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ANALYTICAL REPORT

Job Number: 160-36593-1

Job Description: ACMS - Yerington OU-4b_OU-5_SOIL

Contract Number: EPSCM 2017-009//BP01498843

For:
Wood E&I Solutions Inc
10940 White Rock Road Suite 190
Rancho Cordova, CA 95670

Attention: Kent Parrish

Approved for release.
Jayna K Awalt
Project Manager II
2/18/2020 1:55 PM

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02/18/2020
Revision: 1

The test results in this report meet NELAP requirements for parameters for which accreditation is required or available. Any exceptions to the NELAP requirements are noted. Results pertain only to samples listed in this report. Pursuant to NELAP, this report shall not be reproduced, except in full, without the written approval of the laboratory. This report is confidential and is intended for the sole use of TestAmerica and its client. All questions regarding this report should be directed to the TestAmerica Project Manager.

Louisiana Lab Certification ID (Non-Potable, Solid/Haz. Material): 106151
Florida Lab Certification ID (Drinking Water): E87689.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins TestAmerica Project Manager.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Job Number: 160-36593-1

Job Description: ACMS - Yerington OU-4b_OU-5_SOIL

The results listed within this Laboratory Report pertain only to the samples tested in the laboratory. The analyses contained in this report were performed in accordance with the BPLAMP Technical Specifications, applicable federal, state, local regulations and certification requirements as well as the methodologies as described in laboratory SOPs reviewed by the BPLAMP. This Laboratory Report is confidential and is intended for the sole use of Eurofins TestAmerica and its client. This report shall not be reproduced, except in full, without written permission from TestAmerica. The signature on the cover page extends to the case narrative and all the data and forms in the package. The Chain of Custody is included and is an integral part of this report.

Approved for release.
Jayna K Awalt
Project Manager II
2/18/2020 1:55 PM

Jayna K Awalt

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Qualifiers

Metals

Qualifier	Qualifier Description
F3	Duplicate RPD exceeds the control limit
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

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)

CASE NARRATIVE

Client: Wood E&I Solutions Inc

Project: ACMS - Yerington OU-4b_OU-5_SOIL

Report Number: 160-36593-1
Rev. 1 - The correct monthly background for 901.1 is now included.

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Eurofins TestAmerica, St. Louis attests to the validity of the laboratory data generated by Eurofins TestAmerica facilities reported herein. All analyses performed by Eurofins TestAmerica facilities were done using established laboratory SOPs that incorporate QA/QC procedures described in the application methods. Eurofins TestAmerica's operations groups have reviewed the data for compliance with the laboratory QA/QC plan, and data have been found to be compliant with laboratory protocols unless otherwise noted below.

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced, except in full, without the written approval of the laboratory.

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

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

All solid sample results for Chemistry analyses are reported on an ""as received"" basis unless otherwise indicated by the presence of a % solids value in the method header. All soil/sediment sample results for radiochemistry analyses are based upon sample as dried and disaggregated with the exception of tritium, carbon-14, and iodine-129 by gamma spectroscopy unless requested as wet weight by the client."

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.

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

Manual Integrations and ROIs were performed only when necessary and are in compliance with the laboratory's standard operating procedure. Detailed information can be found in the raw data section of the level IV report.

This laboratory report is confidential and is intended for the sole use of Eurofins TestAmerica and its client.

RECEIPT
The samples were received on 12/5/2019 9:30 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 2.5º C and 4.1º C.

METALS (ICPMS)
Samples STSB32_0-0.5 (160-36593-1), STSB32_0.5-3 (160-36593-2), STSB32_3-6 (160-36593-3), STSB32_6-15 (160-36593-4), STSB34_0-0.5 (160-36593-5), STSB34_0.5-3 (160-36593-6), STSB34_3-6 (160-36593-7), STSB34_6-15 (160-36593-8), STSB34-FD_3-6 (160-36593-9), STSB33_0-0.5 (160-36593-10), STSB33_0.5-3 (160-36593-11), STSB33-FD_0.5-3 (160-36593-12), STSB33_3-6 (160-36593-13), STSB33_6-15 (160-36593-14), STSB35_0.5-3 (160-36593-15), STSB35_0-0.5 (160-36593-16), STSB35_3-6 (160-36593-17) and STSB35_6-15 (160-36593-18) were analyzed for metals (ICPMS) in accordance with EPA SW-846 Methods 6020A. The samples were prepared on 12/10/2019 and analyzed on 12/27/2019.

For ICPMS Metals, a 2X dilution was performed. This is a standard dilution that is performed by TestAmerica St. Louis on all samples analyzed by method SW-846 6020A. The dilution is performed in order to have the matrix of the samples (i.e. the concentration of acids) match the matrix of the standards used for calibration and instrument quality control purposes. The MDL studies analyzed by this method undergo the same 2X dilution, and all detection limits are based on this. As such, MDL's and RL's are not affected by the dilution.

The sample duplicate (DUP) precision for preparation batch 160-453801 and analytical batch 160-455416 was outside control limits for Thorium and Uranium. Sample matrix interference is suspected. STSB32_0-0.5 (160-36593-1[DU])

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

PERCENT SOLIDS

Samples STSB32_0-0.5 (160-36593-1), STSB32_0.5-3 (160-36593-2), STSB32_3-6 (160-36593-3), STSB32_6-15 (160-36593-4), STSB34_0-0.5 (160-36593-5), STSB34_0.5-3 (160-36593-6), STSB34_3-6 (160-36593-7), STSB34_6-15 (160-36593-8), STSB34-FD_3-6 (160-36593-9), STSB33_0-0.5 (160-36593-10), STSB33_0.5-3 (160-36593-11), STSB33-FD_0.5-3 (160-36593-12), STSB33_3-6 (160-36593-13), STSB33_6-15 (160-36593-14), STSB35_0.5-3 (160-36593-15), STSB35_0-0.5 (160-36593-16), STSB35_3-6 (160-36593-17) and STSB35_6-15 (160-36593-18) were analyzed for percent solids in accordance with EPA Method 160.3 MOD. The samples were analyzed on 12/05/2019.

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

RADIUM-226 BY GAMMA SPEC (21 DAY INGROWTH)

Samples STSB32_0-0.5 (160-36593-1), STSB32_0.5-3 (160-36593-2), STSB32_3-6 (160-36593-3), STSB32_6-15 (160-36593-4), STSB34_0-0.5 (160-36593-5), STSB34_0.5-3 (160-36593-6), STSB34_3-6 (160-36593-7), STSB34_6-15 (160-36593-8), STSB34-FD_3-6 (160-36593-9), STSB33_0-0.5 (160-36593-10), STSB33_0.5-3 (160-36593-11), STSB33-FD_0.5-3 (160-36593-12), STSB33_3-6 (160-36593-13), STSB33_6-15 (160-36593-14), STSB35_0.5-3 (160-36593-15), STSB35_0-0.5 (160-36593-16), STSB35_3-6 (160-36593-17) and STSB35_6-15 (160-36593-18) were analyzed for Radium-226 by gamma spec (21 day ingrowth) in accordance with EPA 901.1. The samples were dried on 12/05/2019, prepared on 12/06/2019 and analyzed on 12/27/2019.

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
Th-234	Pa-234
Th-234	U-238
Pb-210	Po-210
Pb-210	Bi-210
Cs-137	Ba-137m
Pb-212	Po-216
Xe-131m	Xe-131
Sb-125	Te-125m
Ag-108m	Ag-108
Rh-106	Ru-106
Pb-212	Th-228
Pb-212	Ra-224
U-235	Th-231
Ac-228	Th-232
Ac-228	Ra-228
Th-227	Ra-223
Th-227	Ac-227
Th-227	Bi-211
Th-227	Pb-211
Bi-214	Ra-226

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

Client Sample ID: STSB32_0-0.5
Lab Sample ID: 160-36593-1

Date Collected: 11/25/19 13:25
Matrix: Solid
Date Received: 12/05/19 09:30

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	3.01		0.306	0.438	1.00	0.166	pCi/g	12/06/19 13:38	12/27/19 07:44	1
Radium-228	0.910		0.232	0.250	1.00	0.185	pCi/g	12/06/19 13:38	12/27/19 07:44	1

Client Sample ID: STSB32_0-0.5
Lab Sample ID: 160-36593-1

Date Collected: 11/25/19 13:25
Matrix: Solid
Date Received: 12/05/19 09:30
Percent Solids: 93.3

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Thorium	4.3		0.20	0.088	mg/Kg	☼	12/10/19 13:15	12/27/19 01:59	2
Uranium	1.0		0.098	0.039	mg/Kg	☼	12/10/19 13:15	12/27/19 01:59	2

Client Sample ID: STSB32_0.5-3
Lab Sample ID: 160-36593-2

Date Collected: 11/25/19 13:40
Matrix: Solid
Date Received: 12/05/19 09:30

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	2.49		0.225	0.343	1.00	0.127	pCi/g	12/06/19 13:38	12/27/19 08:16	1
Radium-228	0.754		0.253	0.264	1.00	0.319	pCi/g	12/06/19 13:38	12/27/19 08:16	1

Client Sample ID: STSB32_0.5-3
Lab Sample ID: 160-36593-2

Date Collected: 11/25/19 13:40
Matrix: Solid
Date Received: 12/05/19 09:30
Percent Solids: 95.4

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Thorium	6.1		0.20	0.088	mg/Kg	☼	12/10/19 13:15	12/27/19 02:33	2
Uranium	1.4		0.098	0.039	mg/Kg	☼	12/10/19 13:15	12/27/19 02:33	2

Client Sample ID: STSB32_3-6
Lab Sample ID: 160-36593-3

Date Collected: 11/25/19 13:49
Matrix: Solid
Date Received: 12/05/19 09:30

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	3.31		0.335	0.475	1.00	0.208	pCi/g	12/06/19 13:38	12/27/19 08:17	1
Radium-228	1.03		0.383	0.397	1.00	0.360	pCi/g	12/06/19 13:38	12/27/19 08:17	1

Client Sample ID: STSB32_3-6
Lab Sample ID: 160-36593-3

Date Collected: 11/25/19 13:49
Matrix: Solid
Date Received: 12/05/19 09:30
Percent Solids: 93.3

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Thorium	4.9		0.19	0.086	mg/Kg	☼	12/10/19 13:15	12/27/19 02:40	2

Client Sample ID: STSB32_3-6
Lab Sample ID: 160-36593-3
Date Collected: 11/25/19 13:49
Matrix: Solid
Date Received: 12/05/19 09:30
Percent Solids: 93.3

Method: 6020A - Metals (ICP/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Uranium	1.7		0.095	0.038	mg/Kg	☼	12/10/19 13:15	12/27/19 02:40	2

Client Sample ID: STSB32_6-15
Lab Sample ID: 160-36593-4
Date Collected: 11/25/19 14:06
Matrix: Solid
Date Received: 12/05/19 09:30

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	3.17		0.360	0.488	1.00	0.162	pCi/g	12/06/19 13:38	12/27/19 08:19	1
Radium-228	1.36		0.287	0.319	1.00	0.336	pCi/g	12/06/19 13:38	12/27/19 08:19	1

Client Sample ID: STSB32_6-15
Lab Sample ID: 160-36593-4
Date Collected: 11/25/19 14:06
Matrix: Solid
Date Received: 12/05/19 09:30
Percent Solids: 91.0

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Thorium	7.6		0.21	0.097	mg/Kg	☼	12/10/19 13:15	12/27/19 03:07	2
Uranium	2.3		0.11	0.043	mg/Kg	☼	12/10/19 13:15	12/27/19 03:07	2

Client Sample ID: STSB34_0-0.5
Lab Sample ID: 160-36593-5
Date Collected: 11/25/19 15:00
Matrix: Solid
Date Received: 12/05/19 09:30

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	1.84		0.237	0.305	1.00	0.145	pCi/g	12/06/19 13:38	12/27/19 08:58	1
Radium-228	1.07		0.248	0.271	1.00	0.170	pCi/g	12/06/19 13:38	12/27/19 08:58	1

Client Sample ID: STSB34_0-0.5
Lab Sample ID: 160-36593-5
Date Collected: 11/25/19 15:00
Matrix: Solid
Date Received: 12/05/19 09:30
Percent Solids: 94.9

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Thorium	4.7		0.19	0.086	mg/Kg	☼	12/10/19 13:15	12/27/19 03:13	2
Uranium	1.4		0.096	0.038	mg/Kg	☼	12/10/19 13:15	12/27/19 03:13	2

Client Sample ID: STSB34_0.5-3
Lab Sample ID: 160-36593-6
Date Collected: 11/25/19 15:05
Matrix: Solid
Date Received: 12/05/19 09:30

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	2.34		0.284	0.374	1.00	0.158	pCi/g	12/06/19 13:38	12/27/19 09:03	1
Radium-228	0.930		0.224	0.243	1.00	0.289	pCi/g	12/06/19 13:38	12/27/19 09:03	1

Client Sample ID: STSB34_0.5-3
Lab Sample ID: 160-36593-6
Date Collected: 11/25/19 15:05
Matrix: Solid
Date Received: 12/05/19 09:30
Percent Solids: 94.3

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Thorium	4.6		0.21	0.093	mg/Kg	☼	12/10/19 13:15	12/27/19 03:20	2
Uranium	1.1		0.10	0.041	mg/Kg	☼	12/10/19 13:15	12/27/19 03:20	2

Client Sample ID: STSB34_3-6
Lab Sample ID: 160-36593-7
Date Collected: 11/25/19 15:12
Matrix: Solid
Date Received: 12/05/19 09:30

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	1.90		0.223	0.298	1.00	0.146	pCi/g	12/06/19 13:38	12/27/19 09:30	1
Radium-228	0.863		0.161	0.184	1.00	0.169	pCi/g	12/06/19 13:38	12/27/19 09:30	1

Client Sample ID: STSB34_3-6
Lab Sample ID: 160-36593-7
Date Collected: 11/25/19 15:12
Matrix: Solid
Date Received: 12/05/19 09:30
Percent Solids: 94.7

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Thorium	4.7		0.20	0.089	mg/Kg	☼	12/10/19 13:15	12/27/19 03:27	2
Uranium	1.1		0.099	0.040	mg/Kg	☼	12/10/19 13:15	12/27/19 03:27	2

Client Sample ID: STSB34_6-15
Lab Sample ID: 160-36593-8
Date Collected: 11/25/19 15:28
Matrix: Solid
Date Received: 12/05/19 09:30

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	2.76		0.387	0.478	1.00	0.270	pCi/g	12/06/19 13:38	12/27/19 09:31	1
Radium-228	1.56		0.424	0.452	1.00	0.330	pCi/g	12/06/19 13:38	12/27/19 09:31	1

Client Sample ID: STSB34_6-15
Lab Sample ID: 160-36593-8
Date Collected: 11/25/19 15:28
Matrix: Solid
Date Received: 12/05/19 09:30
Percent Solids: 77.9

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Thorium	16		0.23	0.10	mg/Kg	☼	12/10/19 13:15	12/27/19 03:33	2
Uranium	4.3		0.12	0.046	mg/Kg	☼	12/10/19 13:15	12/27/19 03:33	2

Client Sample ID: STSB34-FD_3-6
Lab Sample ID: 160-36593-9
Date Collected: 11/25/19 15:13
Matrix: Solid
Date Received: 12/05/19 09:30

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	2.15		0.285	0.362	1.00	0.178	pCi/g	12/06/19 13:38	12/27/19 09:35	1

Client Sample ID: STSB34-FD_3-6
Lab Sample ID: 160-36593-9
Date Collected: 11/25/19 15:13
Matrix: Solid
Date Received: 12/05/19 09:30

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.982		0.244	0.263	1.00	0.215	pCi/g	12/06/19 13:38	12/27/19 09:35	1

Client Sample ID: STSB34-FD_3-6
Lab Sample ID: 160-36593-9
Date Collected: 11/25/19 15:13
Matrix: Solid
Date Received: 12/05/19 09:30
Percent Solids: 94.7

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Thorium	5.1		0.20	0.088	mg/Kg	☼	12/10/19 13:15	12/27/19 03:40	2
Uranium	1.2		0.098	0.039	mg/Kg	☼	12/10/19 13:15	12/27/19 03:40	2

Client Sample ID: STSB33_0-0.5
Lab Sample ID: 160-36593-10
Date Collected: 12/03/19 12:31
Matrix: Solid
Date Received: 12/05/19 09:30

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	1.48		0.212	0.262	1.00	0.131	pCi/g	12/06/19 13:38	12/27/19 09:34	1
Radium-228	0.714		0.192	0.206	1.00	0.223	pCi/g	12/06/19 13:38	12/27/19 09:34	1

Client Sample ID: STSB33_0-0.5
Lab Sample ID: 160-36593-10
Date Collected: 12/03/19 12:31
Matrix: Solid
Date Received: 12/05/19 09:30
Percent Solids: 94.9

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Thorium	3.4		0.19	0.084	mg/Kg	☼	12/10/19 13:15	12/27/19 03:47	2
Uranium	2.1		0.093	0.037	mg/Kg	☼	12/10/19 13:15	12/27/19 03:47	2

Client Sample ID: STSB33_0.5-3
Lab Sample ID: 160-36593-11
Date Collected: 12/03/19 12:40
Matrix: Solid
Date Received: 12/05/19 09:30

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	1.60		0.199	0.260	1.00	0.113	pCi/g	12/06/19 13:38	12/27/19 10:11	1
Radium-228	1.05		0.194	0.222	1.00	0.169	pCi/g	12/06/19 13:38	12/27/19 10:11	1

Client Sample ID: STSB33_0.5-3
Lab Sample ID: 160-36593-11
Date Collected: 12/03/19 12:40
Matrix: Solid
Date Received: 12/05/19 09:30
Percent Solids: 94.0

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Thorium	5.9		0.21	0.092	mg/Kg	☼	12/10/19 13:15	12/27/19 03:54	2
Uranium	1.5		0.10	0.041	mg/Kg	☼	12/10/19 13:15	12/27/19 03:54	2

Client Sample ID: STSB33-FD_0.5-3
Lab Sample ID: 160-36593-12

Date Collected: 12/03/19 12:48
Matrix: Solid
Date Received: 12/05/19 09:30

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	1.58		0.239	0.288	1.00	0.209	pCi/g	12/06/19 13:38	12/27/19 10:12	1
Radium-228	0.820		0.362	0.371	1.00	0.345	pCi/g	12/06/19 13:38	12/27/19 10:12	1

Client Sample ID: STSB33-FD_0.5-3
Lab Sample ID: 160-36593-12

Date Collected: 12/03/19 12:48
Matrix: Solid
Date Received: 12/05/19 09:30
Percent Solids: 94.5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Thorium	6.4		0.19	0.086	mg/Kg	☼	12/10/19 13:15	12/27/19 04:00	2
Uranium	1.6		0.096	0.038	mg/Kg	☼	12/10/19 13:15	12/27/19 04:00	2

Client Sample ID: STSB33_3-6
Lab Sample ID: 160-36593-13

Date Collected: 12/03/19 12:51
Matrix: Solid
Date Received: 12/05/19 09:30

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	1.20		0.285	0.311	1.00	0.316	pCi/g	12/06/19 13:38	12/27/19 10:14	1
Radium-228	1.95		0.532	0.568	1.00	0.691	pCi/g	12/06/19 13:38	12/27/19 10:14	1

Client Sample ID: STSB33_3-6
Lab Sample ID: 160-36593-13

Date Collected: 12/03/19 12:51
Matrix: Solid
Date Received: 12/05/19 09:30
Percent Solids: 93.3

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Thorium	9.9		0.21	0.092	mg/Kg	☼	12/10/19 13:15	12/27/19 04:07	2
Uranium	2.3		0.10	0.041	mg/Kg	☼	12/10/19 13:15	12/27/19 04:07	2

Client Sample ID: STSB33_6-15
Lab Sample ID: 160-36593-14

Date Collected: 12/03/19 13:05
Matrix: Solid
Date Received: 12/05/19 09:30

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	1.68		0.244	0.300	1.00	0.133	pCi/g	12/06/19 13:38	12/27/19 10:15	1
Radium-228	1.40		0.249	0.288	1.00	0.130	pCi/g	12/06/19 13:38	12/27/19 10:15	1

Client Sample ID: STSB33_6-15
Lab Sample ID: 160-36593-14

Date Collected: 12/03/19 13:05
Matrix: Solid
Date Received: 12/05/19 09:30
Percent Solids: 93.5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Thorium	6.5		0.21	0.093	mg/Kg	☼	12/10/19 13:15	12/27/19 04:34	2

Client Sample ID: STSB33_6-15
Lab Sample ID: 160-36593-14

Date Collected: 12/03/19 13:05
Matrix: Solid
Date Received: 12/05/19 09:30
Percent Solids: 93.5

Method: 6020A - Metals (ICP/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Uranium	1.9		0.10	0.041	mg/Kg	☼	12/10/19 13:15	12/27/19 04:34	2

Client Sample ID: STSB35_0.5-3
Lab Sample ID: 160-36593-15

Date Collected: 12/03/19 14:41
Matrix: Solid
Date Received: 12/05/19 09:30

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	1.71		0.203	0.270	1.00	0.133	pCi/g	12/06/19 13:38	12/27/19 10:53	1
Radium-228	0.715		0.265	0.275	1.00	0.253	pCi/g	12/06/19 13:38	12/27/19 10:53	1

Client Sample ID: STSB35_0.5-3
Lab Sample ID: 160-36593-15

Date Collected: 12/03/19 14:41
Matrix: Solid
Date Received: 12/05/19 09:30
Percent Solids: 95.5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Thorium	5.2		0.18	0.081	mg/Kg	☼	12/10/19 13:15	12/27/19 04:41	2
Uranium	1.2		0.090	0.036	mg/Kg	☼	12/10/19 13:15	12/27/19 04:41	2

Client Sample ID: STSB35_0-0.5
Lab Sample ID: 160-36593-16

Date Collected: 12/03/19 14:35
Matrix: Solid
Date Received: 12/05/19 09:30

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	3.54		0.400	0.543	1.00	0.214	pCi/g	12/06/19 13:38	12/27/19 10:54	1
Radium-228	0.952		0.352	0.365	1.00	0.497	pCi/g	12/06/19 13:38	12/27/19 10:54	1

Client Sample ID: STSB35_0-0.5
Lab Sample ID: 160-36593-16

Date Collected: 12/03/19 14:35
Matrix: Solid
Date Received: 12/05/19 09:30
Percent Solids: 92.4

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Thorium	6.3		0.20	0.089	mg/Kg	☼	12/10/19 13:15	12/27/19 04:47	2
Uranium	1.6		0.099	0.040	mg/Kg	☼	12/10/19 13:15	12/27/19 04:47	2

Client Sample ID: STSB35_3-6
Lab Sample ID: 160-36593-17

Date Collected: 12/03/19 14:54
Matrix: Solid
Date Received: 12/05/19 09:30

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	2.34		0.225	0.332	1.00	0.132	pCi/g	12/06/19 13:38	12/27/19 11:37	1
Radium-228	0.700		0.278	0.287	1.00	0.271	pCi/g	12/06/19 13:38	12/27/19 11:37	1

Client Sample ID: STSB35_3-6
Lab Sample ID: 160-36593-17

Date Collected: 12/03/19 14:54
Matrix: Solid
Date Received: 12/05/19 09:30
Percent Solids: 94.3

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Thorium	5.0		0.18	0.082	mg/Kg	☼	12/10/19 13:15	12/27/19 04:54	2
Uranium	1.8		0.091	0.037	mg/Kg	☼	12/10/19 13:15	12/27/19 04:54	2

Client Sample ID: STSB35_6-15
Lab Sample ID: 160-36593-18

Date Collected: 12/03/19 15:00
Matrix: Solid
Date Received: 12/05/19 09:30

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	5.62		0.426	0.714	1.00	0.214	pCi/g	12/06/19 13:38	12/27/19 11:37	1
Radium-228	1.15		0.333	0.353	1.00	0.354	pCi/g	12/06/19 13:38	12/27/19 11:37	1

Client Sample ID: STSB35_6-15
Lab Sample ID: 160-36593-18

Date Collected: 12/03/19 15:00
Matrix: Solid
Date Received: 12/05/19 09:30
Percent Solids: 92.6

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Thorium	5.5		0.19	0.085	mg/Kg	☼	12/10/19 13:49	12/27/19 05:01	2
Uranium	2.2		0.095	0.038	mg/Kg	☼	12/10/19 13:49	12/27/19 05:01	2

Default Detection Limits

Client: Wood E&I Solutions Inc
Job ID: 160-36593-1
Project/Site: ACMS - Yerington OU-4b_OU-5_SOIL

Method: 6020A - Metals (ICP/MS)

Prep: 3050B

Analyte	RL	MDL	Units
Thorium	0.20	0.090	mg/Kg
Uranium	0.10	0.040	mg/Kg

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 160-453801/1-A — **Client Sample ID: Method Blank**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 455416 — **Prep Batch: 453801**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Thorium	ND		0.19	0.087	mg/Kg		12/10/19 13:15	12/27/19 01:39	2
Uranium	ND		0.097	0.039	mg/Kg		12/10/19 13:15	12/27/19 01:39	2

Lab Sample ID: LCS 160-453801/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 455416 — **Prep Batch: 453801**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Thorium	90.2	90.2		mg/Kg		100	80 - 120

Lab Sample ID: LCSSRM 160-453801/3-A — **Client Sample ID: Lab Control Sample**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 455416 — **Prep Batch: 453801**

Analyte	Spike Added	LCSSRM Result	LCSSRM Qualifier	Unit	D	%Rec	%Rec. Limits
Uranium	98.1	102		mg/Kg		104.3	74.0 - 126.4

Lab Sample ID: 160-36593-1 MS — **Client Sample ID: STSB32_0-0.5**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 455416 — **Prep Batch: 453801**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Thorium	4.3		101	105		mg/Kg	☼	99	75 - 125
Uranium	1.0		101	102		mg/Kg	☼	99	75 - 125

Lab Sample ID: 160-36593-1 MSD — **Client Sample ID: STSB32_0-0.5**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 455416 — **Prep Batch: 453801**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Thorium	4.3		104	110		mg/Kg	☼	102	75 - 125	5	30
Uranium	1.0		104	107		mg/Kg	☼	101	75 - 125	5	30

Lab Sample ID: 160-36593-1 DU — **Client Sample ID: STSB32_0-0.5**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 455416 — **Prep Batch: 453801**

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Thorium	4.3		8.07	F3	mg/Kg	☼	62	30
Uranium	1.0		2.12	F3	mg/Kg	☼	69	30

Lab Sample ID: LRC 160-455416/2 — **Client Sample ID: Lab Control Sample**
Matrix: Solid
Analysis Batch: 455416

Analyte	Spike Added	LRC Result	LRC Qualifier	Unit	D	%Rec	%Rec. Limits
Thorium	2000	2090		ug/L		104	90 - 110
Uranium	2000	2030		ug/L		101	90 - 110

QC Sample Results

Client: Wood E&I Solutions Inc
Project/Site: ACMS - Yerington OU-4b_OU-5_SOIL

Job ID: 160-36593-1

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

Lab Sample ID: MB 160-453329/1-A
Matrix: Solid
Analysis Batch: 455404

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 453329

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	-0.001468	U	0.147	0.147	1.00	0.256	pCi/g	12/06/19 13:38	12/27/19 07:39	1
Radium-228	0.006121	U	0.0488	0.0488	1.00	0.188	pCi/g	12/06/19 13:38	12/27/19 07:39	1

Lab Sample ID: LCS 160-453329/2-A
Matrix: Solid
Analysis Batch: 455401

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 453329

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Americium-241	96.6	99.53		11.7		1.14	pCi/g	103	75 - 125
Cesium-137	27.3	30.32		3.19		0.310	pCi/g	111	75 - 125
Cobalt-60	10.7	11.88		1.25		0.161	pCi/g	111	75 - 125

Lab Sample ID: 160-36593-1 DU
Matrix: Solid
Analysis Batch: 455402

Client Sample ID: STSB32_0-0.5
Prep Type: Total/NA
Prep Batch: 453329

Analyte	Sample Result	Sample Qual	DU Result	DU Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	DER	DER Limit
Radium-226	3.01		3.248		0.479	1.00	0.181	pCi/g	0.72	2
Radium-228	0.910		1.268		0.378	1.00	0.238	pCi/g	1.58	2

Metals

Prep Batch: 453801

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-36593-1	STSB32_0-0.5	Total/NA	Solid	3050B	
160-36593-2	STSB32_0.5-3	Total/NA	Solid	3050B	
160-36593-3	STSB32_3-6	Total/NA	Solid	3050B	
160-36593-4	STSB32_6-15	Total/NA	Solid	3050B	
160-36593-5	STSB34_0-0.5	Total/NA	Solid	3050B	
160-36593-6	STSB34_0.5-3	Total/NA	Solid	3050B	
160-36593-7	STSB34_3-6	Total/NA	Solid	3050B	
160-36593-8	STSB34_6-15	Total/NA	Solid	3050B	
160-36593-9	STSB34-FD_3-6	Total/NA	Solid	3050B	
160-36593-10	STSB33_0-0.5	Total/NA	Solid	3050B	
160-36593-11	STSB33_0.5-3	Total/NA	Solid	3050B	
160-36593-12	STSB33-FD_0.5-3	Total/NA	Solid	3050B	
160-36593-13	STSB33_3-6	Total/NA	Solid	3050B	
160-36593-14	STSB33_6-15	Total/NA	Solid	3050B	
160-36593-15	STSB35_0.5-3	Total/NA	Solid	3050B	
160-36593-16	STSB35_0-0.5	Total/NA	Solid	3050B	
160-36593-17	STSB35_3-6	Total/NA	Solid	3050B	
160-36593-18	STSB35_6-15	Total/NA	Solid	3050B	
MB 160-453801/1-A	Method Blank	Total/NA	Solid	3050B	
LCS 160-453801/2-A	Lab Control Sample	Total/NA	Solid	3050B	
LCSSRM 160-453801/3-A	Lab Control Sample	Total/NA	Solid	3050B	
160-36593-1 MS	STSB32_0-0.5	Total/NA	Solid	3050B	
160-36593-1 MSD	STSB32_0-0.5	Total/NA	Solid	3050B	
160-36593-1 DU	STSB32_0-0.5	Total/NA	Solid	3050B	

Analysis Batch: 455416

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-36593-1	STSB32_0-0.5	Total/NA	Solid	6020A	453801
160-36593-2	STSB32_0.5-3	Total/NA	Solid	6020A	453801
160-36593-3	STSB32_3-6	Total/NA	Solid	6020A	453801
160-36593-4	STSB32_6-15	Total/NA	Solid	6020A	453801
160-36593-5	STSB34_0-0.5	Total/NA	Solid	6020A	453801
160-36593-6	STSB34_0.5-3	Total/NA	Solid	6020A	453801
160-36593-7	STSB34_3-6	Total/NA	Solid	6020A	453801
160-36593-8	STSB34_6-15	Total/NA	Solid	6020A	453801
160-36593-9	STSB34-FD_3-6	Total/NA	Solid	6020A	453801
160-36593-10	STSB33_0-0.5	Total/NA	Solid	6020A	453801
160-36593-11	STSB33_0.5-3	Total/NA	Solid	6020A	453801
160-36593-12	STSB33-FD_0.5-3	Total/NA	Solid	6020A	453801
160-36593-13	STSB33_3-6	Total/NA	Solid	6020A	453801
160-36593-14	STSB33_6-15	Total/NA	Solid	6020A	453801
160-36593-15	STSB35_0.5-3	Total/NA	Solid	6020A	453801
160-36593-16	STSB35_0-0.5	Total/NA	Solid	6020A	453801
160-36593-17	STSB35_3-6	Total/NA	Solid	6020A	453801
160-36593-18	STSB35_6-15	Total/NA	Solid	6020A	453801
MB 160-453801/1-A	Method Blank	Total/NA	Solid	6020A	453801
LCS 160-453801/2-A	Lab Control Sample	Total/NA	Solid	6020A	453801
LCSSRM 160-453801/3-A	Lab Control Sample	Total/NA	Solid	6020A	453801
LRC 160-455416/2	Lab Control Sample		Solid	6020A	
160-36593-1 MS	STSB32_0-0.5	Total/NA	Solid	6020A	453801
160-36593-1 MSD	STSB32_0-0.5	Total/NA	Solid	6020A	453801

Metals (Continued)

Analysis Batch: 455416 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-36593-1 DU	STSB32_0-0.5	Total/NA	Solid	6020A	453801

General Chemistry

Analysis Batch: 453177

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-36593-1	STSB32_0-0.5	Total/NA	Solid	Moisture	
160-36593-2	STSB32_0.5-3	Total/NA	Solid	Moisture	
160-36593-3	STSB32_3-6	Total/NA	Solid	Moisture	
160-36593-4	STSB32_6-15	Total/NA	Solid	Moisture	
160-36593-5	STSB34_0-0.5	Total/NA	Solid	Moisture	
160-36593-6	STSB34_0.5-3	Total/NA	Solid	Moisture	
160-36593-7	STSB34_3-6	Total/NA	Solid	Moisture	
160-36593-8	STSB34_6-15	Total/NA	Solid	Moisture	
160-36593-9	STSB34-FD_3-6	Total/NA	Solid	Moisture	
160-36593-10	STSB33_0-0.5	Total/NA	Solid	Moisture	
160-36593-11	STSB33_0.5-3	Total/NA	Solid	Moisture	
160-36593-12	STSB33-FD_0.5-3	Total/NA	Solid	Moisture	
160-36593-13	STSB33_3-6	Total/NA	Solid	Moisture	
160-36593-14	STSB33_6-15	Total/NA	Solid	Moisture	
160-36593-15	STSB35_0.5-3	Total/NA	Solid	Moisture	
160-36593-16	STSB35_0-0.5	Total/NA	Solid	Moisture	
160-36593-17	STSB35_3-6	Total/NA	Solid	Moisture	
160-36593-18	STSB35_6-15	Total/NA	Solid	Moisture	
160-36593-1 DU	STSB32_0-0.5	Total/NA	Solid	Moisture	

Rad

Leach Batch: 453184

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-36593-1	STSB32_0-0.5	Total/NA	Solid	Dry and Grind	
160-36593-2	STSB32_0.5-3	Total/NA	Solid	Dry and Grind	
160-36593-3	STSB32_3-6	Total/NA	Solid	Dry and Grind	
160-36593-4	STSB32_6-15	Total/NA	Solid	Dry and Grind	
160-36593-5	STSB34_0-0.5	Total/NA	Solid	Dry and Grind	
160-36593-6	STSB34_0.5-3	Total/NA	Solid	Dry and Grind	
160-36593-7	STSB34_3-6	Total/NA	Solid	Dry and Grind	
160-36593-8	STSB34_6-15	Total/NA	Solid	Dry and Grind	
160-36593-9	STSB34-FD_3-6	Total/NA	Solid	Dry and Grind	
160-36593-10	STSB33_0-0.5	Total/NA	Solid	Dry and Grind	
160-36593-11	STSB33_0.5-3	Total/NA	Solid	Dry and Grind	
160-36593-12	STSB33-FD_0.5-3	Total/NA	Solid	Dry and Grind	
160-36593-13	STSB33_3-6	Total/NA	Solid	Dry and Grind	
160-36593-14	STSB33_6-15	Total/NA	Solid	Dry and Grind	
160-36593-15	STSB35_0.5-3	Total/NA	Solid	Dry and Grind	
160-36593-16	STSB35_0-0.5	Total/NA	Solid	Dry and Grind	
160-36593-17	STSB35_3-6	Total/NA	Solid	Dry and Grind	
160-36593-18	STSB35_6-15	Total/NA	Solid	Dry and Grind	
160-36593-1 DU	STSB32_0-0.5	Total/NA	Solid	Dry and Grind	

QC Association Summary

Client: Wood E&I Solutions Inc
Job ID: 160-36593-1
Project/Site: ACMS - Yerington OU-4b_OU-5_SOIL

Rad

Prep Batch: 453329

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-36593-1	STSB32_0-0.5	Total/NA	Solid	Fill_Geo-21	453184
160-36593-2	STSB32_0.5-3	Total/NA	Solid	Fill_Geo-21	453184
160-36593-3	STSB32_3-6	Total/NA	Solid	Fill_Geo-21	453184
160-36593-4	STSB32_6-15	Total/NA	Solid	Fill_Geo-21	453184
160-36593-5	STSB34_0-0.5	Total/NA	Solid	Fill_Geo-21	453184
160-36593-6	STSB34_0.5-3	Total/NA	Solid	Fill_Geo-21	453184
160-36593-7	STSB34_3-6	Total/NA	Solid	Fill_Geo-21	453184
160-36593-8	STSB34_6-15	Total/NA	Solid	Fill_Geo-21	453184
160-36593-9	STSB34-FD_3-6	Total/NA	Solid	Fill_Geo-21	453184
160-36593-10	STSB33_0-0.5	Total/NA	Solid	Fill_Geo-21	453184
160-36593-11	STSB33_0.5-3	Total/NA	Solid	Fill_Geo-21	453184
160-36593-12	STSB33-FD_0.5-3	Total/NA	Solid	Fill_Geo-21	453184
160-36593-13	STSB33_3-6	Total/NA	Solid	Fill_Geo-21	453184
160-36593-14	STSB33_6-15	Total/NA	Solid	Fill_Geo-21	453184
160-36593-15	STSB35_0.5-3	Total/NA	Solid	Fill_Geo-21	453184
160-36593-16	STSB35_0-0.5	Total/NA	Solid	Fill_Geo-21	453184
160-36593-17	STSB35_3-6	Total/NA	Solid	Fill_Geo-21	453184
160-36593-18	STSB35_6-15	Total/NA	Solid	Fill_Geo-21	453184
MB 160-453329/1-A	Method Blank	Total/NA	Solid	Fill_Geo-21	
LCS 160-453329/2-A	Lab Control Sample	Total/NA	Solid	Fill_Geo-21	
160-36593-1 DU	STSB32_0-0.5	Total/NA	Solid	Fill_Geo-21	453184

Lab Chronicle

Client: Wood E&I Solutions Inc
Project/Site: ACMS - Yerington OU-4b_OU-5_SOIL

Job ID: 160-36593-1

Client Sample ID: STSB32_0-0.5
Lab Sample ID: 160-36593-1
Date Collected: 11/25/19 13:25
Matrix: Solid
Date Received: 12/05/19 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	453177	12/05/19 14:09	DRO	TAL SL
Total/NA	Leach	Dry and Grind			453184	12/05/19 15:08	DRO	TAL SL
Total/NA	Prep	Fill_Geo-21			453329	12/06/19 13:38	KRS	TAL SL
Total/NA	Analysis	901.1		1	455403	12/27/19 07:44	KLS	TAL SL

Client Sample ID: STSB32_0-0.5
Lab Sample ID: 160-36593-1
Date Collected: 11/25/19 13:25
Matrix: Solid
Date Received: 12/05/19 09:30
Percent Solids: 93.3

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			453801	12/10/19 13:15	LAM	TAL SL
Total/NA	Analysis	6020A		2	455416	12/27/19 01:59	FLC	TAL SL

Client Sample ID: STSB32_0.5-3
Lab Sample ID: 160-36593-2
Date Collected: 11/25/19 13:40
Matrix: Solid
Date Received: 12/05/19 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	453177	12/05/19 14:09	DRO	TAL SL
Total/NA	Leach	Dry and Grind			453184	12/05/19 15:08	DRO	TAL SL
Total/NA	Prep	Fill_Geo-21			453329	12/06/19 13:38	KRS	TAL SL
Total/NA	Analysis	901.1		1	455404	12/27/19 08:16	KLS	TAL SL

Client Sample ID: STSB32_0.5-3
Lab Sample ID: 160-36593-2
Date Collected: 11/25/19 13:40
Matrix: Solid
Date Received: 12/05/19 09:30
Percent Solids: 95.4

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			453801	12/10/19 13:15	LAM	TAL SL
Total/NA	Analysis	6020A		2	455416	12/27/19 02:33	FLC	TAL SL

Client Sample ID: STSB32_3-6
Lab Sample ID: 160-36593-3
Date Collected: 11/25/19 13:49
Matrix: Solid
Date Received: 12/05/19 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	453177	12/05/19 14:09	DRO	TAL SL
Total/NA	Leach	Dry and Grind			453184	12/05/19 15:08	DRO	TAL SL
Total/NA	Prep	Fill_Geo-21			453329	12/06/19 13:38	KRS	TAL SL
Total/NA	Analysis	901.1		1	455401	12/27/19 08:17	KLS	TAL SL

Client Sample ID: STSB32_3-6
Lab Sample ID: 160-36593-3

Date Collected: 11/25/19 13:49
Matrix: Solid
Date Received: 12/05/19 09:30
Percent Solids: 93.3

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			453801	12/10/19 13:15	LAM	TAL SL
Total/NA	Analysis	6020A		2	455416	12/27/19 02:40	FLC	TAL SL

Client Sample ID: STSB32_6-15
Lab Sample ID: 160-36593-4

Date Collected: 11/25/19 14:06
Matrix: Solid
Date Received: 12/05/19 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	453177	12/05/19 14:09	DRO	TAL SL
Total/NA	Leach	Dry and Grind			453184	12/05/19 15:08	DRO	TAL SL
Total/NA	Prep	Fill_Geo-21			453329	12/06/19 13:38	KRS	TAL SL
Total/NA	Analysis	901.1		1	455403	12/27/19 08:19	KLS	TAL SL

Client Sample ID: STSB32_6-15
Lab Sample ID: 160-36593-4

Date Collected: 11/25/19 14:06
Matrix: Solid
Date Received: 12/05/19 09:30
Percent Solids: 91.0

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			453801	12/10/19 13:15	LAM	TAL SL
Total/NA	Analysis	6020A		2	455416	12/27/19 03:07	FLC	TAL SL

Client Sample ID: STSB34_0-0.5
Lab Sample ID: 160-36593-5

Date Collected: 11/25/19 15:00
Matrix: Solid
Date Received: 12/05/19 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	453177	12/05/19 14:09	DRO	TAL SL
Total/NA	Leach	Dry and Grind			453184	12/05/19 15:08	DRO	TAL SL
Total/NA	Prep	Fill_Geo-21			453329	12/06/19 13:38	KRS	TAL SL
Total/NA	Analysis	901.1		1	455403	12/27/19 08:58	KLS	TAL SL

Client Sample ID: STSB34_0-0.5
Lab Sample ID: 160-36593-5

Date Collected: 11/25/19 15:00
Matrix: Solid
Date Received: 12/05/19 09:30
Percent Solids: 94.9

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			453801	12/10/19 13:15	LAM	TAL SL
Total/NA	Analysis	6020A		2	455416	12/27/19 03:13	FLC	TAL SL

Client Sample ID: STSB34_0.5-3
Lab Sample ID: 160-36593-6

Date Collected: 11/25/19 15:05
Matrix: Solid
Date Received: 12/05/19 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	453177	12/05/19 14:09	DRO	TAL SL

Client Sample ID: STSB34_0.5-3
Lab Sample ID: 160-36593-6

Date Collected: 11/25/19 15:05
Matrix: Solid
Date Received: 12/05/19 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Leach	Dry and Grind			453184	12/05/19 15:08	DRO	TAL SL
Total/NA	Prep	Fill_Geo-21			453329	12/06/19 13:38	KRS	TAL SL
Total/NA	Analysis	901.1		1	455402	12/27/19 09:03	KLS	TAL SL

Client Sample ID: STSB34_0.5-3
Lab Sample ID: 160-36593-6

Date Collected: 11/25/19 15:05
Matrix: Solid
Date Received: 12/05/19 09:30
Percent Solids: 94.3

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			453801	12/10/19 13:15	LAM	TAL SL
Total/NA	Analysis	6020A		2	455416	12/27/19 03:20	FLC	TAL SL

Client Sample ID: STSB34_3-6
Lab Sample ID: 160-36593-7

Date Collected: 11/25/19 15:12
Matrix: Solid
Date Received: 12/05/19 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	453177	12/05/19 14:09	DRO	TAL SL
Total/NA	Leach	Dry and Grind			453184	12/05/19 15:08	DRO	TAL SL
Total/NA	Prep	Fill_Geo-21			453329	12/06/19 13:38	KRS	TAL SL
Total/NA	Analysis	901.1		1	455404	12/27/19 09:30	KLS	TAL SL

Client Sample ID: STSB34_3-6
Lab Sample ID: 160-36593-7

Date Collected: 11/25/19 15:12
Matrix: Solid
Date Received: 12/05/19 09:30
Percent Solids: 94.7

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			453801	12/10/19 13:15	LAM	TAL SL
Total/NA	Analysis	6020A		2	455416	12/27/19 03:27	FLC	TAL SL

Client Sample ID: STSB34_6-15
Lab Sample ID: 160-36593-8

Date Collected: 11/25/19 15:28
Matrix: Solid
Date Received: 12/05/19 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	453177	12/05/19 14:09	DRO	TAL SL
Total/NA	Leach	Dry and Grind			453184	12/05/19 15:08	DRO	TAL SL
Total/NA	Prep	Fill_Geo-21			453329	12/06/19 13:38	KRS	TAL SL
Total/NA	Analysis	901.1		1	455401	12/27/19 09:31	KLS	TAL SL

Client Sample ID: STSB34_6-15
Lab Sample ID: 160-36593-8

Date Collected: 11/25/19 15:28
Matrix: Solid
Date Received: 12/05/19 09:30
Percent Solids: 77.9

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			453801	12/10/19 13:15	LAM	TAL SL
Total/NA	Analysis	6020A		2	455416	12/27/19 03:33	FLC	TAL SL

Client Sample ID: STSB34-FD_3-6
Lab Sample ID: 160-36593-9

Date Collected: 11/25/19 15:13
Matrix: Solid
Date Received: 12/05/19 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	453177	12/05/19 14:09	DRO	TAL SL
Total/NA	Leach	Dry and Grind			453184	12/05/19 15:08	DRO	TAL SL
Total/NA	Prep	Fill_Geo-21			453329	12/06/19 13:38	KRS	TAL SL
Total/NA	Analysis	901.1		1	455402	12/27/19 09:35	KLS	TAL SL

Client Sample ID: STSB34-FD_3-6
Lab Sample ID: 160-36593-9

Date Collected: 11/25/19 15:13
Matrix: Solid
Date Received: 12/05/19 09:30
Percent Solids: 94.7

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			453801	12/10/19 13:15	LAM	TAL SL
Total/NA	Analysis	6020A		2	455416	12/27/19 03:40	FLC	TAL SL

Client Sample ID: STSB33_0-0.5
Lab Sample ID: 160-36593-10

Date Collected: 12/03/19 12:31
Matrix: Solid
Date Received: 12/05/19 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	453177	12/05/19 14:09	DRO	TAL SL
Total/NA	Leach	Dry and Grind			453184	12/05/19 15:08	DRO	TAL SL
Total/NA	Prep	Fill_Geo-21			453329	12/06/19 13:38	KRS	TAL SL
Total/NA	Analysis	901.1		1	455403	12/27/19 09:34	KLS	TAL SL

Client Sample ID: STSB33_0-0.5
Lab Sample ID: 160-36593-10

Date Collected: 12/03/19 12:31
Matrix: Solid
Date Received: 12/05/19 09:30
Percent Solids: 94.9

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			453801	12/10/19 13:15	LAM	TAL SL
Total/NA	Analysis	6020A		2	455416	12/27/19 03:47	FLC	TAL SL

Client Sample ID: STSB33_0.5-3
Lab Sample ID: 160-36593-11

Date Collected: 12/03/19 12:40
Matrix: Solid
Date Received: 12/05/19 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	453177	12/05/19 14:09	DRO	TAL SL

Client Sample ID: STSB33_0.5-3
Lab Sample ID: 160-36593-11

Date Collected: 12/03/19 12:40
Matrix: Solid
Date Received: 12/05/19 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Leach	Dry and Grind			453184	12/05/19 15:08	DRO	TAL SL
Total/NA	Prep	Fill_Geo-21			453329	12/06/19 13:38	KRS	TAL SL
Total/NA	Analysis	901.1		1	455404	12/27/19 10:11	KLS	TAL SL

Client Sample ID: STSB33_0.5-3
Lab Sample ID: 160-36593-11

Date Collected: 12/03/19 12:40
Matrix: Solid
Date Received: 12/05/19 09:30
Percent Solids: 94.0

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			453801	12/10/19 13:15	LAM	TAL SL
Total/NA	Analysis	6020A		2	455416	12/27/19 03:54	FLC	TAL SL

Client Sample ID: STSB33-FD_0.5-3
Lab Sample ID: 160-36593-12

Date Collected: 12/03/19 12:48
Matrix: Solid
Date Received: 12/05/19 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	453177	12/05/19 14:09	DRO	TAL SL
Total/NA	Leach	Dry and Grind			453184	12/05/19 15:08	DRO	TAL SL
Total/NA	Prep	Fill_Geo-21			453329	12/06/19 13:38	KRS	TAL SL
Total/NA	Analysis	901.1		1	455401	12/27/19 10:12	KLS	TAL SL

Client Sample ID: STSB33-FD_0.5-3
Lab Sample ID: 160-36593-12

Date Collected: 12/03/19 12:48
Matrix: Solid
Date Received: 12/05/19 09:30
Percent Solids: 94.5

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			453801	12/10/19 13:15	LAM	TAL SL
Total/NA	Analysis	6020A		2	455416	12/27/19 04:00	FLC	TAL SL

Client Sample ID: STSB33_3-6
Lab Sample ID: 160-36593-13

Date Collected: 12/03/19 12:51
Matrix: Solid
Date Received: 12/05/19 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	453177	12/05/19 14:09	DRO	TAL SL
Total/NA	Leach	Dry and Grind			453184	12/05/19 15:08	DRO	TAL SL
Total/NA	Prep	Fill_Geo-21			453329	12/06/19 13:38	KRS	TAL SL
Total/NA	Analysis	901.1		1	455402	12/27/19 10:14	KLS	TAL SL

Client Sample ID: STSB33_3-6
Lab Sample ID: 160-36593-13

Date Collected: 12/03/19 12:51
Matrix: Solid
Date Received: 12/05/19 09:30
Percent Solids: 93.3

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			453801	12/10/19 13:15	LAM	TAL SL
Total/NA	Analysis	6020A		2	455416	12/27/19 04:07	FLC	TAL SL

Client Sample ID: STSB33_6-15
Lab Sample ID: 160-36593-14

Date Collected: 12/03/19 13:05
Matrix: Solid
Date Received: 12/05/19 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	453177	12/05/19 14:09	DRO	TAL SL
Total/NA	Leach	Dry and Grind			453184	12/05/19 15:08	DRO	TAL SL
Total/NA	Prep	Fill_Geo-21			453329	12/06/19 13:38	KRS	TAL SL
Total/NA	Analysis	901.1		1	455403	12/27/19 10:15	KLS	TAL SL

Client Sample ID: STSB33_6-15
Lab Sample ID: 160-36593-14

Date Collected: 12/03/19 13:05
Matrix: Solid
Date Received: 12/05/19 09:30
Percent Solids: 93.5

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			453801	12/10/19 13:15	LAM	TAL SL
Total/NA	Analysis	6020A		2	455416	12/27/19 04:34	FLC	TAL SL

Client Sample ID: STSB35_0.5-3
Lab Sample ID: 160-36593-15

Date Collected: 12/03/19 14:41
Matrix: Solid
Date Received: 12/05/19 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	453177	12/05/19 14:09	DRO	TAL SL
Total/NA	Leach	Dry and Grind			453184	12/05/19 15:08	DRO	TAL SL
Total/NA	Prep	Fill_Geo-21			453329	12/06/19 13:38	KRS	TAL SL
Total/NA	Analysis	901.1		1	455404	12/27/19 10:53	KLS	TAL SL

Client Sample ID: STSB35_0.5-3
Lab Sample ID: 160-36593-15

Date Collected: 12/03/19 14:41
Matrix: Solid
Date Received: 12/05/19 09:30
Percent Solids: 95.5

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			453801	12/10/19 13:15	LAM	TAL SL
Total/NA	Analysis	6020A		2	455416	12/27/19 04:41	FLC	TAL SL

Client Sample ID: STSB35_0-0.5
Lab Sample ID: 160-36593-16

Date Collected: 12/03/19 14:35
Matrix: Solid
Date Received: 12/05/19 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	453177	12/05/19 14:09	DRO	TAL SL

Lab Chronicle

Client: Wood E&I Solutions Inc
Project/Site: ACMS - Yerington OU-4b_OU-5_SOIL

Job ID: 160-36593-1

Client Sample ID: STSB35_0-0.5
Lab Sample ID: 160-36593-16

Date Collected: 12/03/19 14:35
Matrix: Solid
Date Received: 12/05/19 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Leach	Dry and Grind			453184	12/05/19 15:08	DRO	TAL SL
Total/NA	Prep	Fill_Geo-21			453329	12/06/19 13:38	KRS	TAL SL
Total/NA	Analysis	901.1		1	455403	12/27/19 10:54	KLS	TAL SL

Client Sample ID: STSB35_0-0.5
Lab Sample ID: 160-36593-16

Date Collected: 12/03/19 14:35
Matrix: Solid
Date Received: 12/05/19 09:30
Percent Solids: 92.4

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			453801	12/10/19 13:15	LAM	TAL SL
Total/NA	Analysis	6020A		2	455416	12/27/19 04:47	FLC	TAL SL

Client Sample ID: STSB35_3-6
Lab Sample ID: 160-36593-17

Date Collected: 12/03/19 14:54
Matrix: Solid
Date Received: 12/05/19 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	453177	12/05/19 14:09	DRO	TAL SL
Total/NA	Leach	Dry and Grind			453184	12/05/19 15:08	DRO	TAL SL
Total/NA	Prep	Fill_Geo-21			453329	12/06/19 13:38	KRS	TAL SL
Total/NA	Analysis	901.1		1	455404	12/27/19 11:37	KLS	TAL SL

Client Sample ID: STSB35_3-6
Lab Sample ID: 160-36593-17

Date Collected: 12/03/19 14:54
Matrix: Solid
Date Received: 12/05/19 09:30
Percent Solids: 94.3

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			453801	12/10/19 13:15	LAM	TAL SL
Total/NA	Analysis	6020A		2	455416	12/27/19 04:54	FLC	TAL SL

Client Sample ID: STSB35_6-15
Lab Sample ID: 160-36593-18

Date Collected: 12/03/19 15:00
Matrix: Solid
Date Received: 12/05/19 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	453177	12/05/19 14:09	DRO	TAL SL
Total/NA	Leach	Dry and Grind			453184	12/05/19 15:08	DRO	TAL SL
Total/NA	Prep	Fill_Geo-21			453329	12/06/19 13:38	KRS	TAL SL
Total/NA	Analysis	901.1		1	455401	12/27/19 11:37	KLS	TAL SL

Lab Chronicle

Client: Wood E&I Solutions Inc
Project/Site: ACMS - Yerington OU-4b_OU-5_SOIL

Job ID: 160-36593-1

Client Sample ID: STSB35_6-15

Date Collected: 12/03/19 15:00
Date Received: 12/05/19 09:30

Lab Sample ID: 160-36593-18

Matrix: Solid
Percent Solids: 92.6

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			453801	12/10/19 13:49	LAM	TAL SL
Total/NA	Analysis	6020A		2	455416	12/27/19 05:01	FLC	TAL SL

Laboratory References:

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

Accreditation/Certification Summary

Client: Wood E&I Solutions Inc
Job ID: 160-36593-1
Project/Site: ACMS - Yerington OU-4b_OU-5_SOIL

Laboratory: Eurofins TestAmerica, St. Louis

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
Louisiana	NELAP	04080	06-30-20

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
901.1	Fill_Geo-21	Solid	Radium-226
901.1	Fill_Geo-21	Solid	Radium-228
Moisture		Solid	Percent Moisture
Moisture		Solid	Percent Solids

Nevada	State Program	MO000542018-1	07-31-20

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
6020A	3050B	Solid	Thorium
901.1	Fill_Geo-21	Solid	Radium-226
901.1	Fill_Geo-21	Solid	Radium-228
Moisture		Solid	Percent Moisture
Moisture		Solid	Percent Solids

Method Summary

Client: Wood E&I Solutions Inc
Project/Site: ACMS - Yerington OU-4b_OU-5_SOIL

Job ID: 160-36593-1

Method	Method Description	Protocol	Laboratory
6020A	Metals (ICP/MS)	SW846	TAL SL
Moisture	Percent Moisture	EPA	TAL SL
901.1	Radium-226 & Other Gamma Emitters (GS)	EPA	TAL SL
3050B	Preparation, Metals	SW846	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

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

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

Sample Summary

Client: Wood E&I Solutions Inc
Job ID: 160-36593-1
Project/Site: ACMS - Yerington OU-4b_OU-5_SOIL

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
160-36593-1	STSB32_0-0.5	Solid	11/25/19 13:25	12/05/19 09:30	
160-36593-2	STSB32_0.5-3	Solid	11/25/19 13:40	12/05/19 09:30	
160-36593-3	STSB32_3-6	Solid	11/25/19 13:49	12/05/19 09:30	
160-36593-4	STSB32_6-15	Solid	11/25/19 14:06	12/05/19 09:30	
160-36593-5	STSB34_0-0.5	Solid	11/25/19 15:00	12/05/19 09:30	
160-36593-6	STSB34_0.5-3	Solid	11/25/19 15:05	12/05/19 09:30	
160-36593-7	STSB34_3-6	Solid	11/25/19 15:12	12/05/19 09:30	
160-36593-8	STSB34_6-15	Solid	11/25/19 15:28	12/05/19 09:30	
160-36593-9	STSB34-FD_3-6	Solid	11/25/19 15:13	12/05/19 09:30	
160-36593-10	STSB33_0-0.5	Solid	12/03/19 12:31	12/05/19 09:30	
160-36593-11	STSB33_0.5-3	Solid	12/03/19 12:40	12/05/19 09:30	
160-36593-12	STSB33-FD_0.5-3	Solid	12/03/19 12:48	12/05/19 09:30	
160-36593-13	STSB33_3-6	Solid	12/03/19 12:51	12/05/19 09:30	
160-36593-14	STSB33_6-15	Solid	12/03/19 13:05	12/05/19 09:30	
160-36593-15	STSB35_0.5-3	Solid	12/03/19 14:41	12/05/19 09:30	
160-36593-16	STSB35_0-0.5	Solid	12/03/19 14:35	12/05/19 09:30	
160-36593-17	STSB35_3-6	Solid	12/03/19 14:54	12/05/19 09:30	
160-36593-18	STSB35_6-15	Solid	12/03/19 15:00	12/05/19 09:30	

REAGENT TRACEABILITY SUMMARY

Lab Name: Eurofins TestAmerica, St. Louis Job No.: 160-36593-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
MPREP1-A_00004	11/26/20	CPI International, Lot 10094019-9			(Purchased Reagent)		Ag	40 mg/L
							Al	2000 mg/L
							As	200 mg/L
							B	40 mg/L
							Ba	200 mg/L
							Be	20 mg/L
							Bi	200 mg/L
							Ca	2000 mg/L
							Cd	200 mg/L
							Co	200 mg/L
							Cr	200 mg/L
							Cu	200 mg/L
							Fe	2000 mg/L
							K	2000 mg/L
							Li	20 mg/L
							Mg	2000 mg/L
							Mn	200 mg/L
							Na	2000 mg/L
							Ni	200 mg/L
							P	200 mg/L
							Pb	200 mg/L
							Se	100 mg/L
							Sm	200 mg/L
							Sr	200 mg/L
							Thorium	200 mg/L
							Tl	40 mg/L
							Uranium	200 mg/L
							V	200 mg/L
							Zn	200 mg/L
MPREP1-B_00004	11/26/20	CPI International, Lot 10094019-8			(Purchased Reagent)		Sulfur	2000 mg/L
MPREP2_00022	11/26/20	CPI International, Lot 10094019-7			(Purchased Reagent)		Mo	100 mg/L
							Sb	99.99 mg/L
							Si	1000 mg/L
							Sn	200 mg/L
							Ti	200 mg/L
							W	200 mg/L
							Zr	200 mg/L
MS A CAL1 LLC_00421	01/22/20	12/26/19	2% HCL 2% HN03, Lot 1854886	500 mL	MS CAL 1 A_00006	0.5 mL	Thorium	2 ug/L
							Uranium	1 ug/L
.MS CAL 1 A_00006	09/18/20	CPI, Lot 10103046-1			(Purchased Reagent)		Thorium	2 ug/mL
							Uranium	1 ug/mL
MS A CAL2 CCV_00378	01/22/20	12/26/19	2% HCL 2% HN03, Lot 1854886	500 mL	MS CAL3 A_00011	0.5 mL	Thorium	100 ug/L
							Uranium	100 ug/L
.MS CAL3 A_00011	05/31/20	CPI, Lot 10097743-1			(Purchased Reagent)		Thorium	100 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: Eurofins TestAmerica, St. Louis Job No.: 160-36593-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Uranium	100 ug/mL
MS A CAL3_00337	01/22/20	12/26/19	2% HCL 2% HN03, Lot 1854886	200 mL	MS CAL3 A_00011	0.4 mL	Thorium	200 ug/L
							Uranium	200 ug/L
.MS CAL3 A_00011	05/31/20	CPI, Lot 10097743-1			(Purchased Reagent)		Thorium	100 ug/mL
							Uranium	100 ug/mL
MS A ICSA_00329	01/01/20	12/26/19	2% HCL 2% HN03, Lot 1854886	100 mL	STD TI_00010	0.2 mL	Ti	2 mg/L
.STD TI_00010	08/19/20	CPI, Lot 987438-5			(Purchased Reagent)		Ti	1000 ug/mL
MS A ICSAB_00341	01/01/20	12/26/19	2% HCL 2% HN03, Lot 1854886	100 mL	MS CAL3 A_00012	0.05 mL	Thorium	50 ug/L
							Uranium	50 ug/L
.MS CAL3 A_00012	11/20/20	CPI, Lot 10097743-1			(Purchased Reagent)		Thorium	100 ug/mL
							Uranium	100 ug/mL
MS A ICV_01081	12/27/19	12/26/19	2% Nitric Acid, Lot 1854886	100 mL	MS ICV 2_00009	0.05 mL	Thorium	100 ug/L
							Uranium	100 ug/L
.MS ICV 2_00009	05/31/20	CPI, Lot 10097743-4			(Purchased Reagent)		Thorium	200 ug/mL
							Uranium	200 ug/mL
MS LDR 2_00188	01/24/20	12/24/19	2% HCL 2% HNO3, Lot 1854886	100 mL	MS CAL3 A_00011	2 mL	Thorium	2 ug/mL
							Uranium	2 ug/mL
.MS CAL3 A_00011	05/31/20	CPI, Lot 10097743-1			(Purchased Reagent)		Thorium	100 ug/mL
							Uranium	100 ug/mL
PR_LCSSRM U_00001	03/31/20	ERA, Lot D099-540			(Purchased Reagent)		Ag	43.3 mg/Kg
							Al	8360 mg/Kg
							As	161 mg/Kg
							B	81.6 mg/Kg
							Ba	260 mg/Kg
							Be	97.6 mg/Kg
							Ca	4760 mg/Kg
							Cd	211 mg/Kg
							Co	48.2 mg/Kg
							Cr	136 mg/Kg
							Cu	166 mg/Kg
							Fe	14100 mg/Kg
							Hg	11.5 mg/Kg
							K	2020 mg/Kg
							Mg	2340 mg/Kg
							Mn	228 mg/Kg
							Mo	110 mg/Kg
							Na	218 mg/Kg
							Ni	91.9 mg/Kg
							Pb	111 mg/Kg
							Sb	75.5 mg/Kg
							Se	191 mg/Kg

Lab Name: Eurofins TestAmerica, St. Louis Job No.: 160-36593-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Sn	99.9 mg/Kg
							Sr	107 mg/Kg
							Ti	376 mg/Kg
							Tl	156 mg/Kg
							Uranium	98.1 mg/Kg
							V	56.7 mg/Kg
							Zn	199 mg/Kg
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
							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

REAGENT TRACEABILITY SUMMARY

Lab Name: Eurofins TestAmerica, St. Louis Job No.: 160-36593-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							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 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

REAGENT TRACEABILITY SUMMARY

Lab Name: Eurofins TestAmerica, St. Louis Job No.: 160-36593-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
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

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.
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

MPREP1-A_00004

CPI INTERNATIONAL

1842468
ID MPREP1-A_00004
Exp.11/26/20 Prpd:LAM Opn 11/26/19
Metals Prep 1 Spike A

CERTIFICATE OF ANALYSIS

Multi-Element Aqueous CRM

Product #: TA-CM-FEB19-STL1-A

Custom ISO G34 Metals Prep 1 Spike A

Lot #: 10094019-9

Matrix: 5% HNO_3

Element	Certified Concentration & Uncertainty	Element	Certified Concentration & Uncertainty	Element	Certified Concentration & Uncertainty
Ag	40.00 ± 0.40 µg/mL	Cr	200.0 ± 2.0 µg/mL	Pb	200.0 ± 2.0 µg/mL
Al	2000 ± 10 µg/mL	Cu	200.0 ± 2.0 µg/mL	Se	100.0 ± 1.0 µg/mL
As	200.0 ± 2.0 µg/mL	Fe	2000 ± 10 µg/mL	Sm	200.0 ± 2.0 µg/mL
B	40.00 ± 0.20 µg/mL	K	2000 ± 10 µg/mL	Sr	200.0 ± 2.0 µg/mL
Ba	200.0 ± 2.0 µg/mL	Li	20.00 ± 0.20 µg/mL	Th	200.0 ± 2.0 µg/mL
Be	20.00 ± 0.20 µg/mL	Mg	2000 ± 10 µg/mL	Tl	40.00 ± 0.40 µg/mL
Bi	200.0 ± 2.0 µg/mL	Mn	200.0 ± 2.0 µg/mL	U	200.0 ± 2.0 µg/mL
Ca	2000 ± 10 µg/mL	Na	2000 ± 10 µg/mL	V	200.0 ± 2.0 µg/mL
Cd	200.0 ± 2.0 µg/mL	Ni	200.0 ± 2.0 µg/mL	Zn	200.0 ± 2.0 µg/mL
Co	200.0 ± 2.0 µg/mL	P	200.0 ± 2.0 µg/mL		

Source Material Lot# Chart

Element	Source Material Lot#	Element	Source Material Lot#	Element	Source Material Lot#
Ag	975475	Cr	880115	Pb	168223
Al	992545	Cu	148793	Se	929078
As	166531	Fe	1004971	Sm	120677R
B	982524	K	983959	Sr	976606
Ba	150283R	Li	156949	Th	122067
Be	998969	Mg	738337	Tl	991734
Bi	753003	Mn	985851	U	AM17-111UX
Ca	150704	Na	994710	V	983037
Cd	173171	Ni	752769	Zn	979871
Co	979870	P	122196R		

Intended Use: This solution is intended for use as a certified reference material (CRM) or calibration standard for inductively coupled plasma optical emission spectroscopy (ICP-OES), inductively coupled plasma mass spectrometry (ICP-MS), flame or furnace atomic absorption spectroscopy (AA or GFAA), and other techniques for elemental analysis.

Certification & Traceability: This CRM was manufactured, processed, and certified under a quality management system that is registered/accredited to **ISO 9001**, **ISO 17034**, and **ISO/IEC 17025**. This CRM was prepared to the certified concentrations shown above by gravimetric methods, using single-element concentrates that were certified using the "High Performance ICP-OES" protocol developed by NIST and are directly traceable to **NIST SRMs (see reverse side)**. The solution was stabilized using high purity nitric acid (HNO_3) and diluted with filtered (0.22 µm), 18 M-ohm deionized water. The balances used in the preparation of this CRM are calibrated regularly with traceability to NIST, using a calibration provider that is accredited to ISO/IEC 17025 by a mutually recognized accreditation body. All volumetric dilutions are performed in Class A calibrated glassware. The certified concentrations were determined based upon gravimetric procedures. Secondary verification of the certified concentrations was performed using ICP-OES that was calibrated and/or referenced against **NIST SRMs (see reverse side)**. The uncertainty associated with each certified concentration represents the expanded uncertainty at the 95% confidence level using a coverage factor of k=2.

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The Netherlands

02/18/2020

Instructions for Use: We recommend that the solution be thoroughly mixed by repeated shaking or swirling of the bottle immediately prior to use. To achieve the highest accuracy, the analyst should: (1) use only pre-cleaned containers and transferware, (2) not pipette directly from the CRM's original container, (3) never pour used product back into the original container, (4) make dilutions using calibrated balances or certified class A volumetric flasks and pipettes, (5) use a minimum sub-sample size of 500 µL, and (6) dilute with the same matrix as the original CRM or other chemically suitable matrix. The solution should be kept tightly capped and stored under normal laboratory conditions. Do not freeze, heat, or immerse the bottle or its contents, and avoid exposure to direct sunlight or moisture.

Period of Validity: CPI International ensures the accuracy of this solution for **18 months** from the certification date shown below, provided the instructions for use are followed. During the period of validity, the purchaser will be notified if this product is recalled due to any significant changes in the stability of the solution.

Chuck Goudreau

Chuck Goudreau, Certifying Officer

November 8, 2019

Certification Date

CPI International waives all responsibility for any damages resulting from the usage and/or implementation of the products/data described herein.

Health and Safety Information: Refer to the Safety Data Sheet (SDS).

Homogeneity: This solution was determined to be homogeneous by procedures consistent with the requirements of ISO Guide 34 and ISO Guide 35. Replicate samples of the finished solution were analyzed to confirm its homogeneity, in accordance with QSP 6-13 Assessment of Homogeneity and Stability. To ensure homogeneity, users should not take a smaller sub-sample than specified in the Instructions for Use, as doing so will invalidate the certified values and uncertainties.

Quality Manual Rev: No. 5, 03/01/2013

Further Information: Please contact CPI International for further information about this CRM.

Quality Certifications: This CRM was prepared under a quality management system that is registered/accredited to the following:

- ISO 9001 – Quality Management Systems – Requirements (TUV NORD Cert. No. 44 100 16560231)
- ISO/IEC 17025 – General Requirements for the Competence of Testing and Calibration Laboratories (A2LA Cert. No. 2848.01)
- ISO Guide 34 – General Requirements for the Competence of Reference Material Producers (A2LA Cert. No. 2848.02)
    - ISO Guide 34 references additional requirements specified in ISO Guide 31 and ISO Guide 35.

This CRM is traceable to the following NIST SRMs:

Analyte	Aq. SRM	MO SRM		Analyte	Aq. SRM	MO SRM		Analyte	Aq. SRM	MO SRM
Ag	3151	1077a		Hf	3122	—		S	3154	2770
Al	3101a	1075a		Hg	3133	3133		Sb	3102a	3102a
As	3103a	3103a		Ho	3123a	—		Sc	3148a	3148a
Au	3121	—		In	3124a	3124a		Se	3149	3149
B	3107	3107		K	3141a	3141a		Si	3150	1066a
Ba	3104a	1051b		La	3127a	3127a		Sm	3147a	—
Be	3105a	3105a		Li	3129a	3129a		Sn	3161a	1057b
Bi	3106	3106		Lu	3130a	—		SO_4^{-2}	3181	—
Br^-	3184	—		Mg	3131a	3131a		Sr	3153a	3153a
Ca	3109a	3109a		Mn	3132	3132		Ta	3155	—
Cd	3108	1053a		Mo	3134	3134		Tb	3157a	—
Ce	3110	3110		Na	3152a	3152a		Te	3156	—
Cl^-	3182	1818a		Nb	3137	—		Th	3159	—
Co	3113	3113		Nd	3135a	—		Ti	3162a	3162a
Cr	3112a	1078b		Ni	3136	1065b		Tl	3158	3158
Cs	3111a	—		NO_3^-	3185	—		Tm	3160a	—
Cu	3114	1080a		P	3139a	3139a		U	3164	—
Dy	3115a	—		Pb	3128	3128		V	3165	1052b
Er	3116a	—		Pd	3138	—		W	3163	3163
Eu	3117a	—		PO_4^{-3}	3186	—		Y	3167a	3167a
F^-	3183	—		Pr	3142a	—		Yb	3166a	—
Fe	3126a	1079b		Pt	3140	3140		Zn	3168a	3168a
Ga	3119a	—		Rb	3145a	—		Zr	3169	3169
Gd	3118a	—		Re	3143	—				
Ge	3120a	—		Rh	3144	3144				

Reagent

MPREP1-B_00004

1842490
ID: MPREP1-B_00004
Exp:11/26/20 Prpd:LAM Opn:11/26/19
Metals Prep 1 Spike B

CERTIFICATE OF ANALYSIS

Single-Element Aqueous CRM

Product #: TA-CM-FEB19-STL1-B

Custom ISO G34 Metals Prep 1 Spike Std. Solution B

Product Lot #: 10094019-8

Matrix: H_2O

Source Material Lot #: 983063

Element	Certified Concentration & Uncertainty
S	**2000 ± 10 µg/mL**

Intended Use: This solution is intended for use as a certified reference material (CRM) or calibration standard for inductively coupled plasma optical emission spectroscopy (ICP-OES), inductively coupled plasma mass spectrometry (ICP-MS), flame or furnace atomic absorption spectroscopy (AA or GFAA), and other techniques for elemental analysis.

Certification & Traceability: This CRM was manufactured, processed, and certified under a quality management system that is registered/accredited to **ISO 9001**, **ISO 17034**, and **ISO/IEC 17025**. This CRM was prepared to a nominal concentration of 2000 µg/mL by gravimetric methods using a single-element concentrate dissolved in high purity nitric acid (HNO_3) and diluted with filtered (0.22 µm), 18 M-ohm deionized water. The balances used in the preparation of this CRM are calibrated regularly with traceability to NIST, using a calibration provider that is accredited to ISO/IEC 17025 by a mutually recognized accreditation body. All volumetric dilutions are performed in Class A calibrated glassware. The certified concentration and uncertainty were determined using the "High Performance ICP-OES" protocol developed by NIST, and both the certified concentration and uncertainty values are traceable to **NIST SRM 3154**. The uncertainty associated with the certified concentration represents the expanded uncertainty at the 95% confidence level using a coverage factor of k=2.

Instructions for Use: We recommend that the solution be thoroughly mixed by repeated shaking or swirling of the bottle immediately prior to use. To achieve the highest accuracy, the analyst should: (1) use only pre-cleaned containers and transferware, (2) not pipette directly from the CRM's original container, (3) never pour used product back into the original container, (4) make dilutions using calibrated balances or certified class A volumetric flasks and pipettes, (5) use a minimum sub-sample size of 500 µL, and (6) dilute with the same matrix as the original CRM or other chemically suitable matrix. The solution should be kept tightly capped and stored under normal laboratory conditions. Do not freeze, heat, or immerse the bottle or its contents, and avoid exposure to direct sunlight or moisture.

Period of Validity: CPI International ensures the accuracy of this solution for **18 months** from the certification date shown below, provided the instructions for use are followed. During the period of validity, the purchaser will be notified if this product is recalled due to any significant changes in the stability of the solution.

Chuck Goudreau

Chuck Goudreau, Certifying Officer

November 8, 2019
Certification Date

CPI International waives all responsibility for any damages resulting from the usage and/or implementation of the products/data described herein.

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Health and Safety Information: Refer to the Safety Data Sheet (SDS).

Homogeneity: This solution was determined to be homogeneous by procedures consistent with the requirements of ISO Guide 34 and ISO Guide 35. Replicate samples of the finished solution were analyzed to confirm its homogeneity, in accordance with QSP 6-13 Assessment of Homogeneity and Stability. To ensure homogeneity, users should not take a smaller sub-sample than specified in the Instructions for Use, as doing so will invalidate the certified values and uncertainties.

Quality Manual Rev: No. 5, 03/01/2013

Further Information: Please contact CPI International for further information about this CRM.

Quality Certifications: This CRM was prepared under a quality management system that is registered/accredited to the following:

- ISO 9001 – Quality Management Systems – Requirements (TUV NORD Cert. No. 44 100 16560231)
- ISO/IEC 17025 – General Requirements for the Competence of Testing and Calibration Laboratories (A2LA Cert. No. 2848.01)
- ISO Guide 34 – General Requirements for the Competence of Reference Material Producers (A2LA Cert. No. 2848.02)
    - ISO Guide 34 references additional requirements specified in ISO Guide 31 and ISO Guide 35.

Reagent

MPREP2_00022

1842492
ID: MPREP2_00022
Exp:11/26/20 Prpd:LAM Opn 11/26/19
Metals Prep 2 Spike

CERTIFICATE OF ANALYSIS

Multi-Element Aqueous CRM

Product #: TA-CM-FEB19-STL2-500

Custom ISO G34 Metals Prep 2 Spike Standard

Lot #: 10094019-7

Matrix: 5% HNO_3/tr. HF

Element	Certified Concentration & Uncertainty	Element	Certified Concentration & Uncertainty	Element	Certified Concentration & Uncertainty
Mo	100.0 ± 1.0 µg/mL	Sn	200.0 ± 2.0 µg/mL	Zr	200.0 ± 2.0 µg/mL
Sb	99.99 ± 0.50 µg/mL	Ti	200.0 ± 2.0 µg/mL		
Si	1000 ± 10 µg/mL	W	200.0 ± 2.0 µg/mL		

Source Material Lot# Chart

Element	Source Material Lot#	Element	Source Material Lot#	Element	Source Material Lot#
Mo	175215	Sn	171360	Zr	172925
Sb	978317	Ti	161694		
Si	977647	W	997482		

Intended Use: This solution is intended for use as a certified reference material (CRM) or calibration standard for inductively coupled plasma optical emission spectroscopy (ICP-OES), inductively coupled plasma mass spectrometry (ICP-MS), flame or furnace atomic absorption spectroscopy (AA or GFAA), and other techniques for elemental analysis.

Certification & Traceability: This CRM was manufactured, processed, and certified under a quality management system that is registered/accredited to **ISO 9001**, **ISO 17034**, and **ISO/IEC 17025**. This CRM was prepared to the certified concentrations shown above by gravimetric methods, using single-element concentrates that were certified using the "High Performance ICP-OES" protocol developed by NIST and are directly traceable to **NIST SRMs (see reverse side)**. The solution was stabilized using high purity nitric acid (HNO_3), trace hydrofluoric acid (HF) and diluted with filtered (0.22 µm), 18 M-ohm deionized water. The balances used in the preparation of this CRM are calibrated regularly with traceability to NIST, using a calibration provider that is accredited to ISO/IEC 17025 by a mutually recognized accreditation body. All volumetric dilutions are performed in Class A calibrated glassware. The certified concentrations were determined based upon gravimetric procedures. Secondary verification of the certified concentrations was performed using ICP-OES that was calibrated and/or referenced against **NIST SRMs (see reverse side)**. The uncertainty associated with each certified concentration represents the expanded uncertainty at the 95% confidence level using a coverage factor of k=2.

Instructions for Use: We recommend that the solution be thoroughly mixed by repeated shaking or swirling of the bottle immediately prior to use. To achieve the highest accuracy, the analyst should: (1) use only pre-cleaned containers and transferware, (2) not pipette directly from the CRM's original container, (3) never pour used product back into the original container, (4) make dilutions using calibrated balances or certified class A volumetric flasks and pipettes, (5) use a minimum sub-sample size of 500 µL, and (6) dilute with the same matrix as the original CRM or other chemically suitable matrix. The solution should be kept tightly capped and stored under normal laboratory conditions. Do not freeze, heat, or immerse the bottle or its contents, and avoid exposure to direct sunlight or moisture.

Period of Validity: CPI International ensures the accuracy of this solution for **18 months** from the certification date shown below, provided the instructions for use are followed. During the period of validity, the purchaser will be notified if this product is recalled due to any significant changes in the stability of the solution.

Chuck Goudreau

Chuck Goudreau, Certifying Officer

November 8, 2019
Certification Date

CPI International waives all responsibility for any damages resulting from the usage and/or implementation of the products/data described herein.

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02/18/2020

Health and Safety Information: Refer to the Safety Data Sheet (SDS).

Homogeneity: This solution was determined to be homogeneous by procedures consistent with the requirements of ISO Guide 34 and ISO Guide 35. Replicate samples of the finished solution were analyzed to confirm its homogeneity, in accordance with QSP 6-13 Assessment of Homogeneity and Stability. To ensure homogeneity, users should not take a smaller sub-sample than specified in the Instructions for Use, as doing so will invalidate the certified values and uncertainties.

Quality Manual Rev: No. 5, 03/01/2013

Further Information: Please contact CPI International for further information about this CRM.

Quality Certifications: This CRM was prepared under a quality management system that is registered/accredited to the following:

- ISO 9001 – Quality Management Systems – Requirements (TUV NORD Cert. No. 44 100 16560231)
- ISO/IEC 17025 – General Requirements for the Competence of Testing and Calibration Laboratories (A2LA Cert. No. 2848.01)
- ISO Guide 34 – General Requirements for the Competence of Reference Material Producers (A2LA Cert. No. 2848.02)
    - ISO Guide 34 references additional requirements specified in ISO Guide 31 and ISO Guide 35.

This CRM is traceable to the following NIST SRMs:

Analyte	Aq. SRM	MO SRM		Analyte	Aq. SRM	MO SRM		Analyte	Aq. SRM	MO SRM
Ag	3151	1077a		Hf	3122	—		S	3154	2770
Al	3101a	1075a		Hg	3133	3133		Sb	3102a	3102a
As	3103a	3103a		Ho	3123a	—		Sc	3148a	3148a
Au	3121	—		In	3124a	3124a		Se	3149	3149
B	3107	3107		K	3141a	3141a		Si	3150	1066a
Ba	3104a	1051b		La	3127a	3127a		Sm	3147a	—
Be	3105a	3105a		Li	3129a	3129a		Sn	3161a	1057b
Bi	3106	3106		Lu	3130a	—		SO_4^{-2}	3181	—
Br^-	3184	—		Mg	3131a	3131a		Sr	3153a	3153a
Ca	3109a	3109a		Mn	3132	3132		Ta	3155	—
Cd	3108	1053a		Mo	3134	3134		Tb	3157a	—
Ce	3110	3110		Na	3152a	3152a		Te	3156	—
Cl^-	3182	1818a		Nb	3137	—		Th	3159	—
Co	3113	3113		Nd	3135a	—		Ti	3162a	3162a
Cr	3112a	1078b		Ni	3136	1065b		Tl	3158	3158
Cs	3111a	—		NO_3^-	3185	—		Tm	3160a	—
Cu	3114	1080a		P	3139a	3139a		U	3164	—
Dy	3115a	—		Pb	3128	3128		V	3165	1052b
Er	3116a	—		Pd	3138	—		W	3163	3163
Eu	3117a	—		PO_4^{-3}	3186	—		Y	3167a	3167a
F^-	3183	—		Pr	3142a	—		Yb	3166a	—
Fe	3126a	1079b		Pt	3140	3140		Zn	3168a	3168a
Ga	3119a	—		Rb	3145a	—		Zr	3169	3169
Gd	3118a	—		Re	3143	—				
Ge	3120a	—		Rh	3144	3144				

Reagent

MS CAL 1 A_00006

1799532
ID: MS CAL 1 A_00006
Exp:09/18/20 Prpd:cb Opn:09/18/19
MS CAL 1 A

CPI INTERNATIONAL

CERTIFICATE OF ANALYSIS

Multi-Element Aqueous CRM

Product #: TA-CM-AUG19-STL4

Custom Standard

Lot #: 10103046-1

Matrix: 5% HNO_3

Element	Certified Concentration	Element	Certified Concentration	Element	Certified Concentration
Ag	2.0 µg/mL	Cr	10.0 µg/mL	Sm	10.0 µg/mL
As	10.0 µg/mL	Cu	3.0 µg/mL	Sr	5.0 µg/mL
B	100 µg/mL	Li	5.0 µg/mL	Th	2.0 µg/mL
Ba	2.0 µg/mL	Mn	4.0 µg/mL	Tl	2.0 µg/mL
Be	0.5 µg/mL	Ni	5.0 µg/mL	U	1.0 µg/mL
Cd	0.5 µg/mL	Pb	3.0 µg/mL	V	10.0 µg/mL
Co	2.0 µg/mL	Se	5.0 µg/mL	Zn	20.0 µg/mL

Source Material Lot # Chart

Element	Source Material Lot#	Element	Source Material Lot#	Element	Source Material Lot#
Ag	975475	Cr	975466	Sm	148251
As	175385	Cu	982446	Sr	998106
B	982186	Li	751942	Th	987024
Ba	994634	Mn	997487	Tl	991734
Be	998969	Ni	984273	U	992180
Cd	996631	Pb	981329	V	990117
Co	979906	Se	982461	Zn	984272

Intended Use: This solution is intended for use as a reference material (RM) or calibration standard for inductively coupled plasma optical emission spectroscopy (ICP-OES), inductively coupled plasma mass spectrometry (ICP-MS), flame or furnace atomic absorption spectroscopy (AA or GFAA), and other techniques for elemental analysis.

Certification & Traceability: This RM was manufactured, processed, and/or certified under a quality management system that is registered/accredited to **ISO 9001**, **ISO 17034**, and **ISO/IEC 17025**. This RM was prepared to the certified concentrations shown above by gravimetric methods using single-element concentrates, and was stabilized using high purity nitric acid (HNO_3), and diluted with filtered (0.22 µm), 18 M-ohm deionized water. The balances used in the preparation of this RM are calibrated regularly with traceability to NIST, using a calibration provider that is accredited to ISO/IEC 17025 by a mutually recognized accreditation body. All volumetric dilutions are performed in Class A calibrated glassware. The certified concentrations were determined based upon gravimetric procedures. Secondary verification of the certified concentrations was performed using ICP-OES that was calibrated and/or referenced against **NIST SRMs (see reverse side)**. The uncertainty associated with the certified concentration is ±0.5% relative, which is the sum of the estimated errors due to the purity of the raw materials, the gravimetric preparation of the solution, and transpiration through the container. This represents the expanded uncertainty at the 95% confidence level using a coverage factor of k=2.

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The Netherlands

Instructions for Use: We recommend that the solution be thoroughly mixed by repeated shaking or swirling of the bottle immediately prior to use. To achieve the highest accuracy, the analyst should: (1) use only pre-cleaned containers and transferware, (2) not pipette directly from the RM's original container, (3) never pour used product back into the original container, (4) make dilutions using calibrated balances or certified class A volumetric flasks and pipettes, (5) use a minimum sub-sample size of 500 µL, and (6) dilute with the same matrix as the original RM or other chemically suitable matrix. The solution should be kept tightly capped and stored under normal laboratory conditions. Do not freeze, heat, or immerse the bottle or its contents, and avoid exposure to direct sunlight or moisture.

Period of Validity: CPI International ensures the accuracy of this solution for **18 months** from the certification date shown below, provided the instructions for use are followed. During the period of validity, the purchaser will be notified if this product is recalled due to any significant changes in the stability of the solution.

Chuck Goudreau

Chuck Goudreau, Certifying Officer

September 12, 2019

Certification Date

CPI International waives all responsibility for any damages resulting from the usage and/or implementation of the products/data described herein.

