 5 Business Days
☑ **10 Business Days**

ITEMS #	SAMPLE ID Samples IDs MUST BE UNIQUE	SAMPLE LOCATION	Sample Depth: Depth Unit Start Depth	Sample Depth: Select Unit End Depth	MATRIX CODE	G= GRAB C=COMP	SAMPLE TYPE	SAMPLE DATE	SAMPLE TIME	# OF CONTAINERS	Comments/ Lab Sample I.D.	MS/MSD	Analysis: BACKGROUNDSOIL_RAD	Analysis: BACKGROUNDSOIL_BLANKS_RAD
1	WBF-BS-BG11-1.5/3.5-20190917	WBF-BG-11	1.5	3.5	BS	G	N	9/17/2019	0832	2	NA	☐	X	
2	WBF-BS-BG11-6.5/8.5-20190917	WBF-BG-11	6.5	8.5	BS	G	N	9/17/2019	0848	2	NA	☐	X	
3	WBF-BS-BG11-11.5/13.5-20190917	WBF-BG-11	11.5	13.5	BS	G	N	9/17/2019	0908	2	NA	X	X	
4	WBF-BS-BG11-16.5/18.5-20190917	WBF-BG-11	16.5	18.5	BS	G	N	9/17/2019	0928	2	NA	☐	X	
5	WBF-BS-BG11-0.0/0.5-20190917	WBF-BG-11	0	0.5	BS	G	N	9/17/2019	1004	2	NA	☐	X	
6	WBF-BS-FB09-20190917	WBF-BG-11	--	--	AQ	G	FB	9/17/2019	0957	3	NA	☐		X
7	WBF-BS-EB03-20190917	WBF-BG-11	--	--	AQ	G	EB	9/17/2019	1012	3	NA	☐		X
8	WBF-BS-BG12-1.5/3.5-20190917	WBF-BG-12	1.5	3.5	BS	G	N	9/17/2019	1318	2	NA	☐	X	
9	WBF-BS-BG12-6.5/8.5-20190917	WBF-BG-12	6.5	8.5	BS	G	N	9/17/2019	1330	2	NA	☐	X	
10	WBF-BS-BG12-11.5/13.5-20190917	WBF-BG-12	11.5	13.5	BS	G	N	9/17/2019	1352	2	NA	☐	X	
11	WBF-BS-BG12-16.5/18.5-20190917	WBF-BG-12	16.5	18.5	BS	G	N	9/17/2019	1406	2	NA	☐	X	
12	WBF-BS-BG12-21.5/23.5-20190917	WBF-BG-12	21.5	23.5	BS	G	N	9/17/2019	1431	2	NA	☐	X	
13	WBF-BS-BG12-0.0/0.5-20190917	WBF-BG-12	0	0.5	BS	G	N	9/17/2019	1450	2	NA	☐	X	
14	WBF-BS-DUP03-20190917	--	--	--	BS	G	N	9/17/2019	--	2	NA	☐	X	

Filtered	Preserve
N	None
N	HNO3

JO 9/17/2019

Additional Comments/Special Instructions:

Additional volume collected should be used for laboratory duplicate analysis.

JO 9/17/2019

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
Joe Ottolino / Stantec	9/17/2019	17:00	Craig Millhollin / Stantec	9/17/2019	17:00
JO 9/17/2019				9/18/19	9:00

SHIPPING METHOD:	SAMPLER NAME AND SIGNATURE
Fedex JO	Joe Ottolino 9/17/2019

Sample Receipt Conditions

Temperature in °C	Sample on Ice?	Sample Intact?	Trip Blank?
☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
☑ Yes ☐ No	☑ Yes ☐ No	☑ Yes ☐ No	☐ Yes ☑ No
☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No

Form TVA 30067A

TVA Environmental Investigations

Tennessee Valley Authority

COOLER No.:	3	of	3
COC No:	WBF_BS_20190917_1B		
1 of 1 Pages			
Task Desc:	WBF_BS		