This RM is traceable to the following NIST SRMs:

Analyte	Aq. SRM	MO SRM		Analyte	Aq. SRM	MO SRM		Analyte	Aq. SRM	MO SRM
Ag	3151	1077a		Hf	3122	—		S	3154	2770
Al	3101a	1075a		Hg	3133	3133		Sb	3102a	3102a
As	3103a	3103a		Ho	3123a	—		Sc	3148a	3148a
Au	3121	—		In	3124a	3124a		Se	3149	3149
B	3107	3107		K	3141a	3141a		Si	3150	1066a
Ba	3104a	1051b		La	3127a	3127a		Sm	3147a	—
Be	3105a	3105a		Li	3129a	3129a		Sn	3161a	1057b
Bi	3106	3106		Lu	3130a	—		SO_4^{2-}	3181	—
Br	3184	—		Mg	3131a	3131a		Sr	3153a	3153a
Ca	3109a	3109a		Mn	3132	3132		Ta	3155	—
Cd	3108	1053a		Mo	3134	3134		Tb	3157a	—
Ce	3110	3110		Na	3152a	3152a		Te	3156	—
Cl^-	3182	1818a		Nb	3137	—		Th	3159	—
Co	3113	3113		Nd	3135a	—		Ti	3162a	3162a
Cr	3112a	1078b		Ni	3136	1065b		Tl	3158	3158
Cs	3111a	—		NO_3^-	3186	—		Tm	3160a	—
Cu	3114	1080a		P	3139a	3139a		U	3164	—
Dy	3115a	—		Pb	3128	3128		V	3165	1052b
Er	3116a	—		Pd	3138	—		W	3163	3163
Eu	3117a	—		PO_4^{3-}	3186	—		Y	3167a	3167a
F^-	3183	—		Pr	3142a	—		Yb	3166a	—
Fe	3126a	1079b		Pt	3140	3140		Zn	3168a	3168a
Ga	3119a	—		Rb	3145a	—		Zr	3169	3169
Gd	3118a	—		Re	3143	—				
Ge	3120a	—		Rh	3144	3144				

Reagent

MS CAL3 A_00011

1738191
ID: MS CAL3 A_00011
Exp:05/31/20 Prpd:cb Opn:05/31/19
MS CAL 3 A

CPI INTERNATIONAL

CERTIFICATE OF ANALYSIS

Multi-Element Aqueous CRM

Product #: TA-CM-APR19-STL5

Mix Name: TA-CAL-3

Lot #: 10097743-1

Matrix: 2% HNO_3

Element	Certified Concentration & Uncertainty	Element	Certified Concentration & Uncertainty	Element	Certified Concentration & Uncertainty
Ag	20.02 ± 0.10 µg/mL	Cr	100.1 ± 0.5 µg/mL	Sm	100.1 ± 0.5 µg/mL
As	100.0 ± 0.5 µg/mL	Cu	100.0 ± 0.5 µg/mL	Sr	100.1 ± 0.5 µg/mL
B	200.0 ± 1.0 µg/mL	Li	100.1 ± 0.5 µg/mL	Th	100.1 ± 0.5 µg/mL
Ba	100.1 ± 0.5 µg/mL	Mn	100.1 ± 0.5 µg/mL	Tl	20.02 ± 0.10 µg/mL
Be	100.0 ± 0.5 µg/mL	Ni	100.0 ± 0.5 µg/mL	U	100.1 ± 0.5 µg/mL
Cd	100.0 ± 0.5 µg/mL	Pb	100.1 ± 0.5 µg/mL	V	100.0 ± 0.5 µg/mL
Co	100.0 ± 0.5 µg/mL	Se	50.01 ± 0.25 µg/mL	Zn	100.0 ± 0.5 µg/mL

Intended Use: This solution is intended for use as a certified reference material (CRM) or calibration standard for inductively coupled plasma optical emission spectroscopy (ICP-OES), inductively coupled plasma mass spectrometry (ICP-MS), flame or furnace atomic absorption spectroscopy (AA or GFAA), and other techniques for elemental analysis.

Certification & Traceability: This CRM was manufactured, processed, and certified under a quality management system that is registered/accredited to **ISO 9001**, **ISO 17034**, and **ISO/IEC 17025**. This CRM was prepared to the certified concentrations shown above by gravimetric methods, using single-element concentrates that were certified using the "High Performance ICP-OES" protocol developed by NIST and are directly traceable to **NIST SRMs (see reverse side)**. The solution was stabilized using high purity nitric acid (HNO_3) and diluted with filtered (0.22 µm), 18 M-ohm deionized water. The balances used in the preparation of this CRM are calibrated regularly with traceability to NIST, using a calibration provider that is accredited to ISO/IEC 17025 by a mutually recognized accreditation body. All volumetric dilutions are performed in Class A calibrated glassware. The certified concentrations were determined based upon gravimetric procedures. Secondary verification of the certified concentrations was performed using ICP-OES that was calibrated and/or referenced against **NIST SRMs (see reverse side)**. The uncertainty associated with each certified concentration represents the expanded uncertainty at the 95% confidence level using a coverage factor of k=2.

Instructions for Use: We recommend that the solution be thoroughly mixed by repeated shaking or swirling of the bottle immediately prior to use. To achieve the highest accuracy, the analyst should: (1) use only pre-cleaned containers and transferware, (2) not pipette directly from the CRM's original container, (3) never pour used product back into the original container, (4) make dilutions using calibrated balances or certified class A volumetric flasks and pipettes, (5) use a minimum sub-sample size of 500 µL, and (6) dilute with the same matrix as the original CRM or other chemically suitable matrix. The solution should be kept tightly capped and stored under normal laboratory conditions. Do not freeze, heat, or immerse the bottle or its contents, and avoid exposure to direct sunlight or moisture.

Period of Validity: CPI International ensures the accuracy of this solution for **18 months** from the certification date shown below, provided the instructions for use are followed. During the period of validity, the purchaser will be notified if this product is recalled due to any significant changes in the stability of the solution.

Chuck Goudreau

Chuck Goudreau, Certifying Officer

May 23, 2019
Certification Date

CPI International waives all responsibility for any damages resulting from the usage and/or implementation of the products/data described herein.

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1013BG Amsterdam F: +31 20 420 28 36
The Netherlands

02/18/2020

Health and Safety Information: Refer to the Safety Data Sheet (SDS).

Homogeneity: This solution was determined to be homogeneous by procedures consistent with the requirements of ISO Guide 34 and ISO Guide 35. Replicate samples of the finished solution were analyzed to confirm its homogeneity, in accordance with QSP 6-13 Assessment of Homogeneity and Stability. To ensure homogeneity, users should not take a smaller sub-sample than specified in the Instructions for Use, as doing so will invalidate the certified values and uncertainties.

Quality Manual Rev: No. 5, 03/01/2013

Further Information: Please contact CPI International for further information about this CRM.

Quality Certifications: This CRM was prepared under a quality management system that is registered/accredited to the following:

- ISO 9001 – Quality Management Systems – Requirements (TUV NORD Cert. No. 44 100 16560231)
- ISO/IEC 17025 – General Requirements for the Competence of Testing and Calibration Laboratories (A2LA Cert. No. 2848.01)
- ISO Guide 34 – General Requirements for the Competence of Reference Material Producers (A2LA Cert. No. 2848.02)
    - ISO Guide 34 references additional requirements specified in ISO Guide 31 and ISO Guide 35.

This CRM is traceable to the following NIST SRMs:

Analyte	Aq. SRM	MO SRM		Analyte	Aq. SRM	MO SRM		Analyte	Aq. SRM	MO SRM
Ag	3151	1077a		Hf	3122	—		S	3154	2770
Al	3101a	1075a		Hg	3133	3133		Sb	3102a	3102a
As	3103a	3103a		Ho	3123a	—		Sc	3148a	3148a
Au	3121	—		In	3124a	3124a		Se	3149	3149
B	3107	3107		K	3141a	3141a		Si	3150	1066a
Ba	3104a	1051b		La	3127a	3127a		Sm	3147a	—
Be	3105a	3105a		Li	3129a	3129a		Sn	3161a	1057b
Bi	3106	3106		Lu	3130a	—		SO_4^{-2}	3181	—
Br^-	3184	—		Mg	3131a	3131a		Sr	3153a	3153a
Ca	3109a	3109a		Mn	3132	3132		Ta	3155	—
Cd	3108	1053a		Mo	3134	3134		Tb	3157a	—
Ce	3110	3110		Na	3152a	3152a		Te	3156	—
Cl^-	3182	1818a		Nb	3137	—		Th	3159	—
Co	3113	3113		Nd	3135a	—		Ti	3162a	3162a
Cr	3112a	1078b		Ni	3136	1065b		Tl	3158	3158
Cs	3111a	—		NO_3^-	3185	—		Tm	3160a	—
Cu	3114	1080a		P	3139a	3139a		U	3164	—
Dy	3115a	—		Pb	3128	3128		V	3165	1052b
Er	3116a	—		Pd	3138	—		W	3163	3163
Eu	3117a	—		PO_4^{-3}	3186	—		Y	3167a	3167a
F^-	3183	—		Pr	3142a	—		Yb	3166a	—
Fe	3126a	1079b		Pt	3140	3140		Zn	3168a	3168a
Ga	3119a	—		Rb	3145a	—		Zr	3169	3169
Gd	3118a	—		Re	3143	—				
Ge	3120a	—		Rh	3144	3144				

Reagent

MS CAL3 A_00012

1837637
ID: MS CAL3 A_00012
Exp:11/20/20 Prpd:LKP Opn 11/20/19
MS CAL 3 A

CERTIFICATE OF ANALYSIS

Multi-Element Aqueous CRM

Product #: TA-CM-APR19-STL5

Mix Name: TA-CAL-3

Lot #: 10097743-1

Matrix: 2% HNO_3

Element	Certified Concentration & Uncertainty	Element	Certified Concentration & Uncertainty	Element	Certified Concentration & Uncertainty
Ag	20.02 ± 0.10 µg/mL	Cr	100.1 ± 0.5 µg/mL	Sm	100.1 ± 0.5 µg/mL
As	100.0 ± 0.5 µg/mL	Cu	100.0 ± 0.5 µg/mL	Sr	100.1 ± 0.5 µg/mL
B	200.0 ± 1.0 µg/mL	Li	100.1 ± 0.5 µg/mL	Th	100.1 ± 0.5 µg/mL
Ba	100.1 ± 0.5 µg/mL	Mn	100.1 ± 0.5 µg/mL	Tl	20.02 ± 0.10 µg/mL
Be	100.0 ± 0.5 µg/mL	Ni	100.0 ± 0.5 µg/mL	U	100.1 ± 0.5 µg/mL
Cd	100.0 ± 0.5 µg/mL	Pb	100.1 ± 0.5 µg/mL	V	100.0 ± 0.5 µg/mL
Co	100.0 ± 0.5 µg/mL	Se	50.01 ± 0.25 µg/mL	Zn	100.0 ± 0.5 µg/mL

Intended Use: This solution is intended for use as a certified reference material (CRM) or calibration standard for inductively coupled plasma optical emission spectroscopy (ICP-OES), inductively coupled plasma mass spectrometry (ICP-MS), flame or furnace atomic absorption spectroscopy (AA or GFAA), and other techniques for elemental analysis.

Certification & Traceability: This CRM was manufactured, processed, and certified under a quality management system that is registered/accredited to **ISO 9001**, **ISO 17034**, and **ISO/IEC 17025**. This CRM was prepared to the certified concentrations shown above by gravimetric methods, using single-element concentrates that were certified using the "High Performance ICP-OES" protocol developed by NIST and are directly traceable to **NIST SRMs (see reverse side)**. The solution was stabilized using high purity nitric acid (HNO_3) and diluted with filtered (0.22 µm), 18 M-ohm deionized water. The balances used in the preparation of this CRM are calibrated regularly with traceability to NIST, using a calibration provider that is accredited to ISO/IEC 17025 by a mutually recognized accreditation body. All volumetric dilutions are performed in Class A calibrated glassware. The certified concentrations were determined based upon gravimetric procedures. Secondary verification of the certified concentrations was performed using ICP-OES that was calibrated and/or referenced against **NIST SRMs (see reverse side)**. The uncertainty associated with each certified concentration represents the expanded uncertainty at the 95% confidence level using a coverage factor of k=2.

Instructions for Use: We recommend that the solution be thoroughly mixed by repeated shaking or swirling of the bottle immediately prior to use. To achieve the highest accuracy, the analyst should: (1) use only pre-cleaned containers and transferware, (2) not pipette directly from the CRM's original container, (3) never pour used product back into the original container, (4) make dilutions using calibrated balances or certified class A volumetric flasks and pipettes, (5) use a minimum sub-sample size of 500 µL, and (6) dilute with the same matrix as the original CRM or other chemically suitable matrix. The solution should be kept tightly capped and stored under normal laboratory conditions. Do not freeze, heat, or immerse the bottle or its contents, and avoid exposure to direct sunlight or moisture.

Period of Validity: CPI International ensures the accuracy of this solution for **18 months** from the certification date shown below, provided the instructions for use are followed. During the period of validity, the purchaser will be notified if this product is recalled due to any significant changes in the stability of the solution.

Chuck Goudreau

Chuck Goudreau, Certifying Officer

November 12, 2019
Certification Date

CPI International waives all responsibility for any damages resulting from the usage and/or implementation of the products/data described herein.

Health and Safety Information: Refer to the Safety Data Sheet (SDS).

Homogeneity: This solution was determined to be homogeneous by procedures consistent with the requirements of ISO Guide 34 and ISO Guide 35. Replicate samples of the finished solution were analyzed to confirm its homogeneity, in accordance with QSP 6-13 Assessment of Homogeneity and Stability. To ensure homogeneity, users should not take a smaller sub-sample than specified in the Instructions for Use, as doing so will invalidate the certified values and uncertainties.

Quality Manual Rev: No. 5, 03/01/2013

Further Information: Please contact CPI International for further information about this CRM.

Quality Certifications: This CRM was prepared under a quality management system that is registered/accredited to the following:

- ISO 9001 – Quality Management Systems – Requirements (TUV NORD Cert. No. 44 100 16560231)
- ISO/IEC 17025 – General Requirements for the Competence of Testing and Calibration Laboratories (A2LA Cert. No. 2848.01)
- ISO Guide 34 – General Requirements for the Competence of Reference Material Producers (A2LA Cert. No. 2848.02)
    - ISO Guide 34 references additional requirements specified in ISO Guide 31 and ISO Guide 35.

This CRM is traceable to the following NIST SRMs:

Analyte	Aq. SRM	MO SRM		Analyte	Aq. SRM	MO SRM		Analyte	Aq. SRM	MO SRM
Ag	3151	1077a		Hf	3122	—		S	3154	2770
Al	3101a	1075a		Hg	3133	3133		Sb	3102a	3102a
As	3103a	3103a		Ho	3123a	—		Sc	3148a	3148a
Au	3121	—		In	3124a	3124a		Se	3149	3149
B	3107	3107		K	3141a	3141a		Si	3150	1066a
Ba	3104a	1051b		La	3127a	3127a		Sm	3147a	—
Be	3105a	3105a		Li	3129a	3129a		Sn	3161a	1057b
Bi	3106	3106		Lu	3130a	—		SO_4^{-2}	3181	—
Br^-	3184	—		Mg	3131a	3131a		Sr	3153a	3153a
Ca	3109a	3109a		Mn	3132	3132		Ta	3155	—
Cd	3108	1053a		Mo	3134	3134		Tb	3157a	—
Ce	3110	3110		Na	3152a	3152a		Te	3156	—
Cl^-	3182	1818a		Nb	3137	—		Th	3159	—
Co	3113	3113		Nd	3135a	—		Ti	3162a	3162a
Cr	3112a	1078b		Ni	3136	1065b		Tl	3158	3158
Cs	3111a	—		NO_3^-	3185	—		Tm	3160a	—
Cu	3114	1080a		P	3139a	3139a		U	3164	—
Dy	3115a	—		Pb	3128	3128		V	3165	1052b
Er	3116a	—		Pd	3138	—		W	3163	3163
Eu	3117a	—		PO_4^{-3}	3186	—		Y	3167a	3167a
F^-	3183	—		Pr	3142a	—		Yb	3166a	—
Fe	3126a	1079b		Pt	3140	3140		Zn	3168a	3168a
Ga	3119a	—		Rb	3145a	—		Zr	3169	3169
Gd	3118a	—		Re	3143	—				
Ge	3120a	—		Rh	3144	3144				

Reagent

MS ICV 2_00009

1738164
ID MS ICV 2_00009
Exp 05/31/20 Prpd:cb Opn 05/31/19
ICV 2 - new

CPI INTERNATIONAL

CERTIFICATE OF ANALYSIS

Multi-Element Aqueous CRM

Product #: G34-TA-CM-APR19-STL8

Mix Name: G34 MC ICV 2

Lot #: 10097743-4

Matrix: 2% HNO_3

Element	Certified Concentration & Uncertainty	Element	Certified Concentration & Uncertainty	Element	Certified Concentration & Uncertainty
Ag	39.98 ± 0.20 µg/mL	Li	200.1 ± 1.0 µg/mL	Tl	40.17 ± 0.20 µg/mL
Ba	200.0 ± 1.0 µg/mL	Mn	200.4 ± 1.0 µg/mL	U	200.4 ± 1.0 µg/mL
Be	200.4 ± 1.0 µg/mL	Ni	200.1 ± 1.0 µg/mL	V	200.1 ± 1.0 µg/mL
Cd	200.3 ± 1.0 µg/mL	Pb	200.1 ± 1.0 µg/mL	Zn	200.1 ± 1.0 µg/mL
Co	200.1 ± 1.0 µg/mL	Sm	200.2 ± 1.0 µg/mL	Zr	200.5 ± 1.0 µg/mL
Cr	200.2 ± 1.0 µg/mL	Sr	200.5 ± 1.0 µg/mL		
Cu	200.2 ± 1.0 µg/mL	Th	200.0 ± 1.0 µg/mL		

Intended Use: This solution is intended for use as a second source certified reference material (CRM) or calibration standard for inductively coupled plasma optical emission spectroscopy (ICP-OES), inductively coupled plasma mass spectrometry (ICP-MS), flame or furnace atomic absorption spectroscopy (AA or GFAA), and other techniques for elemental analysis.

Certification & Traceability: This CRM was manufactured, processed, and certified under a quality management system that is registered/accredited to **ISO 9001**, **ISO 17034**, and **ISO/IEC 17025**. This CRM was prepared to the certified concentrations shown above by gravimetric methods, using single-element concentrates that were certified using the "High Performance ICP-OES" protocol developed by NIST and are directly traceable to **NIST SRMs (see reverse side)**. The solution was stabilized using high purity nitric acid (HNO_3) and diluted with filtered (0.22 µm), 18 M-ohm deionized water. The balances used in the preparation of this CRM are calibrated regularly with traceability to NIST, using a calibration provider that is accredited to ISO/IEC 17025 by a mutually recognized accreditation body. All volumetric dilutions are performed in Class A calibrated glassware. The certified concentrations were determined based upon gravimetric procedures. Secondary verification of the certified concentrations was performed using ICP-OES that was calibrated and/or referenced against **NIST SRMs (see reverse side)**. The uncertainty associated with each certified concentration represents the expanded uncertainty at the 95% confidence level using a coverage factor of k=2.

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Period of Validity: CPI International ensures the accuracy of this solution for **18 months** from the certification date shown below, provided the instructions for use are followed. During the period of validity, the purchaser will be notified if this product is recalled due to any significant changes in the stability of the solution.

Chuck Goudreau

Chuck Goudreau, Certifying Officer

May 23, 2019
Certification Date

CPI International waives all responsibility for any damages resulting from the usage and/or implementation of the products/data described herein.

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The Netherlands

www.cpiinternational.com

02/18/2020

Health and Safety Information: Refer to the Safety Data Sheet (SDS).

Homogeneity: This solution was determined to be homogeneous by procedures consistent with the requirements of ISO Guide 34 and ISO Guide 35. Replicate samples of the finished solution were analyzed to confirm its homogeneity, in accordance with QSP 6-13 Assessment of Homogeneity and Stability. To ensure homogeneity, users should not take a smaller sub-sample than specified in the Instructions for Use, as doing so will invalidate the certified values and uncertainties.

Quality Manual Rev: No. 5, 03/01/2013

Further Information: Please contact CPI International for further information about this CRM.

Quality Certifications: This CRM was prepared under a quality management system that is registered/accredited to the following:

- ISO 9001 – Quality Management Systems – Requirements (TUV NORD Cert. No. 44 100 16560231)
- ISO/IEC 17025 – General Requirements for the Competence of Testing and Calibration Laboratories (A2LA Cert. No. 2848.01)
- ISO Guide 34 – General Requirements for the Competence of Reference Material Producers (A2LA Cert. No. 2848.02)
    - ISO Guide 34 references additional requirements specified in ISO Guide 31 and ISO Guide 35.

This CRM is traceable to the following NIST SRMs:

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Ag	3151	1077a		Hf	3122	—		S	3154	2770
Al	3101a	1075a		Hg	3133	3133		Sb	3102a	3102a
As	3103a	3103a		Ho	3123a	—		Sc	3148a	3148a
Au	3121	—		In	3124a	3124a		Se	3149	3149
B	3107	3107		K	3141a	3141a		Si	3150	1066a
Ba	3104a	1051b		La	3127a	3127a		Sm	3147a	—
Be	3105a	3105a		Li	3129a	3129a		Sn	3161a	1057b
Bi	3106	3106		Lu	3130a	—		SO_4^{-2}	3181	—
Br^-	3184	—		Mg	3131a	3131a		Sr	3153a	3153a
Ca	3109a	3109a		Mn	3132	3132		Ta	3155	—
Cd	3108	1053a		Mo	3134	3134		Tb	3157a	—
Ce	3110	3110		Na	3152a	3152a		Te	3156	—
Cl^-	3182	1818a		Nb	3137	—		Th	3159	—
Co	3113	3113		Nd	3135a	—		Ti	3162a	3162a
Cr	3112a	1078b		Ni	3136	1065b		Tl	3158	3158
Cs	3111a	—		NO_3^-	3185	—		Tm	3160a	—
Cu	3114	1080a		P	3139a	3139a		U	3164	—
Dy	3115a	—		Pb	3128	3128		V	3165	1052b
Er	3116a	—		Pd	3138	—		W	3163	3163
Eu	3117a	—		PO_4^{-3}	3186	—		Y	3167a	3167a
F^-	3183	—		Pr	3142a	—		Yb	3166a	—
Fe	3126a	1079b		Pt	3140	3140		Zn	3168a	3168a
Ga	3119a	—		Rb	3145a	—		Zr	3169	3169
Gd	3118a	—		Re	3143	—				
Ge	3120a	—		Rh	3144	3144				

Reagent

PR_LCSSRM U_00001

Reference Materials

▪ Certificate of Analysis ▪

Product: Metals in Soil
Catalog Number: 540
Lot No. D099-540
Certificate Issue Date: September 25, 2017
Expiration Date: May 31, 2020
Revision Number: Original

1598419
ID PR_LCSSRM_00023
Exp:05/31/20 Prep: LKP Opn:06/23/19
Soil ERA

Product use instructions are included as part of the certification packet and are paginated separately from this Certificate of Analysis. Please reference the product use instructions for catalog #540 revision 030512.

CERTIFICATION

Parameter	Certified Value[1]	Reference Value	Uncertainty[2]	QC Performance Acceptance Limits[3]	PT Performance Acceptance Limits[4]
	mg/kg	mg/kg	%	mg/kg	mg/kg
Aluminum	10100	8360	6.40	4150 - 12600	4200 - 12500
Antimony	145	75.5	4.11	2.85 - 148	14.5 - 199
Arsenic	171	161	5.55	134 - 188	113 - 209
Barium	272	260	1.63	215 - 305	195 - 325
Beryllium	102	97.6	6.04	81.4 - 114	73.2 - 122
Boron	102	81.6	5.55	59.2 - 104	49.0 - 114
Cadmium	225	211	4.08	176 - 246	158 - 264
Calcium	5190	4760	5.49	3890 - 5640	3460 - 6070
Chromium	144	136	5.99	112 - 160	95.2 - 177
Cobalt	48.8	48.2	5.95	40.6 - 55.7	36.1 - 60.2
Copper	174	166	6.60	139 - 192	124 - 207
Iron	15000	14100	7.12	8470 - 19700	4930 - 23200
Lead	111	111	5.58	92.1 - 130	78.8 - 143
Magnesium	2570	2340	5.51	1780 - 2900	1450 - 3220
Manganese	232	228	3.96	188 - 268	165 - 291
Mercury	12.0	11.5	1.02	8.23 - 14.7	6.87 - 16.0
Molybdenum	123	110	2.96	88.2 - 132	77.5 - 142
Nickel	98.3	91.9	5.89	76.2 - 108	64.3 - 119
Potassium	2420	2020	6.79	1410 - 2630	1190 - 2850
Selenium	206	191	6.44	152 - 231	131 - 252
Silver	45.5	43.3	6.26	34.6 - 51.9	30.1 - 56.5
Sodium	252	218	6.53	159 - 278	105 - 332
Strontium	111	107	5.08	87.0 - 127	77.2 - 137
Thallium	167	156	6.28	127 - 186	110 - 202

16341 Table Mountain Pkwy ▪ Golden, CO 80403 ▪ T: 800.372.0122 ▪ 303.431.8454 ▪ www.eragc.com

▪ Certificate of Analysis ▪

Parameter	Certified Value[1]	Reference Value	Uncertainty[2]	QC Performance Acceptance Limits[3]	PT Performance Acceptance Limits[4]
	mg/kg	mg/kg	%	mg/kg	mg/kg
Tin	111	99.9	6.00	78.1 - 122	56.7 - 143
Titanium	512	376	5.98	68.8 - 683	51.2 - 803
Uranium	97.6	98.1	6.22	74.9 - 121	72.6 - 124
Vanadium	61.8	56.7	9.53	44.8 - 68.7	32.2 - 81.3
Zinc	207	199	7.09	162 - 237	139 - 259

ANALYTICAL VERIFICATION

Parameter	Certified Value[1]	Proficiency Testing Study			NIST Traceability	
		Mean	Recovery[5]	n	SRM Number	Recovery
	mg/kg	mg/kg	%			%
Aluminum	10100	8360	82.8	157	-	-
Antimony	145	75.5	52.0	160	-	-
Arsenic	171	161	94.2	200	-	-
Barium	272	260	95.6	182	-	-
Beryllium	102	97.6	95.6	167	-	-
Boron	102	81.6	80.0	115	-	-
Cadmium	225	211	93.7	200	-	-
Calcium	5190	4760	91.8	140	-	-
Chromium	144	136	94.5	191	-	-
Cobalt	48.8	48.2	98.7	168	-	-
Copper	174	166	95.2	202	-	-
Iron	15000	14100	93.6	153	-	-
Lead	111	111	99.9	208	-	-
Magnesium	2570	2340	90.9	143	-	-
Manganese	232	228	98.4	170	-	-
Mercury	12.0	11.5	95.5	133	-	-
Molybdenum	123	110	89.4	168	-	-
Nickel	98.3	91.9	93.5	197	-	-
Potassium	2420	2020	83.6	142	-	-
Selenium	206	191	92.9	184	-	-

16341 Table Mountain Pkwy ▪ Golden, CO 80403 ▪ T: 800.372.0122 ▪ 303.431.8454 ▪ www.eragc.com

▪ Certificate of Analysis ▪

Parameter	Certified Value[1]	Proficiency Testing Study			NIST Traceability	
		Mean	Recovery[5]	n	SRM Number	Recovery
	mg/kg	mg/kg	%			%
Silver	45.5	43.3	95.1	165	-	-
Sodium	252	218	86.6	138	-	-
Strontium	111	107	96.5	118	-	-
Thallium	167	156	93.6	163	-	-
Tin	111	99.9	90.0	126	-	-
Titanium	512	376	73.4	122	-	-
Uranium	97.6	98.1	100	36	-	-
Vanadium	61.8	56.7	91.8	163	-	-
Zinc	207	199	96.2	200	-	-

1. The **Certified Values** are the actual "made-to" concentrations confirmed by ERA analytical verification. The certified values are monitored and purchasers will be notified of any significant changes resulting in recertification or withdrawal of this certified reference material during the period of validity of this certificate.

2. The **Uncertainty** is the total propagated uncertainty at the 95% confidence interval. The uncertainty is based on the preparation and internal analytical verification of the product by ERA, multiplied by a coverage factor. The uncertainty applies to the product as supplied and does not take into account any required or optional dilution and/or preparations the laboratory may perform while using this product.

3. The **QC Performance Acceptance Limits (QC PALs™)** are based on actual historical data collected in ERA's Proficiency Testing program. The QC PALs™ reflect any inherent biases in the methods used to establish the limits and closely approximate a 95% confidence interval of the performance that experienced laboratories should achieve using accepted environmental methods. Use the QC PALs™ to realistically evaluate your performance against your peers.

4. The **PT Performance Acceptance Limits (PT PALs™)** are calculated using the regression equations and fixed acceptance criteria specified in the NELAC proficiency testing requirements. Use the PT PALs™ when analyzing this QC standard alongside USEPA and NELAC compliant PT standards. Please note that many PT study acceptance limits are concentration dependent (some non-linearly) and, therefore, the acceptance limits of this QC standard and any PT standard may differ relative to their difference in concentrations.

5. The **PT Data/Traceability** data include the mean value, percent recovery and number of data points reported by the laboratories in our Proficiency Testing study compared to the Certified Values. In addition, where NIST Standard Reference Materials (SRMs) are available, each analyte has been analytically traced to the NIST SRM listed. This product is traceable to the lot numbers of its starting materials. All gravimetric and volumetric measurements related to its manufacture are traceable to NIST through an unbroken chain of comparisons.
Traceability Recovery (%) = [(% recovery certified standard)/(% recovery NIST SRM)]*100
The traceability data shown were compiled by analyzing the ERA standards or their associated stock solutions against the applicable NIST SRMs.

6. For additional information on this product such as intended use, instructions for use, level of homogeneity, and safety information, please refer to the provided Instruction Sheet

If you have any questions or need technical assistance, please call ERA technical assistance at 1-800-372-0122 or send an email to info@eraqc.com.

Certifying Officer

Brian Miller

Quality Officer

Patrick Larson

16341 Table Mountain Pkwy ▪ Golden, CO 80403 ▪ T: 800.372.0122 ▪ 303.431.8454 ▪ www.eraqc.com

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 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

STD TI_00010

1783061
ID: STD TI_00010
Exp:08/19/20 Prpd:cb Opn:08/19/19
TI 1000PPM

CPI INTERNATIONAL

CERTIFICATE OF ANALYSIS

Single-Element Aqueous CRM — Product #: TA-1000623

SE Std Titanium (Ti) – 1000 µg/mL — Lot #: 987438-5

Matrix: 5% HNO_3/tr. HF

Element	Certified Concentration & Uncertainty
Ti	998 ± 2 µg/mL (w/v)
	978 ± 2 µg/g (w/w)

Intended Use: This solution is intended for use as a certified reference material (CRM) or calibration standard for inductively coupled plasma optical emission spectroscopy (ICP-OES), inductively coupled plasma mass spectrometry (ICP-MS), flame or furnace atomic absorption spectroscopy (AA or GFAA), and other techniques for elemental analysis.

Certification & Traceability: This CRM was manufactured, processed, and certified under a quality management system that is registered/accredited to **ISO 9001**, **ISO 17034**, and **ISO/IEC 17025**. This CRM was prepared to a nominal concentration of 1000 µg/mL by gravimetric methods using 99.99+% pure titanium (Ti) metal dissolved in high purity nitric acid (HNO_3), trace hydrofluoric acid (HF) and diluted with filtered (0.22 µm), 18 M-ohm deionized water. The balances used in the preparation of this CRM are calibrated regularly with traceability to NIST, using a calibration provider that is accredited to ISO/IEC 17025 by a mutually recognized accreditation body. All volumetric dilutions are performed in Class A calibrated glassware. The certified concentration and uncertainty were determined using the "High Performance ICP-OES" protocol developed by NIST, and both the certified concentration and uncertainty values are traceable to **NIST SRM 3162a, lot #130925**. The uncertainty associated with the certified concentration represents the expanded uncertainty at the 95% confidence level using a coverage factor of k=2.

Indicative Values: ICP-MS was used to determine trace metal concentrations for this product (nd = not determined).

Trace Concentrations (µg/L)

Ag	0.7	Co	<1	Ge	<0.5	Lu	<0.2	P	<100	Sb	<0.5	Te	<1
Al	<2	Cs	<0.5	Hf	1	Mg	<5	Pb	<1	Sc	<5	Ti	MAJOR
As	<2	Cr	1	Hg	<0.5	Mn	<1	Pd	<0.5	Se	<2	Tl	<0.5
Au	<0.5	Cu	<1	Ho	<0.2	Mo	15	Pr	<0.2	Si	<100	Tm	<0.2
B	<5	Dy	<0.2	In	nd	Na	<25	Pt	<0.5	Sm	<0.2	V	<1
Ba	<1	Er	<0.2	Ir	<0.2	Nb	0.8	Rb	<0.5	Sn	2	W	<0.5
Bi	<0.2	Eu	<0.2	K	<25	Nd	<0.2	Re	<0.2	Sr	<1	Y	<0.5
Ca	<25	Fe	<10	La	<0.5	Ni	<2	Rh	<0.5	Ta	23	Yb	<0.2
Cd	<0.5	Ga	<0.5	Li	<2	Os	<0.5	Ru	<0.5	Tb	<0.5	Zn	<2
Ce	<0.2	Gd	<0.2										

Instructions for Use: We recommend that the solution be thoroughly mixed by repeated shaking or swirling of the bottle immediately prior to use. To achieve the highest accuracy, the analyst should: (1) use only pre-cleaned containers and transferware, (2) not pipette directly from the CRM's original container, (3) never pour used product back into the original container, (4) make dilutions using calibrated balances or certified class A volumetric flasks and pipettes, (5) use a minimum sub-sample size of 500 µL, and (6) dilute with the same matrix as the original CRM or other chemically suitable matrix. The solution should be kept tightly capped and stored under normal laboratory conditions. Do not freeze, heat, or immerse the bottle or its contents, and avoid exposure to direct sunlight or moisture.

Period of Validity: CPI International ensures the accuracy of this solution for **18 months** from the certification date shown below, provided the instructions for use are followed. During the period of validity, the purchaser will be notified if this product is recalled due to any significant changes in the stability of the solution.

Chuck Goudreau

Chuck Goudreau, Certifying Officer

August 2, 2019
Certification Date

CPI International waives all responsibility for any damages resulting from the usage and/or implementation of the products/data described herein.

USA
5580 Skylane Boulevard P: 707.525.5788
Santa Rosa, CA 95403 P: 800.878.7654
F: 707.545.7901

Europe
Nieuwe Hemweg 7P P: +31 20 638 05 97
1013BG Amsterdam F: +31 20 420 28 36
The Netherlands

www.cpiinternational.com

02/18/2020

Health and Safety Information: Refer to the Safety Data Sheet (SDS).

Homogeneity: This solution was determined to be homogeneous by procedures consistent with the requirements of ISO Guide 34 and ISO Guide 35. Replicate samples of the finished solution were analyzed to confirm its homogeneity, in accordance with QSP 6-13 Assessment of Homogeneity and Stability. To ensure homogeneity, users should not take a smaller sub-sample than specified in the Instructions for Use, as doing so will invalidate the certified values and uncertainties.

Quality Manual Rev: No. 5, 03/01/2013

Further Information: Please contact CPI International for further information about this CRM.

Quality Certifications: This CRM was prepared under a quality management system that is registered/accredited to the following:

- ISO 9001 – Quality Management Systems – Requirements (TUV NORD Cert. No. 44 100 16560231)
- ISO/IEC 17025 – General Requirements for the Competence of Testing and Calibration Laboratories (A2LA Cert. No. 2848.01)
- ISO Guide 34 – General Requirements for the Competence of Reference Material Producers (A2LA Cert. No. 2848.02)
    - ISO Guide 34 references additional requirements specified in ISO Guide 31 and ISO Guide 35.

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

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

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

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

St. Louis Radiological Standard Verification

Printed: 9/17/2019 12:44 PM

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)

ACCREDITED SOURCE CALIBRATION LABORATORY HEALTH PHYSICS SOCIETY FOUNDED 1956

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

METALS

COVER PAGE
METALS

Lab Name: Eurofins TestAmerica, St. Louis Job Number: 160-36593-1

SDG No.:

Project: ACMS - Yerington OU-4b_OU-5_SOIL

Client Sample ID	Lab Sample ID
STSB32_0-0.5	160-36593-1
STSB32_0.5-3	160-36593-2
STSB32_3-6	160-36593-3
STSB32_6-15	160-36593-4
STSB34_0-0.5	160-36593-5
STSB34_0.5-3	160-36593-6
STSB34_3-6	160-36593-7
STSB34_6-15	160-36593-8
STSB34-FD_3-6	160-36593-9
STSB33_0-0.5	160-36593-10
STSB33_0.5-3	160-36593-11
STSB33-FD_0.5-3	160-36593-12
STSB33_3-6	160-36593-13
STSB33_6-15	160-36593-14
STSB35_0.5-3	160-36593-15
STSB35_0-0.5	160-36593-16
STSB35_3-6	160-36593-17
STSB35_6-15	160-36593-18

Comments:

1A-IN
INORGANIC ANALYSIS DATA SHEET
METALS

Client Sample ID: STSB32_0-0.5
Lab Sample ID: 160-36593-1
Lab Name: Eurofins TestAmerica, St. Louis
Job No.: 160-36593-1
SDG ID.:
Matrix: Solid
Date Sampled: 11/25/2019 13:25
Reporting Basis: DRY
Date Received: 12/05/2019 09:30
% Solids: 93.3

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7440-29-1	Thorium	4.3	0.20	0.088	mg/Kg			2	6020A
7440-61-1	Uranium	1.0	0.098	0.039	mg/Kg			2	6020A

1A-IN
INORGANIC ANALYSIS DATA SHEET
METALS

Client Sample ID: STSB32_0.5-3

Lab Sample ID: 160-36593-2

Lab Name: Eurofins TestAmerica, St. Louis

Job No.: 160-36593-1

SDG ID.:

Matrix: Solid

Date Sampled: 11/25/2019 13:40

Reporting Basis: DRY

Date Received: 12/05/2019 09:30

% Solids: 95.4

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7440-29-1	Thorium	6.1	0.20	0.088	mg/Kg			2	6020A
7440-61-1	Uranium	1.4	0.098	0.039	mg/Kg			2	6020A

1A-IN
INORGANIC ANALYSIS DATA SHEET
METALS

Client Sample ID: STSB32_3-6

Lab Sample ID: 160-36593-3

Lab Name: Eurofins TestAmerica, St. Louis

Job No.: 160-36593-1

SDG ID.:

Matrix: Solid

Date Sampled: 11/25/2019 13:49

Reporting Basis: DRY

Date Received: 12/05/2019 09:30

% Solids: 93.3

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7440-29-1	Thorium	4.9	0.19	0.086	mg/Kg			2	6020A
7440-61-1	Uranium	1.7	0.095	0.038	mg/Kg			2	6020A

1A-IN
INORGANIC ANALYSIS DATA SHEET
METALS

Client Sample ID: STSB32_6-15

Lab Sample ID: 160-36593-4

Lab Name: Eurofins TestAmerica, St. Louis

Job No.: 160-36593-1

SDG ID.:

Matrix: Solid

Date Sampled: 11/25/2019 14:06

Reporting Basis: DRY

Date Received: 12/05/2019 09:30

% Solids: 91.0

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7440-29-1	Thorium	7.6	0.21	0.097	mg/Kg			2	6020A
7440-61-1	Uranium	2.3	0.11	0.043	mg/Kg			2	6020A

1A-IN
INORGANIC ANALYSIS DATA SHEET
METALS

Client Sample ID: STSB34_0-0.5

Lab Sample ID: 160-36593-5

Lab Name: Eurofins TestAmerica, St. Louis

Job No.: 160-36593-1

SDG ID.:

Matrix: Solid

Date Sampled: 11/25/2019 15:00

Reporting Basis: DRY

Date Received: 12/05/2019 09:30

% Solids: 94.9

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7440-29-1	Thorium	4.7	0.19	0.086	mg/Kg			2	6020A
7440-61-1	Uranium	1.4	0.096	0.038	mg/Kg			2	6020A

1A-IN
INORGANIC ANALYSIS DATA SHEET
METALS

Client Sample ID: STSB34_0.5-3

Lab Sample ID: 160-36593-6

Lab Name: Eurofins TestAmerica, St. Louis

Job No.: 160-36593-1

SDG ID.:

Matrix: Solid

Date Sampled: 11/25/2019 15:05

Reporting Basis: DRY

Date Received: 12/05/2019 09:30

% Solids: 94.3

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7440-29-1	Thorium	4.6	0.21	0.093	mg/Kg			2	6020A
7440-61-1	Uranium	1.1	0.10	0.041	mg/Kg			2	6020A

1A-IN
INORGANIC ANALYSIS DATA SHEET
METALS

Client Sample ID: STSB34_3-6

Lab Sample ID: 160-36593-7

Lab Name: Eurofins TestAmerica, St. Louis

Job No.: 160-36593-1

SDG ID.:

Matrix: Solid

Date Sampled: 11/25/2019 15:12

Reporting Basis: DRY

Date Received: 12/05/2019 09:30

% Solids: 94.7

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7440-29-1	Thorium	4.7	0.20	0.089	mg/Kg			2	6020A
7440-61-1	Uranium	1.1	0.099	0.040	mg/Kg			2	6020A

1A-IN
INORGANIC ANALYSIS DATA SHEET
METALS

Client Sample ID: STSB34_6-15

Lab Sample ID: 160-36593-8

Lab Name: Eurofins TestAmerica, St. Louis

Job No.: 160-36593-1

SDG ID.:

Matrix: Solid

Date Sampled: 11/25/2019 15:28

Reporting Basis: DRY

Date Received: 12/05/2019 09:30

% Solids: 77.9

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7440-29-1	Thorium	16	0.23	0.10	mg/Kg			2	6020A
7440-61-1	Uranium	4.3	0.12	0.046	mg/Kg			2	6020A

1A-IN
INORGANIC ANALYSIS DATA SHEET
METALS

Client Sample ID: STSB34-FD_3-6

Lab Sample ID: 160-36593-9

Lab Name: Eurofins TestAmerica, St. Louis

Job No.: 160-36593-1

SDG ID.:

Matrix: Solid

Date Sampled: 11/25/2019 15:13

Reporting Basis: DRY

Date Received: 12/05/2019 09:30

% Solids: 94.7

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7440-29-1	Thorium	5.1	0.20	0.088	mg/Kg			2	6020A
7440-61-1	Uranium	1.2	0.098	0.039	mg/Kg			2	6020A

1A-IN
INORGANIC ANALYSIS DATA SHEET
METALS

Client Sample ID: STSB33_0-0.5

Lab Sample ID: 160-36593-10

Lab Name: Eurofins TestAmerica, St. Louis

Job No.: 160-36593-1

SDG ID.:

Matrix: Solid

Date Sampled: 12/03/2019 12:31

Reporting Basis: DRY

Date Received: 12/05/2019 09:30

% Solids: 94.9

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7440-29-1	Thorium	3.4	0.19	0.084	mg/Kg			2	6020A
7440-61-1	Uranium	2.1	0.093	0.037	mg/Kg			2	6020A

1A-IN
INORGANIC ANALYSIS DATA SHEET
METALS

Client Sample ID: STSB33_0.5-3

Lab Sample ID: 160-36593-11

Lab Name: Eurofins TestAmerica, St. Louis

Job No.: 160-36593-1

SDG ID.:

Matrix: Solid

Date Sampled: 12/03/2019 12:40

Reporting Basis: DRY

Date Received: 12/05/2019 09:30

% Solids: 94.0

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7440-29-1	Thorium	5.9	0.21	0.092	mg/Kg			2	6020A
7440-61-1	Uranium	1.5	0.10	0.041	mg/Kg			2	6020A

1A-IN
INORGANIC ANALYSIS DATA SHEET
METALS

Client Sample ID: STSB33-FD_0.5-3

Lab Sample ID: 160-36593-12

Lab Name: Eurofins TestAmerica, St. Louis

Job No.: 160-36593-1

SDG ID.:

Matrix: Solid

Date Sampled: 12/03/2019 12:48

Reporting Basis: DRY

Date Received: 12/05/2019 09:30

% Solids: 94.5

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7440-29-1	Thorium	6.4	0.19	0.086	mg/Kg			2	6020A
7440-61-1	Uranium	1.6	0.096	0.038	mg/Kg			2	6020A

1A-IN
INORGANIC ANALYSIS DATA SHEET
METALS

Client Sample ID: STSB33_3-6

Lab Sample ID: 160-36593-13

Lab Name: Eurofins TestAmerica, St. Louis

Job No.: 160-36593-1

SDG ID.:

Matrix: Solid

Date Sampled: 12/03/2019 12:51

Reporting Basis: DRY

Date Received: 12/05/2019 09:30

% Solids: 93.3

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7440-29-1	Thorium	9.9	0.21	0.092	mg/Kg			2	6020A
7440-61-1	Uranium	2.3	0.10	0.041	mg/Kg			2	6020A

1A-IN
INORGANIC ANALYSIS DATA SHEET
METALS

Client Sample ID: STSB33_6-15

Lab Sample ID: 160-36593-14

Lab Name: Eurofins TestAmerica, St. Louis

Job No.: 160-36593-1

SDG ID.:

Matrix: Solid

Date Sampled: 12/03/2019 13:05

Reporting Basis: DRY

Date Received: 12/05/2019 09:30

% Solids: 93.5

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7440-29-1	Thorium	6.5	0.21	0.093	mg/Kg			2	6020A
7440-61-1	Uranium	1.9	0.10	0.041	mg/Kg			2	6020A

1A-IN
INORGANIC ANALYSIS DATA SHEET
METALS

Client Sample ID: STSB35_0.5-3

Lab Sample ID: 160-36593-15

Lab Name: Eurofins TestAmerica, St. Louis

Job No.: 160-36593-1

SDG ID.:

Matrix: Solid

Date Sampled: 12/03/2019 14:41

Reporting Basis: DRY

Date Received: 12/05/2019 09:30

% Solids: 95.5

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7440-29-1	Thorium	5.2	0.18	0.081	mg/Kg			2	6020A
7440-61-1	Uranium	1.2	0.090	0.036	mg/Kg			2	6020A

1A-IN
INORGANIC ANALYSIS DATA SHEET
METALS

Client Sample ID: STSB35_0-0.5
Lab Sample ID: 160-36593-16
Lab Name: Eurofins TestAmerica, St. Louis
Job No.: 160-36593-1
SDG ID.:
Matrix: Solid
Date Sampled: 12/03/2019 14:35
Reporting Basis: DRY
Date Received: 12/05/2019 09:30
% Solids: 92.4

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7440-29-1	Thorium	6.3	0.20	0.089	mg/Kg			2	6020A
7440-61-1	Uranium	1.6	0.099	0.040	mg/Kg			2	6020A

1A-IN
INORGANIC ANALYSIS DATA SHEET
METALS

Client Sample ID: STSB35_3-6

Lab Sample ID: 160-36593-17

Lab Name: Eurofins TestAmerica, St. Louis

Job No.: 160-36593-1

SDG ID.:

Matrix: Solid

Date Sampled: 12/03/2019 14:54

Reporting Basis: DRY

Date Received: 12/05/2019 09:30

% Solids: 94.3

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7440-29-1	Thorium	5.0	0.18	0.082	mg/Kg			2	6020A
7440-61-1	Uranium	1.8	0.091	0.037	mg/Kg			2	6020A

1A-IN
INORGANIC ANALYSIS DATA SHEET
METALS

Client Sample ID: STSB35_6-15

Lab Sample ID: 160-36593-18

Lab Name: Eurofins TestAmerica, St. Louis

Job No.: 160-36593-1

SDG ID.:

Matrix: Solid

Date Sampled: 12/03/2019 15:00

Reporting Basis: DRY

Date Received: 12/05/2019 09:30

% Solids: 92.6

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7440-29-1	Thorium	5.5	0.19	0.085	mg/Kg			2	6020A
7440-61-1	Uranium	2.2	0.095	0.038	mg/Kg			2	6020A

2A-IN
CALIBRATION VERIFICATIONS
METALS

Lab Name: Eurofins TestAmerica, St. Louis Job No.: 160-36593-1

SDG No.:

ICV Source: MS A ICV_01081 Concentration Units: ug/L

CCV Source: MS A CAL1 LLC_00421

Analyte	ICV 160-455416/7 12/27/2019 00:51				CCVL 160-455416/24 12/27/2019 02:46				CCVL 160-455416/37 12/27/2019 04:14			
	Found	C	True	%R	Found	C	True	%R	Found	C	True	%R
Thorium	99.3		100	99	1.85	J	2.00	93	1.80	J	2.00	90
Uranium	101		100	101	0.908	J	1.00	91	0.890	J	1.00	89

Note! Calculations are performed before rounding to avoid round-off errors in calculated results.
Italicized analytes were not requested for this sequence.

2A-IN
CALIBRATION VERIFICATIONS
METALS

Lab Name: Eurofins TestAmerica, St. Louis Job No.: 160-36593-1

SDG No.:

ICV Source: MS A ICV_01081 Concentration Units: ug/L

CCV Source: MS A CAL1 LLC_00421

Analyte	CCVL 160-455416/50 12/27/2019 05:41											
	Found	C	True	%R	Found	C	True	%R	Found	C	True	%R
Thorium	1.80	J	2.00	90								
Uranium	0.901	J	1.00	90								

Note! Calculations are performed before rounding to avoid round-off errors in calculated results.
Italicized analytes were not requested for this sequence.

2A-IN
CALIBRATION VERIFICATIONS
METALS

Lab Name: Eurofins TestAmerica, St. Louis Job No.: 160-36593-1

SDG No.:

ICV Source: MS A ICV_01081 Concentration Units: ug/L

CCV Source: MS A CAL2 CCV_00378

Analyte	ICV 160-455416/7 12/27/2019 00:51				CCV 160-455416/12 12/27/2019 01:25				CCV 160-455416/25 12/27/2019 02:53			
	Found	C	True	%R	Found	C	True	%R	Found	C	True	%R
Thorium	99.3		100	99	101		100	101	97.9		100	98
Uranium	101		100	101	101		100	101	98.5		100	98

Note! Calculations are performed before rounding to avoid round-off errors in calculated results.
Italicized analytes were not requested for this sequence.

2A-IN
CALIBRATION VERIFICATIONS
METALS

Lab Name: Eurofins TestAmerica, St. Louis Job No.: 160-36593-1

SDG No.:

ICV Source: MS A ICV_01081 Concentration Units: ug/L

CCV Source: MS A CAL2 CCV_00378

Analyte	CCV 160-455416/38 12/27/2019 04:20				CCV 160-455416/51 12/27/2019 05:48							
	Found	C	True	%R	Found	C	True	%R	Found	C	True	%R
Thorium	98.5		100	99	101		100	101				
Uranium	99.1		100	99	102		100	102				

Note! Calculations are performed before rounding to avoid round-off errors in calculated results.
Italicized analytes were not requested for this sequence.

2B-IN
CRQL CHECK STANDARD
METALS

Lab Name: Eurofins TestAmerica, St. Louis Job No.: 160-36593-1

SDG No.:

Method: 6020A Instrument ID: ICPMS7700

Lab Sample ID: CRI 160-455416/9 Concentration Units: ug/L

CRQL Check Standard Source: MS A CAL1 LLC_00421

Analyte	CRQL Check Standard				
	True	Found	Qualifiers	%R(1)	Limits
Thorium	2.00	1.90	J	95	70-130
Uranium	1.00	0.921	J	92	70-130

Note! Calculations are performed before rounding to avoid round-off errors in calculated results.

FORM IIB-IN

3-IN
INSTRUMENT BLANKS
METALS

Lab Name: Eurofins TestAmerica, St. Louis Job No.: 160-36593-1

SDG No.:

Concentration Units: ug/L

Analyte	RL	ICB 160-455416/8 12/27/2019 00:58		CCB 160-455416/13 12/27/2019 01:32		CCB 160-455416/26 12/27/2019 03:00		CCB 160-455416/39 12/27/2019 04:27	
		Found	C	Found	C	Found	C	Found	C
Thorium	2.0	ND		ND		ND		ND	
Uranium	1.0	ND		ND		ND		ND	

Italicized analytes were not requested for this sequence.

3-IN
INSTRUMENT BLANKS
METALS

Lab Name: Eurofins TestAmerica, St. Louis Job No.: 160-36593-1

SDG No.:

Concentration Units: ug/L

Analyte	RL	CCB 160-455416/52 12/27/2019 05:55							
		Found	C	Found	C	Found	C	Found	C
Thorium	2.0	ND							
Uranium	1.0	ND							

Italicized analytes were not requested for this sequence.

3-IN
METHOD BLANK
METALS

Lab Name: Eurofins TestAmerica, St. Louis Job No.: 160-36593-1

SDG No.:

Concentration Units: mg/Kg Lab Sample ID: MB 160-453801/1-A

Instrument Code: ICPMS7700 Batch No.: 455416

CAS No.	Analyte	Concentration	C	Q	Method
7440-29-1	Thorium	ND			6020A
7440-61-1	Uranium	ND			6020A

FORM III-IN

4A-IN
INTERFERENCE CHECK STANDARD
METALS

Lab Name: Eurofins TestAmerica, St. Louis Job No.: 160-36593-1

SDG No.:

Lab Sample ID: ICSA 160-455416/10 Instrument ID: ICPMS7700

Lab File ID: 082ICSA.D ICS Source: MS A ICSA_00329

Concentration Units: ug/L

Analyte	True Solution A	Found Solution A	Percent Recovery
Thorium		**0.0570**	
Uranium		**0.0000**	
Titanium	*2000*	*2165*	*108*

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

FORM IVA-IN

4A-IN
INTERFERENCE CHECK STANDARD
METALS

Lab Name: Eurofins TestAmerica, St. Louis Job No.: 160-36593-1

SDG No.:

Lab Sample ID: ICSAB 160-455416/11 Instrument ID: ICPMS7700

Lab File ID: 083ICSB.D ICS Source: MS A ICSAB_00341

Concentration Units: ug/L

Analyte	True Solution AB	Found Solution AB	Percent Recovery
Thorium	**50.0**	**50.9**	**102**
Uranium	**50.0**	**50.6**	**101**

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

FORM IVA-IN

5A-IN
MATRIX SPIKE SAMPLE RECOVERY
METALS

Client ID: STSB32_0-0.5 MS

Lab ID: 160-36593-1 MS

Lab Name: Eurofins TestAmerica, St. Louis

Job No.: 160-36593-1

SDG No.:

Matrix: Solid

Concentration Units: mg/Kg

% Solids: 93.3

Analyte	SSR	C	Sample Result (SR)	C	Spike Added (SA)	%R	Control Limit %R	Q	Method
Thorium	105		4.3		101	99	75-125		6020A
Uranium	102		1.0		101	99	75-125		6020A

SSR = Spiked Sample Result

Calculations are performed before rounding to avoid round-off errors in calculated results.
Note - Results and Reporting Limits have been adjusted for dry weight.

FORM VA - IN

5A-IN
MATRIX SPIKE DUPLICATE SAMPLE RECOVERY
METALS

Client ID: STSB32_0-0.5 MSD

Lab ID: 160-36593-1 MSD

Lab Name: Eurofins TestAmerica, St. Louis

Job No.: 160-36593-1

SDG No.:

Matrix: Solid

Concentration Units: mg/Kg

% Solids: 93.3

Analyte	(SDR)	C	Spike Added (SA)	%R	Control Limit %R	RPD	RPD Limit	Q	Method
Thorium	110		104	102	75-125	5	30		6020A
Uranium	107		104	101	75-125	5	30		6020A

SDR = Sample Duplicate Result

Calculations are performed before rounding to avoid round-off errors in calculated results.
Note - Results and Reporting Limits have been adjusted for dry weight.

FORM VD - IN

6-IN
DUPLICATES
METALS

Client ID: STSB32_0-0.5 DU

Lab ID: 160-36593-1 DU

Lab Name: Eurofins TestAmerica, St. Louis

Job No.: 160-36593-1

SDG No.:

% Solids for Sample: 93.3

% Solids for Duplicate: 93.8

Matrix: Solid

Concentration Units: mg/Kg

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	Method
Thorium	0.20	4.3		8.07		62	F3	6020A
Uranium	0.10	1.0		2.12		69	F3	6020A

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

FORM VI-IN

LINEAR RANGE CHECK STANDARD
METALS -

Lab ID: LRC 160-455416/2

Lab Name: Eurofins TestAmerica, St. Louis Job No.: 160-36593-1

Sample Matrix: Solid LCS Source: MS LDR 2_00188

Analyte	Solid(ug/L)							
	True	Found	C	%R	Limits		Q	Method
Thorium	2000	2090		104	90	110		6020A
Uranium	2000	2030		101	90	110		6020A

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

7A-IN
LAB CONTROL SAMPLE
METALS

Lab ID: LCS 160-453801/2-A

Lab Name: Eurofins TestAmerica, St. Louis Job No.: 160-36593-1

Sample Matrix: Solid LCS Source: MPREP1-A_00004

Analyte	Solid(mg/Kg)							
	True	Found	C	%R	Limits		Q	Method
Thorium	90.2	90.2		100	80	120		6020A

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

FORM VIIA - IN

7A-IN
LCS-CERTIFIED REFERENCE MATERIAL
METALS

Lab ID: LCSSRM 160-453801/3-A

Lab Name: Eurofins TestAmerica, St. Louis Job No.: 160-36593-1

Sample Matrix: Solid LCS Source: PR_LCSSRM U_00001

Analyte	Solid(mg/Kg)							
	True	Found	C	%R	Limits		Q	Method
Uranium	98.1	102		104.3	74.0	126.4		6020A

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

FORM VIIA - IN

8-IN
ICP-AES AND ICP-MS SERIAL DILUTIONS
METALS

Lab ID: 160-36593-1

SDG No:

Lab Name: Eurofins TestAmerica, St. Louis Job No: 160-36593-1

Matrix: Solid Concentration Units: mg/Kg

Analyte	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Difference	Q	Method
Thorium	4.3		3.82		NC		6020A
Uranium	1.0		1.04		NC		6020A

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

FORM VIII-IN

9-IN
DETECTION LIMITS
METALS

Lab Name: Eurofins TestAmerica, St. Louis Job Number: 160-36593-1

SDG Number:

Matrix: Solid Instrument ID: ICPMS7700

Method: 6020A MDL Date: 05/14/2018 10:39

Prep Method: 3050B

Analyte	Wavelength/ Mass	RL (mg/Kg)	MDL (mg/Kg)
Thorium	232	0.2	0.09
Uranium	238	0.1	0.04

9-IN
CALIBRATION BLANK DETECTION LIMITS
METALS

Lab Name: Eurofins TestAmerica, St. Louis Job Number: 160-36593-1

SDG Number:

Matrix: Solid Instrument ID: ICPMS7700

Method: 6020A XMDL Date: 06/27/2019 14:00

Analyte	Wavelength/ Mass	XRL (ug/L)	XMDL (ug/L)
Thorium	232	2	0.9
Uranium	238	1	0.4

FORM IX - IN

11-IN
LINEAR RANGES
METALS

Lab Name: Eurofins TestAmerica, St. Loui Job No: 160-36593-1

SDG No.:

Instrument ID: ICPMS7700 Date: 08/05/2019 16:42

Analyte	Integ. Time (Sec.)	Concentration (ug/L)	Method
Thorium		2000	6020A
Uranium		2000	6020A

FORM XI - IN

12-IN
PREPARATION LOG
METALS

Lab Name: Eurofins TestAmerica, St. Louis Job No.: 160-36593-1

SDG No.:

Prep Method: 3050B

Lab Sample ID	Preparation Date	Prep Batch	Initial Weight (g)	Initial Volume	Final Volume (mL)
MB 160-453801/1-A	12/10/2019 13:15	453801	0.5153		50
LCS 160-453801/2-A	12/10/2019 13:15	453801	0.5542		50
LCSSRM 160-453801/3-A	12/10/2019 13:15	453801	0.5708		50
160-36593-1	12/10/2019 13:15	453801	0.5479		50
160-36593-1 DU	12/10/2019 13:15	453801	0.5295		50
160-36593-1 MS	12/10/2019 13:15	453801	0.5289		50
160-36593-1 MSD	12/10/2019 13:15	453801	0.5132		50
160-36593-2	12/10/2019 13:15	453801	0.5375		50
160-36593-3	12/10/2019 13:15	453801	0.5635		50
160-36593-4	12/10/2019 13:15	453801	0.5122		50
160-36593-5	12/10/2019 13:15	453801	0.5511		50
160-36593-6	12/10/2019 13:15	453801	0.5151		50
160-36593-7	12/10/2019 13:15	453801	0.5310		50
160-36593-8	12/10/2019 13:15	453801	0.5567		50
160-36593-9	12/10/2019 13:15	453801	0.5410		50
160-36593-10	12/10/2019 13:15	453801	0.5644		50
160-36593-11	12/10/2019 13:15	453801	0.5175		50
160-36593-12	12/10/2019 13:15	453801	0.5527		50
160-36593-13	12/10/2019 13:15	453801	0.5224		50
160-36593-14	12/10/2019 13:15	453801	0.5166		50
160-36593-15	12/10/2019 13:15	453801	0.5816		50
160-36593-16	12/10/2019 13:15	453801	0.5462		50
160-36593-17	12/10/2019 13:15	453801	0.5803		50
160-36593-18	12/10/2019 13:49	453801	0.5713		50

FORM XII-IN

13-IN
ANALYSIS RUN LOG
METALS

Lab Name: Eurofins TestAmerica, St. Louis Job No.: 160-36593-1

SDG No.:

Instrument ID: ICPMS7700 Analysis Method: 6020A

Start Date: 12/26/2019 17:19 End Date: 12/27/2019 07:50

Lab Sample Id	D/F	Type	Time	Analytes																							
				Th	U																						
LRC 160-455416/1			17:19																								
LRC 160-455416/2	1		17:26	X	X																						
ICIS 160-455416/3			00:24	X	X																						
IC 160-455416/4	1		00:31	X	X																						
IC 160-455416/5	1		00:38	X	X																						
IC 160-455416/6	1		00:45	X	X																						
ICV 160-455416/7	1		00:51	X	X																						
ICB 160-455416/8	1		00:58	X	X																						
CRI 160-455416/9	1		01:05	X	X																						
ICSA 160-455416/10	1		01:12	X	X																						
ICSAB 160-455416/11	1		01:18	X	X																						
CCV 160-455416/12	1		01:25	X	X																						
CCB 160-455416/13	1		01:32	X	X																						
MB 160-453801/1-A	2	T	01:39	X	X																						
LCS 160-453801/2-A	2	T	01:45	X																							
LCSSRM 160-453801/3-A	10	T	01:52		X																						
160-36593-1	2	T	01:59	X	X																						
160-36593-1 SD	10	T	02:06	X	X																						
160-36593-1 DU	2	T	02:12	X	X																						
160-36593-1 MS	2	T	02:19	X	X																						
160-36593-1 MSD	2	T	02:26	X	X																						
160-36593-2	2	T	02:33	X	X																						
160-36593-3	2	T	02:40	X	X																						
CCVL 160-455416/24	1		02:46	X	X																						
CCV 160-455416/25	1		02:53	X	X																						
CCB 160-455416/26	1		03:00	X	X																						
160-36593-4	2	T	03:07	X	X																						
160-36593-5	2	T	03:13	X	X																						
160-36593-6	2	T	03:20	X	X																						
160-36593-7	2	T	03:27	X	X																						
160-36593-8	2	T	03:33	X	X																						
160-36593-9	2	T	03:40	X	X																						
160-36593-10	2	T	03:47	X	X																						
160-36593-11	2	T	03:54	X	X																						
160-36593-12	2	T	04:00	X	X																						
160-36593-13	2	T	04:07	X	X																						
CCVL 160-455416/37	1		04:14	X	X																						
CCV 160-455416/38	1		04:20	X	X																						
CCB 160-455416/39	1		04:27	X	X																						
160-36593-14	2	T	04:34	X	X																						
160-36593-15	2	T	04:41	X	X																						
160-36593-16	2	T	04:47	X	X																						

FORM XIII-IN

13-IN
ANALYSIS RUN LOG
METALS

Lab Name: Eurofins TestAmerica, St. Louis Job No.: 160-36593-1

SDG No.:

Instrument ID: ICPMS7700 Analysis Method: 6020A

Start Date: 12/26/2019 17:19 End Date: 12/27/2019 07:50

Lab Sample Id	D/F	Type	Time	Analytes																							
				Th	U																						
160-36593-17	2	T	04:54	X	X																						
160-36593-18	2	T	05:01	X	X																						
ZZZZZZ			05:08																								
ZZZZZZ			05:15																								
ZZZZZZ			05:21																								
ZZZZZZ			05:28																								
ZZZZZZ			05:35																								
CCVL 160-455416/50	1		05:41	X	X																						
CCV 160-455416/51	1		05:48	X	X																						
CCB 160-455416/52	1		05:55	X	X																						
ZZZZZZ			06:02																								
ZZZZZZ			06:08																								
ZZZZZZ			06:15																								
ZZZZZZ			06:22																								
ZZZZZZ			06:29																								
ZZZZZZ			06:35																								
ZZZZZZ			06:42																								
ZZZZZZ			06:49																								
ZZZZZZ			06:56																								
ZZZZZZ			07:02																								
CCVL 160-455416/63			07:09																								
CCV 160-455416/64			07:16																								
CCB 160-455416/65			07:23																								
ZZZZZZ			07:29																								
CCVL 160-455416/67			07:36																								
CCV 160-455416/68			07:43																								
CCB 160-455416/69			07:50																								

Prep Types:
T = Total/NA

FORM XIII-IN

15-IN
ICP-MS INTERNAL STANDARDS RELATIVE INTENSITY SUMMARY
METALS

Lab Name: Eurofins TestAmerica, St. Louis Job No.: 160-36593-1

SDG No.:

ICP-MS Instrument ID: ICPMS7700 Start Date: 12/26/2019 End Date: 12/27/2019

Lab Sample ID	Time	Internal Standards %RI For:									
		Element Li-6	Q	Element Sc/2	Q	Element Sc/3	Q	Element Ge/2	Q	Element Ge/3	Q
LRC 160-455416/2	17:26	94		124		108		118		106	
IC 160-455416/4	00:31	102		101		103		102		103	
IC 160-455416/5	00:38	99		102		103		107		104	
IC 160-455416/6	00:45	100		103		104		110		106	
ICV 160-455416/7	00:51	103		101		104		107		105	
ICB 160-455416/8	00:58	101		104		103		103		102	
CRI 160-455416/9	01:05	102		104		103		106		104	
ICSA 160-455416/10	01:12	112		110		110		107		105	
ICSAB 160-455416/11	01:18	114		118		115		114		108	
CCV 160-455416/12	01:25	108		114		112		119		112	
CCB 160-455416/13	01:32	105		110		109		109		106	
MB 160-453801/1-A	01:39	106		110		108		113		110	
LCS 160-453801/2-A	01:45	100		107		104		108		104	
LCSSRM 160-453801/3-A	01:52	101		111		110		109		105	
160-36593-1	01:59	110		122		126		114		113	
160-36593-1 SD	02:06	111		118		114		118		114	
160-36593-1 DU	02:12	112		133		132		120		114	
160-36593-1 MS	02:19	107		133		130		114		110	
160-36593-1 MSD	02:26	105		130		127		114		109	
160-36593-2	02:33	108		123		125		115		112	
160-36593-3	02:40	107		128		127		117		111	
CCVL 160-455416/24	02:46	106		112		110		113		108	
CCV 160-455416/25	02:53	103		112		109		118		110	
CCB 160-455416/26	03:00	101		108		105		106		104	
160-36593-4	03:07	108		129		126		120		114	
160-36593-5	03:13	109		133		133		119		114	
160-36593-6	03:20	109		130		131		118		114	
160-36593-7	03:27	109		132		129		118		113	
160-36593-8	03:33	109		126		126		119		114	
160-36593-9	03:40	108		130		130		117		113	
160-36593-10	03:47	107		127		128		117		113	
160-36593-11	03:54	104		124		124		116		111	
160-36593-12	04:00	105		125		126		116		112	
160-36593-13	04:07	103		122		123		116		112	
CCVL 160-455416/37	04:14	107		116		114		116		112	
CCV 160-455416/38	04:20	102		115		110		120		111	
CCB 160-455416/39	04:27	101		109		108		108		106	
160-36593-14	04:34	102		122		121		115		111	
160-36593-15	04:41	107		131		133		118		114	
160-36593-16	04:47	104		129		128		116		112	
160-36593-17	04:54	104		132		131		115		112	

FORM XV - IN

15-IN
ICP-MS INTERNAL STANDARDS RELATIVE INTENSITY SUMMARY
METALS

Lab Name: Eurofins TestAmerica, St. Louis Job No.: 160-36593-1

SDG No.:

ICP-MS Instrument ID: ICPMS7700 Start Date: 12/26/2019 End Date: 12/27/2019

Lab Sample ID	Time	Internal Standards %RI For:									
		Element Li-6	Q	Element Sc/2	Q	Element Sc/3	Q	Element Ge/2	Q	Element Ge/3	Q
160-36593-18	05:01	101		125		124		116		110	
CCVL 160-455416/50	05:41	93		104		100		105		101	
CCV 160-455416/51	05:48	89		99		98		106		99	
CCB 160-455416/52	05:55	90		100		97		100		97	

FORM XV - IN

15-IN
ICP-MS INTERNAL STANDARDS RELATIVE INTENSITY SUMMARY
METALS

Lab Name: Eurofins TestAmerica, St. Louis Job No.: 160-36593-1

SDG No.:

ICP-MS Instrument ID: ICPMS7700 Start Date: 12/26/2019 End Date: 12/27/2019

Lab Sample ID	Time	Internal Standards %RI For:									
		Element In	Q	Element Ho/2	Q	Element Ho/3	Q	Element Ir/2	Q	Element Ir/3	Q
LRC 160-455416/2	17:26	93		100		95		89		87	
IC 160-455416/4	00:31	103		99		103		100		103	
IC 160-455416/5	00:38	102		101		103		100		101	
IC 160-455416/6	00:45	102		101		104		100		102	
ICV 160-455416/7	00:51	104		99		103		100		104	
ICB 160-455416/8	00:58	102		102		103		102		102	
CRI 160-455416/9	01:05	103		102		102		102		102	
ICSA 160-455416/10	01:12	95		97		96		89		88	
ICSAB 160-455416/11	01:18	98		99		98		89		90	
CCV 160-455416/12	01:25	106		106		103		101		99	
CCB 160-455416/13	01:32	106		102		103		100		101	
MB 160-453801/1-A	01:39	106		104		103		104		102	
LCS 160-453801/2-A	01:45	102		101		102		96		98	
LCSSRM 160-453801/3-A	01:52	101		102		102		99		99	
160-36593-1	01:59	104		104		104		99		99	
160-36593-1 SD	02:06	105		106		103		101		99	
160-36593-1 DU	02:12	105		106		103		99		97	
160-36593-1 MS	02:19	102		103		101		95		96	
160-36593-1 MSD	02:26	101		102		101		95		95	
160-36593-2	02:33	103		104		102		97		96	
160-36593-3	02:40	101		104		100		96		94	
CCVL 160-455416/24	02:46	105		103		101		100		99	
CCV 160-455416/25	02:53	103		103		101		100		98	
CCB 160-455416/26	03:00	102		100		100		98		99	
160-36593-4	03:07	104		107		103		99		97	
160-36593-5	03:13	104		104		103		97		97	
160-36593-6	03:20	104		104		102		96		97	
160-36593-7	03:27	104		103		101		95		96	
160-36593-8	03:33	105		103		102		96		96	
160-36593-9	03:40	103		102		101		94		95	
160-36593-10	03:47	103		102		102		95		95	
160-36593-11	03:54	102		101		100		95		94	
160-36593-12	04:00	103		102		100		95		95	
160-36593-13	04:07	103		102		101		95		95	
CCVL 160-455416/37	04:14	109		103		103		101		100	
CCV 160-455416/38	04:20	105		104		101		101		99	
CCB 160-455416/39	04:27	103		100		100		97		98	
160-36593-14	04:34	102		103		100		96		95	
160-36593-15	04:41	105		102		101		94		95	
160-36593-16	04:47	102		101		100		93		93	
160-36593-17	04:54	102		101		100		94		93	

FORM XV - IN

15-IN
ICP-MS INTERNAL STANDARDS RELATIVE INTENSITY SUMMARY
METALS

Lab Name: Eurofins TestAmerica, St. Louis Job No.: 160-36593-1

SDG No.:

ICP-MS Instrument ID: ICPMS7700 Start Date: 12/26/2019 End Date: 12/27/2019

Lab Sample ID	Time	Internal Standards %RI For:									
		Element In	Q	Element Ho/2	Q	Element Ho/3	Q	Element Ir/2	Q	Element Ir/3	Q
160-36593-18	05:01	100		101		98		93		91	
CCVL 160-455416/50	05:41	99		98		96		96		95	
CCV 160-455416/51	05:48	96		96		95		93		93	
CCB 160-455416/52	05:55	97		96		95		94		94	

FORM XV - IN

METALS BATCH WORKSHEET

Lab Name: Eurofins TestAmerica, St. Loui Job No.: 160-36593-1

SDG No.:

Batch Number: 453801 Batch Start Date: 12/10/19 13:15 Batch Analyst: Mazariegos, Leonel A

Batch Method: 3050B Batch End Date: 12/11/19 13:45

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	FinalAmount	MPREP1-A 00004	MPREP1-B 00004	MPREP2 00022	PR_LCSSRM U 00001
MB 160-453801/1		3050B, 6020A		0.5153 g	50 mL				
LCS 160-453801/2		3050B, 6020A		0.5542 g	50 mL	0.25 mL	0.25 mL	0.25 mL	
LCSSRM 160-453801/3		3050B, 6020A		0.5708 g	50 mL				0.5708 g
160-36593-B-1	STSB32_0-0.5	3050B, 6020A	T	0.5479 g	50 mL				
160-36593-B-1 DU	STSB32_0-0.5	3050B, 6020A	T	0.5295 g	50 mL				
160-36593-A-1 MS	STSB32_0-0.5	3050B, 6020A	T	0.5289 g	50 mL	0.25 mL	0.25 mL	0.25 mL	
160-36593-A-1 MSD	STSB32_0-0.5	3050B, 6020A	T	0.5132 g	50 mL	0.25 mL	0.25 mL	0.25 mL	
160-36593-B-2	STSB32_0.5-3	3050B, 6020A	T	0.5375 g	50 mL				
160-36593-B-3	STSB32_3-6	3050B, 6020A	T	0.5635 g	50 mL				
160-36593-B-4	STSB32_6-15	3050B, 6020A	T	0.5122 g	50 mL				
160-36593-B-5	STSB34_0-0.5	3050B, 6020A	T	0.5511 g	50 mL				
160-36593-B-6	STSB34_0.5-3	3050B, 6020A	T	0.5151 g	50 mL				
160-36593-B-7	STSB34_3-6	3050B, 6020A	T	0.5310 g	50 mL				
160-36593-B-8	STSB34_6-15	3050B, 6020A	T	0.5567 g	50 mL				
160-36593-B-9	STSB34-FD_3-6	3050B, 6020A	T	0.5410 g	50 mL				
160-36593-B-10	STSB33_0-0.5	3050B, 6020A	T	0.5644 g	50 mL				
160-36593-B-11	STSB33_0.5-3	3050B, 6020A	T	0.5175 g	50 mL				
160-36593-B-12	STSB33-FD_0.5-3	3050B, 6020A	T	0.5527 g	50 mL				
160-36593-B-13	STSB33_3-6	3050B, 6020A	T	0.5224 g	50 mL				
160-36593-B-14	STSB33_6-15	3050B, 6020A	T	0.5166 g	50 mL				
160-36593-B-15	STSB35_0.5-3	3050B, 6020A	T	0.5816 g	50 mL				
160-36593-B-16	STSB35_0-0.5	3050B, 6020A	T	0.5462 g	50 mL				
160-36593-B-17	STSB35_3-6	3050B, 6020A	T	0.5803 g	50 mL				
160-36593-B-18	STSB35_6-15	3050B, 6020A	T	0.5713 g	50 mL				

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.

METALS BATCH WORKSHEET

Lab Name: Eurofins TestAmerica, St. Loui Job No.: 160-36593-1

SDG No.:

Batch Number: 453801 Batch Start Date: 12/10/19 13:15 Batch Analyst: Mazariegos, Leonel A

Batch Method: 3050B Batch End Date: 12/11/19 13:45

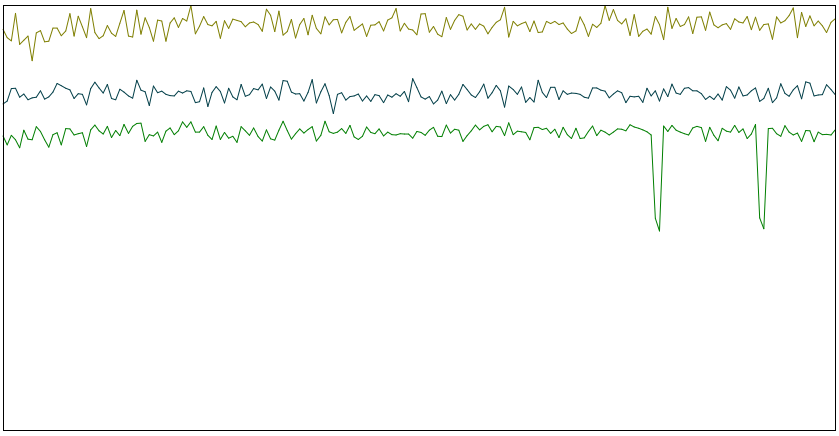
Batch Notes	
Balance ID	27150420
Blank Soil Lot Number	25438819
Temperature - Corrected - End	E5: 91.7 Degrees C
Temperature - Corrected - Start	B1: 92.5 Degrees C
Digestion End Time	12/11/2019 13:15
Digestion Start Time	12/11/2019 10:34
Digestion Unit ID	HOTBLOCK 2
Digestion Tube/Cup ID	344749-4653
Hydrogen Peroxide ID	1819373
Hydrochloric Acid ID	1843669
Nitric Acid ID	1843691, 1847195
Pipette/Syringe/Dispenser ID	MET-12
Analyst ID - Spike Analyst	LAM
Sufficient Volume for Batch QC	YES
Thermometer ID	160322347

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.

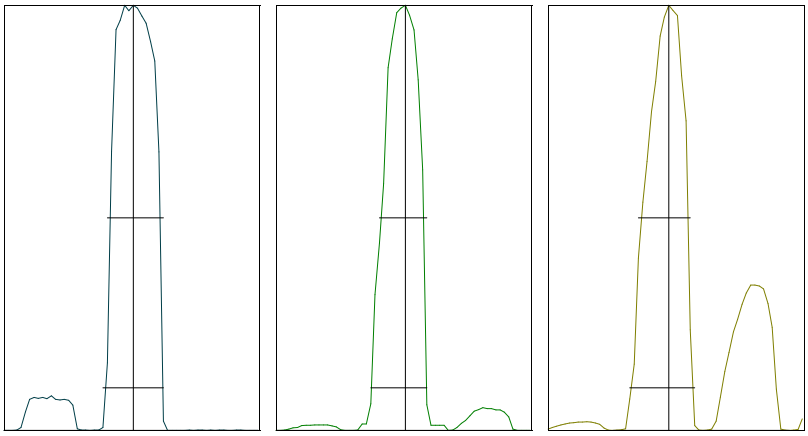
Tune Report

Tune File : autotune.u
Comment :



Integration Time:	0.1000 sec	
Sampling Period:	0.3100 sec	
n:	200	
Oxide:	156/140	1.045%
Doubly Charged:	70/140	1.126%

m/z	Range	Count	Mean	RSD%	Background
7	50,000	39532.0	39641.2	1.80	1.00
89	200,000	141511.0	139424.7	4.68	2.60
205	100,000	96857.0	95317.5	2.15	5.20



m/z:	7	89	205
Height:	39,705	97,240	95,532
Axis:	7.05	89.05	204.95
W-50%:	0.65	0.55	0.60
W-10%:	0.700	0.6500	0.7500

Integration Time: 0.1000 sec
Acquisition Time: 22.7600 sec

Y axis : Linear

Tune Report

Tune File : autotune.u
Comment :

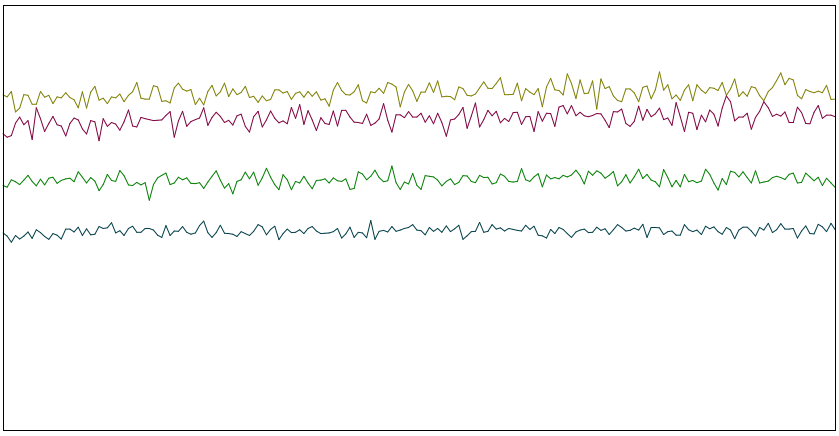
Tuning Parameters

===Plasma Condition===			===Ion Lenses===			===Q-Pole Parameters===		
RF Power	:	1550 W	Extract 1	:	0 V	AMU Gain	:	118
RF Matching	:	1.5 V	Extract 2	:	-120 V	AMU Offset	:	128
Smpl Depth	:	8 mm	Omega Bias	:	-90 V	Axis Gain	:	0.998
Torch-H	:	0.1 mm	Omega Lens	:	8 V	Axis Offset	:	0.11
Torch-V	:	0 mm	Cell Entrance	:	-30 V	QP Bias	:	-3 V
Carrier Gas	:	0.55 L/min	Cell Exit	:	-50 V			
Dilution Mode	:	ON	Deflect	:	12.2 V	===Detector Parameters===		
Dilution Gas	:	0.5 L/min	Plate Bias	:	-40 V	Discriminator	:	4.5 mV
Optional Gas	:	0 %	===Octopole Parameters===			Analog HV	:	1931 V
Nebulizer Pump	:	0.1 rps	OctP RF	:	190 V	Pulse HV	:	1184 V
Sample Pump	:	--- rps	OctP Bias	:	-8 V			
S/C Temp	:	2 degC						

===Reaction Cell===								
Reaction Mode	:	OFF						
H2 Gas	:	0 mL/min	He Gas	:	0 mL/min	Optional Gas	:	--- %

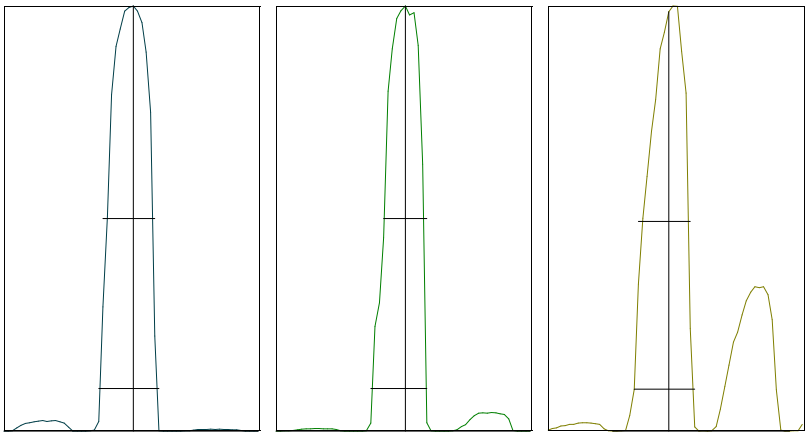
Tune Report

Tune File : he.u
Comment :



Integration Time: 0.1000 sec
Sampling Period: 0.6200 sec
n: 200
Oxide: 156/140 0.365%
Doubly Charged: 70/140 0.987%

m/z	Range	Count	Mean	RSD%	Background
59	50,000	23625.0	23479.8	2.04	0.10
89	50,000	28607.0	29513.4	2.13	0.10
140	100,000	78001.0	79484.4	2.16	0.50
205	100,000	73851.0	73411.4	2.50	0.50
156/140	1	0.299%	0.328%	7.99	
70/140	2	0.910%	0.977%	5.26	



m/z:	59	89	205
Height:	23,681	29,911	73,743
Axis:	59.05	89.05	204.95
W-50%:	0.60	0.50	0.60
W-10%:	0.700	0.6500	0.700

Integration Time: 0.1000 sec
Acquisition Time: 22.5600 sec

Y axis : Linear

Tune Report

Tune File : he.u
Comment :

Tuning Parameters

===Plasma Condition===			===Ion Lenses===			===Q-Pole Parameters===		
RF Power	:	1550 W	Extract 1	:	0 V	AMU Gain	:	118
RF Matching	:	1.5 V	Extract 2	:	-120 V	AMU Offset	:	128
Smpl Depth	:	8 mm	Omega Bias	:	-80 V	Axis Gain	:	0.998
Torch-H	:	0.1 mm	Omega Lens	:	8.5 V	Axis Offset	:	0.11
Torch-V	:	0 mm	Cell Entrance	:	-40 V	QP Bias	:	-15 V
Carrier Gas	:	0.55 L/min	Cell Exit	:	-60 V			
Dilution Mode	:	ON	Deflect	:	-0.4 V	===Detector Parameters===		
Dilution Gas	:	0.5 L/min	Plate Bias	:	-60 V	Discriminator	:	4.5 mV
Optional Gas	:	0 %	===Octopole Parameters===			Analog HV	:	1931 V
Nebulizer Pump	:	0.1 rps	OctP RF	:	190 V	Pulse HV	:	1184 V
Sample Pump	:	--- rps	OctP Bias	:	-18 V			
S/C Temp	:	2 degC						

===Reaction Cell===								
Reaction Mode	:	ON						
H2 Gas	:	0 mL/min	He Gas	:	4.3 mL/min	Optional Gas	:	--- %

QC Tune Report

Data File: C:\ICPMH\1\7500\QCTUNE.D
Date Acquired: 26 Dec 2019 04:03:31 pm
Operator: LP 7700
Misc Info:
Vial Number: 1307
Current Method: C:\ICPMH\1\METHODS\TN_6020.m

Minimum Response(CPS)

Element	Actual	Required	Flag

RSD (%)

Element	Actual	Required	Flag
6 Li	0.49	5.00	
59 Co	1.08	5.00	
115 In	1.03	5.00	
205 Tl	1.41	5.00	

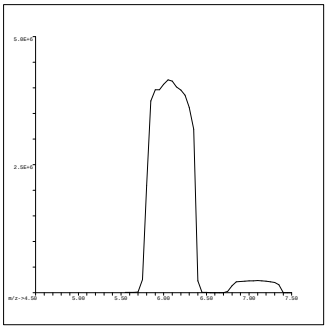
Ion Ratio

Element	Actual	Required	Flag

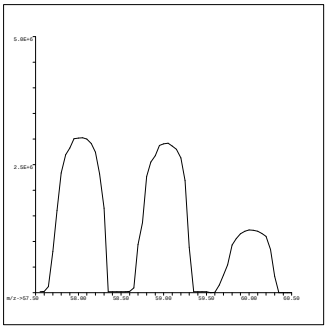
Maximum Bkg. Count(CPS)

Element	Actual	Required	Flag

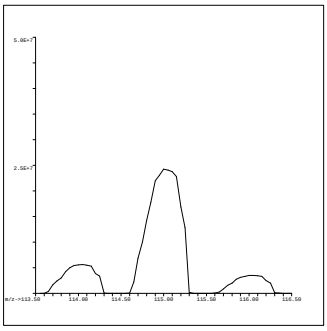
C:\ICPMH\1\DATA\122619B1.B\QCTUNE00.D



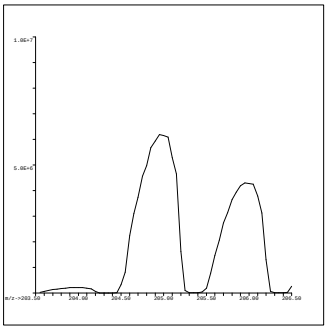
6 Li
Mass Calib.
Actual: 6.05
Required: 5.90-6.10
Flag:
Peak Width
Actual: 0.65
Required: 0.90
Flag:



59 Co
Mass Calib.
Actual: 59.05
Required: 58.90-59.10
Flag:
Peak Width
Actual: 0.60
Required: 0.90
Flag:



115 In
Mass Calib.
Actual: 115.05
Required: 114.90-115.10
Flag:
Peak Width
Actual: 0.60
Required: 0.90
Flag:



205 Tl
Mass Calib.
Actual: 204.95
Required: 204.90-205.10
Flag:
Peak Width
Actual: 0.65
Required: 0.90
Flag:

QC Tune Result:Pass

C:\ICPMH\1\DATA\122619B1.B\QCTUNE00.D

Replicated Data: Tune #1

Mass	Count(CPS)				
6	2283606.00	2262525.00	2261298.00	2265936.00	2268574.00
7	129469.60	128890.10	129287.10	128711.50	129095.40
8	27.50	22.00	18.50	21.50	28.50
58	1601094.00	1603206.00	1613231.00	1614190.00	1606794.00
59	1488278.00	1508473.00	1500156.00	1506911.00	1509109.00
60	611248.00	619122.31	621654.13	625654.19	625113.13
95	893246.50	906927.63	916263.31	912930.81	906383.19
111	1082867.00	1087430.00	1095493.00	1097177.00	1086668.00
114	2569336.00	2571551.00	2592238.00	2593701.00	2583909.00
115	11069500.00	10972350.00	11040990.00	10990880.00	11225750.00
116	1607604.00	1605007.00	1620643.00	1635359.00	1622187.00
118	1519578.00	1521277.00	1537396.00	1538859.00	1540469.00
204	117522.30	121152.00	125969.20	128844.10	128699.60
205	2997790.00	3064880.00	3075998.00	3101899.00	3128373.00
206	2132391.00	2165216.00	2170110.00	2202991.00	2199913.00
207	1913012.00	1922433.00	1967207.00	1966196.00	1967767.00
208	4520813.00	4616707.00	4639973.00	4658486.00	4670178.00

Blank Sample

Sample Name	**RINSE**
Data File Name	**002BLNK.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-26T16:11:44-06:00**
Type	**6-Blank**
VialNumber	**1**
Dilution	**1**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	

TuneStep	TuneFile
2	he.u
3	nogas.u

Calibration Blank Report

Sample Name	**ICIS 1854886**
Data File Name	**003CALB.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-26T16:18:31-06:00**
Type	**CalBlk**
VialNumber	**4**
Dilution	**1**
Comment	
Operator	**LP 7700**

QC Analyte Table

Element	m/z	ISTD	Tune Step	CPS	%RSD
Li	7	6	3	350602	0.72
Be	9	6	3	164	20.51
B	11	6	3	7213	2.38
Na	23	45	2	16872	1.18
Mg	24	45	2	468	6.23
Al	27	45	2	357	19.34
P	31	45	2	188	26.17
K	39	45	2	32671	0.67
Ca	44	45	3	70585	0.31
Ti	47	45	3	774	8.79
V	51	45	2	4534	4.28
Cr	52	45	2	1869	4.59
Mn	55	72	2	350	11.55
Fe	57	72	2	486	9.96
Co	59	72	2	578	1.85
Ni	60	72	2	159	18.80
Cu	63	72	2	10452	0.54
Zn	66	72	2	1165	6.17
As	75	72	2	290	11.67
Se	78	72	2	87	10.18
Sr	88	72	3	1215	9.21
Y	89	72	2	188	8.00
Zr	90	72	2	764	10.76
Nb	93	72	2	2206	4.76
Mo	95	72	3	3597	2.84
Ru	101	72	2	122	22.71
Rh	103	72	2	861	2.58
Pd	105	72	2	100	20.00
Ag	107	115	3	1844	2.70
Cd	111	115	3	192	9.65
Sn	118	115	3	10496	2.51
Sb	121	115	3	1319	9.27
Te	125	165	2	2	86.60
Cs	133	165	2	119	11.67
Ba	137	165	3	709	6.61
La	139	165	2	250	6.11
Ce	140	165	2	373	3.89
Pr	141	165	2	328	6.21
Nd	146	165	2	70	4.76
Sm	147	165	3	111	17.58
Hf	178	165	2	778	7.78
Ta	181	165	2	24068	1.19
W	182	165	2	12906	2.72
Re	185	193	3	204	27.10
Pt	195	193	2	420	12.32
Au	197	193	3	712	5.94
Tl	205	193	3	4420	10.15
(Pb)	206	193	3	5840	2.86
(Pb)	207	193	3	5814	2.47
Pb	208	193	3	22830	0.68
Bi	209	193	2	9355	1.43
Th	232	193	3	8384	2.04
U	238	193	3	743	6.03

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD
Li (IS)	6	3	6327920	0.23
Sc (IS)	45	2	224146	0.96
Sc (IS)	45	3	3966854	0.37
Ge (IS)	72	2	458627	0.83
Ge (IS)	72	3	2917719	0.43
In (IS)	115	3	22065637	0.21
Ho (IS)	165	2	16245218	0.86
Ho (IS)	165	3	27266963	0.93
Ir (IS)	193	2	10999175	0.26
Ir (IS)	193	3	13591604	0.66

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Calibration Standard Report

Sample Name	**IC 1856860**
Data File Name	**004CALS.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-26T16:25:15-06:00**
Type	**CalStd**
VialNumber	**1101**
Dilution	**1**
Comment	
Operator	**LP 7700**

QC Analyte Table

Element	m/z	ISTD	Tune Step	CPS	%RSD
Li	7	6	3	536321	0.35
Be	9	6	3	5210	2.41
B	11	6	3	757857	0.80
Na	23	45	2	185237	0.71
Mg	24	45	2	47666	0.79
Al	27	45	2	20947	1.27
P	31	45	2	2813	2.34
K	39	45	2	130353	0.88
Ca	44	45	3	493052	0.25
Ti	47	45	3	25922	0.54
V	51	45	2	111537	1.21
Cr	52	45	2	138940	0.84
Mn	55	72	2	34297	1.91
Fe	57	72	2	15307	3.93
Co	59	72	2	43337	1.74
Ni	60	72	2	29341	1.54
Cu	63	72	2	54908	1.46
Zn	66	72	2	62027	1.21
As	75	72	2	20518	2.48
Se	78	72	2	806	5.38
Sr	88	72	3	539287	0.57
Y	89	72	2	128064	1.50
Zr	90	72	2	98609	1.67
Nb	93	72	2	775117	0.26
Mo	95	72	3	102035	1.20
Ru	101	72	2	116993	0.23
Rh	103	72	2	671008	0.51
Pd	105	72	2	7154	4.66
Ag	107	115	3	108776	0.35
Cd	111	115	3	6010	2.64
Sn	118	115	3	69229	0.54
Sb	121	115	3	212425	0.85
Te	125	165	2	3611	6.75
Cs	133	165	2	29381	2.35
Ba	137	165	3	35038	0.57
La	139	165	2	124437	1.14
Ce	140	165	2	719847	0.92
Pr	141	165	2	150521	1.91
Nd	146	165	2	27702	2.12
Sm	147	165	3	262947	0.27
Hf	178	165	2	292165	1.56
Ta	181	165	2	923338	1.60
W	182	165	2	162224	0.68
Re	185	193	3	552545	0.31
Pt	195	193	2	22071	1.59
Au	197	193	3	213081	0.72
Tl	205	193	3	190055	1.16
(Pb)	206	193	3	100635	0.32
(Pb)	207	193	3	87710	1.28
Pb	208	193	3	400608	0.56
Bi	209	193	2	1678732	0.34
Th	232	193	3	289165	0.89
U	238	193	3	135873	0.65

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	QC Flag
Li (IS)	6	3	6381641	0.09	6327920	100.8	80	120	
Sc (IS)	45	2	223678	0.75	224146	99.8	80	120	
Sc (IS)	45	3	3966455	0.39	3966854	100.0	80	120	
Ge (IS)	72	2	482539	0.78	458627	105.2	80	120	
Ge (IS)	72	3	3002732	0.41	2917719	102.9	80	120	
In (IS)	115	3	22460969	0.59	22065637	101.8	80	120	
Ho (IS)	165	2	16358787	0.25	16245218	100.7	80	120	
Ho (IS)	165	3	27432432	0.90	27266963	100.6	80	120	
Ir (IS)	193	2	10974360	0.40	10999175	99.8	80	120	
Ir (IS)	193	3	13625742	0.85	13591604	100.3	80	120	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Calibration Standard Report

Sample Name	**IC 1856861**
Data File Name	**005CALS.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-26T16:31:58-06:00**
Type	**CalStd**
VialNumber	**1102**
Dilution	**1**
Comment	
Operator	**LP 7700**

QC Analyte Table

Element	m/z	ISTD	Tune Step	CPS	%RSD
Li	7	6	3	3879194	0.35
Be	9	6	3	1036619	0.87
B	11	6	3	1580002	0.82
Na	23	45	2	4163724	0.49
Mg	24	45	2	2127199	0.71
Al	27	45	2	944608	0.31
P	31	45	2	63746	1.22
K	39	45	2	2374695	0.46
Ca	44	45	3	4442349	0.29
Ti	47	45	3	499791	0.33
V	51	45	2	1079652	0.75
Cr	52	45	2	1364944	0.54
Mn	55	72	2	834924	0.66
Fe	57	72	2	732975	0.24
Co	59	72	2	2182931	1.01
Ni	60	72	2	543713	0.65
Cu	63	72	2	1540395	0.09
Zn	66	72	2	290326	0.57
As	75	72	2	200704	0.39
Se	78	72	2	7636	1.82
Sr	88	72	3	10776529	0.33
Y	89	72	2	2669461	0.29
Zr	90	72	2	2047698	0.39
Nb	93	72	2	2007193	0.12
Mo	95	72	3	964490	0.42
Ru	101	72	2	1140416	0.23
Rh	103	72	2	6890872	0.31
Pd	105	72	2	135727	1.07
Ag	107	115	3	1058010	0.62
Cd	111	115	3	1132309	1.15
Sn	118	115	3	3391013	0.49
Sb	121	115	3	2215573	1.19
Te	125	165	2	37623	1.50
Cs	133	165	2	3063331	0.31
Ba	137	165	3	1778354	0.35
La	139	165	2	6671775	0.42
Ce	140	165	2	7703497	0.39
Pr	141	165	2	7992232	0.14
Nd	146	165	2	1506688	0.32
Sm	147	165	3	2776317	0.87
Hf	178	165	2	3283692	0.54
Ta	181	165	2	13846463	0.93
W	182	165	2	3411345	0.95
Re	185	193	3	5995635	0.54
Pt	195	193	2	214145	1.75
Au	197	193	3	4506430	0.33
Tl	205	193	3	2030757	0.08
(Pb)	206	193	3	3505372	0.89
(Pb)	207	193	3	3060415	0.54
Pb	208	193	3	13934110	0.32
Bi	209	193	2	8243419	1.18
Th	232	193	3	16020526	0.91
U	238	193	3	15099523	0.62

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	QC Flag
Li (IS)	6	3	6310620	0.28	6327920	99.7	80	120	
Sc (IS)	45	2	229270	2.21	224146	102.3	80	120	
Sc (IS)	45	3	3979233	0.26	3966854	100.3	80	120	
Ge (IS)	72	2	510032	1.63	458627	111.2	80	120	
Ge (IS)	72	3	3065480	0.43	2917719	105.1	80	120	
In (IS)	115	3	22216767	0.61	22065637	100.7	80	120	
Ho (IS)	165	2	16513562	1.62	16245218	101.7	80	120	
Ho (IS)	165	3	27456845	0.17	27266963	100.7	80	120	
Ir (IS)	193	2	11082552	2.12	10999175	100.8	80	120	
Ir (IS)	193	3	13538447	0.22	13591604	99.6	80	120	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Calibration Standard Report

Sample Name	**IC 1856862**
Data File Name	**006CALS.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-26T16:38:41-06:00**
Type	**CalStd**
VialNumber	**1103**
Dilution	**1**
Comment	
Operator	**LP 7700**

QC Analyte Table

Element	m/z	ISTD	Tune Step	CPS	%RSD
Li	7	6	3	7426182	0.43
Be	9	6	3	2066143	0.79
B	11	6	3	3173024	0.36
Na	23	45	2	8288140	0.68
Mg	24	45	2	4192201	1.26
Al	27	45	2	1742575	0.60
P	31	45	2	126421	0.33
K	39	45	2	4609371	0.52
Ca	44	45	3	8727003	0.38
Ti	47	45	3	1004257	0.11
V	51	45	2	2213315	0.68
Cr	52	45	2	2693778	0.79
Mn	55	72	2	1725757	0.62
Fe	57	72	2	1519278	0.62
Co	59	72	2	4259950	0.62
Ni	60	72	2	1055521	0.29
Cu	63	72	2	2987043	0.04
Zn	66	72	2	572554	0.19
As	75	72	2	395721	0.50
Se	78	72	2	15302	2.74
Sr	88	72	3	21332529	0.32
Y	89	72	2	5268766	0.97
Zr	90	72	2	4054185	0.64
Nb	93	72	2	4084292	1.04
Mo	95	72	3	2045941	0.60
Ru	101	72	2	2360077	0.41
Rh	103	72	2	13548677	0.27
Pd	105	72	2	263819	1.19
Ag	107	115	3	2189192	0.30
Cd	111	115	3	2367361	0.22
Sn	118	115	3	6799664	0.91
Sb	121	115	3	4425031	0.26
Te	125	165	2	75662	0.98
Cs	133	165	2	6054596	0.44
Ba	137	165	3	3601522	0.57
La	139	165	2	13147530	0.40
Ce	140	165	2	15193803	0.31
Pr	141	165	2	15783304	1.34
Nd	146	165	2	2964563	0.37
Sm	147	165	3	5522050	0.41
Hf	178	165	2	6637387	0.48
Ta	181	165	2	28315816	0.84
W	182	165	2	6752232	0.35
Re	185	193	3	11942471	0.19
Pt	195	193	2	423490	0.29
Au	197	193	3	9013084	0.60
Tl	205	193	3	4008059	0.68
(Pb)	206	193	3	6861667	0.58
(Pb)	207	193	3	5980599	0.52
Pb	208	193	3	27311647	0.37
Bi	209	193	2	16157749	0.40
Th	232	193	3	31816599	0.61
U	238	193	3	29966126	0.49

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	QC Flag
Li (IS)	6	3	6344334	0.19	6327920	100.3	80	120	
Sc (IS)	45	2	227471	0.09	224146	101.5	80	120	
Sc (IS)	45	3	4021330	0.43	3966854	101.4	80	120	
Ge (IS)	72	2	517458	0.41	458627	112.8	80	120	
Ge (IS)	72	3	3078212	0.47	2917719	105.5	80	120	
In (IS)	115	3	22092870	0.56	22065637	100.1	80	120	
Ho (IS)	165	2	16287001	0.71	16245218	100.3	80	120	
Ho (IS)	165	3	27585670	0.95	27266963	101.2	80	120	
Ir (IS)	193	2	10769026	0.60	10999175	97.9	80	120	
Ir (IS)	193	3	13582966	0.88	13591604	99.9	80	120	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Initial Calibration Verification (ICV) - US EPA Method 6020

Sample Name	**ICV 1856859**
Data File Name	**007_ICV.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-26T16:45:22-06:00**
Type	**ICV**
VialNumber	**1104**
Dilution	**1**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**003CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	Units	ExpectedValue	%Recovery	%QC Low	%QC High	Analyte	QC Flag
Li	7	6	3	103.24104	ug/l	100	103.2	90	110	Li	
Be	9	6	3	103.76007	ug/l	100	103.8	90	110	Be	
B	11	6	3	207.13102	ug/l	200	103.6	90	110	B	
Na	23	45	2	1043.56570	ug/l	1000	104.4	90	110	Na	
Mg	24	45	2	1121.23251	ug/l	1000	112.1	90	110	Mg	FAILED
Al	27	45	2	1114.20339	ug/l	1000	111.4	90	110	Al	FAILED
P	31	45	2	1080.69750	ug/l	1000	108.1	90	110	P	
K	39	45	2	1081.15189	ug/l	1000	108.1	90	110	K	
Ca	44	45	3	1063.79369	ug/l	1000	106.4	90	110	Ca	
Ti	47	45	3	101.91879	ug/l	100	101.9	90	110	Ti	
V	51	45	2	98.65744	ug/l	100	98.7	90	110	V	
Cr	52	45	2	104.31913	ug/l	100	104.3	90	110	Cr	
Mn	55	72	2	103.16984	ug/l	100	103.2	90	110	Mn	
Fe	57	72	2	1024.29156	ug/l	1000	102.4	90	110	Fe	
Co	59	72	2	107.11466	ug/l	100	107.1	90	110	Co	
Ni	60	72	2	108.23458	ug/l	100	108.2	90	110	Ni	
Cu	63	72	2	109.00626	ug/l	100	109.0	90	110	Cu	
Zn	66	72	2	109.17712	ug/l	100	109.2	90	110	Zn	
As	75	72	2	108.40105	ug/l	100	108.4	90	110	As	
Se	78	72	2	55.58661	ug/l	50	111.2	90	110	Se	FAILED
Sr	88	72	3	103.19360	ug/l	100	103.2	90	110	Sr	
Y	89	72	2	109.90439	ug/l	100	109.9	90	110	Y	
Zr	90	72	2	105.59049	ug/l	100	105.6	90	110	Zr	
Nb	93	72	2	59.91317	ug/l	50	119.8	90	110	Nb	FAILED
Mo	95	72	3	48.78895	ug/l	50	97.6	90	110	Mo	
Ru	101	72	2	102.92158	ug/l	100	102.9	90	110	Ru	
Rh	103	72	2	113.43111	ug/l	100	113.4	90	110	Rh	FAILED
Pd	105	72	2	11.08052	ug/l	10	110.8	90	110	Pd	FAILED
Ag	107	115	3	19.12976	ug/l	20	95.6	90	110	Ag	
Cd	111	115	3	100.68122	ug/l	100	100.7	90	110	Cd	
Sn	118	115	3	100.16178	ug/l	100	100.2	90	110	Sn	
Sb	121	115	3	51.69571	ug/l	50	103.4	90	110	Sb	
Te	125	165	2	108.78715	ug/l	100	108.8	90	110	Te	
Cs	133	165	2	106.74504	ug/l	100	106.7	90	110	Cs	
Ba	137	165	3	100.51517	ug/l	100	100.5	90	110	Ba	
La	139	165	2	105.26681	ug/l	100	105.3	90	110	La	
Ce	140	165	2	106.84658	ug/l	100	106.8	90	110	Ce	
Pr	141	165	2	104.88478	ug/l	100	104.9	90	110	Pr	
Nd	146	165	2	107.16761	ug/l	100	107.2	90	110	Nd	
Sm	147	165	3	103.36111	ug/l	100	103.4	90	110	Sm	
Hf	178	165	2	102.55958	ug/l	100	102.6	90	110	Hf	
Ta	181	165	2	94.76241	ug/l	100	94.8	90	110	Ta	
W	182	165	2	100.50620	ug/l	100	100.5	90	110	W	
Re	185	193	3	106.55462	ug/l	100	106.6	90	110	Re	
Pt	195	193	2	10.24112	ug/l	10	102.4	90	110	Pt	
Au	197	193	3	106.50810	ug/l	100	106.5	90	110	Au	
Tl	205	193	3	20.76581	ug/l	20	103.8	90	110	Tl	
Pb	208	193	3	102.02636	ug/l	100	102.0	90	110	Pb	
Bi	209	193	2	106.35179	ug/l	100	106.4	90	110	Bi	
Th	232	193	3	101.04279	ug/l	100	101.0	90	110	Th	
U	238	193	3	100.93339	ug/l	100	100.9	90	110	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	6389485	0.94	6327920	101.0	80	120	Li (IS)	
Sc (IS)	45	2	223536	1.26	224146	99.7	80	120	Sc (IS)	
Sc (IS)	45	3	3941166	2.08	3966854	99.4	80	120	Sc (IS)	
Ge (IS)	72	2	500411	1.40	458627	109.1	80	120	Ge (IS)	
Ge (IS)	72	3	3021368	2.56	2917719	103.6	80	120	Ge (IS)	
In (IS)	115	3	21968886	2.30	22065637	99.6	80	120	In (IS)	
Ho (IS)	165	2	16279569	0.83	16245218	100.2	80	120	Ho (IS)	
Ho (IS)	165	3	26996741	2.09	27266963	99.0	80	120	Ho (IS)	
Ir (IS)	193	2	11127464	1.03	10999175	101.2	80	120	Ir (IS)	
Ir (IS)	193	3	13583180	1.43	13591604	99.9	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Initial Calibration Blank (ICB) - US EPA Method 6020

Sample Name	**ICB 1854886**
Data File Name	**008_ICB.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-26T16:52:09-06:00**
Type	**ICB**
VialNumber	**4**
Dilution	**1**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**003CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	Units	QC High	Analyte	QC Flag
Li	7	6	3	0.03627	ug/l	1.388	Li	
Be	9	6	3	0.00560	ug/l	0.7	Be	
B	11	6	3	4.03556	ug/l	20	B	
Na	23	45	2	-0.34044	ug/l	30	Na	
Mg	24	45	2	-0.01917	ug/l	11.18	Mg	
Al	27	45	2	-0.24608	ug/l	25.8	Al	
P	31	45	2	0.68041	ug/l	16.46	P	
K	39	45	2	0.47968	ug/l	83.2	K	
Ca	44	45	3	-6.09172	ug/l	136.2	Ca	
Ti	47	45	3	0.00414	ug/l	4.2	Ti	
V	51	45	2	-0.00857	ug/l	4.74	V	
Cr	52	45	2	-0.00651	ug/l	6.52	Cr	
Mn	55	72	2	0.00009	ug/l	0.49	Mn	
Fe	57	72	2	-0.06591	ug/l	40.7	Fe	
Co	59	72	2	0.00181	ug/l	0.434	Co	
Ni	60	72	2	-0.00497	ug/l	0.8	Ni	
Cu	63	72	2	-0.09284	ug/l	0.902	Cu	
Zn	66	72	2	-0.04665	ug/l	16.58	Zn	
As	75	72	2	0.01051	ug/l	2.36	As	
Se	78	72	2	-0.10490	ug/l	3.18	Se	
Sr	88	72	3	0.00059	ug/l	2	Sr	
Y	89	72	2	-0.00059	ug/l	0.424	Y	
Zr	90	72	2	0.04825	ug/l	0.496	Zr	
Nb	93	72	2	0.32920	ug/l	4.62	Nb	
Mo	95	72	3	0.00454	ug/l	2	Mo	
Ru	101	72	2	-0.00148	ug/l	2	Ru	
Rh	103	72	2	0.00248	ug/l	1.634	Rh	
Pd	105	72	2	-0.00083	ug/l	0.08	Pd	
Ag	107	115	3	0.00017	ug/l	1.54	Ag	
Cd	111	115	3	0.00661	ug/l	0.4	Cd	
Sn	118	115	3	0.03555	ug/l	2	Sn	
Sb	121	115	3	0.00422	ug/l	3.34	Sb	
Te	125	165	2	0.06785	ug/l	1.072	Te	
Cs	133	165	2	0.01156	ug/l	0.106	Cs	
Ba	137	165	3	0.00445	ug/l	0.446	Ba	
La	139	165	2	-0.00008	ug/l	0.102	La	
Ce	140	165	2	-0.00009	ug/l	1.772	Ce	
Pr	141	165	2	0.00009	ug/l	0.084	Pr	
Nd	146	165	2	0.00001	ug/l	0.208	Nd	
Sm	147	165	3	0.00079	ug/l	0.652	Sm	
Hf	178	165	2	0.09880	ug/l	2.26	Hf	
Ta	181	165	2	0.16606	ug/l	1.46	Ta	
W	182	165	2	0.66414	ug/l	4	W	
Re	185	193	3	0.00244	ug/l	0.05	Re	
Pt	195	193	2	-0.00073	ug/l	0.12	Pt	
Au	197	193	3	0.21989	ug/l	1	Au	
Tl	205	193	3	0.01110	ug/l	1.1	Tl	
Pb	208	193	3	0.00218	ug/l	0.346	Pb	
Bi	209	193	2	0.11350	ug/l	1.464	Bi	
Th	232	193	3	0.14553	ug/l	1.104	Th	
U	238	193	3	0.00343	ug/l	0.462	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	6417571	3.72	6327920	101.4	80	120	Li (IS)	
Sc (IS)	45	2	223871	0.81	224146	99.9	80	120	Sc (IS)	
Sc (IS)	45	3	3965495	3.81	3966854	100.0	80	120	Sc (IS)	
Ge (IS)	72	2	478294	2.16	458627	104.3	80	120	Ge (IS)	
Ge (IS)	72	3	2906914	4.07	2917719	99.6	80	120	Ge (IS)	
In (IS)	115	3	22272044	4.44	22065637	100.9	80	120	In (IS)	
Ho (IS)	165	2	16213616	1.19	16245218	99.8	80	120	Ho (IS)	
Ho (IS)	165	3	27556973	4.14	27266963	101.1	80	120	Ho (IS)	
Ir (IS)	193	2	10881970	0.89	10999175	98.9	80	120	Ir (IS)	
Ir (IS)	193	3	13732237	3.80	13591604	101.0	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Low Level Continuing Calibration Verification (CCV) - US EPA Method 6020

Sample Name	**CRI 1856860**
Data File Name	**009LCCV.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-26T16:58:52-06:00**
Type	**CRI**
VialNumber	**1101**
Dilution	**1**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**003CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	Units	ExpectedValue	%Recovery	%QC Low	%QC High	Analyte	QC Flag
Li	7	6	3	5.09162	ug/l	5	101.8	80	120	Li	
Be	9	6	3	0.48619	ug/l	0.5	97.2	80	120	Be	
B	11	6	3	94.41608	ug/l	100	94.4	80	120	B	
Na	23	45	2	102.60008	ug/l	100	102.6	80	120	Na	
Mg	24	45	2	56.61232	ug/l	50	113.2	80	120	Mg	
Al	27	45	2	57.30676	ug/l	50	114.6	80	120	Al	
P	31	45	2	106.69088	ug/l	100	106.7	80	120	P	
K	39	45	2	106.34309	ug/l	100	106.3	80	120	K	
Ca	44	45	3	236.10337	ug/l	200	118.1	80	120	Ca	
Ti	47	45	3	4.97101	ug/l	5	99.4	80	120	Ti	
V	51	45	2	9.77721	ug/l	10	97.8	80	120	V	
Cr	52	45	2	10.14933	ug/l	10	101.5	80	120	Cr	
Mn	55	72	2	4.28040	ug/l	4	107.0	80	120	Mn	
Fe	57	72	2	53.61946	ug/l	50	107.2	80	120	Fe	
Co	59	72	2	2.13021	ug/l	2	106.5	80	120	Co	
Ni	60	72	2	5.76672	ug/l	5	115.3	80	120	Ni	
Cu	63	72	2	3.06552	ug/l	3	102.2	80	120	Cu	
Zn	66	72	2	22.45190	ug/l	20	112.3	80	120	Zn	
As	75	72	2	10.85090	ug/l	10	108.5	80	120	As	
Se	78	72	2	4.86282	ug/l	5	97.3	80	120	Se	
Sr	88	72	3	5.04775	ug/l	5	101.0	80	120	Sr	
Y	89	72	2	5.16155	ug/l	5	103.2	80	120	Y	
Zr	90	72	2	5.48601	ug/l	5	109.7	80	120	Zr	
Nb	93	72	2	20.80119	ug/l	25	83.2	80	120	Nb	
Mo	95	72	3	4.83397	ug/l	5	96.7	80	120	Mo	
Ru	101	72	2	10.58259	ug/l	10	105.8	80	120	Ru	
Rh	103	72	2	10.43108	ug/l	10	104.3	80	120	Rh	
Pd	105	72	2	0.57295	ug/l	0.5	114.6	80	120	Pd	
Ag	107	115	3	1.90302	ug/l	2	95.2	80	120	Ag	
Cd	111	115	3	0.47226	ug/l	0.5	94.5	80	120	Cd	
Sn	118	115	3	1.69472	ug/l	2	84.7	80	120	Sn	
Sb	121	115	3	4.63250	ug/l	5	92.6	80	120	Sb	
Te	125	165	2	9.96737	ug/l	10	99.7	80	120	Te	
Cs	133	165	2	0.94555	ug/l	1	94.6	80	120	Cs	
Ba	137	165	3	1.86659	ug/l	2	93.3	80	120	Ba	
La	139	165	2	1.89582	ug/l	2	94.8	80	120	La	
Ce	140	165	2	9.40836	ug/l	10	94.1	80	120	Ce	
Pr	141	165	2	1.89015	ug/l	2	94.5	80	120	Pr	
Nd	146	165	2	1.88897	ug/l	2	94.4	80	120	Nd	
Sm	147	165	3	9.31704	ug/l	10	93.2	80	120	Sm	
Hf	178	165	2	9.58557	ug/l	10	95.9	80	120	Hf	
Ta	181	165	2	6.85332	ug/l	10	68.5	80	120	Ta	FAILED
W	182	165	2	4.71756	ug/l	5	94.4	80	120	W	
Re	185	193	3	9.19531	ug/l	10	92.0	80	120	Re	
Pt	195	193	2	1.02309	ug/l	1	102.3	80	120	Pt	
Au	197	193	3	4.73464	ug/l	5	94.7	80	120	Au	
Tl	205	193	3	1.80606	ug/l	2	90.3	80	120	Tl	
Pb	208	193	3	2.71018	ug/l	3	90.3	80	120	Pb	
Bi	209	193	2	20.16129	ug/l	20	100.8	80	120	Bi	
Th	232	193	3	1.84000	ug/l	2	92.0	80	120	Th	
U	238	193	3	0.89568	ug/l	1	89.6	80	120	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	6436947	0.91	6327920	101.7	80	120	Li (IS)	
Sc (IS)	45	2	224120	0.63	224146	100.0	80	120	Sc (IS)	
Sc (IS)	45	3	3985434	1.73	3966854	100.5	80	120	Sc (IS)	
Ge (IS)	72	2	480032	0.99	458627	104.7	80	120	Ge (IS)	
Ge (IS)	72	3	3025041	2.24	2917719	103.7	80	120	Ge (IS)	
In (IS)	115	3	22399410	1.34	22065637	101.5	80	120	In (IS)	
Ho (IS)	165	2	16262623	0.80	16245218	100.1	80	120	Ho (IS)	
Ho (IS)	165	3	27684898	1.32	27266963	101.5	80	120	Ho (IS)	
Ir (IS)	193	2	10894891	1.04	10999175	99.1	80	120	Ir (IS)	
Ir (IS)	193	3	13598345	1.86	13591604	100.0	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Interference Check Sample A (ICS-A) - US EPA Method 6020

Sample Name	**ICSA 1856863**
Data File Name	**010ICSA.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-26T17:05:39-06:00**
Type	**ICSA**
VialNumber	**1105**
Dilution	**1**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**003CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	Units	QC High	Analyte	QC Flag
Li	7	6	3	0.32852	ug/l	1.388	Li	
Be	9	6	3	-0.00141	ug/l	0.7	Be	
B	11	6	3	2.88975	ug/l	20	B	
Na	23	45	2	101598.76167	ug/l	120000	Na	
Mg	24	45	2	100636.01946	ug/l	120000	Mg	
Al	27	45	2	102033.80005	ug/l	120000	Al	
P	31	45	2	105148.48157	ug/l	120000	P	
K	39	45	2	102416.42139	ug/l	120000	K	
Ca	44	45	3	96711.72725	ug/l	120000	Ca	
Ti	47	45	3	2104.00746	ug/l	2400	Ti	
V	51	45	2	0.05068	ug/l	4.74	V	
Cr	52	45	2	1.25878	ug/l	6.52	Cr	
Mn	55	72	2	0.60132	ug/l	0.49	Mn	FAILED
Fe	57	72	2	105619.90819	ug/l	120000	Fe	
Co	59	72	2	0.31811	ug/l	0.434	Co	
Ni	60	72	2	1.54327	ug/l	0.8	Ni	FAILED
Cu	63	72	2	0.77002	ug/l	0.902	Cu	
Zn	66	72	2	3.05251	ug/l	16.58	Zn	
As	75	72	2	0.07113	ug/l	2.36	As	
Se	78	72	2	0.12918	ug/l	3.18	Se	
Sr	88	72	3	0.98873	ug/l	2	Sr	
Y	89	72	2	0.04992	ug/l	0.424	Y	
Zr	90	72	2	2.23929	ug/l	0.496	Zr	FAILED
Nb	93	72	2	0.66828	ug/l	4.62	Nb	
Mo	95	72	3	2025.64279	ug/l	2400	Mo	
Ru	101	72	2	-0.00221	ug/l	2	Ru	
Rh	103	72	2	-0.00289	ug/l	1.634	Rh	
Pd	105	72	2	-0.00132	ug/l	0.08	Pd	
Ag	107	115	3	0.11021	ug/l	1.54	Ag	
Cd	111	115	3	0.61353	ug/l	0.4	Cd	FAILED
Sn	118	115	3	-0.06201	ug/l	2	Sn	
Sb	121	115	3	0.00625	ug/l	3.34	Sb	
Te	125	165	2	0.02170	ug/l	1.072	Te	
Cs	133	165	2	0.05134	ug/l	0.106	Cs	
Ba	137	165	3	0.52331	ug/l	0.446	Ba	FAILED
La	139	165	2	0.00713	ug/l	0.102	La	
Ce	140	165	2	0.57026	ug/l	1.772	Ce	
Pr	141	165	2	-0.00057	ug/l	0.084	Pr	
Nd	146	165	2	0.00682	ug/l	0.208	Nd	
Sm	147	165	3	0.00333	ug/l	0.652	Sm	
Hf	178	165	2	0.11691	ug/l	2.26	Hf	
Ta	181	165	2	0.28899	ug/l	1.46	Ta	
W	182	165	2	0.23885	ug/l	4	W	
Re	185	193	3	0.02377	ug/l	0.05	Re	
Pt	195	193	2	0.01946	ug/l	0.12	Pt	
Au	197	193	3	0.05047	ug/l	1	Au	
Tl	205	193	3	-0.02082	ug/l	1.1	Tl	
Pb	208	193	3	0.00977	ug/l	0.346	Pb	
Bi	209	193	2	0.14012	ug/l	1.464	Bi	
Th	232	193	3	0.04132	ug/l	1.104	Th	
U	238	193	3	0.00067	ug/l	0.462	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	6806505	1.23	6327920	107.6	80	120	Li (IS)	
Sc (IS)	45	2	237984	1.85	224146	106.2	80	120	Sc (IS)	
Sc (IS)	45	3	4206842	1.23	3966854	106.0	80	120	Sc (IS)	
Ge (IS)	72	2	494170	1.46	458627	107.7	80	120	Ge (IS)	
Ge (IS)	72	3	3063331	1.39	2917719	105.0	80	120	Ge (IS)	
In (IS)	115	3	20557673	1.04	22065637	93.2	80	120	In (IS)	
Ho (IS)	165	2	15624933	0.42	16245218	96.2	80	120	Ho (IS)	
Ho (IS)	165	3	25604821	0.63	27266963	93.9	80	120	Ho (IS)	
Ir (IS)	193	2	9615929	0.08	10999175	87.4	80	120	Ir (IS)	
Ir (IS)	193	3	11922957	0.84	13591604	87.7	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Interference Check Sample AB (ICS-AB) - US EPA Method 6020

Sample Name	**ICSAB 1856864**
Data File Name	**011ICSB.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-26T17:12:30-06:00**
Type	**ICSAB**
VialNumber	**1106**
Dilution	**1**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**003CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	Units	ExpectedValue	%Recovery	%QC Low	%QC High	Analyte	QC Flag
Li	7	6	3	50.33650	ug/l	50	100.7	80	120	Li	
Be	9	6	3	48.65165	ug/l	50	97.3	80	120	Be	
B	11	6	3	91.41108	ug/l	100	91.4	80	120	B	
Na	23	45	2	100323.34043	ug/l	100000	100.3	80	120	Na	
Mg	24	45	2	99451.86820	ug/l	100000	99.5	80	120	Mg	
Al	27	45	2	102078.21919	ug/l	100000	102.1	80	120	Al	
P	31	45	2	104203.97418	ug/l	100000	104.2	80	120	P	
K	39	45	2	101367.30311	ug/l	100000	101.4	80	120	K	
Ca	44	45	3	96625.25791	ug/l	100000	96.6	80	120	Ca	
Ti	47	45	3	2159.41660	ug/l	2100	102.8	80	120	Ti	
V	51	45	2	48.79963	ug/l	50	97.6	80	120	V	
Cr	52	45	2	48.49812	ug/l	50	97.0	80	120	Cr	
Mn	55	72	2	50.12904	ug/l	50	100.3	80	120	Mn	
Fe	57	72	2	101584.85874	ug/l	100000	101.6	80	120	Fe	
Co	59	72	2	46.82343	ug/l	50	93.6	80	120	Co	
Ni	60	72	2	50.03518	ug/l	50	100.1	80	120	Ni	
Cu	63	72	2	47.01970	ug/l	50	94.0	80	120	Cu	
Zn	66	72	2	50.86904	ug/l	50	101.7	80	120	Zn	
As	75	72	2	52.42144	ug/l	50	104.8	80	120	As	
Se	78	72	2	25.55924	ug/l	25	102.2	80	120	Se	
Sr	88	72	3	50.76634	ug/l	50	101.5	80	120	Sr	
Y	89	72	2	53.69518	ug/l	50	107.4	80	120	Y	
Zr	90	72	2	43.49152	ug/l	50	87.0	80	120	Zr	
Nb	93	72	2	27.23336	ug/l	25	108.9	80	120	Nb	
Mo	95	72	3	2072.29952	ug/l	2050	101.1	80	120	Mo	
Ru	101	72	2	46.18341	ug/l	50	92.4	80	120	Ru	
Rh	103	72	2	47.22613	ug/l	50	94.5	80	120	Rh	
Pd	105	72	2	4.63150	ug/l	5	92.6	80	120	Pd	
Ag	107	115	3	9.50932	ug/l	10	95.1	80	120	Ag	
Cd	111	115	3	47.92860	ug/l	50	95.9	80	120	Cd	
Sn	118	115	3	51.43173	ug/l	50	102.9	80	120	Sn	
Sb	121	115	3	24.29848	ug/l	25	97.2	80	120	Sb	
Te	125	165	2	51.73236	ug/l	50	103.5	80	120	Te	
Cs	133	165	2	53.22203	ug/l	50	106.4	80	120	Cs	
Ba	137	165	3	47.77634	ug/l	50	95.6	80	120	Ba	
La	139	165	2	52.45887	ug/l	50	104.9	80	120	La	
Ce	140	165	2	52.33425	ug/l	50	104.7	80	120	Ce	
Pr	141	165	2	52.15500	ug/l	50	104.3	80	120	Pr	
Nd	146	165	2	47.84052	ug/l	50	95.7	80	120	Nd	
Sm	147	165	3	47.77794	ug/l	50	95.6	80	120	Sm	
Hf	178	165	2	42.86781	ug/l	50	85.7	80	120	Hf	
Ta	181	165	2	49.70245	ug/l	50	99.4	80	120	Ta	
W	182	165	2	49.32486	ug/l	50	98.6	80	120	W	
Re	185	193	3	53.90590	ug/l	50	107.8	80	120	Re	
Pt	195	193	2	5.15500	ug/l	5	103.1	80	120	Pt	
Au	197	193	3	53.23752	ug/l	50	106.5	80	120	Au	
Tl	205	193	3	9.13750	ug/l	10	91.4	80	120	Tl	
Pb	208	193	3	47.90890	ug/l	50	95.8	80	120	Pb	
Bi	209	193	2	50.55284	ug/l	50	101.1	80	120	Bi	
Th	232	193	3	51.22934	ug/l	50	102.5	80	120	Th	
U	238	193	3	50.56436	ug/l	50	101.1	80	120	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	7073365	1.53	6327920	111.8	80	120	Li (IS)	
Sc (IS)	45	2	252653	0.62	224146	112.7	80	120	Sc (IS)	
Sc (IS)	45	3	4370546	2.21	3966854	110.2	80	120	Sc (IS)	
Ge (IS)	72	2	542673	1.94	458627	118.3	80	120	Ge (IS)	
Ge (IS)	72	3	3176025	1.24	2917719	108.9	80	120	Ge (IS)	
In (IS)	115	3	21304628	1.72	22065637	96.6	80	120	In (IS)	
Ho (IS)	165	2	16205072	0.60	16245218	99.8	80	120	Ho (IS)	
Ho (IS)	165	3	26673682	2.75	27266963	97.8	80	120	Ho (IS)	
Ir (IS)	193	2	9851767	1.04	10999175	89.6	80	120	Ir (IS)	
Ir (IS)	193	3	12200851	2.11	13591604	89.8	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Sample Name	**LRC 1856174**
Data File Name	**012SMPL.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-26T17:19:18-06:00**
Type	**Sample**
VialNumber	**1301**
Dilution	**1**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**003CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	FinalConcentration	Units	High Value	Analyte	QC Flag
Li	7	6	3	1055.50478	1055.50478	ug/l	1000	Li	FAILED
Be	9	6	3	1032.36029	1032.36029	ug/l	1000	Be	FAILED
B	11	6	3	2111.29308	2111.29308	ug/l	2000	B	FAILED
Na	23	45	2	48677.72093	48677.72093	ug/l	50000	Na	
Mg	24	45	2	48231.98364	48231.98364	ug/l	50000	Mg	
Al	27	45	2	48019.73170	48019.73170	ug/l	100000	Al	
P	31	45	2	48813.60167	48813.60167	ug/l	100000	P	
K	39	45	2	47201.88311	47201.88311	ug/l	100000	K	
Ca	44	45	3	49248.49709	49248.49709	ug/l	100000	Ca	
Ti	47	45	3	2064.72048	2064.72048	ug/l	2000	Ti	FAILED
V	51	45	2	946.16632	946.16632	ug/l	2000	V	
Cr	52	45	2	902.57764	902.57764	ug/l	2000	Cr	
Mn	55	72	2	1019.20366	1019.20366	ug/l	5000	Mn	
Fe	57	72	2	50823.04865	50823.04865	ug/l	100000	Fe	
Co	59	72	2	974.20549	974.20549	ug/l	2000	Co	
Ni	60	72	2	1012.70698	1012.70698	ug/l	2000	Ni	
Cu	63	72	2	947.30319	947.30319	ug/l	2000	Cu	
Zn	66	72	2	1009.98838	1009.98838	ug/l	5000	Zn	
As	75	72	2	1044.53066	1044.53066	ug/l	2000	As	
Se	78	72	2	488.64234	488.64234	ug/l	1000	Se	
Sr	88	72	3	993.05774	993.05774	ug/l	2000	Sr	
Y	89	72	2	0.03646	0.03646	ug/l	200	Y	
Zr	90	72	2	1027.39491	1027.39491	ug/l	2000	Zr	
Nb	93	72	2	0.83309	0.83309	ug/l	100	Nb	
Mo	95	72	3	1533.86246	1533.86246	ug/l	1000	Mo	FAILED
Ru	101	72	2	-0.00255	-0.00255	ug/l	200	Ru	
Rh	103	72	2	0.04236	0.04236	ug/l	200	Rh	
Pd	105	72	2	0.05547	0.05547	ug/l	20	Pd	
Ag	107	115	3	200.30479	200.30479	ug/l	400	Ag	
Cd	111	115	3	1011.00324	1011.00324	ug/l	2000	Cd	
Sn	118	115	3	1029.87758	1029.87758	ug/l	2000	Sn	
Sb	121	115	3	513.30950	513.30950	ug/l	1000	Sb	
Te	125	165	2	0.31428	0.31428	ug/l	200	Te	
Cs	133	165	2	0.03432	0.03432	ug/l	2000	Cs	
Ba	137	165	3	983.42402	983.42402	ug/l	5000	Ba	
La	139	165	2	1.56172	1.56172	ug/l	200	La	
Ce	140	165	2	0.31857	0.31857	ug/l	200	Ce	
Pr	141	165	2	0.00905	0.00905	ug/l	200	Pr	
Nd	146	165	2	0.02464	0.02464	ug/l	200	Nd	
Sm	147	165	3	1012.10289	1012.10289	ug/l	2000	Sm	
Hf	178	165	2	0.94844	0.94844	ug/l	200	Hf	
Ta	181	165	2	0.92950	0.92950	ug/l	200	Ta	
W	182	165	2	965.58685	965.58685	ug/l	2000	W	
Re	185	193	3	0.03648	0.03648	ug/l	200	Re	
Pt	195	193	2	0.01079	0.01079	ug/l	200	Pt	
Au	197	193	3	0.13537	0.13537	ug/l	2000	Au	
Tl	205	193	3	200.32471	200.32471	ug/l	400	Tl	
Pb	208	193	3	996.16913	996.16913	ug/l	5000	Pb	
Bi	209	193	2	0.10978	0.10978	ug/l	2000	Bi	
Th	232	193	3	1036.66117	1036.66117	ug/l	2000	Th	
U	238	193	3	1017.86134	1017.86134	ug/l	2000	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	6073953	1.49	6327920	96.0	80	120	Li (IS)	
Sc (IS)	45	2	258786	1.58	224146	115.5	80	120	Sc (IS)	
Sc (IS)	45	3	4086025	2.09	3966854	103.0	80	120	Sc (IS)	
Ge (IS)	72	2	522651	1.55	458627	114.0	80	120	Ge (IS)	
Ge (IS)	72	3	3043382	2.00	2917719	104.3	80	120	Ge (IS)	
In (IS)	115	3	20595418	1.25	22065637	93.3	80	120	In (IS)	
Ho (IS)	165	2	16350647	1.59	16245218	100.6	80	120	Ho (IS)	
Ho (IS)	165	3	26193702	1.07	27266963	96.1	80	120	Ho (IS)	
Ir (IS)	193	2	10150985	1.26	10999175	92.3	80	120	Ir (IS)	
Ir (IS)	193	3	12209630	1.22	13591604	89.8	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Sample Name	**LRC 1856175**
Data File Name	**013SMPL.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-26T17:26:02-06:00**
Type	**Sample**
VialNumber	**1302**
Dilution	**1**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**003CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	FinalConcentration	Units	High Value	Analyte	QC Flag
Li	7	6	3	2283.92007	2283.92007	ug/l	1000	Li	FAILED
Be	9	6	3	2195.69500	2195.69500	ug/l	1000	Be	FAILED
B	11	6	3	4513.74528	4513.74528	ug/l	2000	B	FAILED
Na	23	45	2	90078.02516	90078.02516	ug/l	50000	Na	FAILED
Mg	24	45	2	88950.37776	88950.37776	ug/l	50000	Mg	FAILED
Al	27	45	2	90449.58686	90449.58686	ug/l	100000	Al	
P	31	45	2	91935.25987	91935.25987	ug/l	100000	P	
K	39	45	2	90490.09426	90490.09426	ug/l	100000	K	
Ca	44	45	3	97013.01176	97013.01176	ug/l	100000	Ca	
Ti	47	45	3	4074.63207	4074.63207	ug/l	2000	Ti	FAILED
V	51	45	2	1770.97168	1770.97168	ug/l	2000	V	
Cr	52	45	2	1708.52775	1708.52775	ug/l	2000	Cr	
Mn	55	72	2	5060.70703	5060.70703	ug/l	5000	Mn	FAILED
Fe	57	72	2	99332.45143	99332.45143	ug/l	100000	Fe	
Co	59	72	2	1892.73427	1892.73427	ug/l	2000	Co	
Ni	60	72	2	1948.94546	1948.94546	ug/l	2000	Ni	
Cu	63	72	2	1818.61559	1818.61559	ug/l	2000	Cu	
Zn	66	72	2	4850.13225	4850.13225	ug/l	5000	Zn	
As	75	72	2	2066.65878	2066.65878	ug/l	2000	As	FAILED
Se	78	72	2	959.97760	959.97760	ug/l	1000	Se	
Sr	88	72	3	1983.41775	1983.41775	ug/l	2000	Sr	
Y	89	72	2	0.08134	0.08134	ug/l	200	Y	
Zr	90	72	2	2055.54467	2055.54467	ug/l	2000	Zr	FAILED
Nb	93	72	2	0.54372	0.54372	ug/l	100	Nb	
Mo	95	72	3	3042.30396	3042.30396	ug/l	1000	Mo	FAILED
Ru	101	72	2	-0.00204	-0.00204	ug/l	200	Ru	
Rh	103	72	2	0.20330	0.20330	ug/l	200	Rh	
Pd	105	72	2	0.11134	0.11134	ug/l	20	Pd	
Ag	107	115	3	395.28559	395.28559	ug/l	400	Ag	
Cd	111	115	3	2012.44526	2012.44526	ug/l	2000	Cd	FAILED
Sn	118	115	3	2045.12450	2045.12450	ug/l	2000	Sn	FAILED
Sb	121	115	3	1025.54148	1025.54148	ug/l	1000	Sb	FAILED
Te	125	165	2	0.46480	0.46480	ug/l	200	Te	
Cs	133	165	2	0.05315	0.05315	ug/l	2000	Cs	
Ba	137	165	3	4963.54719	4963.54719	ug/l	5000	Ba	
La	139	165	2	3.12418	3.12418	ug/l	200	La	
Ce	140	165	2	0.63397	0.63397	ug/l	200	Ce	
Pr	141	165	2	0.01795	0.01795	ug/l	200	Pr	
Nd	146	165	2	0.05221	0.05221	ug/l	200	Nd	
Sm	147	165	3	2024.71574	2024.71574	ug/l	2000	Sm	FAILED
Hf	178	165	2	0.30742	0.30742	ug/l	200	Hf	
Ta	181	165	2	0.62727	0.62727	ug/l	200	Ta	
W	182	165	2	1926.02500	1926.02500	ug/l	2000	W	
Re	185	193	3	0.07497	0.07497	ug/l	200	Re	
Pt	195	193	2	0.01858	0.01858	ug/l	200	Pt	
Au	197	193	3	0.05163	0.05163	ug/l	2000	Au	
Tl	205	193	3	398.88646	398.88646	ug/l	400	Tl	
Pb	208	193	3	4944.53272	4944.53272	ug/l	5000	Pb	
Bi	209	193	2	1966.66166	1966.66166	ug/l	2000	Bi	
Th	232	193	3	2087.20849	2087.20849	ug/l	2000	Th	FAILED
U	238	193	3	2028.24864	2028.24864	ug/l	2000	U	FAILED

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	5942010	2.11	6327920	93.9	80	120	Li (IS)	
Sc (IS)	45	2	278391	0.36	224146	124.2	80	120	Sc (IS)	FAILED
Sc (IS)	45	3	4296722	3.25	3966854	108.3	80	120	Sc (IS)	
Ge (IS)	72	2	540236	1.39	458627	117.8	80	120	Ge (IS)	
Ge (IS)	72	3	3098047	2.26	2917719	106.2	80	120	Ge (IS)	
In (IS)	115	3	20485175	3.11	22065637	92.8	80	120	In (IS)	
Ho (IS)	165	2	16218988	1.21	16245218	99.8	80	120	Ho (IS)	
Ho (IS)	165	3	25920385	3.70	27266963	95.1	80	120	Ho (IS)	
Ir (IS)	193	2	9822578	0.34	10999175	89.3	80	120	Ir (IS)	
Ir (IS)	193	3	11856490	3.69	13591604	87.2	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Continuing Calibration Verification (CCV) - US EPA Method 6020

Sample Name	**CCV 1856861**
Data File Name	**014_CCV.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-26T17:32:53-06:00**
Type	**CCV**
VialNumber	**1102**
Dilution	**1**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**003CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	Units	ExpectedValue	%Recovery	%QC Low	%QC High	Analyte	QC Flag
Li	7	6	3	100.53889	ug/l	100	100.5	90	110	Li	
Be	9	6	3	99.66971	ug/l	100	99.7	90	110	Be	
B	11	6	3	243.70336	ug/l	200	121.9	90	110	B	FAILED
Na	23	45	2	2487.94022	ug/l	2500	99.5	90	110	Na	
Mg	24	45	2	2525.65057	ug/l	2500	101.0	90	110	Mg	
Al	27	45	2	2675.93557	ug/l	2500	107.0	90	110	Al	
P	31	45	2	2520.05098	ug/l	2500	100.8	90	110	P	
K	39	45	2	2578.57331	ug/l	2500	103.1	90	110	K	
Ca	44	45	3	2524.17120	ug/l	2500	101.0	90	110	Ca	
Ti	47	45	3	99.99985	ug/l	100	100.0	90	110	Ti	
V	51	45	2	96.88945	ug/l	100	96.9	90	110	V	
Cr	52	45	2	100.18152	ug/l	100	100.2	90	110	Cr	
Mn	55	72	2	97.46765	ug/l	100	97.5	90	110	Mn	
Fe	57	72	2	2404.82943	ug/l	2500	96.2	90	110	Fe	
Co	59	72	2	100.63017	ug/l	100	100.6	90	110	Co	
Ni	60	72	2	99.95857	ug/l	100	100.0	90	110	Ni	
Cu	63	72	2	100.01428	ug/l	100	100.0	90	110	Cu	
Zn	66	72	2	99.15425	ug/l	100	99.2	90	110	Zn	
As	75	72	2	99.56348	ug/l	100	99.6	90	110	As	
Se	78	72	2	51.02523	ug/l	50	102.1	90	110	Se	
Sr	88	72	3	97.60422	ug/l	100	97.6	90	110	Sr	
Y	89	72	2	100.54278	ug/l	100	100.5	90	110	Y	
Zr	90	72	2	100.90330	ug/l	100	100.9	90	110	Zr	
Nb	93	72	2	49.21660	ug/l	50	98.4	90	110	Nb	
Mo	95	72	3	47.44779	ug/l	50	94.9	90	110	Mo	
Ru	101	72	2	95.06067	ug/l	100	95.1	90	110	Ru	
Rh	103	72	2	99.43280	ug/l	100	99.4	90	110	Rh	
Pd	105	72	2	9.93505	ug/l	10	99.4	90	110	Pd	
Ag	107	115	3	19.27535	ug/l	20	96.4	90	110	Ag	
Cd	111	115	3	95.08436	ug/l	100	95.1	90	110	Cd	
Sn	118	115	3	97.46275	ug/l	100	97.5	90	110	Sn	
Sb	121	115	3	49.29164	ug/l	50	98.6	90	110	Sb	
Te	125	165	2	101.93587	ug/l	100	101.9	90	110	Te	
Cs	133	165	2	103.37167	ug/l	100	103.4	90	110	Cs	
Ba	137	165	3	100.40792	ug/l	100	100.4	90	110	Ba	
La	139	165	2	102.01972	ug/l	100	102.0	90	110	La	
Ce	140	165	2	101.57614	ug/l	100	101.6	90	110	Ce	
Pr	141	165	2	101.73878	ug/l	100	101.7	90	110	Pr	
Nd	146	165	2	101.81405	ug/l	100	101.8	90	110	Nd	
Sm	147	165	3	101.13737	ug/l	100	101.1	90	110	Sm	
Hf	178	165	2	98.87289	ug/l	100	98.9	90	110	Hf	
Ta	181	165	2	97.02683	ug/l	100	97.0	90	110	Ta	
W	182	165	2	102.66077	ug/l	100	102.7	90	110	W	
Re	185	193	3	100.02929	ug/l	100	100.0	90	110	Re	
Pt	195	193	2	9.82626	ug/l	10	98.3	90	110	Pt	
Au	197	193	3	99.46497	ug/l	100	99.5	90	110	Au	
Tl	205	193	3	20.30362	ug/l	20	101.5	90	110	Tl	
Pb	208	193	3	101.35303	ug/l	100	101.4	90	110	Pb	
Bi	209	193	2	100.86526	ug/l	100	100.9	90	110	Bi	
Th	232	193	3	99.79979	ug/l	100	99.8	90	110	Th	
U	238	193	3	99.45492	ug/l	100	99.5	90	110	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	6370176	1.00	6327920	100.7	80	120	Li (IS)	
Sc (IS)	45	2	236626	3.58	224146	105.6	80	120	Sc (IS)	
Sc (IS)	45	3	4069097	2.06	3966854	102.6	80	120	Sc (IS)	
Ge (IS)	72	2	537280	3.65	458627	117.1	80	120	Ge (IS)	
Ge (IS)	72	3	3209513	2.97	2917719	110.0	80	120	Ge (IS)	
In (IS)	115	3	22357563	1.24	22065637	101.3	80	120	In (IS)	
Ho (IS)	165	2	16549563	3.43	16245218	101.9	80	120	Ho (IS)	
Ho (IS)	165	3	27079952	1.26	27266963	99.3	80	120	Ho (IS)	
Ir (IS)	193	2	10892943	3.24	10999175	99.0	80	120	Ir (IS)	
Ir (IS)	193	3	13238307	1.64	13591604	97.4	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Continuing Calibration Blank (CCB) - US EPA Method 6020

Sample Name	**CCB 1854886**
Data File Name	**015_CCB.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-26T17:39:38-06:00**
Type	**CCB**
VialNumber	**4**
Dilution	**1**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**003CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	Units	QC High	Analyte	QC Flag
Li	7	6	3	0.28541	ug/l	1.388	Li	
Be	9	6	3	0.11608	ug/l	0.7	Be	
B	11	6	3	26.50722	ug/l	20	B	FAILED
Na	23	45	2	3.55878	ug/l	30	Na	
Mg	24	45	2	1.79412	ug/l	11.18	Mg	
Al	27	45	2	1.17194	ug/l	25.8	Al	
P	31	45	2	0.34154	ug/l	16.46	P	
K	39	45	2	2.56042	ug/l	83.2	K	
Ca	44	45	3	-10.02325	ug/l	136.2	Ca	
Ti	47	45	3	0.29097	ug/l	4.2	Ti	
V	51	45	2	-0.02852	ug/l	4.74	V	
Cr	52	45	2	0.05817	ug/l	6.52	Cr	
Mn	55	72	2	0.07508	ug/l	0.49	Mn	
Fe	57	72	2	2.09067	ug/l	40.7	Fe	
Co	59	72	2	0.03687	ug/l	0.434	Co	
Ni	60	72	2	0.03774	ug/l	0.8	Ni	
Cu	63	72	2	-0.07604	ug/l	0.902	Cu	
Zn	66	72	2	0.62361	ug/l	16.58	Zn	
As	75	72	2	0.12109	ug/l	2.36	As	
Se	78	72	2	0.00890	ug/l	3.18	Se	
Sr	88	72	3	0.04681	ug/l	2	Sr	
Y	89	72	2	0.02199	ug/l	0.424	Y	
Zr	90	72	2	0.09107	ug/l	0.496	Zr	
Nb	93	72	2	0.60893	ug/l	4.62	Nb	
Mo	95	72	3	0.69149	ug/l	2	Mo	
Ru	101	72	2	0.01785	ug/l	2	Ru	
Rh	103	72	2	0.02444	ug/l	1.634	Rh	
Pd	105	72	2	-0.00025	ug/l	0.08	Pd	
Ag	107	115	3	0.04423	ug/l	1.54	Ag	
Cd	111	115	3	0.08725	ug/l	0.4	Cd	
Sn	118	115	3	0.33325	ug/l	2	Sn	
Sb	121	115	3	0.14413	ug/l	3.34	Sb	
Te	125	165	2	0.05866	ug/l	1.072	Te	
Cs	133	165	2	0.03411	ug/l	0.106	Cs	
Ba	137	165	3	0.07216	ug/l	0.446	Ba	
La	139	165	2	0.02256	ug/l	0.102	La	
Ce	140	165	2	0.01941	ug/l	1.772	Ce	
Pr	141	165	2	0.02051	ug/l	0.084	Pr	
Nd	146	165	2	0.01645	ug/l	0.208	Nd	
Sm	147	165	3	0.04008	ug/l	0.652	Sm	
Hf	178	165	2	0.07019	ug/l	2.26	Hf	
Ta	181	165	2	0.08329	ug/l	1.46	Ta	
W	182	165	2	1.76596	ug/l	4	W	
Re	185	193	3	0.02938	ug/l	0.05	Re	
Pt	195	193	2	0.00256	ug/l	0.12	Pt	
Au	197	193	3	0.16912	ug/l	1	Au	
Tl	205	193	3	0.10176	ug/l	1.1	Tl	
Pb	208	193	3	0.58816	ug/l	0.346	Pb	FAILED
Bi	209	193	2	0.64563	ug/l	1.464	Bi	
Th	232	193	3	0.17330	ug/l	1.104	Th	
U	238	193	3	0.04332	ug/l	0.462	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	6122290	2.53	6327920	96.8	80	120	Li (IS)	
Sc (IS)	45	2	225881	0.65	224146	100.8	80	120	Sc (IS)	
Sc (IS)	45	3	3863398	3.98	3966854	97.4	80	120	Sc (IS)	
Ge (IS)	72	2	481685	0.77	458627	105.0	80	120	Ge (IS)	
Ge (IS)	72	3	2880757	3.41	2917719	98.7	80	120	Ge (IS)	
In (IS)	115	3	21541617	4.05	22065637	97.6	80	120	In (IS)	
Ho (IS)	165	2	16373534	0.49	16245218	100.8	80	120	Ho (IS)	
Ho (IS)	165	3	26349546	3.83	27266963	96.6	80	120	Ho (IS)	
Ir (IS)	193	2	10878113	1.28	10999175	98.9	80	120	Ir (IS)	
Ir (IS)	193	3	12963916	4.10	13591604	95.4	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Sample Name	**MB 160-454797/1-A**
Data File Name	**016SMPL.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-26T17:46:22-06:00**
Type	**Sample**
VialNumber	**2101**
Dilution	**2**
Comment	**454797**
Operator	**LP 7700**
ISTDRefDataFileName	**003CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	FinalConcentration	Units	High Value	Analyte	QC Flag
Li	7	6	3	0.29307	0.58615	ug/l	1000	Li	
Be	9	6	3	0.04521	0.09043	ug/l	1000	Be	
B	11	6	3	16.10872	32.21744	ug/l	2000	B	
Na	23	45	2	38.13684	76.27368	ug/l	50000	Na	
Mg	24	45	2	2.02856	4.05713	ug/l	50000	Mg	
Al	27	45	2	5.39415	10.78830	ug/l	100000	Al	
P	31	45	2	0.37157	0.74314	ug/l	100000	P	
K	39	45	2	1.44750	2.89499	ug/l	100000	K	
Ca	44	45	3	6.75756	13.51511	ug/l	100000	Ca	
Ti	47	45	3	0.19764	0.39528	ug/l	2000	Ti	
V	51	45	2	-0.17429	-0.34858	ug/l	2000	V	
Cr	52	45	2	0.06182	0.12363	ug/l	2000	Cr	
Mn	55	72	2	1.02505	2.05011	ug/l	5000	Mn	
Fe	57	72	2	3.78510	7.57020	ug/l	100000	Fe	
Co	59	72	2	-0.00268	-0.00536	ug/l	2000	Co	
Ni	60	72	2	0.14261	0.28523	ug/l	2000	Ni	
Cu	63	72	2	-0.15030	-0.30060	ug/l	2000	Cu	
Zn	66	72	2	0.95840	1.91680	ug/l	5000	Zn	
As	75	72	2	-0.02763	-0.05527	ug/l	2000	As	
Se	78	72	2	-0.12789	-0.25578	ug/l	1000	Se	
Sr	88	72	3	0.03168	0.06336	ug/l	2000	Sr	
Y	89	72	2	-0.00191	-0.00382	ug/l	200	Y	
Zr	90	72	2	0.05901	0.11801	ug/l	2000	Zr	
Nb	93	72	2	0.19793	0.39586	ug/l	100	Nb	
Mo	95	72	3	0.33782	0.67565	ug/l	1000	Mo	
Ru	101	72	2	-0.00513	-0.01025	ug/l	200	Ru	
Rh	103	72	2	-0.00158	-0.00316	ug/l	200	Rh	
Pd	105	72	2	-0.00478	-0.00955	ug/l	20	Pd	
Ag	107	115	3	0.01152	0.02304	ug/l	400	Ag	
Cd	111	115	3	0.01479	0.02958	ug/l	2000	Cd	
Sn	118	115	3	0.03280	0.06560	ug/l	2000	Sn	
Sb	121	115	3	0.04162	0.08324	ug/l	1000	Sb	
Te	125	165	2	0.01445	0.02891	ug/l	200	Te	
Cs	133	165	2	0.00190	0.00381	ug/l	2000	Cs	
Ba	137	165	3	0.22276	0.44552	ug/l	5000	Ba	
La	139	165	2	0.00083	0.00165	ug/l	200	La	
Ce	140	165	2	0.00151	0.00302	ug/l	200	Ce	
Pr	141	165	2	-0.00174	-0.00349	ug/l	200	Pr	
Nd	146	165	2	0.00008	0.00015	ug/l	200	Nd	
Sm	147	165	3	0.00091	0.00182	ug/l	2000	Sm	
Hf	178	165	2	0.04857	0.09714	ug/l	200	Hf	
Ta	181	165	2	0.02956	0.05911	ug/l	200	Ta	
W	182	165	2	0.79494	1.58987	ug/l	2000	W	
Re	185	193	3	-0.00106	-0.00212	ug/l	200	Re	
Pt	195	193	2	0.00513	0.01027	ug/l	200	Pt	
Au	197	193	3	0.03947	0.07893	ug/l	2000	Au	
Tl	205	193	3	0.02225	0.04451	ug/l	400	Tl	
Pb	208	193	3	0.35252	0.70504	ug/l	5000	Pb	
Bi	209	193	2	0.13067	0.26134	ug/l	2000	Bi	
Th	232	193	3	0.01433	0.02866	ug/l	2000	Th	
U	238	193	3	0.03545	0.07090	ug/l	2000	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	6178870	1.66	6327920	97.6	80	120	Li (IS)	
Sc (IS)	45	2	227651	0.46	224146	101.6	80	120	Sc (IS)	
Sc (IS)	45	3	3954869	1.67	3966854	99.7	80	120	Sc (IS)	
Ge (IS)	72	2	524325	1.95	458627	114.3	80	120	Ge (IS)	
Ge (IS)	72	3	3030746	0.79	2917719	103.9	80	120	Ge (IS)	
In (IS)	115	3	21894824	1.40	22065637	99.2	80	120	In (IS)	
Ho (IS)	165	2	16493391	0.38	16245218	101.5	80	120	Ho (IS)	
Ho (IS)	165	3	26698836	1.85	27266963	97.9	80	120	Ho (IS)	
Ir (IS)	193	2	11012262	0.15	10999175	100.1	80	120	Ir (IS)	
Ir (IS)	193	3	13374060	1.04	13591604	98.4	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Sample Name	**160-36005-A-17-E MDLV**
Data File Name	**017SMPL.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-26T17:53:05-06:00**
Type	**Sample**
VialNumber	**2102**
Dilution	**2**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**003CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	FinalConcentration	Units	High Value	Analyte	QC Flag
Li	7	6	3	5.31115	10.62230	ug/l	1000	Li	
Be	9	6	3	0.51603	1.03205	ug/l	1000	Be	
B	11	6	3	57.51511	115.03022	ug/l	2000	B	
Na	23	45	2	105.64658	211.29316	ug/l	50000	Na	
Mg	24	45	2	1.72452	3.44904	ug/l	50000	Mg	
Al	27	45	2	38.86736	77.73472	ug/l	100000	Al	
P	31	45	2	255.24901	510.49801	ug/l	100000	P	
K	39	45	2	52.19238	104.38477	ug/l	100000	K	
Ca	44	45	3	244.05439	488.10878	ug/l	100000	Ca	
Ti	47	45	3	2.77486	5.54972	ug/l	2000	Ti	
V	51	45	2	4.75568	9.51136	ug/l	2000	V	
Cr	52	45	2	5.17497	10.34995	ug/l	2000	Cr	
Mn	55	72	2	2.55302	5.10604	ug/l	5000	Mn	
Fe	57	72	2	52.22103	104.44205	ug/l	100000	Fe	
Co	59	72	2	0.99591	1.99181	ug/l	2000	Co	
Ni	60	72	2	3.35530	6.71059	ug/l	2000	Ni	
Cu	63	72	2	5.30469	10.60938	ug/l	2000	Cu	
Zn	66	72	2	25.51603	51.03206	ug/l	5000	Zn	
As	75	72	2	4.93974	9.87948	ug/l	2000	As	
Se	78	72	2	2.48275	4.96549	ug/l	1000	Se	
Sr	88	72	3	2.44953	4.89906	ug/l	2000	Sr	
Y	89	72	2	4.86914	9.73828	ug/l	200	Y	
Zr	90	72	2	4.27082	8.54164	ug/l	2000	Zr	
Nb	93	72	2	11.41240	22.82481	ug/l	100	Nb	
Mo	95	72	3	2.66215	5.32429	ug/l	1000	Mo	
Ru	101	72	2	4.77097	9.54194	ug/l	200	Ru	
Rh	103	72	2	5.09513	10.19026	ug/l	200	Rh	
Pd	105	72	2	5.11818	10.23636	ug/l	20	Pd	
Ag	107	115	3	0.97328	1.94657	ug/l	400	Ag	
Cd	111	115	3	0.24420	0.48841	ug/l	2000	Cd	
Sn	118	115	3	0.89711	1.79423	ug/l	2000	Sn	
Sb	121	115	3	2.34849	4.69698	ug/l	1000	Sb	
Te	125	165	2	4.89724	9.79448	ug/l	200	Te	
Cs	133	165	2	2.44458	4.88916	ug/l	2000	Cs	
Ba	137	165	3	9.50404	19.00807	ug/l	5000	Ba	
La	139	165	2	0.93240	1.86479	ug/l	200	La	
Ce	140	165	2	4.74852	9.49705	ug/l	200	Ce	
Pr	141	165	2	0.93898	1.87796	ug/l	200	Pr	
Nd	146	165	2	0.91909	1.83818	ug/l	200	Nd	
Sm	147	165	3	4.75282	9.50564	ug/l	2000	Sm	
Hf	178	165	2	4.44369	8.88738	ug/l	200	Hf	
Ta	181	165	2	3.98237	7.96474	ug/l	200	Ta	
W	182	165	2	11.49211	22.98423	ug/l	2000	W	
Re	185	193	3	4.63682	9.27363	ug/l	200	Re	
Pt	195	193	2	0.50819	1.01639	ug/l	200	Pt	
Au	197	193	3	2.27210	4.54420	ug/l	2000	Au	
Tl	205	193	3	2.28317	4.56635	ug/l	400	Tl	
Pb	208	193	3	1.60390	3.20780	ug/l	5000	Pb	
Bi	209	193	2	9.38956	18.77912	ug/l	2000	Bi	
Th	232	193	3	0.84089	1.68177	ug/l	2000	Th	
U	238	193	3	0.45254	0.90508	ug/l	2000	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	6313569	0.27	6327920	99.8	80	120	Li (IS)	
Sc (IS)	45	2	230093	2.45	224146	102.7	80	120	Sc (IS)	
Sc (IS)	45	3	4019909	0.41	3966854	101.3	80	120	Sc (IS)	
Ge (IS)	72	2	524787	5.22	458627	114.4	80	120	Ge (IS)	
Ge (IS)	72	3	3104981	1.17	2917719	106.4	80	120	Ge (IS)	
In (IS)	115	3	22317163	0.13	22065637	101.1	80	120	In (IS)	
Ho (IS)	165	2	16692496	2.80	16245218	102.8	80	120	Ho (IS)	
Ho (IS)	165	3	27285783	1.18	27266963	100.1	80	120	Ho (IS)	
Ir (IS)	193	2	11044041	2.86	10999175	100.4	80	120	Ir (IS)	
Ir (IS)	193	3	13527274	1.03	13591604	99.5	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Sample Name	**160-36007-A-16-A LOQV**
Data File Name	**018SMPL.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-26T17:59:47-06:00**
Type	**Sample**
VialNumber	**2103**
Dilution	**2**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**003CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	FinalConcentration	Units	High Value	Analyte	QC Flag
Li	7	6	3	5.25503	10.51005	ug/l	1000	Li	
Be	9	6	3	0.50001	1.00002	ug/l	1000	Be	
B	11	6	3	55.31866	110.63731	ug/l	2000	B	
Na	23	45	2	105.14459	210.28919	ug/l	50000	Na	
Mg	24	45	2	1.87894	3.75788	ug/l	50000	Mg	
Al	27	45	2	32.65888	65.31776	ug/l	100000	Al	
P	31	45	2	248.31492	496.62984	ug/l	100000	P	
K	39	45	2	52.44384	104.88768	ug/l	100000	K	
Ca	44	45	3	246.93175	493.86350	ug/l	100000	Ca	
Ti	47	45	3	2.68263	5.36526	ug/l	2000	Ti	
V	51	45	2	4.78244	9.56488	ug/l	2000	V	
Cr	52	45	2	5.15373	10.30746	ug/l	2000	Cr	
Mn	55	72	2	2.64696	5.29391	ug/l	5000	Mn	
Fe	57	72	2	58.67570	117.35141	ug/l	100000	Fe	
Co	59	72	2	1.01239	2.02478	ug/l	2000	Co	
Ni	60	72	2	2.69034	5.38069	ug/l	2000	Ni	
Cu	63	72	2	5.02054	10.04107	ug/l	2000	Cu	
Zn	66	72	2	26.32942	52.65884	ug/l	5000	Zn	
As	75	72	2	5.15451	10.30903	ug/l	2000	As	
Se	78	72	2	2.46917	4.93834	ug/l	1000	Se	
Sr	88	72	3	2.48626	4.97253	ug/l	2000	Sr	
Y	89	72	2	4.96571	9.93141	ug/l	200	Y	
Zr	90	72	2	4.34682	8.69364	ug/l	2000	Zr	
Nb	93	72	2	11.87736	23.75472	ug/l	100	Nb	
Mo	95	72	3	2.58710	5.17421	ug/l	1000	Mo	
Ru	101	72	2	4.92839	9.85677	ug/l	200	Ru	
Rh	103	72	2	5.19254	10.38508	ug/l	200	Rh	
Pd	105	72	2	5.20081	10.40162	ug/l	20	Pd	
Ag	107	115	3	0.96173	1.92346	ug/l	400	Ag	
Cd	111	115	3	0.24833	0.49666	ug/l	2000	Cd	
Sn	118	115	3	0.86309	1.72619	ug/l	2000	Sn	
Sb	121	115	3	2.29568	4.59137	ug/l	1000	Sb	
Te	125	165	2	4.64638	9.29277	ug/l	200	Te	
Cs	133	165	2	2.44437	4.88873	ug/l	2000	Cs	
Ba	137	165	3	10.51410	21.02820	ug/l	5000	Ba	
La	139	165	2	0.94275	1.88549	ug/l	200	La	
Ce	140	165	2	4.74422	9.48843	ug/l	200	Ce	
Pr	141	165	2	0.93416	1.86832	ug/l	200	Pr	
Nd	146	165	2	0.94347	1.88694	ug/l	200	Nd	
Sm	147	165	3	4.77308	9.54617	ug/l	2000	Sm	
Hf	178	165	2	4.48308	8.96616	ug/l	200	Hf	
Ta	181	165	2	3.89818	7.79636	ug/l	200	Ta	
W	182	165	2	11.46884	22.93767	ug/l	2000	W	
Re	185	193	3	4.65069	9.30138	ug/l	200	Re	
Pt	195	193	2	0.50235	1.00470	ug/l	200	Pt	
Au	197	193	3	2.29931	4.59863	ug/l	2000	Au	
Tl	205	193	3	2.29660	4.59321	ug/l	400	Tl	
Pb	208	193	3	1.61267	3.22534	ug/l	5000	Pb	
Bi	209	193	2	9.32401	18.64801	ug/l	2000	Bi	
Th	232	193	3	0.82809	1.65619	ug/l	2000	Th	
U	238	193	3	0.46480	0.92960	ug/l	2000	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	6255896	0.31	6327920	98.9	80	120	Li (IS)	
Sc (IS)	45	2	230527	1.39	224146	102.8	80	120	Sc (IS)	
Sc (IS)	45	3	4010930	0.50	3966854	101.1	80	120	Sc (IS)	
Ge (IS)	72	2	509811	0.69	458627	111.2	80	120	Ge (IS)	
Ge (IS)	72	3	3066297	0.42	2917719	105.1	80	120	Ge (IS)	
In (IS)	115	3	22441204	0.09	22065637	101.7	80	120	In (IS)	
Ho (IS)	165	2	16620564	0.11	16245218	102.3	80	120	Ho (IS)	
Ho (IS)	165	3	26953850	0.62	27266963	98.9	80	120	Ho (IS)	
Ir (IS)	193	2	11095552	0.72	10999175	100.9	80	120	Ir (IS)	
Ir (IS)	193	3	13415952	0.16	13591604	98.7	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Sample Name	**MB 160-454924/1-A**
Data File Name	**019SMPL.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-26T18:06:30-06:00**
Type	**Sample**
VialNumber	**2104**
Dilution	**2**
Comment	**454924**
Operator	**LP 7700**
ISTDRefDataFileName	**003CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	FinalConcentration	Units	High Value	Analyte	QC Flag
Li	7	6	3	0.25573	0.51146	ug/l	1000	Li	
Be	9	6	3	0.01272	0.02544	ug/l	1000	Be	
B	11	6	3	8.36361	16.72721	ug/l	2000	B	
Na	23	45	2	3.75036	7.50072	ug/l	50000	Na	
Mg	24	45	2	2.02355	4.04710	ug/l	50000	Mg	
Al	27	45	2	3.76098	7.52196	ug/l	100000	Al	
P	31	45	2	6.97958	13.95917	ug/l	100000	P	
K	39	45	2	0.63210	1.26420	ug/l	100000	K	
Ca	44	45	3	12.12439	24.24878	ug/l	100000	Ca	
Ti	47	45	3	0.13927	0.27855	ug/l	2000	Ti	
V	51	45	2	-0.08688	-0.17376	ug/l	2000	V	
Cr	52	45	2	0.04712	0.09425	ug/l	2000	Cr	
Mn	55	72	2	0.03058	0.06116	ug/l	5000	Mn	
Fe	57	72	2	1.18375	2.36751	ug/l	100000	Fe	
Co	59	72	2	-0.00212	-0.00424	ug/l	2000	Co	
Ni	60	72	2	0.05534	0.11068	ug/l	2000	Ni	
Cu	63	72	2	-0.06556	-0.13113	ug/l	2000	Cu	
Zn	66	72	2	1.00520	2.01040	ug/l	5000	Zn	
As	75	72	2	-0.02248	-0.04496	ug/l	2000	As	
Se	78	72	2	-0.06787	-0.13573	ug/l	1000	Se	
Sr	88	72	3	0.02972	0.05945	ug/l	2000	Sr	
Y	89	72	2	-0.00276	-0.00552	ug/l	200	Y	
Zr	90	72	2	0.00354	0.00707	ug/l	2000	Zr	
Nb	93	72	2	0.29187	0.58374	ug/l	100	Nb	
Mo	95	72	3	0.07696	0.15392	ug/l	1000	Mo	
Ru	101	72	2	-0.00707	-0.01414	ug/l	200	Ru	
Rh	103	72	2	-0.00433	-0.00867	ug/l	200	Rh	
Pd	105	72	2	-0.00313	-0.00627	ug/l	20	Pd	
Ag	107	115	3	0.01216	0.02433	ug/l	400	Ag	
Cd	111	115	3	-0.00262	-0.00525	ug/l	2000	Cd	
Sn	118	115	3	-0.01467	-0.02935	ug/l	2000	Sn	
Sb	121	115	3	0.02659	0.05317	ug/l	1000	Sb	
Te	125	165	2	0.02069	0.04137	ug/l	200	Te	
Cs	133	165	2	-0.00021	-0.00041	ug/l	2000	Cs	
Ba	137	165	3	0.04893	0.09786	ug/l	5000	Ba	
La	139	165	2	-0.00267	-0.00534	ug/l	200	La	
Ce	140	165	2	-0.00311	-0.00621	ug/l	200	Ce	
Pr	141	165	2	-0.00388	-0.00777	ug/l	200	Pr	
Nd	146	165	2	-0.00376	-0.00753	ug/l	200	Nd	
Sm	147	165	3	-0.00244	-0.00488	ug/l	2000	Sm	
Hf	178	165	2	0.01139	0.02277	ug/l	200	Hf	
Ta	181	165	2	0.03651	0.07302	ug/l	200	Ta	
W	182	165	2	0.30960	0.61919	ug/l	2000	W	
Re	185	193	3	-0.00298	-0.00596	ug/l	200	Re	
Pt	195	193	2	0.00097	0.00194	ug/l	200	Pt	
Au	197	193	3	0.01099	0.02198	ug/l	2000	Au	
Tl	205	193	3	-0.01171	-0.02341	ug/l	400	Tl	
Pb	208	193	3	0.18899	0.37799	ug/l	5000	Pb	
Bi	209	193	2	0.07960	0.15919	ug/l	2000	Bi	
Th	232	193	3	-0.00653	-0.01306	ug/l	2000	Th	
U	238	193	3	-0.00102	-0.00203	ug/l	2000	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	6156878	0.74	6327920	97.3	80	120	Li (IS)	
Sc (IS)	45	2	226051	0.49	224146	100.8	80	120	Sc (IS)	
Sc (IS)	45	3	3998838	0.47	3966854	100.8	80	120	Sc (IS)	
Ge (IS)	72	2	492918	0.79	458627	107.5	80	120	Ge (IS)	
Ge (IS)	72	3	3045680	0.83	2917719	104.4	80	120	Ge (IS)	
In (IS)	115	3	22251814	0.03	22065637	100.8	80	120	In (IS)	
Ho (IS)	165	2	16374036	1.13	16245218	100.8	80	120	Ho (IS)	
Ho (IS)	165	3	27207660	0.22	27266963	99.8	80	120	Ho (IS)	
Ir (IS)	193	2	10901586	1.20	10999175	99.1	80	120	Ir (IS)	
Ir (IS)	193	3	13261048	0.38	13591604	97.6	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Sample Name	**LCS 160-454924/2-A**
Data File Name	**020SMPL.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-26T18:13:12-06:00**
Type	**Sample**
VialNumber	**2105**
Dilution	**2**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**003CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	FinalConcentration	Units	High Value	Analyte	QC Flag
Li	7	6	3	51.62184	103.24368	ug/l	1000	Li	
Be	9	6	3	49.58551	99.17101	ug/l	1000	Be	
B	11	6	3	103.13468	206.26937	ug/l	2000	B	
Na	23	45	2	5226.45833	10452.91666	ug/l	50000	Na	
Mg	24	45	2	5176.45159	10352.90317	ug/l	50000	Mg	
Al	27	45	2	5118.40150	10236.80299	ug/l	100000	Al	
P	31	45	2	524.67672	1049.35344	ug/l	100000	P	
K	39	45	2	5220.21234	10440.42468	ug/l	100000	K	
Ca	44	45	3	5218.32892	10436.65784	ug/l	100000	Ca	
Ti	47	45	3	513.37781	1026.75562	ug/l	2000	Ti	
V	51	45	2	509.07314	1018.14629	ug/l	2000	V	
Cr	52	45	2	507.80659	1015.61317	ug/l	2000	Cr	
Mn	55	72	2	546.64859	1093.29718	ug/l	5000	Mn	
Fe	57	72	2	5498.71149	10997.42298	ug/l	100000	Fe	
Co	59	72	2	541.52869	1083.05739	ug/l	2000	Co	
Ni	60	72	2	568.81165	1137.62330	ug/l	2000	Ni	
Cu	63	72	2	543.93380	1087.86760	ug/l	2000	Cu	
Zn	66	72	2	552.73786	1105.47572	ug/l	5000	Zn	
As	75	72	2	524.52600	1049.05199	ug/l	2000	As	
Se	78	72	2	263.22580	526.45161	ug/l	1000	Se	
Sr	88	72	3	518.29635	1036.59271	ug/l	2000	Sr	
Y	89	72	2	0.00146	0.00292	ug/l	200	Y	
Zr	90	72	2	547.41076	1094.82152	ug/l	2000	Zr	
Nb	93	72	2	0.89845	1.79690	ug/l	100	Nb	
Mo	95	72	3	259.46972	518.93945	ug/l	1000	Mo	
Ru	101	72	2	-0.00559	-0.01119	ug/l	200	Ru	
Rh	103	72	2	0.02014	0.04028	ug/l	200	Rh	
Pd	105	72	2	0.03017	0.06035	ug/l	20	Pd	
Ag	107	115	3	101.59806	203.19612	ug/l	400	Ag	
Cd	111	115	3	514.78373	1029.56746	ug/l	2000	Cd	
Sn	118	115	3	499.70279	999.40558	ug/l	2000	Sn	
Sb	121	115	3	253.15587	506.31174	ug/l	1000	Sb	
Te	125	165	2	0.06806	0.13612	ug/l	200	Te	
Cs	133	165	2	0.00156	0.00312	ug/l	2000	Cs	
Ba	137	165	3	498.58783	997.17566	ug/l	5000	Ba	
La	139	165	2	0.79806	1.59612	ug/l	200	La	
Ce	140	165	2	0.01740	0.03480	ug/l	200	Ce	
Pr	141	165	2	0.00043	0.00087	ug/l	200	Pr	
Nd	146	165	2	0.00431	0.00861	ug/l	200	Nd	
Sm	147	165	3	511.01213	1022.02426	ug/l	2000	Sm	
Hf	178	165	2	0.53012	1.06024	ug/l	200	Hf	
Ta	181	165	2	0.76575	1.53149	ug/l	200	Ta	
W	182	165	2	506.69144	1013.38288	ug/l	2000	W	
Re	185	193	3	0.01060	0.02119	ug/l	200	Re	
Pt	195	193	2	0.00532	0.01065	ug/l	200	Pt	
Au	197	193	3	0.01975	0.03951	ug/l	2000	Au	
Tl	205	193	3	102.82308	205.64615	ug/l	400	Tl	
Pb	208	193	3	518.93894	1037.87787	ug/l	5000	Pb	
Bi	209	193	2	523.12985	1046.25970	ug/l	2000	Bi	
Th	232	193	3	519.36504	1038.73008	ug/l	2000	Th	
U	238	193	3	523.10524	1046.21048	ug/l	2000	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	5934065	0.58	6327920	93.8	80	120	Li (IS)	
Sc (IS)	45	2	225021	0.67	224146	100.4	80	120	Sc (IS)	
Sc (IS)	45	3	3910954	0.56	3966854	98.6	80	120	Sc (IS)	
Ge (IS)	72	2	477430	0.55	458627	104.1	80	120	Ge (IS)	
Ge (IS)	72	3	2974533	0.88	2917719	101.9	80	120	Ge (IS)	
In (IS)	115	3	21333335	0.36	22065637	96.7	80	120	In (IS)	
Ho (IS)	165	2	16216815	1.23	16245218	99.8	80	120	Ho (IS)	
Ho (IS)	165	3	26810052	1.03	27266963	98.3	80	120	Ho (IS)	
Ir (IS)	193	2	10381362	1.07	10999175	94.4	80	120	Ir (IS)	
Ir (IS)	193	3	13025016	0.49	13591604	95.8	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Sample Name	**280-131107-E-1-B**
Data File Name	**021SMPL.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-26T18:19:54-06:00**
Type	**Sample**
VialNumber	**2106**
Dilution	**2**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**003CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	FinalConcentration	Units	High Value	Analyte	QC Flag
Li	7	6	3	17.78982	35.57964	ug/l	1000	Li	
Be	9	6	3	0.03724	0.07447	ug/l	1000	Be	
B	11	6	3	87.00693	174.01386	ug/l	2000	B	
Na	23	45	2	13025.44655	26050.89309	ug/l	50000	Na	
Mg	24	45	2	29425.30073	58850.60147	ug/l	50000	Mg	
Al	27	45	2	621.40697	1242.81395	ug/l	100000	Al	
P	31	45	2	513.34207	1026.68414	ug/l	100000	P	
K	39	45	2	4200.24206	8400.48411	ug/l	100000	K	
Ca	44	45	3	95144.53837	190289.07673	ug/l	100000	Ca	
Ti	47	45	3	14.48319	28.96639	ug/l	2000	Ti	
V	51	45	2	1.44522	2.89044	ug/l	2000	V	
Cr	52	45	2	0.69255	1.38511	ug/l	2000	Cr	
Mn	55	72	2	1974.48061	3948.96123	ug/l	5000	Mn	
Fe	57	72	2	9329.15999	18658.31998	ug/l	100000	Fe	
Co	59	72	2	3.23259	6.46517	ug/l	2000	Co	
Ni	60	72	2	9.89862	19.79725	ug/l	2000	Ni	
Cu	63	72	2	1.03618	2.07236	ug/l	2000	Cu	
Zn	66	72	2	7.42539	14.85078	ug/l	5000	Zn	
As	75	72	2	3.86035	7.72071	ug/l	2000	As	
Se	78	72	2	-0.01253	-0.02507	ug/l	1000	Se	
Sr	88	72	3	669.44288	1338.88575	ug/l	2000	Sr	
Y	89	72	2	0.30050	0.60100	ug/l	200	Y	
Zr	90	72	2	0.88253	1.76506	ug/l	2000	Zr	
Nb	93	72	2	0.09893	0.19787	ug/l	100	Nb	
Mo	95	72	3	0.40036	0.80071	ug/l	1000	Mo	
Ru	101	72	2	-0.00617	-0.01235	ug/l	200	Ru	
Rh	103	72	2	-0.00351	-0.00702	ug/l	200	Rh	
Pd	105	72	2	0.02868	0.05736	ug/l	20	Pd	
Ag	107	115	3	0.03895	0.07790	ug/l	400	Ag	
Cd	111	115	3	0.10082	0.20165	ug/l	2000	Cd	
Sn	118	115	3	0.22476	0.44952	ug/l	2000	Sn	
Sb	121	115	3	0.16212	0.32425	ug/l	1000	Sb	
Te	125	165	2	0.01827	0.03654	ug/l	200	Te	
Cs	133	165	2	0.05275	0.10549	ug/l	2000	Cs	
Ba	137	165	3	187.79365	375.58730	ug/l	5000	Ba	
La	139	165	2	0.31431	0.62863	ug/l	200	La	
Ce	140	165	2	0.58524	1.17047	ug/l	200	Ce	
Pr	141	165	2	0.07075	0.14150	ug/l	200	Pr	
Nd	146	165	2	0.29082	0.58164	ug/l	200	Nd	
Sm	147	165	3	0.10166	0.20332	ug/l	2000	Sm	
Hf	178	165	2	0.00953	0.01907	ug/l	200	Hf	
Ta	181	165	2	0.03901	0.07802	ug/l	200	Ta	
W	182	165	2	1.33673	2.67346	ug/l	2000	W	
Re	185	193	3	0.00630	0.01261	ug/l	200	Re	
Pt	195	193	2	0.00050	0.00101	ug/l	200	Pt	
Au	197	193	3	0.00341	0.00681	ug/l	2000	Au	
Tl	205	193	3	0.12976	0.25952	ug/l	400	Tl	
Pb	208	193	3	0.54274	1.08547	ug/l	5000	Pb	
Bi	209	193	2	0.13717	0.27434	ug/l	2000	Bi	
Th	232	193	3	0.33781	0.67562	ug/l	2000	Th	
U	238	193	3	0.58579	1.17158	ug/l	2000	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	6369135	0.53	6327920	100.7	80	120	Li (IS)	
Sc (IS)	45	2	228922	2.74	224146	102.1	80	120	Sc (IS)	
Sc (IS)	45	3	4234911	0.41	3966854	106.8	80	120	Sc (IS)	
Ge (IS)	72	2	492031	0.82	458627	107.3	80	120	Ge (IS)	
Ge (IS)	72	3	3147905	0.67	2917719	107.9	80	120	Ge (IS)	
In (IS)	115	3	22097354	0.11	22065637	100.1	80	120	In (IS)	
Ho (IS)	165	2	16026853	2.60	16245218	98.7	80	120	Ho (IS)	
Ho (IS)	165	3	27768476	0.59	27266963	101.8	80	120	Ho (IS)	
Ir (IS)	193	2	10493093	2.41	10999175	95.4	80	120	Ir (IS)	
Ir (IS)	193	3	13319877	0.74	13591604	98.0	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Sample Name	**280-131107-E-2-D**
Data File Name	**022SMPL.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-26T18:26:36-06:00**
Type	**Sample**
VialNumber	**2107**
Dilution	**2**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**003CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	FinalConcentration	Units	High Value	Analyte	QC Flag
Li	7	6	3	11.59110	23.18220	ug/l	1000	Li	
Be	9	6	3	0.04698	0.09396	ug/l	1000	Be	
B	11	6	3	39.48559	78.97118	ug/l	2000	B	
Na	23	45	2	18723.30711	37446.61422	ug/l	50000	Na	
Mg	24	45	2	11036.47232	22072.94465	ug/l	50000	Mg	
Al	27	45	2	1456.87134	2913.74268	ug/l	100000	Al	
P	31	45	2	178.43655	356.87309	ug/l	100000	P	
K	39	45	2	4255.26675	8510.53349	ug/l	100000	K	
Ca	44	45	3	39862.90560	79725.81120	ug/l	100000	Ca	
Ti	47	45	3	19.55741	39.11483	ug/l	2000	Ti	
V	51	45	2	4.21270	8.42540	ug/l	2000	V	
Cr	52	45	2	1.44949	2.89899	ug/l	2000	Cr	
Mn	55	72	2	298.21421	596.42841	ug/l	5000	Mn	
Fe	57	72	2	1314.92125	2629.84249	ug/l	100000	Fe	
Co	59	72	2	0.69443	1.38887	ug/l	2000	Co	
Ni	60	72	2	3.04286	6.08571	ug/l	2000	Ni	
Cu	63	72	2	1.72532	3.45064	ug/l	2000	Cu	
Zn	66	72	2	5.71587	11.43174	ug/l	5000	Zn	
As	75	72	2	2.10653	4.21306	ug/l	2000	As	
Se	78	72	2	0.86157	1.72313	ug/l	1000	Se	
Sr	88	72	3	244.48212	488.96424	ug/l	2000	Sr	
Y	89	72	2	0.46282	0.92564	ug/l	200	Y	
Zr	90	72	2	0.92396	1.84793	ug/l	2000	Zr	
Nb	93	72	2	0.06688	0.13376	ug/l	100	Nb	
Mo	95	72	3	1.55590	3.11179	ug/l	1000	Mo	
Ru	101	72	2	-0.00346	-0.00692	ug/l	200	Ru	
Rh	103	72	2	-0.00337	-0.00674	ug/l	200	Rh	
Pd	105	72	2	0.00638	0.01276	ug/l	20	Pd	
Ag	107	115	3	0.01468	0.02936	ug/l	400	Ag	
Cd	111	115	3	0.03996	0.07991	ug/l	2000	Cd	
Sn	118	115	3	0.10554	0.21108	ug/l	2000	Sn	
Sb	121	115	3	0.25540	0.51080	ug/l	1000	Sb	
Te	125	165	2	0.01948	0.03897	ug/l	200	Te	
Cs	133	165	2	0.15032	0.30063	ug/l	2000	Cs	
Ba	137	165	3	99.38971	198.77943	ug/l	5000	Ba	
La	139	165	2	0.69710	1.39419	ug/l	200	La	
Ce	140	165	2	1.33067	2.66133	ug/l	200	Ce	
Pr	141	165	2	0.16448	0.32897	ug/l	200	Pr	
Nd	146	165	2	0.62943	1.25886	ug/l	200	Nd	
Sm	147	165	3	0.11973	0.23946	ug/l	2000	Sm	
Hf	178	165	2	0.01101	0.02202	ug/l	200	Hf	
Ta	181	165	2	0.01796	0.03591	ug/l	200	Ta	
W	182	165	2	1.26447	2.52894	ug/l	2000	W	
Re	185	193	3	0.03842	0.07685	ug/l	200	Re	
Pt	195	193	2	0.00156	0.00312	ug/l	200	Pt	
Au	197	193	3	0.00081	0.00162	ug/l	2000	Au	
Tl	205	193	3	0.03313	0.06626	ug/l	400	Tl	
Pb	208	193	3	0.68916	1.37832	ug/l	5000	Pb	
Bi	209	193	2	0.06902	0.13803	ug/l	2000	Bi	
Th	232	193	3	0.26195	0.52390	ug/l	2000	Th	
U	238	193	3	2.17434	4.34868	ug/l	2000	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	6355126	0.53	6327920	100.4	80	120	Li (IS)	
Sc (IS)	45	2	238226	1.94	224146	106.3	80	120	Sc (IS)	
Sc (IS)	45	3	4249809	1.29	3966854	107.1	80	120	Sc (IS)	
Ge (IS)	72	2	514675	1.36	458627	112.2	80	120	Ge (IS)	
Ge (IS)	72	3	3179665	0.46	2917719	109.0	80	120	Ge (IS)	
In (IS)	115	3	22511864	1.06	22065637	102.0	80	120	In (IS)	
Ho (IS)	165	2	16846406	2.52	16245218	103.7	80	120	Ho (IS)	
Ho (IS)	165	3	27871452	0.45	27266963	102.2	80	120	Ho (IS)	
Ir (IS)	193	2	10785731	2.37	10999175	98.1	80	120	Ir (IS)	
Ir (IS)	193	3	13329350	0.25	13591604	98.1	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Sample Name	**280-131107-E-2-D SD**
Data File Name	**023SMPL.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-26T18:33:20-06:00**
Type	**Sample**
VialNumber	**2108**
Dilution	**10**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**003CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	FinalConcentration	Units	High Value	Analyte	QC Flag
Li	7	6	3	2.45887	24.58867	ug/l	1000	Li	
Be	9	6	3	0.01375	0.13750	ug/l	1000	Be	
B	11	6	3	10.90517	109.05169	ug/l	2000	B	
Na	23	45	2	3732.20146	37322.01457	ug/l	50000	Na	
Mg	24	45	2	2210.29179	22102.91792	ug/l	50000	Mg	
Al	27	45	2	290.88166	2908.81662	ug/l	100000	Al	
P	31	45	2	31.65246	316.52457	ug/l	100000	P	
K	39	45	2	862.54643	8625.46432	ug/l	100000	K	
Ca	44	45	3	8109.67936	81096.79357	ug/l	100000	Ca	
Ti	47	45	3	3.95723	39.57230	ug/l	2000	Ti	
V	51	45	2	0.72106	7.21063	ug/l	2000	V	
Cr	52	45	2	0.27434	2.74344	ug/l	2000	Cr	
Mn	55	72	2	55.83703	558.37029	ug/l	5000	Mn	
Fe	57	72	2	261.71193	2617.11929	ug/l	100000	Fe	
Co	59	72	2	0.17524	1.75240	ug/l	2000	Co	
Ni	60	72	2	0.64051	6.40510	ug/l	2000	Ni	
Cu	63	72	2	0.24387	2.43870	ug/l	2000	Cu	
Zn	66	72	2	1.67039	16.70394	ug/l	5000	Zn	
As	75	72	2	0.37760	3.77597	ug/l	2000	As	
Se	78	72	2	-0.05451	-0.54514	ug/l	1000	Se	
Sr	88	72	3	48.51358	485.13581	ug/l	2000	Sr	
Y	89	72	2	0.08863	0.88630	ug/l	200	Y	
Zr	90	72	2	0.19963	1.99631	ug/l	2000	Zr	
Nb	93	72	2	0.06888	0.68878	ug/l	100	Nb	
Mo	95	72	3	0.33464	3.34642	ug/l	1000	Mo	
Ru	101	72	2	-0.00685	-0.06847	ug/l	200	Ru	
Rh	103	72	2	-0.00374	-0.03745	ug/l	200	Rh	
Pd	105	72	2	-0.00226	-0.02258	ug/l	20	Pd	
Ag	107	115	3	0.00364	0.03645	ug/l	400	Ag	
Cd	111	115	3	0.03815	0.38150	ug/l	2000	Cd	
Sn	118	115	3	-0.03952	-0.39522	ug/l	2000	Sn	
Sb	121	115	3	0.07226	0.72261	ug/l	1000	Sb	
Te	125	165	2	-0.00021	-0.00210	ug/l	200	Te	
Cs	133	165	2	0.02971	0.29708	ug/l	2000	Cs	
Ba	137	165	3	18.82832	188.28321	ug/l	5000	Ba	
La	139	165	2	0.13790	1.37897	ug/l	200	La	
Ce	140	165	2	0.27078	2.70785	ug/l	200	Ce	
Pr	141	165	2	0.02983	0.29832	ug/l	200	Pr	
Nd	146	165	2	0.12338	1.23382	ug/l	200	Nd	
Sm	147	165	3	0.06397	0.63968	ug/l	2000	Sm	
Hf	178	165	2	-0.01253	-0.12526	ug/l	200	Hf	
Ta	181	165	2	0.00453	0.04531	ug/l	200	Ta	
W	182	165	2	0.25237	2.52369	ug/l	2000	W	
Re	185	193	3	0.00551	0.05509	ug/l	200	Re	
Pt	195	193	2	0.00107	0.01069	ug/l	200	Pt	
Au	197	193	3	-0.00100	-0.00995	ug/l	2000	Au	
Tl	205	193	3	0.00282	0.02815	ug/l	400	Tl	
Pb	208	193	3	0.21250	2.12496	ug/l	5000	Pb	
Bi	209	193	2	0.03941	0.39407	ug/l	2000	Bi	
Th	232	193	3	0.04542	0.45424	ug/l	2000	Th	
U	238	193	3	0.45587	4.55868	ug/l	2000	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	6450398	0.43	6327920	101.9	80	120	Li (IS)	
Sc (IS)	45	2	236259	0.45	224146	105.4	80	120	Sc (IS)	
Sc (IS)	45	3	4170216	0.45	3966854	105.1	80	120	Sc (IS)	
Ge (IS)	72	2	520285	0.91	458627	113.4	80	120	Ge (IS)	
Ge (IS)	72	3	3196584	0.26	2917719	109.6	80	120	Ge (IS)	
In (IS)	115	3	22886919	0.23	22065637	103.7	80	120	In (IS)	
Ho (IS)	165	2	16671422	0.75	16245218	102.6	80	120	Ho (IS)	
Ho (IS)	165	3	27475654	0.61	27266963	100.8	80	120	Ho (IS)	
Ir (IS)	193	2	10980595	0.07	10999175	99.8	80	120	Ir (IS)	
Ir (IS)	193	3	13462288	0.19	13591604	99.0	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Sample Name	**280-131107-E-2-E MS**
Data File Name	**024SMPL.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-26T18:40:02-06:00**
Type	**Sample**
VialNumber	**2109**
Dilution	**2**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**003CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	FinalConcentration	Units	High Value	Analyte	QC Flag
Li	7	6	3	62.25460	124.50919	ug/l	1000	Li	
Be	9	6	3	49.78145	99.56290	ug/l	1000	Be	
B	11	6	3	144.58911	289.17821	ug/l	2000	B	
Na	23	45	2	24092.71009	48185.42018	ug/l	50000	Na	
Mg	24	45	2	16096.85528	32193.71056	ug/l	50000	Mg	
Al	27	45	2	6678.61081	13357.22162	ug/l	100000	Al	
P	31	45	2	680.64399	1361.28799	ug/l	100000	P	
K	39	45	2	9326.13492	18652.26984	ug/l	100000	K	
Ca	44	45	3	45116.50068	90233.00137	ug/l	100000	Ca	
Ti	47	45	3	513.34842	1026.69684	ug/l	2000	Ti	
V	51	45	2	496.45005	992.90010	ug/l	2000	V	
Cr	52	45	2	488.31122	976.62245	ug/l	2000	Cr	
Mn	55	72	2	817.15253	1634.30506	ug/l	5000	Mn	
Fe	57	72	2	6631.14224	13262.28447	ug/l	100000	Fe	
Co	59	72	2	513.47021	1026.94042	ug/l	2000	Co	
Ni	60	72	2	541.54422	1083.08843	ug/l	2000	Ni	
Cu	63	72	2	508.73707	1017.47415	ug/l	2000	Cu	
Zn	66	72	2	532.08204	1064.16407	ug/l	5000	Zn	
As	75	72	2	517.75815	1035.51630	ug/l	2000	As	
Se	78	72	2	254.28629	508.57257	ug/l	1000	Se	
Sr	88	72	3	748.60061	1497.20121	ug/l	2000	Sr	
Y	89	72	2	0.47836	0.95671	ug/l	200	Y	
Zr	90	72	2	531.39228	1062.78457	ug/l	2000	Zr	
Nb	93	72	2	0.33223	0.66447	ug/l	100	Nb	
Mo	95	72	3	256.03813	512.07626	ug/l	1000	Mo	
Ru	101	72	2	-0.00667	-0.01334	ug/l	200	Ru	
Rh	103	72	2	0.02081	0.04161	ug/l	200	Rh	
Pd	105	72	2	0.03689	0.07378	ug/l	20	Pd	
Ag	107	115	3	96.87603	193.75207	ug/l	400	Ag	
Cd	111	115	3	499.10181	998.20361	ug/l	2000	Cd	
Sn	118	115	3	500.70253	1001.40505	ug/l	2000	Sn	
Sb	121	115	3	250.41583	500.83167	ug/l	1000	Sb	
Te	125	165	2	0.12998	0.25995	ug/l	200	Te	
Cs	133	165	2	0.17059	0.34117	ug/l	2000	Cs	
Ba	137	165	3	578.96772	1157.93544	ug/l	5000	Ba	
La	139	165	2	1.51426	3.02853	ug/l	200	La	
Ce	140	165	2	1.41259	2.82517	ug/l	200	Ce	
Pr	141	165	2	0.17590	0.35181	ug/l	200	Pr	
Nd	146	165	2	0.67133	1.34265	ug/l	200	Nd	
Sm	147	165	3	497.32631	994.65261	ug/l	2000	Sm	
Hf	178	165	2	0.21913	0.43826	ug/l	200	Hf	
Ta	181	165	2	0.39613	0.79226	ug/l	200	Ta	
W	182	165	2	511.90545	1023.81089	ug/l	2000	W	
Re	185	193	3	0.05183	0.10365	ug/l	200	Re	
Pt	195	193	2	0.00340	0.00681	ug/l	200	Pt	
Au	197	193	3	0.00644	0.01287	ug/l	2000	Au	
Tl	205	193	3	99.59440	199.18880	ug/l	400	Tl	
Pb	208	193	3	495.44883	990.89766	ug/l	5000	Pb	
Bi	209	193	2	498.18208	996.36417	ug/l	2000	Bi	
Th	232	193	3	506.47699	1012.95398	ug/l	2000	Th	
U	238	193	3	514.80185	1029.60369	ug/l	2000	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	5897283	0.12	6327920	93.2	80	120	Li (IS)	
Sc (IS)	45	2	232819	1.01	224146	103.9	80	120	Sc (IS)	
Sc (IS)	45	3	4058602	0.62	3966854	102.3	80	120	Sc (IS)	
Ge (IS)	72	2	492325	0.84	458627	107.3	80	120	Ge (IS)	
Ge (IS)	72	3	3035145	0.43	2917719	104.0	80	120	Ge (IS)	
In (IS)	115	3	21522659	0.43	22065637	97.5	80	120	In (IS)	
Ho (IS)	165	2	16236437	1.30	16245218	99.9	80	120	Ho (IS)	
Ho (IS)	165	3	27339945	0.48	27266963	100.3	80	120	Ho (IS)	
Ir (IS)	193	2	10402271	0.44	10999175	94.6	80	120	Ir (IS)	
Ir (IS)	193	3	13085053	0.90	13591604	96.3	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Sample Name	**280-131107-E-2-F MSD**
Data File Name	**025SMPL.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-26T18:46:46-06:00**
Type	**Sample**
VialNumber	**2110**
Dilution	**2**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**003CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	FinalConcentration	Units	High Value	Analyte	QC Flag
Li	7	6	3	61.45360	122.90720	ug/l	1000	Li	
Be	9	6	3	49.22173	98.44346	ug/l	1000	Be	
B	11	6	3	143.13590	286.27180	ug/l	2000	B	
Na	23	45	2	23464.22121	46928.44243	ug/l	50000	Na	
Mg	24	45	2	15763.50157	31527.00314	ug/l	50000	Mg	
Al	27	45	2	6933.46334	13866.92667	ug/l	100000	Al	
P	31	45	2	669.58498	1339.16997	ug/l	100000	P	
K	39	45	2	9239.17555	18478.35110	ug/l	100000	K	
Ca	44	45	3	44009.46264	88018.92529	ug/l	100000	Ca	
Ti	47	45	3	504.82655	1009.65310	ug/l	2000	Ti	
V	51	45	2	491.13926	982.27852	ug/l	2000	V	
Cr	52	45	2	485.05192	970.10385	ug/l	2000	Cr	
Mn	55	72	2	796.04191	1592.08382	ug/l	5000	Mn	
Fe	57	72	2	6567.58098	13135.16197	ug/l	100000	Fe	
Co	59	72	2	502.48759	1004.97517	ug/l	2000	Co	
Ni	60	72	2	525.69551	1051.39102	ug/l	2000	Ni	
Cu	63	72	2	499.17317	998.34634	ug/l	2000	Cu	
Zn	66	72	2	514.66878	1029.33756	ug/l	5000	Zn	
As	75	72	2	504.30313	1008.60625	ug/l	2000	As	
Se	78	72	2	246.81879	493.63759	ug/l	1000	Se	
Sr	88	72	3	736.18667	1472.37335	ug/l	2000	Sr	
Y	89	72	2	0.45455	0.90910	ug/l	200	Y	
Zr	90	72	2	517.26159	1034.52317	ug/l	2000	Zr	
Nb	93	72	2	0.23956	0.47911	ug/l	100	Nb	
Mo	95	72	3	247.97433	495.94866	ug/l	1000	Mo	
Ru	101	72	2	-0.00360	-0.00721	ug/l	200	Ru	
Rh	103	72	2	0.02071	0.04142	ug/l	200	Rh	
Pd	105	72	2	0.03883	0.07767	ug/l	20	Pd	
Ag	107	115	3	95.66428	191.32857	ug/l	400	Ag	
Cd	111	115	3	495.18412	990.36824	ug/l	2000	Cd	
Sn	118	115	3	489.91868	979.83735	ug/l	2000	Sn	
Sb	121	115	3	247.03545	494.07090	ug/l	1000	Sb	
Te	125	165	2	0.10735	0.21469	ug/l	200	Te	
Cs	133	165	2	0.18774	0.37548	ug/l	2000	Cs	
Ba	137	165	3	573.18179	1146.36358	ug/l	5000	Ba	
La	139	165	2	1.51036	3.02073	ug/l	200	La	
Ce	140	165	2	1.41640	2.83281	ug/l	200	Ce	
Pr	141	165	2	0.17256	0.34513	ug/l	200	Pr	
Nd	146	165	2	0.66826	1.33652	ug/l	200	Nd	
Sm	147	165	3	490.51612	981.03225	ug/l	2000	Sm	
Hf	178	165	2	0.14479	0.28957	ug/l	200	Hf	
Ta	181	165	2	0.27443	0.54886	ug/l	200	Ta	
W	182	165	2	497.03185	994.06370	ug/l	2000	W	
Re	185	193	3	0.05170	0.10340	ug/l	200	Re	
Pt	195	193	2	0.00467	0.00934	ug/l	200	Pt	
Au	197	193	3	0.00398	0.00797	ug/l	2000	Au	
Tl	205	193	3	97.71897	195.43793	ug/l	400	Tl	
Pb	208	193	3	489.83883	979.67765	ug/l	5000	Pb	
Bi	209	193	2	491.31759	982.63519	ug/l	2000	Bi	
Th	232	193	3	497.21873	994.43747	ug/l	2000	Th	
U	238	193	3	510.29178	1020.58355	ug/l	2000	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	5781509	0.50	6327920	91.4	80	120	Li (IS)	
Sc (IS)	45	2	226012	0.26	224146	100.8	80	120	Sc (IS)	
Sc (IS)	45	3	4028363	0.53	3966854	101.6	80	120	Sc (IS)	
Ge (IS)	72	2	486908	0.63	458627	106.2	80	120	Ge (IS)	
Ge (IS)	72	3	3005598	0.89	2917719	103.0	80	120	Ge (IS)	
In (IS)	115	3	21171208	0.61	22065637	95.9	80	120	In (IS)	
Ho (IS)	165	2	16104074	0.23	16245218	99.1	80	120	Ho (IS)	
Ho (IS)	165	3	26933923	0.77	27266963	98.8	80	120	Ho (IS)	
Ir (IS)	193	2	10294588	1.23	10999175	93.6	80	120	Ir (IS)	
Ir (IS)	193	3	12902398	0.29	13591604	94.9	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Low Level Continuing Calibration Verification (CCV) - US EPA Method 6020