Chain-of-Custody / Analytical Request Document

Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed and accurate

Required Ship to Lab:		Required Project Information:		Required Sampler Information	
Lab Name:	TestAmerica Pittsburgh	Site ID #:	Watts Bar Fossil Plant	Sampler:	Joe Ottolino
Lab Address:	301 Alpha Drive	Project #:		Sampling Company:	Stantec
	Pittsburgh, PA 15238	Site Address	933 Old Ferry Road	Address	601 Grassmere Park Suite 22
		City	Spring City, State, Zip: TN 37381	City/State	Nashville/TN, Phone: (615) 885-1144
Lab Manager Contact Information		Site PM Name:	Roy Quinn		
Lab PM:	Gail Lage	Phone/Fax:	423-751-3753	Sampling Team Number:	1
Phone/Fax:	615-301-5741/615-726-3404	Site PM Email:	jrquinn@tva.gov	Send EDD/Hard Copy to:	tva_deliverables@envstd.com
Lab Email:	Gail.Lage@testamericainc.com				

Analysis Turnaround Time

☐ CALENDAR DAYS ☑ WORKING DAYS

TAT if different from Below _____

☐ 24 Hours
☐ 3 Business Days
☐ 5 Business Days
☑ **10 Business Days**

ITEMS #	SAMPLE ID Samples IDs MUST BE UNIQUE	SAMPLE LOCATION	Sample Depth: Start Depth (Depth Unit)	Sample Depth: End Depth (Select Unit)	MATRIX CODE	G= GRAB C=COMP	SAMPLE TYPE	SAMPLE DATE	SAMPLE TIME	# OF CONTAINERS	Comments/ Lab Sample I.D.	MS/MSD	Filtered	Preserve: None	Preserve: HNO3	Analysis: BACKGROUNDSOIL_RAD	Analysis: BACKGROUNDSOIL_BLANKS_RAD
1	WBF-BS-BG11-1.5/3.5-20190917	WBF-BG-11	1.5	3.5	BS	G	N	9/17/2019	0832	2	NA	☐	N			X	
2	WBF-BS-BG11-6.5/8.5-20190917	WBF-BG-11	6.5	8.5	BS	G	N	9/17/2019	0848	2	NA	☐	N			X	
3	WBF-BS-BG11-11.5/13.5-20190917	WBF-BG-11	11.5	13.5	BS	G	N	9/17/2019	0908	2	NA	X	N			X	
4	WBF-BS-BG11-16.5/18.5-20190917	WBF-BG-11	16.5	18.5	BS	G	N	9/17/2019	0928	2	NA	☐	N			X	
5	WBF-BS-BG11-0.0/0.5-20190917	WBF-BG-11	0	0.5	BS	G	N	9/17/2019	1004	2	NA	☐	N			X	
6	WBF-BS-FB09-20190917	WBF-BG-11	--	--	AQ	G	FB	9/17/2019	0957	3	NA	☐	N		X		
7	WBF-BS-EB03-20190917	WBF-BG-11	--	--	AQ	G	EB	9/17/2019	1012	3	NA	☐	N		X		
8	WBF-BS-BG12-1.5/3.5-20190917	WBF-BG-12	1.5	3.5	BS	G	N	9/17/2019	1318	2	NA	☐	N			X	
9	WBF-BS-BG12-6.5/8.5-20190917	WBF-BG-12	6.5	8.5	BS	G	N	9/17/2019	1330	2	NA	☐	N			X	
10	WBF-BS-BG12-11.5/13.5-20190917	WBF-BG-12	11.5	13.5	BS	G	N	9/17/2019	1352	2	NA	☐	N			X	
11	WBF-BS-BG12-16.5/18.5-20190917	WBF-BG-12	16.5	18.5	BS	G	N	9/17/2019	1406	2	NA	☐	N			X	
12	WBF-BS-BG12-21.5/23.5-20190917	WBF-BG-12	21.5	23.5	BS	G	N	9/17/2019	1431	2	NA	☐	N			X	
13	WBF-BS-BG12-0.0/0.5-20190917	WBF-BG-12	0	0.5	BS	G	N	9/17/2019	1450	2	NA	☐	N			X	
14	WBF-BS-DUP03-20190917	--	--	--	BS	G	N	9/17/2019	--	2	NA		N			X	