Sample Name	**CCVL 1856860**
Data File Name	**026LCCV.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-26T18:53:31-06:00**
Type	**CRI**
VialNumber	**1101**
Dilution	**1**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**003CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	Units	ExpectedValue	%Recovery	%QC Low	%QC High	Analyte	QC Flag
Li	7	6	3	5.16302	ug/l	5	103.3	80	120	Li	
Be	9	6	3	0.50094	ug/l	0.5	100.2	80	120	Be	
B	11	6	3	101.11100	ug/l	100	101.1	80	120	B	
Na	23	45	2	106.67000	ug/l	100	106.7	80	120	Na	
Mg	24	45	2	59.29901	ug/l	50	118.6	80	120	Mg	
Al	27	45	2	59.49353	ug/l	50	119.0	80	120	Al	
P	31	45	2	97.88296	ug/l	100	97.9	80	120	P	
K	39	45	2	111.02414	ug/l	100	111.0	80	120	K	
Ca	44	45	3	236.11220	ug/l	200	118.1	80	120	Ca	
Ti	47	45	3	5.11598	ug/l	5	102.3	80	120	Ti	
V	51	45	2	9.92609	ug/l	10	99.3	80	120	V	
Cr	52	45	2	10.33982	ug/l	10	103.4	80	120	Cr	
Mn	55	72	2	4.30030	ug/l	4	107.5	80	120	Mn	
Fe	57	72	2	52.86978	ug/l	50	105.7	80	120	Fe	
Co	59	72	2	2.16271	ug/l	2	108.1	80	120	Co	
Ni	60	72	2	5.71786	ug/l	5	114.4	80	120	Ni	
Cu	63	72	2	3.25544	ug/l	3	108.5	80	120	Cu	
Zn	66	72	2	22.58059	ug/l	20	112.9	80	120	Zn	
As	75	72	2	10.88465	ug/l	10	108.8	80	120	As	
Se	78	72	2	4.77719	ug/l	5	95.5	80	120	Se	
Sr	88	72	3	5.24644	ug/l	5	104.9	80	120	Sr	
Y	89	72	2	5.14735	ug/l	5	102.9	80	120	Y	
Zr	90	72	2	5.38205	ug/l	5	107.6	80	120	Zr	
Nb	93	72	2	20.15191	ug/l	25	80.6	80	120	Nb	
Mo	95	72	3	5.00593	ug/l	5	100.1	80	120	Mo	
Ru	101	72	2	10.46177	ug/l	10	104.6	80	120	Ru	
Rh	103	72	2	10.36048	ug/l	10	103.6	80	120	Rh	
Pd	105	72	2	0.55179	ug/l	0.5	110.4	80	120	Pd	
Ag	107	115	3	1.98231	ug/l	2	99.1	80	120	Ag	
Cd	111	115	3	0.54089	ug/l	0.5	108.2	80	120	Cd	
Sn	118	115	3	1.92263	ug/l	2	96.1	80	120	Sn	
Sb	121	115	3	4.79941	ug/l	5	96.0	80	120	Sb	
Te	125	165	2	9.60015	ug/l	10	96.0	80	120	Te	
Cs	133	165	2	0.97657	ug/l	1	97.7	80	120	Cs	
Ba	137	165	3	1.97952	ug/l	2	99.0	80	120	Ba	
La	139	165	2	1.90491	ug/l	2	95.2	80	120	La	
Ce	140	165	2	9.64222	ug/l	10	96.4	80	120	Ce	
Pr	141	165	2	1.94919	ug/l	2	97.5	80	120	Pr	
Nd	146	165	2	1.90107	ug/l	2	95.1	80	120	Nd	
Sm	147	165	3	9.67683	ug/l	10	96.8	80	120	Sm	
Hf	178	165	2	9.00147	ug/l	10	90.0	80	120	Hf	
Ta	181	165	2	6.38986	ug/l	10	63.9	80	120	Ta	FAILED
W	182	165	2	5.74001	ug/l	5	114.8	80	120	W	
Re	185	193	3	9.18173	ug/l	10	91.8	80	120	Re	
Pt	195	193	2	1.02160	ug/l	1	102.2	80	120	Pt	
Au	197	193	3	4.70724	ug/l	5	94.1	80	120	Au	
Tl	205	193	3	2.00120	ug/l	2	100.1	80	120	Tl	
Pb	208	193	3	2.99103	ug/l	3	99.7	80	120	Pb	
Bi	209	193	2	20.72939	ug/l	20	103.6	80	120	Bi	
Th	232	193	3	2.06191	ug/l	2	103.1	80	120	Th	
U	238	193	3	0.93847	ug/l	1	93.8	80	120	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	6161212	0.10	6327920	97.4	80	120	Li (IS)	
Sc (IS)	45	2	225552	1.88	224146	100.6	80	120	Sc (IS)	
Sc (IS)	45	3	3998206	0.51	3966854	100.8	80	120	Sc (IS)	
Ge (IS)	72	2	493787	1.70	458627	107.7	80	120	Ge (IS)	
Ge (IS)	72	3	3036622	0.77	2917719	104.1	80	120	Ge (IS)	
In (IS)	115	3	22277130	0.54	22065637	101.0	80	120	In (IS)	
Ho (IS)	165	2	16329282	2.44	16245218	100.5	80	120	Ho (IS)	
Ho (IS)	165	3	27188393	0.40	27266963	99.7	80	120	Ho (IS)	
Ir (IS)	193	2	10915485	2.02	10999175	99.2	80	120	Ir (IS)	
Ir (IS)	193	3	13438316	0.32	13591604	98.9	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Continuing Calibration Verification (CCV) - US EPA Method 6020

Sample Name	**CCV 1856861**
Data File Name	**027_CCV.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-26T19:00:14-06:00**
Type	**CCV**
VialNumber	**1102**
Dilution	**1**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**003CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	Units	ExpectedValue	%Recovery	%QC Low	%QC High	Analyte	QC Flag
Li	7	6	3	99.99267	ug/l	100	100.0	90	110	Li	
Be	9	6	3	99.73384	ug/l	100	99.7	90	110	Be	
B	11	6	3	205.02373	ug/l	200	102.5	90	110	B	
Na	23	45	2	2529.89635	ug/l	2500	101.2	90	110	Na	
Mg	24	45	2	2553.20009	ug/l	2500	102.1	90	110	Mg	
Al	27	45	2	2692.43991	ug/l	2500	107.7	90	110	Al	
P	31	45	2	2533.51920	ug/l	2500	101.3	90	110	P	
K	39	45	2	2567.38402	ug/l	2500	102.7	90	110	K	
Ca	44	45	3	2502.82367	ug/l	2500	100.1	90	110	Ca	
Ti	47	45	3	99.62974	ug/l	100	99.6	90	110	Ti	
V	51	45	2	99.99578	ug/l	100	100.0	90	110	V	
Cr	52	45	2	102.96421	ug/l	100	103.0	90	110	Cr	
Mn	55	72	2	99.25948	ug/l	100	99.3	90	110	Mn	
Fe	57	72	2	2488.40963	ug/l	2500	99.5	90	110	Fe	
Co	59	72	2	103.14260	ug/l	100	103.1	90	110	Co	
Ni	60	72	2	104.05701	ug/l	100	104.1	90	110	Ni	
Cu	63	72	2	103.08868	ug/l	100	103.1	90	110	Cu	
Zn	66	72	2	103.12130	ug/l	100	103.1	90	110	Zn	
As	75	72	2	102.91749	ug/l	100	102.9	90	110	As	
Se	78	72	2	51.23457	ug/l	50	102.5	90	110	Se	
Sr	88	72	3	100.25290	ug/l	100	100.3	90	110	Sr	
Y	89	72	2	103.87082	ug/l	100	103.9	90	110	Y	
Zr	90	72	2	103.57262	ug/l	100	103.6	90	110	Zr	
Nb	93	72	2	50.86779	ug/l	50	101.7	90	110	Nb	
Mo	95	72	3	47.54885	ug/l	50	95.1	90	110	Mo	
Ru	101	72	2	100.38466	ug/l	100	100.4	90	110	Ru	
Rh	103	72	2	103.96914	ug/l	100	104.0	90	110	Rh	
Pd	105	72	2	10.46045	ug/l	10	104.6	90	110	Pd	
Ag	107	115	3	19.36495	ug/l	20	96.8	90	110	Ag	
Cd	111	115	3	96.10767	ug/l	100	96.1	90	110	Cd	
Sn	118	115	3	97.91885	ug/l	100	97.9	90	110	Sn	
Sb	121	115	3	49.37128	ug/l	50	98.7	90	110	Sb	
Te	125	165	2	100.20800	ug/l	100	100.2	90	110	Te	
Cs	133	165	2	100.91078	ug/l	100	100.9	90	110	Cs	
Ba	137	165	3	98.80081	ug/l	100	98.8	90	110	Ba	
La	139	165	2	100.48246	ug/l	100	100.5	90	110	La	
Ce	140	165	2	100.76178	ug/l	100	100.8	90	110	Ce	
Pr	141	165	2	101.15806	ug/l	100	101.2	90	110	Pr	
Nd	146	165	2	99.24942	ug/l	100	99.2	90	110	Nd	
Sm	147	165	3	100.41387	ug/l	100	100.4	90	110	Sm	
Hf	178	165	2	99.85945	ug/l	100	99.9	90	110	Hf	
Ta	181	165	2	99.82574	ug/l	100	99.8	90	110	Ta	
W	182	165	2	101.77496	ug/l	100	101.8	90	110	W	
Re	185	193	3	100.14382	ug/l	100	100.1	90	110	Re	
Pt	195	193	2	10.22189	ug/l	10	102.2	90	110	Pt	
Au	197	193	3	99.26778	ug/l	100	99.3	90	110	Au	
Tl	205	193	3	20.16750	ug/l	20	100.8	90	110	Tl	
Pb	208	193	3	101.46636	ug/l	100	101.5	90	110	Pb	
Bi	209	193	2	101.52381	ug/l	100	101.5	90	110	Bi	
Th	232	193	3	101.55256	ug/l	100	101.6	90	110	Th	
U	238	193	3	102.03469	ug/l	100	102.0	90	110	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	5896629	0.51	6327920	93.2	80	120	Li (IS)	
Sc (IS)	45	2	218015	0.63	224146	97.3	80	120	Sc (IS)	
Sc (IS)	45	3	3894064	0.72	3966854	98.2	80	120	Sc (IS)	
Ge (IS)	72	2	498115	1.31	458627	108.6	80	120	Ge (IS)	
Ge (IS)	72	3	3038261	0.28	2917719	104.1	80	120	Ge (IS)	
In (IS)	115	3	21893366	0.68	22065637	99.2	80	120	In (IS)	
Ho (IS)	165	2	16140956	1.54	16245218	99.4	80	120	Ho (IS)	
Ho (IS)	165	3	27091709	0.82	27266963	99.4	80	120	Ho (IS)	
Ir (IS)	193	2	10791959	0.11	10999175	98.1	80	120	Ir (IS)	
Ir (IS)	193	3	13181988	0.73	13591604	97.0	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Continuing Calibration Blank (CCB) - US EPA Method 6020

Sample Name	**CCB 1854886**
Data File Name	**028_CCB.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-26T19:07:02-06:00**
Type	**CCB**
VialNumber	**4**
Dilution	**1**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**003CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	Units	QC High	Analyte	QC Flag
Li	7	6	3	0.15335	ug/l	1.388	Li	
Be	9	6	3	0.01063	ug/l	0.7	Be	
B	11	6	3	5.01658	ug/l	20	B	
Na	23	45	2	0.89574	ug/l	30	Na	
Mg	24	45	2	0.15446	ug/l	11.18	Mg	
Al	27	45	2	-0.32708	ug/l	25.8	Al	
P	31	45	2	-0.76530	ug/l	16.46	P	
K	39	45	2	1.70477	ug/l	83.2	K	
Ca	44	45	3	-14.98375	ug/l	136.2	Ca	
Ti	47	45	3	0.00354	ug/l	4.2	Ti	
V	51	45	2	-0.08857	ug/l	4.74	V	
Cr	52	45	2	-0.00893	ug/l	6.52	Cr	
Mn	55	72	2	0.02812	ug/l	0.49	Mn	
Fe	57	72	2	-0.13118	ug/l	40.7	Fe	
Co	59	72	2	0.00884	ug/l	0.434	Co	
Ni	60	72	2	-0.00304	ug/l	0.8	Ni	
Cu	63	72	2	-0.03622	ug/l	0.902	Cu	
Zn	66	72	2	-0.01791	ug/l	16.58	Zn	
As	75	72	2	0.01550	ug/l	2.36	As	
Se	78	72	2	-0.23694	ug/l	3.18	Se	
Sr	88	72	3	0.00579	ug/l	2	Sr	
Y	89	72	2	0.00015	ug/l	0.424	Y	
Zr	90	72	2	0.01706	ug/l	0.496	Zr	
Nb	93	72	2	0.65679	ug/l	4.62	Nb	
Mo	95	72	3	0.00922	ug/l	2	Mo	
Ru	101	72	2	-0.00229	ug/l	2	Ru	
Rh	103	72	2	0.00170	ug/l	1.634	Rh	
Pd	105	72	2	-0.00348	ug/l	0.08	Pd	
Ag	107	115	3	0.00720	ug/l	1.54	Ag	
Cd	111	115	3	0.01436	ug/l	0.4	Cd	
Sn	118	115	3	0.10427	ug/l	2	Sn	
Sb	121	115	3	0.01385	ug/l	3.34	Sb	
Te	125	165	2	0.03318	ug/l	1.072	Te	
Cs	133	165	2	0.00907	ug/l	0.106	Cs	
Ba	137	165	3	0.01162	ug/l	0.446	Ba	
La	139	165	2	0.00064	ug/l	0.102	La	
Ce	140	165	2	0.00089	ug/l	1.772	Ce	
Pr	141	165	2	0.00038	ug/l	0.084	Pr	
Nd	146	165	2	-0.00030	ug/l	0.208	Nd	
Sm	147	165	3	0.00267	ug/l	0.652	Sm	
Hf	178	165	2	0.04537	ug/l	2.26	Hf	
Ta	181	165	2	0.06930	ug/l	1.46	Ta	
W	182	165	2	0.59617	ug/l	4	W	
Re	185	193	3	0.00170	ug/l	0.05	Re	
Pt	195	193	2	0.00009	ug/l	0.12	Pt	
Au	197	193	3	0.12997	ug/l	1	Au	
Tl	205	193	3	0.02851	ug/l	1.1	Tl	
Pb	208	193	3	0.14380	ug/l	0.346	Pb	
Bi	209	193	2	0.13720	ug/l	1.464	Bi	
Th	232	193	3	0.10134	ug/l	1.104	Th	
U	238	193	3	0.00420	ug/l	0.462	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	5926791	0.46	6327920	93.7	80	120	Li (IS)	
Sc (IS)	45	2	217080	0.35	224146	96.8	80	120	Sc (IS)	
Sc (IS)	45	3	3843718	0.57	3966854	96.9	80	120	Sc (IS)	
Ge (IS)	72	2	465850	0.12	458627	101.6	80	120	Ge (IS)	
Ge (IS)	72	3	2909577	0.34	2917719	99.7	80	120	Ge (IS)	
In (IS)	115	3	21770900	0.39	22065637	98.7	80	120	In (IS)	
Ho (IS)	165	2	15957806	0.05	16245218	98.2	80	120	Ho (IS)	
Ho (IS)	165	3	26785904	0.37	27266963	98.2	80	120	Ho (IS)	
Ir (IS)	193	2	10839034	0.72	10999175	98.5	80	120	Ir (IS)	
Ir (IS)	193	3	13274907	0.22	13591604	97.7	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Sample Name	**280-131107-E-3-B**
Data File Name	**029SMPL.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-26T19:13:46-06:00**
Type	**Sample**
VialNumber	**2111**
Dilution	**2**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**003CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	FinalConcentration	Units	High Value	Analyte	QC Flag
Li	7	6	3	16.21081	32.42162	ug/l	1000	Li	
Be	9	6	3	0.01676	0.03352	ug/l	1000	Be	
B	11	6	3	83.69391	167.38782	ug/l	2000	B	
Na	23	45	2	30539.23356	61078.46711	ug/l	50000	Na	
Mg	24	45	2	25135.56087	50271.12173	ug/l	50000	Mg	
Al	27	45	2	416.01624	832.03248	ug/l	100000	Al	
P	31	45	2	427.53506	855.07013	ug/l	100000	P	
K	39	45	2	4057.11239	8114.22479	ug/l	100000	K	
Ca	44	45	3	84320.00339	168640.00678	ug/l	100000	Ca	
Ti	47	45	3	6.59585	13.19170	ug/l	2000	Ti	
V	51	45	2	0.94274	1.88548	ug/l	2000	V	
Cr	52	45	2	0.70030	1.40060	ug/l	2000	Cr	
Mn	55	72	2	139.15336	278.30673	ug/l	5000	Mn	
Fe	57	72	2	7960.89495	15921.78990	ug/l	100000	Fe	
Co	59	72	2	0.59726	1.19451	ug/l	2000	Co	
Ni	60	72	2	1.00366	2.00733	ug/l	2000	Ni	
Cu	63	72	2	0.83322	1.66643	ug/l	2000	Cu	
Zn	66	72	2	10.12227	20.24454	ug/l	5000	Zn	
As	75	72	2	1.06059	2.12118	ug/l	2000	As	
Se	78	72	2	0.02753	0.05507	ug/l	1000	Se	
Sr	88	72	3	899.52307	1799.04615	ug/l	2000	Sr	
Y	89	72	2	0.16787	0.33575	ug/l	200	Y	
Zr	90	72	2	0.40590	0.81179	ug/l	2000	Zr	
Nb	93	72	2	0.26473	0.52946	ug/l	100	Nb	
Mo	95	72	3	0.26370	0.52739	ug/l	1000	Mo	
Ru	101	72	2	-0.00527	-0.01054	ug/l	200	Ru	
Rh	103	72	2	-0.00244	-0.00489	ug/l	200	Rh	
Pd	105	72	2	0.03700	0.07400	ug/l	20	Pd	
Ag	107	115	3	0.00626	0.01252	ug/l	400	Ag	
Cd	111	115	3	0.02836	0.05671	ug/l	2000	Cd	
Sn	118	115	3	0.04516	0.09031	ug/l	2000	Sn	
Sb	121	115	3	0.07006	0.14012	ug/l	1000	Sb	
Te	125	165	2	0.05222	0.10444	ug/l	200	Te	
Cs	133	165	2	0.06962	0.13924	ug/l	2000	Cs	
Ba	137	165	3	919.92956	1839.85911	ug/l	5000	Ba	
La	139	165	2	0.21132	0.42264	ug/l	200	La	
Ce	140	165	2	0.42024	0.84049	ug/l	200	Ce	
Pr	141	165	2	0.04757	0.09514	ug/l	200	Pr	
Nd	146	165	2	0.20630	0.41261	ug/l	200	Nd	
Sm	147	165	3	0.04234	0.08467	ug/l	2000	Sm	
Hf	178	165	2	0.08142	0.16284	ug/l	200	Hf	
Ta	181	165	2	0.03592	0.07184	ug/l	200	Ta	
W	182	165	2	0.28247	0.56494	ug/l	2000	W	
Re	185	193	3	0.00221	0.00442	ug/l	200	Re	
Pt	195	193	2	0.00226	0.00452	ug/l	200	Pt	
Au	197	193	3	0.03707	0.07414	ug/l	2000	Au	
Tl	205	193	3	0.00468	0.00937	ug/l	400	Tl	
Pb	208	193	3	0.44300	0.88600	ug/l	5000	Pb	
Bi	209	193	2	0.03665	0.07330	ug/l	2000	Bi	
Th	232	193	3	0.11366	0.22731	ug/l	2000	Th	
U	238	193	3	0.15008	0.30016	ug/l	2000	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	5922570	1.12	6327920	93.6	80	120	Li (IS)	
Sc (IS)	45	2	215883	0.81	224146	96.3	80	120	Sc (IS)	
Sc (IS)	45	3	3960328	0.52	3966854	99.8	80	120	Sc (IS)	
Ge (IS)	72	2	468499	0.46	458627	102.2	80	120	Ge (IS)	
Ge (IS)	72	3	2945126	0.86	2917719	100.9	80	120	Ge (IS)	
In (IS)	115	3	20944054	1.10	22065637	94.9	80	120	In (IS)	
Ho (IS)	165	2	15698059	0.47	16245218	96.6	80	120	Ho (IS)	
Ho (IS)	165	3	26648722	0.66	27266963	97.7	80	120	Ho (IS)	
Ir (IS)	193	2	10379650	0.30	10999175	94.4	80	120	Ir (IS)	
Ir (IS)	193	3	12794369	0.71	13591604	94.1	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Sample Name	**280-131107-E-4-B**
Data File Name	**030SMPL.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-26T19:20:29-06:00**
Type	**Sample**
VialNumber	**2112**
Dilution	**2**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**003CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	FinalConcentration	Units	High Value	Analyte	QC Flag
Li	7	6	3	15.36274	30.72548	ug/l	1000	Li	
Be	9	6	3	0.18838	0.37676	ug/l	1000	Be	
B	11	6	3	58.11472	116.22944	ug/l	2000	B	
Na	23	45	2	39678.62780	79357.25560	ug/l	50000	Na	
Mg	24	45	2	24060.66155	48121.32309	ug/l	50000	Mg	
Al	27	45	2	5389.52457	10779.04914	ug/l	100000	Al	
P	31	45	2	567.58155	1135.16311	ug/l	100000	P	
K	39	45	2	5820.67213	11641.34425	ug/l	100000	K	
Ca	44	45	3	82484.14986	164968.29972	ug/l	100000	Ca	
Ti	47	45	3	70.43010	140.86020	ug/l	2000	Ti	
V	51	45	2	11.59178	23.18356	ug/l	2000	V	
Cr	52	45	2	5.57353	11.14706	ug/l	2000	Cr	
Mn	55	72	2	838.61472	1677.22945	ug/l	5000	Mn	
Fe	57	72	2	11846.46332	23692.92665	ug/l	100000	Fe	
Co	59	72	2	2.18109	4.36217	ug/l	2000	Co	
Ni	60	72	2	5.04742	10.09483	ug/l	2000	Ni	
Cu	63	72	2	3.59553	7.19106	ug/l	2000	Cu	
Zn	66	72	2	16.63309	33.26618	ug/l	5000	Zn	
As	75	72	2	11.42335	22.84671	ug/l	2000	As	
Se	78	72	2	0.48015	0.96029	ug/l	1000	Se	
Sr	88	72	3	637.64898	1275.29796	ug/l	2000	Sr	
Y	89	72	2	1.85540	3.71080	ug/l	200	Y	
Zr	90	72	2	2.39542	4.79085	ug/l	2000	Zr	
Nb	93	72	2	0.35063	0.70126	ug/l	100	Nb	
Mo	95	72	3	1.37900	2.75801	ug/l	1000	Mo	
Ru	101	72	2	-0.00236	-0.00471	ug/l	200	Ru	
Rh	103	72	2	-0.00233	-0.00466	ug/l	200	Rh	
Pd	105	72	2	0.03286	0.06572	ug/l	20	Pd	
Ag	107	115	3	0.01996	0.03993	ug/l	400	Ag	
Cd	111	115	3	0.05873	0.11746	ug/l	2000	Cd	
Sn	118	115	3	0.20528	0.41056	ug/l	2000	Sn	
Sb	121	115	3	0.16372	0.32744	ug/l	1000	Sb	
Te	125	165	2	0.03041	0.06082	ug/l	200	Te	
Cs	133	165	2	0.53920	1.07839	ug/l	2000	Cs	
Ba	137	165	3	355.87085	711.74169	ug/l	5000	Ba	
La	139	165	2	2.65729	5.31458	ug/l	200	La	
Ce	140	165	2	5.21433	10.42866	ug/l	200	Ce	
Pr	141	165	2	0.65572	1.31144	ug/l	200	Pr	
Nd	146	165	2	2.49609	4.99218	ug/l	200	Nd	
Sm	147	165	3	0.50835	1.01671	ug/l	2000	Sm	
Hf	178	165	2	0.10021	0.20041	ug/l	200	Hf	
Ta	181	165	2	0.02625	0.05251	ug/l	200	Ta	
W	182	165	2	1.14223	2.28446	ug/l	2000	W	
Re	185	193	3	0.00076	0.00153	ug/l	200	Re	
Pt	195	193	2	0.00132	0.00265	ug/l	200	Pt	
Au	197	193	3	0.01588	0.03177	ug/l	2000	Au	
Tl	205	193	3	0.04140	0.08280	ug/l	400	Tl	
Pb	208	193	3	2.64079	5.28158	ug/l	5000	Pb	
Bi	209	193	2	0.05807	0.11615	ug/l	2000	Bi	
Th	232	193	3	0.95558	1.91116	ug/l	2000	Th	
U	238	193	3	1.24821	2.49642	ug/l	2000	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	5839315	0.19	6327920	92.3	80	120	Li (IS)	
Sc (IS)	45	2	222586	0.78	224146	99.3	80	120	Sc (IS)	
Sc (IS)	45	3	4106339	0.62	3966854	103.5	80	120	Sc (IS)	
Ge (IS)	72	2	474605	0.39	458627	103.5	80	120	Ge (IS)	
Ge (IS)	72	3	2948339	0.19	2917719	101.0	80	120	Ge (IS)	
In (IS)	115	3	20724295	0.60	22065637	93.9	80	120	In (IS)	
Ho (IS)	165	2	15828239	0.76	16245218	97.4	80	120	Ho (IS)	
Ho (IS)	165	3	26561333	0.49	27266963	97.4	80	120	Ho (IS)	
Ir (IS)	193	2	10298657	0.78	10999175	93.6	80	120	Ir (IS)	
Ir (IS)	193	3	12679587	0.80	13591604	93.3	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Sample Name	**280-131107-E-6-B**
Data File Name	**031SMPL.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-26T19:27:12-06:00**
Type	**Sample**
VialNumber	**2201**
Dilution	**2**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**003CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	FinalConcentration	Units	High Value	Analyte	QC Flag
Li	7	6	3	12.58984	25.17968	ug/l	1000	Li	
Be	9	6	3	0.07635	0.15270	ug/l	1000	Be	
B	11	6	3	50.98311	101.96622	ug/l	2000	B	
Na	23	45	2	32483.59786	64967.19573	ug/l	50000	Na	
Mg	24	45	2	14137.42850	28274.85700	ug/l	50000	Mg	
Al	27	45	2	2572.45778	5144.91557	ug/l	100000	Al	
P	31	45	2	229.17011	458.34023	ug/l	100000	P	
K	39	45	2	4426.77166	8853.54333	ug/l	100000	K	
Ca	44	45	3	53385.14828	106770.29656	ug/l	100000	Ca	
Ti	47	45	3	34.03059	68.06118	ug/l	2000	Ti	
V	51	45	2	5.44772	10.89544	ug/l	2000	V	
Cr	52	45	2	2.45090	4.90180	ug/l	2000	Cr	
Mn	55	72	2	362.16000	724.32000	ug/l	5000	Mn	
Fe	57	72	2	2846.85576	5693.71152	ug/l	100000	Fe	
Co	59	72	2	0.97741	1.95482	ug/l	2000	Co	
Ni	60	72	2	3.31886	6.63773	ug/l	2000	Ni	
Cu	63	72	2	1.65051	3.30101	ug/l	2000	Cu	
Zn	66	72	2	8.50403	17.00805	ug/l	5000	Zn	
As	75	72	2	2.97143	5.94287	ug/l	2000	As	
Se	78	72	2	0.25828	0.51655	ug/l	1000	Se	
Sr	88	72	3	369.19652	738.39305	ug/l	2000	Sr	
Y	89	72	2	0.81069	1.62139	ug/l	200	Y	
Zr	90	72	2	1.37965	2.75931	ug/l	2000	Zr	
Nb	93	72	2	0.17982	0.35965	ug/l	100	Nb	
Mo	95	72	3	0.91670	1.83341	ug/l	1000	Mo	
Ru	101	72	2	-0.00792	-0.01584	ug/l	200	Ru	
Rh	103	72	2	-0.00397	-0.00794	ug/l	200	Rh	
Pd	105	72	2	0.01250	0.02500	ug/l	20	Pd	
Ag	107	115	3	0.00418	0.00837	ug/l	400	Ag	
Cd	111	115	3	0.03165	0.06329	ug/l	2000	Cd	
Sn	118	115	3	0.07846	0.15692	ug/l	2000	Sn	
Sb	121	115	3	0.09745	0.19490	ug/l	1000	Sb	
Te	125	165	2	0.00313	0.00625	ug/l	200	Te	
Cs	133	165	2	0.23329	0.46658	ug/l	2000	Cs	
Ba	137	165	3	165.71345	331.42690	ug/l	5000	Ba	
La	139	165	2	1.15413	2.30825	ug/l	200	La	
Ce	140	165	2	2.27133	4.54266	ug/l	200	Ce	
Pr	141	165	2	0.27551	0.55102	ug/l	200	Pr	
Nd	146	165	2	1.06967	2.13933	ug/l	200	Nd	
Sm	147	165	3	0.21072	0.42145	ug/l	2000	Sm	
Hf	178	165	2	0.04627	0.09254	ug/l	200	Hf	
Ta	181	165	2	0.02450	0.04899	ug/l	200	Ta	
W	182	165	2	0.50454	1.00908	ug/l	2000	W	
Re	185	193	3	0.01063	0.02126	ug/l	200	Re	
Pt	195	193	2	0.00159	0.00318	ug/l	200	Pt	
Au	197	193	3	0.00330	0.00659	ug/l	2000	Au	
Tl	205	193	3	0.00529	0.01059	ug/l	400	Tl	
Pb	208	193	3	1.11225	2.22451	ug/l	5000	Pb	
Bi	209	193	2	0.02624	0.05248	ug/l	2000	Bi	
Th	232	193	3	0.40713	0.81425	ug/l	2000	Th	
U	238	193	3	2.54272	5.08543	ug/l	2000	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	5720546	1.06	6327920	90.4	80	120	Li (IS)	
Sc (IS)	45	2	217163	0.55	224146	96.9	80	120	Sc (IS)	
Sc (IS)	45	3	3923234	0.58	3966854	98.9	80	120	Sc (IS)	
Ge (IS)	72	2	473886	0.83	458627	103.3	80	120	Ge (IS)	
Ge (IS)	72	3	2927992	0.58	2917719	100.4	80	120	Ge (IS)	
In (IS)	115	3	20859191	0.62	22065637	94.5	80	120	In (IS)	
Ho (IS)	165	2	15884515	0.51	16245218	97.8	80	120	Ho (IS)	
Ho (IS)	165	3	26417424	0.86	27266963	96.9	80	120	Ho (IS)	
Ir (IS)	193	2	10326935	0.84	10999175	93.9	80	120	Ir (IS)	
Ir (IS)	193	3	12675615	1.03	13591604	93.3	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Sample Name	**MB 160-454230/1-A**
Data File Name	**032SMPL.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-26T19:33:55-06:00**
Type	**Sample**
VialNumber	**2202**
Dilution	**2**
Comment	**454230**
Operator	**LP 7700**
ISTDRefDataFileName	**003CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	FinalConcentration	Units	High Value	Analyte	QC Flag
Li	7	6	3	0.31809	0.63618	ug/l	1000	Li	
Be	9	6	3	-0.00719	-0.01438	ug/l	1000	Be	
B	11	6	3	2.48895	4.97790	ug/l	2000	B	
Na	23	45	2	3.77228	7.54456	ug/l	50000	Na	
Mg	24	45	2	0.91985	1.83970	ug/l	50000	Mg	
Al	27	45	2	1.99270	3.98539	ug/l	100000	Al	
P	31	45	2	5.84280	11.68561	ug/l	100000	P	
K	39	45	2	2.47006	4.94012	ug/l	100000	K	
Ca	44	45	3	-10.05630	-20.11259	ug/l	100000	Ca	
Ti	47	45	3	0.07468	0.14935	ug/l	2000	Ti	
V	51	45	2	-0.10466	-0.20931	ug/l	2000	V	
Cr	52	45	2	-0.02080	-0.04161	ug/l	2000	Cr	
Mn	55	72	2	0.01920	0.03839	ug/l	5000	Mn	
Fe	57	72	2	0.22455	0.44911	ug/l	100000	Fe	
Co	59	72	2	-0.00683	-0.01366	ug/l	2000	Co	
Ni	60	72	2	0.00448	0.00895	ug/l	2000	Ni	
Cu	63	72	2	-0.11125	-0.22250	ug/l	2000	Cu	
Zn	66	72	2	0.16049	0.32099	ug/l	5000	Zn	
As	75	72	2	-0.05521	-0.11043	ug/l	2000	As	
Se	78	72	2	-0.20191	-0.40381	ug/l	1000	Se	
Sr	88	72	3	0.02854	0.05709	ug/l	2000	Sr	
Y	89	72	2	-0.00560	-0.01121	ug/l	200	Y	
Zr	90	72	2	-0.01059	-0.02119	ug/l	2000	Zr	
Nb	93	72	2	0.04626	0.09251	ug/l	100	Nb	
Mo	95	72	3	-0.08190	-0.16380	ug/l	1000	Mo	
Ru	101	72	2	-0.00674	-0.01349	ug/l	200	Ru	
Rh	103	72	2	-0.00376	-0.00751	ug/l	200	Rh	
Pd	105	72	2	-0.00611	-0.01222	ug/l	20	Pd	
Ag	107	115	3	-0.00565	-0.01129	ug/l	400	Ag	
Cd	111	115	3	-0.00553	-0.01106	ug/l	2000	Cd	
Sn	118	115	3	-0.04035	-0.08070	ug/l	2000	Sn	
Sb	121	115	3	-0.00400	-0.00800	ug/l	1000	Sb	
Te	125	165	2	0.00669	0.01337	ug/l	200	Te	
Cs	133	165	2	-0.00067	-0.00135	ug/l	2000	Cs	
Ba	137	165	3	0.02963	0.05926	ug/l	5000	Ba	
La	139	165	2	-0.00305	-0.00610	ug/l	200	La	
Ce	140	165	2	-0.00384	-0.00769	ug/l	200	Ce	
Pr	141	165	2	-0.00393	-0.00787	ug/l	200	Pr	
Nd	146	165	2	-0.00442	-0.00885	ug/l	200	Nd	
Sm	147	165	3	-0.00319	-0.00639	ug/l	2000	Sm	
Hf	178	165	2	-0.01350	-0.02699	ug/l	200	Hf	
Ta	181	165	2	0.01812	0.03623	ug/l	200	Ta	
W	182	165	2	0.05878	0.11756	ug/l	2000	W	
Re	185	193	3	-0.00296	-0.00591	ug/l	200	Re	
Pt	195	193	2	0.00163	0.00327	ug/l	200	Pt	
Au	197	193	3	0.00037	0.00075	ug/l	2000	Au	
Tl	205	193	3	-0.02368	-0.04736	ug/l	400	Tl	
Pb	208	193	3	0.04899	0.09799	ug/l	5000	Pb	
Bi	209	193	2	0.00192	0.00384	ug/l	2000	Bi	
Th	232	193	3	-0.02472	-0.04944	ug/l	2000	Th	
U	238	193	3	-0.00367	-0.00735	ug/l	2000	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	5851178	0.36	6327920	92.5	80	120	Li (IS)	
Sc (IS)	45	2	217240	3.99	224146	96.9	80	120	Sc (IS)	
Sc (IS)	45	3	3820861	0.15	3966854	96.3	80	120	Sc (IS)	
Ge (IS)	72	2	469506	2.20	458627	102.4	80	120	Ge (IS)	
Ge (IS)	72	3	2958284	0.30	2917719	101.4	80	120	Ge (IS)	
In (IS)	115	3	21805203	0.64	22065637	98.8	80	120	In (IS)	
Ho (IS)	165	2	15905949	3.78	16245218	97.9	80	120	Ho (IS)	
Ho (IS)	165	3	26687757	1.07	27266963	97.9	80	120	Ho (IS)	
Ir (IS)	193	2	10700367	3.65	10999175	97.3	80	120	Ir (IS)	
Ir (IS)	193	3	13148429	0.96	13591604	96.7	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Sample Name	**LCS 160-454230/2-A**
Data File Name	**033SMPL.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-26T19:40:38-06:00**
Type	**Sample**
VialNumber	**2203**
Dilution	**2**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**003CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	FinalConcentration	Units	High Value	Analyte	QC Flag
Li	7	6	3	50.65723	101.31445	ug/l	1000	Li	
Be	9	6	3	49.69370	99.38740	ug/l	1000	Be	
B	11	6	3	98.59359	197.18717	ug/l	2000	B	
Na	23	45	2	5171.33883	10342.67765	ug/l	50000	Na	
Mg	24	45	2	5136.41481	10272.82962	ug/l	50000	Mg	
Al	27	45	2	5080.07379	10160.14757	ug/l	100000	Al	
P	31	45	2	515.64413	1031.28827	ug/l	100000	P	
K	39	45	2	5093.47829	10186.95659	ug/l	100000	K	
Ca	44	45	3	5149.50303	10299.00606	ug/l	100000	Ca	
Ti	47	45	3	507.28448	1014.56896	ug/l	2000	Ti	
V	51	45	2	497.23629	994.47259	ug/l	2000	V	
Cr	52	45	2	499.82168	999.64336	ug/l	2000	Cr	
Mn	55	72	2	534.35020	1068.70040	ug/l	5000	Mn	
Fe	57	72	2	5392.94823	10785.89646	ug/l	100000	Fe	
Co	59	72	2	532.58493	1065.16987	ug/l	2000	Co	
Ni	60	72	2	560.27733	1120.55465	ug/l	2000	Ni	
Cu	63	72	2	548.93199	1097.86397	ug/l	2000	Cu	
Zn	66	72	2	551.99671	1103.99343	ug/l	5000	Zn	
As	75	72	2	511.08839	1022.17679	ug/l	2000	As	
Se	78	72	2	253.77925	507.55850	ug/l	1000	Se	
Sr	88	72	3	508.88293	1017.76586	ug/l	2000	Sr	
Y	89	72	2	0.00259	0.00518	ug/l	200	Y	
Zr	90	72	2	542.53201	1085.06402	ug/l	2000	Zr	
Nb	93	72	2	0.51013	1.02027	ug/l	100	Nb	
Mo	95	72	3	253.83423	507.66845	ug/l	1000	Mo	
Ru	101	72	2	-0.00658	-0.01315	ug/l	200	Ru	
Rh	103	72	2	0.02111	0.04223	ug/l	200	Rh	
Pd	105	72	2	0.02743	0.05486	ug/l	20	Pd	
Ag	107	115	3	98.32433	196.64866	ug/l	400	Ag	
Cd	111	115	3	506.77683	1013.55365	ug/l	2000	Cd	
Sn	118	115	3	495.31124	990.62247	ug/l	2000	Sn	
Sb	121	115	3	249.42045	498.84090	ug/l	1000	Sb	
Te	125	165	2	0.11132	0.22264	ug/l	200	Te	
Cs	133	165	2	0.00030	0.00059	ug/l	2000	Cs	
Ba	137	165	3	484.09407	968.18814	ug/l	5000	Ba	
La	139	165	2	0.77372	1.54743	ug/l	200	La	
Ce	140	165	2	0.01671	0.03341	ug/l	200	Ce	
Pr	141	165	2	0.00061	0.00121	ug/l	200	Pr	
Nd	146	165	2	0.00673	0.01346	ug/l	200	Nd	
Sm	147	165	3	502.35525	1004.71051	ug/l	2000	Sm	
Hf	178	165	2	0.35638	0.71276	ug/l	200	Hf	
Ta	181	165	2	0.51818	1.03636	ug/l	200	Ta	
W	182	165	2	513.50385	1027.00770	ug/l	2000	W	
Re	185	193	3	0.00782	0.01563	ug/l	200	Re	
Pt	195	193	2	0.00369	0.00738	ug/l	200	Pt	
Au	197	193	3	0.01071	0.02142	ug/l	2000	Au	
Tl	205	193	3	101.40166	202.80331	ug/l	400	Tl	
Pb	208	193	3	512.69987	1025.39973	ug/l	5000	Pb	
Bi	209	193	2	513.82928	1027.65856	ug/l	2000	Bi	
Th	232	193	3	515.56626	1031.13251	ug/l	2000	Th	
U	238	193	3	519.26687	1038.53373	ug/l	2000	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	5509991	0.35	6327920	87.1	80	120	Li (IS)	
Sc (IS)	45	2	212683	0.94	224146	94.9	80	120	Sc (IS)	
Sc (IS)	45	3	3732684	0.62	3966854	94.1	80	120	Sc (IS)	
Ge (IS)	72	2	454973	0.43	458627	99.2	80	120	Ge (IS)	
Ge (IS)	72	3	2896012	0.38	2917719	99.3	80	120	Ge (IS)	
In (IS)	115	3	20961909	0.43	22065637	95.0	80	120	In (IS)	
Ho (IS)	165	2	15541603	0.73	16245218	95.7	80	120	Ho (IS)	
Ho (IS)	165	3	26646193	0.90	27266963	97.7	80	120	Ho (IS)	
Ir (IS)	193	2	10181673	0.75	10999175	92.6	80	120	Ir (IS)	
Ir (IS)	193	3	12897781	0.38	13591604	94.9	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Sample Name	**280-131840-I-1-A**
Data File Name	**034SMPL.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-26T19:47:21-06:00**
Type	**Sample**
VialNumber	**2204**
Dilution	**2**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**003CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	FinalConcentration	Units	High Value	Analyte	QC Flag
Li	7	6	3	47.28443	94.56885	ug/l	1000	Li	
Be	9	6	3	0.02055	0.04110	ug/l	1000	Be	
B	11	6	3	280.41932	560.83864	ug/l	2000	B	
Na	23	45	2	105959.74884	211919.49769	ug/l	50000	Na	FAILED
Mg	24	45	2	13700.25572	27400.51144	ug/l	50000	Mg	
Al	27	45	2	719.68503	1439.37005	ug/l	100000	Al	
P	31	45	2	390.18236	780.36472	ug/l	100000	P	
K	39	45	2	10025.01134	20050.02267	ug/l	100000	K	
Ca	44	45	3	33076.51043	66153.02087	ug/l	100000	Ca	
Ti	47	45	3	14.56878	29.13755	ug/l	2000	Ti	
V	51	45	2	8.31201	16.62401	ug/l	2000	V	
Cr	52	45	2	12.69736	25.39471	ug/l	2000	Cr	
Mn	55	72	2	120.30951	240.61903	ug/l	5000	Mn	
Fe	57	72	2	1533.62834	3067.25667	ug/l	100000	Fe	
Co	59	72	2	1.22723	2.45446	ug/l	2000	Co	
Ni	60	72	2	10.09923	20.19846	ug/l	2000	Ni	
Cu	63	72	2	37.36630	74.73259	ug/l	2000	Cu	
Zn	66	72	2	109.01304	218.02607	ug/l	5000	Zn	
As	75	72	2	3.42695	6.85390	ug/l	2000	As	
Se	78	72	2	1.45050	2.90099	ug/l	1000	Se	
Sr	88	72	3	458.50431	917.00863	ug/l	2000	Sr	
Y	89	72	2	0.26851	0.53702	ug/l	200	Y	
Zr	90	72	2	4.54896	9.09791	ug/l	2000	Zr	
Nb	93	72	2	0.20610	0.41219	ug/l	100	Nb	
Mo	95	72	3	3.85142	7.70284	ug/l	1000	Mo	
Ru	101	72	2	-0.00456	-0.00912	ug/l	200	Ru	
Rh	103	72	2	-0.00277	-0.00554	ug/l	200	Rh	
Pd	105	72	2	0.02278	0.04557	ug/l	20	Pd	
Ag	107	115	3	0.10340	0.20679	ug/l	400	Ag	
Cd	111	115	3	1.10381	2.20763	ug/l	2000	Cd	
Sn	118	115	3	1.85500	3.70999	ug/l	2000	Sn	
Sb	121	115	3	14.07751	28.15502	ug/l	1000	Sb	
Te	125	165	2	0.03168	0.06335	ug/l	200	Te	
Cs	133	165	2	0.06627	0.13254	ug/l	2000	Cs	
Ba	137	165	3	74.95821	149.91643	ug/l	5000	Ba	
La	139	165	2	0.32208	0.64415	ug/l	200	La	
Ce	140	165	2	0.65731	1.31462	ug/l	200	Ce	
Pr	141	165	2	0.07436	0.14872	ug/l	200	Pr	
Nd	146	165	2	0.29988	0.59975	ug/l	200	Nd	
Sm	147	165	3	0.06856	0.13712	ug/l	2000	Sm	
Hf	178	165	2	0.05128	0.10256	ug/l	200	Hf	
Ta	181	165	2	0.02903	0.05806	ug/l	200	Ta	
W	182	165	2	3.00821	6.01641	ug/l	2000	W	
Re	185	193	3	0.00300	0.00600	ug/l	200	Re	
Pt	195	193	2	0.01216	0.02433	ug/l	200	Pt	
Au	197	193	3	0.00226	0.00452	ug/l	2000	Au	
Tl	205	193	3	0.10568	0.21135	ug/l	400	Tl	
Pb	208	193	3	12.13962	24.27924	ug/l	5000	Pb	
Bi	209	193	2	0.21063	0.42127	ug/l	2000	Bi	
Th	232	193	3	0.31614	0.63228	ug/l	2000	Th	
U	238	193	3	3.20301	6.40602	ug/l	2000	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	5640341	0.37	6327920	89.1	80	120	Li (IS)	
Sc (IS)	45	2	211422	2.30	224146	94.3	80	120	Sc (IS)	
Sc (IS)	45	3	3865355	0.33	3966854	97.4	80	120	Sc (IS)	
Ge (IS)	72	2	462862	2.11	458627	100.9	80	120	Ge (IS)	
Ge (IS)	72	3	2868938	0.64	2917719	98.3	80	120	Ge (IS)	
In (IS)	115	3	20442593	1.04	22065637	92.6	80	120	In (IS)	
Ho (IS)	165	2	15299724	1.16	16245218	94.2	80	120	Ho (IS)	
Ho (IS)	165	3	25720647	0.79	27266963	94.3	80	120	Ho (IS)	
Ir (IS)	193	2	10002477	0.69	10999175	90.9	80	120	Ir (IS)	
Ir (IS)	193	3	12201733	0.30	13591604	89.8	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Sample Name	**280-131840-I-2-A**
Data File Name	**035SMPL.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-26T19:54:11-06:00**
Type	**Sample**
VialNumber	**2205**
Dilution	**2**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**003CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	FinalConcentration	Units	High Value	Analyte	QC Flag
Li	7	6	3	64.45192	128.90384	ug/l	1000	Li	
Be	9	6	3	-0.00105	-0.00210	ug/l	1000	Be	
B	11	6	3	163.89089	327.78178	ug/l	2000	B	
Na	23	45	2	536203.51086	1072407.02173	ug/l	50000	Na	FAILED
Mg	24	45	2	13401.17429	26802.34857	ug/l	50000	Mg	
Al	27	45	2	127.94066	255.88131	ug/l	100000	Al	
P	31	45	2	50.46863	100.93726	ug/l	100000	P	
K	39	45	2	12431.27180	24862.54360	ug/l	100000	K	
Ca	44	45	3	11663.85938	23327.71877	ug/l	100000	Ca	
Ti	47	45	3	2.25988	4.51976	ug/l	2000	Ti	
V	51	45	2	1.57731	3.15462	ug/l	2000	V	
Cr	52	45	2	3.86293	7.72587	ug/l	2000	Cr	
Mn	55	72	2	35.36778	70.73557	ug/l	5000	Mn	
Fe	57	72	2	1079.88463	2159.76925	ug/l	100000	Fe	
Co	59	72	2	0.64573	1.29146	ug/l	2000	Co	
Ni	60	72	2	24.09948	48.19896	ug/l	2000	Ni	
Cu	63	72	2	54.02497	108.04995	ug/l	2000	Cu	
Zn	66	72	2	23.32914	46.65828	ug/l	5000	Zn	
As	75	72	2	1.23192	2.46384	ug/l	2000	As	
Se	78	72	2	1.80560	3.61120	ug/l	1000	Se	
Sr	88	72	3	300.93116	601.86232	ug/l	2000	Sr	
Y	89	72	2	0.07858	0.15715	ug/l	200	Y	
Zr	90	72	2	1.21078	2.42156	ug/l	2000	Zr	
Nb	93	72	2	0.04888	0.09775	ug/l	100	Nb	
Mo	95	72	3	18.99907	37.99813	ug/l	1000	Mo	
Ru	101	72	2	-0.00620	-0.01239	ug/l	200	Ru	
Rh	103	72	2	-0.00314	-0.00627	ug/l	200	Rh	
Pd	105	72	2	0.01066	0.02132	ug/l	20	Pd	
Ag	107	115	3	0.02330	0.04661	ug/l	400	Ag	
Cd	111	115	3	0.17544	0.35089	ug/l	2000	Cd	
Sn	118	115	3	1.78721	3.57441	ug/l	2000	Sn	
Sb	121	115	3	20.88650	41.77301	ug/l	1000	Sb	
Te	125	165	2	0.02274	0.04547	ug/l	200	Te	
Cs	133	165	2	0.04587	0.09174	ug/l	2000	Cs	
Ba	137	165	3	18.74022	37.48044	ug/l	5000	Ba	
La	139	165	2	0.06108	0.12215	ug/l	200	La	
Ce	140	165	2	0.13808	0.27616	ug/l	200	Ce	
Pr	141	165	2	0.01204	0.02408	ug/l	200	Pr	
Nd	146	165	2	0.06261	0.12523	ug/l	200	Nd	
Sm	147	165	3	0.01842	0.03684	ug/l	2000	Sm	
Hf	178	165	2	0.00353	0.00707	ug/l	200	Hf	
Ta	181	165	2	0.04384	0.08767	ug/l	200	Ta	
W	182	165	2	1.12983	2.25966	ug/l	2000	W	
Re	185	193	3	0.00607	0.01215	ug/l	200	Re	
Pt	195	193	2	0.00102	0.00204	ug/l	200	Pt	
Au	197	193	3	0.00055	0.00111	ug/l	2000	Au	
Tl	205	193	3	0.00928	0.01856	ug/l	400	Tl	
Pb	208	193	3	4.58396	9.16791	ug/l	5000	Pb	
Bi	209	193	2	0.06414	0.12828	ug/l	2000	Bi	
Th	232	193	3	0.09655	0.19309	ug/l	2000	Th	
U	238	193	3	3.80416	7.60831	ug/l	2000	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	5910792	3.04	6327920	93.4	80	120	Li (IS)	
Sc (IS)	45	2	220394	3.61	224146	98.3	80	120	Sc (IS)	
Sc (IS)	45	3	3918140	3.08	3966854	98.8	80	120	Sc (IS)	
Ge (IS)	72	2	467436	2.56	458627	101.9	80	120	Ge (IS)	
Ge (IS)	72	3	2813262	2.44	2917719	96.4	80	120	Ge (IS)	
In (IS)	115	3	19764165	3.70	22065637	89.6	80	120	In (IS)	
Ho (IS)	165	2	14870662	3.54	16245218	91.5	80	120	Ho (IS)	
Ho (IS)	165	3	24561180	2.24	27266963	90.1	80	120	Ho (IS)	
Ir (IS)	193	2	9363462	2.25	10999175	85.1	80	120	Ir (IS)	
Ir (IS)	193	3	11468221	2.64	13591604	84.4	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Sample Name	**280-131840-I-2-A SD**
Data File Name	**036SMPL.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-26T20:01:00-06:00**
Type	**Sample**
VialNumber	**2206**
Dilution	**10**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**003CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	FinalConcentration	Units	High Value	Analyte	QC Flag
Li	7	6	3	12.75870	127.58701	ug/l	1000	Li	
Be	9	6	3	-0.00431	-0.04309	ug/l	1000	Be	
B	11	6	3	33.07284	330.72836	ug/l	2000	B	
Na	23	45	2	102991.35485	1029913.54849	ug/l	50000	Na	FAILED
Mg	24	45	2	2603.77019	26037.70187	ug/l	50000	Mg	
Al	27	45	2	25.93047	259.30473	ug/l	100000	Al	
P	31	45	2	8.81359	88.13589	ug/l	100000	P	
K	39	45	2	2394.08976	23940.89755	ug/l	100000	K	
Ca	44	45	3	2290.16076	22901.60760	ug/l	100000	Ca	
Ti	47	45	3	0.44048	4.40482	ug/l	2000	Ti	
V	51	45	2	0.26085	2.60853	ug/l	2000	V	
Cr	52	45	2	0.72873	7.28726	ug/l	2000	Cr	
Mn	55	72	2	6.86041	68.60408	ug/l	5000	Mn	
Fe	57	72	2	209.65170	2096.51702	ug/l	100000	Fe	
Co	59	72	2	0.13413	1.34135	ug/l	2000	Co	
Ni	60	72	2	4.75023	47.50235	ug/l	2000	Ni	
Cu	63	72	2	10.47856	104.78561	ug/l	2000	Cu	
Zn	66	72	2	4.68257	46.82571	ug/l	5000	Zn	
As	75	72	2	0.20273	2.02735	ug/l	2000	As	
Se	78	72	2	0.15841	1.58407	ug/l	1000	Se	
Sr	88	72	3	57.87063	578.70627	ug/l	2000	Sr	
Y	89	72	2	0.01221	0.12205	ug/l	200	Y	
Zr	90	72	2	0.20308	2.03079	ug/l	2000	Zr	
Nb	93	72	2	-0.01205	-0.12048	ug/l	100	Nb	
Mo	95	72	3	3.58604	35.86037	ug/l	1000	Mo	
Ru	101	72	2	-0.00707	-0.07067	ug/l	200	Ru	
Rh	103	72	2	-0.00340	-0.03397	ug/l	200	Rh	
Pd	105	72	2	-0.00162	-0.01619	ug/l	20	Pd	
Ag	107	115	3	-0.00630	-0.06302	ug/l	400	Ag	
Cd	111	115	3	0.02978	0.29777	ug/l	2000	Cd	
Sn	118	115	3	0.32252	3.22520	ug/l	2000	Sn	
Sb	121	115	3	4.02659	40.26588	ug/l	1000	Sb	
Te	125	165	2	0.00325	0.03249	ug/l	200	Te	
Cs	133	165	2	0.00840	0.08401	ug/l	2000	Cs	
Ba	137	165	3	3.63498	36.34985	ug/l	5000	Ba	
La	139	165	2	0.01022	0.10220	ug/l	200	La	
Ce	140	165	2	0.02333	0.23325	ug/l	200	Ce	
Pr	141	165	2	-0.00032	-0.00319	ug/l	200	Pr	
Nd	146	165	2	0.01019	0.10187	ug/l	200	Nd	
Sm	147	165	3	0.00349	0.03487	ug/l	2000	Sm	
Hf	178	165	2	-0.01122	-0.11217	ug/l	200	Hf	
Ta	181	165	2	0.00489	0.04889	ug/l	200	Ta	
W	182	165	2	0.20859	2.08589	ug/l	2000	W	
Re	185	193	3	-0.00092	-0.00924	ug/l	200	Re	
Pt	195	193	2	0.00057	0.00574	ug/l	200	Pt	
Au	197	193	3	-0.00259	-0.02594	ug/l	2000	Au	
Tl	205	193	3	-0.01028	-0.10281	ug/l	400	Tl	
Pb	208	193	3	0.87812	8.78120	ug/l	5000	Pb	
Bi	209	193	2	0.00599	0.05993	ug/l	2000	Bi	
Th	232	193	3	-0.00572	-0.05717	ug/l	2000	Th	
U	238	193	3	0.71832	7.18316	ug/l	2000	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	5864752	0.77	6327920	92.7	80	120	Li (IS)	
Sc (IS)	45	2	219075	1.37	224146	97.7	80	120	Sc (IS)	
Sc (IS)	45	3	3866611	0.93	3966854	97.5	80	120	Sc (IS)	
Ge (IS)	72	2	471601	0.34	458627	102.8	80	120	Ge (IS)	
Ge (IS)	72	3	2940350	0.99	2917719	100.8	80	120	Ge (IS)	
In (IS)	115	3	20998242	0.56	22065637	95.2	80	120	In (IS)	
Ho (IS)	165	2	15692291	1.02	16245218	96.6	80	120	Ho (IS)	
Ho (IS)	165	3	26105183	0.68	27266963	95.7	80	120	Ho (IS)	
Ir (IS)	193	2	10071620	0.66	10999175	91.6	80	120	Ir (IS)	
Ir (IS)	193	3	12554102	0.23	13591604	92.4	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Sample Name	**280-131840-I-2-B MS**
Data File Name	**037SMPL.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-26T20:07:48-06:00**
Type	**Sample**
VialNumber	**2207**
Dilution	**2**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**003CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	FinalConcentration	Units	High Value	Analyte	QC Flag
Li	7	6	3	112.55255	225.10511	ug/l	1000	Li	
Be	9	6	3	48.72571	97.45143	ug/l	1000	Be	
B	11	6	3	254.33974	508.67949	ug/l	2000	B	
Na	23	45	2	508268.70224	1016537.40449	ug/l	50000	Na	FAILED
Mg	24	45	2	17376.63517	34753.27034	ug/l	50000	Mg	
Al	27	45	2	5059.20126	10118.40252	ug/l	100000	Al	
P	31	45	2	540.93374	1081.86748	ug/l	100000	P	
K	39	45	2	16536.06744	33072.13487	ug/l	100000	K	
Ca	44	45	3	16213.70941	32427.41883	ug/l	100000	Ca	
Ti	47	45	3	501.24971	1002.49943	ug/l	2000	Ti	
V	51	45	2	494.00372	988.00744	ug/l	2000	V	
Cr	52	45	2	473.73875	947.47750	ug/l	2000	Cr	
Mn	55	72	2	550.97813	1101.95627	ug/l	5000	Mn	
Fe	57	72	2	6232.13843	12464.27686	ug/l	100000	Fe	
Co	59	72	2	501.26143	1002.52287	ug/l	2000	Co	
Ni	60	72	2	540.18437	1080.36874	ug/l	2000	Ni	
Cu	63	72	2	543.84909	1087.69818	ug/l	2000	Cu	
Zn	66	72	2	531.52563	1063.05127	ug/l	5000	Zn	
As	75	72	2	505.49338	1010.98675	ug/l	2000	As	
Se	78	72	2	252.84379	505.68758	ug/l	1000	Se	
Sr	88	72	3	806.44084	1612.88169	ug/l	2000	Sr	
Y	89	72	2	0.08277	0.16554	ug/l	200	Y	
Zr	90	72	2	530.26630	1060.53260	ug/l	2000	Zr	
Nb	93	72	2	0.24702	0.49404	ug/l	100	Nb	
Mo	95	72	3	278.85902	557.71804	ug/l	1000	Mo	
Ru	101	72	2	-0.00749	-0.01497	ug/l	200	Ru	
Rh	103	72	2	0.02051	0.04101	ug/l	200	Rh	
Pd	105	72	2	0.05025	0.10051	ug/l	20	Pd	
Ag	107	115	3	92.47278	184.94556	ug/l	400	Ag	
Cd	111	115	3	488.07998	976.15996	ug/l	2000	Cd	
Sn	118	115	3	509.15541	1018.31083	ug/l	2000	Sn	
Sb	121	115	3	271.46335	542.92671	ug/l	1000	Sb	
Te	125	165	2	0.13679	0.27357	ug/l	200	Te	
Cs	133	165	2	0.05013	0.10026	ug/l	2000	Cs	
Ba	137	165	3	512.20802	1024.41604	ug/l	5000	Ba	
La	139	165	2	0.83358	1.66716	ug/l	200	La	
Ce	140	165	2	0.15622	0.31244	ug/l	200	Ce	
Pr	141	165	2	0.01868	0.03735	ug/l	200	Pr	
Nd	146	165	2	0.06917	0.13834	ug/l	200	Nd	
Sm	147	165	3	508.18778	1016.37557	ug/l	2000	Sm	
Hf	178	165	2	0.12413	0.24827	ug/l	200	Hf	
Ta	181	165	2	0.32233	0.64466	ug/l	200	Ta	
W	182	165	2	495.83931	991.67863	ug/l	2000	W	
Re	185	193	3	0.01707	0.03414	ug/l	200	Re	
Pt	195	193	2	0.00357	0.00714	ug/l	200	Pt	
Au	197	193	3	0.00400	0.00800	ug/l	2000	Au	
Tl	205	193	3	97.90269	195.80538	ug/l	400	Tl	
Pb	208	193	3	497.64172	995.28344	ug/l	5000	Pb	
Bi	209	193	2	506.57087	1013.14174	ug/l	2000	Bi	
Th	232	193	3	517.54352	1035.08705	ug/l	2000	Th	
U	238	193	3	519.95878	1039.91755	ug/l	2000	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	5605339	0.68	6327920	88.6	80	120	Li (IS)	
Sc (IS)	45	2	220840	1.00	224146	98.5	80	120	Sc (IS)	
Sc (IS)	45	3	3760303	1.01	3966854	94.8	80	120	Sc (IS)	
Ge (IS)	72	2	460460	1.46	458627	100.4	80	120	Ge (IS)	
Ge (IS)	72	3	2685544	1.03	2917719	92.0	80	120	Ge (IS)	
In (IS)	115	3	18737240	1.44	22065637	84.9	80	120	In (IS)	
Ho (IS)	165	2	14792924	0.38	16245218	91.1	80	120	Ho (IS)	
Ho (IS)	165	3	23469023	0.96	27266963	86.1	80	120	Ho (IS)	
Ir (IS)	193	2	9151837	0.28	10999175	83.2	80	120	Ir (IS)	
Ir (IS)	193	3	10930609	0.51	13591604	80.4	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Sample Name	**280-131840-I-2-C MSD**
Data File Name	**038SMPL.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-26T20:14:39-06:00**
Type	**Sample**
VialNumber	**2208**
Dilution	**2**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**003CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	FinalConcentration	Units	High Value	Analyte	QC Flag
Li	7	6	3	114.00335	228.00669	ug/l	1000	Li	
Be	9	6	3	49.32476	98.64951	ug/l	1000	Be	
B	11	6	3	260.72655	521.45310	ug/l	2000	B	
Na	23	45	2	508944.48885	1017888.97769	ug/l	50000	Na	FAILED
Mg	24	45	2	17490.12646	34980.25293	ug/l	50000	Mg	
Al	27	45	2	5142.63046	10285.26091	ug/l	100000	Al	
P	31	45	2	548.20275	1096.40550	ug/l	100000	P	
K	39	45	2	16739.84697	33479.69394	ug/l	100000	K	
Ca	44	45	3	16282.99730	32565.99461	ug/l	100000	Ca	
Ti	47	45	3	504.38523	1008.77047	ug/l	2000	Ti	
V	51	45	2	490.74752	981.49505	ug/l	2000	V	
Cr	52	45	2	476.98470	953.96939	ug/l	2000	Cr	
Mn	55	72	2	568.37413	1136.74826	ug/l	5000	Mn	
Fe	57	72	2	6408.28975	12816.57950	ug/l	100000	Fe	
Co	59	72	2	512.20177	1024.40354	ug/l	2000	Co	
Ni	60	72	2	546.20381	1092.40762	ug/l	2000	Ni	
Cu	63	72	2	548.82226	1097.64452	ug/l	2000	Cu	
Zn	66	72	2	549.20291	1098.40581	ug/l	5000	Zn	
As	75	72	2	513.28270	1026.56540	ug/l	2000	As	
Se	78	72	2	261.70435	523.40870	ug/l	1000	Se	
Sr	88	72	3	808.73900	1617.47799	ug/l	2000	Sr	
Y	89	72	2	0.08773	0.17545	ug/l	200	Y	
Zr	90	72	2	539.87511	1079.75021	ug/l	2000	Zr	
Nb	93	72	2	0.19516	0.39033	ug/l	100	Nb	
Mo	95	72	3	278.59445	557.18889	ug/l	1000	Mo	
Ru	101	72	2	-0.00592	-0.01184	ug/l	200	Ru	
Rh	103	72	2	0.01873	0.03745	ug/l	200	Rh	
Pd	105	72	2	0.04056	0.08112	ug/l	20	Pd	
Ag	107	115	3	93.29769	186.59538	ug/l	400	Ag	
Cd	111	115	3	493.28311	986.56622	ug/l	2000	Cd	
Sn	118	115	3	510.24784	1020.49568	ug/l	2000	Sn	
Sb	121	115	3	272.59908	545.19815	ug/l	1000	Sb	
Te	125	165	2	0.07763	0.15527	ug/l	200	Te	
Cs	133	165	2	0.04800	0.09600	ug/l	2000	Cs	
Ba	137	165	3	509.23963	1018.47926	ug/l	5000	Ba	
La	139	165	2	0.84702	1.69405	ug/l	200	La	
Ce	140	165	2	0.16271	0.32542	ug/l	200	Ce	
Pr	141	165	2	0.01772	0.03544	ug/l	200	Pr	
Nd	146	165	2	0.06788	0.13577	ug/l	200	Nd	
Sm	147	165	3	505.94033	1011.88067	ug/l	2000	Sm	
Hf	178	165	2	0.08996	0.17992	ug/l	200	Hf	
Ta	181	165	2	0.26521	0.53042	ug/l	200	Ta	
W	182	165	2	497.47838	994.95677	ug/l	2000	W	
Re	185	193	3	0.01710	0.03420	ug/l	200	Re	
Pt	195	193	2	0.00502	0.01005	ug/l	200	Pt	
Au	197	193	3	0.00138	0.00276	ug/l	2000	Au	
Tl	205	193	3	98.99127	197.98254	ug/l	400	Tl	
Pb	208	193	3	499.34635	998.69270	ug/l	5000	Pb	
Bi	209	193	2	504.82718	1009.65437	ug/l	2000	Bi	
Th	232	193	3	518.14378	1036.28756	ug/l	2000	Th	
U	238	193	3	529.42538	1058.85076	ug/l	2000	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	5664754	1.31	6327920	89.5	80	120	Li (IS)	
Sc (IS)	45	2	226446	1.22	224146	101.0	80	120	Sc (IS)	
Sc (IS)	45	3	3835690	0.65	3966854	96.7	80	120	Sc (IS)	
Ge (IS)	72	2	462606	1.18	458627	100.9	80	120	Ge (IS)	
Ge (IS)	72	3	2745755	0.76	2917719	94.1	80	120	Ge (IS)	
In (IS)	115	3	19172752	0.51	22065637	86.9	80	120	In (IS)	
Ho (IS)	165	2	14967343	1.44	16245218	92.1	80	120	Ho (IS)	
Ho (IS)	165	3	24028779	0.61	27266963	88.1	80	120	Ho (IS)	
Ir (IS)	193	2	9182894	1.33	10999175	83.5	80	120	Ir (IS)	
Ir (IS)	193	3	11111478	0.36	13591604	81.8	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Sample Name	**CCVL 1856860**
Data File Name	**039LCCV.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-26T20:21:29-06:00**
Type	**CRI**
VialNumber	**1101**
Dilution	**1**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**003CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	Units	ExpectedValue	%Recovery	%QC Low	%QC High	Analyte	QC Flag
Li	7	6	3	5.40855	ug/l	5	108.2	80	120	Li	
Be	9	6	3	0.50750	ug/l	0.5	101.5	80	120	Be	
B	11	6	3	98.42600	ug/l	100	98.4	80	120	B	
Na	23	45	2	190.20733	ug/l	100	190.2	80	120	Na	FAILED
Mg	24	45	2	58.20417	ug/l	50	116.4	80	120	Mg	
Al	27	45	2	59.11502	ug/l	50	118.2	80	120	Al	
P	31	45	2	98.80717	ug/l	100	98.8	80	120	P	
K	39	45	2	108.93001	ug/l	100	108.9	80	120	K	
Ca	44	45	3	228.03306	ug/l	200	114.0	80	120	Ca	
Ti	47	45	3	5.07486	ug/l	5	101.5	80	120	Ti	
V	51	45	2	9.60874	ug/l	10	96.1	80	120	V	
Cr	52	45	2	10.09452	ug/l	10	100.9	80	120	Cr	
Mn	55	72	2	4.25434	ug/l	4	106.4	80	120	Mn	
Fe	57	72	2	52.52463	ug/l	50	105.0	80	120	Fe	
Co	59	72	2	2.11455	ug/l	2	105.7	80	120	Co	
Ni	60	72	2	5.50875	ug/l	5	110.2	80	120	Ni	
Cu	63	72	2	2.94858	ug/l	3	98.3	80	120	Cu	
Zn	66	72	2	21.85978	ug/l	20	109.3	80	120	Zn	
As	75	72	2	10.37134	ug/l	10	103.7	80	120	As	
Se	78	72	2	5.24101	ug/l	5	104.8	80	120	Se	
Sr	88	72	3	5.24969	ug/l	5	105.0	80	120	Sr	
Y	89	72	2	5.18048	ug/l	5	103.6	80	120	Y	
Zr	90	72	2	5.30460	ug/l	5	106.1	80	120	Zr	
Nb	93	72	2	19.47948	ug/l	25	77.9	80	120	Nb	FAILED
Mo	95	72	3	5.07360	ug/l	5	101.5	80	120	Mo	
Ru	101	72	2	10.35336	ug/l	10	103.5	80	120	Ru	
Rh	103	72	2	10.08837	ug/l	10	100.9	80	120	Rh	
Pd	105	72	2	0.56029	ug/l	0.5	112.1	80	120	Pd	
Ag	107	115	3	1.94087	ug/l	2	97.0	80	120	Ag	
Cd	111	115	3	0.52493	ug/l	0.5	105.0	80	120	Cd	
Sn	118	115	3	1.82833	ug/l	2	91.4	80	120	Sn	
Sb	121	115	3	4.71682	ug/l	5	94.3	80	120	Sb	
Te	125	165	2	9.89510	ug/l	10	99.0	80	120	Te	
Cs	133	165	2	0.97006	ug/l	1	97.0	80	120	Cs	
Ba	137	165	3	1.95276	ug/l	2	97.6	80	120	Ba	
La	139	165	2	1.91520	ug/l	2	95.8	80	120	La	
Ce	140	165	2	9.50680	ug/l	10	95.1	80	120	Ce	
Pr	141	165	2	1.92766	ug/l	2	96.4	80	120	Pr	
Nd	146	165	2	1.91259	ug/l	2	95.6	80	120	Nd	
Sm	147	165	3	9.64887	ug/l	10	96.5	80	120	Sm	
Hf	178	165	2	8.83285	ug/l	10	88.3	80	120	Hf	
Ta	181	165	2	6.25664	ug/l	10	62.6	80	120	Ta	FAILED
W	182	165	2	5.51494	ug/l	5	110.3	80	120	W	
Re	185	193	3	9.28956	ug/l	10	92.9	80	120	Re	
Pt	195	193	2	0.99975	ug/l	1	100.0	80	120	Pt	
Au	197	193	3	4.69366	ug/l	5	93.9	80	120	Au	
Tl	205	193	3	2.00710	ug/l	2	100.4	80	120	Tl	
Pb	208	193	3	2.89906	ug/l	3	96.6	80	120	Pb	
Bi	209	193	2	20.62252	ug/l	20	103.1	80	120	Bi	
Th	232	193	3	2.10694	ug/l	2	105.3	80	120	Th	
U	238	193	3	0.95810	ug/l	1	95.8	80	120	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	5569034	0.51	6327920	88.0	80	120	Li (IS)	
Sc (IS)	45	2	219924	0.49	224146	98.1	80	120	Sc (IS)	
Sc (IS)	45	3	3687286	0.14	3966854	93.0	80	120	Sc (IS)	
Ge (IS)	72	2	480321	0.53	458627	104.7	80	120	Ge (IS)	
Ge (IS)	72	3	2818916	1.04	2917719	96.6	80	120	Ge (IS)	
In (IS)	115	3	20957316	0.56	22065637	95.0	80	120	In (IS)	
Ho (IS)	165	2	15925951	0.13	16245218	98.0	80	120	Ho (IS)	
Ho (IS)	165	3	25479917	1.00	27266963	93.4	80	120	Ho (IS)	
Ir (IS)	193	2	10468844	0.53	10999175	95.2	80	120	Ir (IS)	
Ir (IS)	193	3	12566126	0.52	13591604	92.5	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Continuing Calibration Verification (CCV) - US EPA Method 6020