JO 9/17/2019

Additional Comments/Special Instructions:

Additional volume collected should be used for laboratory duplicate analysis.

JO 9/17/2019

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
Joe Ottolino / Stantec	9/17/2019	17:00	Craig Millhollin / Stantec	9/17/2019	17:00
JO 9/17/2019				9/18/19	900

Sample Receipt Conditions			
☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Temperature in °C	Sample on Ice?	Sample Intact?	Trip Blank?

SHIPPING METHOD:	SAMPLER NAME AND SIGNATURE
Fedex	Joe Ottolino
JO	9/17/2019

Form TVA 30067A

eurofins | Environment Testing
TestAmerica

ORIGIN ID:PHDA (615) 885-1144
GREG BUDD
STANTEC CONSULTING CORP.
933 OLD FERRY ROAD

SPRING CITY, TN 37381
UNITED STATES US

SHIP
ACTW
CAD: RT97
FZ

1
10:30

TO

EUROFINS TESTAMERICA PITTSBURGH
301 ALPHA DRIVE
RIDC PARK
PITTSBURGH PA 152382907
(412) 963-7058
REF: S180-53662

RMA:

FedEx Express

FedEx
TRK# 0221 1155 5314 4277

WED - 18 SEP 10:30A
PRIORITY OVERNIGHT

NA AGCA

15238
PA-US PIT

Uncorrected temp 2.9 °C
Thermometer ID 10

CF 0 Initials TB

PT-WI-SR-001 effective 11/8/18

180-95857 Waybill

eurofins | Environment Testing
TestAmerica

ORIGIN ID:PHDA (615) 885-1144
GREG BUDD
STANTEC CONSULTING CORP.
933 OLD FERRY ROAD

SPRING CITY, TN 37381
UNITED STATES US

TO

EUROFINS TESTAMERICA PIT
301 ALPHA DRIVE
RIDC PARK
PITTSBURGH PA 152382907

(412) 963-7058
REF: S180-53662

RMA:

FedEx Express

FedEx
TRK# 0221 1155 5314 4325

WED - 18 SEP 10:30A
PRIORITY OVERNIGHT

NA AGCA

15238
PA-US PIT

Uncorrected temp 14 °C
Thermometer ID 19
CF 0 Initials TB
PT-WI-SR-001 effective 11/8/18

#2633640 09/17 567J1/9D04/05A2

eurofins

Environment Test
TestAmerica

ORIGIN ID:PDDA (615) 885-1144
GREG BUDY
ENVIRO-CONSULTING CORP.
838 OLD FERRY ROAD

SPRING CITY, PA 19481
UNITED STATES US

SHIP DATE: 09MAR
ACTWGT: 10.00 LB
CAD: 6582065/CAFE

TO

EUROFINS TESTAMERICA PITTSBURGH
301 ALPHA DRIVE
RIDC PARK
PITTSBURGH PA 152382907

(412) 963-7052
REF: S190-53662

FedEx Express

FedEx
TRK# 0221 1155 5314 4314

WED - 18 SEP 10:30A
PRIORITY OVERNIGHT

NA

Uncorrected temp 13 °C
Thermometer ID 10

15238
PIT

CF 0 Initials TB

PT-WI-SR-001 effective 11/8/18

#2633640 09/17 567J1/9D04/05A2

Eurofins TestAmerica, Pittsburgh
301 Alpha Drive RIDC Park
Pittsburgh, PA 15238
Phone: 412-963-7058 Fax: 412-963-2468