Sample Name	**CCV 1856861**
Data File Name	**040_CCV.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-26T20:28:12-06:00**
Type	**CCV**
VialNumber	**1102**
Dilution	**1**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**003CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	Units	ExpectedValue	%Recovery	%QC Low	%QC High	Analyte	QC Flag
Li	7	6	3	100.27361	ug/l	100	100.3	90	110	Li	
Be	9	6	3	98.53570	ug/l	100	98.5	90	110	Be	
B	11	6	3	204.69897	ug/l	200	102.3	90	110	B	
Na	23	45	2	2470.05303	ug/l	2500	98.8	90	110	Na	
Mg	24	45	2	2493.68010	ug/l	2500	99.7	90	110	Mg	
Al	27	45	2	2690.81605	ug/l	2500	107.6	90	110	Al	
P	31	45	2	2468.54071	ug/l	2500	98.7	90	110	P	
K	39	45	2	2528.05694	ug/l	2500	101.1	90	110	K	
Ca	44	45	3	2481.18357	ug/l	2500	99.2	90	110	Ca	
Ti	47	45	3	98.68269	ug/l	100	98.7	90	110	Ti	
V	51	45	2	96.96946	ug/l	100	97.0	90	110	V	
Cr	52	45	2	98.40569	ug/l	100	98.4	90	110	Cr	
Mn	55	72	2	98.94945	ug/l	100	98.9	90	110	Mn	
Fe	57	72	2	2437.38728	ug/l	2500	97.5	90	110	Fe	
Co	59	72	2	99.19789	ug/l	100	99.2	90	110	Co	
Ni	60	72	2	100.75111	ug/l	100	100.8	90	110	Ni	
Cu	63	72	2	98.93650	ug/l	100	98.9	90	110	Cu	
Zn	66	72	2	99.65629	ug/l	100	99.7	90	110	Zn	
As	75	72	2	99.66562	ug/l	100	99.7	90	110	As	
Se	78	72	2	51.17989	ug/l	50	102.4	90	110	Se	
Sr	88	72	3	102.37512	ug/l	100	102.4	90	110	Sr	
Y	89	72	2	102.97848	ug/l	100	103.0	90	110	Y	
Zr	90	72	2	101.42716	ug/l	100	101.4	90	110	Zr	
Nb	93	72	2	50.15991	ug/l	50	100.3	90	110	Nb	
Mo	95	72	3	48.64859	ug/l	50	97.3	90	110	Mo	
Ru	101	72	2	98.25192	ug/l	100	98.3	90	110	Ru	
Rh	103	72	2	100.94322	ug/l	100	100.9	90	110	Rh	
Pd	105	72	2	10.22877	ug/l	10	102.3	90	110	Pd	
Ag	107	115	3	19.19876	ug/l	20	96.0	90	110	Ag	
Cd	111	115	3	94.81756	ug/l	100	94.8	90	110	Cd	
Sn	118	115	3	98.43529	ug/l	100	98.4	90	110	Sn	
Sb	121	115	3	48.75555	ug/l	50	97.5	90	110	Sb	
Te	125	165	2	99.46460	ug/l	100	99.5	90	110	Te	
Cs	133	165	2	101.28254	ug/l	100	101.3	90	110	Cs	
Ba	137	165	3	96.89769	ug/l	100	96.9	90	110	Ba	
La	139	165	2	100.62577	ug/l	100	100.6	90	110	La	
Ce	140	165	2	100.24988	ug/l	100	100.2	90	110	Ce	
Pr	141	165	2	101.02915	ug/l	100	101.0	90	110	Pr	
Nd	146	165	2	95.10568	ug/l	100	95.1	90	110	Nd	
Sm	147	165	3	99.27124	ug/l	100	99.3	90	110	Sm	
Hf	178	165	2	100.50532	ug/l	100	100.5	90	110	Hf	
Ta	181	165	2	98.09480	ug/l	100	98.1	90	110	Ta	
W	182	165	2	100.28175	ug/l	100	100.3	90	110	W	
Re	185	193	3	99.32236	ug/l	100	99.3	90	110	Re	
Pt	195	193	2	10.03541	ug/l	10	100.4	90	110	Pt	
Au	197	193	3	97.33689	ug/l	100	97.3	90	110	Au	
Tl	205	193	3	20.01330	ug/l	20	100.1	90	110	Tl	
Pb	208	193	3	100.50723	ug/l	100	100.5	90	110	Pb	
Bi	209	193	2	101.62250	ug/l	100	101.6	90	110	Bi	
Th	232	193	3	100.11997	ug/l	100	100.1	90	110	Th	
U	238	193	3	100.25179	ug/l	100	100.3	90	110	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	5329667	0.73	6327920	84.2	80	120	Li (IS)	
Sc (IS)	45	2	211421	1.18	224146	94.3	80	120	Sc (IS)	
Sc (IS)	45	3	3659735	1.10	3966854	92.3	80	120	Sc (IS)	
Ge (IS)	72	2	483803	0.94	458627	105.5	80	120	Ge (IS)	
Ge (IS)	72	3	2824472	0.23	2917719	96.8	80	120	Ge (IS)	
In (IS)	115	3	20816087	1.04	22065637	94.3	80	120	In (IS)	
Ho (IS)	165	2	15628678	1.46	16245218	96.2	80	120	Ho (IS)	
Ho (IS)	165	3	25960066	0.73	27266963	95.2	80	120	Ho (IS)	
Ir (IS)	193	2	10392267	1.61	10999175	94.5	80	120	Ir (IS)	
Ir (IS)	193	3	12709861	0.91	13591604	93.5	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Continuing Calibration Blank (CCB) - US EPA Method 6020

Sample Name	**CCB 1854886**
Data File Name	**041_CCB.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-26T20:34:57-06:00**
Type	**CCB**
VialNumber	**4**
Dilution	**1**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**003CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	Units	QC High	Analyte	QC Flag
Li	7	6	3	0.25202	ug/l	1.388	Li	
Be	9	6	3	0.00282	ug/l	0.7	Be	
B	11	6	3	4.65043	ug/l	20	B	
Na	23	45	2	21.62757	ug/l	30	Na	
Mg	24	45	2	0.06777	ug/l	11.18	Mg	
Al	27	45	2	-0.07862	ug/l	25.8	Al	
P	31	45	2	-2.73438	ug/l	16.46	P	
K	39	45	2	1.50765	ug/l	83.2	K	
Ca	44	45	3	-21.05054	ug/l	136.2	Ca	
Ti	47	45	3	-0.00454	ug/l	4.2	Ti	
V	51	45	2	-0.07587	ug/l	4.74	V	
Cr	52	45	2	0.00013	ug/l	6.52	Cr	
Mn	55	72	2	0.02163	ug/l	0.49	Mn	
Fe	57	72	2	0.04562	ug/l	40.7	Fe	
Co	59	72	2	0.00973	ug/l	0.434	Co	
Ni	60	72	2	-0.00367	ug/l	0.8	Ni	
Cu	63	72	2	-0.28038	ug/l	0.902	Cu	
Zn	66	72	2	-0.09782	ug/l	16.58	Zn	
As	75	72	2	0.02044	ug/l	2.36	As	
Se	78	72	2	0.05852	ug/l	3.18	Se	
Sr	88	72	3	0.00820	ug/l	2	Sr	
Y	89	72	2	0.00093	ug/l	0.424	Y	
Zr	90	72	2	0.01779	ug/l	0.496	Zr	
Nb	93	72	2	0.59368	ug/l	4.62	Nb	
Mo	95	72	3	-0.02233	ug/l	2	Mo	
Ru	101	72	2	-0.00320	ug/l	2	Ru	
Rh	103	72	2	0.00267	ug/l	1.634	Rh	
Pd	105	72	2	-0.00432	ug/l	0.08	Pd	
Ag	107	115	3	-0.00371	ug/l	1.54	Ag	
Cd	111	115	3	0.00877	ug/l	0.4	Cd	
Sn	118	115	3	0.02395	ug/l	2	Sn	
Sb	121	115	3	0.02564	ug/l	3.34	Sb	
Te	125	165	2	0.05962	ug/l	1.072	Te	
Cs	133	165	2	0.01122	ug/l	0.106	Cs	
Ba	137	165	3	0.01152	ug/l	0.446	Ba	
La	139	165	2	0.00236	ug/l	0.102	La	
Ce	140	165	2	0.00167	ug/l	1.772	Ce	
Pr	141	165	2	0.00186	ug/l	0.084	Pr	
Nd	146	165	2	0.00240	ug/l	0.208	Nd	
Sm	147	165	3	0.00367	ug/l	0.652	Sm	
Hf	178	165	2	0.04250	ug/l	2.26	Hf	
Ta	181	165	2	0.05286	ug/l	1.46	Ta	
W	182	165	2	0.49091	ug/l	4	W	
Re	185	193	3	0.00263	ug/l	0.05	Re	
Pt	195	193	2	-0.00268	ug/l	0.12	Pt	
Au	197	193	3	0.13424	ug/l	1	Au	
Tl	205	193	3	0.02981	ug/l	1.1	Tl	
Pb	208	193	3	0.05968	ug/l	0.346	Pb	
Bi	209	193	2	0.02267	ug/l	1.464	Bi	
Th	232	193	3	0.10256	ug/l	1.104	Th	
U	238	193	3	0.00666	ug/l	0.462	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	5232162	0.26	6327920	82.7	80	120	Li (IS)	
Sc (IS)	45	2	203929	0.30	224146	91.0	80	120	Sc (IS)	
Sc (IS)	45	3	3500524	0.19	3966854	88.2	80	120	Sc (IS)	
Ge (IS)	72	2	447104	1.35	458627	97.5	80	120	Ge (IS)	
Ge (IS)	72	3	2671819	0.18	2917719	91.6	80	120	Ge (IS)	
In (IS)	115	3	20298540	0.52	22065637	92.0	80	120	In (IS)	
Ho (IS)	165	2	15381773	0.20	16245218	94.7	80	120	Ho (IS)	
Ho (IS)	165	3	25207079	0.51	27266963	92.4	80	120	Ho (IS)	
Ir (IS)	193	2	10295397	0.35	10999175	93.6	80	120	Ir (IS)	
Ir (IS)	193	3	12407994	0.12	13591604	91.3	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Sample Name	**280-131840-I-2-A PDS**
Data File Name	**042SMPL.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-26T20:41:41-06:00**
Type	**Sample**
VialNumber	**2209**
Dilution	**2**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**003CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	FinalConcentration	Units	High Value	Analyte	QC Flag
Li	7	6	3	113.76579	227.53158	ug/l	1000	Li	
Be	9	6	3	5.10070	10.20140	ug/l	1000	Be	
B	11	6	3	1164.57154	2329.14307	ug/l	2000	B	
Na	23	45	2	506369.77971	1012739.55941	ug/l	50000	Na	FAILED
Mg	24	45	2	13193.59724	26387.19448	ug/l	50000	Mg	
Al	27	45	2	670.42280	1340.84560	ug/l	100000	Al	
P	31	45	2	1085.87006	2171.74011	ug/l	100000	P	
K	39	45	2	12784.50739	25569.01479	ug/l	100000	K	
Ca	44	45	3	13254.26977	26508.53955	ug/l	100000	Ca	
Ti	47	45	3	53.21211	106.42421	ug/l	2000	Ti	
V	51	45	2	102.40236	204.80473	ug/l	2000	V	
Cr	52	45	2	103.64361	207.28722	ug/l	2000	Cr	
Mn	55	72	2	75.56734	151.13468	ug/l	5000	Mn	
Fe	57	72	2	1538.07492	3076.14985	ug/l	100000	Fe	
Co	59	72	2	20.83837	41.67673	ug/l	2000	Co	
Ni	60	72	2	75.03554	150.07107	ug/l	2000	Ni	
Cu	63	72	2	80.65577	161.31154	ug/l	2000	Cu	
Zn	66	72	2	227.58199	455.16398	ug/l	5000	Zn	
As	75	72	2	107.06978	214.13956	ug/l	2000	As	
Se	78	72	2	54.23198	108.46395	ug/l	1000	Se	
Sr	88	72	3	343.43089	686.86179	ug/l	2000	Sr	
Y	89	72	2	0.08047	0.16094	ug/l	200	Y	
Zr	90	72	2	53.38690	106.77381	ug/l	2000	Zr	
Nb	93	72	2	1.30107	2.60215	ug/l	100	Nb	
Mo	95	72	3	68.98264	137.96529	ug/l	1000	Mo	
Ru	101	72	2	-0.00594	-0.01189	ug/l	200	Ru	
Rh	103	72	2	-0.00161	-0.00322	ug/l	200	Rh	
Pd	105	72	2	0.01238	0.02475	ug/l	20	Pd	
Ag	107	115	3	18.39677	36.79354	ug/l	400	Ag	
Cd	111	115	3	5.03517	10.07034	ug/l	2000	Cd	
Sn	118	115	3	21.49216	42.98432	ug/l	2000	Sn	
Sb	121	115	3	72.45523	144.91046	ug/l	1000	Sb	
Te	125	165	2	0.02766	0.05533	ug/l	200	Te	
Cs	133	165	2	0.04880	0.09761	ug/l	2000	Cs	
Ba	137	165	3	37.22917	74.45833	ug/l	5000	Ba	
La	139	165	2	0.07047	0.14094	ug/l	200	La	
Ce	140	165	2	0.13853	0.27707	ug/l	200	Ce	
Pr	141	165	2	0.01208	0.02416	ug/l	200	Pr	
Nd	146	165	2	0.06327	0.12653	ug/l	200	Nd	
Sm	147	165	3	104.67637	209.35273	ug/l	2000	Sm	
Hf	178	165	2	0.40681	0.81363	ug/l	200	Hf	
Ta	181	165	2	0.76727	1.53454	ug/l	200	Ta	
W	182	165	2	51.39900	102.79800	ug/l	2000	W	
Re	185	193	3	0.01065	0.02130	ug/l	200	Re	
Pt	195	193	2	0.00552	0.01103	ug/l	200	Pt	
Au	197	193	3	0.05205	0.10409	ug/l	2000	Au	
Tl	205	193	3	20.49325	40.98649	ug/l	400	Tl	
Pb	208	193	3	34.01936	68.03873	ug/l	5000	Pb	
Bi	209	193	2	0.04174	0.08347	ug/l	2000	Bi	
Th	232	193	3	21.73550	43.47100	ug/l	2000	Th	
U	238	193	3	14.90996	29.81991	ug/l	2000	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	5412373	0.48	6327920	85.5	80	120	Li (IS)	
Sc (IS)	45	2	209070	1.49	224146	93.3	80	120	Sc (IS)	
Sc (IS)	45	3	3600339	1.20	3966854	90.8	80	120	Sc (IS)	
Ge (IS)	72	2	446721	1.70	458627	97.4	80	120	Ge (IS)	
Ge (IS)	72	3	2620832	0.85	2917719	89.8	80	120	Ge (IS)	
In (IS)	115	3	18454800	1.28	22065637	83.6	80	120	In (IS)	
Ho (IS)	165	2	14340430	1.07	16245218	88.3	80	120	Ho (IS)	
Ho (IS)	165	3	23040295	0.88	27266963	84.5	80	120	Ho (IS)	
Ir (IS)	193	2	8862232	1.85	10999175	80.6	80	120	Ir (IS)	
Ir (IS)	193	3	10789110	0.62	13591604	79.4	80	120	Ir (IS)	FAILED

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Sample Name	**160-36457-A-149-B**
Data File Name	**043SMPL.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-26T20:48:29-06:00**
Type	**Sample**
VialNumber	**2210**
Dilution	**10**
Comment	**453793**
Operator	**LP 7700**
ISTDRefDataFileName	**003CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	FinalConcentration	Units	High Value	Analyte	QC Flag
Li	7	6	3	12.33012	123.30120	ug/l	1000	Li	
Be	9	6	3	1.47459	14.74587	ug/l	1000	Be	
B	11	6	3	20.10976	201.09756	ug/l	2000	B	
Na	23	45	2	830.95910	8309.59100	ug/l	50000	Na	
Mg	24	45	2	1446.97014	14469.70138	ug/l	50000	Mg	
Al	27	45	2	5322.19616	53221.96164	ug/l	100000	Al	
P	31	45	2	73.84871	738.48709	ug/l	100000	P	
K	39	45	2	858.91791	8589.17905	ug/l	100000	K	
Ca	44	45	3	5467.37156	54673.71562	ug/l	100000	Ca	
Ti	47	45	3	240.13414	2401.34138	ug/l	2000	Ti	
V	51	45	2	64.51245	645.12454	ug/l	2000	V	
Cr	52	45	2	6.96261	69.62610	ug/l	2000	Cr	
Mn	55	72	2	377.95357	3779.53571	ug/l	5000	Mn	
Fe	57	72	2	29560.11020	295601.10199	ug/l	100000	Fe	
Co	59	72	2	35.20204	352.02042	ug/l	2000	Co	
Ni	60	72	2	8.57313	85.73129	ug/l	2000	Ni	
Cu	63	72	2	31.92117	319.21173	ug/l	2000	Cu	
Zn	66	72	2	11.30767	113.07673	ug/l	5000	Zn	
As	75	72	2	37.11435	371.14346	ug/l	2000	As	
Se	78	72	2	3.28529	32.85293	ug/l	1000	Se	
Sr	88	72	3	115.47992	1154.79917	ug/l	2000	Sr	
Y	89	72	2	12.53360	125.33595	ug/l	200	Y	
Zr	90	72	2	7.55666	75.56664	ug/l	2000	Zr	
Nb	93	72	2	0.23672	2.36717	ug/l	100	Nb	
Mo	95	72	3	0.75002	7.50022	ug/l	1000	Mo	
Ru	101	72	2	-0.00671	-0.06709	ug/l	200	Ru	
Rh	103	72	2	-0.00149	-0.01490	ug/l	200	Rh	
Pd	105	72	2	0.02090	0.20903	ug/l	20	Pd	
Ag	107	115	3	0.05580	0.55803	ug/l	400	Ag	
Cd	111	115	3	0.06851	0.68510	ug/l	2000	Cd	
Sn	118	115	3	3.32651	33.26508	ug/l	2000	Sn	
Sb	121	115	3	0.24335	2.43354	ug/l	1000	Sb	
Te	125	165	2	0.19315	1.93155	ug/l	200	Te	
Cs	133	165	2	3.47678	34.76783	ug/l	2000	Cs	
Ba	137	165	3	358.16636	3581.66364	ug/l	5000	Ba	
La	139	165	2	31.68021	316.80206	ug/l	200	La	
Ce	140	165	2	91.79232	917.92315	ug/l	200	Ce	
Pr	141	165	2	12.54003	125.40028	ug/l	200	Pr	
Nd	146	165	2	49.56052	495.60523	ug/l	200	Nd	
Sm	147	165	3	9.26391	92.63905	ug/l	2000	Sm	
Hf	178	165	2	0.24213	2.42133	ug/l	200	Hf	
Ta	181	165	2	-0.00069	-0.00693	ug/l	200	Ta	
W	182	165	2	0.13433	1.34326	ug/l	2000	W	
Re	185	193	3	0.00203	0.02030	ug/l	200	Re	
Pt	195	193	2	0.00382	0.03817	ug/l	200	Pt	
Au	197	193	3	0.01775	0.17750	ug/l	2000	Au	
Tl	205	193	3	0.18833	1.88332	ug/l	400	Tl	
Pb	208	193	3	33.87359	338.73594	ug/l	5000	Pb	
Bi	209	193	2	1.92758	19.27575	ug/l	2000	Bi	
Th	232	193	3	13.74826	137.48263	ug/l	2000	Th	
U	238	193	3	5.38370	53.83700	ug/l	2000	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	5308106	0.51	6327920	83.9	80	120	Li (IS)	
Sc (IS)	45	2	229551	0.60	224146	102.4	80	120	Sc (IS)	
Sc (IS)	45	3	3955700	0.75	3966854	99.7	80	120	Sc (IS)	
Ge (IS)	72	2	466546	0.85	458627	101.7	80	120	Ge (IS)	
Ge (IS)	72	3	2782423	0.88	2917719	95.4	80	120	Ge (IS)	
In (IS)	115	3	20113985	1.16	22065637	91.2	80	120	In (IS)	
Ho (IS)	165	2	15432192	0.67	16245218	95.0	80	120	Ho (IS)	
Ho (IS)	165	3	25122592	0.59	27266963	92.1	80	120	Ho (IS)	
Ir (IS)	193	2	10075317	0.43	10999175	91.6	80	120	Ir (IS)	
Ir (IS)	193	3	12277547	0.75	13591604	90.3	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Sample Name	**160-36457-A-155-A**
Data File Name	**044SMPL.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-26T20:55:13-06:00**
Type	**Sample**
VialNumber	**2211**
Dilution	**10**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**003CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	FinalConcentration	Units	High Value	Analyte	QC Flag
Li	7	6	3	2.36471	23.64705	ug/l	1000	Li	
Be	9	6	3	0.28063	2.80633	ug/l	1000	Be	
B	11	6	3	8.80324	88.03237	ug/l	2000	B	
Na	23	45	2	4738.74468	47387.44683	ug/l	50000	Na	
Mg	24	45	2	1713.88759	17138.87591	ug/l	50000	Mg	
Al	27	45	2	1912.26158	19122.61579	ug/l	100000	Al	
P	31	45	2	30.51297	305.12970	ug/l	100000	P	
K	39	45	2	814.09031	8140.90312	ug/l	100000	K	
Ca	44	45	3	16150.24444	161502.44443	ug/l	100000	Ca	
Ti	47	45	3	192.12087	1921.20868	ug/l	2000	Ti	
V	51	45	2	10.06085	100.60853	ug/l	2000	V	
Cr	52	45	2	3.81748	38.17476	ug/l	2000	Cr	
Mn	55	72	2	29.97861	299.78614	ug/l	5000	Mn	
Fe	57	72	2	13079.65324	130796.53237	ug/l	100000	Fe	
Co	59	72	2	3.54389	35.43885	ug/l	2000	Co	
Ni	60	72	2	1.55978	15.59785	ug/l	2000	Ni	
Cu	63	72	2	14.72739	147.27391	ug/l	2000	Cu	
Zn	66	72	2	5.30075	53.00751	ug/l	5000	Zn	
As	75	72	2	54.12830	541.28297	ug/l	2000	As	
Se	78	72	2	2.93234	29.32341	ug/l	1000	Se	
Sr	88	72	3	125.89293	1258.92931	ug/l	2000	Sr	
Y	89	72	2	9.82160	98.21604	ug/l	200	Y	
Zr	90	72	2	60.38751	603.87507	ug/l	2000	Zr	
Nb	93	72	2	0.89560	8.95595	ug/l	100	Nb	
Mo	95	72	3	600.01611	6000.16110	ug/l	1000	Mo	
Ru	101	72	2	-0.00514	-0.05139	ug/l	200	Ru	
Rh	103	72	2	0.00054	0.00541	ug/l	200	Rh	
Pd	105	72	2	0.01679	0.16787	ug/l	20	Pd	
Ag	107	115	3	0.09873	0.98732	ug/l	400	Ag	
Cd	111	115	3	0.23270	2.32700	ug/l	2000	Cd	
Sn	118	115	3	2.44191	24.41906	ug/l	2000	Sn	
Sb	121	115	3	2.18964	21.89642	ug/l	1000	Sb	
Te	125	165	2	0.01902	0.19017	ug/l	200	Te	
Cs	133	165	2	0.30115	3.01147	ug/l	2000	Cs	
Ba	137	165	3	66.00198	660.01979	ug/l	5000	Ba	
La	139	165	2	4.69191	46.91905	ug/l	200	La	
Ce	140	165	2	15.28317	152.83167	ug/l	200	Ce	
Pr	141	165	2	2.16045	21.60450	ug/l	200	Pr	
Nd	146	165	2	9.93410	99.34097	ug/l	200	Nd	
Sm	147	165	3	3.74233	37.42327	ug/l	2000	Sm	
Hf	178	165	2	0.79390	7.93900	ug/l	200	Hf	
Ta	181	165	2	0.00058	0.00580	ug/l	200	Ta	
W	182	165	2	0.12201	1.22011	ug/l	2000	W	
Re	185	193	3	0.02455	0.24553	ug/l	200	Re	
Pt	195	193	2	0.00338	0.03375	ug/l	200	Pt	
Au	197	193	3	0.01523	0.15233	ug/l	2000	Au	
Tl	205	193	3	8.51602	85.16024	ug/l	400	Tl	
Pb	208	193	3	37.36679	373.66787	ug/l	5000	Pb	
Bi	209	193	2	0.18476	1.84759	ug/l	2000	Bi	
Th	232	193	3	12.49641	124.96413	ug/l	2000	Th	
U	238	193	3	541.52957	5415.29567	ug/l	2000	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	5368973	0.18	6327920	84.8	80	120	Li (IS)	
Sc (IS)	45	2	240513	0.69	224146	107.3	80	120	Sc (IS)	
Sc (IS)	45	3	4154352	0.62	3966854	104.7	80	120	Sc (IS)	
Ge (IS)	72	2	466873	0.35	458627	101.8	80	120	Ge (IS)	
Ge (IS)	72	3	2799313	0.35	2917719	95.9	80	120	Ge (IS)	
In (IS)	115	3	20487483	0.53	22065637	92.8	80	120	In (IS)	
Ho (IS)	165	2	15395984	0.11	16245218	94.8	80	120	Ho (IS)	
Ho (IS)	165	3	25494390	0.61	27266963	93.5	80	120	Ho (IS)	
Ir (IS)	193	2	10053543	0.85	10999175	91.4	80	120	Ir (IS)	
Ir (IS)	193	3	12411553	1.00	13591604	91.3	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Sample Name	**160-36457-A-157-A**
Data File Name	**045SMPL.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-26T21:01:58-06:00**
Type	**Sample**
VialNumber	**2212**
Dilution	**10**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**003CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	FinalConcentration	Units	High Value	Analyte	QC Flag
Li	7	6	3	7.11301	71.13013	ug/l	1000	Li	
Be	9	6	3	0.91793	9.17930	ug/l	1000	Be	
B	11	6	3	8.11032	81.10322	ug/l	2000	B	
Na	23	45	2	403.40934	4034.09341	ug/l	50000	Na	
Mg	24	45	2	2145.46401	21454.64005	ug/l	50000	Mg	
Al	27	45	2	5886.64630	58866.46297	ug/l	100000	Al	
P	31	45	2	125.16272	1251.62720	ug/l	100000	P	
K	39	45	2	938.27491	9382.74913	ug/l	100000	K	
Ca	44	45	3	5010.60081	50106.00810	ug/l	100000	Ca	
Ti	47	45	3	105.61750	1056.17503	ug/l	2000	Ti	
V	51	45	2	21.59588	215.95875	ug/l	2000	V	
Cr	52	45	2	5.82494	58.24941	ug/l	2000	Cr	
Mn	55	72	2	208.76349	2087.63495	ug/l	5000	Mn	
Fe	57	72	2	14649.40929	146494.09287	ug/l	100000	Fe	
Co	59	72	2	32.31122	323.11221	ug/l	2000	Co	
Ni	60	72	2	13.41793	134.17931	ug/l	2000	Ni	
Cu	63	72	2	11.52642	115.26423	ug/l	2000	Cu	
Zn	66	72	2	27.69465	276.94649	ug/l	5000	Zn	
As	75	72	2	44.30622	443.06221	ug/l	2000	As	
Se	78	72	2	2.93736	29.37363	ug/l	1000	Se	
Sr	88	72	3	108.45879	1084.58789	ug/l	2000	Sr	
Y	89	72	2	25.83698	258.36984	ug/l	200	Y	
Zr	90	72	2	17.21190	172.11905	ug/l	2000	Zr	
Nb	93	72	2	0.35848	3.58483	ug/l	100	Nb	
Mo	95	72	3	219.45871	2194.58714	ug/l	1000	Mo	
Ru	101	72	2	-0.00643	-0.06429	ug/l	200	Ru	
Rh	103	72	2	-0.00143	-0.01431	ug/l	200	Rh	
Pd	105	72	2	0.03472	0.34719	ug/l	20	Pd	
Ag	107	115	3	0.05265	0.52653	ug/l	400	Ag	
Cd	111	115	3	1.06833	10.68326	ug/l	2000	Cd	
Sn	118	115	3	3.11753	31.17533	ug/l	2000	Sn	
Sb	121	115	3	0.28339	2.83388	ug/l	1000	Sb	
Te	125	165	2	0.03487	0.34870	ug/l	200	Te	
Cs	133	165	2	0.82720	8.27200	ug/l	2000	Cs	
Ba	137	165	3	211.90534	2119.05336	ug/l	5000	Ba	
La	139	165	2	24.63683	246.36826	ug/l	200	La	
Ce	140	165	2	68.87601	688.76006	ug/l	200	Ce	
Pr	141	165	2	8.67751	86.77511	ug/l	200	Pr	
Nd	146	165	2	36.84967	368.49672	ug/l	200	Nd	
Sm	147	165	3	7.94839	79.48392	ug/l	2000	Sm	
Hf	178	165	2	0.32776	3.27761	ug/l	200	Hf	
Ta	181	165	2	-0.00726	-0.07256	ug/l	200	Ta	
W	182	165	2	0.03082	0.30820	ug/l	2000	W	
Re	185	193	3	-0.00012	-0.00121	ug/l	200	Re	
Pt	195	193	2	0.00071	0.00713	ug/l	200	Pt	
Au	197	193	3	0.00597	0.05965	ug/l	2000	Au	
Tl	205	193	3	4.24915	42.49149	ug/l	400	Tl	
Pb	208	193	3	21.38298	213.82977	ug/l	5000	Pb	
Bi	209	193	2	0.13277	1.32770	ug/l	2000	Bi	
Th	232	193	3	6.42747	64.27471	ug/l	2000	Th	
U	238	193	3	282.36764	2823.67641	ug/l	2000	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	5341096	0.34	6327920	84.4	80	120	Li (IS)	
Sc (IS)	45	2	226694	0.43	224146	101.1	80	120	Sc (IS)	
Sc (IS)	45	3	3956174	0.76	3966854	99.7	80	120	Sc (IS)	
Ge (IS)	72	2	461205	0.49	458627	100.6	80	120	Ge (IS)	
Ge (IS)	72	3	2792255	0.06	2917719	95.7	80	120	Ge (IS)	
In (IS)	115	3	20430097	0.50	22065637	92.6	80	120	In (IS)	
Ho (IS)	165	2	15299565	0.32	16245218	94.2	80	120	Ho (IS)	
Ho (IS)	165	3	25435465	1.03	27266963	93.3	80	120	Ho (IS)	
Ir (IS)	193	2	10136789	0.27	10999175	92.2	80	120	Ir (IS)	
Ir (IS)	193	3	12422249	1.11	13591604	91.4	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Sample Name	**160-36457-A-159-A**
Data File Name	**046SMPL.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-26T21:08:40-06:00**
Type	**Sample**
VialNumber	**2301**
Dilution	**10**
Comment	**453794**
Operator	**LP 7700**
ISTDRefDataFileName	**003CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	FinalConcentration	Units	High Value	Analyte	QC Flag
Li	7	6	3	12.04185	120.41852	ug/l	1000	Li	
Be	9	6	3	1.30986	13.09861	ug/l	1000	Be	
B	11	6	3	8.61390	86.13898	ug/l	2000	B	
Na	23	45	2	552.56784	5525.67836	ug/l	50000	Na	
Mg	24	45	2	1330.15313	13301.53132	ug/l	50000	Mg	
Al	27	45	2	6396.94837	63969.48369	ug/l	100000	Al	
P	31	45	2	40.14031	401.40314	ug/l	100000	P	
K	39	45	2	569.20192	5692.01921	ug/l	100000	K	
Ca	44	45	3	9058.44620	90584.46203	ug/l	100000	Ca	
Ti	47	45	3	25.24390	252.43903	ug/l	2000	Ti	
V	51	45	2	19.44900	194.48999	ug/l	2000	V	
Cr	52	45	2	5.16416	51.64160	ug/l	2000	Cr	
Mn	55	72	2	171.49762	1714.97616	ug/l	5000	Mn	
Fe	57	72	2	9225.57032	92255.70316	ug/l	100000	Fe	
Co	59	72	2	21.92676	219.26764	ug/l	2000	Co	
Ni	60	72	2	7.00104	70.01042	ug/l	2000	Ni	
Cu	63	72	2	12.70625	127.06246	ug/l	2000	Cu	
Zn	66	72	2	20.42157	204.21575	ug/l	5000	Zn	
As	75	72	2	2.46999	24.69985	ug/l	2000	As	
Se	78	72	2	1.13573	11.35728	ug/l	1000	Se	
Sr	88	72	3	245.92567	2459.25671	ug/l	2000	Sr	
Y	89	72	2	7.56925	75.69253	ug/l	200	Y	
Zr	90	72	2	4.51411	45.14109	ug/l	2000	Zr	
Nb	93	72	2	0.05877	0.58765	ug/l	100	Nb	
Mo	95	72	3	2.23158	22.31585	ug/l	1000	Mo	
Ru	101	72	2	-0.00629	-0.06293	ug/l	200	Ru	
Rh	103	72	2	-0.00294	-0.02942	ug/l	200	Rh	
Pd	105	72	2	0.01980	0.19798	ug/l	20	Pd	
Ag	107	115	3	0.04322	0.43220	ug/l	400	Ag	
Cd	111	115	3	1.78846	17.88464	ug/l	2000	Cd	
Sn	118	115	3	1.70995	17.09945	ug/l	2000	Sn	
Sb	121	115	3	0.06575	0.65753	ug/l	1000	Sb	
Te	125	165	2	0.02875	0.28745	ug/l	200	Te	
Cs	133	165	2	0.45074	4.50742	ug/l	2000	Cs	
Ba	137	165	3	241.41402	2414.14016	ug/l	5000	Ba	
La	139	165	2	9.60207	96.02072	ug/l	200	La	
Ce	140	165	2	28.27150	282.71495	ug/l	200	Ce	
Pr	141	165	2	3.40685	34.06851	ug/l	200	Pr	
Nd	146	165	2	13.78033	137.80333	ug/l	200	Nd	
Sm	147	165	3	2.81769	28.17690	ug/l	2000	Sm	
Hf	178	165	2	0.14276	1.42756	ug/l	200	Hf	
Ta	181	165	2	-0.01241	-0.12412	ug/l	200	Ta	
W	182	165	2	-0.05880	-0.58804	ug/l	2000	W	
Re	185	193	3	-0.00030	-0.00300	ug/l	200	Re	
Pt	195	193	2	0.00276	0.02762	ug/l	200	Pt	
Au	197	193	3	0.00372	0.03718	ug/l	2000	Au	
Tl	205	193	3	0.26954	2.69541	ug/l	400	Tl	
Pb	208	193	3	10.76749	107.67489	ug/l	5000	Pb	
Bi	209	193	2	0.15452	1.54517	ug/l	2000	Bi	
Th	232	193	3	7.64914	76.49142	ug/l	2000	Th	
U	238	193	3	30.30139	303.01385	ug/l	2000	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	5239844	0.20	6327920	82.8	80	120	Li (IS)	
Sc (IS)	45	2	223402	2.46	224146	99.7	80	120	Sc (IS)	
Sc (IS)	45	3	3914372	0.62	3966854	98.7	80	120	Sc (IS)	
Ge (IS)	72	2	458470	1.60	458627	100.0	80	120	Ge (IS)	
Ge (IS)	72	3	2787343	0.51	2917719	95.5	80	120	Ge (IS)	
In (IS)	115	3	20424599	0.29	22065637	92.6	80	120	In (IS)	
Ho (IS)	165	2	15303491	1.63	16245218	94.2	80	120	Ho (IS)	
Ho (IS)	165	3	25362642	0.54	27266963	93.0	80	120	Ho (IS)	
Ir (IS)	193	2	9972444	1.44	10999175	90.7	80	120	Ir (IS)	
Ir (IS)	193	3	12212524	0.76	13591604	89.9	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Sample Name	**160-36457-A-160-A**
Data File Name	**047SMPL.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-26T21:15:22-06:00**
Type	**Sample**
VialNumber	**2302**
Dilution	**10**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**003CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	FinalConcentration	Units	High Value	Analyte	QC Flag
Li	7	6	3	20.93406	209.34056	ug/l	1000	Li	
Be	9	6	3	2.17012	21.70117	ug/l	1000	Be	
B	11	6	3	8.76146	87.61465	ug/l	2000	B	
Na	23	45	2	807.22361	8072.23608	ug/l	50000	Na	
Mg	24	45	2	2833.66517	28336.65168	ug/l	50000	Mg	
Al	27	45	2	9562.44154	95624.41539	ug/l	100000	Al	
P	31	45	2	66.89505	668.95051	ug/l	100000	P	
K	39	45	2	965.37908	9653.79078	ug/l	100000	K	
Ca	44	45	3	33987.41256	339874.12558	ug/l	100000	Ca	
Ti	47	45	3	42.14211	421.42113	ug/l	2000	Ti	
V	51	45	2	36.51356	365.13560	ug/l	2000	V	
Cr	52	45	2	6.10415	61.04150	ug/l	2000	Cr	
Mn	55	72	2	1380.97022	13809.70217	ug/l	5000	Mn	
Fe	57	72	2	11543.62459	115436.24593	ug/l	100000	Fe	
Co	59	72	2	415.80773	4158.07732	ug/l	2000	Co	
Ni	60	72	2	93.46904	934.69043	ug/l	2000	Ni	
Cu	63	72	2	15.67729	156.77286	ug/l	2000	Cu	
Zn	66	72	2	163.60495	1636.04946	ug/l	5000	Zn	
As	75	72	2	6.66605	66.66053	ug/l	2000	As	
Se	78	72	2	3.95694	39.56938	ug/l	1000	Se	
Sr	88	72	3	313.18171	3131.81708	ug/l	2000	Sr	
Y	89	72	2	63.73146	637.31458	ug/l	200	Y	
Zr	90	72	2	6.23672	62.36719	ug/l	2000	Zr	
Nb	93	72	2	0.05476	0.54762	ug/l	100	Nb	
Mo	95	72	3	5.80784	58.07839	ug/l	1000	Mo	
Ru	101	72	2	-0.00752	-0.07522	ug/l	200	Ru	
Rh	103	72	2	-0.00369	-0.03687	ug/l	200	Rh	
Pd	105	72	2	0.09430	0.94296	ug/l	20	Pd	
Ag	107	115	3	0.05808	0.58078	ug/l	400	Ag	
Cd	111	115	3	61.73650	617.36496	ug/l	2000	Cd	
Sn	118	115	3	2.07284	20.72838	ug/l	2000	Sn	
Sb	121	115	3	0.07616	0.76163	ug/l	1000	Sb	
Te	125	165	2	0.02585	0.25852	ug/l	200	Te	
Cs	133	165	2	0.73531	7.35309	ug/l	2000	Cs	
Ba	137	165	3	536.92416	5369.24156	ug/l	5000	Ba	
La	139	165	2	12.83907	128.39068	ug/l	200	La	
Ce	140	165	2	44.94959	449.49589	ug/l	200	Ce	
Pr	141	165	2	6.37965	63.79655	ug/l	200	Pr	
Nd	146	165	2	31.46777	314.67771	ug/l	200	Nd	
Sm	147	165	3	8.04128	80.41278	ug/l	2000	Sm	
Hf	178	165	2	0.18576	1.85760	ug/l	200	Hf	
Ta	181	165	2	-0.01259	-0.12590	ug/l	200	Ta	
W	182	165	2	-0.06223	-0.62230	ug/l	2000	W	
Re	185	193	3	0.00165	0.01649	ug/l	200	Re	
Pt	195	193	2	0.00080	0.00804	ug/l	200	Pt	
Au	197	193	3	0.00187	0.01866	ug/l	2000	Au	
Tl	205	193	3	0.38922	3.89223	ug/l	400	Tl	
Pb	208	193	3	14.63474	146.34743	ug/l	5000	Pb	
Bi	209	193	2	0.14377	1.43774	ug/l	2000	Bi	
Th	232	193	3	11.75471	117.54706	ug/l	2000	Th	
U	238	193	3	508.54580	5085.45796	ug/l	2000	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	5235507	1.39	6327920	82.7	80	120	Li (IS)	
Sc (IS)	45	2	236786	1.15	224146	105.6	80	120	Sc (IS)	
Sc (IS)	45	3	4206609	2.25	3966854	106.0	80	120	Sc (IS)	
Ge (IS)	72	2	452535	0.41	458627	98.7	80	120	Ge (IS)	
Ge (IS)	72	3	2783059	1.98	2917719	95.4	80	120	Ge (IS)	
In (IS)	115	3	20257205	3.32	22065637	91.8	80	120	In (IS)	
Ho (IS)	165	2	15113667	0.53	16245218	93.0	80	120	Ho (IS)	
Ho (IS)	165	3	25416510	2.98	27266963	93.2	80	120	Ho (IS)	
Ir (IS)	193	2	9837001	0.16	10999175	89.4	80	120	Ir (IS)	
Ir (IS)	193	3	12066022	2.43	13591604	88.8	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Sample Name	**160-36457-A-162-A**
Data File Name	**048SMPL.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-26T21:22:06-06:00**
Type	**Sample**
VialNumber	**2303**
Dilution	**10**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**003CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	FinalConcentration	Units	High Value	Analyte	QC Flag
Li	7	6	3	4.70742	47.07419	ug/l	1000	Li	
Be	9	6	3	0.48792	4.87918	ug/l	1000	Be	
B	11	6	3	5.76101	57.61007	ug/l	2000	B	
Na	23	45	2	924.30928	9243.09285	ug/l	50000	Na	
Mg	24	45	2	918.99795	9189.97948	ug/l	50000	Mg	
Al	27	45	2	3305.19060	33051.90604	ug/l	100000	Al	
P	31	45	2	49.09032	490.90319	ug/l	100000	P	
K	39	45	2	567.17535	5671.75348	ug/l	100000	K	
Ca	44	45	3	6482.89216	64828.92160	ug/l	100000	Ca	
Ti	47	45	3	50.65567	506.55666	ug/l	2000	Ti	
V	51	45	2	15.01949	150.19491	ug/l	2000	V	
Cr	52	45	2	4.46231	44.62308	ug/l	2000	Cr	
Mn	55	72	2	125.02884	1250.28843	ug/l	5000	Mn	
Fe	57	72	2	12713.71307	127137.13068	ug/l	100000	Fe	
Co	59	72	2	25.48093	254.80932	ug/l	2000	Co	
Ni	60	72	2	7.69469	76.94687	ug/l	2000	Ni	
Cu	63	72	2	8.75578	87.55778	ug/l	2000	Cu	
Zn	66	72	2	20.94610	209.46101	ug/l	5000	Zn	
As	75	72	2	49.27208	492.72082	ug/l	2000	As	
Se	78	72	2	1.38647	13.86467	ug/l	1000	Se	
Sr	88	72	3	165.81863	1658.18633	ug/l	2000	Sr	
Y	89	72	2	8.29795	82.97947	ug/l	200	Y	
Zr	90	72	2	9.68101	96.81013	ug/l	2000	Zr	
Nb	93	72	2	0.22904	2.29037	ug/l	100	Nb	
Mo	95	72	3	263.00187	2630.01869	ug/l	1000	Mo	
Ru	101	72	2	-0.00727	-0.07270	ug/l	200	Ru	
Rh	103	72	2	-0.00326	-0.03262	ug/l	200	Rh	
Pd	105	72	2	0.01229	0.12290	ug/l	20	Pd	
Ag	107	115	3	0.06494	0.64939	ug/l	400	Ag	
Cd	111	115	3	0.37038	3.70380	ug/l	2000	Cd	
Sn	118	115	3	2.27284	22.72841	ug/l	2000	Sn	
Sb	121	115	3	0.24802	2.48024	ug/l	1000	Sb	
Te	125	165	2	0.00038	0.00383	ug/l	200	Te	
Cs	133	165	2	0.46623	4.66229	ug/l	2000	Cs	
Ba	137	165	3	294.18319	2941.83193	ug/l	5000	Ba	
La	139	165	2	16.87661	168.76608	ug/l	200	La	
Ce	140	165	2	52.60505	526.05046	ug/l	200	Ce	
Pr	141	165	2	6.11818	61.18180	ug/l	200	Pr	
Nd	146	165	2	24.20495	242.04949	ug/l	200	Nd	
Sm	147	165	3	4.45029	44.50291	ug/l	2000	Sm	
Hf	178	165	2	0.21373	2.13733	ug/l	200	Hf	
Ta	181	165	2	-0.00299	-0.02988	ug/l	200	Ta	
W	182	165	2	-0.05149	-0.51487	ug/l	2000	W	
Re	185	193	3	0.04923	0.49230	ug/l	200	Re	
Pt	195	193	2	0.00134	0.01340	ug/l	200	Pt	
Au	197	193	3	-0.00105	-0.01053	ug/l	2000	Au	
Tl	205	193	3	5.40030	54.00298	ug/l	400	Tl	
Pb	208	193	3	15.47578	154.75779	ug/l	5000	Pb	
Bi	209	193	2	0.11179	1.11789	ug/l	2000	Bi	
Th	232	193	3	5.55694	55.56942	ug/l	2000	Th	
U	238	193	3	82.71076	827.10756	ug/l	2000	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	5311564	0.41	6327920	83.9	80	120	Li (IS)	
Sc (IS)	45	2	217834	0.67	224146	97.2	80	120	Sc (IS)	
Sc (IS)	45	3	3782563	0.29	3966854	95.4	80	120	Sc (IS)	
Ge (IS)	72	2	459731	0.50	458627	100.2	80	120	Ge (IS)	
Ge (IS)	72	3	2788724	0.53	2917719	95.6	80	120	Ge (IS)	
In (IS)	115	3	20509792	0.42	22065637	92.9	80	120	In (IS)	
Ho (IS)	165	2	15334605	0.72	16245218	94.4	80	120	Ho (IS)	
Ho (IS)	165	3	25323210	0.31	27266963	92.9	80	120	Ho (IS)	
Ir (IS)	193	2	10049537	0.30	10999175	91.4	80	120	Ir (IS)	
Ir (IS)	193	3	12313392	0.39	13591604	90.6	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Sample Name	**160-36457-A-163-A**
Data File Name	**049SMPL.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-26T21:28:47-06:00**
Type	**Sample**
VialNumber	**2304**
Dilution	**10**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**003CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	FinalConcentration	Units	High Value	Analyte	QC Flag
Li	7	6	3	12.53404	125.34043	ug/l	1000	Li	
Be	9	6	3	1.43585	14.35848	ug/l	1000	Be	
B	11	6	3	7.71285	77.12845	ug/l	2000	B	
Na	23	45	2	621.07107	6210.71066	ug/l	50000	Na	
Mg	24	45	2	989.64219	9896.42195	ug/l	50000	Mg	
Al	27	45	2	5842.94856	58429.48561	ug/l	100000	Al	
P	31	45	2	27.41661	274.16606	ug/l	100000	P	
K	39	45	2	549.69795	5496.97949	ug/l	100000	K	
Ca	44	45	3	6988.61337	69886.13373	ug/l	100000	Ca	
Ti	47	45	3	22.03835	220.38346	ug/l	2000	Ti	
V	51	45	2	16.16416	161.64157	ug/l	2000	V	
Cr	52	45	2	4.69070	46.90703	ug/l	2000	Cr	
Mn	55	72	2	196.05857	1960.58568	ug/l	5000	Mn	
Fe	57	72	2	7443.04080	74430.40803	ug/l	100000	Fe	
Co	59	72	2	45.56614	455.66141	ug/l	2000	Co	
Ni	60	72	2	12.16964	121.69641	ug/l	2000	Ni	
Cu	63	72	2	12.71801	127.18011	ug/l	2000	Cu	
Zn	66	72	2	31.66841	316.68408	ug/l	5000	Zn	
As	75	72	2	5.60475	56.04755	ug/l	2000	As	
Se	78	72	2	1.12830	11.28301	ug/l	1000	Se	
Sr	88	72	3	148.35784	1483.57843	ug/l	2000	Sr	
Y	89	72	2	9.61519	96.15188	ug/l	200	Y	
Zr	90	72	2	5.75531	57.55307	ug/l	2000	Zr	
Nb	93	72	2	0.06489	0.64888	ug/l	100	Nb	
Mo	95	72	3	13.17054	131.70535	ug/l	1000	Mo	
Ru	101	72	2	-0.00777	-0.07767	ug/l	200	Ru	
Rh	103	72	2	-0.00313	-0.03132	ug/l	200	Rh	
Pd	105	72	2	0.01008	0.10075	ug/l	20	Pd	
Ag	107	115	3	0.04872	0.48724	ug/l	400	Ag	
Cd	111	115	3	0.31339	3.13390	ug/l	2000	Cd	
Sn	118	115	3	2.08799	20.87986	ug/l	2000	Sn	
Sb	121	115	3	0.06282	0.62819	ug/l	1000	Sb	
Te	125	165	2	0.00988	0.09882	ug/l	200	Te	
Cs	133	165	2	0.32882	3.28815	ug/l	2000	Cs	
Ba	137	165	3	164.43498	1644.34982	ug/l	5000	Ba	
La	139	165	2	9.78885	97.88849	ug/l	200	La	
Ce	140	165	2	29.26801	292.68011	ug/l	200	Ce	
Pr	141	165	2	3.43296	34.32960	ug/l	200	Pr	
Nd	146	165	2	14.19181	141.91812	ug/l	200	Nd	
Sm	147	165	3	2.91401	29.14009	ug/l	2000	Sm	
Hf	178	165	2	0.17341	1.73410	ug/l	200	Hf	
Ta	181	165	2	-0.00167	-0.01665	ug/l	200	Ta	
W	182	165	2	-0.09068	-0.90675	ug/l	2000	W	
Re	185	193	3	0.01536	0.15362	ug/l	200	Re	
Pt	195	193	2	0.00227	0.02267	ug/l	200	Pt	
Au	197	193	3	-0.00038	-0.00375	ug/l	2000	Au	
Tl	205	193	3	0.69718	6.97183	ug/l	400	Tl	
Pb	208	193	3	14.13647	141.36469	ug/l	5000	Pb	
Bi	209	193	2	0.24588	2.45877	ug/l	2000	Bi	
Th	232	193	3	7.86435	78.64353	ug/l	2000	Th	
U	238	193	3	38.96288	389.62883	ug/l	2000	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	5035018	4.05	6327920	79.6	80	120	Li (IS)	FAILED
Sc (IS)	45	2	224446	0.93	224146	100.1	80	120	Sc (IS)	
Sc (IS)	45	3	3788385	5.21	3966854	95.5	80	120	Sc (IS)	
Ge (IS)	72	2	456461	0.44	458627	99.5	80	120	Ge (IS)	
Ge (IS)	72	3	2676505	3.94	2917719	91.7	80	120	Ge (IS)	
In (IS)	115	3	19456317	4.81	22065637	88.2	80	120	In (IS)	
Ho (IS)	165	2	15107065	0.92	16245218	93.0	80	120	Ho (IS)	
Ho (IS)	165	3	24139397	5.93	27266963	88.5	80	120	Ho (IS)	
Ir (IS)	193	2	9928360	0.63	10999175	90.3	80	120	Ir (IS)	
Ir (IS)	193	3	11813250	5.49	13591604	86.9	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Sample Name	**160-36457-A-164-A**
Data File Name	**050SMPL.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-26T21:35:30-06:00**
Type	**Sample**
VialNumber	**2305**
Dilution	**10**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**003CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	FinalConcentration	Units	High Value	Analyte	QC Flag
Li	7	6	3	10.92556	109.25562	ug/l	1000	Li	
Be	9	6	3	0.99137	9.91368	ug/l	1000	Be	
B	11	6	3	6.31548	63.15485	ug/l	2000	B	
Na	23	45	2	797.41525	7974.15247	ug/l	50000	Na	
Mg	24	45	2	1809.23390	18092.33904	ug/l	50000	Mg	
Al	27	45	2	5795.85006	57958.50058	ug/l	100000	Al	
P	31	45	2	68.66459	686.64588	ug/l	100000	P	
K	39	45	2	814.60679	8146.06786	ug/l	100000	K	
Ca	44	45	3	8868.62355	88686.23551	ug/l	100000	Ca	
Ti	47	45	3	52.96872	529.68723	ug/l	2000	Ti	
V	51	45	2	18.82480	188.24796	ug/l	2000	V	
Cr	52	45	2	4.94653	49.46533	ug/l	2000	Cr	
Mn	55	72	2	227.06961	2270.69608	ug/l	5000	Mn	
Fe	57	72	2	9810.35925	98103.59250	ug/l	100000	Fe	
Co	59	72	2	78.69508	786.95078	ug/l	2000	Co	
Ni	60	72	2	21.66500	216.64995	ug/l	2000	Ni	
Cu	63	72	2	10.20675	102.06751	ug/l	2000	Cu	
Zn	66	72	2	34.18542	341.85418	ug/l	5000	Zn	
As	75	72	2	39.25754	392.57544	ug/l	2000	As	
Se	78	72	2	1.22538	12.25383	ug/l	1000	Se	
Sr	88	72	3	141.92954	1419.29539	ug/l	2000	Sr	
Y	89	72	2	10.75893	107.58925	ug/l	200	Y	
Zr	90	72	2	12.29484	122.94838	ug/l	2000	Zr	
Nb	93	72	2	0.19015	1.90145	ug/l	100	Nb	
Mo	95	72	3	57.47488	574.74884	ug/l	1000	Mo	
Ru	101	72	2	-0.00620	-0.06202	ug/l	200	Ru	
Rh	103	72	2	-0.00049	-0.00490	ug/l	200	Rh	
Pd	105	72	2	0.01452	0.14520	ug/l	20	Pd	
Ag	107	115	3	0.04657	0.46571	ug/l	400	Ag	
Cd	111	115	3	1.92880	19.28804	ug/l	2000	Cd	
Sn	118	115	3	1.75275	17.52752	ug/l	2000	Sn	
Sb	121	115	3	0.13063	1.30633	ug/l	1000	Sb	
Te	125	165	2	0.02588	0.25885	ug/l	200	Te	
Cs	133	165	2	0.49376	4.93758	ug/l	2000	Cs	
Ba	137	165	3	293.57403	2935.74027	ug/l	5000	Ba	
La	139	165	2	8.57519	85.75192	ug/l	200	La	
Ce	140	165	2	25.57750	255.77504	ug/l	200	Ce	
Pr	141	165	2	3.14355	31.43554	ug/l	200	Pr	
Nd	146	165	2	13.40740	134.07402	ug/l	200	Nd	
Sm	147	165	3	2.92138	29.21379	ug/l	2000	Sm	
Hf	178	165	2	0.26139	2.61394	ug/l	200	Hf	
Ta	181	165	2	-0.00874	-0.08743	ug/l	200	Ta	
W	182	165	2	-0.07478	-0.74776	ug/l	2000	W	
Re	185	193	3	0.03660	0.36604	ug/l	200	Re	
Pt	195	193	2	0.00243	0.02434	ug/l	200	Pt	
Au	197	193	3	0.00022	0.00224	ug/l	2000	Au	
Tl	205	193	3	2.13371	21.33706	ug/l	400	Tl	
Pb	208	193	3	34.64763	346.47625	ug/l	5000	Pb	
Bi	209	193	2	0.10307	1.03073	ug/l	2000	Bi	
Th	232	193	3	6.26201	62.62012	ug/l	2000	Th	
U	238	193	3	240.13980	2401.39798	ug/l	2000	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	5155208	0.53	6327920	81.5	80	120	Li (IS)	
Sc (IS)	45	2	219020	0.53	224146	97.7	80	120	Sc (IS)	
Sc (IS)	45	3	3867486	0.09	3966854	97.5	80	120	Sc (IS)	
Ge (IS)	72	2	451019	0.27	458627	98.3	80	120	Ge (IS)	
Ge (IS)	72	3	2776049	0.29	2917719	95.1	80	120	Ge (IS)	
In (IS)	115	3	20166528	0.95	22065637	91.4	80	120	In (IS)	
Ho (IS)	165	2	15104668	0.53	16245218	93.0	80	120	Ho (IS)	
Ho (IS)	165	3	25373520	0.73	27266963	93.1	80	120	Ho (IS)	
Ir (IS)	193	2	9934711	0.16	10999175	90.3	80	120	Ir (IS)	
Ir (IS)	193	3	12204060	0.95	13591604	89.8	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Sample Name	**160-36457-A-165-A**
Data File Name	**051SMPL.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-26T21:42:12-06:00**
Type	**Sample**
VialNumber	**2306**
Dilution	**10**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**003CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	FinalConcentration	Units	High Value	Analyte	QC Flag
Li	7	6	3	6.77545	67.75446	ug/l	1000	Li	
Be	9	6	3	1.14282	11.42819	ug/l	1000	Be	
B	11	6	3	4.70425	47.04249	ug/l	2000	B	
Na	23	45	2	1070.15543	10701.55435	ug/l	50000	Na	
Mg	24	45	2	724.75371	7247.53712	ug/l	50000	Mg	
Al	27	45	2	4667.49820	46674.98201	ug/l	100000	Al	
P	31	45	2	51.28752	512.87522	ug/l	100000	P	
K	39	45	2	540.72626	5407.26261	ug/l	100000	K	
Ca	44	45	3	2994.60955	29946.09554	ug/l	100000	Ca	
Ti	47	45	3	32.28158	322.81579	ug/l	2000	Ti	
V	51	45	2	14.55807	145.58066	ug/l	2000	V	
Cr	52	45	2	4.00196	40.01959	ug/l	2000	Cr	
Mn	55	72	2	80.35664	803.56638	ug/l	5000	Mn	
Fe	57	72	2	11960.50152	119605.01516	ug/l	100000	Fe	
Co	59	72	2	25.16612	251.66122	ug/l	2000	Co	
Ni	60	72	2	7.28446	72.84459	ug/l	2000	Ni	
Cu	63	72	2	13.36779	133.67789	ug/l	2000	Cu	
Zn	66	72	2	23.79826	237.98263	ug/l	5000	Zn	
As	75	72	2	22.19027	221.90274	ug/l	2000	As	
Se	78	72	2	2.51138	25.11379	ug/l	1000	Se	
Sr	88	72	3	181.49981	1814.99807	ug/l	2000	Sr	
Y	89	72	2	11.22763	112.27632	ug/l	200	Y	
Zr	90	72	2	7.48999	74.89988	ug/l	2000	Zr	
Nb	93	72	2	0.16749	1.67486	ug/l	100	Nb	
Mo	95	72	3	39.28209	392.82085	ug/l	1000	Mo	
Ru	101	72	2	-0.00602	-0.06022	ug/l	200	Ru	
Rh	103	72	2	-0.00159	-0.01585	ug/l	200	Rh	
Pd	105	72	2	0.02146	0.21461	ug/l	20	Pd	
Ag	107	115	3	0.07690	0.76902	ug/l	400	Ag	
Cd	111	115	3	0.49238	4.92382	ug/l	2000	Cd	
Sn	118	115	3	1.94738	19.47377	ug/l	2000	Sn	
Sb	121	115	3	0.13688	1.36882	ug/l	1000	Sb	
Te	125	165	2	0.01307	0.13074	ug/l	200	Te	
Cs	133	165	2	0.65562	6.55619	ug/l	2000	Cs	
Ba	137	165	3	158.97307	1589.73069	ug/l	5000	Ba	
La	139	165	2	25.88844	258.88444	ug/l	200	La	
Ce	140	165	2	76.68402	766.84019	ug/l	200	Ce	
Pr	141	165	2	8.91962	89.19624	ug/l	200	Pr	
Nd	146	165	2	35.38012	353.80120	ug/l	200	Nd	
Sm	147	165	3	7.07845	70.78446	ug/l	2000	Sm	
Hf	178	165	2	0.19008	1.90077	ug/l	200	Hf	
Ta	181	165	2	0.01729	0.17286	ug/l	200	Ta	
W	182	165	2	-0.08783	-0.87828	ug/l	2000	W	
Re	185	193	3	0.00506	0.05062	ug/l	200	Re	
Pt	195	193	2	0.00130	0.01301	ug/l	200	Pt	
Au	197	193	3	-0.00266	-0.02658	ug/l	2000	Au	
Tl	205	193	3	2.15827	21.58268	ug/l	400	Tl	
Pb	208	193	3	19.45534	194.55339	ug/l	5000	Pb	
Bi	209	193	2	0.13907	1.39067	ug/l	2000	Bi	
Th	232	193	3	8.39967	83.99668	ug/l	2000	Th	
U	238	193	3	30.63293	306.32929	ug/l	2000	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	5207495	2.81	6327920	82.3	80	120	Li (IS)	
Sc (IS)	45	2	224919	1.61	224146	100.3	80	120	Sc (IS)	
Sc (IS)	45	3	3922511	4.10	3966854	98.9	80	120	Sc (IS)	
Ge (IS)	72	2	454915	1.26	458627	99.2	80	120	Ge (IS)	
Ge (IS)	72	3	2763930	2.93	2917719	94.7	80	120	Ge (IS)	
In (IS)	115	3	19949582	4.58	22065637	90.4	80	120	In (IS)	
Ho (IS)	165	2	15036965	2.61	16245218	92.6	80	120	Ho (IS)	
Ho (IS)	165	3	24900869	4.51	27266963	91.3	80	120	Ho (IS)	
Ir (IS)	193	2	9918881	2.09	10999175	90.2	80	120	Ir (IS)	
Ir (IS)	193	3	12029956	4.04	13591604	88.5	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Low Level Continuing Calibration Verification (CCV) - US EPA Method 6020

Sample Name	**CCVL 1856860**
Data File Name	**052LCCV.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-26T21:48:55-06:00**
Type	**CRI**
VialNumber	**1101**
Dilution	**1**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**003CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	Units	ExpectedValue	%Recovery	%QC Low	%QC High	Analyte	QC Flag
Li	7	6	3	5.21340	ug/l	5	104.3	80	120	Li	
Be	9	6	3	0.48310	ug/l	0.5	96.6	80	120	Be	
B	11	6	3	94.68684	ug/l	100	94.7	80	120	B	
Na	23	45	2	106.84738	ug/l	100	106.8	80	120	Na	
Mg	24	45	2	56.14259	ug/l	50	112.3	80	120	Mg	
Al	27	45	2	58.22935	ug/l	50	116.5	80	120	Al	
P	31	45	2	95.12219	ug/l	100	95.1	80	120	P	
K	39	45	2	106.52987	ug/l	100	106.5	80	120	K	
Ca	44	45	3	226.76220	ug/l	200	113.4	80	120	Ca	
Ti	47	45	3	5.02950	ug/l	5	100.6	80	120	Ti	
V	51	45	2	9.73447	ug/l	10	97.3	80	120	V	
Cr	52	45	2	10.18956	ug/l	10	101.9	80	120	Cr	
Mn	55	72	2	4.16783	ug/l	4	104.2	80	120	Mn	
Fe	57	72	2	51.36418	ug/l	50	102.7	80	120	Fe	
Co	59	72	2	2.05987	ug/l	2	103.0	80	120	Co	
Ni	60	72	2	5.55391	ug/l	5	111.1	80	120	Ni	
Cu	63	72	2	2.87083	ug/l	3	95.7	80	120	Cu	
Zn	66	72	2	21.96572	ug/l	20	109.8	80	120	Zn	
As	75	72	2	10.25117	ug/l	10	102.5	80	120	As	
Se	78	72	2	4.51449	ug/l	5	90.3	80	120	Se	
Sr	88	72	3	5.22590	ug/l	5	104.5	80	120	Sr	
Y	89	72	2	5.14135	ug/l	5	102.8	80	120	Y	
Zr	90	72	2	5.27373	ug/l	5	105.5	80	120	Zr	
Nb	93	72	2	19.30359	ug/l	25	77.2	80	120	Nb	FAILED
Mo	95	72	3	4.98413	ug/l	5	99.7	80	120	Mo	
Ru	101	72	2	10.42846	ug/l	10	104.3	80	120	Ru	
Rh	103	72	2	10.33334	ug/l	10	103.3	80	120	Rh	
Pd	105	72	2	0.55300	ug/l	0.5	110.6	80	120	Pd	
Ag	107	115	3	1.92600	ug/l	2	96.3	80	120	Ag	
Cd	111	115	3	0.48856	ug/l	0.5	97.7	80	120	Cd	
Sn	118	115	3	1.72535	ug/l	2	86.3	80	120	Sn	
Sb	121	115	3	4.70586	ug/l	5	94.1	80	120	Sb	
Te	125	165	2	9.15239	ug/l	10	91.5	80	120	Te	
Cs	133	165	2	0.96517	ug/l	1	96.5	80	120	Cs	
Ba	137	165	3	1.96645	ug/l	2	98.3	80	120	Ba	
La	139	165	2	1.90090	ug/l	2	95.0	80	120	La	
Ce	140	165	2	9.53135	ug/l	10	95.3	80	120	Ce	
Pr	141	165	2	1.92095	ug/l	2	96.0	80	120	Pr	
Nd	146	165	2	1.90874	ug/l	2	95.4	80	120	Nd	
Sm	147	165	3	9.67678	ug/l	10	96.8	80	120	Sm	
Hf	178	165	2	9.05433	ug/l	10	90.5	80	120	Hf	
Ta	181	165	2	6.41412	ug/l	10	64.1	80	120	Ta	FAILED
W	182	165	2	4.41235	ug/l	5	88.2	80	120	W	
Re	185	193	3	9.30287	ug/l	10	93.0	80	120	Re	
Pt	195	193	2	1.02423	ug/l	1	102.4	80	120	Pt	
Au	197	193	3	4.67651	ug/l	5	93.5	80	120	Au	
Tl	205	193	3	1.83351	ug/l	2	91.7	80	120	Tl	
Pb	208	193	3	2.79223	ug/l	3	93.1	80	120	Pb	
Bi	209	193	2	19.81626	ug/l	20	99.1	80	120	Bi	
Th	232	193	3	1.80295	ug/l	2	90.1	80	120	Th	
U	238	193	3	0.93816	ug/l	1	93.8	80	120	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	5300880	4.13	6327920	83.8	80	120	Li (IS)	
Sc (IS)	45	2	204502	3.35	224146	91.2	80	120	Sc (IS)	
Sc (IS)	45	3	3554594	5.98	3966854	89.6	80	120	Sc (IS)	
Ge (IS)	72	2	451352	2.16	458627	98.4	80	120	Ge (IS)	
Ge (IS)	72	3	2746646	4.81	2917719	94.1	80	120	Ge (IS)	
In (IS)	115	3	20485400	5.89	22065637	92.8	80	120	In (IS)	
Ho (IS)	165	2	15097918	4.06	16245218	92.9	80	120	Ho (IS)	
Ho (IS)	165	3	25020704	5.86	27266963	91.8	80	120	Ho (IS)	
Ir (IS)	193	2	10111703	3.55	10999175	91.9	80	120	Ir (IS)	
Ir (IS)	193	3	12467403	5.89	13591604	91.7	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Continuing Calibration Verification (CCV) - US EPA Method 6020

Sample Name	**CCV 1856861**
Data File Name	**053_CCV.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-26T21:55:37-06:00**
Type	**CCV**
VialNumber	**1102**
Dilution	**1**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**003CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	Units	ExpectedValue	%Recovery	%QC Low	%QC High	Analyte	QC Flag
Li	7	6	3	101.40509	ug/l	100	101.4	90	110	Li	
Be	9	6	3	100.33336	ug/l	100	100.3	90	110	Be	
B	11	6	3	202.91385	ug/l	200	101.5	90	110	B	
Na	23	45	2	2456.96063	ug/l	2500	98.3	90	110	Na	
Mg	24	45	2	2471.69989	ug/l	2500	98.9	90	110	Mg	
Al	27	45	2	2648.00814	ug/l	2500	105.9	90	110	Al	
P	31	45	2	2430.83317	ug/l	2500	97.2	90	110	P	
K	39	45	2	2507.03299	ug/l	2500	100.3	90	110	K	
Ca	44	45	3	2498.21466	ug/l	2500	99.9	90	110	Ca	
Ti	47	45	3	100.55041	ug/l	100	100.6	90	110	Ti	
V	51	45	2	97.81254	ug/l	100	97.8	90	110	V	
Cr	52	45	2	98.87985	ug/l	100	98.9	90	110	Cr	
Mn	55	72	2	97.73208	ug/l	100	97.7	90	110	Mn	
Fe	57	72	2	2433.82993	ug/l	2500	97.4	90	110	Fe	
Co	59	72	2	99.76416	ug/l	100	99.8	90	110	Co	
Ni	60	72	2	101.49108	ug/l	100	101.5	90	110	Ni	
Cu	63	72	2	95.65174	ug/l	100	95.7	90	110	Cu	
Zn	66	72	2	100.54271	ug/l	100	100.5	90	110	Zn	
As	75	72	2	99.63434	ug/l	100	99.6	90	110	As	
Se	78	72	2	50.77652	ug/l	50	101.6	90	110	Se	
Sr	88	72	3	101.52259	ug/l	100	101.5	90	110	Sr	
Y	89	72	2	102.05986	ug/l	100	102.1	90	110	Y	
Zr	90	72	2	101.49361	ug/l	100	101.5	90	110	Zr	
Nb	93	72	2	50.05824	ug/l	50	100.1	90	110	Nb	
Mo	95	72	3	48.21219	ug/l	50	96.4	90	110	Mo	
Ru	101	72	2	99.17845	ug/l	100	99.2	90	110	Ru	
Rh	103	72	2	101.53676	ug/l	100	101.5	90	110	Rh	
Pd	105	72	2	10.37420	ug/l	10	103.7	90	110	Pd	
Ag	107	115	3	19.39542	ug/l	20	97.0	90	110	Ag	
Cd	111	115	3	96.01370	ug/l	100	96.0	90	110	Cd	
Sn	118	115	3	98.66569	ug/l	100	98.7	90	110	Sn	
Sb	121	115	3	49.14892	ug/l	50	98.3	90	110	Sb	
Te	125	165	2	96.83119	ug/l	100	96.8	90	110	Te	
Cs	133	165	2	99.38698	ug/l	100	99.4	90	110	Cs	
Ba	137	165	3	99.60200	ug/l	100	99.6	90	110	Ba	
La	139	165	2	99.45939	ug/l	100	99.5	90	110	La	
Ce	140	165	2	98.91873	ug/l	100	98.9	90	110	Ce	
Pr	141	165	2	99.55088	ug/l	100	99.6	90	110	Pr	
Nd	146	165	2	94.16989	ug/l	100	94.2	90	110	Nd	
Sm	147	165	3	100.75035	ug/l	100	100.8	90	110	Sm	
Hf	178	165	2	99.25148	ug/l	100	99.3	90	110	Hf	
Ta	181	165	2	97.99731	ug/l	100	98.0	90	110	Ta	
W	182	165	2	99.49269	ug/l	100	99.5	90	110	W	
Re	185	193	3	100.62717	ug/l	100	100.6	90	110	Re	
Pt	195	193	2	9.94369	ug/l	10	99.4	90	110	Pt	
Au	197	193	3	98.86308	ug/l	100	98.9	90	110	Au	
Tl	205	193	3	20.34223	ug/l	20	101.7	90	110	Tl	
Pb	208	193	3	102.36949	ug/l	100	102.4	90	110	Pb	
Bi	209	193	2	100.12453	ug/l	100	100.1	90	110	Bi	
Th	232	193	3	101.93951	ug/l	100	101.9	90	110	Th	
U	238	193	3	102.38732	ug/l	100	102.4	90	110	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	5138312	0.46	6327920	81.2	80	120	Li (IS)	
Sc (IS)	45	2	202587	0.98	224146	90.4	80	120	Sc (IS)	
Sc (IS)	45	3	3524493	0.42	3966854	88.8	80	120	Sc (IS)	
Ge (IS)	72	2	466010	0.05	458627	101.6	80	120	Ge (IS)	
Ge (IS)	72	3	2775867	0.05	2917719	95.1	80	120	Ge (IS)	
In (IS)	115	3	20151651	0.18	22065637	91.3	80	120	In (IS)	
Ho (IS)	165	2	15134298	0.74	16245218	93.2	80	120	Ho (IS)	
Ho (IS)	165	3	24737280	0.74	27266963	90.7	80	120	Ho (IS)	
Ir (IS)	193	2	10220850	0.73	10999175	92.9	80	120	Ir (IS)	
Ir (IS)	193	3	12224630	0.39	13591604	89.9	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Continuing Calibration Blank (CCB) - US EPA Method 6020

Sample Name	**CCB 1854886**
Data File Name	**054_CCB.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-26T22:02:22-06:00**
Type	**CCB**
VialNumber	**4**
Dilution	**1**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**003CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	Units	QC High	Analyte	QC Flag
Li	7	6	3	0.19087	ug/l	1.388	Li	
Be	9	6	3	0.00155	ug/l	0.7	Be	
B	11	6	3	3.65793	ug/l	20	B	
Na	23	45	2	4.80849	ug/l	30	Na	
Mg	24	45	2	-0.01207	ug/l	11.18	Mg	
Al	27	45	2	-0.19562	ug/l	25.8	Al	
P	31	45	2	-2.57579	ug/l	16.46	P	
K	39	45	2	0.75944	ug/l	83.2	K	
Ca	44	45	3	-23.76190	ug/l	136.2	Ca	
Ti	47	45	3	-0.02326	ug/l	4.2	Ti	
V	51	45	2	-0.14988	ug/l	4.74	V	
Cr	52	45	2	-0.01403	ug/l	6.52	Cr	
Mn	55	72	2	0.00807	ug/l	0.49	Mn	
Fe	57	72	2	0.06643	ug/l	40.7	Fe	
Co	59	72	2	0.00470	ug/l	0.434	Co	
Ni	60	72	2	-0.00245	ug/l	0.8	Ni	
Cu	63	72	2	-0.35121	ug/l	0.902	Cu	
Zn	66	72	2	-0.14976	ug/l	16.58	Zn	
As	75	72	2	-0.03378	ug/l	2.36	As	
Se	78	72	2	-0.07919	ug/l	3.18	Se	
Sr	88	72	3	0.00503	ug/l	2	Sr	
Y	89	72	2	0.00287	ug/l	0.424	Y	
Zr	90	72	2	0.01557	ug/l	0.496	Zr	
Nb	93	72	2	0.61318	ug/l	4.62	Nb	
Mo	95	72	3	-0.03622	ug/l	2	Mo	
Ru	101	72	2	-0.00105	ug/l	2	Ru	
Rh	103	72	2	0.00339	ug/l	1.634	Rh	
Pd	105	72	2	-0.00304	ug/l	0.08	Pd	
Ag	107	115	3	-0.00988	ug/l	1.54	Ag	
Cd	111	115	3	0.00119	ug/l	0.4	Cd	
Sn	118	115	3	-0.00803	ug/l	2	Sn	
Sb	121	115	3	0.01220	ug/l	3.34	Sb	
Te	125	165	2	0.08060	ug/l	1.072	Te	
Cs	133	165	2	0.01174	ug/l	0.106	Cs	
Ba	137	165	3	0.01089	ug/l	0.446	Ba	
La	139	165	2	0.00144	ug/l	0.102	La	
Ce	140	165	2	0.00095	ug/l	1.772	Ce	
Pr	141	165	2	0.00099	ug/l	0.084	Pr	
Nd	146	165	2	0.00162	ug/l	0.208	Nd	
Sm	147	165	3	0.00222	ug/l	0.652	Sm	
Hf	178	165	2	0.04406	ug/l	2.26	Hf	
Ta	181	165	2	0.04158	ug/l	1.46	Ta	
W	182	165	2	0.25483	ug/l	4	W	
Re	185	193	3	0.00198	ug/l	0.05	Re	
Pt	195	193	2	0.00181	ug/l	0.12	Pt	
Au	197	193	3	0.13211	ug/l	1	Au	
Tl	205	193	3	0.00269	ug/l	1.1	Tl	
Pb	208	193	3	-0.00234	ug/l	0.346	Pb	
Bi	209	193	2	-0.00104	ug/l	1.464	Bi	
Th	232	193	3	0.07426	ug/l	1.104	Th	
U	238	193	3	0.00503	ug/l	0.462	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	5146036	0.04	6327920	81.3	80	120	Li (IS)	
Sc (IS)	45	2	199179	0.51	224146	88.9	80	120	Sc (IS)	
Sc (IS)	45	3	3483701	0.61	3966854	87.8	80	120	Sc (IS)	
Ge (IS)	72	2	429316	1.19	458627	93.6	80	120	Ge (IS)	
Ge (IS)	72	3	2645069	0.17	2917719	90.7	80	120	Ge (IS)	
In (IS)	115	3	20132789	0.92	22065637	91.2	80	120	In (IS)	
Ho (IS)	165	2	14987114	0.20	16245218	92.3	80	120	Ho (IS)	
Ho (IS)	165	3	24859611	0.45	27266963	91.2	80	120	Ho (IS)	
Ir (IS)	193	2	10150012	0.51	10999175	92.3	80	120	Ir (IS)	
Ir (IS)	193	3	12366844	0.76	13591604	91.0	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Sample Name	**MB 160-454546/1-A**
Data File Name	**055SMPL.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-26T22:09:06-06:00**
Type	**Sample**
VialNumber	**2307**
Dilution	**2**
Comment	**454546**
Operator	**LP 7700**
ISTDRefDataFileName	**003CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	FinalConcentration	Units	High Value	Analyte	QC Flag
Li	7	6	3	0.26876	0.53751	ug/l	1000	Li	
Be	9	6	3	-0.01044	-0.02088	ug/l	1000	Be	
B	11	6	3	2.18160	4.36320	ug/l	2000	B	
Na	23	45	2	4.82465	9.64930	ug/l	50000	Na	
Mg	24	45	2	0.79828	1.59655	ug/l	50000	Mg	
Al	27	45	2	1.58592	3.17184	ug/l	100000	Al	
P	31	45	2	3.81421	7.62842	ug/l	100000	P	
K	39	45	2	-0.66795	-1.33590	ug/l	100000	K	
Ca	44	45	3	-15.06370	-30.12740	ug/l	100000	Ca	
Ti	47	45	3	0.07387	0.14774	ug/l	2000	Ti	
V	51	45	2	-0.21852	-0.43704	ug/l	2000	V	
Cr	52	45	2	-0.01136	-0.02273	ug/l	2000	Cr	
Mn	55	72	2	0.02220	0.04439	ug/l	5000	Mn	
Fe	57	72	2	1.15113	2.30225	ug/l	100000	Fe	
Co	59	72	2	-0.00380	-0.00760	ug/l	2000	Co	
Ni	60	72	2	0.00597	0.01194	ug/l	2000	Ni	
Cu	63	72	2	-0.31137	-0.62273	ug/l	2000	Cu	
Zn	66	72	2	0.48387	0.96774	ug/l	5000	Zn	
As	75	72	2	-0.09881	-0.19762	ug/l	2000	As	
Se	78	72	2	-0.18274	-0.36548	ug/l	1000	Se	
Sr	88	72	3	0.00945	0.01890	ug/l	2000	Sr	
Y	89	72	2	-0.00332	-0.00663	ug/l	200	Y	
Zr	90	72	2	-0.00929	-0.01858	ug/l	2000	Zr	
Nb	93	72	2	0.19337	0.38675	ug/l	100	Nb	
Mo	95	72	3	-0.10950	-0.21900	ug/l	1000	Mo	
Ru	101	72	2	-0.00833	-0.01666	ug/l	200	Ru	
Rh	103	72	2	-0.00304	-0.00608	ug/l	200	Rh	
Pd	105	72	2	-0.00615	-0.01231	ug/l	20	Pd	
Ag	107	115	3	-0.01591	-0.03182	ug/l	400	Ag	
Cd	111	115	3	-0.00487	-0.00974	ug/l	2000	Cd	
Sn	118	115	3	-0.10538	-0.21076	ug/l	2000	Sn	
Sb	121	115	3	0.00427	0.00854	ug/l	1000	Sb	
Te	125	165	2	0.00358	0.00715	ug/l	200	Te	
Cs	133	165	2	0.00077	0.00153	ug/l	2000	Cs	
Ba	137	165	3	0.01785	0.03571	ug/l	5000	Ba	
La	139	165	2	-0.00314	-0.00627	ug/l	200	La	
Ce	140	165	2	-0.00362	-0.00724	ug/l	200	Ce	
Pr	141	165	2	-0.00372	-0.00745	ug/l	200	Pr	
Nd	146	165	2	-0.00401	-0.00801	ug/l	200	Nd	
Sm	147	165	3	-0.00292	-0.00584	ug/l	2000	Sm	
Hf	178	165	2	0.00603	0.01206	ug/l	200	Hf	
Ta	181	165	2	-0.00053	-0.00106	ug/l	200	Ta	
W	182	165	2	0.04980	0.09960	ug/l	2000	W	
Re	185	193	3	-0.00301	-0.00602	ug/l	200	Re	
Pt	195	193	2	-0.00185	-0.00369	ug/l	200	Pt	
Au	197	193	3	0.02593	0.05185	ug/l	2000	Au	
Tl	205	193	3	-0.02427	-0.04853	ug/l	400	Tl	
Pb	208	193	3	-0.02091	-0.04181	ug/l	5000	Pb	
Bi	209	193	2	-0.02618	-0.05236	ug/l	2000	Bi	
Th	232	193	3	-0.00380	-0.00760	ug/l	2000	Th	
U	238	193	3	-0.00079	-0.00157	ug/l	2000	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	5222031	0.76	6327920	82.5	80	120	Li (IS)	
Sc (IS)	45	2	200003	0.81	224146	89.2	80	120	Sc (IS)	
Sc (IS)	45	3	3530716	1.85	3966854	89.0	80	120	Sc (IS)	
Ge (IS)	72	2	444590	0.64	458627	96.9	80	120	Ge (IS)	
Ge (IS)	72	3	2752968	1.04	2917719	94.4	80	120	Ge (IS)	
In (IS)	115	3	20394963	1.21	22065637	92.4	80	120	In (IS)	
Ho (IS)	165	2	15121009	0.48	16245218	93.1	80	120	Ho (IS)	
Ho (IS)	165	3	25079015	1.93	27266963	92.0	80	120	Ho (IS)	
Ir (IS)	193	2	10127426	0.58	10999175	92.1	80	120	Ir (IS)	
Ir (IS)	193	3	12477052	1.17	13591604	91.8	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Sample Name	**LCS 160-454546/2-A**
Data File Name	**056SMPL.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-26T22:15:49-06:00**
Type	**Sample**
VialNumber	**2308**
Dilution	**2**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**003CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	FinalConcentration	Units	High Value	Analyte	QC Flag
Li	7	6	3	50.67186	101.34371	ug/l	1000	Li	
Be	9	6	3	49.22337	98.44674	ug/l	1000	Be	
B	11	6	3	96.26706	192.53412	ug/l	2000	B	
Na	23	45	2	4976.89794	9953.79588	ug/l	50000	Na	
Mg	24	45	2	5047.52536	10095.05073	ug/l	50000	Mg	
Al	27	45	2	4964.46747	9928.93494	ug/l	100000	Al	
P	31	45	2	486.20704	972.41407	ug/l	100000	P	
K	39	45	2	4932.33895	9864.67791	ug/l	100000	K	
Ca	44	45	3	5096.24247	10192.48493	ug/l	100000	Ca	
Ti	47	45	3	496.46023	992.92047	ug/l	2000	Ti	
V	51	45	2	490.58046	981.16091	ug/l	2000	V	
Cr	52	45	2	491.04968	982.09935	ug/l	2000	Cr	
Mn	55	72	2	511.74966	1023.49931	ug/l	5000	Mn	
Fe	57	72	2	5010.01591	10020.03183	ug/l	100000	Fe	
Co	59	72	2	506.03608	1012.07215	ug/l	2000	Co	
Ni	60	72	2	531.74719	1063.49437	ug/l	2000	Ni	
Cu	63	72	2	509.99980	1019.99961	ug/l	2000	Cu	
Zn	66	72	2	495.00970	990.01941	ug/l	5000	Zn	
As	75	72	2	486.32431	972.64863	ug/l	2000	As	
Se	78	72	2	239.00866	478.01733	ug/l	1000	Se	
Sr	88	72	3	511.61752	1023.23504	ug/l	2000	Sr	
Y	89	72	2	0.00207	0.00414	ug/l	200	Y	
Zr	90	72	2	517.38988	1034.77977	ug/l	2000	Zr	
Nb	93	72	2	0.81794	1.63588	ug/l	100	Nb	
Mo	95	72	3	251.71794	503.43589	ug/l	1000	Mo	
Ru	101	72	2	-0.00627	-0.01255	ug/l	200	Ru	
Rh	103	72	2	0.01897	0.03794	ug/l	200	Rh	
Pd	105	72	2	0.02140	0.04280	ug/l	20	Pd	
Ag	107	115	3	97.84717	195.69435	ug/l	400	Ag	
Cd	111	115	3	496.60037	993.20073	ug/l	2000	Cd	
Sn	118	115	3	492.84151	985.68302	ug/l	2000	Sn	
Sb	121	115	3	247.06662	494.13324	ug/l	1000	Sb	
Te	125	165	2	0.09331	0.18661	ug/l	200	Te	
Cs	133	165	2	0.00195	0.00389	ug/l	2000	Cs	
Ba	137	165	3	482.90424	965.80848	ug/l	5000	Ba	
La	139	165	2	0.77243	1.54486	ug/l	200	La	
Ce	140	165	2	0.01738	0.03477	ug/l	200	Ce	
Pr	141	165	2	0.00103	0.00206	ug/l	200	Pr	
Nd	146	165	2	0.00679	0.01359	ug/l	200	Nd	
Sm	147	165	3	497.98744	995.97488	ug/l	2000	Sm	
Hf	178	165	2	0.35961	0.71922	ug/l	200	Hf	
Ta	181	165	2	0.48308	0.96616	ug/l	200	Ta	
W	182	165	2	491.46021	982.92043	ug/l	2000	W	
Re	185	193	3	0.00919	0.01838	ug/l	200	Re	
Pt	195	193	2	0.00244	0.00488	ug/l	200	Pt	
Au	197	193	3	0.01933	0.03865	ug/l	2000	Au	
Tl	205	193	3	101.71095	203.42190	ug/l	400	Tl	
Pb	208	193	3	513.68951	1027.37903	ug/l	5000	Pb	
Bi	209	193	2	515.82684	1031.65368	ug/l	2000	Bi	
Th	232	193	3	520.54505	1041.09010	ug/l	2000	Th	
U	238	193	3	524.32289	1048.64578	ug/l	2000	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	4998872	0.66	6327920	79.0	80	120	Li (IS)	FAILED
Sc (IS)	45	2	200310	2.08	224146	89.4	80	120	Sc (IS)	
Sc (IS)	45	3	3454641	0.26	3966854	87.1	80	120	Sc (IS)	
Ge (IS)	72	2	439600	2.45	458627	95.9	80	120	Ge (IS)	
Ge (IS)	72	3	2679146	0.50	2917719	91.8	80	120	Ge (IS)	
In (IS)	115	3	19396937	0.21	22065637	87.9	80	120	In (IS)	
Ho (IS)	165	2	14951142	2.92	16245218	92.0	80	120	Ho (IS)	
Ho (IS)	165	3	24742817	0.16	27266963	90.7	80	120	Ho (IS)	
Ir (IS)	193	2	9619813	2.71	10999175	87.5	80	120	Ir (IS)	
Ir (IS)	193	3	11909266	0.70	13591604	87.6	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Sample Name	**280-131980-A-1-B**
Data File Name	**057SMPL.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-26T22:22:33-06:00**
Type	**Sample**
VialNumber	**2309**
Dilution	**20**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**003CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	FinalConcentration	Units	High Value	Analyte	QC Flag
Li	7	6	3	3.02367	60.47344	ug/l	1000	Li	
Be	9	6	3	-0.00375	-0.07509	ug/l	1000	Be	
B	11	6	3	344.73720	6894.74406	ug/l	2000	B	
Na	23	45	2	2787.23238	55744.64756	ug/l	50000	Na	
Mg	24	45	2	1306.47924	26129.58489	ug/l	50000	Mg	
Al	27	45	2	28.96810	579.36194	ug/l	100000	Al	
P	31	45	2	-1.84012	-36.80234	ug/l	100000	P	
K	39	45	2	5731.85520	114637.10402	ug/l	100000	K	
Ca	44	45	3	1792.63683	35852.73651	ug/l	100000	Ca	
Ti	47	45	3	0.15785	3.15694	ug/l	2000	Ti	
V	51	45	2	0.47423	9.48453	ug/l	2000	V	
Cr	52	45	2	0.46834	9.36686	ug/l	2000	Cr	
Mn	55	72	2	0.15267	3.05330	ug/l	5000	Mn	
Fe	57	72	2	1.83831	36.76626	ug/l	100000	Fe	
Co	59	72	2	0.05855	1.17094	ug/l	2000	Co	
Ni	60	72	2	0.71625	14.32506	ug/l	2000	Ni	
Cu	63	72	2	1.35624	27.12471	ug/l	2000	Cu	
Zn	66	72	2	2.39287	47.85731	ug/l	5000	Zn	
As	75	72	2	0.16842	3.36846	ug/l	2000	As	
Se	78	72	2	0.19983	3.99655	ug/l	1000	Se	
Sr	88	72	3	44.80859	896.17178	ug/l	2000	Sr	
Y	89	72	2	-0.00306	-0.06124	ug/l	200	Y	
Zr	90	72	2	0.15855	3.17097	ug/l	2000	Zr	
Nb	93	72	2	0.02288	0.45766	ug/l	100	Nb	
Mo	95	72	3	0.16624	3.32470	ug/l	1000	Mo	
Ru	101	72	2	-0.00695	-0.13901	ug/l	200	Ru	
Rh	103	72	2	-0.00285	-0.05709	ug/l	200	Rh	
Pd	105	72	2	-0.00259	-0.05175	ug/l	20	Pd	
Ag	107	115	3	120.57850	2411.56991	ug/l	400	Ag	
Cd	111	115	3	0.05665	1.13292	ug/l	2000	Cd	
Sn	118	115	3	0.23993	4.79868	ug/l	2000	Sn	
Sb	121	115	3	0.04789	0.95775	ug/l	1000	Sb	
Te	125	165	2	-0.00594	-0.11871	ug/l	200	Te	
Cs	133	165	2	0.00045	0.00890	ug/l	2000	Cs	
Ba	137	165	3	4.70085	94.01701	ug/l	5000	Ba	
La	139	165	2	0.00477	0.09538	ug/l	200	La	
Ce	140	165	2	-0.00235	-0.04704	ug/l	200	Ce	
Pr	141	165	2	-0.00316	-0.06323	ug/l	200	Pr	
Nd	146	165	2	-0.00309	-0.06180	ug/l	200	Nd	
Sm	147	165	3	0.04092	0.81834	ug/l	2000	Sm	
Hf	178	165	2	-0.01356	-0.27115	ug/l	200	Hf	
Ta	181	165	2	-0.01108	-0.22161	ug/l	200	Ta	
W	182	165	2	0.81727	16.34544	ug/l	2000	W	
Re	185	193	3	-0.00225	-0.04498	ug/l	200	Re	
Pt	195	193	2	-0.00145	-0.02898	ug/l	200	Pt	
Au	197	193	3	0.06219	1.24379	ug/l	2000	Au	
Tl	205	193	3	0.10668	2.13367	ug/l	400	Tl	
Pb	208	193	3	0.29599	5.91980	ug/l	5000	Pb	
Bi	209	193	2	0.08517	1.70339	ug/l	2000	Bi	
Th	232	193	3	0.14963	2.99264	ug/l	2000	Th	
U	238	193	3	0.30893	6.17860	ug/l	2000	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	5090869	0.28	6327920	80.5	80	120	Li (IS)	
Sc (IS)	45	2	194584	1.51	224146	86.8	80	120	Sc (IS)	
Sc (IS)	45	3	3415360	0.82	3966854	86.1	80	120	Sc (IS)	
Ge (IS)	72	2	439483	0.14	458627	95.8	80	120	Ge (IS)	
Ge (IS)	72	3	2694120	0.89	2917719	92.3	80	120	Ge (IS)	
In (IS)	115	3	19798938	0.53	22065637	89.7	80	120	In (IS)	
Ho (IS)	165	2	14882353	0.46	16245218	91.6	80	120	Ho (IS)	
Ho (IS)	165	3	24533035	1.40	27266963	90.0	80	120	Ho (IS)	
Ir (IS)	193	2	9969072	0.71	10999175	90.6	80	120	Ir (IS)	
Ir (IS)	193	3	12114446	1.12	13591604	89.1	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Sample Name	**280-131980-A-1-B SD**
Data File Name	**058SMPL.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-26T22:29:19-06:00**
Type	**Sample**
VialNumber	**2310**
Dilution	**100**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**003CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	FinalConcentration	Units	High Value	Analyte	QC Flag
Li	7	6	3	0.89101	89.10133	ug/l	1000	Li	
Be	9	6	3	-0.00743	-0.74295	ug/l	1000	Be	
B	11	6	3	67.51399	6751.39895	ug/l	2000	B	
Na	23	45	2	553.33949	55333.94863	ug/l	50000	Na	
Mg	24	45	2	253.93005	25393.00475	ug/l	50000	Mg	
Al	27	45	2	13.00916	1300.91631	ug/l	100000	Al	
P	31	45	2	-1.57490	-157.49028	ug/l	100000	P	
K	39	45	2	1142.65110	114265.11040	ug/l	100000	K	
Ca	44	45	3	336.01530	33601.53015	ug/l	100000	Ca	
Ti	47	45	3	0.01078	1.07820	ug/l	2000	Ti	
V	51	45	2	-0.02563	-2.56325	ug/l	2000	V	
Cr	52	45	2	0.07639	7.63922	ug/l	2000	Cr	
Mn	55	72	2	0.04578	4.57833	ug/l	5000	Mn	
Fe	57	72	2	0.52203	52.20264	ug/l	100000	Fe	
Co	59	72	2	0.00738	0.73787	ug/l	2000	Co	
Ni	60	72	2	0.14470	14.47036	ug/l	2000	Ni	
Cu	63	72	2	-0.07582	-7.58170	ug/l	2000	Cu	
Zn	66	72	2	0.53185	53.18497	ug/l	5000	Zn	
As	75	72	2	0.01201	1.20119	ug/l	2000	As	
Se	78	72	2	0.03351	3.35145	ug/l	1000	Se	
Sr	88	72	3	8.41813	841.81342	ug/l	2000	Sr	
Y	89	72	2	-0.00383	-0.38272	ug/l	200	Y	
Zr	90	72	2	0.00500	0.50030	ug/l	2000	Zr	
Nb	93	72	2	-0.00639	-0.63902	ug/l	100	Nb	
Mo	95	72	3	-0.04301	-4.30145	ug/l	1000	Mo	
Ru	101	72	2	-0.00647	-0.64746	ug/l	200	Ru	
Rh	103	72	2	-0.00248	-0.24784	ug/l	200	Rh	
Pd	105	72	2	-0.00500	-0.50038	ug/l	20	Pd	
Ag	107	115	3	22.79483	2279.48302	ug/l	400	Ag	
Cd	111	115	3	0.00467	0.46662	ug/l	2000	Cd	
Sn	118	115	3	0.01773	1.77289	ug/l	2000	Sn	
Sb	121	115	3	0.01728	1.72829	ug/l	1000	Sb	
Te	125	165	2	-0.00275	-0.27493	ug/l	200	Te	
Cs	133	165	2	0.00013	0.01269	ug/l	2000	Cs	
Ba	137	165	3	0.93081	93.08074	ug/l	5000	Ba	
La	139	165	2	0.00414	0.41446	ug/l	200	La	
Ce	140	165	2	-0.00239	-0.23902	ug/l	200	Ce	
Pr	141	165	2	-0.00339	-0.33869	ug/l	200	Pr	
Nd	146	165	2	-0.00311	-0.31126	ug/l	200	Nd	
Sm	147	165	3	0.00224	0.22447	ug/l	2000	Sm	
Hf	178	165	2	-0.01821	-1.82144	ug/l	200	Hf	
Ta	181	165	2	-0.02110	-2.11039	ug/l	200	Ta	
W	182	165	2	0.13471	13.47150	ug/l	2000	W	
Re	185	193	3	-0.00269	-0.26883	ug/l	200	Re	
Pt	195	193	2	-0.00445	-0.44534	ug/l	200	Pt	
Au	197	193	3	0.01248	1.24793	ug/l	2000	Au	
Tl	205	193	3	0.00554	0.55354	ug/l	400	Tl	
Pb	208	193	3	0.04391	4.39112	ug/l	5000	Pb	
Bi	209	193	2	-0.00816	-0.81644	ug/l	2000	Bi	
Th	232	193	3	0.01458	1.45775	ug/l	2000	Th	
U	238	193	3	0.05741	5.74087	ug/l	2000	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	5133015	0.26	6327920	81.1	80	120	Li (IS)	
Sc (IS)	45	2	199414	0.48	224146	89.0	80	120	Sc (IS)	
Sc (IS)	45	3	3454742	0.47	3966854	87.1	80	120	Sc (IS)	
Ge (IS)	72	2	447236	1.13	458627	97.5	80	120	Ge (IS)	
Ge (IS)	72	3	2725773	0.16	2917719	93.4	80	120	Ge (IS)	
In (IS)	115	3	19886902	0.56	22065637	90.1	80	120	In (IS)	
Ho (IS)	165	2	15023475	1.07	16245218	92.5	80	120	Ho (IS)	
Ho (IS)	165	3	24586275	0.82	27266963	90.2	80	120	Ho (IS)	
Ir (IS)	193	2	10064053	0.64	10999175	91.5	80	120	Ir (IS)	
Ir (IS)	193	3	12124976	0.22	13591604	89.2	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Sample Name	**280-131980-A-1-C MS**
Data File Name	**059SMPL.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-26T22:36:02-06:00**
Type	**Sample**
VialNumber	**2311**
Dilution	**20**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**003CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	FinalConcentration	Units	High Value	Analyte	QC Flag
Li	7	6	3	8.25738	165.14766	ug/l	1000	Li	
Be	9	6	3	5.02079	100.41579	ug/l	1000	Be	
B	11	6	3	364.64856	7292.97116	ug/l	2000	B	
Na	23	45	2	3342.73524	66854.70479	ug/l	50000	Na	
Mg	24	45	2	1760.71333	35214.26663	ug/l	50000	Mg	
Al	27	45	2	571.37744	11427.54890	ug/l	100000	Al	
P	31	45	2	49.01136	980.22721	ug/l	100000	P	
K	39	45	2	6324.38540	126487.70803	ug/l	100000	K	
Ca	44	45	3	2338.47334	46769.46677	ug/l	100000	Ca	
Ti	47	45	3	49.73487	994.69742	ug/l	2000	Ti	
V	51	45	2	49.64321	992.86415	ug/l	2000	V	
Cr	52	45	2	50.26887	1005.37731	ug/l	2000	Cr	
Mn	55	72	2	50.25374	1005.07477	ug/l	5000	Mn	
Fe	57	72	2	504.72653	10094.53064	ug/l	100000	Fe	
Co	59	72	2	49.98477	999.69537	ug/l	2000	Co	
Ni	60	72	2	53.23953	1064.79067	ug/l	2000	Ni	
Cu	63	72	2	52.14357	1042.87132	ug/l	2000	Cu	
Zn	66	72	2	54.07976	1081.59518	ug/l	5000	Zn	
As	75	72	2	50.24589	1004.91775	ug/l	2000	As	
Se	78	72	2	24.28435	485.68692	ug/l	1000	Se	
Sr	88	72	3	96.99417	1939.88342	ug/l	2000	Sr	
Y	89	72	2	-0.00294	-0.05881	ug/l	200	Y	
Zr	90	72	2	49.59161	991.83215	ug/l	2000	Zr	
Nb	93	72	2	0.03677	0.73542	ug/l	100	Nb	
Mo	95	72	3	24.38312	487.66245	ug/l	1000	Mo	
Ru	101	72	2	-0.00775	-0.15503	ug/l	200	Ru	
Rh	103	72	2	-0.00122	-0.02434	ug/l	200	Rh	
Pd	105	72	2	0.00159	0.03173	ug/l	20	Pd	
Ag	107	115	3	132.45896	2649.17917	ug/l	400	Ag	
Cd	111	115	3	48.19574	963.91480	ug/l	2000	Cd	
Sn	118	115	3	51.01598	1020.31951	ug/l	2000	Sn	
Sb	121	115	3	23.53968	470.79362	ug/l	1000	Sb	
Te	125	165	2	0.00708	0.14153	ug/l	200	Te	
Cs	133	165	2	-0.00012	-0.00234	ug/l	2000	Cs	
Ba	137	165	3	52.09287	1041.85736	ug/l	5000	Ba	
La	139	165	2	0.08308	1.66164	ug/l	200	La	
Ce	140	165	2	-0.00130	-0.02601	ug/l	200	Ce	
Pr	141	165	2	-0.00278	-0.05553	ug/l	200	Pr	
Nd	146	165	2	-0.00175	-0.03494	ug/l	200	Nd	
Sm	147	165	3	48.31888	966.37760	ug/l	2000	Sm	
Hf	178	165	2	-0.00122	-0.02445	ug/l	200	Hf	
Ta	181	165	2	0.02028	0.40554	ug/l	200	Ta	
W	182	165	2	51.07184	1021.43685	ug/l	2000	W	
Re	185	193	3	-0.00150	-0.02999	ug/l	200	Re	
Pt	195	193	2	-0.00137	-0.02748	ug/l	200	Pt	
Au	197	193	3	0.06004	1.20084	ug/l	2000	Au	
Tl	205	193	3	9.51085	190.21696	ug/l	400	Tl	
Pb	208	193	3	51.58257	1031.65139	ug/l	5000	Pb	
Bi	209	193	2	53.11515	1062.30292	ug/l	2000	Bi	
Th	232	193	3	51.44114	1028.82271	ug/l	2000	Th	
U	238	193	3	53.13100	1062.62000	ug/l	2000	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	5069262	0.61	6327920	80.1	80	120	Li (IS)	
Sc (IS)	45	2	196184	0.29	224146	87.5	80	120	Sc (IS)	
Sc (IS)	45	3	3424630	0.63	3966854	86.3	80	120	Sc (IS)	
Ge (IS)	72	2	441877	0.07	458627	96.3	80	120	Ge (IS)	
Ge (IS)	72	3	2692615	0.81	2917719	92.3	80	120	Ge (IS)	
In (IS)	115	3	19627392	0.57	22065637	89.0	80	120	In (IS)	
Ho (IS)	165	2	14715665	0.32	16245218	90.6	80	120	Ho (IS)	
Ho (IS)	165	3	24511597	1.37	27266963	89.9	80	120	Ho (IS)	
Ir (IS)	193	2	9857141	0.30	10999175	89.6	80	120	Ir (IS)	
Ir (IS)	193	3	11977233	0.86	13591604	88.1	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Sample Name	**280-131980-A-1-D MSD**
Data File Name	**060SMPL.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-26T22:42:47-06:00**
Type	**Sample**
VialNumber	**2312**
Dilution	**20**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**003CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	FinalConcentration	Units	High Value	Analyte	QC Flag
Li	7	6	3	8.02948	160.58963	ug/l	1000	Li	
Be	9	6	3	4.91959	98.39189	ug/l	1000	Be	
B	11	6	3	361.53989	7230.79787	ug/l	2000	B	
Na	23	45	2	3286.80504	65736.10081	ug/l	50000	Na	
Mg	24	45	2	1737.55113	34751.02255	ug/l	50000	Mg	
Al	27	45	2	569.25233	11385.04650	ug/l	100000	Al	
P	31	45	2	49.63782	992.75632	ug/l	100000	P	
K	39	45	2	6257.60155	125152.03090	ug/l	100000	K	
Ca	44	45	3	2300.20057	46004.01144	ug/l	100000	Ca	
Ti	47	45	3	48.95426	979.08523	ug/l	2000	Ti	
V	51	45	2	48.92738	978.54768	ug/l	2000	V	
Cr	52	45	2	49.79938	995.98757	ug/l	2000	Cr	
Mn	55	72	2	49.33349	986.66979	ug/l	5000	Mn	
Fe	57	72	2	491.29610	9825.92209	ug/l	100000	Fe	
Co	59	72	2	48.68684	973.73673	ug/l	2000	Co	
Ni	60	72	2	51.96415	1039.28303	ug/l	2000	Ni	
Cu	63	72	2	51.39034	1027.80687	ug/l	2000	Cu	
Zn	66	72	2	53.01701	1060.34028	ug/l	5000	Zn	
As	75	72	2	48.90381	978.07626	ug/l	2000	As	
Se	78	72	2	24.58636	491.72712	ug/l	1000	Se	
Sr	88	72	3	94.52812	1890.56237	ug/l	2000	Sr	
Y	89	72	2	-0.00300	-0.06007	ug/l	200	Y	
Zr	90	72	2	48.85462	977.09236	ug/l	2000	Zr	
Nb	93	72	2	0.01819	0.36373	ug/l	100	Nb	
Mo	95	72	3	24.09870	481.97394	ug/l	1000	Mo	
Ru	101	72	2	-0.00732	-0.14638	ug/l	200	Ru	
Rh	103	72	2	-0.00135	-0.02701	ug/l	200	Rh	
Pd	105	72	2	-0.00273	-0.05462	ug/l	20	Pd	
Ag	107	115	3	130.60425	2612.08500	ug/l	400	Ag	
Cd	111	115	3	47.35842	947.16839	ug/l	2000	Cd	
Sn	118	115	3	50.20753	1004.15065	ug/l	2000	Sn	
Sb	121	115	3	23.36773	467.35461	ug/l	1000	Sb	
Te	125	165	2	0.01356	0.27122	ug/l	200	Te	
Cs	133	165	2	-0.00028	-0.00557	ug/l	2000	Cs	
Ba	137	165	3	50.87914	1017.58274	ug/l	5000	Ba	
La	139	165	2	0.08381	1.67621	ug/l	200	La	
Ce	140	165	2	-0.00068	-0.01355	ug/l	200	Ce	
Pr	141	165	2	-0.00308	-0.06166	ug/l	200	Pr	
Nd	146	165	2	-0.00088	-0.01755	ug/l	200	Nd	
Sm	147	165	3	47.29422	945.88432	ug/l	2000	Sm	
Hf	178	165	2	-0.00588	-0.11768	ug/l	200	Hf	
Ta	181	165	2	0.01610	0.32190	ug/l	200	Ta	
W	182	165	2	48.52413	970.48266	ug/l	2000	W	
Re	185	193	3	-0.00162	-0.03237	ug/l	200	Re	
Pt	195	193	2	-0.00124	-0.02483	ug/l	200	Pt	
Au	197	193	3	0.05633	1.12669	ug/l	2000	Au	
Tl	205	193	3	9.39346	187.86922	ug/l	400	Tl	
Pb	208	193	3	49.87282	997.45639	ug/l	5000	Pb	
Bi	209	193	2	51.76823	1035.36458	ug/l	2000	Bi	
Th	232	193	3	50.36154	1007.23071	ug/l	2000	Th	
U	238	193	3	52.04726	1040.94525	ug/l	2000	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	5041329	0.77	6327920	79.7	80	120	Li (IS)	FAILED
Sc (IS)	45	2	194582	1.32	224146	86.8	80	120	Sc (IS)	
Sc (IS)	45	3	3413003	0.32	3966854	86.0	80	120	Sc (IS)	
Ge (IS)	72	2	443028	0.57	458627	96.6	80	120	Ge (IS)	
Ge (IS)	72	3	2679818	0.34	2917719	91.8	80	120	Ge (IS)	
In (IS)	115	3	19368325	0.68	22065637	87.8	80	120	In (IS)	
Ho (IS)	165	2	14857095	1.13	16245218	91.5	80	120	Ho (IS)	
Ho (IS)	165	3	24340927	0.45	27266963	89.3	80	120	Ho (IS)	
Ir (IS)	193	2	9854390	0.54	10999175	89.6	80	120	Ir (IS)	
Ir (IS)	193	3	11929237	0.49	13591604	87.8	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Sample Name	**280-131980-A-1-B PDS**
Data File Name	**061SMPL.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-26T22:49:28-06:00**
Type	**Sample**
VialNumber	**2401**
Dilution	**20**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**003CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	FinalConcentration	Units	High Value	Analyte	QC Flag
Li	7	6	3	52.61944	1052.38878	ug/l	1000	Li	
Be	9	6	3	4.97866	99.57329	ug/l	1000	Be	
B	11	6	3	1327.12420	26542.48405	ug/l	2000	B	
Na	23	45	2	3701.59628	74031.92552	ug/l	50000	Na	
Mg	24	45	2	1703.24681	34064.93623	ug/l	50000	Mg	
Al	27	45	2	566.98809	11339.76182	ug/l	100000	Al	
P	31	45	2	996.73439	19934.68777	ug/l	100000	P	
K	39	45	2	6634.08471	132681.69428	ug/l	100000	K	
Ca	44	45	3	3683.20140	73664.02806	ug/l	100000	Ca	
Ti	47	45	3	49.78068	995.61350	ug/l	2000	Ti	
V	51	45	2	98.88833	1977.76657	ug/l	2000	V	
Cr	52	45	2	100.31430	2006.28599	ug/l	2000	Cr	
Mn	55	72	2	39.62820	792.56403	ug/l	5000	Mn	
Fe	57	72	2	485.21625	9704.32505	ug/l	100000	Fe	
Co	59	72	2	19.60134	392.02679	ug/l	2000	Co	
Ni	60	72	2	51.62815	1032.56291	ug/l	2000	Ni	
Cu	63	72	2	30.98952	619.79041	ug/l	2000	Cu	
Zn	66	72	2	202.55965	4051.19300	ug/l	5000	Zn	
As	75	72	2	98.56480	1971.29606	ug/l	2000	As	
Se	78	72	2	48.32527	966.50537	ug/l	1000	Se	
Sr	88	72	3	94.46701	1889.34017	ug/l	2000	Sr	
Y	89	72	2	-0.00163	-0.03256	ug/l	200	Y	
Zr	90	72	2	49.12614	982.52279	ug/l	2000	Zr	
Nb	93	72	2	0.28609	5.72172	ug/l	100	Nb	
Mo	95	72	3	48.83376	976.67525	ug/l	1000	Mo	
Ru	101	72	2	-0.00779	-0.15573	ug/l	200	Ru	
Rh	103	72	2	-0.00119	-0.02385	ug/l	200	Rh	
Pd	105	72	2	0.00207	0.04140	ug/l	20	Pd	
Ag	107	115	3	135.71775	2714.35499	ug/l	400	Ag	
Cd	111	115	3	4.85773	97.15461	ug/l	2000	Cd	
Sn	118	115	3	19.06621	381.32419	ug/l	2000	Sn	
Sb	121	115	3	49.20806	984.16123	ug/l	1000	Sb	
Te	125	165	2	0.03977	0.79534	ug/l	200	Te	
Cs	133	165	2	0.00032	0.00643	ug/l	2000	Cs	
Ba	137	165	3	23.06734	461.34671	ug/l	5000	Ba	
La	139	165	2	0.01185	0.23697	ug/l	200	La	
Ce	140	165	2	0.00409	0.08170	ug/l	200	Ce	
Pr	141	165	2	-0.00307	-0.06147	ug/l	200	Pr	
Nd	146	165	2	-0.00251	-0.05012	ug/l	200	Nd	
Sm	147	165	3	99.68028	1993.60565	ug/l	2000	Sm	
Hf	178	165	2	0.09240	1.84809	ug/l	200	Hf	
Ta	181	165	2	0.37610	7.52204	ug/l	200	Ta	
W	182	165	2	50.12059	1002.41174	ug/l	2000	W	
Re	185	193	3	-0.00046	-0.00928	ug/l	200	Re	
Pt	195	193	2	-0.00049	-0.00971	ug/l	200	Pt	
Au	197	193	3	0.05992	1.19841	ug/l	2000	Au	
Tl	205	193	3	20.19567	403.91349	ug/l	400	Tl	
Pb	208	193	3	29.80072	596.01440	ug/l	5000	Pb	
Bi	209	193	2	-0.01237	-0.24731	ug/l	2000	Bi	
Th	232	193	3	20.80452	416.09048	ug/l	2000	Th	
U	238	193	3	9.56865	191.37305	ug/l	2000	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	4994314	0.11	6327920	78.9	80	120	Li (IS)	FAILED
Sc (IS)	45	2	193151	1.10	224146	86.2	80	120	Sc (IS)	
Sc (IS)	45	3	3367571	0.19	3966854	84.9	80	120	Sc (IS)	
Ge (IS)	72	2	446055	1.16	458627	97.3	80	120	Ge (IS)	
Ge (IS)	72	3	2645855	0.17	2917719	90.7	80	120	Ge (IS)	
In (IS)	115	3	19359828	0.26	22065637	87.7	80	120	In (IS)	
Ho (IS)	165	2	14767542	1.44	16245218	90.9	80	120	Ho (IS)	
Ho (IS)	165	3	24172208	0.18	27266963	88.7	80	120	Ho (IS)	
Ir (IS)	193	2	9805521	1.73	10999175	89.1	80	120	Ir (IS)	
Ir (IS)	193	3	11818999	0.80	13591604	87.0	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Sample Report

Sample Name	**280-131980-A-2-B**
Data File Name	**062SMPL.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-26T22:56:12-06:00**
Type	**Sample**
VialNumber	**2402**
Dilution	**2**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**003CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	FinalConcentration	Units	High Value	Analyte	QC Flag
Li	7	6	3	27.39430	54.78859	ug/l	1000	Li	
Be	9	6	3	-0.00933	-0.01865	ug/l	1000	Be	
B	11	6	3	1702.77899	3405.55797	ug/l	2000	B	
Na	23	45	2	21144.95951	42289.91901	ug/l	50000	Na	
Mg	24	45	2	13254.80993	26509.61986	ug/l	50000	Mg	
Al	27	45	2	6.85907	13.71813	ug/l	100000	Al	
P	31	45	2	-1.84296	-3.68592	ug/l	100000	P	
K	39	45	2	24584.77006	49169.54011	ug/l	100000	K	
Ca	44	45	3	15449.56149	30899.12298	ug/l	100000	Ca	
Ti	47	45	3	0.67197	1.34395	ug/l	2000	Ti	
V	51	45	2	0.06631	0.13262	ug/l	2000	V	
Cr	52	45	2	0.25888	0.51777	ug/l	2000	Cr	
Mn	55	72	2	0.68672	1.37344	ug/l	5000	Mn	
Fe	57	72	2	4.44008	8.88017	ug/l	100000	Fe	
Co	59	72	2	0.00601	0.01203	ug/l	2000	Co	
Ni	60	72	2	4.52552	9.05104	ug/l	2000	Ni	
Cu	63	72	2	1.81396	3.62792	ug/l	2000	Cu	
Zn	66	72	2	15.18798	30.37595	ug/l	5000	Zn	
As	75	72	2	2.18862	4.37724	ug/l	2000	As	
Se	78	72	2	-0.16260	-0.32521	ug/l	1000	Se	
Sr	88	72	3	386.38592	772.77183	ug/l	2000	Sr	
Y	89	72	2	0.00198	0.00397	ug/l	200	Y	
Zr	90	72	2	0.03720	0.07441	ug/l	2000	Zr	
Nb	93	72	2	-0.00300	-0.00600	ug/l	100	Nb	
Mo	95	72	3	-0.09519	-0.19037	ug/l	1000	Mo	
Ru	101	72	2	-0.00653	-0.01307	ug/l	200	Ru	
Rh	103	72	2	-0.00277	-0.00555	ug/l	200	Rh	
Pd	105	72	2	0.01008	0.02016	ug/l	20	Pd	
Ag	107	115	3	0.36800	0.73599	ug/l	400	Ag	
Cd	111	115	3	-0.00010	-0.00020	ug/l	2000	Cd	
Sn	118	115	3	5.35413	10.70826	ug/l	2000	Sn	
Sb	121	115	3	0.06741	0.13482	ug/l	1000	Sb	
Te	125	165	2	0.02735	0.05470	ug/l	200	Te	
Cs	133	165	2	0.00193	0.00385	ug/l	2000	Cs	
Ba	137	165	3	34.26140	68.52281	ug/l	5000	Ba	
La	139	165	2	0.00035	0.00070	ug/l	200	La	
Ce	140	165	2	0.00198	0.00396	ug/l	200	Ce	
Pr	141	165	2	-0.00288	-0.00576	ug/l	200	Pr	
Nd	146	165	2	-0.00120	-0.00239	ug/l	200	Nd	
Sm	147	165	3	0.00121	0.00243	ug/l	2000	Sm	
Hf	178	165	2	-0.01623	-0.03246	ug/l	200	Hf	
Ta	181	165	2	-0.00227	-0.00454	ug/l	200	Ta	
W	182	165	2	0.04218	0.08437	ug/l	2000	W	
Re	185	193	3	-0.00296	-0.00592	ug/l	200	Re	
Pt	195	193	2	0.00164	0.00328	ug/l	200	Pt	
Au	197	193	3	-0.00346	-0.00692	ug/l	2000	Au	
Tl	205	193	3	0.01154	0.02307	ug/l	400	Tl	
Pb	208	193	3	0.17339	0.34679	ug/l	5000	Pb	
Bi	209	193	2	-0.02954	-0.05907	ug/l	2000	Bi	
Th	232	193	3	0.01066	0.02132	ug/l	2000	Th	
U	238	193	3	0.00297	0.00595	ug/l	2000	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	5065684	0.89	6327920	80.1	80	120	Li (IS)	
Sc (IS)	45	2	191711	0.82	224146	85.5	80	120	Sc (IS)	
Sc (IS)	45	3	3437191	0.30	3966854	86.6	80	120	Sc (IS)	
Ge (IS)	72	2	432831	0.61	458627	94.4	80	120	Ge (IS)	
Ge (IS)	72	3	2646728	0.29	2917719	90.7	80	120	Ge (IS)	
In (IS)	115	3	18928496	0.13	22065637	85.8	80	120	In (IS)	
Ho (IS)	165	2	14483212	0.69	16245218	89.2	80	120	Ho (IS)	
Ho (IS)	165	3	23922954	0.21	27266963	87.7	80	120	Ho (IS)	
Ir (IS)	193	2	9582142	1.15	10999175	87.1	80	120	Ir (IS)	
Ir (IS)	193	3	11618085	0.37	13591604	85.5	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Sample Name	**280-131980-A-3-B**
Data File Name	**063SMPL.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-26T23:02:55-06:00**
Type	**Sample**
VialNumber	**2403**
Dilution	**20**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**003CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	FinalConcentration	Units	High Value	Analyte	QC Flag
Li	7	6	3	3.02360	60.47208	ug/l	1000	Li	
Be	9	6	3	-0.00914	-0.18285	ug/l	1000	Be	
B	11	6	3	296.14931	5922.98626	ug/l	2000	B	
Na	23	45	2	2629.37292	52587.45840	ug/l	50000	Na	
Mg	24	45	2	2579.87614	51597.52282	ug/l	50000	Mg	
Al	27	45	2	22.82425	456.48500	ug/l	100000	Al	
P	31	45	2	-2.45794	-49.15875	ug/l	100000	P	
K	39	45	2	4193.04771	83860.95415	ug/l	100000	K	
Ca	44	45	3	1835.16970	36703.39398	ug/l	100000	Ca	
Ti	47	45	3	0.06032	1.20647	ug/l	2000	Ti	
V	51	45	2	0.72513	14.50254	ug/l	2000	V	
Cr	52	45	2	0.31153	6.23056	ug/l	2000	Cr	
Mn	55	72	2	0.28770	5.75393	ug/l	5000	Mn	
Fe	57	72	2	0.70313	14.06250	ug/l	100000	Fe	
Co	59	72	2	0.00386	0.07721	ug/l	2000	Co	
Ni	60	72	2	0.05760	1.15194	ug/l	2000	Ni	
Cu	63	72	2	9.31196	186.23930	ug/l	2000	Cu	
Zn	66	72	2	1.93054	38.61076	ug/l	5000	Zn	
As	75	72	2	0.03857	0.77150	ug/l	2000	As	
Se	78	72	2	0.06968	1.39368	ug/l	1000	Se	
Sr	88	72	3	42.40214	848.04272	ug/l	2000	Sr	
Y	89	72	2	-0.00390	-0.07806	ug/l	200	Y	
Zr	90	72	2	-0.00465	-0.09303	ug/l	2000	Zr	
Nb	93	72	2	-0.01961	-0.39230	ug/l	100	Nb	
Mo	95	72	3	0.06716	1.34318	ug/l	1000	Mo	
Ru	101	72	2	-0.00734	-0.14677	ug/l	200	Ru	
Rh	103	72	2	-0.00427	-0.08548	ug/l	200	Rh	
Pd	105	72	2	-0.00362	-0.07246	ug/l	20	Pd	
Ag	107	115	3	56.70314	1134.06274	ug/l	400	Ag	
Cd	111	115	3	-0.00713	-0.14253	ug/l	2000	Cd	
Sn	118	115	3	0.27764	5.55281	ug/l	2000	Sn	
Sb	121	115	3	0.01703	0.34067	ug/l	1000	Sb	
Te	125	165	2	0.01354	0.27089	ug/l	200	Te	
Cs	133	165	2	-0.00123	-0.02458	ug/l	2000	Cs	
Ba	137	165	3	4.18358	83.67159	ug/l	5000	Ba	
La	139	165	2	0.00402	0.08035	ug/l	200	La	
Ce	140	165	2	-0.00269	-0.05383	ug/l	200	Ce	
Pr	141	165	2	-0.00372	-0.07430	ug/l	200	Pr	
Nd	146	165	2	-0.00416	-0.08315	ug/l	200	Nd	
Sm	147	165	3	-0.00013	-0.00257	ug/l	2000	Sm	
Hf	178	165	2	-0.01836	-0.36712	ug/l	200	Hf	
Ta	181	165	2	-0.01109	-0.22184	ug/l	200	Ta	
W	182	165	2	-0.03449	-0.68970	ug/l	2000	W	
Re	185	193	3	-0.00223	-0.04465	ug/l	200	Re	
Pt	195	193	2	-0.00272	-0.05430	ug/l	200	Pt	
Au	197	193	3	0.02365	0.47295	ug/l	2000	Au	
Tl	205	193	3	-0.01287	-0.25744	ug/l	400	Tl	
Pb	208	193	3	0.23405	4.68102	ug/l	5000	Pb	
Bi	209	193	2	-0.02860	-0.57199	ug/l	2000	Bi	
Th	232	193	3	-0.02386	-0.47720	ug/l	2000	Th	
U	238	193	3	0.24912	4.98241	ug/l	2000	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	5218969	0.35	6327920	82.5	80	120	Li (IS)	
Sc (IS)	45	2	196598	1.60	224146	87.7	80	120	Sc (IS)	
Sc (IS)	45	3	3442990	0.94	3966854	86.8	80	120	Sc (IS)	
Ge (IS)	72	2	445327	1.26	458627	97.1	80	120	Ge (IS)	
Ge (IS)	72	3	2716387	0.35	2917719	93.1	80	120	Ge (IS)	
In (IS)	115	3	19544824	0.41	22065637	88.6	80	120	In (IS)	
Ho (IS)	165	2	14802735	0.35	16245218	91.1	80	120	Ho (IS)	
Ho (IS)	165	3	24192093	0.42	27266963	88.7	80	120	Ho (IS)	
Ir (IS)	193	2	9837741	0.06	10999175	89.4	80	120	Ir (IS)	
Ir (IS)	193	3	11948241	1.32	13591604	87.9	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Sample Name	**280-131980-A-4-B**
Data File Name	**064SMPL.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-26T23:09:37-06:00**
Type	**Sample**
VialNumber	**2404**
Dilution	**20**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**003CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	FinalConcentration	Units	High Value	Analyte	QC Flag
Li	7	6	3	3.13255	62.65100	ug/l	1000	Li	
Be	9	6	3	-0.00995	-0.19896	ug/l	1000	Be	
B	11	6	3	274.06854	5481.37081	ug/l	2000	B	
Na	23	45	2	2607.67435	52153.48693	ug/l	50000	Na	
Mg	24	45	2	2592.18519	51843.70374	ug/l	50000	Mg	
Al	27	45	2	22.19059	443.81182	ug/l	100000	Al	
P	31	45	2	-0.57680	-11.53595	ug/l	100000	P	
K	39	45	2	3971.60744	79432.14872	ug/l	100000	K	
Ca	44	45	3	1868.17953	37363.59069	ug/l	100000	Ca	
Ti	47	45	3	0.06053	1.21057	ug/l	2000	Ti	
V	51	45	2	0.75787	15.15737	ug/l	2000	V	
Cr	52	45	2	0.32978	6.59557	ug/l	2000	Cr	
Mn	55	72	2	0.27909	5.58175	ug/l	5000	Mn	
Fe	57	72	2	1.84789	36.95775	ug/l	100000	Fe	
Co	59	72	2	0.00218	0.04365	ug/l	2000	Co	
Ni	60	72	2	0.06097	1.21939	ug/l	2000	Ni	
Cu	63	72	2	9.16185	183.23694	ug/l	2000	Cu	
Zn	66	72	2	2.18570	43.71404	ug/l	5000	Zn	
As	75	72	2	0.05001	1.00013	ug/l	2000	As	
Se	78	72	2	0.08843	1.76852	ug/l	1000	Se	
Sr	88	72	3	42.70093	854.01860	ug/l	2000	Sr	
Y	89	72	2	-0.00370	-0.07401	ug/l	200	Y	
Zr	90	72	2	-0.00529	-0.10581	ug/l	2000	Zr	
Nb	93	72	2	-0.01409	-0.28183	ug/l	100	Nb	
Mo	95	72	3	0.05805	1.16105	ug/l	1000	Mo	
Ru	101	72	2	-0.00829	-0.16571	ug/l	200	Ru	
Rh	103	72	2	-0.00400	-0.08007	ug/l	200	Rh	
Pd	105	72	2	-0.00435	-0.08697	ug/l	20	Pd	
Ag	107	115	3	52.46758	1049.35168	ug/l	400	Ag	
Cd	111	115	3	-0.00367	-0.07340	ug/l	2000	Cd	
Sn	118	115	3	0.08906	1.78124	ug/l	2000	Sn	
Sb	121	115	3	0.01268	0.25354	ug/l	1000	Sb	
Te	125	165	2	0.00052	0.01041	ug/l	200	Te	
Cs	133	165	2	-0.00060	-0.01197	ug/l	2000	Cs	
Ba	137	165	3	4.20385	84.07705	ug/l	5000	Ba	
La	139	165	2	0.00422	0.08433	ug/l	200	La	
Ce	140	165	2	-0.00306	-0.06122	ug/l	200	Ce	
Pr	141	165	2	-0.00362	-0.07237	ug/l	200	Pr	
Nd	146	165	2	-0.00314	-0.06288	ug/l	200	Nd	
Sm	147	165	3	-0.00135	-0.02694	ug/l	2000	Sm	
Hf	178	165	2	-0.01826	-0.36524	ug/l	200	Hf	
Ta	181	165	2	-0.01417	-0.28341	ug/l	200	Ta	
W	182	165	2	-0.09820	-1.96399	ug/l	2000	W	
Re	185	193	3	-0.00215	-0.04296	ug/l	200	Re	
Pt	195	193	2	-0.00152	-0.03036	ug/l	200	Pt	
Au	197	193	3	0.01602	0.32039	ug/l	2000	Au	
Tl	205	193	3	-0.02421	-0.48420	ug/l	400	Tl	
Pb	208	193	3	0.21886	4.37711	ug/l	5000	Pb	
Bi	209	193	2	-0.02920	-0.58396	ug/l	2000	Bi	
Th	232	193	3	-0.03069	-0.61378	ug/l	2000	Th	
U	238	193	3	0.25036	5.00711	ug/l	2000	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	5127852	0.28	6327920	81.0	80	120	Li (IS)	
Sc (IS)	45	2	194152	0.80	224146	86.6	80	120	Sc (IS)	
Sc (IS)	45	3	3382511	0.61	3966854	85.3	80	120	Sc (IS)	
Ge (IS)	72	2	439249	0.80	458627	95.8	80	120	Ge (IS)	
Ge (IS)	72	3	2708957	0.84	2917719	92.8	80	120	Ge (IS)	
In (IS)	115	3	19522923	0.75	22065637	88.5	80	120	In (IS)	
Ho (IS)	165	2	14669916	1.38	16245218	90.3	80	120	Ho (IS)	
Ho (IS)	165	3	24441237	0.12	27266963	89.6	80	120	Ho (IS)	
Ir (IS)	193	2	9869907	0.79	10999175	89.7	80	120	Ir (IS)	
Ir (IS)	193	3	11941562	0.51	13591604	87.9	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Low Level Continuing Calibration Verification (CCV) - US EPA Method 6020

Sample Name	**CCVL 1856860**
Data File Name	**065LCCV.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-26T23:16:20-06:00**
Type	**CRI**
VialNumber	**1101**
Dilution	**1**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**003CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	Units	ExpectedValue	%Recovery	%QC Low	%QC High	Analyte	QC Flag
Li	7	6	3	5.21835	ug/l	5	104.4	80	120	Li	
Be	9	6	3	0.48007	ug/l	0.5	96.0	80	120	Be	
B	11	6	3	106.48156	ug/l	100	106.5	80	120	B	
Na	23	45	2	104.71978	ug/l	100	104.7	80	120	Na	
Mg	24	45	2	56.66195	ug/l	50	113.3	80	120	Mg	
Al	27	45	2	57.84316	ug/l	50	115.7	80	120	Al	
P	31	45	2	97.76165	ug/l	100	97.8	80	120	P	
K	39	45	2	107.06892	ug/l	100	107.1	80	120	K	
Ca	44	45	3	226.44314	ug/l	200	113.2	80	120	Ca	
Ti	47	45	3	5.00788	ug/l	5	100.2	80	120	Ti	
V	51	45	2	9.90045	ug/l	10	99.0	80	120	V	
Cr	52	45	2	10.15026	ug/l	10	101.5	80	120	Cr	
Mn	55	72	2	4.19213	ug/l	4	104.8	80	120	Mn	
Fe	57	72	2	51.31788	ug/l	50	102.6	80	120	Fe	
Co	59	72	2	2.01220	ug/l	2	100.6	80	120	Co	
Ni	60	72	2	5.34549	ug/l	5	106.9	80	120	Ni	
Cu	63	72	2	2.65155	ug/l	3	88.4	80	120	Cu	
Zn	66	72	2	21.52033	ug/l	20	107.6	80	120	Zn	
As	75	72	2	10.20128	ug/l	10	102.0	80	120	As	
Se	78	72	2	5.57921	ug/l	5	111.6	80	120	Se	
Sr	88	72	3	5.23256	ug/l	5	104.7	80	120	Sr	
Y	89	72	2	5.13512	ug/l	5	102.7	80	120	Y	
Zr	90	72	2	4.93754	ug/l	5	98.8	80	120	Zr	
Nb	93	72	2	19.04714	ug/l	25	76.2	80	120	Nb	FAILED
Mo	95	72	3	4.83007	ug/l	5	96.6	80	120	Mo	
Ru	101	72	2	10.34653	ug/l	10	103.5	80	120	Ru	
Rh	103	72	2	10.25001	ug/l	10	102.5	80	120	Rh	
Pd	105	72	2	0.53574	ug/l	0.5	107.1	80	120	Pd	
Ag	107	115	3	1.93586	ug/l	2	96.8	80	120	Ag	
Cd	111	115	3	0.47961	ug/l	0.5	95.9	80	120	Cd	
Sn	118	115	3	1.76088	ug/l	2	88.0	80	120	Sn	
Sb	121	115	3	4.73095	ug/l	5	94.6	80	120	Sb	
Te	125	165	2	9.77377	ug/l	10	97.7	80	120	Te	
Cs	133	165	2	0.94117	ug/l	1	94.1	80	120	Cs	
Ba	137	165	3	1.92926	ug/l	2	96.5	80	120	Ba	
La	139	165	2	1.88903	ug/l	2	94.5	80	120	La	
Ce	140	165	2	9.35421	ug/l	10	93.5	80	120	Ce	
Pr	141	165	2	1.89561	ug/l	2	94.8	80	120	Pr	
Nd	146	165	2	1.90186	ug/l	2	95.1	80	120	Nd	
Sm	147	165	3	9.61119	ug/l	10	96.1	80	120	Sm	
Hf	178	165	2	8.85335	ug/l	10	88.5	80	120	Hf	
Ta	181	165	2	6.22382	ug/l	10	62.2	80	120	Ta	FAILED
W	182	165	2	4.44093	ug/l	5	88.8	80	120	W	
Re	185	193	3	9.16163	ug/l	10	91.6	80	120	Re	
Pt	195	193	2	0.98824	ug/l	1	98.8	80	120	Pt	
Au	197	193	3	4.62578	ug/l	5	92.5	80	120	Au	
Tl	205	193	3	1.81528	ug/l	2	90.8	80	120	Tl	
Pb	208	193	3	2.75710	ug/l	3	91.9	80	120	Pb	
Bi	209	193	2	18.55702	ug/l	20	92.8	80	120	Bi	
Th	232	193	3	1.76601	ug/l	2	88.3	80	120	Th	
U	238	193	3	0.93606	ug/l	1	93.6	80	120	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	5094118	0.89	6327920	80.5	80	120	Li (IS)	
Sc (IS)	45	2	194174	0.39	224146	86.6	80	120	Sc (IS)	
Sc (IS)	45	3	3344232	1.07	3966854	84.3	80	120	Sc (IS)	
Ge (IS)	72	2	432408	0.72	458627	94.3	80	120	Ge (IS)	
Ge (IS)	72	3	2603360	0.12	2917719	89.2	80	120	Ge (IS)	
In (IS)	115	3	19492085	1.72	22065637	88.3	80	120	In (IS)	
Ho (IS)	165	2	14649885	0.19	16245218	90.2	80	120	Ho (IS)	
Ho (IS)	165	3	23955955	0.22	27266963	87.9	80	120	Ho (IS)	
Ir (IS)	193	2	9919916	0.41	10999175	90.2	80	120	Ir (IS)	
Ir (IS)	193	3	12040977	1.61	13591604	88.6	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Continuing Calibration Verification (CCV) - US EPA Method 6020

Sample Name	**CCV 1856861**
Data File Name	**066_CCV.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-26T23:23:02-06:00**
Type	**CCV**
VialNumber	**1102**
Dilution	**1**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**003CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	Units	ExpectedValue	%Recovery	%QC Low	%QC High	Analyte	QC Flag
Li	7	6	3	100.26740	ug/l	100	100.3	90	110	Li	
Be	9	6	3	99.33963	ug/l	100	99.3	90	110	Be	
B	11	6	3	208.54090	ug/l	200	104.3	90	110	B	
Na	23	45	2	2449.15224	ug/l	2500	98.0	90	110	Na	
Mg	24	45	2	2483.93051	ug/l	2500	99.4	90	110	Mg	
Al	27	45	2	2677.54537	ug/l	2500	107.1	90	110	Al	
P	31	45	2	2419.97453	ug/l	2500	96.8	90	110	P	
K	39	45	2	2527.26751	ug/l	2500	101.1	90	110	K	
Ca	44	45	3	2502.47655	ug/l	2500	100.1	90	110	Ca	
Ti	47	45	3	100.75472	ug/l	100	100.8	90	110	Ti	
V	51	45	2	98.37974	ug/l	100	98.4	90	110	V	
Cr	52	45	2	98.74343	ug/l	100	98.7	90	110	Cr	
Mn	55	72	2	96.97531	ug/l	100	97.0	90	110	Mn	
Fe	57	72	2	2415.66397	ug/l	2500	96.6	90	110	Fe	
Co	59	72	2	98.96792	ug/l	100	99.0	90	110	Co	
Ni	60	72	2	100.47180	ug/l	100	100.5	90	110	Ni	
Cu	63	72	2	95.21474	ug/l	100	95.2	90	110	Cu	
Zn	66	72	2	99.22302	ug/l	100	99.2	90	110	Zn	
As	75	72	2	98.73168	ug/l	100	98.7	90	110	As	
Se	78	72	2	49.87953	ug/l	50	99.8	90	110	Se	
Sr	88	72	3	102.33151	ug/l	100	102.3	90	110	Sr	
Y	89	72	2	102.57853	ug/l	100	102.6	90	110	Y	
Zr	90	72	2	100.71585	ug/l	100	100.7	90	110	Zr	
Nb	93	72	2	49.71136	ug/l	50	99.4	90	110	Nb	
Mo	95	72	3	48.47418	ug/l	50	96.9	90	110	Mo	
Ru	101	72	2	99.26181	ug/l	100	99.3	90	110	Ru	
Rh	103	72	2	101.63914	ug/l	100	101.6	90	110	Rh	
Pd	105	72	2	10.35910	ug/l	10	103.6	90	110	Pd	
Ag	107	115	3	19.35199	ug/l	20	96.8	90	110	Ag	
Cd	111	115	3	96.30226	ug/l	100	96.3	90	110	Cd	
Sn	118	115	3	99.36072	ug/l	100	99.4	90	110	Sn	
Sb	121	115	3	49.41622	ug/l	50	98.8	90	110	Sb	
Te	125	165	2	96.24607	ug/l	100	96.2	90	110	Te	
Cs	133	165	2	97.94120	ug/l	100	97.9	90	110	Cs	
Ba	137	165	3	98.13879	ug/l	100	98.1	90	110	Ba	
La	139	165	2	97.89326	ug/l	100	97.9	90	110	La	
Ce	140	165	2	97.99435	ug/l	100	98.0	90	110	Ce	
Pr	141	165	2	98.66679	ug/l	100	98.7	90	110	Pr	
Nd	146	165	2	94.06887	ug/l	100	94.1	90	110	Nd	
Sm	147	165	3	100.25363	ug/l	100	100.3	90	110	Sm	
Hf	178	165	2	99.43442	ug/l	100	99.4	90	110	Hf	
Ta	181	165	2	98.33818	ug/l	100	98.3	90	110	Ta	
W	182	165	2	99.93579	ug/l	100	99.9	90	110	W	
Re	185	193	3	100.60620	ug/l	100	100.6	90	110	Re	
Pt	195	193	2	9.92398	ug/l	10	99.2	90	110	Pt	
Au	197	193	3	98.57692	ug/l	100	98.6	90	110	Au	
Tl	205	193	3	20.31095	ug/l	20	101.6	90	110	Tl	
Pb	208	193	3	102.35864	ug/l	100	102.4	90	110	Pb	
Bi	209	193	2	100.70195	ug/l	100	100.7	90	110	Bi	
Th	232	193	3	103.29705	ug/l	100	103.3	90	110	Th	
U	238	193	3	103.43359	ug/l	100	103.4	90	110	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	4887155	0.40	6327920	77.2	80	120	Li (IS)	FAILED
Sc (IS)	45	2	190958	1.04	224146	85.2	80	120	Sc (IS)	
Sc (IS)	45	3	3329170	0.20	3966854	83.9	80	120	Sc (IS)	
Ge (IS)	72	2	445479	0.39	458627	97.1	80	120	Ge (IS)	
Ge (IS)	72	3	2631804	0.83	2917719	90.2	80	120	Ge (IS)	
In (IS)	115	3	19168336	0.15	22065637	86.9	80	120	In (IS)	
Ho (IS)	165	2	14768296	0.62	16245218	90.9	80	120	Ho (IS)	
Ho (IS)	165	3	24103390	0.78	27266963	88.4	80	120	Ho (IS)	
Ir (IS)	193	2	9979111	0.81	10999175	90.7	80	120	Ir (IS)	
Ir (IS)	193	3	11839158	0.71	13591604	87.1	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Continuing Calibration Blank (CCB) - US EPA Method 6020

Sample Name	**CCB 1854886**
Data File Name	**067_CCB.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-26T23:29:46-06:00**
Type	**CCB**
VialNumber	**4**
Dilution	**1**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**003CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	Units	QC High	Analyte	QC Flag
Li	7	6	3	0.23281	ug/l	1.388	Li	
Be	9	6	3	0.00328	ug/l	0.7	Be	
B	11	6	3	9.32341	ug/l	20	B	
Na	23	45	2	1.77624	ug/l	30	Na	
Mg	24	45	2	-0.06232	ug/l	11.18	Mg	
Al	27	45	2	-0.25628	ug/l	25.8	Al	
P	31	45	2	-1.96811	ug/l	16.46	P	
K	39	45	2	0.59002	ug/l	83.2	K	
Ca	44	45	3	-23.80380	ug/l	136.2	Ca	
Ti	47	45	3	-0.02357	ug/l	4.2	Ti	
V	51	45	2	-0.06429	ug/l	4.74	V	
Cr	52	45	2	0.00699	ug/l	6.52	Cr	
Mn	55	72	2	0.01148	ug/l	0.49	Mn	
Fe	57	72	2	-0.22353	ug/l	40.7	Fe	
Co	59	72	2	0.00483	ug/l	0.434	Co	
Ni	60	72	2	-0.00229	ug/l	0.8	Ni	
Cu	63	72	2	-0.41702	ug/l	0.902	Cu	
Zn	66	72	2	-0.16738	ug/l	16.58	Zn	
As	75	72	2	-0.02747	ug/l	2.36	As	
Se	78	72	2	-0.23501	ug/l	3.18	Se	
Sr	88	72	3	0.00910	ug/l	2	Sr	
Y	89	72	2	0.00131	ug/l	0.424	Y	
Zr	90	72	2	0.01637	ug/l	0.496	Zr	
Nb	93	72	2	0.59553	ug/l	4.62	Nb	
Mo	95	72	3	-0.07502	ug/l	2	Mo	
Ru	101	72	2	-0.00098	ug/l	2	Ru	
Rh	103	72	2	0.00374	ug/l	1.634	Rh	
Pd	105	72	2	-0.00463	ug/l	0.08	Pd	
Ag	107	115	3	0.00222	ug/l	1.54	Ag	
Cd	111	115	3	0.00530	ug/l	0.4	Cd	
Sn	118	115	3	-0.00684	ug/l	2	Sn	
Sb	121	115	3	0.01567	ug/l	3.34	Sb	
Te	125	165	2	0.08911	ug/l	1.072	Te	
Cs	133	165	2	0.01058	ug/l	0.106	Cs	
Ba	137	165	3	0.01217	ug/l	0.446	Ba	
La	139	165	2	0.00199	ug/l	0.102	La	
Ce	140	165	2	0.00101	ug/l	1.772	Ce	
Pr	141	165	2	0.00251	ug/l	0.084	Pr	
Nd	146	165	2	0.00011	ug/l	0.208	Nd	
Sm	147	165	3	0.00774	ug/l	0.652	Sm	
Hf	178	165	2	0.04925	ug/l	2.26	Hf	
Ta	181	165	2	0.04361	ug/l	1.46	Ta	
W	182	165	2	0.26734	ug/l	4	W	
Re	185	193	3	0.00675	ug/l	0.05	Re	
Pt	195	193	2	-0.00013	ug/l	0.12	Pt	
Au	197	193	3	0.14252	ug/l	1	Au	
Tl	205	193	3	-0.00001	ug/l	1.1	Tl	
Pb	208	193	3	-0.02494	ug/l	0.346	Pb	
Bi	209	193	2	-0.00415	ug/l	1.464	Bi	
Th	232	193	3	0.10730	ug/l	1.104	Th	
U	238	193	3	0.00975	ug/l	0.462	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	4927009	0.40	6327920	77.9	80	120	Li (IS)	FAILED
Sc (IS)	45	2	192653	2.92	224146	85.9	80	120	Sc (IS)	
Sc (IS)	45	3	3299098	1.15	3966854	83.2	80	120	Sc (IS)	
Ge (IS)	72	2	418698	2.56	458627	91.3	80	120	Ge (IS)	
Ge (IS)	72	3	2562809	0.63	2917719	87.8	80	120	Ge (IS)	
In (IS)	115	3	19326165	0.38	22065637	87.6	80	120	In (IS)	
Ho (IS)	165	2	14606446	2.17	16245218	89.9	80	120	Ho (IS)	
Ho (IS)	165	3	23920872	0.33	27266963	87.7	80	120	Ho (IS)	
Ir (IS)	193	2	9943536	1.73	10999175	90.4	80	120	Ir (IS)	
Ir (IS)	193	3	12001455	0.84	13591604	88.3	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Sample Name	**280-131980-A-5-B**
Data File Name	**068SMPL.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-26T23:36:30-06:00**
Type	**Sample**
VialNumber	**2405**
Dilution	**2**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**003CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	FinalConcentration	Units	High Value	Analyte	QC Flag
Li	7	6	3	27.56244	55.12489	ug/l	1000	Li	
Be	9	6	3	-0.00607	-0.01215	ug/l	1000	Be	
B	11	6	3	2450.47995	4900.95990	ug/l	2000	B	FAILED
Na	23	45	2	25671.42495	51342.84990	ug/l	50000	Na	
Mg	24	45	2	22755.15972	45510.31943	ug/l	50000	Mg	
Al	27	45	2	2.01697	4.03394	ug/l	100000	Al	
P	31	45	2	-1.73436	-3.46872	ug/l	100000	P	
K	39	45	2	41741.69111	83483.38223	ug/l	100000	K	
Ca	44	45	3	8658.58149	17317.16298	ug/l	100000	Ca	
Ti	47	45	3	0.54158	1.08316	ug/l	2000	Ti	
V	51	45	2	0.15386	0.30772	ug/l	2000	V	
Cr	52	45	2	0.07711	0.15422	ug/l	2000	Cr	
Mn	55	72	2	0.23038	0.46075	ug/l	5000	Mn	
Fe	57	72	2	4.72655	9.45311	ug/l	100000	Fe	
Co	59	72	2	0.13275	0.26551	ug/l	2000	Co	
Ni	60	72	2	0.98332	1.96664	ug/l	2000	Ni	
Cu	63	72	2	71.60253	143.20506	ug/l	2000	Cu	
Zn	66	72	2	24.59467	49.18935	ug/l	5000	Zn	
As	75	72	2	0.37229	0.74458	ug/l	2000	As	
Se	78	72	2	-0.02076	-0.04152	ug/l	1000	Se	
Sr	88	72	3	165.15798	330.31597	ug/l	2000	Sr	
Y	89	72	2	-0.00214	-0.00428	ug/l	200	Y	
Zr	90	72	2	0.20857	0.41714	ug/l	2000	Zr	
Nb	93	72	2	0.33565	0.67130	ug/l	100	Nb	
Mo	95	72	3	-0.12557	-0.25114	ug/l	1000	Mo	
Ru	101	72	2	-0.00668	-0.01335	ug/l	200	Ru	
Rh	103	72	2	-0.00242	-0.00484	ug/l	200	Rh	
Pd	105	72	2	0.00156	0.00311	ug/l	20	Pd	
Ag	107	115	3	0.01019	0.02037	ug/l	400	Ag	
Cd	111	115	3	-0.00333	-0.00667	ug/l	2000	Cd	
Sn	118	115	3	3.90972	7.81944	ug/l	2000	Sn	
Sb	121	115	3	0.05036	0.10071	ug/l	1000	Sb	
Te	125	165	2	0.04436	0.08871	ug/l	200	Te	
Cs	133	165	2	0.00898	0.01795	ug/l	2000	Cs	
Ba	137	165	3	11.73032	23.46065	ug/l	5000	Ba	
La	139	165	2	-0.00170	-0.00339	ug/l	200	La	
Ce	140	165	2	-0.00268	-0.00536	ug/l	200	Ce	
Pr	141	165	2	-0.00365	-0.00730	ug/l	200	Pr	
Nd	146	165	2	-0.00346	-0.00691	ug/l	200	Nd	
Sm	147	165	3	-0.00082	-0.00163	ug/l	2000	Sm	
Hf	178	165	2	0.27711	0.55422	ug/l	200	Hf	
Ta	181	165	2	0.04197	0.08394	ug/l	200	Ta	
W	182	165	2	-0.03596	-0.07193	ug/l	2000	W	
Re	185	193	3	-0.00053	-0.00106	ug/l	200	Re	
Pt	195	193	2	0.00303	0.00606	ug/l	200	Pt	
Au	197	193	3	0.03532	0.07064	ug/l	2000	Au	
Tl	205	193	3	-0.02323	-0.04646	ug/l	400	Tl	
Pb	208	193	3	0.04700	0.09400	ug/l	5000	Pb	
Bi	209	193	2	-0.02828	-0.05655	ug/l	2000	Bi	
Th	232	193	3	0.04747	0.09493	ug/l	2000	Th	
U	238	193	3	0.00063	0.00127	ug/l	2000	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	5111793	1.13	6327920	80.8	80	120	Li (IS)	
Sc (IS)	45	2	191212	0.28	224146	85.3	80	120	Sc (IS)	
Sc (IS)	45	3	3437575	0.95	3966854	86.7	80	120	Sc (IS)	
Ge (IS)	72	2	425656	0.78	458627	92.8	80	120	Ge (IS)	
Ge (IS)	72	3	2629734	1.36	2917719	90.1	80	120	Ge (IS)	
In (IS)	115	3	18627462	0.99	22065637	84.4	80	120	In (IS)	
Ho (IS)	165	2	14301345	0.79	16245218	88.0	80	120	Ho (IS)	
Ho (IS)	165	3	23529859	0.70	27266963	86.3	80	120	Ho (IS)	
Ir (IS)	193	2	9429074	0.88	10999175	85.7	80	120	Ir (IS)	
Ir (IS)	193	3	11448375	0.31	13591604	84.2	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Sample Report

Sample Name	**280-131980-A-6-B**
Data File Name	**069SMPL.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-26T23:43:15-06:00**
Type	**Sample**
VialNumber	**2406**
Dilution	**2**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**003CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	FinalConcentration	Units	High Value	Analyte	QC Flag
Li	7	6	3	26.83788	53.67575	ug/l	1000	Li	
Be	9	6	3	-0.01061	-0.02122	ug/l	1000	Be	
B	11	6	3	131.57889	263.15779	ug/l	2000	B	
Na	23	45	2	17489.46112	34978.92223	ug/l	50000	Na	
Mg	24	45	2	13240.28036	26480.56073	ug/l	50000	Mg	
Al	27	45	2	27.48068	54.96135	ug/l	100000	Al	
P	31	45	2	2.06587	4.13175	ug/l	100000	P	
K	39	45	2	3517.18656	7034.37312	ug/l	100000	K	
Ca	44	45	3	16197.56077	32395.12154	ug/l	100000	Ca	
Ti	47	45	3	0.53066	1.06133	ug/l	2000	Ti	
V	51	45	2	6.45320	12.90640	ug/l	2000	V	
Cr	52	45	2	1.93065	3.86131	ug/l	2000	Cr	
Mn	55	72	2	0.45550	0.91101	ug/l	5000	Mn	
Fe	57	72	2	5.99957	11.99915	ug/l	100000	Fe	
Co	59	72	2	-0.00583	-0.01166	ug/l	2000	Co	
Ni	60	72	2	1.11522	2.23044	ug/l	2000	Ni	
Cu	63	72	2	55.25737	110.51474	ug/l	2000	Cu	
Zn	66	72	2	14.14841	28.29683	ug/l	5000	Zn	
As	75	72	2	0.81658	1.63316	ug/l	2000	As	
Se	78	72	2	1.32835	2.65670	ug/l	1000	Se	
Sr	88	72	3	407.39407	814.78813	ug/l	2000	Sr	
Y	89	72	2	-0.00213	-0.00427	ug/l	200	Y	
Zr	90	72	2	0.01928	0.03856	ug/l	2000	Zr	
Nb	93	72	2	0.12201	0.24403	ug/l	100	Nb	
Mo	95	72	3	1.46193	2.92387	ug/l	1000	Mo	
Ru	101	72	2	-0.00711	-0.01423	ug/l	200	Ru	
Rh	103	72	2	-0.00258	-0.00515	ug/l	200	Rh	
Pd	105	72	2	0.01267	0.02533	ug/l	20	Pd	
Ag	107	115	3	3.94744	7.89489	ug/l	400	Ag	
Cd	111	115	3	-0.00515	-0.01030	ug/l	2000	Cd	
Sn	118	115	3	5.47885	10.95771	ug/l	2000	Sn	
Sb	121	115	3	0.05918	0.11836	ug/l	1000	Sb	
Te	125	165	2	0.01058	0.02116	ug/l	200	Te	
Cs	133	165	2	0.00182	0.00364	ug/l	2000	Cs	
Ba	137	165	3	39.23105	78.46211	ug/l	5000	Ba	
La	139	165	2	-0.00232	-0.00463	ug/l	200	La	
Ce	140	165	2	-0.00315	-0.00631	ug/l	200	Ce	
Pr	141	165	2	-0.00404	-0.00808	ug/l	200	Pr	
Nd	146	165	2	-0.00221	-0.00442	ug/l	200	Nd	
Sm	147	165	3	-0.00237	-0.00474	ug/l	2000	Sm	
Hf	178	165	2	0.03315	0.06630	ug/l	200	Hf	
Ta	181	165	2	0.02432	0.04864	ug/l	200	Ta	
W	182	165	2	-0.06730	-0.13459	ug/l	2000	W	
Re	185	193	3	0.00027	0.00053	ug/l	200	Re	
Pt	195	193	2	0.00253	0.00506	ug/l	200	Pt	
Au	197	193	3	0.02388	0.04776	ug/l	2000	Au	
Tl	205	193	3	-0.02796	-0.05592	ug/l	400	Tl	
Pb	208	193	3	0.40551	0.81102	ug/l	5000	Pb	
Bi	209	193	2	0.02620	0.05240	ug/l	2000	Bi	
Th	232	193	3	-0.00291	-0.00581	ug/l	2000	Th	
U	238	193	3	2.36628	4.73256	ug/l	2000	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	5123018	0.31	6327920	81.0	80	120	Li (IS)	
Sc (IS)	45	2	192745	1.11	224146	86.0	80	120	Sc (IS)	
Sc (IS)	45	3	3469808	0.55	3966854	87.5	80	120	Sc (IS)	
Ge (IS)	72	2	433194	0.78	458627	94.5	80	120	Ge (IS)	
Ge (IS)	72	3	2694707	0.28	2917719	92.4	80	120	Ge (IS)	
In (IS)	115	3	19109326	0.33	22065637	86.6	80	120	In (IS)	
Ho (IS)	165	2	14540025	0.86	16245218	89.5	80	120	Ho (IS)	
Ho (IS)	165	3	24207564	0.66	27266963	88.8	80	120	Ho (IS)	
Ir (IS)	193	2	9531485	0.35	10999175	86.7	80	120	Ir (IS)	
Ir (IS)	193	3	11656985	1.08	13591604	85.8	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Sample Report

Sample Name	**280-131980-A-7-D**
Data File Name	**070SMPL.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-26T23:50:00-06:00**
Type	**Sample**
VialNumber	**2407**
Dilution	**2**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**003CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	FinalConcentration	Units	High Value	Analyte	QC Flag
Li	7	6	3	26.42666	52.85332	ug/l	1000	Li	
Be	9	6	3	-0.01061	-0.02121	ug/l	1000	Be	
B	11	6	3	1377.72772	2755.45545	ug/l	2000	B	
Na	23	45	2	26458.63160	52917.26321	ug/l	50000	Na	
Mg	24	45	2	12414.91965	24829.83930	ug/l	50000	Mg	
Al	27	45	2	5.46137	10.92273	ug/l	100000	Al	
P	31	45	2	3.93010	7.86021	ug/l	100000	P	
K	39	45	2	25393.81685	50787.63370	ug/l	100000	K	
Ca	44	45	3	10433.70428	20867.40857	ug/l	100000	Ca	
Ti	47	45	3	0.25825	0.51650	ug/l	2000	Ti	
V	51	45	2	0.26123	0.52247	ug/l	2000	V	
Cr	52	45	2	0.06321	0.12642	ug/l	2000	Cr	
Mn	55	72	2	58.07385	116.14770	ug/l	5000	Mn	
Fe	57	72	2	32.06632	64.13263	ug/l	100000	Fe	
Co	59	72	2	0.29983	0.59966	ug/l	2000	Co	
Ni	60	72	2	4.29818	8.59636	ug/l	2000	Ni	
Cu	63	72	2	12.12429	24.24857	ug/l	2000	Cu	
Zn	66	72	2	30.93703	61.87406	ug/l	5000	Zn	
As	75	72	2	-0.00105	-0.00211	ug/l	2000	As	
Se	78	72	2	-0.15533	-0.31066	ug/l	1000	Se	
Sr	88	72	3	208.21312	416.42625	ug/l	2000	Sr	
Y	89	72	2	-0.00184	-0.00368	ug/l	200	Y	
Zr	90	72	2	0.01665	0.03330	ug/l	2000	Zr	
Nb	93	72	2	0.06531	0.13061	ug/l	100	Nb	
Mo	95	72	3	-0.13410	-0.26819	ug/l	1000	Mo	
Ru	101	72	2	-0.00745	-0.01490	ug/l	200	Ru	
Rh	103	72	2	-0.00338	-0.00675	ug/l	200	Rh	
Pd	105	72	2	0.00268	0.00537	ug/l	20	Pd	
Ag	107	115	3	-0.00207	-0.00413	ug/l	400	Ag	
Cd	111	115	3	-0.00190	-0.00380	ug/l	2000	Cd	
Sn	118	115	3	0.93754	1.87509	ug/l	2000	Sn	
Sb	121	115	3	0.02547	0.05094	ug/l	1000	Sb	
Te	125	165	2	0.01729	0.03457	ug/l	200	Te	
Cs	133	165	2	0.00507	0.01014	ug/l	2000	Cs	
Ba	137	165	3	8.07173	16.14346	ug/l	5000	Ba	
La	139	165	2	-0.00029	-0.00059	ug/l	200	La	
Ce	140	165	2	-0.00170	-0.00340	ug/l	200	Ce	
Pr	141	165	2	-0.00377	-0.00754	ug/l	200	Pr	
Nd	146	165	2	-0.00229	-0.00458	ug/l	200	Nd	
Sm	147	165	3	-0.00262	-0.00523	ug/l	2000	Sm	
Hf	178	165	2	0.01832	0.03663	ug/l	200	Hf	
Ta	181	165	2	0.00301	0.00601	ug/l	200	Ta	
W	182	165	2	-0.09824	-0.19647	ug/l	2000	W	
Re	185	193	3	-0.00293	-0.00586	ug/l	200	Re	
Pt	195	193	2	0.00058	0.00116	ug/l	200	Pt	
Au	197	193	3	0.00667	0.01335	ug/l	2000	Au	
Tl	205	193	3	-0.02854	-0.05708	ug/l	400	Tl	
Pb	208	193	3	0.00852	0.01704	ug/l	5000	Pb	
Bi	209	193	2	-0.03677	-0.07353	ug/l	2000	Bi	
Th	232	193	3	-0.01567	-0.03134	ug/l	2000	Th	
U	238	193	3	-0.00065	-0.00131	ug/l	2000	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	5248943	0.18	6327920	82.9	80	120	Li (IS)	
Sc (IS)	45	2	195538	0.89	224146	87.2	80	120	Sc (IS)	
Sc (IS)	45	3	3492311	0.59	3966854	88.0	80	120	Sc (IS)	
Ge (IS)	72	2	433581	0.95	458627	94.5	80	120	Ge (IS)	
Ge (IS)	72	3	2690265	0.52	2917719	92.2	80	120	Ge (IS)	
In (IS)	115	3	18987941	0.58	22065637	86.1	80	120	In (IS)	
Ho (IS)	165	2	14471254	0.19	16245218	89.1	80	120	Ho (IS)	
Ho (IS)	165	3	23666962	0.22	27266963	86.8	80	120	Ho (IS)	
Ir (IS)	193	2	9469156	0.35	10999175	86.1	80	120	Ir (IS)	
Ir (IS)	193	3	11473728	0.74	13591604	84.4	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Low Level Continuing Calibration Verification (CCV) - US EPA Method 6020

Sample Name	**CCVL 1856860**
Data File Name	**071LCCV.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-26T23:56:44-06:00**
Type	**CRI**
VialNumber	**1101**
Dilution	**1**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**003CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	Units	ExpectedValue	%Recovery	%QC Low	%QC High	Analyte	QC Flag
Li	7	6	3	5.27950	ug/l	5	105.6	80	120	Li	
Be	9	6	3	0.48339	ug/l	0.5	96.7	80	120	Be	
B	11	6	3	115.59753	ug/l	100	115.6	80	120	B	
Na	23	45	2	110.78323	ug/l	100	110.8	80	120	Na	
Mg	24	45	2	58.31361	ug/l	50	116.6	80	120	Mg	
Al	27	45	2	58.62347	ug/l	50	117.2	80	120	Al	
P	31	45	2	98.00176	ug/l	100	98.0	80	120	P	
K	39	45	2	113.06551	ug/l	100	113.1	80	120	K	
Ca	44	45	3	228.28171	ug/l	200	114.1	80	120	Ca	
Ti	47	45	3	5.05646	ug/l	5	101.1	80	120	Ti	
V	51	45	2	9.97856	ug/l	10	99.8	80	120	V	
Cr	52	45	2	10.15794	ug/l	10	101.6	80	120	Cr	
Mn	55	72	2	4.27694	ug/l	4	106.9	80	120	Mn	
Fe	57	72	2	50.57643	ug/l	50	101.2	80	120	Fe	
Co	59	72	2	2.06354	ug/l	2	103.2	80	120	Co	
Ni	60	72	2	5.51437	ug/l	5	110.3	80	120	Ni	
Cu	63	72	2	2.75724	ug/l	3	91.9	80	120	Cu	
Zn	66	72	2	21.76528	ug/l	20	108.8	80	120	Zn	
As	75	72	2	10.34451	ug/l	10	103.4	80	120	As	
Se	78	72	2	5.51636	ug/l	5	110.3	80	120	Se	
Sr	88	72	3	5.18783	ug/l	5	103.8	80	120	Sr	
Y	89	72	2	5.13591	ug/l	5	102.7	80	120	Y	
Zr	90	72	2	5.01474	ug/l	5	100.3	80	120	Zr	
Nb	93	72	2	19.53323	ug/l	25	78.1	80	120	Nb	FAILED
Mo	95	72	3	4.80847	ug/l	5	96.2	80	120	Mo	
Ru	101	72	2	10.44286	ug/l	10	104.4	80	120	Ru	
Rh	103	72	2	10.31449	ug/l	10	103.1	80	120	Rh	
Pd	105	72	2	0.53156	ug/l	0.5	106.3	80	120	Pd	
Ag	107	115	3	1.93191	ug/l	2	96.6	80	120	Ag	
Cd	111	115	3	0.48690	ug/l	0.5	97.4	80	120	Cd	
Sn	118	115	3	1.73273	ug/l	2	86.6	80	120	Sn	
Sb	121	115	3	4.69121	ug/l	5	93.8	80	120	Sb	
Te	125	165	2	9.55344	ug/l	10	95.5	80	120	Te	
Cs	133	165	2	0.95081	ug/l	1	95.1	80	120	Cs	
Ba	137	165	3	1.93511	ug/l	2	96.8	80	120	Ba	
La	139	165	2	1.89039	ug/l	2	94.5	80	120	La	
Ce	140	165	2	9.50104	ug/l	10	95.0	80	120	Ce	
Pr	141	165	2	1.90726	ug/l	2	95.4	80	120	Pr	
Nd	146	165	2	1.90319	ug/l	2	95.2	80	120	Nd	
Sm	147	165	3	9.58746	ug/l	10	95.9	80	120	Sm	
Hf	178	165	2	9.09757	ug/l	10	91.0	80	120	Hf	
Ta	181	165	2	6.50804	ug/l	10	65.1	80	120	Ta	FAILED
W	182	165	2	4.43095	ug/l	5	88.6	80	120	W	
Re	185	193	3	9.27016	ug/l	10	92.7	80	120	Re	
Pt	195	193	2	0.99223	ug/l	1	99.2	80	120	Pt	
Au	197	193	3	4.65678	ug/l	5	93.1	80	120	Au	
Tl	205	193	3	1.82157	ug/l	2	91.1	80	120	Tl	
Pb	208	193	3	2.78160	ug/l	3	92.7	80	120	Pb	
Bi	209	193	2	18.91621	ug/l	20	94.6	80	120	Bi	
Th	232	193	3	1.77991	ug/l	2	89.0	80	120	Th	
U	238	193	3	0.93220	ug/l	1	93.2	80	120	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	5242637	0.35	6327920	82.8	80	120	Li (IS)	
Sc (IS)	45	2	197593	3.61	224146	88.2	80	120	Sc (IS)	
Sc (IS)	45	3	3401931	0.53	3966854	85.8	80	120	Sc (IS)	
Ge (IS)	72	2	436085	2.80	458627	95.1	80	120	Ge (IS)	
Ge (IS)	72	3	2651125	0.40	2917719	90.9	80	120	Ge (IS)	
In (IS)	115	3	19698302	0.27	22065637	89.3	80	120	In (IS)	
Ho (IS)	165	2	14653971	4.45	16245218	90.2	80	120	Ho (IS)	
Ho (IS)	165	3	23924714	0.50	27266963	87.7	80	120	Ho (IS)	
Ir (IS)	193	2	9791240	4.08	10999175	89.0	80	120	Ir (IS)	
Ir (IS)	193	3	11876750	0.97	13591604	87.4	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Continuing Calibration Verification (CCV) - US EPA Method 6020

Sample Name	**CCV 1856861**
Data File Name	**072_CCV.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-27T00:03:27-06:00**
Type	**CCV**
VialNumber	**1102**
Dilution	**1**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**003CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	Units	ExpectedValue	%Recovery	%QC Low	%QC High	Analyte	QC Flag
Li	7	6	3	101.25472	ug/l	100	101.3	90	110	Li	
Be	9	6	3	99.51078	ug/l	100	99.5	90	110	Be	
B	11	6	3	216.09071	ug/l	200	108.0	90	110	B	
Na	23	45	2	2437.50649	ug/l	2500	97.5	90	110	Na	
Mg	24	45	2	2466.20275	ug/l	2500	98.6	90	110	Mg	
Al	27	45	2	2675.65118	ug/l	2500	107.0	90	110	Al	
P	31	45	2	2461.62988	ug/l	2500	98.5	90	110	P	
K	39	45	2	2518.00383	ug/l	2500	100.7	90	110	K	
Ca	44	45	3	2539.89591	ug/l	2500	101.6	90	110	Ca	
Ti	47	45	3	101.03557	ug/l	100	101.0	90	110	Ti	
V	51	45	2	97.42621	ug/l	100	97.4	90	110	V	
Cr	52	45	2	97.98724	ug/l	100	98.0	90	110	Cr	
Mn	55	72	2	97.41740	ug/l	100	97.4	90	110	Mn	
Fe	57	72	2	2399.80979	ug/l	2500	96.0	90	110	Fe	
Co	59	72	2	97.92463	ug/l	100	97.9	90	110	Co	
Ni	60	72	2	99.46593	ug/l	100	99.5	90	110	Ni	
Cu	63	72	2	94.54064	ug/l	100	94.5	90	110	Cu	
Zn	66	72	2	99.71042	ug/l	100	99.7	90	110	Zn	
As	75	72	2	99.48692	ug/l	100	99.5	90	110	As	
Se	78	72	2	49.36425	ug/l	50	98.7	90	110	Se	
Sr	88	72	3	103.00397	ug/l	100	103.0	90	110	Sr	
Y	89	72	2	102.16413	ug/l	100	102.2	90	110	Y	
Zr	90	72	2	100.31388	ug/l	100	100.3	90	110	Zr	
Nb	93	72	2	49.80638	ug/l	50	99.6	90	110	Nb	
Mo	95	72	3	48.71491	ug/l	50	97.4	90	110	Mo	
Ru	101	72	2	98.97843	ug/l	100	99.0	90	110	Ru	
Rh	103	72	2	101.28042	ug/l	100	101.3	90	110	Rh	
Pd	105	72	2	10.37439	ug/l	10	103.7	90	110	Pd	
Ag	107	115	3	19.53232	ug/l	20	97.7	90	110	Ag	
Cd	111	115	3	96.94720	ug/l	100	96.9	90	110	Cd	
Sn	118	115	3	99.90768	ug/l	100	99.9	90	110	Sn	
Sb	121	115	3	49.97021	ug/l	50	99.9	90	110	Sb	
Te	125	165	2	97.30769	ug/l	100	97.3	90	110	Te	
Cs	133	165	2	98.52246	ug/l	100	98.5	90	110	Cs	
Ba	137	165	3	98.88690	ug/l	100	98.9	90	110	Ba	
La	139	165	2	99.02044	ug/l	100	99.0	90	110	La	
Ce	140	165	2	99.09666	ug/l	100	99.1	90	110	Ce	
Pr	141	165	2	99.53025	ug/l	100	99.5	90	110	Pr	
Nd	146	165	2	94.42320	ug/l	100	94.4	90	110	Nd	
Sm	147	165	3	100.80823	ug/l	100	100.8	90	110	Sm	
Hf	178	165	2	99.69140	ug/l	100	99.7	90	110	Hf	
Ta	181	165	2	98.90767	ug/l	100	98.9	90	110	Ta	
W	182	165	2	99.90244	ug/l	100	99.9	90	110	W	
Re	185	193	3	101.26072	ug/l	100	101.3	90	110	Re	
Pt	195	193	2	10.09581	ug/l	10	101.0	90	110	Pt	
Au	197	193	3	99.62836	ug/l	100	99.6	90	110	Au	
Tl	205	193	3	20.50765	ug/l	20	102.5	90	110	Tl	
Pb	208	193	3	103.56539	ug/l	100	103.6	90	110	Pb	
Bi	209	193	2	102.18864	ug/l	100	102.2	90	110	Bi	
Th	232	193	3	103.99841	ug/l	100	104.0	90	110	Th	
U	238	193	3	104.44896	ug/l	100	104.4	90	110	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	4916021	2.26	6327920	77.7	80	120	Li (IS)	FAILED
Sc (IS)	45	2	192886	0.40	224146	86.1	80	120	Sc (IS)	
Sc (IS)	45	3	3317298	3.56	3966854	83.6	80	120	Sc (IS)	
Ge (IS)	72	2	446392	0.14	458627	97.3	80	120	Ge (IS)	
Ge (IS)	72	3	2612407	2.57	2917719	89.5	80	120	Ge (IS)	
In (IS)	115	3	19032909	2.78	22065637	86.3	80	120	In (IS)	
Ho (IS)	165	2	14596762	0.44	16245218	89.9	80	120	Ho (IS)	
Ho (IS)	165	3	23843003	3.35	27266963	87.4	80	120	Ho (IS)	
Ir (IS)	193	2	9777271	0.73	10999175	88.9	80	120	Ir (IS)	
Ir (IS)	193	3	11749022	3.43	13591604	86.4	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Continuing Calibration Blank (CCB) - US EPA Method 6020