Chain of Custody Record

eurofins | Environment Testing TestAmerica

Client Information (Sub Contract Lab)

Client Contact: Shipping/Receiving
Company: TestAmerica Laboratories, Inc.
Address: 13715 Rider Trail North,
City: Earth City
State, Zip: MO, 63045
Phone: 314-298-8566(Tel) 314-298-8757(Fax)
Email:
Project Name: WBF_BS_20190917_1B
Site:

Sampler:
Phone:
Due Date Requested: 9/30/2019
TAT Requested (days):
PO #:
WO #:
Project #: 18020303
SSOW#:

Lab PM: Rumble, Jennifer L
E-Mail: jennifer.rumble@testamericainc.com
Carrier Tracking No(s):
State of Origin: Tennessee
Accreditations Required (See note):

COC No: 180-373904.1
Page: Page 1 of 2
Job #: 180-95857-1

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA
M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)
Other:

Analysis Requested

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	901.1_Ra/Dry_Grind Radium-226/228	901.1_Ra/Fill_Geo_21 Radium-226/228	Total Number of containers	Special Instructions/Note:
			Preservation Code:							
WBF-BS-BG11-1.5/3.5-20190917 ~ WBF-BG-11 (180-95857-1)	9/17/19	08:32 Eastern		Solid			X		2	TVA - Batch alone. Quarantine zone soil. Contact PM if insufficient volume for Tuna
WBF-BS-BG11-6.5/8.5-20190917 ~ WBF-BG-11 (180-95857-2)	9/17/19	08:48 Eastern		Solid			X		2	TVA - Batch alone. Quarantine zone soil. Contact PM if insufficient volume for Tuna
WBF-BS-BG11-11.5/13.5-20190917 ~ WBF-BG-11 (180-95857-3	9/17/19	09:08 Eastern		Solid			X		2	TVA - Batch alone. Quarantine zone soil. Contact PM if insufficient volume for Tuna
WBF-BS-BG11-11.5/13.5-20190917 ~ WBF-BG-11 (180-95857-3	9/17/19	09:08 Eastern	DU	Solid			X		1	TVA - Batch alone. Quarantine zone soil. Contact PM if insufficient volume for Tuna
WBF-BS-BG11-16.5/18.5-20190917 ~ WBF-BG-11 (180-95857-4	9/17/19	09:28 Eastern		Solid			X		2	TVA - Batch alone. Quarantine zone soil. Contact PM if insufficient volume for Tuna
WBF-BS-BG11-0.0/0.5-20190917 ~ WBF-BG-11 (180-95857-5)	9/17/19	10:04 Eastern		Solid			X		2	TVA - Batch alone. Quarantine zone soil. Contact PM if insufficient volume for Tuna
WBF-BS-FB09-20190917 ~ WBF-BG-11 (180-95857-6)	9/17/19	09:57 Eastern		Water				X	3	TVA - Batch alone
WBF-BS-EB03-20190917 ~ WBF-BG-11 (180-95857-7)	9/17/19	10:12 Eastern		Water				X	3	TVA - Batch alone
WBF-BS-BG12-1.5/3.5-20190917 ~ WBF-BG-12 (180-95857-8)	9/17/19	13:18 Eastern		Solid			X		2	TVA - Batch alone. Quarantine zone soil. Contact PM if insufficient volume for Tuna

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, Inc.