Sample Name	**CCB 1854886**
Data File Name	**073_CCB.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-27T00:10:19-06:00**
Type	**CCB**
VialNumber	**4**
Dilution	**1**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**003CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	Units	QC High	Analyte	QC Flag
Li	7	6	3	0.22507	ug/l	1.388	Li	
Be	9	6	3	0.00103	ug/l	0.7	Be	
B	11	6	3	11.97972	ug/l	20	B	
Na	23	45	2	2.59910	ug/l	30	Na	
Mg	24	45	2	0.08210	ug/l	11.18	Mg	
Al	27	45	2	0.13746	ug/l	25.8	Al	
P	31	45	2	-1.04210	ug/l	16.46	P	
K	39	45	2	1.88051	ug/l	83.2	K	
Ca	44	45	3	-23.47322	ug/l	136.2	Ca	
Ti	47	45	3	-0.03487	ug/l	4.2	Ti	
V	51	45	2	0.07303	ug/l	4.74	V	
Cr	52	45	2	0.00413	ug/l	6.52	Cr	
Mn	55	72	2	0.02337	ug/l	0.49	Mn	
Fe	57	72	2	0.33670	ug/l	40.7	Fe	
Co	59	72	2	0.00732	ug/l	0.434	Co	
Ni	60	72	2	0.00511	ug/l	0.8	Ni	
Cu	63	72	2	-0.42861	ug/l	0.902	Cu	
Zn	66	72	2	-0.14531	ug/l	16.58	Zn	
As	75	72	2	0.00880	ug/l	2.36	As	
Se	78	72	2	-0.09744	ug/l	3.18	Se	
Sr	88	72	3	0.00524	ug/l	2	Sr	
Y	89	72	2	0.00746	ug/l	0.424	Y	
Zr	90	72	2	0.02479	ug/l	0.496	Zr	
Nb	93	72	2	0.59092	ug/l	4.62	Nb	
Mo	95	72	3	-0.09988	ug/l	2	Mo	
Ru	101	72	2	0.00713	ug/l	2	Ru	
Rh	103	72	2	0.01243	ug/l	1.634	Rh	
Pd	105	72	2	-0.00474	ug/l	0.08	Pd	
Ag	107	115	3	-0.00747	ug/l	1.54	Ag	
Cd	111	115	3	0.00496	ug/l	0.4	Cd	
Sn	118	115	3	-0.01645	ug/l	2	Sn	
Sb	121	115	3	0.00993	ug/l	3.34	Sb	
Te	125	165	2	0.08016	ug/l	1.072	Te	
Cs	133	165	2	0.01817	ug/l	0.106	Cs	
Ba	137	165	3	0.00823	ug/l	0.446	Ba	
La	139	165	2	0.00918	ug/l	0.102	La	
Ce	140	165	2	0.00844	ug/l	1.772	Ce	
Pr	141	165	2	0.00700	ug/l	0.084	Pr	
Nd	146	165	2	0.01007	ug/l	0.208	Nd	
Sm	147	165	3	0.00221	ug/l	0.652	Sm	
Hf	178	165	2	0.05163	ug/l	2.26	Hf	
Ta	181	165	2	0.04413	ug/l	1.46	Ta	
W	182	165	2	0.21497	ug/l	4	W	
Re	185	193	3	0.00324	ug/l	0.05	Re	
Pt	195	193	2	0.00076	ug/l	0.12	Pt	
Au	197	193	3	0.13748	ug/l	1	Au	
Tl	205	193	3	-0.00611	ug/l	1.1	Tl	
Pb	208	193	3	-0.04656	ug/l	0.346	Pb	
Bi	209	193	2	0.00247	ug/l	1.464	Bi	
Th	232	193	3	0.09491	ug/l	1.104	Th	
U	238	193	3	0.00529	ug/l	0.462	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	4940182	0.22	6327920	78.1	80	120	Li (IS)	FAILED
Sc (IS)	45	2	190926	1.03	224146	85.2	80	120	Sc (IS)	
Sc (IS)	45	3	3304931	0.10	3966854	83.3	80	120	Sc (IS)	
Ge (IS)	72	2	416096	1.07	458627	90.7	80	120	Ge (IS)	
Ge (IS)	72	3	2566199	0.42	2917719	88.0	80	120	Ge (IS)	
In (IS)	115	3	19155375	0.19	22065637	86.8	80	120	In (IS)	
Ho (IS)	165	2	14496937	0.22	16245218	89.2	80	120	Ho (IS)	
Ho (IS)	165	3	23639260	0.67	27266963	86.7	80	120	Ho (IS)	
Ir (IS)	193	2	9751405	1.20	10999175	88.7	80	120	Ir (IS)	
Ir (IS)	193	3	11790075	0.15	13591604	86.7	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Sample Name	**RINSE**
Data File Name	**074BLNK.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-27T00:17:58-06:00**
Type	**6-Blank**
VialNumber	**1**
Dilution	**1**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**003CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	Units	QC High	QC Flag
Li	7	6	3	0.36	ug/l	5	
Be	9	6	3	0.12	ug/l	0.5	
B	11	6	3	9.84	ug/l	50	
Na	23	45	2	65.13	ug/l	50	FAILED
Mg	24	45	2	28.31	ug/l	50	
Al	27	45	2	45.17	ug/l	30	FAILED
P	31	45	2	9.55	ug/l	50	
K	39	45	2	20.75	ug/l	100	
Ca	44	45	3	45.95	ug/l	100	
Ti	47	45	3	1.14	ug/l	5	
V	51	45	2	0.55	ug/l	10	
Cr	52	45	2	0.41	ug/l	10	
Mn	55	72	2	1.18	ug/l	2	
Fe	57	72	2	56.87	ug/l	50	FAILED
Co	59	72	2	0.34	ug/l	2	
Ni	60	72	2	0.32	ug/l	5	
Cu	63	72	2	0.05	ug/l	1	
Zn	66	72	2	0.67	ug/l	10	
As	75	72	2	0.26	ug/l	10	
Se	78	72	2	-0.02	ug/l	5	
Sr	88	72	3	0.84	ug/l	5	
Y	89	72	2	0.13	ug/l	5	
Zr	90	72	2	0.32	ug/l	5	
Nb	93	72	2	0.42	ug/l	25	
Mo	95	72	3	0.51	ug/l	5	
Ru	101	72	2	0.10	ug/l	10	
Rh	103	72	2	0.09	ug/l	10	
Pd	105	72	2	0.01	ug/l	0.5	
Ag	107	115	3	0.08	ug/l	2	
Cd	111	115	3	0.24	ug/l	0.5	
Sn	118	115	3	0.43	ug/l	2	
Sb	121	115	3	0.13	ug/l	5	
Te	125	165	2	0.14	ug/l	10	
Cs	133	165	2	0.07	ug/l	0.1	
Ba	137	165	3	0.94	ug/l	2	
La	139	165	2	0.11	ug/l	2	
Ce	140	165	2	0.17	ug/l	10	
Pr	141	165	2	0.09	ug/l	2	
Nd	146	165	2	0.12	ug/l	2	
Sm	147	165	3	0.25	ug/l	10	
Hf	178	165	2	0.14	ug/l	10	
Ta	181	165	2	0.12	ug/l	10	
W	182	165	2	0.57	ug/l	5	
Re	185	193	3	0.07	ug/l	10	
Pt	195	193	2	0.01	ug/l	1	
Au	197	193	3	0.22	ug/l	5	
Tl	205	193	3	0.12	ug/l	2	
Pb	208	193	3	0.36	ug/l	3	
Bi	209	193	2	0.20	ug/l	20	
Th	232	193	3	0.34	ug/l	2	
U	238	193	3	0.36	ug/l	1	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	QC Flag
Li (IS)	6	3	4944485	0.18	6327920	78.1	80	120	FAILED
Sc (IS)	45	2	189136	0.33	224146	84.4	80	120	
Sc (IS)	45	3	3340242	0.26	3966854	84.2	80	120	
Ge (IS)	72	2	415641	0.43	458627	90.6	80	120	
Ge (IS)	72	3	2618479	0.36	2917719	89.7	80	120	
In (IS)	115	3	19344909	0.51	22065637	87.7	80	120	
Ho (IS)	165	2	14518137	0.69	16245218	89.4	80	120	
Ho (IS)	165	3	24326849	0.38	27266963	89.2	80	120	
Ir (IS)	193	2	9749261	0.91	10999175	88.6	80	120	
Ir (IS)	193	3	11963527	0.71	13591604	88.0	80	120	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Calibration Blank Report

Sample Name	**ICIS 1854886**
Data File Name	**075CALB.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-27T00:24:53-06:00**
Type	**CalBlk**
VialNumber	**4**
Dilution	**1**
Comment	
Operator	**LP 7700**

QC Analyte Table

Element	m/z	ISTD	Tune Step	CPS	%RSD
Li	7	6	3	277928	0.57
Be	9	6	3	106	34.93
B	11	6	3	47708	0.43
Na	23	45	2	16816	3.49
Mg	24	45	2	447	2.99
Al	27	45	2	288	7.71
P	31	45	2	112	16.89
K	39	45	2	28045	1.06
Ca	44	45	3	24995	0.99
Ti	47	45	3	490	6.15
V	51	45	2	4530	1.48
Cr	52	45	2	1518	4.78
Mn	55	72	2	409	27.04
Fe	57	72	2	379	14.65
Co	59	72	2	578	8.83
Ni	60	72	2	130	11.75
Cu	63	72	2	4454	4.74
Zn	66	72	2	600	1.47
As	75	72	2	212	12.00
Se	78	72	2	84	31.91
Sr	88	72	3	1400	8.74
Y	89	72	2	221	12.18
Zr	90	72	2	543	14.27
Nb	93	72	2	6107	6.63
Mo	95	72	3	1002	5.78
Ru	101	72	2	98	30.55
Rh	103	72	2	1033	15.25
Pd	105	72	2	38	10.18
Ag	107	115	3	1083	0.62
Cd	111	115	3	148	18.41
Sn	118	115	3	8096	2.25
Sb	121	115	3	1316	2.21
Te	125	165	2	12	56.76
Cs	133	165	2	270	18.19
Ba	137	165	3	693	8.03
La	139	165	2	368	0.52
Ce	140	165	2	479	3.96
Pr	141	165	2	438	8.49
Nd	146	165	2	106	27.23
Sm	147	165	3	177	9.80
Hf	178	165	2	756	4.00
Ta	181	165	2	22008	1.74
W	182	165	2	10086	1.13
Re	185	193	3	307	6.79
Pt	195	193	2	347	15.89
Au	197	193	3	1445	2.69
Tl	205	193	3	1288	3.42
(Pb)	206	193	3	3312	5.06
(Pb)	207	193	3	3533	4.97
Pb	208	193	3	13390	2.53
Bi	209	193	2	6159	2.39
Th	232	193	3	5232	2.58
U	238	193	3	939	9.64

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD
Li (IS)	6	3	4941712	0.16
Sc (IS)	45	2	186699	0.59
Sc (IS)	45	3	3281398	0.44
Ge (IS)	72	2	410530	0.75
Ge (IS)	72	3	2540877	0.32
In (IS)	115	3	19102387	0.71
Ho (IS)	165	2	14511718	0.44
Ho (IS)	165	3	23609138	0.96
Ir (IS)	193	2	9828030	1.20
Ir (IS)	193	3	11858846	0.51

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Calibration Standard Report

Sample Name	**IC 1856860**
Data File Name	**076CALS.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-27T00:31:37-06:00**
Type	**CalStd**
VialNumber	**1101**
Dilution	**1**
Comment	
Operator	**LP 7700**

QC Analyte Table

Element	m/z	ISTD	Tune Step	CPS	%RSD
Li	7	6	3	425702	1.56
Be	9	6	3	4103	4.96
B	11	6	3	621146	1.96
Na	23	45	2	159422	0.55
Mg	24	45	2	39799	0.83
Al	27	45	2	17613	1.35
P	31	45	2	2168	2.30
K	39	45	2	108762	0.89
Ca	44	45	3	384285	0.88
Ti	47	45	3	21343	1.20
V	51	45	2	93851	1.09
Cr	52	45	2	116496	1.53
Mn	55	72	2	29652	1.43
Fe	57	72	2	13207	0.87
Co	59	72	2	37073	0.95
Ni	60	72	2	23752	0.78
Cu	63	72	2	43311	0.33
Zn	66	72	2	52706	1.04
As	75	72	2	16770	1.49
Se	78	72	2	673	5.22
Sr	88	72	3	469138	1.29
Y	89	72	2	112474	0.88
Zr	90	72	2	88168	0.91
Nb	93	72	2	647004	1.34
Mo	95	72	3	85172	1.54
Ru	101	72	2	101326	0.98
Rh	103	72	2	578572	1.04
Pd	105	72	2	5886	1.34
Ag	107	115	3	93805	0.83
Cd	111	115	3	5155	5.37
Sn	118	115	3	60082	0.90
Sb	121	115	3	184416	0.73
Te	125	165	2	3215	9.03
Cs	133	165	2	25433	1.73
Ba	137	165	3	30610	0.56
La	139	165	2	108803	0.84
Ce	140	165	2	635732	0.61
Pr	141	165	2	133079	0.62
Nd	146	165	2	24872	1.01
Sm	147	165	3	230625	1.24
Hf	178	165	2	274616	0.93
Ta	181	165	2	844694	1.47
W	182	165	2	145685	0.57
Re	185	193	3	488036	1.04
Pt	195	193	2	19777	0.89
Au	197	193	3	185584	1.36
Tl	205	193	3	165741	0.73
(Pb)	206	193	3	89271	0.85
(Pb)	207	193	3	79576	0.88
Pb	208	193	3	357904	0.66
Bi	209	193	2	1386711	0.77
Th	232	193	3	259225	1.05
U	238	193	3	124346	1.18

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	QC Flag
Li (IS)	6	3	5019572	2.43	4941712	101.6	80	120	
Sc (IS)	45	2	188179	1.94	186699	100.8	80	120	
Sc (IS)	45	3	3380348	3.71	3281398	103.0	80	120	
Ge (IS)	72	2	418056	0.96	410530	101.8	80	120	
Ge (IS)	72	3	2621882	2.55	2540877	103.2	80	120	
In (IS)	115	3	19749789	4.58	19102387	103.4	80	120	
Ho (IS)	165	2	14362259	1.44	14511718	99.0	80	120	
Ho (IS)	165	3	24342989	4.25	23609138	103.1	80	120	
Ir (IS)	193	2	9805928	1.58	9828030	99.8	80	120	
Ir (IS)	193	3	12228778	2.88	11858846	103.1	80	120	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Calibration Standard Report

Sample Name	**IC 1856861**
Data File Name	**077CALS.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-27T00:38:21-06:00**
Type	**CalStd**
VialNumber	**1102**
Dilution	**1**
Comment	
Operator	**LP 7700**

QC Analyte Table

Element	m/z	ISTD	Tune Step	CPS	%RSD
Li	7	6	3	3028036	0.29
Be	9	6	3	793030	0.47
B	11	6	3	1237035	0.90
Na	23	45	2	3377022	0.46
Mg	24	45	2	1734588	0.45
Al	27	45	2	788279	0.87
P	31	45	2	51534	0.98
K	39	45	2	1947668	0.59
Ca	44	45	3	3674555	0.57
Ti	47	45	3	418815	0.10
V	51	45	2	900480	0.68
Cr	52	45	2	1111978	0.41
Mn	55	72	2	711552	1.27
Fe	57	72	2	620471	0.74
Co	59	72	2	1802096	0.25
Ni	60	72	2	453635	0.83
Cu	63	72	2	1222953	0.83
Zn	66	72	2	244310	0.39
As	75	72	2	167437	0.11
Se	78	72	2	6406	1.25
Sr	88	72	3	9380319	0.75
Y	89	72	2	2287733	0.22
Zr	90	72	2	1758526	0.58
Nb	93	72	2	1731296	0.92
Mo	95	72	3	838407	1.41
Ru	101	72	2	992989	1.22
Rh	103	72	2	5940768	0.26
Pd	105	72	2	116119	0.54
Ag	107	115	3	922891	0.79
Cd	111	115	3	986219	0.15
Sn	118	115	3	2947468	0.39
Sb	121	115	3	1912135	0.43
Te	125	165	2	32220	0.96
Cs	133	165	2	2643897	0.36
Ba	137	165	3	1536094	0.98
La	139	165	2	5789030	0.45
Ce	140	165	2	6702679	0.37
Pr	141	165	2	6963589	0.50
Nd	146	165	2	1249534	0.86
Sm	147	165	3	2430003	1.16
Hf	178	165	2	2960874	1.25
Ta	181	165	2	12504466	1.21
W	182	165	2	3026049	0.75
Re	185	193	3	5221675	0.81
Pt	195	193	2	193505	0.89
Au	197	193	3	3895077	0.59
Tl	205	193	3	1787007	0.35
(Pb)	206	193	3	3077278	0.31
(Pb)	207	193	3	2700548	1.12
Pb	208	193	3	12284926	0.84
Bi	209	193	2	7463191	0.66
Th	232	193	3	14276154	0.23
U	238	193	3	13660324	0.39

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	QC Flag
Li (IS)	6	3	4900801	3.55	4941712	99.2	80	120	
Sc (IS)	45	2	190657	1.06	186699	102.1	80	120	
Sc (IS)	45	3	3363765	5.11	3281398	102.5	80	120	
Ge (IS)	72	2	439811	0.46	410530	107.1	80	120	
Ge (IS)	72	3	2650996	4.16	2540877	104.3	80	120	
In (IS)	115	3	19486516	4.71	19102387	102.0	80	120	
Ho (IS)	165	2	14629069	1.19	14511718	100.8	80	120	
Ho (IS)	165	3	24360109	4.91	23609138	103.2	80	120	
Ir (IS)	193	2	9834022	0.64	9828030	100.1	80	120	
Ir (IS)	193	3	11937071	5.59	11858846	100.7	80	120	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Calibration Standard Report

Sample Name	**IC 1856862**
Data File Name	**078CALS.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-27T00:45:03-06:00**
Type	**CalStd**
VialNumber	**1103**
Dilution	**1**
Comment	
Operator	**LP 7700**

QC Analyte Table

Element	m/z	ISTD	Tune Step	CPS	%RSD
Li	7	6	3	5751348	0.38
Be	9	6	3	1593908	0.22
B	11	6	3	2475711	0.32
Na	23	45	2	6788721	0.74
Mg	24	45	2	3483536	1.14
Al	27	45	2	1459042	1.08
P	31	45	2	103147	1.07
K	39	45	2	3868129	0.55
Ca	44	45	3	7342842	0.70
Ti	47	45	3	844731	0.28
V	51	45	2	1861172	1.02
Cr	52	45	2	2241938	0.76
Mn	55	72	2	1464911	0.47
Fe	57	72	2	1228209	0.50
Co	59	72	2	3582320	0.29
Ni	60	72	2	901333	0.20
Cu	63	72	2	2502879	0.20
Zn	66	72	2	488076	1.17
As	75	72	2	332770	1.40
Se	78	72	2	12765	2.75
Sr	88	72	3	18673086	0.34
Y	89	72	2	4637877	0.79
Zr	90	72	2	3531689	0.76
Nb	93	72	2	3528025	0.60
Mo	95	72	3	1771743	0.41
Ru	101	72	2	2054484	0.27
Rh	103	72	2	11715326	0.17
Pd	105	72	2	231714	0.68
Ag	107	115	3	1887375	0.19
Cd	111	115	3	2050883	0.34
Sn	118	115	3	5925774	0.60
Sb	121	115	3	3830440	1.08
Te	125	165	2	66192	2.14
Cs	133	165	2	5321223	0.92
Ba	137	165	3	3162041	0.34
La	139	165	2	11625452	1.05
Ce	140	165	2	13478176	0.64
Pr	141	165	2	13987577	0.98
Nd	146	165	2	2648107	0.60
Sm	147	165	3	4831226	0.39
Hf	178	165	2	5930958	0.82
Ta	181	165	2	25012234	1.15
W	182	165	2	6064214	1.31
Re	185	193	3	10444282	0.39
Pt	195	193	2	386162	0.77
Au	197	193	3	7825591	0.78
Tl	205	193	3	3564272	1.49
(Pb)	206	193	3	6097083	0.53
(Pb)	207	193	3	5321707	0.65
Pb	208	193	3	24376804	0.29
Bi	209	193	2	14701700	0.78
Th	232	193	3	28836035	0.22
U	238	193	3	27038049	0.16

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	QC Flag
Li (IS)	6	3	4925733	0.94	4941712	99.7	80	120	
Sc (IS)	45	2	191752	3.65	186699	102.7	80	120	
Sc (IS)	45	3	3412200	2.01	3281398	104.0	80	120	
Ge (IS)	72	2	449919	2.89	410530	109.6	80	120	
Ge (IS)	72	3	2699376	1.14	2540877	106.2	80	120	
In (IS)	115	3	19537426	1.22	19102387	102.3	80	120	
Ho (IS)	165	2	14606229	4.28	14511718	100.7	80	120	
Ho (IS)	165	3	24573104	0.99	23609138	104.1	80	120	
Ir (IS)	193	2	9821265	3.79	9828030	99.9	80	120	
Ir (IS)	193	3	12050986	1.35	11858846	101.6	80	120	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Initial Calibration Verification (ICV) - US EPA Method 6020

Sample Name	**ICV 1856859**
Data File Name	**079_ICV.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-27T00:51:45-06:00**
Type	**ICV**
VialNumber	**1104**
Dilution	**1**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**075CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	Units	ExpectedValue	%Recovery	%QC Low	%QC High	Analyte	QC Flag
Li	7	6	3	103.89820	ug/l	100	103.9	90	110	Li	
Be	9	6	3	103.97551	ug/l	100	104.0	90	110	Be	
B	11	6	3	204.33347	ug/l	200	102.2	90	110	B	
Na	23	45	2	1079.36591	ug/l	1000	107.9	90	110	Na	
Mg	24	45	2	1165.51368	ug/l	1000	116.6	90	110	Mg	FAILED
Al	27	45	2	1159.84877	ug/l	1000	116.0	90	110	Al	FAILED
P	31	45	2	1081.15594	ug/l	1000	108.1	90	110	P	
K	39	45	2	1121.09495	ug/l	1000	112.1	90	110	K	FAILED
Ca	44	45	3	1072.57456	ug/l	1000	107.3	90	110	Ca	
Ti	47	45	3	102.68783	ug/l	100	102.7	90	110	Ti	
V	51	45	2	102.91871	ug/l	100	102.9	90	110	V	
Cr	52	45	2	107.47296	ug/l	100	107.5	90	110	Cr	
Mn	55	72	2	107.04162	ug/l	100	107.0	90	110	Mn	
Fe	57	72	2	1102.40494	ug/l	1000	110.2	90	110	Fe	FAILED
Co	59	72	2	110.02432	ug/l	100	110.0	90	110	Co	FAILED
Ni	60	72	2	110.90565	ug/l	100	110.9	90	110	Ni	FAILED
Cu	63	72	2	109.38277	ug/l	100	109.4	90	110	Cu	
Zn	66	72	2	112.97106	ug/l	100	113.0	90	110	Zn	FAILED
As	75	72	2	111.34858	ug/l	100	111.3	90	110	As	FAILED
Se	78	72	2	57.37812	ug/l	50	114.8	90	110	Se	FAILED
Sr	88	72	3	104.52355	ug/l	100	104.5	90	110	Sr	
Y	89	72	2	111.41164	ug/l	100	111.4	90	110	Y	FAILED
Zr	90	72	2	107.23932	ug/l	100	107.2	90	110	Zr	
Nb	93	72	2	64.15980	ug/l	50	128.3	90	110	Nb	FAILED
Mo	95	72	3	49.83862	ug/l	50	99.7	90	110	Mo	
Ru	101	72	2	105.48124	ug/l	100	105.5	90	110	Ru	
Rh	103	72	2	115.21222	ug/l	100	115.2	90	110	Rh	FAILED
Pd	105	72	2	11.14688	ug/l	10	111.5	90	110	Pd	FAILED
Ag	107	115	3	19.35567	ug/l	20	96.8	90	110	Ag	
Cd	111	115	3	101.60369	ug/l	100	101.6	90	110	Cd	
Sn	118	115	3	100.85829	ug/l	100	100.9	90	110	Sn	
Sb	121	115	3	51.39421	ug/l	50	102.8	90	110	Sb	
Te	125	165	2	111.74224	ug/l	100	111.7	90	110	Te	FAILED
Cs	133	165	2	111.14573	ug/l	100	111.1	90	110	Cs	FAILED
Ba	137	165	3	101.69826	ug/l	100	101.7	90	110	Ba	
La	139	165	2	109.19090	ug/l	100	109.2	90	110	La	
Ce	140	165	2	110.92522	ug/l	100	110.9	90	110	Ce	FAILED
Pr	141	165	2	109.59920	ug/l	100	109.6	90	110	Pr	
Nd	146	165	2	109.98107	ug/l	100	110.0	90	110	Nd	
Sm	147	165	3	104.92247	ug/l	100	104.9	90	110	Sm	
Hf	178	165	2	106.26934	ug/l	100	106.3	90	110	Hf	
Ta	181	165	2	72.03259	ug/l	100	72.0	90	110	Ta	FAILED
W	182	165	2	101.13036	ug/l	100	101.1	90	110	W	
Re	185	193	3	106.00688	ug/l	100	106.0	90	110	Re	
Pt	195	193	2	10.75408	ug/l	10	107.5	90	110	Pt	
Au	197	193	3	105.76296	ug/l	100	105.8	90	110	Au	
Tl	205	193	3	20.30022	ug/l	20	101.5	90	110	Tl	
Pb	208	193	3	101.50513	ug/l	100	101.5	90	110	Pb	
Bi	209	193	2	110.88374	ug/l	100	110.9	90	110	Bi	FAILED
Th	232	193	3	99.30194	ug/l	100	99.3	90	110	Th	
U	238	193	3	100.85078	ug/l	100	100.9	90	110	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	5074506	0.14	4941712	102.7	80	120	Li (IS)	
Sc (IS)	45	2	187975	7.55	186699	100.7	80	120	Sc (IS)	
Sc (IS)	45	3	3413073	0.44	3281398	104.0	80	120	Sc (IS)	
Ge (IS)	72	2	439457	5.68	410530	107.0	80	120	Ge (IS)	
Ge (IS)	72	3	2679024	0.34	2540877	105.4	80	120	Ge (IS)	
In (IS)	115	3	19765831	0.68	19102387	103.5	80	120	In (IS)	
Ho (IS)	165	2	14316218	7.17	14511718	98.7	80	120	Ho (IS)	
Ho (IS)	165	3	24297858	0.17	23609138	102.9	80	120	Ho (IS)	
Ir (IS)	193	2	9838232	6.71	9828030	100.1	80	120	Ir (IS)	
Ir (IS)	193	3	12340150	1.15	11858846	104.1	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Initial Calibration Blank (ICB) - US EPA Method 6020

Sample Name	**ICB 1854886**
Data File Name	**080_ICB.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-27T00:58:33-06:00**
Type	**ICB**
VialNumber	**4**
Dilution	**1**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**075CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	Units	QC High	Analyte	QC Flag
Li	7	6	3	0.05913	ug/l	1.388	Li	
Be	9	6	3	0.01741	ug/l	0.7	Be	
B	11	6	3	0.40127	ug/l	20	B	
Na	23	45	2	-0.45957	ug/l	30	Na	
Mg	24	45	2	-0.11932	ug/l	11.18	Mg	
Al	27	45	2	-0.21620	ug/l	25.8	Al	
P	31	45	2	-0.62514	ug/l	16.46	P	
K	39	45	2	-0.37223	ug/l	83.2	K	
Ca	44	45	3	-0.91561	ug/l	136.2	Ca	
Ti	47	45	3	0.02738	ug/l	4.2	Ti	
V	51	45	2	-0.14791	ug/l	4.74	V	
Cr	52	45	2	0.00728	ug/l	6.52	Cr	
Mn	55	72	2	-0.00094	ug/l	0.49	Mn	
Fe	57	72	2	0.12179	ug/l	40.7	Fe	
Co	59	72	2	0.00206	ug/l	0.434	Co	
Ni	60	72	2	0.00317	ug/l	0.8	Ni	
Cu	63	72	2	-0.00937	ug/l	0.902	Cu	
Zn	66	72	2	0.03944	ug/l	16.58	Zn	
As	75	72	2	0.02999	ug/l	2.36	As	
Se	78	72	2	-0.08343	ug/l	3.18	Se	
Sr	88	72	3	0.00464	ug/l	2	Sr	
Y	89	72	2	0.00297	ug/l	0.424	Y	
Zr	90	72	2	0.04436	ug/l	0.496	Zr	
Nb	93	72	2	0.18352	ug/l	4.62	Nb	
Mo	95	72	3	0.05518	ug/l	2	Mo	
Ru	101	72	2	-0.00027	ug/l	2	Ru	
Rh	103	72	2	0.00057	ug/l	1.634	Rh	
Pd	105	72	2	0.00237	ug/l	0.08	Pd	
Ag	107	115	3	0.00303	ug/l	1.54	Ag	
Cd	111	115	3	0.01439	ug/l	0.4	Cd	
Sn	118	115	3	0.06897	ug/l	2	Sn	
Sb	121	115	3	0.01811	ug/l	3.34	Sb	
Te	125	165	2	0.03589	ug/l	1.072	Te	
Cs	133	165	2	0.01166	ug/l	0.106	Cs	
Ba	137	165	3	0.00417	ug/l	0.446	Ba	
La	139	165	2	0.00126	ug/l	0.102	La	
Ce	140	165	2	0.00029	ug/l	1.772	Ce	
Pr	141	165	2	0.00018	ug/l	0.084	Pr	
Nd	146	165	2	-0.00125	ug/l	0.208	Nd	
Sm	147	165	3	0.00538	ug/l	0.652	Sm	
Hf	178	165	2	0.08280	ug/l	2.26	Hf	
Ta	181	165	2	0.11420	ug/l	1.46	Ta	
W	182	165	2	0.54478	ug/l	4	W	
Re	185	193	3	0.00658	ug/l	0.05	Re	
Pt	195	193	2	0.00080	ug/l	0.12	Pt	
Au	197	193	3	0.23306	ug/l	1	Au	
Tl	205	193	3	0.04420	ug/l	1.1	Tl	
Pb	208	193	3	0.02348	ug/l	0.346	Pb	
Bi	209	193	2	0.07432	ug/l	1.464	Bi	
Th	232	193	3	0.16494	ug/l	1.104	Th	
U	238	193	3	0.00747	ug/l	0.462	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	5006222	0.80	4941712	101.3	80	120	Li (IS)	
Sc (IS)	45	2	193553	0.66	186699	103.7	80	120	Sc (IS)	
Sc (IS)	45	3	3370916	0.99	3281398	102.7	80	120	Sc (IS)	
Ge (IS)	72	2	420739	0.43	410530	102.5	80	120	Ge (IS)	
Ge (IS)	72	3	2591626	0.91	2540877	102.0	80	120	Ge (IS)	
In (IS)	115	3	19546614	0.74	19102387	102.3	80	120	In (IS)	
Ho (IS)	165	2	14812530	0.39	14511718	102.1	80	120	Ho (IS)	
Ho (IS)	165	3	24315914	0.91	23609138	103.0	80	120	Ho (IS)	
Ir (IS)	193	2	9998910	0.49	9828030	101.7	80	120	Ir (IS)	
Ir (IS)	193	3	12106571	1.64	11858846	102.1	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Low Level Continuing Calibration Verification (CCV) - US EPA Method 6020

Sample Name	**CRI 1856860**
Data File Name	**081LCCV.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-27T01:05:16-06:00**
Type	**CRI**
VialNumber	**1101**
Dilution	**1**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**075CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	Units	ExpectedValue	%Recovery	%QC Low	%QC High	Analyte	QC Flag
Li	7	6	3	5.12348	ug/l	5	102.5	80	120	Li	
Be	9	6	3	0.51675	ug/l	0.5	103.4	80	120	Be	
B	11	6	3	93.79069	ug/l	100	93.8	80	120	B	
Na	23	45	2	105.05517	ug/l	100	105.1	80	120	Na	
Mg	24	45	2	56.95557	ug/l	50	113.9	80	120	Mg	
Al	27	45	2	57.59695	ug/l	50	115.2	80	120	Al	
P	31	45	2	105.07778	ug/l	100	105.1	80	120	P	
K	39	45	2	105.10265	ug/l	100	105.1	80	120	K	
Ca	44	45	3	250.99914	ug/l	200	125.5	80	120	Ca	FAILED
Ti	47	45	3	5.09026	ug/l	5	101.8	80	120	Ti	
V	51	45	2	9.54814	ug/l	10	95.5	80	120	V	
Cr	52	45	2	10.22219	ug/l	10	102.2	80	120	Cr	
Mn	55	72	2	4.16530	ug/l	4	104.1	80	120	Mn	
Fe	57	72	2	53.50868	ug/l	50	107.0	80	120	Fe	
Co	59	72	2	2.11847	ug/l	2	105.9	80	120	Co	
Ni	60	72	2	5.50910	ug/l	5	110.2	80	120	Ni	
Cu	63	72	2	3.24758	ug/l	3	108.3	80	120	Cu	
Zn	66	72	2	22.20239	ug/l	20	111.0	80	120	Zn	
As	75	72	2	10.55313	ug/l	10	105.5	80	120	As	
Se	78	72	2	5.31935	ug/l	5	106.4	80	120	Se	
Sr	88	72	3	5.23325	ug/l	5	104.7	80	120	Sr	
Y	89	72	2	5.04585	ug/l	5	100.9	80	120	Y	
Zr	90	72	2	5.31802	ug/l	5	106.4	80	120	Zr	
Nb	93	72	2	19.73413	ug/l	25	78.9	80	120	Nb	FAILED
Mo	95	72	3	5.02756	ug/l	5	100.6	80	120	Mo	
Ru	101	72	2	10.27454	ug/l	10	102.7	80	120	Ru	
Rh	103	72	2	10.23091	ug/l	10	102.3	80	120	Rh	
Pd	105	72	2	0.54509	ug/l	0.5	109.0	80	120	Pd	
Ag	107	115	3	1.98100	ug/l	2	99.1	80	120	Ag	
Cd	111	115	3	0.50786	ug/l	0.5	101.6	80	120	Cd	
Sn	118	115	3	1.80343	ug/l	2	90.2	80	120	Sn	
Sb	121	115	3	4.82637	ug/l	5	96.5	80	120	Sb	
Te	125	165	2	9.43957	ug/l	10	94.4	80	120	Te	
Cs	133	165	2	0.95618	ug/l	1	95.6	80	120	Cs	
Ba	137	165	3	1.98941	ug/l	2	99.5	80	120	Ba	
La	139	165	2	1.89151	ug/l	2	94.6	80	120	La	
Ce	140	165	2	9.41437	ug/l	10	94.1	80	120	Ce	
Pr	141	165	2	1.89943	ug/l	2	95.0	80	120	Pr	
Nd	146	165	2	1.89270	ug/l	2	94.6	80	120	Nd	
Sm	147	165	3	9.80400	ug/l	10	98.0	80	120	Sm	
Hf	178	165	2	9.36984	ug/l	10	93.7	80	120	Hf	
Ta	181	165	2	6.81331	ug/l	10	68.1	80	120	Ta	FAILED
W	182	165	2	4.66587	ug/l	5	93.3	80	120	W	
Re	185	193	3	9.35927	ug/l	10	93.6	80	120	Re	
Pt	195	193	2	0.99076	ug/l	1	99.1	80	120	Pt	
Au	197	193	3	4.86954	ug/l	5	97.4	80	120	Au	
Tl	205	193	3	1.88013	ug/l	2	94.0	80	120	Tl	
Pb	208	193	3	2.83261	ug/l	3	94.4	80	120	Pb	
Bi	209	193	2	18.44074	ug/l	20	92.2	80	120	Bi	
Th	232	193	3	1.89862	ug/l	2	94.9	80	120	Th	
U	238	193	3	0.92139	ug/l	1	92.1	80	120	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	5054921	0.31	4941712	102.3	80	120	Li (IS)	
Sc (IS)	45	2	194863	0.29	186699	104.4	80	120	Sc (IS)	
Sc (IS)	45	3	3388840	0.40	3281398	103.3	80	120	Sc (IS)	
Ge (IS)	72	2	434547	0.24	410530	105.9	80	120	Ge (IS)	
Ge (IS)	72	3	2630789	0.40	2540877	103.5	80	120	Ge (IS)	
In (IS)	115	3	19695645	0.68	19102387	103.1	80	120	In (IS)	
Ho (IS)	165	2	14856292	0.76	14511718	102.4	80	120	Ho (IS)	
Ho (IS)	165	3	24086649	0.12	23609138	102.0	80	120	Ho (IS)	
Ir (IS)	193	2	10000257	0.20	9828030	101.8	80	120	Ir (IS)	
Ir (IS)	193	3	12052855	0.58	11858846	101.6	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Interference Check Sample A (ICS-A) - US EPA Method 6020

Sample Name	**ICSA 1856863**
Data File Name	**082ICSA.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-27T01:12:00-06:00**
Type	**ICSA**
VialNumber	**1105**
Dilution	**1**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**075CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	Units	QC High	Analyte	QC Flag
Li	7	6	3	0.38416	ug/l	1.388	Li	
Be	9	6	3	-0.00061	ug/l	0.7	Be	
B	11	6	3	-1.22814	ug/l	20	B	
Na	23	45	2	104012.50734	ug/l	120000	Na	
Mg	24	45	2	101429.20246	ug/l	120000	Mg	
Al	27	45	2	102613.18769	ug/l	120000	Al	
P	31	45	2	104953.23024	ug/l	120000	P	
K	39	45	2	103580.94607	ug/l	120000	K	
Ca	44	45	3	100661.70134	ug/l	120000	Ca	
Ti	47	45	3	2165.47070	ug/l	2400	Ti	
V	51	45	2	-0.05429	ug/l	4.74	V	
Cr	52	45	2	1.29520	ug/l	6.52	Cr	
Mn	55	72	2	0.63934	ug/l	0.49	Mn	FAILED
Fe	57	72	2	110598.39476	ug/l	120000	Fe	
Co	59	72	2	0.34036	ug/l	0.434	Co	
Ni	60	72	2	1.58291	ug/l	0.8	Ni	FAILED
Cu	63	72	2	1.03326	ug/l	0.902	Cu	FAILED
Zn	66	72	2	3.33981	ug/l	16.58	Zn	
As	75	72	2	0.10304	ug/l	2.36	As	
Se	78	72	2	0.04922	ug/l	3.18	Se	
Sr	88	72	3	1.03943	ug/l	2	Sr	
Y	89	72	2	0.05134	ug/l	0.424	Y	
Zr	90	72	2	2.27652	ug/l	0.496	Zr	FAILED
Nb	93	72	2	0.49248	ug/l	4.62	Nb	
Mo	95	72	3	2110.65354	ug/l	2400	Mo	
Ru	101	72	2	0.00007	ug/l	2	Ru	
Rh	103	72	2	-0.00753	ug/l	1.634	Rh	
Pd	105	72	2	0.00701	ug/l	0.08	Pd	
Ag	107	115	3	0.11707	ug/l	1.54	Ag	
Cd	111	115	3	0.49818	ug/l	0.4	Cd	FAILED
Sn	118	115	3	-0.01269	ug/l	2	Sn	
Sb	121	115	3	0.01798	ug/l	3.34	Sb	
Te	125	165	2	-0.00581	ug/l	1.072	Te	
Cs	133	165	2	0.04825	ug/l	0.106	Cs	
Ba	137	165	3	0.55013	ug/l	0.446	Ba	FAILED
La	139	165	2	0.00429	ug/l	0.102	La	
Ce	140	165	2	0.59379	ug/l	1.772	Ce	
Pr	141	165	2	-0.00172	ug/l	0.084	Pr	
Nd	146	165	2	0.00455	ug/l	0.208	Nd	
Sm	147	165	3	-0.00006	ug/l	0.652	Sm	
Hf	178	165	2	0.11486	ug/l	2.26	Hf	
Ta	181	165	2	0.24781	ug/l	1.46	Ta	
W	182	165	2	0.27715	ug/l	4	W	
Re	185	193	3	0.01973	ug/l	0.05	Re	
Pt	195	193	2	0.01715	ug/l	0.12	Pt	
Au	197	193	3	0.03523	ug/l	1	Au	
Tl	205	193	3	0.00665	ug/l	1.1	Tl	
Pb	208	193	3	0.05572	ug/l	0.346	Pb	
Bi	209	193	2	0.17795	ug/l	1.464	Bi	
Th	232	193	3	0.05687	ug/l	1.104	Th	
U	238	193	3	-0.00029	ug/l	0.462	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	5513894	4.03	4941712	111.6	80	120	Li (IS)	
Sc (IS)	45	2	205402	3.03	186699	110.0	80	120	Sc (IS)	
Sc (IS)	45	3	3598868	6.25	3281398	109.7	80	120	Sc (IS)	
Ge (IS)	72	2	437869	2.46	410530	106.7	80	120	Ge (IS)	
Ge (IS)	72	3	2658507	4.47	2540877	104.6	80	120	Ge (IS)	
In (IS)	115	3	18150670	6.15	19102387	95.0	80	120	In (IS)	
Ho (IS)	165	2	14025200	2.91	14511718	96.6	80	120	Ho (IS)	
Ho (IS)	165	3	22665021	5.63	23609138	96.0	80	120	Ho (IS)	
Ir (IS)	193	2	8770514	2.32	9828030	89.2	80	120	Ir (IS)	
Ir (IS)	193	3	10390646	5.90	11858846	87.6	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Interference Check Sample AB (ICS-AB) - US EPA Method 6020

Sample Name	**ICSAB 1856864**
Data File Name	**083ICSB.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-27T01:18:48-06:00**
Type	**ICSAB**
VialNumber	**1106**
Dilution	**1**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**075CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	Units	ExpectedValue	%Recovery	%QC Low	%QC High	Analyte	QC Flag
Li	7	6	3	50.13291	ug/l	50	100.3	80	120	Li	
Be	9	6	3	48.65104	ug/l	50	97.3	80	120	Be	
B	11	6	3	88.22099	ug/l	100	88.2	80	120	B	
Na	23	45	2	99283.44759	ug/l	100000	99.3	80	120	Na	
Mg	24	45	2	97417.87696	ug/l	100000	97.4	80	120	Mg	
Al	27	45	2	98918.99100	ug/l	100000	98.9	80	120	Al	
P	31	45	2	100313.03172	ug/l	100000	100.3	80	120	P	
K	39	45	2	99774.07949	ug/l	100000	99.8	80	120	K	
Ca	44	45	3	96901.62564	ug/l	100000	96.9	80	120	Ca	
Ti	47	45	3	2138.47257	ug/l	2100	101.8	80	120	Ti	
V	51	45	2	47.69520	ug/l	50	95.4	80	120	V	
Cr	52	45	2	48.19921	ug/l	50	96.4	80	120	Cr	
Mn	55	72	2	51.48640	ug/l	50	103.0	80	120	Mn	
Fe	57	72	2	106369.47611	ug/l	100000	106.4	80	120	Fe	
Co	59	72	2	48.29958	ug/l	50	96.6	80	120	Co	
Ni	60	72	2	50.72498	ug/l	50	101.4	80	120	Ni	
Cu	63	72	2	49.03826	ug/l	50	98.1	80	120	Cu	
Zn	66	72	2	52.17253	ug/l	50	104.3	80	120	Zn	
As	75	72	2	53.50262	ug/l	50	107.0	80	120	As	
Se	78	72	2	26.20649	ug/l	25	104.8	80	120	Se	
Sr	88	72	3	51.60372	ug/l	50	103.2	80	120	Sr	
Y	89	72	2	51.63629	ug/l	50	103.3	80	120	Y	
Zr	90	72	2	33.54719	ug/l	50	67.1	80	120	Zr	FAILED
Nb	93	72	2	26.92252	ug/l	25	107.7	80	120	Nb	
Mo	95	72	3	2083.39451	ug/l	2050	101.6	80	120	Mo	
Ru	101	72	2	46.89078	ug/l	50	93.8	80	120	Ru	
Rh	103	72	2	47.53171	ug/l	50	95.1	80	120	Rh	
Pd	105	72	2	4.72845	ug/l	5	94.6	80	120	Pd	
Ag	107	115	3	9.49351	ug/l	10	94.9	80	120	Ag	
Cd	111	115	3	47.70698	ug/l	50	95.4	80	120	Cd	
Sn	118	115	3	49.07263	ug/l	50	98.1	80	120	Sn	
Sb	121	115	3	24.75235	ug/l	25	99.0	80	120	Sb	
Te	125	165	2	52.45119	ug/l	50	104.9	80	120	Te	
Cs	133	165	2	51.40843	ug/l	50	102.8	80	120	Cs	
Ba	137	165	3	49.26407	ug/l	50	98.5	80	120	Ba	
La	139	165	2	52.58677	ug/l	50	105.2	80	120	La	
Ce	140	165	2	52.43189	ug/l	50	104.9	80	120	Ce	
Pr	141	165	2	52.40467	ug/l	50	104.8	80	120	Pr	
Nd	146	165	2	49.48135	ug/l	50	99.0	80	120	Nd	
Sm	147	165	3	48.84355	ug/l	50	97.7	80	120	Sm	
Hf	178	165	2	33.57950	ug/l	50	67.2	80	120	Hf	FAILED
Ta	181	165	2	46.79785	ug/l	50	93.6	80	120	Ta	
W	182	165	2	46.27201	ug/l	50	92.5	80	120	W	
Re	185	193	3	54.02779	ug/l	50	108.1	80	120	Re	
Pt	195	193	2	5.15516	ug/l	5	103.1	80	120	Pt	
Au	197	193	3	52.98025	ug/l	50	106.0	80	120	Au	
Tl	205	193	3	9.24202	ug/l	10	92.4	80	120	Tl	
Pb	208	193	3	47.91904	ug/l	50	95.8	80	120	Pb	
Bi	209	193	2	50.59629	ug/l	50	101.2	80	120	Bi	
Th	232	193	3	50.92151	ug/l	50	101.8	80	120	Th	
U	238	193	3	50.57665	ug/l	50	101.2	80	120	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	5651647	0.85	4941712	114.4	80	120	Li (IS)	
Sc (IS)	45	2	219902	1.69	186699	117.8	80	120	Sc (IS)	
Sc (IS)	45	3	3767235	0.93	3281398	114.8	80	120	Sc (IS)	
Ge (IS)	72	2	467987	0.56	410530	114.0	80	120	Ge (IS)	
Ge (IS)	72	3	2737940	0.83	2540877	107.8	80	120	Ge (IS)	
In (IS)	115	3	18765268	0.99	19102387	98.2	80	120	In (IS)	
Ho (IS)	165	2	14415333	1.05	14511718	99.3	80	120	Ho (IS)	
Ho (IS)	165	3	23026848	0.58	23609138	97.5	80	120	Ho (IS)	
Ir (IS)	193	2	8789680	1.39	9828030	89.4	80	120	Ir (IS)	
Ir (IS)	193	3	10643908	0.94	11858846	89.8	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Sample Name	**CCV 1856861**
Data File Name	**084_CCV.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-27T01:25:38-06:00**
Type	**CCV**
VialNumber	**1102**
Dilution	**1**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**075CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	Units	ExpectedValue	%Recovery	%QC Low	%QC High	Analyte	QC Flag
Li	7	6	3	101.10798	ug/l	100	101.1	90	110	Li	
Be	9	6	3	99.86246	ug/l	100	99.9	90	110	Be	
B	11	6	3	198.95894	ug/l	200	99.5	90	110	B	
Na	23	45	2	2483.84966	ug/l	2500	99.4	90	110	Na	
Mg	24	45	2	2492.44064	ug/l	2500	99.7	90	110	Mg	
Al	27	45	2	2689.22116	ug/l	2500	107.6	90	110	Al	
P	31	45	2	2553.43033	ug/l	2500	102.1	90	110	P	
K	39	45	2	2556.91404	ug/l	2500	102.3	90	110	K	
Ca	44	45	3	2541.73385	ug/l	2500	101.7	90	110	Ca	
Ti	47	45	3	101.67305	ug/l	100	101.7	90	110	Ti	
V	51	45	2	97.65851	ug/l	100	97.7	90	110	V	
Cr	52	45	2	99.75337	ug/l	100	99.8	90	110	Cr	
Mn	55	72	2	99.48880	ug/l	100	99.5	90	110	Mn	
Fe	57	72	2	2553.32845	ug/l	2500	102.1	90	110	Fe	
Co	59	72	2	101.55419	ug/l	100	101.6	90	110	Co	
Ni	60	72	2	102.48729	ug/l	100	102.5	90	110	Ni	
Cu	63	72	2	102.89759	ug/l	100	102.9	90	110	Cu	
Zn	66	72	2	101.08387	ug/l	100	101.1	90	110	Zn	
As	75	72	2	103.37193	ug/l	100	103.4	90	110	As	
Se	78	72	2	53.10302	ug/l	50	106.2	90	110	Se	
Sr	88	72	3	101.31473	ug/l	100	101.3	90	110	Sr	
Y	89	72	2	100.85364	ug/l	100	100.9	90	110	Y	
Zr	90	72	2	101.25630	ug/l	100	101.3	90	110	Zr	
Nb	93	72	2	49.81079	ug/l	50	99.6	90	110	Nb	
Mo	95	72	3	49.82532	ug/l	50	99.7	90	110	Mo	
Ru	101	72	2	96.09539	ug/l	100	96.1	90	110	Ru	
Rh	103	72	2	99.20238	ug/l	100	99.2	90	110	Rh	
Pd	105	72	2	9.97331	ug/l	10	99.7	90	110	Pd	
Ag	107	115	3	20.03281	ug/l	20	100.2	90	110	Ag	
Cd	111	115	3	97.91511	ug/l	100	97.9	90	110	Cd	
Sn	118	115	3	100.25608	ug/l	100	100.3	90	110	Sn	
Sb	121	115	3	50.02175	ug/l	50	100.0	90	110	Sb	
Te	125	165	2	102.87193	ug/l	100	102.9	90	110	Te	
Cs	133	165	2	103.73039	ug/l	100	103.7	90	110	Cs	
Ba	137	165	3	103.41363	ug/l	100	103.4	90	110	Ba	
La	139	165	2	102.20458	ug/l	100	102.2	90	110	La	
Ce	140	165	2	102.27841	ug/l	100	102.3	90	110	Ce	
Pr	141	165	2	102.52027	ug/l	100	102.5	90	110	Pr	
Nd	146	165	2	96.77917	ug/l	100	96.8	90	110	Nd	
Sm	147	165	3	103.78090	ug/l	100	103.8	90	110	Sm	
Hf	178	165	2	99.71832	ug/l	100	99.7	90	110	Hf	
Ta	181	165	2	97.21264	ug/l	100	97.2	90	110	Ta	
W	182	165	2	97.51121	ug/l	100	97.5	90	110	W	
Re	185	193	3	102.70475	ug/l	100	102.7	90	110	Re	
Pt	195	193	2	10.00243	ug/l	10	100.0	90	110	Pt	
Au	197	193	3	101.46650	ug/l	100	101.5	90	110	Au	
Tl	205	193	3	20.28557	ug/l	20	101.4	90	110	Tl	
Pb	208	193	3	102.08231	ug/l	100	102.1	90	110	Pb	
Bi	209	193	2	101.18700	ug/l	100	101.2	90	110	Bi	
Th	232	193	3	100.57108	ug/l	100	100.6	90	110	Th	
U	238	193	3	100.66961	ug/l	100	100.7	90	110	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	5329285	0.46	4941712	107.8	80	120	Li (IS)	
Sc (IS)	45	2	213368	0.57	186699	114.3	80	120	Sc (IS)	
Sc (IS)	45	3	3667692	0.43	3281398	111.8	80	120	Sc (IS)	
Ge (IS)	72	2	489794	0.25	410530	119.3	80	120	Ge (IS)	
Ge (IS)	72	3	2845737	0.17	2540877	112.0	80	120	Ge (IS)	
In (IS)	115	3	20312986	0.49	19102387	106.3	80	120	In (IS)	
Ho (IS)	165	2	15305617	0.27	14511718	105.5	80	120	Ho (IS)	
Ho (IS)	165	3	24243890	0.43	23609138	102.7	80	120	Ho (IS)	
Ir (IS)	193	2	9954589	1.21	9828030	101.3	80	120	Ir (IS)	
Ir (IS)	193	3	11791578	0.32	11858846	99.4	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Continuing Calibration Blank (CCB) - US EPA Method 6020

Sample Name	**CCB 1854886**
Data File Name	**085_CCB.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-27T01:32:24-06:00**
Type	**CCB**
VialNumber	**4**
Dilution	**1**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**075CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	Units	QC High	Analyte	QC Flag
Li	7	6	3	0.16243	ug/l	1.388	Li	
Be	9	6	3	0.02567	ug/l	0.7	Be	
B	11	6	3	-1.32223	ug/l	20	B	
Na	23	45	2	5.66683	ug/l	30	Na	
Mg	24	45	2	3.24817	ug/l	11.18	Mg	
Al	27	45	2	2.46143	ug/l	25.8	Al	
P	31	45	2	2.82189	ug/l	16.46	P	
K	39	45	2	3.24247	ug/l	83.2	K	
Ca	44	45	3	-1.79170	ug/l	136.2	Ca	
Ti	47	45	3	0.24179	ug/l	4.2	Ti	
V	51	45	2	-0.16413	ug/l	4.74	V	
Cr	52	45	2	0.02430	ug/l	6.52	Cr	
Mn	55	72	2	0.05819	ug/l	0.49	Mn	
Fe	57	72	2	4.23368	ug/l	40.7	Fe	
Co	59	72	2	0.03155	ug/l	0.434	Co	
Ni	60	72	2	0.03421	ug/l	0.8	Ni	
Cu	63	72	2	0.03366	ug/l	0.902	Cu	
Zn	66	72	2	0.06388	ug/l	16.58	Zn	
As	75	72	2	0.02150	ug/l	2.36	As	
Se	78	72	2	0.04578	ug/l	3.18	Se	
Sr	88	72	3	0.01307	ug/l	2	Sr	
Y	89	72	2	0.03432	ug/l	0.424	Y	
Zr	90	72	2	0.09251	ug/l	0.496	Zr	
Nb	93	72	2	0.54148	ug/l	4.62	Nb	
Mo	95	72	3	0.59210	ug/l	2	Mo	
Ru	101	72	2	0.03622	ug/l	2	Ru	
Rh	103	72	2	0.03512	ug/l	1.634	Rh	
Pd	105	72	2	0.00644	ug/l	0.08	Pd	
Ag	107	115	3	0.00892	ug/l	1.54	Ag	
Cd	111	115	3	0.01465	ug/l	0.4	Cd	
Sn	118	115	3	0.04251	ug/l	2	Sn	
Sb	121	115	3	0.01051	ug/l	3.34	Sb	
Te	125	165	2	0.06851	ug/l	1.072	Te	
Cs	133	165	2	0.04510	ug/l	0.106	Cs	
Ba	137	165	3	0.01335	ug/l	0.446	Ba	
La	139	165	2	0.03374	ug/l	0.102	La	
Ce	140	165	2	0.03221	ug/l	1.772	Ce	
Pr	141	165	2	0.03264	ug/l	0.084	Pr	
Nd	146	165	2	0.02997	ug/l	0.208	Nd	
Sm	147	165	3	0.01063	ug/l	0.652	Sm	
Hf	178	165	2	0.11878	ug/l	2.26	Hf	
Ta	181	165	2	0.10247	ug/l	1.46	Ta	
W	182	165	2	0.39642	ug/l	4	W	
Re	185	193	3	0.00989	ug/l	0.05	Re	
Pt	195	193	2	0.00403	ug/l	0.12	Pt	
Au	197	193	3	0.18577	ug/l	1	Au	
Tl	205	193	3	0.03303	ug/l	1.1	Tl	
Pb	208	193	3	0.02408	ug/l	0.346	Pb	
Bi	209	193	2	0.07645	ug/l	1.464	Bi	
Th	232	193	3	0.09816	ug/l	1.104	Th	
U	238	193	3	0.01430	ug/l	0.462	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	5175688	0.22	4941712	104.7	80	120	Li (IS)	
Sc (IS)	45	2	205316	0.95	186699	110.0	80	120	Sc (IS)	
Sc (IS)	45	3	3565092	0.19	3281398	108.6	80	120	Sc (IS)	
Ge (IS)	72	2	446955	0.64	410530	108.9	80	120	Ge (IS)	
Ge (IS)	72	3	2702892	0.07	2540877	106.4	80	120	Ge (IS)	
In (IS)	115	3	20274057	0.56	19102387	106.1	80	120	In (IS)	
Ho (IS)	165	2	14865240	0.70	14511718	102.4	80	120	Ho (IS)	
Ho (IS)	165	3	24349455	0.26	23609138	103.1	80	120	Ho (IS)	
Ir (IS)	193	2	9865447	0.32	9828030	100.4	80	120	Ir (IS)	
Ir (IS)	193	3	12016456	0.42	11858846	101.3	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Sample Name	**MB 160-453801/1-A**
Data File Name	**086SMPL.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-27T01:39:09-06:00**
Type	**Sample**
VialNumber	**3101**
Dilution	**2**
Comment	**453801**
Operator	**LP 7700**
ISTDRefDataFileName	**075CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	FinalConcentration	Units	High Value	Analyte	QC Flag
Li	7	6	3	0.14477	0.28954	ug/l	1000	Li	
Be	9	6	3	0.00021	0.00043	ug/l	1000	Be	
B	11	6	3	-3.19797	-6.39593	ug/l	2000	B	
Na	23	45	2	1.90097	3.80194	ug/l	50000	Na	
Mg	24	45	2	1.69390	3.38779	ug/l	50000	Mg	
Al	27	45	2	14.59752	29.19503	ug/l	100000	Al	
P	31	45	2	8.28700	16.57401	ug/l	100000	P	
K	39	45	2	7.46031	14.92061	ug/l	100000	K	
Ca	44	45	3	10.72796	21.45592	ug/l	100000	Ca	
Ti	47	45	3	0.27477	0.54954	ug/l	2000	Ti	
V	51	45	2	-0.30483	-0.60966	ug/l	2000	V	
Cr	52	45	2	0.09855	0.19709	ug/l	2000	Cr	
Mn	55	72	2	0.07813	0.15627	ug/l	5000	Mn	
Fe	57	72	2	5.24125	10.48249	ug/l	100000	Fe	
Co	59	72	2	0.00580	0.01160	ug/l	2000	Co	
Ni	60	72	2	0.13957	0.27915	ug/l	2000	Ni	
Cu	63	72	2	0.04730	0.09460	ug/l	2000	Cu	
Zn	66	72	2	0.38478	0.76957	ug/l	5000	Zn	
As	75	72	2	-0.05100	-0.10200	ug/l	2000	As	
Se	78	72	2	-0.12777	-0.25554	ug/l	1000	Se	
Sr	88	72	3	0.02793	0.05586	ug/l	2000	Sr	
Y	89	72	2	-0.00428	-0.00855	ug/l	200	Y	
Zr	90	72	2	0.04537	0.09074	ug/l	2000	Zr	
Nb	93	72	2	0.08999	0.17999	ug/l	100	Nb	
Mo	95	72	3	0.32821	0.65642	ug/l	1000	Mo	
Ru	101	72	2	-0.00491	-0.00982	ug/l	200	Ru	
Rh	103	72	2	-0.00724	-0.01448	ug/l	200	Rh	
Pd	105	72	2	0.00088	0.00175	ug/l	20	Pd	
Ag	107	115	3	-0.00341	-0.00682	ug/l	400	Ag	
Cd	111	115	3	0.00815	0.01629	ug/l	2000	Cd	
Sn	118	115	3	7.76532	15.53065	ug/l	2000	Sn	
Sb	121	115	3	-0.00066	-0.00132	ug/l	1000	Sb	
Te	125	165	2	-0.02103	-0.04207	ug/l	200	Te	
Cs	133	165	2	-0.00401	-0.00802	ug/l	2000	Cs	
Ba	137	165	3	0.04367	0.08734	ug/l	5000	Ba	
La	139	165	2	-0.00357	-0.00713	ug/l	200	La	
Ce	140	165	2	-0.00246	-0.00492	ug/l	200	Ce	
Pr	141	165	2	-0.00403	-0.00806	ug/l	200	Pr	
Nd	146	165	2	-0.00582	-0.01163	ug/l	200	Nd	
Sm	147	165	3	0.00141	0.00282	ug/l	2000	Sm	
Hf	178	165	2	0.05663	0.11325	ug/l	200	Hf	
Ta	181	165	2	0.01889	0.03777	ug/l	200	Ta	
W	182	165	2	-0.00954	-0.01909	ug/l	2000	W	
Re	185	193	3	-0.00368	-0.00736	ug/l	200	Re	
Pt	195	193	2	0.00213	0.00426	ug/l	200	Pt	
Au	197	193	3	0.04061	0.08123	ug/l	2000	Au	
Tl	205	193	3	0.01299	0.02599	ug/l	400	Tl	
Pb	208	193	3	0.01814	0.03628	ug/l	5000	Pb	
Bi	209	193	2	0.01664	0.03327	ug/l	2000	Bi	
Th	232	193	3	-0.00216	-0.00432	ug/l	2000	Th	
U	238	193	3	0.00655	0.01309	ug/l	2000	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	5218561	0.32	4941712	105.6	80	120	Li (IS)	
Sc (IS)	45	2	206143	1.17	186699	110.4	80	120	Sc (IS)	
Sc (IS)	45	3	3555820	0.51	3281398	108.4	80	120	Sc (IS)	
Ge (IS)	72	2	464959	0.24	410530	113.3	80	120	Ge (IS)	
Ge (IS)	72	3	2788423	0.53	2540877	109.7	80	120	Ge (IS)	
In (IS)	115	3	20176154	0.14	19102387	105.6	80	120	In (IS)	
Ho (IS)	165	2	15142979	0.47	14511718	104.4	80	120	Ho (IS)	
Ho (IS)	165	3	24377541	0.57	23609138	103.3	80	120	Ho (IS)	
Ir (IS)	193	2	10181689	1.10	9828030	103.6	80	120	Ir (IS)	
Ir (IS)	193	3	12064641	1.25	11858846	101.7	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Sample Name	**LCS 160-453801/2-A**
Data File Name	**087SMPL.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-27T01:45:52-06:00**
Type	**Sample**
VialNumber	**3102**
Dilution	**2**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**075CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	FinalConcentration	Units	High Value	Analyte	QC Flag
Li	7	6	3	50.40129	100.80258	ug/l	1000	Li	
Be	9	6	3	49.49548	98.99096	ug/l	1000	Be	
B	11	6	3	89.95237	179.90473	ug/l	2000	B	
Na	23	45	2	5062.28082	10124.56163	ug/l	50000	Na	
Mg	24	45	2	5096.26211	10192.52421	ug/l	50000	Mg	
Al	27	45	2	5035.26191	10070.52382	ug/l	100000	Al	
P	31	45	2	521.29278	1042.58556	ug/l	100000	P	
K	39	45	2	5050.44532	10100.89064	ug/l	100000	K	
Ca	44	45	3	5125.19445	10250.38890	ug/l	100000	Ca	
Ti	47	45	3	505.05047	1010.10095	ug/l	2000	Ti	
V	51	45	2	489.26460	978.52919	ug/l	2000	V	
Cr	52	45	2	496.85639	993.71277	ug/l	2000	Cr	
Mn	55	72	2	523.63389	1047.26779	ug/l	5000	Mn	
Fe	57	72	2	5417.32916	10834.65833	ug/l	100000	Fe	
Co	59	72	2	521.18692	1042.37383	ug/l	2000	Co	
Ni	60	72	2	538.98436	1077.96873	ug/l	2000	Ni	
Cu	63	72	2	523.32011	1046.64022	ug/l	2000	Cu	
Zn	66	72	2	506.77114	1013.54229	ug/l	5000	Zn	
As	75	72	2	509.82407	1019.64813	ug/l	2000	As	
Se	78	72	2	256.63593	513.27185	ug/l	1000	Se	
Sr	88	72	3	511.94111	1023.88222	ug/l	2000	Sr	
Y	89	72	2	0.00597	0.01194	ug/l	200	Y	
Zr	90	72	2	514.92477	1029.84953	ug/l	2000	Zr	
Nb	93	72	2	0.69656	1.39312	ug/l	100	Nb	
Mo	95	72	3	253.30458	506.60916	ug/l	1000	Mo	
Ru	101	72	2	-0.00595	-0.01189	ug/l	200	Ru	
Rh	103	72	2	0.01386	0.02772	ug/l	200	Rh	
Pd	105	72	2	0.03131	0.06262	ug/l	20	Pd	
Ag	107	115	3	98.74063	197.48125	ug/l	400	Ag	
Cd	111	115	3	503.27128	1006.54255	ug/l	2000	Cd	
Sn	118	115	3	510.68437	1021.36873	ug/l	2000	Sn	
Sb	121	115	3	250.11734	500.23467	ug/l	1000	Sb	
Te	125	165	2	0.02664	0.05327	ug/l	200	Te	
Cs	133	165	2	-0.00064	-0.00129	ug/l	2000	Cs	
Ba	137	165	3	497.02053	994.04106	ug/l	5000	Ba	
La	139	165	2	0.81709	1.63419	ug/l	200	La	
Ce	140	165	2	0.05579	0.11158	ug/l	200	Ce	
Pr	141	165	2	0.00446	0.00892	ug/l	200	Pr	
Nd	146	165	2	0.01890	0.03779	ug/l	200	Nd	
Sm	147	165	3	508.36434	1016.72867	ug/l	2000	Sm	
Hf	178	165	2	0.69631	1.39262	ug/l	200	Hf	
Ta	181	165	2	0.51068	1.02137	ug/l	200	Ta	
W	182	165	2	486.79038	973.58076	ug/l	2000	W	
Re	185	193	3	0.00517	0.01034	ug/l	200	Re	
Pt	195	193	2	0.00768	0.01536	ug/l	200	Pt	
Au	197	193	3	0.03147	0.06294	ug/l	2000	Au	
Tl	205	193	3	100.46179	200.92358	ug/l	400	Tl	
Pb	208	193	3	507.59925	1015.19850	ug/l	5000	Pb	
Bi	209	193	2	523.99826	1047.99651	ug/l	2000	Bi	
Th	232	193	3	500.14199	1000.28399	ug/l	2000	Th	
U	238	193	3	508.44312	1016.88623	ug/l	2000	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	4922972	0.61	4941712	99.6	80	120	Li (IS)	
Sc (IS)	45	2	200279	1.18	186699	107.3	80	120	Sc (IS)	
Sc (IS)	45	3	3412992	0.29	3281398	104.0	80	120	Sc (IS)	
Ge (IS)	72	2	442228	1.11	410530	107.7	80	120	Ge (IS)	
Ge (IS)	72	3	2652705	0.53	2540877	104.4	80	120	Ge (IS)	
In (IS)	115	3	19410545	1.02	19102387	101.6	80	120	In (IS)	
Ho (IS)	165	2	14664642	0.89	14511718	101.1	80	120	Ho (IS)	
Ho (IS)	165	3	24077364	0.86	23609138	102.0	80	120	Ho (IS)	
Ir (IS)	193	2	9410142	0.59	9828030	95.7	80	120	Ir (IS)	
Ir (IS)	193	3	11637895	0.24	11858846	98.1	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Sample Name	**LCSSRM 160-453801/3-A**
Data File Name	**088SMPL.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-27T01:52:33-06:00**
Type	**Sample**
VialNumber	**3103**
Dilution	**10**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**075CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	FinalConcentration	Units	High Value	Analyte	QC Flag
Li	7	6	3	8.22910	82.29096	ug/l	1000	Li	
Be	9	6	3	119.43221	1194.32210	ug/l	1000	Be	
B	11	6	3	89.80222	898.02217	ug/l	2000	B	
Na	23	45	2	254.15638	2541.56377	ug/l	50000	Na	
Mg	24	45	2	2732.69300	27326.92999	ug/l	50000	Mg	
Al	27	45	2	9231.59316	92315.93156	ug/l	100000	Al	
P	31	45	2	702.08046	7020.80457	ug/l	100000	P	
K	39	45	2	2293.33826	22933.38262	ug/l	100000	K	
Ca	44	45	3	5469.10284	54691.02836	ug/l	100000	Ca	
Ti	47	45	3	451.28532	4512.85320	ug/l	2000	Ti	
V	51	45	2	67.78217	677.82170	ug/l	2000	V	
Cr	52	45	2	163.20189	1632.01890	ug/l	2000	Cr	
Mn	55	72	2	289.25702	2892.57019	ug/l	5000	Mn	
Fe	57	72	2	20166.39229	201663.92291	ug/l	100000	Fe	
Co	59	72	2	58.86408	588.64078	ug/l	2000	Co	
Ni	60	72	2	116.91001	1169.10013	ug/l	2000	Ni	
Cu	63	72	2	214.37617	2143.76173	ug/l	2000	Cu	
Zn	66	72	2	246.69392	2466.93923	ug/l	5000	Zn	
As	75	72	2	202.05372	2020.53723	ug/l	2000	As	
Se	78	72	2	244.47587	2444.75873	ug/l	1000	Se	
Sr	88	72	3	131.05314	1310.53141	ug/l	2000	Sr	
Y	89	72	2	10.97326	109.73259	ug/l	200	Y	
Zr	90	72	2	7.22933	72.29328	ug/l	2000	Zr	
Nb	93	72	2	0.77072	7.70724	ug/l	100	Nb	
Mo	95	72	3	139.14108	1391.41080	ug/l	1000	Mo	
Ru	101	72	2	-0.00557	-0.05568	ug/l	200	Ru	
Rh	103	72	2	-0.00243	-0.02431	ug/l	200	Rh	
Pd	105	72	2	0.02013	0.20134	ug/l	20	Pd	
Ag	107	115	3	54.13815	541.38147	ug/l	400	Ag	
Cd	111	115	3	257.78752	2577.87523	ug/l	2000	Cd	
Sn	118	115	3	126.01924	1260.19238	ug/l	2000	Sn	
Sb	121	115	3	59.05844	590.58439	ug/l	1000	Sb	
Te	125	165	2	0.03616	0.36162	ug/l	200	Te	
Cs	133	165	2	1.31467	13.14668	ug/l	2000	Cs	
Ba	137	165	3	307.54886	3075.48856	ug/l	5000	Ba	
La	139	165	2	36.83028	368.30276	ug/l	200	La	
Ce	140	165	2	80.53441	805.34412	ug/l	200	Ce	
Pr	141	165	2	9.08456	90.84563	ug/l	200	Pr	
Nd	146	165	2	34.09792	340.97915	ug/l	200	Nd	
Sm	147	165	3	5.76422	57.64223	ug/l	2000	Sm	
Hf	178	165	2	0.15275	1.52752	ug/l	200	Hf	
Ta	181	165	2	0.01625	0.16249	ug/l	200	Ta	
W	182	165	2	1.34547	13.45473	ug/l	2000	W	
Re	185	193	3	-0.00349	-0.03489	ug/l	200	Re	
Pt	195	193	2	0.00101	0.01010	ug/l	200	Pt	
Au	197	193	3	0.01146	0.11457	ug/l	2000	Au	
Tl	205	193	3	192.73971	1927.39709	ug/l	400	Tl	
Pb	208	193	3	137.07455	1370.74545	ug/l	5000	Pb	
Bi	209	193	2	0.58260	5.82600	ug/l	2000	Bi	
Th	232	193	3	18.16713	181.67128	ug/l	2000	Th	
U	238	193	3	116.81818	1168.18177	ug/l	2000	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	4977943	2.29	4941712	100.7	80	120	Li (IS)	
Sc (IS)	45	2	208017	0.96	186699	111.4	80	120	Sc (IS)	
Sc (IS)	45	3	3623816	2.73	3281398	110.4	80	120	Sc (IS)	
Ge (IS)	72	2	447736	0.28	410530	109.1	80	120	Ge (IS)	
Ge (IS)	72	3	2665888	2.21	2540877	104.9	80	120	Ge (IS)	
In (IS)	115	3	19224586	2.88	19102387	100.6	80	120	In (IS)	
Ho (IS)	165	2	14759623	0.70	14511718	101.7	80	120	Ho (IS)	
Ho (IS)	165	3	24101798	3.75	23609138	102.1	80	120	Ho (IS)	
Ir (IS)	193	2	9736573	0.60	9828030	99.1	80	120	Ir (IS)	
Ir (IS)	193	3	11775200	2.95	11858846	99.3	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Sample Name	**160-36593-B-1-A**
Data File Name	**089SMPL.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-27T01:59:17-06:00**
Type	**Sample**
VialNumber	**3104**
Dilution	**2**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**075CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	FinalConcentration	Units	High Value	Analyte	QC Flag
Li	7	6	3	17.59122	35.18244	ug/l	1000	Li	
Be	9	6	3	0.68032	1.36063	ug/l	1000	Be	
B	11	6	3	5.01055	10.02111	ug/l	2000	B	
Na	23	45	2	1134.78776	2269.57552	ug/l	50000	Na	
Mg	24	45	2	34133.26474	68266.52948	ug/l	50000	Mg	
Al	27	45	2	37132.61493	74265.22985	ug/l	100000	Al	
P	31	45	2	3237.70484	6475.40968	ug/l	100000	P	
K	39	45	2	5743.98590	11487.97179	ug/l	100000	K	
Ca	44	45	3	17622.84918	35245.69835	ug/l	100000	Ca	
Ti	47	45	3	1331.68753	2663.37506	ug/l	2000	Ti	
V	51	45	2	89.73355	179.46711	ug/l	2000	V	
Cr	52	45	2	28.42276	56.84551	ug/l	2000	Cr	
Mn	55	72	2	462.40480	924.80960	ug/l	5000	Mn	
Fe	57	72	2	81550.79101	163101.58203	ug/l	100000	Fe	
Co	59	72	2	28.33451	56.66903	ug/l	2000	Co	
Ni	60	72	2	45.35247	90.70495	ug/l	2000	Ni	
Cu	63	72	2	10669.58641	21339.17281	ug/l	2000	Cu	FAILED
Zn	66	72	2	125.13986	250.27971	ug/l	5000	Zn	
As	75	72	2	31.07579	62.15159	ug/l	2000	As	
Se	78	72	2	15.69355	31.38711	ug/l	1000	Se	
Sr	88	72	3	236.14275	472.28551	ug/l	2000	Sr	
Y	89	72	2	17.47178	34.94355	ug/l	200	Y	
Zr	90	72	2	4.92086	9.84171	ug/l	2000	Zr	
Nb	93	72	2	0.40726	0.81453	ug/l	100	Nb	
Mo	95	72	3	10.84985	21.69969	ug/l	1000	Mo	
Ru	101	72	2	-0.00671	-0.01341	ug/l	200	Ru	
Rh	103	72	2	-0.00768	-0.01537	ug/l	200	Rh	
Pd	105	72	2	0.03702	0.07404	ug/l	20	Pd	
Ag	107	115	3	0.39630	0.79260	ug/l	400	Ag	
Cd	111	115	3	0.26818	0.53636	ug/l	2000	Cd	
Sn	118	115	3	8.59132	17.18264	ug/l	2000	Sn	
Sb	121	115	3	2.19573	4.39145	ug/l	1000	Sb	
Te	125	165	2	0.91570	1.83140	ug/l	200	Te	
Cs	133	165	2	3.21237	6.42475	ug/l	2000	Cs	
Ba	137	165	3	171.39202	342.78405	ug/l	5000	Ba	
La	139	165	2	32.02205	64.04411	ug/l	200	La	
Ce	140	165	2	67.89112	135.78223	ug/l	200	Ce	
Pr	141	165	2	8.48368	16.96735	ug/l	200	Pr	
Nd	146	165	2	35.93943	71.87885	ug/l	200	Nd	
Sm	147	165	3	7.00052	14.00104	ug/l	2000	Sm	
Hf	178	165	2	0.16270	0.32540	ug/l	200	Hf	
Ta	181	165	2	0.01646	0.03293	ug/l	200	Ta	
W	182	165	2	1.89797	3.79594	ug/l	2000	W	
Re	185	193	3	0.04174	0.08347	ug/l	200	Re	
Pt	195	193	2	0.00422	0.00844	ug/l	200	Pt	
Au	197	193	3	0.10692	0.21384	ug/l	2000	Au	
Tl	205	193	3	0.95574	1.91148	ug/l	400	Tl	
Pb	208	193	3	14.10533	28.21065	ug/l	5000	Pb	
Bi	209	193	2	3.22381	6.44762	ug/l	2000	Bi	
Th	232	193	3	21.78418	43.56836	ug/l	2000	Th	
U	238	193	3	5.29812	10.59624	ug/l	2000	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	5428243	0.89	4941712	109.8	80	120	Li (IS)	
Sc (IS)	45	2	228465	2.50	186699	122.4	80	120	Sc (IS)	FAILED
Sc (IS)	45	3	4133322	2.57	3281398	126.0	80	120	Sc (IS)	FAILED
Ge (IS)	72	2	468351	2.18	410530	114.1	80	120	Ge (IS)	
Ge (IS)	72	3	2875469	1.94	2540877	113.2	80	120	Ge (IS)	
In (IS)	115	3	19815669	2.24	19102387	103.7	80	120	In (IS)	
Ho (IS)	165	2	15080224	3.17	14511718	103.9	80	120	Ho (IS)	
Ho (IS)	165	3	24586263	2.02	23609138	104.1	80	120	Ho (IS)	
Ir (IS)	193	2	9694808	2.87	9828030	98.6	80	120	Ir (IS)	
Ir (IS)	193	3	11724311	1.94	11858846	98.9	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Sample Name	**160-36593-B-1-A SD**
Data File Name	**090SMPL.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-27T02:06:07-06:00**
Type	**Sample**
VialNumber	**3105**
Dilution	**10**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**075CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	FinalConcentration	Units	High Value	Analyte	QC Flag
Li	7	6	3	3.67077	36.70770	ug/l	1000	Li	
Be	9	6	3	0.14764	1.47636	ug/l	1000	Be	
B	11	6	3	-1.98742	-19.87416	ug/l	2000	B	
Na	23	45	2	248.65512	2486.55116	ug/l	50000	Na	
Mg	24	45	2	7331.36569	73313.65689	ug/l	50000	Mg	
Al	27	45	2	7894.27571	78942.75711	ug/l	100000	Al	
P	31	45	2	685.81086	6858.10856	ug/l	100000	P	
K	39	45	2	1240.42024	12404.20237	ug/l	100000	K	
Ca	44	45	3	3904.05221	39040.52211	ug/l	100000	Ca	
Ti	47	45	3	295.06436	2950.64357	ug/l	2000	Ti	
V	51	45	2	19.09794	190.97943	ug/l	2000	V	
Cr	52	45	2	6.14114	61.41144	ug/l	2000	Cr	
Mn	55	72	2	89.02854	890.28540	ug/l	5000	Mn	
Fe	57	72	2	16274.07407	162740.74070	ug/l	100000	Fe	
Co	59	72	2	5.71580	57.15798	ug/l	2000	Co	
Ni	60	72	2	9.22629	92.26287	ug/l	2000	Ni	
Cu	63	72	2	2179.90640	21799.06398	ug/l	2000	Cu	FAILED
Zn	66	72	2	25.44255	254.42548	ug/l	5000	Zn	
As	75	72	2	6.01409	60.14093	ug/l	2000	As	
Se	78	72	2	2.76650	27.66504	ug/l	1000	Se	
Sr	88	72	3	47.37540	473.75397	ug/l	2000	Sr	
Y	89	72	2	3.40850	34.08504	ug/l	200	Y	
Zr	90	72	2	0.98638	9.86376	ug/l	2000	Zr	
Nb	93	72	2	0.00420	0.04196	ug/l	100	Nb	
Mo	95	72	3	2.32884	23.28836	ug/l	1000	Mo	
Ru	101	72	2	-0.00465	-0.04645	ug/l	200	Ru	
Rh	103	72	2	-0.00879	-0.08789	ug/l	200	Rh	
Pd	105	72	2	0.00683	0.06826	ug/l	20	Pd	
Ag	107	115	3	0.08330	0.83301	ug/l	400	Ag	
Cd	111	115	3	0.05165	0.51646	ug/l	2000	Cd	
Sn	118	115	3	1.72159	17.21592	ug/l	2000	Sn	
Sb	121	115	3	0.44279	4.42792	ug/l	1000	Sb	
Te	125	165	2	0.18106	1.81064	ug/l	200	Te	
Cs	133	165	2	0.64362	6.43616	ug/l	2000	Cs	
Ba	137	165	3	33.08774	330.87737	ug/l	5000	Ba	
La	139	165	2	6.04026	60.40258	ug/l	200	La	
Ce	140	165	2	12.75269	127.52692	ug/l	200	Ce	
Pr	141	165	2	1.70591	17.05912	ug/l	200	Pr	
Nd	146	165	2	7.29890	72.98899	ug/l	200	Nd	
Sm	147	165	3	1.43611	14.36113	ug/l	2000	Sm	
Hf	178	165	2	0.01953	0.19532	ug/l	200	Hf	
Ta	181	165	2	0.00171	0.01711	ug/l	200	Ta	
W	182	165	2	0.39566	3.95659	ug/l	2000	W	
Re	185	193	3	0.00439	0.04386	ug/l	200	Re	
Pt	195	193	2	0.00095	0.00948	ug/l	200	Pt	
Au	197	193	3	0.01592	0.15924	ug/l	2000	Au	
Tl	205	193	3	0.22917	2.29169	ug/l	400	Tl	
Pb	208	193	3	2.90933	29.09326	ug/l	5000	Pb	
Bi	209	193	2	0.66816	6.68158	ug/l	2000	Bi	
Th	232	193	3	3.90982	39.09816	ug/l	2000	Th	
U	238	193	3	1.06561	10.65612	ug/l	2000	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	5493189	4.78	4941712	111.2	80	120	Li (IS)	
Sc (IS)	45	2	219323	0.42	186699	117.5	80	120	Sc (IS)	
Sc (IS)	45	3	3747489	6.72	3281398	114.2	80	120	Sc (IS)	
Ge (IS)	72	2	484244	1.58	410530	118.0	80	120	Ge (IS)	
Ge (IS)	72	3	2886356	5.46	2540877	113.6	80	120	Ge (IS)	
In (IS)	115	3	20066001	5.42	19102387	105.0	80	120	In (IS)	
Ho (IS)	165	2	15325054	2.33	14511718	105.6	80	120	Ho (IS)	
Ho (IS)	165	3	24419997	5.63	23609138	103.4	80	120	Ho (IS)	
Ir (IS)	193	2	9944507	1.53	9828030	101.2	80	120	Ir (IS)	
Ir (IS)	193	3	11793246	6.70	11858846	99.4	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Sample Name	**160-36593-B-1-B DU**
Data File Name	**091SMPL.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-27T02:12:51-06:00**
Type	**Sample**
VialNumber	**3106**
Dilution	**2**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**075CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	FinalConcentration	Units	High Value	Analyte	QC Flag
Li	7	6	3	17.81844	35.63687	ug/l	1000	Li	
Be	9	6	3	1.19466	2.38932	ug/l	1000	Be	
B	11	6	3	9.12590	18.25179	ug/l	2000	B	
Na	23	45	2	1545.61955	3091.23910	ug/l	50000	Na	
Mg	24	45	2	31410.65460	62821.30920	ug/l	50000	Mg	
Al	27	45	2	38124.73572	76249.47145	ug/l	100000	Al	
P	31	45	2	2217.11466	4434.22932	ug/l	100000	P	
K	39	45	2	6143.72582	12287.45165	ug/l	100000	K	
Ca	44	45	3	19683.15738	39366.31476	ug/l	100000	Ca	
Ti	47	45	3	1870.72879	3741.45759	ug/l	2000	Ti	
V	51	45	2	102.22759	204.45518	ug/l	2000	V	
Cr	52	45	2	24.91476	49.82951	ug/l	2000	Cr	
Mn	55	72	2	404.41763	808.83525	ug/l	5000	Mn	
Fe	57	72	2	89416.96914	178833.93828	ug/l	100000	Fe	
Co	59	72	2	24.76775	49.53550	ug/l	2000	Co	
Ni	60	72	2	45.27336	90.54673	ug/l	2000	Ni	
Cu	63	72	2	15857.91614	31715.83228	ug/l	2000	Cu	FAILED
Zn	66	72	2	108.44716	216.89432	ug/l	5000	Zn	
As	75	72	2	45.40579	90.81157	ug/l	2000	As	
Se	78	72	2	29.42968	58.85935	ug/l	1000	Se	
Sr	88	72	3	336.71624	673.43248	ug/l	2000	Sr	
Y	89	72	2	22.83943	45.67886	ug/l	200	Y	
Zr	90	72	2	8.25834	16.51668	ug/l	2000	Zr	
Nb	93	72	2	0.38099	0.76197	ug/l	100	Nb	
Mo	95	72	3	25.61764	51.23528	ug/l	1000	Mo	
Ru	101	72	2	-0.00443	-0.00885	ug/l	200	Ru	
Rh	103	72	2	-0.00578	-0.01156	ug/l	200	Rh	
Pd	105	72	2	0.04765	0.09530	ug/l	20	Pd	
Ag	107	115	3	0.80494	1.60987	ug/l	400	Ag	
Cd	111	115	3	0.34719	0.69438	ug/l	2000	Cd	
Sn	118	115	3	9.08203	18.16406	ug/l	2000	Sn	
Sb	121	115	3	3.10102	6.20204	ug/l	1000	Sb	
Te	125	165	2	1.31699	2.63398	ug/l	200	Te	
Cs	133	165	2	4.03727	8.07454	ug/l	2000	Cs	
Ba	137	165	3	299.89858	599.79716	ug/l	5000	Ba	
La	139	165	2	52.81222	105.62445	ug/l	200	La	
Ce	140	165	2	112.54156	225.08311	ug/l	200	Ce	
Pr	141	165	2	13.52524	27.05048	ug/l	200	Pr	
Nd	146	165	2	55.58690	111.17381	ug/l	200	Nd	
Sm	147	165	3	10.24311	20.48622	ug/l	2000	Sm	
Hf	178	165	2	0.25337	0.50674	ug/l	200	Hf	
Ta	181	165	2	0.02602	0.05204	ug/l	200	Ta	
W	182	165	2	1.30276	2.60552	ug/l	2000	W	
Re	185	193	3	0.07068	0.14135	ug/l	200	Re	
Pt	195	193	2	0.01015	0.02029	ug/l	200	Pt	
Au	197	193	3	0.08147	0.16294	ug/l	2000	Au	
Tl	205	193	3	0.85375	1.70750	ug/l	400	Tl	
Pb	208	193	3	23.96811	47.93622	ug/l	5000	Pb	
Bi	209	193	2	4.38018	8.76036	ug/l	2000	Bi	
Th	232	193	3	40.06883	80.13767	ug/l	2000	Th	
U	238	193	3	10.54123	21.08246	ug/l	2000	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	5520172	0.65	4941712	111.7	80	120	Li (IS)	
Sc (IS)	45	2	247890	2.56	186699	132.8	80	120	Sc (IS)	FAILED
Sc (IS)	45	3	4334848	0.63	3281398	132.1	80	120	Sc (IS)	FAILED
Ge (IS)	72	2	491099	2.77	410530	119.6	80	120	Ge (IS)	
Ge (IS)	72	3	2897017	0.67	2540877	114.0	80	120	Ge (IS)	
In (IS)	115	3	19983868	0.40	19102387	104.6	80	120	In (IS)	
Ho (IS)	165	2	15400225	5.00	14511718	106.1	80	120	Ho (IS)	
Ho (IS)	165	3	24361230	0.32	23609138	103.2	80	120	Ho (IS)	
Ir (IS)	193	2	9761523	3.89	9828030	99.3	80	120	Ir (IS)	
Ir (IS)	193	3	11543157	0.32	11858846	97.3	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Sample Report