Possible Hazard Identification
Unconfirmed

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

Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2

Special Instructions/QC Requirements:

Empty Kit Relinquished by: Date: Time: Method of Shipment:

Relinquished by	Date/Time	Company	Received by	Date/Time	Company
[signature]	9/19/19 1700	TAIS	Michael Fleem	9-20-19 0915	TAIS

Custody Seals Intact: Δ Yes Δ No
Custody Seal No.:
Cooler Temperature(s) °C and Other Remarks:

Ver: 01/16/2019

Eurofins TestAmerica, Pittsburgh
301 Alpha Drive RIDC Park
Pittsburgh, PA 15238
Phone: 412-963-7058 Fax: 412-963-2468

Chain of Custody Record

eurofins | Environment Testing TestAmerica

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Rumble, Jennifer L	Carrier Tracking No(s):	COC No: 180-373904.2
Client Contact: Shipping/Receiving	Phone:	E-Mail: jennifer.rumble@testamericainc.com	State of Origin: Tennessee	Page: Page 2 of 2
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note):		Job #: 180-95857-1
Address: 13715 Rider Trail North, ,	Due Date Requested: 9/30/2019			
City: Earth City	TAT Requested (days):			
State, Zip: MO, 63045				
Phone: 314-298-8566(Tel) 314-298-8757(Fax)	PO #:			
Email:	WO #:			
Project Name: WBF_BS_20190917_1B	Project #: 18020303			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)

Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	901.1_Ra/Dry_Grind Radium-226/228	901.1_Ra/Fill_Geo_21 Radium-226/228	Total Number of containers	Special Instructions/Note:
			Preservation Code:							
WBF-BS-BG12-6.5/8.5-20190917 ~ WBF-BG-12 (180-95857-9)	9/17/19	13:30 Eastern		Solid			X		2	TVA - Batch alone. Quarantine zone soil. Contact PM if insufficient volume for Tuna
WBF-BS-BG12-11.5/13.5-20190917 ~ WBF-BG-12 (180-95857-1	9/17/19	13:52 Eastern		Solid			X		2	TVA - Batch alone. Quarantine zone soil. Contact PM if insufficient volume for Tuna
WBF-BS-BG12-16.5/18.5-20190917 ~ WBF-BG-12 (180-95857-1	9/17/19	14:06 Eastern		Solid			X		2	TVA - Batch alone. Quarantine zone soil. Contact PM if insufficient volume for Tuna
WBF-BS-BG12-21.5/23.5-20190917 ~ WBF-BG-12 (180-95857-1	9/17/19	14:31 Eastern		Solid			X		2	TVA - Batch alone. Quarantine zone soil. Contact PM if insufficient volume for Tuna
WBF-BS-BG12-0.0/0.5-20190917 ~ WBF-BG-12 (180-95857-13)	9/17/19	14:50 Eastern		Solid			X		2	TVA - Batch alone. Quarantine zone soil. Contact PM if insufficient volume for Tuna
WBF-BS-DUP03-20190917 ~ NA (180-95857-14)	9/17/19	Eastern		Solid			X		2	TVA - Batch alone. Quarantine zone soil. Contact PM if insufficient volume for Tuna

180-95857-01 Chain of Custody

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. I

Possible Hazard Identification *Unconfirmed*	***Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*** ☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:		Method of Shipment:	
Relinquished by:	Date/Time: 9/19/19 1700	Company TMSTL	Received by:	Date/Time: 9-20-19 09:15	Company TMSTL
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks:		

Ver: 01/16/2019

Login Sample Receipt Checklist

Client: Environmental Standards Inc. Job Number: 180-95857-1

Login Number: 95857 **List Source: Eurofins TestAmerica, Pittsburgh**
List Number: 1
Creator: Say, Thomas C

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Environmental Standards Inc.

Job Number: 180-95857-1

Login Number: 95857
List Number: 2
Creator: Hellm, Michael

List Source: Eurofins TestAmerica, St. Louis
List Creation: 09/20/19 12:05 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	N/A	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	20.0
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	N/A	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Environmental Standards Inc.

Job Number: 180-95857-1

Login Number: 95857
List Number: 3
Creator: Hellm, Michael

List Source: Eurofins TestAmerica, St. Louis
List Creation: 09/20/19 12:26 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	N/A	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	20.0
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	N/A	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	