Sample Name	**160-36593-A-1-E MS**
Data File Name	**092SMPL.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-27T02:19:40-06:00**
Type	**Sample**
VialNumber	**3107**
Dilution	**2**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**075CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	FinalConcentration	Units	High Value	Analyte	QC Flag
Li	7	6	3	69.25941	138.51881	ug/l	1000	Li	
Be	9	6	3	48.39036	96.78072	ug/l	1000	Be	
B	11	6	3	94.22738	188.45475	ug/l	2000	B	
Na	23	45	2	5407.12785	10814.25570	ug/l	50000	Na	
Mg	24	45	2	41755.50552	83511.01104	ug/l	50000	Mg	
Al	27	45	2	51276.43407	102552.86815	ug/l	100000	Al	
P	31	45	2	2467.08764	4934.17528	ug/l	100000	P	
K	39	45	2	12003.63726	24007.27453	ug/l	100000	K	
Ca	44	45	3	21391.08559	42782.17118	ug/l	100000	Ca	
Ti	47	45	3	3001.74583	6003.49166	ug/l	2000	Ti	FAILED
V	51	45	2	524.20033	1048.40066	ug/l	2000	V	
Cr	52	45	2	439.26871	878.53742	ug/l	2000	Cr	
Mn	55	72	2	853.02992	1706.05984	ug/l	5000	Mn	
Fe	57	72	2	72727.73663	145455.47327	ug/l	100000	Fe	
Co	59	72	2	520.34816	1040.69632	ug/l	2000	Co	
Ni	60	72	2	557.77686	1115.55373	ug/l	2000	Ni	
Cu	63	72	2	12139.58303	24279.16606	ug/l	2000	Cu	FAILED
Zn	66	72	2	589.79647	1179.59294	ug/l	5000	Zn	
As	75	72	2	532.23446	1064.46891	ug/l	2000	As	
Se	78	72	2	263.82600	527.65201	ug/l	1000	Se	
Sr	88	72	3	849.99122	1699.98243	ug/l	2000	Sr	
Y	89	72	2	17.14538	34.29077	ug/l	200	Y	
Zr	90	72	2	508.25596	1016.51192	ug/l	2000	Zr	
Nb	93	72	2	1.11300	2.22600	ug/l	100	Nb	
Mo	95	72	3	256.47214	512.94427	ug/l	1000	Mo	
Ru	101	72	2	-0.00450	-0.00900	ug/l	200	Ru	
Rh	103	72	2	0.01544	0.03087	ug/l	200	Rh	
Pd	105	72	2	0.07885	0.15771	ug/l	20	Pd	
Ag	107	115	3	96.97237	193.94473	ug/l	400	Ag	
Cd	111	115	3	496.98731	993.97461	ug/l	2000	Cd	
Sn	118	115	3	483.64297	967.28594	ug/l	2000	Sn	
Sb	121	115	3	154.01221	308.02442	ug/l	1000	Sb	
Te	125	165	2	1.05921	2.11842	ug/l	200	Te	
Cs	133	165	2	3.70195	7.40391	ug/l	2000	Cs	
Ba	137	165	3	757.67305	1515.34611	ug/l	5000	Ba	
La	139	165	2	38.45654	76.91309	ug/l	200	La	
Ce	140	165	2	77.75829	155.51658	ug/l	200	Ce	
Pr	141	165	2	9.55921	19.11843	ug/l	200	Pr	
Nd	146	165	2	39.56020	79.12040	ug/l	200	Nd	
Sm	147	165	3	511.33691	1022.67383	ug/l	2000	Sm	
Hf	178	165	2	0.39949	0.79899	ug/l	200	Hf	
Ta	181	165	2	0.12558	0.25117	ug/l	200	Ta	
W	182	165	2	368.15773	736.31545	ug/l	2000	W	
Re	185	193	3	0.05406	0.10812	ug/l	200	Re	
Pt	195	193	2	0.00621	0.01242	ug/l	200	Pt	
Au	197	193	3	0.05604	0.11209	ug/l	2000	Au	
Tl	205	193	3	98.49161	196.98323	ug/l	400	Tl	
Pb	208	193	3	505.83510	1011.67021	ug/l	5000	Pb	
Bi	209	193	2	501.08043	1002.16087	ug/l	2000	Bi	
Th	232	193	3	517.06169	1034.12339	ug/l	2000	Th	
U	238	193	3	501.92128	1003.84255	ug/l	2000	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	5307680	0.51	4941712	107.4	80	120	Li (IS)	
Sc (IS)	45	2	248435	0.41	186699	133.1	80	120	Sc (IS)	FAILED
Sc (IS)	45	3	4279803	0.21	3281398	130.4	80	120	Sc (IS)	FAILED
Ge (IS)	72	2	467855	1.29	410530	114.0	80	120	Ge (IS)	
Ge (IS)	72	3	2800922	1.04	2540877	110.2	80	120	Ge (IS)	
In (IS)	115	3	19394314	0.79	19102387	101.5	80	120	In (IS)	
Ho (IS)	165	2	14872770	0.51	14511718	102.5	80	120	Ho (IS)	
Ho (IS)	165	3	23919514	0.67	23609138	101.3	80	120	Ho (IS)	
Ir (IS)	193	2	9377294	1.22	9828030	95.4	80	120	Ir (IS)	
Ir (IS)	193	3	11367926	0.79	11858846	95.9	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Sample Name	**160-36593-A-1-F MSD**
Data File Name	**093SMPL.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-27T02:26:28-06:00**
Type	**Sample**
VialNumber	**3108**
Dilution	**2**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**075CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	FinalConcentration	Units	High Value	Analyte	QC Flag
Li	7	6	3	65.08264	130.16527	ug/l	1000	Li	
Be	9	6	3	49.02741	98.05482	ug/l	1000	Be	
B	11	6	3	96.61694	193.23388	ug/l	2000	B	
Na	23	45	2	5530.07709	11060.15418	ug/l	50000	Na	
Mg	24	45	2	29425.75723	58851.51446	ug/l	50000	Mg	
Al	27	45	2	44453.73004	88907.46009	ug/l	100000	Al	
P	31	45	2	1859.08874	3718.17748	ug/l	100000	P	
K	39	45	2	10951.43644	21902.87287	ug/l	100000	K	
Ca	44	45	3	20981.99982	41963.99964	ug/l	100000	Ca	
Ti	47	45	3	2962.21957	5924.43914	ug/l	2000	Ti	FAILED
V	51	45	2	530.74578	1061.49156	ug/l	2000	V	
Cr	52	45	2	448.24290	896.48579	ug/l	2000	Cr	
Mn	55	72	2	846.16807	1692.33614	ug/l	5000	Mn	
Fe	57	72	2	71597.62397	143195.24794	ug/l	100000	Fe	
Co	59	72	2	523.27701	1046.55402	ug/l	2000	Co	
Ni	60	72	2	549.72564	1099.45128	ug/l	2000	Ni	
Cu	63	72	2	11402.92125	22805.84251	ug/l	2000	Cu	FAILED
Zn	66	72	2	599.31029	1198.62059	ug/l	5000	Zn	
As	75	72	2	532.46551	1064.93102	ug/l	2000	As	
Se	78	72	2	265.53130	531.06259	ug/l	1000	Se	
Sr	88	72	3	792.82224	1585.64448	ug/l	2000	Sr	
Y	89	72	2	16.21629	32.43258	ug/l	200	Y	
Zr	90	72	2	517.42541	1034.85082	ug/l	2000	Zr	
Nb	93	72	2	1.29242	2.58485	ug/l	100	Nb	
Mo	95	72	3	261.10571	522.21141	ug/l	1000	Mo	
Ru	101	72	2	-0.00244	-0.00489	ug/l	200	Ru	
Rh	103	72	2	0.01464	0.02927	ug/l	200	Rh	
Pd	105	72	2	0.06415	0.12830	ug/l	20	Pd	
Ag	107	115	3	97.29143	194.58287	ug/l	400	Ag	
Cd	111	115	3	496.55916	993.11831	ug/l	2000	Cd	
Sn	118	115	3	494.43647	988.87295	ug/l	2000	Sn	
Sb	121	115	3	162.29832	324.59664	ug/l	1000	Sb	
Te	125	165	2	0.97091	1.94182	ug/l	200	Te	
Cs	133	165	2	3.51543	7.03086	ug/l	2000	Cs	
Ba	137	165	3	768.98473	1537.96947	ug/l	5000	Ba	
La	139	165	2	37.67324	75.34647	ug/l	200	La	
Ce	140	165	2	75.66991	151.33983	ug/l	200	Ce	
Pr	141	165	2	9.03720	18.07440	ug/l	200	Pr	
Nd	146	165	2	37.21799	74.43598	ug/l	200	Nd	
Sm	147	165	3	515.87113	1031.74225	ug/l	2000	Sm	
Hf	178	165	2	0.46838	0.93677	ug/l	200	Hf	
Ta	181	165	2	0.16537	0.33075	ug/l	200	Ta	
W	182	165	2	373.09356	746.18712	ug/l	2000	W	
Re	185	193	3	0.07012	0.14024	ug/l	200	Re	
Pt	195	193	2	0.00597	0.01194	ug/l	200	Pt	
Au	197	193	3	0.03399	0.06797	ug/l	2000	Au	
Tl	205	193	3	100.61913	201.23826	ug/l	400	Tl	
Pb	208	193	3	513.76728	1027.53456	ug/l	5000	Pb	
Bi	209	193	2	510.06081	1020.12161	ug/l	2000	Bi	
Th	232	193	3	528.10142	1056.20284	ug/l	2000	Th	
U	238	193	3	512.29609	1024.59217	ug/l	2000	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	5185857	0.31	4941712	104.9	80	120	Li (IS)	
Sc (IS)	45	2	242196	0.34	186699	129.7	80	120	Sc (IS)	FAILED
Sc (IS)	45	3	4154273	0.67	3281398	126.6	80	120	Sc (IS)	FAILED
Ge (IS)	72	2	467936	0.07	410530	114.0	80	120	Ge (IS)	
Ge (IS)	72	3	2766885	0.54	2540877	108.9	80	120	Ge (IS)	
In (IS)	115	3	19245101	0.50	19102387	100.7	80	120	In (IS)	
Ho (IS)	165	2	14864549	0.54	14511718	102.4	80	120	Ho (IS)	
Ho (IS)	165	3	23767582	0.29	23609138	100.7	80	120	Ho (IS)	
Ir (IS)	193	2	9351909	0.57	9828030	95.2	80	120	Ir (IS)	
Ir (IS)	193	3	11217947	0.29	11858846	94.6	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Sample Name	**160-36593-B-2-A**
Data File Name	**094SMPL.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-27T02:33:20-06:00**
Type	**Sample**
VialNumber	**3109**
Dilution	**2**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**075CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	FinalConcentration	Units	High Value	Analyte	QC Flag
Li	7	6	3	13.57331	27.14662	ug/l	1000	Li	
Be	9	6	3	0.74544	1.49088	ug/l	1000	Be	
B	11	6	3	2.69588	5.39177	ug/l	2000	B	
Na	23	45	2	571.32165	1142.64331	ug/l	50000	Na	
Mg	24	45	2	29099.73223	58199.46445	ug/l	50000	Mg	
Al	27	45	2	37132.78116	74265.56231	ug/l	100000	Al	
P	31	45	2	2289.37161	4578.74323	ug/l	100000	P	
K	39	45	2	4317.23906	8634.47811	ug/l	100000	K	
Ca	44	45	3	14746.90028	29493.80055	ug/l	100000	Ca	
Ti	47	45	3	1676.84457	3353.68914	ug/l	2000	Ti	
V	51	45	2	118.17423	236.34847	ug/l	2000	V	
Cr	52	45	2	25.93744	51.87487	ug/l	2000	Cr	
Mn	55	72	2	291.01885	582.03770	ug/l	5000	Mn	
Fe	57	72	2	90473.26890	180946.53781	ug/l	100000	Fe	
Co	59	72	2	17.48345	34.96691	ug/l	2000	Co	
Ni	60	72	2	37.15450	74.30900	ug/l	2000	Ni	
Cu	63	72	2	9505.79817	19011.59633	ug/l	2000	Cu	FAILED
Zn	66	72	2	65.07211	130.14422	ug/l	5000	Zn	
As	75	72	2	46.69953	93.39906	ug/l	2000	As	
Se	78	72	2	21.05178	42.10357	ug/l	1000	Se	
Sr	88	72	3	289.12114	578.24229	ug/l	2000	Sr	
Y	89	72	2	15.92178	31.84356	ug/l	200	Y	
Zr	90	72	2	6.35082	12.70165	ug/l	2000	Zr	
Nb	93	72	2	0.39671	0.79343	ug/l	100	Nb	
Mo	95	72	3	12.88265	25.76529	ug/l	1000	Mo	
Ru	101	72	2	-0.00446	-0.00892	ug/l	200	Ru	
Rh	103	72	2	-0.00730	-0.01461	ug/l	200	Rh	
Pd	105	72	2	0.04056	0.08112	ug/l	20	Pd	
Ag	107	115	3	0.49421	0.98842	ug/l	400	Ag	
Cd	111	115	3	0.24329	0.48658	ug/l	2000	Cd	
Sn	118	115	3	10.10476	20.20953	ug/l	2000	Sn	
Sb	121	115	3	4.67598	9.35197	ug/l	1000	Sb	
Te	125	165	2	1.39807	2.79614	ug/l	200	Te	
Cs	133	165	2	3.04322	6.08643	ug/l	2000	Cs	
Ba	137	165	3	199.69298	399.38596	ug/l	5000	Ba	
La	139	165	2	39.72973	79.45946	ug/l	200	La	
Ce	140	165	2	83.63143	167.26285	ug/l	200	Ce	
Pr	141	165	2	10.04385	20.08769	ug/l	200	Pr	
Nd	146	165	2	41.05785	82.11570	ug/l	200	Nd	
Sm	147	165	3	7.64150	15.28300	ug/l	2000	Sm	
Hf	178	165	2	0.18559	0.37118	ug/l	200	Hf	
Ta	181	165	2	0.05392	0.10783	ug/l	200	Ta	
W	182	165	2	4.89141	9.78282	ug/l	2000	W	
Re	185	193	3	0.01363	0.02725	ug/l	200	Re	
Pt	195	193	2	0.00809	0.01619	ug/l	200	Pt	
Au	197	193	3	0.06365	0.12729	ug/l	2000	Au	
Tl	205	193	3	0.82181	1.64362	ug/l	400	Tl	
Pb	208	193	3	18.44422	36.88843	ug/l	5000	Pb	
Bi	209	193	2	3.92103	7.84207	ug/l	2000	Bi	
Th	232	193	3	31.20722	62.41444	ug/l	2000	Th	
U	238	193	3	7.06742	14.13484	ug/l	2000	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	5325312	0.92	4941712	107.8	80	120	Li (IS)	
Sc (IS)	45	2	230338	0.20	186699	123.4	80	120	Sc (IS)	FAILED
Sc (IS)	45	3	4115752	0.19	3281398	125.4	80	120	Sc (IS)	FAILED
Ge (IS)	72	2	471025	0.62	410530	114.7	80	120	Ge (IS)	
Ge (IS)	72	3	2832009	0.46	2540877	111.5	80	120	Ge (IS)	
In (IS)	115	3	19620824	0.71	19102387	102.7	80	120	In (IS)	
Ho (IS)	165	2	15053066	0.73	14511718	103.7	80	120	Ho (IS)	
Ho (IS)	165	3	24140778	0.37	23609138	102.3	80	120	Ho (IS)	
Ir (IS)	193	2	9543293	0.44	9828030	97.1	80	120	Ir (IS)	
Ir (IS)	193	3	11406777	0.10	11858846	96.2	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Sample Name	**160-36593-B-3-A**
Data File Name	**095SMPL.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-27T02:40:02-06:00**
Type	**Sample**
VialNumber	**3110**
Dilution	**2**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**075CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	FinalConcentration	Units	High Value	Analyte	QC Flag
Li	7	6	3	14.94229	29.88458	ug/l	1000	Li	
Be	9	6	3	0.98087	1.96175	ug/l	1000	Be	
B	11	6	3	2.22074	4.44148	ug/l	2000	B	
Na	23	45	2	419.56262	839.12525	ug/l	50000	Na	
Mg	24	45	2	32189.61915	64379.23830	ug/l	50000	Mg	
Al	27	45	2	38399.28725	76798.57450	ug/l	100000	Al	
P	31	45	2	1895.52965	3791.05931	ug/l	100000	P	
K	39	45	2	5629.91683	11259.83367	ug/l	100000	K	
Ca	44	45	3	15041.13487	30082.26973	ug/l	100000	Ca	
Ti	47	45	3	1423.99379	2847.98758	ug/l	2000	Ti	
V	51	45	2	122.09600	244.19201	ug/l	2000	V	
Cr	52	45	2	30.70808	61.41616	ug/l	2000	Cr	
Mn	55	72	2	292.30816	584.61632	ug/l	5000	Mn	
Fe	57	72	2	89401.98697	178803.97393	ug/l	100000	Fe	
Co	59	72	2	19.54429	39.08858	ug/l	2000	Co	
Ni	60	72	2	40.86246	81.72493	ug/l	2000	Ni	
Cu	63	72	2	7850.10210	15700.20419	ug/l	2000	Cu	FAILED
Zn	66	72	2	86.07310	172.14620	ug/l	5000	Zn	
As	75	72	2	51.91417	103.82833	ug/l	2000	As	
Se	78	72	2	23.77968	47.55936	ug/l	1000	Se	
Sr	88	72	3	293.61822	587.23644	ug/l	2000	Sr	
Y	89	72	2	15.69749	31.39499	ug/l	200	Y	
Zr	90	72	2	6.34562	12.69125	ug/l	2000	Zr	
Nb	93	72	2	0.31229	0.62459	ug/l	100	Nb	
Mo	95	72	3	19.88323	39.76645	ug/l	1000	Mo	
Ru	101	72	2	-0.00666	-0.01332	ug/l	200	Ru	
Rh	103	72	2	-0.00700	-0.01399	ug/l	200	Rh	
Pd	105	72	2	0.03582	0.07163	ug/l	20	Pd	
Ag	107	115	3	0.50365	1.00729	ug/l	400	Ag	
Cd	111	115	3	0.15055	0.30110	ug/l	2000	Cd	
Sn	118	115	3	10.50581	21.01161	ug/l	2000	Sn	
Sb	121	115	3	3.77799	7.55597	ug/l	1000	Sb	
Te	125	165	2	1.36820	2.73641	ug/l	200	Te	
Cs	133	165	2	3.76614	7.53229	ug/l	2000	Cs	
Ba	137	165	3	267.77899	535.55798	ug/l	5000	Ba	
La	139	165	2	49.00672	98.01344	ug/l	200	La	
Ce	140	165	2	99.05387	198.10774	ug/l	200	Ce	
Pr	141	165	2	11.47782	22.95563	ug/l	200	Pr	
Nd	146	165	2	45.52997	91.05995	ug/l	200	Nd	
Sm	147	165	3	7.99248	15.98497	ug/l	2000	Sm	
Hf	178	165	2	0.18567	0.37134	ug/l	200	Hf	
Ta	181	165	2	0.05870	0.11739	ug/l	200	Ta	
W	182	165	2	2.85823	5.71646	ug/l	2000	W	
Re	185	193	3	0.02938	0.05876	ug/l	200	Re	
Pt	195	193	2	0.00988	0.01976	ug/l	200	Pt	
Au	197	193	3	0.06066	0.12133	ug/l	2000	Au	
Tl	205	193	3	0.75245	1.50491	ug/l	400	Tl	
Pb	208	193	3	21.58618	43.17236	ug/l	5000	Pb	
Bi	209	193	2	4.82288	9.64576	ug/l	2000	Bi	
Th	232	193	3	25.87514	51.75028	ug/l	2000	Th	
U	238	193	3	8.89791	17.79581	ug/l	2000	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	5279007	0.53	4941712	106.8	80	120	Li (IS)	
Sc (IS)	45	2	239179	4.19	186699	128.1	80	120	Sc (IS)	FAILED
Sc (IS)	45	3	4160506	0.42	3281398	126.8	80	120	Sc (IS)	FAILED
Ge (IS)	72	2	479253	4.28	410530	116.7	80	120	Ge (IS)	
Ge (IS)	72	3	2815906	0.27	2540877	110.8	80	120	Ge (IS)	
In (IS)	115	3	19315060	0.41	19102387	101.1	80	120	In (IS)	
Ho (IS)	165	2	15013728	4.57	14511718	103.5	80	120	Ho (IS)	
Ho (IS)	165	3	23639971	0.33	23609138	100.1	80	120	Ho (IS)	
Ir (IS)	193	2	9467170	3.94	9828030	96.3	80	120	Ir (IS)	
Ir (IS)	193	3	11121337	0.21	11858846	93.8	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Low Level Continuing Calibration Verification (CCV) - US EPA Method 6020

Sample Name	**CCVL 1856860**
Data File Name	**096LCCV.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-27T02:46:48-06:00**
Type	**CRI**
VialNumber	**1101**
Dilution	**1**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**075CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	Units	ExpectedValue	%Recovery	%QC Low	%QC High	Analyte	QC Flag
Li	7	6	3	5.23909	ug/l	5	104.8	80	120	Li	
Be	9	6	3	0.51041	ug/l	0.5	102.1	80	120	Be	
B	11	6	3	91.45325	ug/l	100	91.5	80	120	B	
Na	23	45	2	100.99159	ug/l	100	101.0	80	120	Na	
Mg	24	45	2	60.81129	ug/l	50	121.6	80	120	Mg	FAILED
Al	27	45	2	62.90582	ug/l	50	125.8	80	120	Al	FAILED
P	31	45	2	106.42582	ug/l	100	106.4	80	120	P	
K	39	45	2	106.42560	ug/l	100	106.4	80	120	K	
Ca	44	45	3	251.16062	ug/l	200	125.6	80	120	Ca	FAILED
Ti	47	45	3	5.38595	ug/l	5	107.7	80	120	Ti	
V	51	45	2	9.76106	ug/l	10	97.6	80	120	V	
Cr	52	45	2	10.25089	ug/l	10	102.5	80	120	Cr	
Mn	55	72	2	4.26025	ug/l	4	106.5	80	120	Mn	
Fe	57	72	2	62.43521	ug/l	50	124.9	80	120	Fe	FAILED
Co	59	72	2	2.15658	ug/l	2	107.8	80	120	Co	
Ni	60	72	2	5.60297	ug/l	5	112.1	80	120	Ni	
Cu	63	72	2	5.56095	ug/l	3	185.4	80	120	Cu	FAILED
Zn	66	72	2	22.04600	ug/l	20	110.2	80	120	Zn	
As	75	72	2	10.77934	ug/l	10	107.8	80	120	As	
Se	78	72	2	5.43964	ug/l	5	108.8	80	120	Se	
Sr	88	72	3	5.23849	ug/l	5	104.8	80	120	Sr	
Y	89	72	2	5.04816	ug/l	5	101.0	80	120	Y	
Zr	90	72	2	5.26970	ug/l	5	105.4	80	120	Zr	
Nb	93	72	2	19.15317	ug/l	25	76.6	80	120	Nb	FAILED
Mo	95	72	3	5.12108	ug/l	5	102.4	80	120	Mo	
Ru	101	72	2	10.18149	ug/l	10	101.8	80	120	Ru	
Rh	103	72	2	10.13654	ug/l	10	101.4	80	120	Rh	
Pd	105	72	2	0.53277	ug/l	0.5	106.6	80	120	Pd	
Ag	107	115	3	2.02399	ug/l	2	101.2	80	120	Ag	
Cd	111	115	3	0.49684	ug/l	0.5	99.4	80	120	Cd	
Sn	118	115	3	1.83045	ug/l	2	91.5	80	120	Sn	
Sb	121	115	3	4.82539	ug/l	5	96.5	80	120	Sb	
Te	125	165	2	10.02668	ug/l	10	100.3	80	120	Te	
Cs	133	165	2	1.00594	ug/l	1	100.6	80	120	Cs	
Ba	137	165	3	2.03238	ug/l	2	101.6	80	120	Ba	
La	139	165	2	1.97216	ug/l	2	98.6	80	120	La	
Ce	140	165	2	9.78156	ug/l	10	97.8	80	120	Ce	
Pr	141	165	2	1.96384	ug/l	2	98.2	80	120	Pr	
Nd	146	165	2	1.93909	ug/l	2	97.0	80	120	Nd	
Sm	147	165	3	9.92439	ug/l	10	99.2	80	120	Sm	
Hf	178	165	2	9.10278	ug/l	10	91.0	80	120	Hf	
Ta	181	165	2	6.43107	ug/l	10	64.3	80	120	Ta	FAILED
W	182	165	2	4.85970	ug/l	5	97.2	80	120	W	
Re	185	193	3	9.46778	ug/l	10	94.7	80	120	Re	
Pt	195	193	2	1.00634	ug/l	1	100.6	80	120	Pt	
Au	197	193	3	4.81201	ug/l	5	96.2	80	120	Au	
Tl	205	193	3	1.89524	ug/l	2	94.8	80	120	Tl	
Pb	208	193	3	2.88280	ug/l	3	96.1	80	120	Pb	
Bi	209	193	2	19.41940	ug/l	20	97.1	80	120	Bi	
Th	232	193	3	1.85315	ug/l	2	92.7	80	120	Th	
U	238	193	3	0.90751	ug/l	1	90.8	80	120	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	5230484	0.12	4941712	105.8	80	120	Li (IS)	
Sc (IS)	45	2	209864	0.69	186699	112.4	80	120	Sc (IS)	
Sc (IS)	45	3	3595909	0.85	3281398	109.6	80	120	Sc (IS)	
Ge (IS)	72	2	463733	1.30	410530	113.0	80	120	Ge (IS)	
Ge (IS)	72	3	2745668	0.48	2540877	108.1	80	120	Ge (IS)	
In (IS)	115	3	20029223	1.05	19102387	104.9	80	120	In (IS)	
Ho (IS)	165	2	14876739	0.72	14511718	102.5	80	120	Ho (IS)	
Ho (IS)	165	3	23772071	0.53	23609138	100.7	80	120	Ho (IS)	
Ir (IS)	193	2	9843580	0.69	9828030	100.2	80	120	Ir (IS)	
Ir (IS)	193	3	11700203	0.54	11858846	98.7	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Continuing Calibration Verification (CCV) - US EPA Method 6020

Sample Name	**CCV 1856861**
Data File Name	**097_CCV.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-27T02:53:29-06:00**
Type	**CCV**
VialNumber	**1102**
Dilution	**1**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**075CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	Units	ExpectedValue	%Recovery	%QC Low	%QC High	Analyte	QC Flag
Li	7	6	3	100.36850	ug/l	100	100.4	90	110	Li	
Be	9	6	3	100.26299	ug/l	100	100.3	90	110	Be	
B	11	6	3	194.85840	ug/l	200	97.4	90	110	B	
Na	23	45	2	2447.51808	ug/l	2500	97.9	90	110	Na	
Mg	24	45	2	2463.01973	ug/l	2500	98.5	90	110	Mg	
Al	27	45	2	2635.45370	ug/l	2500	105.4	90	110	Al	
P	31	45	2	2537.72136	ug/l	2500	101.5	90	110	P	
K	39	45	2	2530.87696	ug/l	2500	101.2	90	110	K	
Ca	44	45	3	2523.14841	ug/l	2500	100.9	90	110	Ca	
Ti	47	45	3	100.72688	ug/l	100	100.7	90	110	Ti	
V	51	45	2	97.18043	ug/l	100	97.2	90	110	V	
Cr	52	45	2	98.69023	ug/l	100	98.7	90	110	Cr	
Mn	55	72	2	98.51224	ug/l	100	98.5	90	110	Mn	
Fe	57	72	2	2522.94390	ug/l	2500	100.9	90	110	Fe	
Co	59	72	2	100.75709	ug/l	100	100.8	90	110	Co	
Ni	60	72	2	101.43507	ug/l	100	101.4	90	110	Ni	
Cu	63	72	2	100.68422	ug/l	100	100.7	90	110	Cu	
Zn	66	72	2	99.94977	ug/l	100	99.9	90	110	Zn	
As	75	72	2	102.37951	ug/l	100	102.4	90	110	As	
Se	78	72	2	51.35643	ug/l	50	102.7	90	110	Se	
Sr	88	72	3	100.13144	ug/l	100	100.1	90	110	Sr	
Y	89	72	2	99.64004	ug/l	100	99.6	90	110	Y	
Zr	90	72	2	98.95306	ug/l	100	99.0	90	110	Zr	
Nb	93	72	2	49.39159	ug/l	50	98.8	90	110	Nb	
Mo	95	72	3	47.96183	ug/l	50	95.9	90	110	Mo	
Ru	101	72	2	95.32520	ug/l	100	95.3	90	110	Ru	
Rh	103	72	2	98.17304	ug/l	100	98.2	90	110	Rh	
Pd	105	72	2	9.88546	ug/l	10	98.9	90	110	Pd	
Ag	107	115	3	19.89941	ug/l	20	99.5	90	110	Ag	
Cd	111	115	3	97.35162	ug/l	100	97.4	90	110	Cd	
Sn	118	115	3	99.40655	ug/l	100	99.4	90	110	Sn	
Sb	121	115	3	49.87854	ug/l	50	99.8	90	110	Sb	
Te	125	165	2	103.08242	ug/l	100	103.1	90	110	Te	
Cs	133	165	2	103.35965	ug/l	100	103.4	90	110	Cs	
Ba	137	165	3	102.63368	ug/l	100	102.6	90	110	Ba	
La	139	165	2	101.86673	ug/l	100	101.9	90	110	La	
Ce	140	165	2	101.48259	ug/l	100	101.5	90	110	Ce	
Pr	141	165	2	101.41058	ug/l	100	101.4	90	110	Pr	
Nd	146	165	2	96.41365	ug/l	100	96.4	90	110	Nd	
Sm	147	165	3	102.41305	ug/l	100	102.4	90	110	Sm	
Hf	178	165	2	97.45128	ug/l	100	97.5	90	110	Hf	
Ta	181	165	2	96.12728	ug/l	100	96.1	90	110	Ta	
W	182	165	2	97.02144	ug/l	100	97.0	90	110	W	
Re	185	193	3	100.69964	ug/l	100	100.7	90	110	Re	
Pt	195	193	2	9.92400	ug/l	10	99.2	90	110	Pt	
Au	197	193	3	99.86861	ug/l	100	99.9	90	110	Au	
Tl	205	193	3	19.90913	ug/l	20	99.5	90	110	Tl	
Pb	208	193	3	99.47369	ug/l	100	99.5	90	110	Pb	
Bi	209	193	2	100.33478	ug/l	100	100.3	90	110	Bi	
Th	232	193	3	97.88427	ug/l	100	97.9	90	110	Th	
U	238	193	3	98.49623	ug/l	100	98.5	90	110	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	5110531	0.55	4941712	103.4	80	120	Li (IS)	
Sc (IS)	45	2	208728	1.20	186699	111.8	80	120	Sc (IS)	
Sc (IS)	45	3	3563635	1.74	3281398	108.6	80	120	Sc (IS)	
Ge (IS)	72	2	482627	1.49	410530	117.6	80	120	Ge (IS)	
Ge (IS)	72	3	2783300	1.23	2540877	109.5	80	120	Ge (IS)	
In (IS)	115	3	19742809	1.40	19102387	103.4	80	120	In (IS)	
Ho (IS)	165	2	14965931	2.01	14511718	103.1	80	120	Ho (IS)	
Ho (IS)	165	3	23816073	2.10	23609138	100.9	80	120	Ho (IS)	
Ir (IS)	193	2	9790163	1.82	9828030	99.6	80	120	Ir (IS)	
Ir (IS)	193	3	11668692	1.62	11858846	98.4	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Continuing Calibration Blank (CCB) - US EPA Method 6020

Sample Name	**CCB 1854886**
Data File Name	**098_CCB.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-27T03:00:17-06:00**
Type	**CCB**
VialNumber	**4**
Dilution	**1**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**075CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	Units	QC High	Analyte	QC Flag
Li	7	6	3	0.03928	ug/l	1.388	Li	
Be	9	6	3	0.02382	ug/l	0.7	Be	
B	11	6	3	-3.01039	ug/l	20	B	
Na	23	45	2	-1.82169	ug/l	30	Na	
Mg	24	45	2	1.58478	ug/l	11.18	Mg	
Al	27	45	2	1.37283	ug/l	25.8	Al	
P	31	45	2	0.79943	ug/l	16.46	P	
K	39	45	2	-0.84836	ug/l	83.2	K	
Ca	44	45	3	-3.46563	ug/l	136.2	Ca	
Ti	47	45	3	0.07633	ug/l	4.2	Ti	
V	51	45	2	-0.12888	ug/l	4.74	V	
Cr	52	45	2	0.02903	ug/l	6.52	Cr	
Mn	55	72	2	0.04708	ug/l	0.49	Mn	
Fe	57	72	2	2.62571	ug/l	40.7	Fe	
Co	59	72	2	0.03662	ug/l	0.434	Co	
Ni	60	72	2	0.03944	ug/l	0.8	Ni	
Cu	63	72	2	1.32574	ug/l	0.902	Cu	FAILED
Zn	66	72	2	0.12071	ug/l	16.58	Zn	
As	75	72	2	0.07057	ug/l	2.36	As	
Se	78	72	2	-0.03891	ug/l	3.18	Se	
Sr	88	72	3	0.01659	ug/l	2	Sr	
Y	89	72	2	0.03776	ug/l	0.424	Y	
Zr	90	72	2	0.05740	ug/l	0.496	Zr	
Nb	93	72	2	0.51114	ug/l	4.62	Nb	
Mo	95	72	3	0.11651	ug/l	2	Mo	
Ru	101	72	2	0.04038	ug/l	2	Ru	
Rh	103	72	2	0.03685	ug/l	1.634	Rh	
Pd	105	72	2	0.00576	ug/l	0.08	Pd	
Ag	107	115	3	0.00564	ug/l	1.54	Ag	
Cd	111	115	3	0.02419	ug/l	0.4	Cd	
Sn	118	115	3	0.04338	ug/l	2	Sn	
Sb	121	115	3	0.00886	ug/l	3.34	Sb	
Te	125	165	2	0.07073	ug/l	1.072	Te	
Cs	133	165	2	0.04297	ug/l	0.106	Cs	
Ba	137	165	3	0.01998	ug/l	0.446	Ba	
La	139	165	2	0.03567	ug/l	0.102	La	
Ce	140	165	2	0.03686	ug/l	1.772	Ce	
Pr	141	165	2	0.03470	ug/l	0.084	Pr	
Nd	146	165	2	0.03373	ug/l	0.208	Nd	
Sm	147	165	3	0.01516	ug/l	0.652	Sm	
Hf	178	165	2	0.06777	ug/l	2.26	Hf	
Ta	181	165	2	0.06876	ug/l	1.46	Ta	
W	182	165	2	0.52723	ug/l	4	W	
Re	185	193	3	0.01105	ug/l	0.05	Re	
Pt	195	193	2	0.00513	ug/l	0.12	Pt	
Au	197	193	3	0.12788	ug/l	1	Au	
Tl	205	193	3	0.04248	ug/l	1.1	Tl	
Pb	208	193	3	0.06809	ug/l	0.346	Pb	
Bi	209	193	2	0.09779	ug/l	1.464	Bi	
Th	232	193	3	0.09171	ug/l	1.104	Th	
U	238	193	3	0.01617	ug/l	0.462	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	4985958	0.41	4941712	100.9	80	120	Li (IS)	
Sc (IS)	45	2	200636	0.50	186699	107.5	80	120	Sc (IS)	
Sc (IS)	45	3	3449906	0.39	3281398	105.1	80	120	Sc (IS)	
Ge (IS)	72	2	433680	1.30	410530	105.6	80	120	Ge (IS)	
Ge (IS)	72	3	2635278	0.14	2540877	103.7	80	120	Ge (IS)	
In (IS)	115	3	19415236	0.43	19102387	101.6	80	120	In (IS)	
Ho (IS)	165	2	14576612	0.65	14511718	100.4	80	120	Ho (IS)	
Ho (IS)	165	3	23514164	1.22	23609138	99.6	80	120	Ho (IS)	
Ir (IS)	193	2	9649886	0.74	9828030	98.2	80	120	Ir (IS)	
Ir (IS)	193	3	11723871	0.63	11858846	98.9	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Sample Name	**160-36593-B-4-A**
Data File Name	**099SMPL.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-27T03:07:00-06:00**
Type	**Sample**
VialNumber	**3111**
Dilution	**2**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**075CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	FinalConcentration	Units	High Value	Analyte	QC Flag
Li	7	6	3	13.16886	26.33772	ug/l	1000	Li	
Be	9	6	3	0.90058	1.80115	ug/l	1000	Be	
B	11	6	3	1.74236	3.48471	ug/l	2000	B	
Na	23	45	2	495.40736	990.81471	ug/l	50000	Na	
Mg	24	45	2	26427.98966	52855.97933	ug/l	50000	Mg	
Al	27	45	2	29081.23817	58162.47634	ug/l	100000	Al	
P	31	45	2	2972.91885	5945.83771	ug/l	100000	P	
K	39	45	2	6292.75905	12585.51809	ug/l	100000	K	
Ca	44	45	3	22052.20626	44104.41251	ug/l	100000	Ca	
Ti	47	45	3	1553.97394	3107.94787	ug/l	2000	Ti	
V	51	45	2	88.36323	176.72646	ug/l	2000	V	
Cr	52	45	2	27.04156	54.08312	ug/l	2000	Cr	
Mn	55	72	2	407.59118	815.18236	ug/l	5000	Mn	
Fe	57	72	2	75777.02339	151554.04678	ug/l	100000	Fe	
Co	59	72	2	27.24128	54.48257	ug/l	2000	Co	
Ni	60	72	2	41.86752	83.73504	ug/l	2000	Ni	
Cu	63	72	2	5222.25888	10444.51776	ug/l	2000	Cu	FAILED
Zn	66	72	2	77.51862	155.03724	ug/l	5000	Zn	
As	75	72	2	16.94197	33.88393	ug/l	2000	As	
Se	78	72	2	10.84301	21.68601	ug/l	1000	Se	
Sr	88	72	3	277.38444	554.76888	ug/l	2000	Sr	
Y	89	72	2	18.36099	36.72198	ug/l	200	Y	
Zr	90	72	2	7.31456	14.62912	ug/l	2000	Zr	
Nb	93	72	2	0.71264	1.42527	ug/l	100	Nb	
Mo	95	72	3	20.66334	41.32668	ug/l	1000	Mo	
Ru	101	72	2	-0.00276	-0.00552	ug/l	200	Ru	
Rh	103	72	2	-0.00498	-0.00996	ug/l	200	Rh	
Pd	105	72	2	0.04140	0.08279	ug/l	20	Pd	
Ag	107	115	3	0.42375	0.84751	ug/l	400	Ag	
Cd	111	115	3	0.14054	0.28107	ug/l	2000	Cd	
Sn	118	115	3	10.49735	20.99471	ug/l	2000	Sn	
Sb	121	115	3	1.41753	2.83506	ug/l	1000	Sb	
Te	125	165	2	1.01754	2.03507	ug/l	200	Te	
Cs	133	165	2	3.66937	7.33874	ug/l	2000	Cs	
Ba	137	165	3	260.43869	520.87738	ug/l	5000	Ba	
La	139	165	2	40.74695	81.49390	ug/l	200	La	
Ce	140	165	2	85.86503	171.73006	ug/l	200	Ce	
Pr	141	165	2	10.18913	20.37825	ug/l	200	Pr	
Nd	146	165	2	41.68739	83.37478	ug/l	200	Nd	
Sm	147	165	3	7.99666	15.99331	ug/l	2000	Sm	
Hf	178	165	2	0.41134	0.82267	ug/l	200	Hf	
Ta	181	165	2	0.05507	0.11014	ug/l	200	Ta	
W	182	165	2	1.72052	3.44104	ug/l	2000	W	
Re	185	193	3	0.22197	0.44395	ug/l	200	Re	
Pt	195	193	2	0.00582	0.01164	ug/l	200	Pt	
Au	197	193	3	0.06018	0.12036	ug/l	2000	Au	
Tl	205	193	3	0.47651	0.95302	ug/l	400	Tl	
Pb	208	193	3	10.20359	20.40718	ug/l	5000	Pb	
Bi	209	193	2	2.47219	4.94439	ug/l	2000	Bi	
Th	232	193	3	35.40798	70.81595	ug/l	2000	Th	
U	238	193	3	10.89159	21.78317	ug/l	2000	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	5319805	1.28	4941712	107.7	80	120	Li (IS)	
Sc (IS)	45	2	240193	2.26	186699	128.7	80	120	Sc (IS)	FAILED
Sc (IS)	45	3	4135967	2.61	3281398	126.0	80	120	Sc (IS)	FAILED
Ge (IS)	72	2	490643	3.27	410530	119.5	80	120	Ge (IS)	
Ge (IS)	72	3	2884158	1.92	2540877	113.5	80	120	Ge (IS)	
In (IS)	115	3	19872073	2.57	19102387	104.0	80	120	In (IS)	
Ho (IS)	165	2	15476543	3.01	14511718	106.6	80	120	Ho (IS)	
Ho (IS)	165	3	24373402	2.20	23609138	103.2	80	120	Ho (IS)	
Ir (IS)	193	2	9771722	2.15	9828030	99.4	80	120	Ir (IS)	
Ir (IS)	193	3	11514022	2.95	11858846	97.1	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Sample Name	**160-36593-B-5-A**
Data File Name	**100SMPL.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-27T03:13:46-06:00**
Type	**Sample**
VialNumber	**3112**
Dilution	**2**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**075CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	FinalConcentration	Units	High Value	Analyte	QC Flag
Li	7	6	3	18.00745	36.01490	ug/l	1000	Li	
Be	9	6	3	1.17953	2.35905	ug/l	1000	Be	
B	11	6	3	5.25245	10.50491	ug/l	2000	B	
Na	23	45	2	592.70920	1185.41839	ug/l	50000	Na	
Mg	24	45	2	28348.97630	56697.95260	ug/l	50000	Mg	
Al	27	45	2	36339.11953	72678.23906	ug/l	100000	Al	
P	31	45	2	2054.10770	4108.21540	ug/l	100000	P	
K	39	45	2	6188.76122	12377.52244	ug/l	100000	K	
Ca	44	45	3	24309.78214	48619.56427	ug/l	100000	Ca	
Ti	47	45	3	1925.19900	3850.39801	ug/l	2000	Ti	
V	51	45	2	112.76929	225.53857	ug/l	2000	V	
Cr	52	45	2	25.94463	51.88926	ug/l	2000	Cr	
Mn	55	72	2	269.48007	538.96014	ug/l	5000	Mn	
Fe	57	72	2	68639.61849	137279.23698	ug/l	100000	Fe	
Co	59	72	2	14.43853	28.87705	ug/l	2000	Co	
Ni	60	72	2	32.55248	65.10497	ug/l	2000	Ni	
Cu	63	72	2	4100.50858	8201.01716	ug/l	2000	Cu	FAILED
Zn	66	72	2	71.44946	142.89893	ug/l	5000	Zn	
As	75	72	2	35.10686	70.21372	ug/l	2000	As	
Se	78	72	2	14.06329	28.12659	ug/l	1000	Se	
Sr	88	72	3	477.92590	955.85181	ug/l	2000	Sr	
Y	89	72	2	14.26386	28.52772	ug/l	200	Y	
Zr	90	72	2	10.66902	21.33803	ug/l	2000	Zr	
Nb	93	72	2	1.03786	2.07572	ug/l	100	Nb	
Mo	95	72	3	19.20322	38.40643	ug/l	1000	Mo	
Ru	101	72	2	-0.00507	-0.01014	ug/l	200	Ru	
Rh	103	72	2	-0.00534	-0.01069	ug/l	200	Rh	
Pd	105	72	2	0.04009	0.08017	ug/l	20	Pd	
Ag	107	115	3	0.31423	0.62846	ug/l	400	Ag	
Cd	111	115	3	0.09905	0.19810	ug/l	2000	Cd	
Sn	118	115	3	11.59030	23.18060	ug/l	2000	Sn	
Sb	121	115	3	1.62569	3.25137	ug/l	1000	Sb	
Te	125	165	2	0.73304	1.46609	ug/l	200	Te	
Cs	133	165	2	4.21579	8.43159	ug/l	2000	Cs	
Ba	137	165	3	267.69307	535.38613	ug/l	5000	Ba	
La	139	165	2	36.07605	72.15211	ug/l	200	La	
Ce	140	165	2	74.05218	148.10436	ug/l	200	Ce	
Pr	141	165	2	8.82771	17.65541	ug/l	200	Pr	
Nd	146	165	2	35.76511	71.53022	ug/l	200	Nd	
Sm	147	165	3	6.61933	13.23867	ug/l	2000	Sm	
Hf	178	165	2	0.38736	0.77472	ug/l	200	Hf	
Ta	181	165	2	0.03991	0.07982	ug/l	200	Ta	
W	182	165	2	1.63999	3.27997	ug/l	2000	W	
Re	185	193	3	0.00447	0.00893	ug/l	200	Re	
Pt	195	193	2	0.00740	0.01481	ug/l	200	Pt	
Au	197	193	3	0.03551	0.07103	ug/l	2000	Au	
Tl	205	193	3	0.47226	0.94451	ug/l	400	Tl	
Pb	208	193	3	23.99715	47.99429	ug/l	5000	Pb	
Bi	209	193	2	2.07051	4.14101	ug/l	2000	Bi	
Th	232	193	3	24.78003	49.56006	ug/l	2000	Th	
U	238	193	3	7.51835	15.03669	ug/l	2000	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	5370475	0.41	4941712	108.7	80	120	Li (IS)	
Sc (IS)	45	2	247696	0.30	186699	132.7	80	120	Sc (IS)	FAILED
Sc (IS)	45	3	4356609	0.50	3281398	132.8	80	120	Sc (IS)	FAILED
Ge (IS)	72	2	488690	1.40	410530	119.0	80	120	Ge (IS)	
Ge (IS)	72	3	2891201	0.29	2540877	113.8	80	120	Ge (IS)	
In (IS)	115	3	19880561	0.43	19102387	104.1	80	120	In (IS)	
Ho (IS)	165	2	15147580	0.22	14511718	104.4	80	120	Ho (IS)	
Ho (IS)	165	3	24298382	0.32	23609138	102.9	80	120	Ho (IS)	
Ir (IS)	193	2	9557723	0.24	9828030	97.2	80	120	Ir (IS)	
Ir (IS)	193	3	11519185	0.77	11858846	97.1	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Sample Name	**160-36593-B-6-A**
Data File Name	**101SMPL.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-27T03:20:29-06:00**
Type	**Sample**
VialNumber	**3201**
Dilution	**2**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**075CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	FinalConcentration	Units	High Value	Analyte	QC Flag
Li	7	6	3	13.56602	27.13204	ug/l	1000	Li	
Be	9	6	3	0.81004	1.62008	ug/l	1000	Be	
B	11	6	3	-0.20872	-0.41744	ug/l	2000	B	
Na	23	45	2	259.60112	519.20225	ug/l	50000	Na	
Mg	24	45	2	32273.31891	64546.63782	ug/l	50000	Mg	
Al	27	45	2	35349.74441	70699.48883	ug/l	100000	Al	
P	31	45	2	1897.78877	3795.57755	ug/l	100000	P	
K	39	45	2	5011.62006	10023.24013	ug/l	100000	K	
Ca	44	45	3	16638.98759	33277.97519	ug/l	100000	Ca	
Ti	47	45	3	1969.81787	3939.63573	ug/l	2000	Ti	
V	51	45	2	121.64061	243.28122	ug/l	2000	V	
Cr	52	45	2	25.89676	51.79351	ug/l	2000	Cr	
Mn	55	72	2	228.59539	457.19079	ug/l	5000	Mn	
Fe	57	72	2	68085.68491	136171.36982	ug/l	100000	Fe	
Co	59	72	2	15.03551	30.07101	ug/l	2000	Co	
Ni	60	72	2	35.39228	70.78457	ug/l	2000	Ni	
Cu	63	72	2	3951.63148	7903.26297	ug/l	2000	Cu	FAILED
Zn	66	72	2	59.31536	118.63072	ug/l	5000	Zn	
As	75	72	2	32.04420	64.08839	ug/l	2000	As	
Se	78	72	2	16.79995	33.59990	ug/l	1000	Se	
Sr	88	72	3	374.27479	748.54958	ug/l	2000	Sr	
Y	89	72	2	12.94918	25.89837	ug/l	200	Y	
Zr	90	72	2	5.06593	10.13186	ug/l	2000	Zr	
Nb	93	72	2	0.51910	1.03819	ug/l	100	Nb	
Mo	95	72	3	22.84616	45.69233	ug/l	1000	Mo	
Ru	101	72	2	-0.00665	-0.01330	ug/l	200	Ru	
Rh	103	72	2	-0.00657	-0.01313	ug/l	200	Rh	
Pd	105	72	2	0.03979	0.07958	ug/l	20	Pd	
Ag	107	115	3	0.31613	0.63226	ug/l	400	Ag	
Cd	111	115	3	0.05796	0.11591	ug/l	2000	Cd	
Sn	118	115	3	9.87002	19.74004	ug/l	2000	Sn	
Sb	121	115	3	1.47210	2.94420	ug/l	1000	Sb	
Te	125	165	2	0.64656	1.29312	ug/l	200	Te	
Cs	133	165	2	3.29620	6.59241	ug/l	2000	Cs	
Ba	137	165	3	233.93244	467.86488	ug/l	5000	Ba	
La	139	165	2	32.26209	64.52419	ug/l	200	La	
Ce	140	165	2	66.43121	132.86241	ug/l	200	Ce	
Pr	141	165	2	7.72863	15.45726	ug/l	200	Pr	
Nd	146	165	2	31.27104	62.54208	ug/l	200	Nd	
Sm	147	165	3	5.67225	11.34449	ug/l	2000	Sm	
Hf	178	165	2	0.19569	0.39138	ug/l	200	Hf	
Ta	181	165	2	0.02066	0.04131	ug/l	200	Ta	
W	182	165	2	1.73478	3.46956	ug/l	2000	W	
Re	185	193	3	-0.00102	-0.00205	ug/l	200	Re	
Pt	195	193	2	0.00567	0.01133	ug/l	200	Pt	
Au	197	193	3	0.04306	0.08611	ug/l	2000	Au	
Tl	205	193	3	0.29800	0.59600	ug/l	400	Tl	
Pb	208	193	3	18.82028	37.64056	ug/l	5000	Pb	
Bi	209	193	2	2.26204	4.52408	ug/l	2000	Bi	
Th	232	193	3	22.17133	44.34267	ug/l	2000	Th	
U	238	193	3	5.48848	10.97697	ug/l	2000	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	5382125	0.23	4941712	108.9	80	120	Li (IS)	
Sc (IS)	45	2	243157	2.08	186699	130.2	80	120	Sc (IS)	FAILED
Sc (IS)	45	3	4288442	0.59	3281398	130.7	80	120	Sc (IS)	FAILED
Ge (IS)	72	2	485185	0.41	410530	118.2	80	120	Ge (IS)	
Ge (IS)	72	3	2887186	0.23	2540877	113.6	80	120	Ge (IS)	
In (IS)	115	3	19841504	0.21	19102387	103.9	80	120	In (IS)	
Ho (IS)	165	2	15133985	1.10	14511718	104.3	80	120	Ho (IS)	
Ho (IS)	165	3	24118868	0.74	23609138	102.2	80	120	Ho (IS)	
Ir (IS)	193	2	9417493	1.27	9828030	95.8	80	120	Ir (IS)	
Ir (IS)	193	3	11461732	0.37	11858846	96.7	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Sample Report

Sample Name	**160-36593-B-7-A**
Data File Name	**102SMPL.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-27T03:27:11-06:00**
Type	**Sample**
VialNumber	**3202**
Dilution	**2**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**075CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	FinalConcentration	Units	High Value	Analyte	QC Flag
Li	7	6	3	17.61414	35.22828	ug/l	1000	Li	
Be	9	6	3	0.92891	1.85782	ug/l	1000	Be	
B	11	6	3	0.39989	0.79979	ug/l	2000	B	
Na	23	45	2	406.39519	812.79038	ug/l	50000	Na	
Mg	24	45	2	32849.09336	65698.18672	ug/l	50000	Mg	
Al	27	45	2	37888.45487	75776.90973	ug/l	100000	Al	
P	31	45	2	2759.89091	5519.78183	ug/l	100000	P	
K	39	45	2	8903.70691	17807.41383	ug/l	100000	K	
Ca	44	45	3	19297.07553	38594.15106	ug/l	100000	Ca	
Ti	47	45	3	1867.76850	3735.53700	ug/l	2000	Ti	
V	51	45	2	123.28876	246.57752	ug/l	2000	V	
Cr	52	45	2	21.67509	43.35017	ug/l	2000	Cr	
Mn	55	72	2	258.16107	516.32214	ug/l	5000	Mn	
Fe	57	72	2	70493.90188	140987.80376	ug/l	100000	Fe	
Co	59	72	2	17.58367	35.16734	ug/l	2000	Co	
Ni	60	72	2	35.20734	70.41468	ug/l	2000	Ni	
Cu	63	72	2	4976.46419	9952.92838	ug/l	2000	Cu	FAILED
Zn	66	72	2	60.15275	120.30549	ug/l	5000	Zn	
As	75	72	2	26.53258	53.06515	ug/l	2000	As	
Se	78	72	2	15.70325	31.40649	ug/l	1000	Se	
Sr	88	72	3	488.16865	976.33730	ug/l	2000	Sr	
Y	89	72	2	16.34801	32.69602	ug/l	200	Y	
Zr	90	72	2	5.39330	10.78660	ug/l	2000	Zr	
Nb	93	72	2	0.58015	1.16030	ug/l	100	Nb	
Mo	95	72	3	17.00206	34.00411	ug/l	1000	Mo	
Ru	101	72	2	-0.00493	-0.00987	ug/l	200	Ru	
Rh	103	72	2	-0.00652	-0.01305	ug/l	200	Rh	
Pd	105	72	2	0.05010	0.10021	ug/l	20	Pd	
Ag	107	115	3	0.35064	0.70127	ug/l	400	Ag	
Cd	111	115	3	0.06800	0.13601	ug/l	2000	Cd	
Sn	118	115	3	9.67156	19.34311	ug/l	2000	Sn	
Sb	121	115	3	1.68001	3.36003	ug/l	1000	Sb	
Te	125	165	2	0.78863	1.57727	ug/l	200	Te	
Cs	133	165	2	4.05143	8.10286	ug/l	2000	Cs	
Ba	137	165	3	258.34739	516.69478	ug/l	5000	Ba	
La	139	165	2	37.45198	74.90396	ug/l	200	La	
Ce	140	165	2	79.63452	159.26903	ug/l	200	Ce	
Pr	141	165	2	9.66416	19.32832	ug/l	200	Pr	
Nd	146	165	2	39.47151	78.94302	ug/l	200	Nd	
Sm	147	165	3	7.29811	14.59622	ug/l	2000	Sm	
Hf	178	165	2	0.20217	0.40435	ug/l	200	Hf	
Ta	181	165	2	0.01000	0.02000	ug/l	200	Ta	
W	182	165	2	2.28139	4.56277	ug/l	2000	W	
Re	185	193	3	0.00380	0.00761	ug/l	200	Re	
Pt	195	193	2	0.00599	0.01197	ug/l	200	Pt	
Au	197	193	3	0.04224	0.08448	ug/l	2000	Au	
Tl	205	193	3	0.45882	0.91764	ug/l	400	Tl	
Pb	208	193	3	17.09210	34.18420	ug/l	5000	Pb	
Bi	209	193	2	2.33642	4.67284	ug/l	2000	Bi	
Th	232	193	3	23.75473	47.50946	ug/l	2000	Th	
U	238	193	3	5.63370	11.26740	ug/l	2000	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	5397530	0.42	4941712	109.2	80	120	Li (IS)	
Sc (IS)	45	2	245647	0.63	186699	131.6	80	120	Sc (IS)	FAILED
Sc (IS)	45	3	4239877	0.47	3281398	129.2	80	120	Sc (IS)	FAILED
Ge (IS)	72	2	484797	0.23	410530	118.1	80	120	Ge (IS)	
Ge (IS)	72	3	2880531	0.38	2540877	113.4	80	120	Ge (IS)	
In (IS)	115	3	19821583	0.42	19102387	103.8	80	120	In (IS)	
Ho (IS)	165	2	14974550	0.28	14511718	103.2	80	120	Ho (IS)	
Ho (IS)	165	3	23943718	0.12	23609138	101.4	80	120	Ho (IS)	
Ir (IS)	193	2	9368209	0.43	9828030	95.3	80	120	Ir (IS)	
Ir (IS)	193	3	11348413	0.74	11858846	95.7	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Sample Name	**160-36593-B-8-A**
Data File Name	**103SMPL.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-27T03:33:53-06:00**
Type	**Sample**
VialNumber	**3203**
Dilution	**2**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**075CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	FinalConcentration	Units	High Value	Analyte	QC Flag
Li	7	6	3	14.21227	28.42454	ug/l	1000	Li	
Be	9	6	3	1.42555	2.85110	ug/l	1000	Be	
B	11	6	3	1.05237	2.10475	ug/l	2000	B	
Na	23	45	2	813.97533	1627.95066	ug/l	50000	Na	
Mg	24	45	2	27721.02543	55442.05086	ug/l	50000	Mg	
Al	27	45	2	32702.82061	65405.64122	ug/l	100000	Al	
P	31	45	2	3327.49143	6654.98287	ug/l	100000	P	
K	39	45	2	7888.34165	15776.68330	ug/l	100000	K	
Ca	44	45	3	21580.08078	43160.16157	ug/l	100000	Ca	
Ti	47	45	3	1270.46274	2540.92547	ug/l	2000	Ti	
V	51	45	2	78.16483	156.32965	ug/l	2000	V	
Cr	52	45	2	28.25386	56.50772	ug/l	2000	Cr	
Mn	55	72	2	456.43731	912.87463	ug/l	5000	Mn	
Fe	57	72	2	93776.87659	187553.75318	ug/l	100000	Fe	
Co	59	72	2	31.45489	62.90978	ug/l	2000	Co	
Ni	60	72	2	44.19343	88.38686	ug/l	2000	Ni	
Cu	63	72	2	4471.68802	8943.37604	ug/l	2000	Cu	FAILED
Zn	66	72	2	65.55972	131.11944	ug/l	5000	Zn	
As	75	72	2	9.55068	19.10137	ug/l	2000	As	
Se	78	72	2	12.39486	24.78971	ug/l	1000	Se	
Sr	88	72	3	304.92936	609.85873	ug/l	2000	Sr	
Y	89	72	2	25.75023	51.50046	ug/l	200	Y	
Zr	90	72	2	10.72168	21.44335	ug/l	2000	Zr	
Nb	93	72	2	0.49660	0.99319	ug/l	100	Nb	
Mo	95	72	3	9.89989	19.79979	ug/l	1000	Mo	
Ru	101	72	2	-0.00387	-0.00775	ug/l	200	Ru	
Rh	103	72	2	-0.00768	-0.01535	ug/l	200	Rh	
Pd	105	72	2	0.04864	0.09727	ug/l	20	Pd	
Ag	107	115	3	0.41109	0.82218	ug/l	400	Ag	
Cd	111	115	3	0.08772	0.17544	ug/l	2000	Cd	
Sn	118	115	3	10.75260	21.50520	ug/l	2000	Sn	
Sb	121	115	3	0.75193	1.50386	ug/l	1000	Sb	
Te	125	165	2	1.45954	2.91909	ug/l	200	Te	
Cs	133	165	2	3.91744	7.83487	ug/l	2000	Cs	
Ba	137	165	3	254.77849	509.55699	ug/l	5000	Ba	
La	139	165	2	69.85896	139.71792	ug/l	200	La	
Ce	140	165	2	141.22202	282.44404	ug/l	200	Ce	
Pr	141	165	2	16.10622	32.21245	ug/l	200	Pr	
Nd	146	165	2	62.74566	125.49131	ug/l	200	Nd	
Sm	147	165	3	11.13950	22.27901	ug/l	2000	Sm	
Hf	178	165	2	0.36875	0.73749	ug/l	200	Hf	
Ta	181	165	2	0.01571	0.03142	ug/l	200	Ta	
W	182	165	2	0.69972	1.39944	ug/l	2000	W	
Re	185	193	3	0.12162	0.24324	ug/l	200	Re	
Pt	195	193	2	0.00731	0.01462	ug/l	200	Pt	
Au	197	193	3	0.00389	0.00779	ug/l	2000	Au	
Tl	205	193	3	0.34333	0.68666	ug/l	400	Tl	
Pb	208	193	3	11.16396	22.32793	ug/l	5000	Pb	
Bi	209	193	2	3.09455	6.18910	ug/l	2000	Bi	
Th	232	193	3	68.59437	137.18875	ug/l	2000	Th	
U	238	193	3	18.84800	37.69600	ug/l	2000	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	5393168	0.15	4941712	109.1	80	120	Li (IS)	
Sc (IS)	45	2	235123	0.73	186699	125.9	80	120	Sc (IS)	FAILED
Sc (IS)	45	3	4131921	0.60	3281398	125.9	80	120	Sc (IS)	FAILED
Ge (IS)	72	2	487849	0.41	410530	118.8	80	120	Ge (IS)	
Ge (IS)	72	3	2895457	0.36	2540877	114.0	80	120	Ge (IS)	
In (IS)	115	3	19962868	0.48	19102387	104.5	80	120	In (IS)	
Ho (IS)	165	2	14909844	0.49	14511718	102.7	80	120	Ho (IS)	
Ho (IS)	165	3	24074328	0.59	23609138	102.0	80	120	Ho (IS)	
Ir (IS)	193	2	9392841	0.56	9828030	95.6	80	120	Ir (IS)	
Ir (IS)	193	3	11379811	0.64	11858846	96.0	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Sample Report

Sample Name	**160-36593-B-9-A**
Data File Name	**104SMPL.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-27T03:40:37-06:00**
Type	**Sample**
VialNumber	**3204**
Dilution	**2**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**075CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	FinalConcentration	Units	High Value	Analyte	QC Flag
Li	7	6	3	18.87688	37.75376	ug/l	1000	Li	
Be	9	6	3	0.86530	1.73060	ug/l	1000	Be	
B	11	6	3	0.33598	0.67195	ug/l	2000	B	
Na	23	45	2	349.36905	698.73809	ug/l	50000	Na	
Mg	24	45	2	43516.39015	87032.78029	ug/l	50000	Mg	
Al	27	45	2	43724.39556	87448.79112	ug/l	100000	Al	
P	31	45	2	2527.48052	5054.96104	ug/l	100000	P	
K	39	45	2	5559.86023	11119.72045	ug/l	100000	K	
Ca	44	45	3	19569.32519	39138.65038	ug/l	100000	Ca	
Ti	47	45	3	1894.59249	3789.18499	ug/l	2000	Ti	
V	51	45	2	112.58193	225.16385	ug/l	2000	V	
Cr	52	45	2	22.21297	44.42593	ug/l	2000	Cr	
Mn	55	72	2	279.17878	558.35756	ug/l	5000	Mn	
Fe	57	72	2	69896.94218	139793.88435	ug/l	100000	Fe	
Co	59	72	2	16.70758	33.41515	ug/l	2000	Co	
Ni	60	72	2	36.37605	72.75210	ug/l	2000	Ni	
Cu	63	72	2	4907.38129	9814.76257	ug/l	2000	Cu	FAILED
Zn	66	72	2	56.37580	112.75160	ug/l	5000	Zn	
As	75	72	2	30.53254	61.06509	ug/l	2000	As	
Se	78	72	2	19.16984	38.33968	ug/l	1000	Se	
Sr	88	72	3	374.12678	748.25355	ug/l	2000	Sr	
Y	89	72	2	13.87361	27.74723	ug/l	200	Y	
Zr	90	72	2	5.47698	10.95396	ug/l	2000	Zr	
Nb	93	72	2	0.50199	1.00397	ug/l	100	Nb	
Mo	95	72	3	17.57619	35.15239	ug/l	1000	Mo	
Ru	101	72	2	-0.00609	-0.01218	ug/l	200	Ru	
Rh	103	72	2	-0.00806	-0.01612	ug/l	200	Rh	
Pd	105	72	2	0.03897	0.07794	ug/l	20	Pd	
Ag	107	115	3	0.39466	0.78932	ug/l	400	Ag	
Cd	111	115	3	0.05812	0.11623	ug/l	2000	Cd	
Sn	118	115	3	9.92955	19.85911	ug/l	2000	Sn	
Sb	121	115	3	1.63769	3.27538	ug/l	1000	Sb	
Te	125	165	2	0.73756	1.47512	ug/l	200	Te	
Cs	133	165	2	3.62797	7.25595	ug/l	2000	Cs	
Ba	137	165	3	255.08422	510.16844	ug/l	5000	Ba	
La	139	165	2	33.52749	67.05498	ug/l	200	La	
Ce	140	165	2	68.58929	137.17858	ug/l	200	Ce	
Pr	141	165	2	8.17087	16.34173	ug/l	200	Pr	
Nd	146	165	2	33.16118	66.32236	ug/l	200	Nd	
Sm	147	165	3	6.02266	12.04532	ug/l	2000	Sm	
Hf	178	165	2	0.19338	0.38676	ug/l	200	Hf	
Ta	181	165	2	0.00583	0.01165	ug/l	200	Ta	
W	182	165	2	2.83535	5.67069	ug/l	2000	W	
Re	185	193	3	0.00389	0.00779	ug/l	200	Re	
Pt	195	193	2	0.00731	0.01462	ug/l	200	Pt	
Au	197	193	3	0.04302	0.08605	ug/l	2000	Au	
Tl	205	193	3	0.31053	0.62106	ug/l	400	Tl	
Pb	208	193	3	17.09128	34.18256	ug/l	5000	Pb	
Bi	209	193	2	2.39636	4.79272	ug/l	2000	Bi	
Th	232	193	3	26.02515	52.05030	ug/l	2000	Th	
U	238	193	3	5.90348	11.80696	ug/l	2000	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	5358072	0.69	4941712	108.4	80	120	Li (IS)	
Sc (IS)	45	2	242316	0.62	186699	129.8	80	120	Sc (IS)	FAILED
Sc (IS)	45	3	4248135	0.31	3281398	129.5	80	120	Sc (IS)	FAILED
Ge (IS)	72	2	479427	0.66	410530	116.8	80	120	Ge (IS)	
Ge (IS)	72	3	2875338	0.37	2540877	113.2	80	120	Ge (IS)	
In (IS)	115	3	19634486	0.44	19102387	102.8	80	120	In (IS)	
Ho (IS)	165	2	14745600	0.42	14511718	101.6	80	120	Ho (IS)	
Ho (IS)	165	3	23720074	1.13	23609138	100.5	80	120	Ho (IS)	
Ir (IS)	193	2	9259590	0.32	9828030	94.2	80	120	Ir (IS)	
Ir (IS)	193	3	11300438	0.07	11858846	95.3	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Sample Name	**160-36593-B-10-A**
Data File Name	**105SMPL.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-27T03:47:19-06:00**
Type	**Sample**
VialNumber	**3205**
Dilution	**2**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**075CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	FinalConcentration	Units	High Value	Analyte	QC Flag
Li	7	6	3	23.69556	47.39113	ug/l	1000	Li	
Be	9	6	3	0.97954	1.95907	ug/l	1000	Be	
B	11	6	3	5.68692	11.37384	ug/l	2000	B	
Na	23	45	2	713.60166	1427.20333	ug/l	50000	Na	
Mg	24	45	2	35306.48987	70612.97974	ug/l	50000	Mg	
Al	27	45	2	42416.34015	84832.68031	ug/l	100000	Al	
P	31	45	2	2336.86030	4673.72060	ug/l	100000	P	
K	39	45	2	2741.85143	5483.70286	ug/l	100000	K	
Ca	44	45	3	19020.31540	38040.63079	ug/l	100000	Ca	
Ti	47	45	3	2311.40385	4622.80769	ug/l	2000	Ti	FAILED
V	51	45	2	123.56274	247.12549	ug/l	2000	V	
Cr	52	45	2	24.98711	49.97422	ug/l	2000	Cr	
Mn	55	72	2	351.07046	702.14093	ug/l	5000	Mn	
Fe	57	72	2	90359.55542	180719.11084	ug/l	100000	Fe	
Co	59	72	2	33.47315	66.94630	ug/l	2000	Co	
Ni	60	72	2	40.12288	80.24577	ug/l	2000	Ni	
Cu	63	72	2	5862.13628	11724.27256	ug/l	2000	Cu	FAILED
Zn	66	72	2	46.83872	93.67744	ug/l	5000	Zn	
As	75	72	2	67.80280	135.60560	ug/l	2000	As	
Se	78	72	2	37.27284	74.54567	ug/l	1000	Se	
Sr	88	72	3	497.88388	995.76776	ug/l	2000	Sr	
Y	89	72	2	11.31537	22.63073	ug/l	200	Y	
Zr	90	72	2	7.56788	15.13576	ug/l	2000	Zr	
Nb	93	72	2	0.50886	1.01772	ug/l	100	Nb	
Mo	95	72	3	17.89882	35.79764	ug/l	1000	Mo	
Ru	101	72	2	-0.00639	-0.01279	ug/l	200	Ru	
Rh	103	72	2	-0.00708	-0.01416	ug/l	200	Rh	
Pd	105	72	2	0.05111	0.10221	ug/l	20	Pd	
Ag	107	115	3	0.51941	1.03881	ug/l	400	Ag	
Cd	111	115	3	0.12677	0.25354	ug/l	2000	Cd	
Sn	118	115	3	10.76736	21.53473	ug/l	2000	Sn	
Sb	121	115	3	3.03889	6.07778	ug/l	1000	Sb	
Te	125	165	2	1.98955	3.97911	ug/l	200	Te	
Cs	133	165	2	2.02570	4.05139	ug/l	2000	Cs	
Ba	137	165	3	257.16776	514.33552	ug/l	5000	Ba	
La	139	165	2	25.67515	51.35029	ug/l	200	La	
Ce	140	165	2	53.99440	107.98879	ug/l	200	Ce	
Pr	141	165	2	6.61098	13.22196	ug/l	200	Pr	
Nd	146	165	2	27.75379	55.50759	ug/l	200	Nd	
Sm	147	165	3	5.11765	10.23530	ug/l	2000	Sm	
Hf	178	165	2	0.30184	0.60368	ug/l	200	Hf	
Ta	181	165	2	-0.00025	-0.00050	ug/l	200	Ta	
W	182	165	2	3.86174	7.72347	ug/l	2000	W	
Re	185	193	3	0.00683	0.01366	ug/l	200	Re	
Pt	195	193	2	0.00811	0.01622	ug/l	200	Pt	
Au	197	193	3	0.05685	0.11371	ug/l	2000	Au	
Tl	205	193	3	0.57420	1.14840	ug/l	400	Tl	
Pb	208	193	3	17.65072	35.30144	ug/l	5000	Pb	
Bi	209	193	2	3.05249	6.10498	ug/l	2000	Bi	
Th	232	193	3	18.10973	36.21946	ug/l	2000	Th	
U	238	193	3	11.12417	22.24834	ug/l	2000	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	5268174	0.28	4941712	106.6	80	120	Li (IS)	
Sc (IS)	45	2	237453	0.40	186699	127.2	80	120	Sc (IS)	FAILED
Sc (IS)	45	3	4185933	0.53	3281398	127.6	80	120	Sc (IS)	FAILED
Ge (IS)	72	2	479147	0.29	410530	116.7	80	120	Ge (IS)	
Ge (IS)	72	3	2868108	0.89	2540877	112.9	80	120	Ge (IS)	
In (IS)	115	3	19611389	0.06	19102387	102.7	80	120	In (IS)	
Ho (IS)	165	2	14825408	0.12	14511718	102.2	80	120	Ho (IS)	
Ho (IS)	165	3	23995522	1.16	23609138	101.6	80	120	Ho (IS)	
Ir (IS)	193	2	9363628	0.87	9828030	95.3	80	120	Ir (IS)	
Ir (IS)	193	3	11311968	0.53	11858846	95.4	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Sample Name	**160-36593-B-11-A**
Data File Name	**106SMPL.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-27T03:54:02-06:00**
Type	**Sample**
VialNumber	**3206**
Dilution	**2**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**075CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	FinalConcentration	Units	High Value	Analyte	QC Flag
Li	7	6	3	13.88210	27.76421	ug/l	1000	Li	
Be	9	6	3	0.75271	1.50543	ug/l	1000	Be	
B	11	6	3	-1.67199	-3.34399	ug/l	2000	B	
Na	23	45	2	423.83150	847.66301	ug/l	50000	Na	
Mg	24	45	2	29038.76638	58077.53276	ug/l	50000	Mg	
Al	27	45	2	30952.04013	61904.08026	ug/l	100000	Al	
P	31	45	2	3280.95553	6561.91106	ug/l	100000	P	
K	39	45	2	5671.15956	11342.31912	ug/l	100000	K	
Ca	44	45	3	15470.19836	30940.39672	ug/l	100000	Ca	
Ti	47	45	3	2081.15957	4162.31914	ug/l	2000	Ti	FAILED
V	51	45	2	100.88259	201.76518	ug/l	2000	V	
Cr	52	45	2	27.92736	55.85473	ug/l	2000	Cr	
Mn	55	72	2	291.12727	582.25455	ug/l	5000	Mn	
Fe	57	72	2	78728.77723	157457.55446	ug/l	100000	Fe	
Co	59	72	2	17.87351	35.74702	ug/l	2000	Co	
Ni	60	72	2	39.63024	79.26048	ug/l	2000	Ni	
Cu	63	72	2	3060.17769	6120.35538	ug/l	2000	Cu	FAILED
Zn	66	72	2	61.34616	122.69232	ug/l	5000	Zn	
As	75	72	2	18.57574	37.15149	ug/l	2000	As	
Se	78	72	2	13.73633	27.47266	ug/l	1000	Se	
Sr	88	72	3	259.15042	518.30085	ug/l	2000	Sr	
Y	89	72	2	13.83808	27.67617	ug/l	200	Y	
Zr	90	72	2	5.86010	11.72021	ug/l	2000	Zr	
Nb	93	72	2	0.41844	0.83687	ug/l	100	Nb	
Mo	95	72	3	12.21228	24.42455	ug/l	1000	Mo	
Ru	101	72	2	-0.00728	-0.01457	ug/l	200	Ru	
Rh	103	72	2	-0.00696	-0.01393	ug/l	200	Rh	
Pd	105	72	2	0.03475	0.06949	ug/l	20	Pd	
Ag	107	115	3	0.53194	1.06388	ug/l	400	Ag	
Cd	111	115	3	0.04447	0.08895	ug/l	2000	Cd	
Sn	118	115	3	10.90736	21.81471	ug/l	2000	Sn	
Sb	121	115	3	1.20534	2.41069	ug/l	1000	Sb	
Te	125	165	2	0.74780	1.49561	ug/l	200	Te	
Cs	133	165	2	2.79791	5.59583	ug/l	2000	Cs	
Ba	137	165	3	190.36333	380.72665	ug/l	5000	Ba	
La	139	165	2	35.13913	70.27827	ug/l	200	La	
Ce	140	165	2	74.52498	149.04996	ug/l	200	Ce	
Pr	141	165	2	8.92620	17.85239	ug/l	200	Pr	
Nd	146	165	2	35.58073	71.16145	ug/l	200	Nd	
Sm	147	165	3	6.45609	12.91218	ug/l	2000	Sm	
Hf	178	165	2	0.23308	0.46616	ug/l	200	Hf	
Ta	181	165	2	0.00587	0.01173	ug/l	200	Ta	
W	182	165	2	1.94414	3.88828	ug/l	2000	W	
Re	185	193	3	0.02158	0.04316	ug/l	200	Re	
Pt	195	193	2	0.00621	0.01242	ug/l	200	Pt	
Au	197	193	3	0.01033	0.02066	ug/l	2000	Au	
Tl	205	193	3	0.25899	0.51797	ug/l	400	Tl	
Pb	208	193	3	10.04092	20.08184	ug/l	5000	Pb	
Bi	209	193	2	1.80060	3.60120	ug/l	2000	Bi	
Th	232	193	3	28.74103	57.48206	ug/l	2000	Th	
U	238	193	3	7.23725	14.47451	ug/l	2000	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	5156493	2.72	4941712	104.3	80	120	Li (IS)	
Sc (IS)	45	2	231655	0.55	186699	124.1	80	120	Sc (IS)	FAILED
Sc (IS)	45	3	4080792	2.66	3281398	124.4	80	120	Sc (IS)	FAILED
Ge (IS)	72	2	475323	0.62	410530	115.8	80	120	Ge (IS)	
Ge (IS)	72	3	2829268	2.46	2540877	111.4	80	120	Ge (IS)	
In (IS)	115	3	19497196	3.69	19102387	102.1	80	120	In (IS)	
Ho (IS)	165	2	14683742	0.51	14511718	101.2	80	120	Ho (IS)	
Ho (IS)	165	3	23612481	3.03	23609138	100.0	80	120	Ho (IS)	
Ir (IS)	193	2	9303016	0.66	9828030	94.7	80	120	Ir (IS)	
Ir (IS)	193	3	11182005	3.29	11858846	94.3	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Sample Report

Sample Name	**160-36593-B-12-A**
Data File Name	**107SMPL.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-27T04:00:46-06:00**
Type	**Sample**
VialNumber	**3207**
Dilution	**2**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**075CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	FinalConcentration	Units	High Value	Analyte	QC Flag
Li	7	6	3	14.52903	29.05805	ug/l	1000	Li	
Be	9	6	3	0.83592	1.67185	ug/l	1000	Be	
B	11	6	3	-1.58823	-3.17646	ug/l	2000	B	
Na	23	45	2	451.16542	902.33084	ug/l	50000	Na	
Mg	24	45	2	29385.48228	58770.96456	ug/l	50000	Mg	
Al	27	45	2	32443.09245	64886.18491	ug/l	100000	Al	
P	31	45	2	3376.89232	6753.78465	ug/l	100000	P	
K	39	45	2	6798.51394	13597.02788	ug/l	100000	K	
Ca	44	45	3	17168.68709	34337.37419	ug/l	100000	Ca	
Ti	47	45	3	2100.12207	4200.24415	ug/l	2000	Ti	FAILED
V	51	45	2	104.47347	208.94695	ug/l	2000	V	
Cr	52	45	2	29.58435	59.16870	ug/l	2000	Cr	
Mn	55	72	2	315.47996	630.95991	ug/l	5000	Mn	
Fe	57	72	2	88713.30797	177426.61593	ug/l	100000	Fe	
Co	59	72	2	19.25411	38.50823	ug/l	2000	Co	
Ni	60	72	2	40.59826	81.19652	ug/l	2000	Ni	
Cu	63	72	2	3512.57050	7025.14100	ug/l	2000	Cu	FAILED
Zn	66	72	2	68.36220	136.72441	ug/l	5000	Zn	
As	75	72	2	21.39445	42.78890	ug/l	2000	As	
Se	78	72	2	16.58130	33.16260	ug/l	1000	Se	
Sr	88	72	3	303.08801	606.17602	ug/l	2000	Sr	
Y	89	72	2	15.10761	30.21521	ug/l	200	Y	
Zr	90	72	2	6.13831	12.27662	ug/l	2000	Zr	
Nb	93	72	2	0.50707	1.01414	ug/l	100	Nb	
Mo	95	72	3	13.58622	27.17244	ug/l	1000	Mo	
Ru	101	72	2	-0.00524	-0.01048	ug/l	200	Ru	
Rh	103	72	2	-0.00767	-0.01533	ug/l	200	Rh	
Pd	105	72	2	0.04141	0.08282	ug/l	20	Pd	
Ag	107	115	3	0.44386	0.88772	ug/l	400	Ag	
Cd	111	115	3	0.04849	0.09698	ug/l	2000	Cd	
Sn	118	115	3	10.00166	20.00331	ug/l	2000	Sn	
Sb	121	115	3	1.54553	3.09107	ug/l	1000	Sb	
Te	125	165	2	0.93120	1.86241	ug/l	200	Te	
Cs	133	165	2	3.13371	6.26742	ug/l	2000	Cs	
Ba	137	165	3	239.52268	479.04535	ug/l	5000	Ba	
La	139	165	2	40.22169	80.44339	ug/l	200	La	
Ce	140	165	2	85.63640	171.27279	ug/l	200	Ce	
Pr	141	165	2	10.16798	20.33596	ug/l	200	Pr	
Nd	146	165	2	40.42305	80.84609	ug/l	200	Nd	
Sm	147	165	3	7.25128	14.50257	ug/l	2000	Sm	
Hf	178	165	2	0.23270	0.46540	ug/l	200	Hf	
Ta	181	165	2	-0.00055	-0.00110	ug/l	200	Ta	
W	182	165	2	2.52350	5.04700	ug/l	2000	W	
Re	185	193	3	0.01796	0.03593	ug/l	200	Re	
Pt	195	193	2	0.00629	0.01257	ug/l	200	Pt	
Au	197	193	3	0.01763	0.03526	ug/l	2000	Au	
Tl	205	193	3	0.29518	0.59037	ug/l	400	Tl	
Pb	208	193	3	11.20645	22.41290	ug/l	5000	Pb	
Bi	209	193	2	2.26242	4.52483	ug/l	2000	Bi	
Th	232	193	3	33.43609	66.87218	ug/l	2000	Th	
U	238	193	3	8.27210	16.54420	ug/l	2000	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	5204887	0.07	4941712	105.3	80	120	Li (IS)	
Sc (IS)	45	2	233683	0.51	186699	125.2	80	120	Sc (IS)	FAILED
Sc (IS)	45	3	4128104	0.10	3281398	125.8	80	120	Sc (IS)	FAILED
Ge (IS)	72	2	476275	0.36	410530	116.0	80	120	Ge (IS)	
Ge (IS)	72	3	2836596	0.31	2540877	111.6	80	120	Ge (IS)	
In (IS)	115	3	19614867	0.97	19102387	102.7	80	120	In (IS)	
Ho (IS)	165	2	14851714	0.11	14511718	102.3	80	120	Ho (IS)	
Ho (IS)	165	3	23698180	0.17	23609138	100.4	80	120	Ho (IS)	
Ir (IS)	193	2	9321478	0.53	9828030	94.8	80	120	Ir (IS)	
Ir (IS)	193	3	11250682	0.54	11858846	94.9	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Sample Name	**160-36593-B-13-A**
Data File Name	**108SMPL.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-27T04:07:29-06:00**
Type	**Sample**
VialNumber	**3208**
Dilution	**2**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**075CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	FinalConcentration	Units	High Value	Analyte	QC Flag
Li	7	6	3	14.74058	29.48117	ug/l	1000	Li	
Be	9	6	3	0.84561	1.69122	ug/l	1000	Be	
B	11	6	3	-2.08482	-4.16964	ug/l	2000	B	
Na	23	45	2	383.92283	767.84566	ug/l	50000	Na	
Mg	24	45	2	24481.92591	48963.85182	ug/l	50000	Mg	
Al	27	45	2	24366.33359	48732.66719	ug/l	100000	Al	
P	31	45	2	3474.82339	6949.64677	ug/l	100000	P	
K	39	45	2	6357.62103	12715.24207	ug/l	100000	K	
Ca	44	45	3	26120.81971	52241.63943	ug/l	100000	Ca	
Ti	47	45	3	1888.74780	3777.49559	ug/l	2000	Ti	
V	51	45	2	72.22875	144.45751	ug/l	2000	V	
Cr	52	45	2	23.06185	46.12370	ug/l	2000	Cr	
Mn	55	72	2	386.07058	772.14116	ug/l	5000	Mn	
Fe	57	72	2	57773.81602	115547.63203	ug/l	100000	Fe	
Co	59	72	2	23.68307	47.36614	ug/l	2000	Co	
Ni	60	72	2	36.05457	72.10913	ug/l	2000	Ni	
Cu	63	72	2	2993.45924	5986.91848	ug/l	2000	Cu	FAILED
Zn	66	72	2	58.17134	116.34268	ug/l	5000	Zn	
As	75	72	2	6.02044	12.04087	ug/l	2000	As	
Se	78	72	2	6.97754	13.95508	ug/l	1000	Se	
Sr	88	72	3	184.18959	368.37919	ug/l	2000	Sr	
Y	89	72	2	19.84856	39.69712	ug/l	200	Y	
Zr	90	72	2	6.24709	12.49418	ug/l	2000	Zr	
Nb	93	72	2	0.51290	1.02579	ug/l	100	Nb	
Mo	95	72	3	8.87889	17.75778	ug/l	1000	Mo	
Ru	101	72	2	-0.00760	-0.01521	ug/l	200	Ru	
Rh	103	72	2	-0.00864	-0.01727	ug/l	200	Rh	
Pd	105	72	2	0.03357	0.06714	ug/l	20	Pd	
Ag	107	115	3	0.39250	0.78501	ug/l	400	Ag	
Cd	111	115	3	0.05177	0.10354	ug/l	2000	Cd	
Sn	118	115	3	9.99020	19.98039	ug/l	2000	Sn	
Sb	121	115	3	0.40214	0.80428	ug/l	1000	Sb	
Te	125	165	2	0.61488	1.22977	ug/l	200	Te	
Cs	133	165	2	2.93517	5.87034	ug/l	2000	Cs	
Ba	137	165	3	198.50855	397.01711	ug/l	5000	Ba	
La	139	165	2	38.85859	77.71718	ug/l	200	La	
Ce	140	165	2	82.77459	165.54917	ug/l	200	Ce	
Pr	141	165	2	9.88206	19.76413	ug/l	200	Pr	
Nd	146	165	2	39.97369	79.94737	ug/l	200	Nd	
Sm	147	165	3	7.59873	15.19746	ug/l	2000	Sm	
Hf	178	165	2	0.22056	0.44112	ug/l	200	Hf	
Ta	181	165	2	0.01914	0.03828	ug/l	200	Ta	
W	182	165	2	0.54210	1.08421	ug/l	2000	W	
Re	185	193	3	0.11201	0.22401	ug/l	200	Re	
Pt	195	193	2	0.01080	0.02160	ug/l	200	Pt	
Au	197	193	3	-0.00104	-0.00209	ug/l	2000	Au	
Tl	205	193	3	0.28162	0.56325	ug/l	400	Tl	
Pb	208	193	3	7.40377	14.80754	ug/l	5000	Pb	
Bi	209	193	2	1.94249	3.88499	ug/l	2000	Bi	
Th	232	193	3	48.44242	96.88483	ug/l	2000	Th	
U	238	193	3	11.08821	22.17641	ug/l	2000	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	5093408	0.06	4941712	103.1	80	120	Li (IS)	
Sc (IS)	45	2	228069	0.28	186699	122.2	80	120	Sc (IS)	FAILED
Sc (IS)	45	3	4019539	0.72	3281398	122.5	80	120	Sc (IS)	FAILED
Ge (IS)	72	2	477659	0.76	410530	116.4	80	120	Ge (IS)	
Ge (IS)	72	3	2855039	1.15	2540877	112.4	80	120	Ge (IS)	
In (IS)	115	3	19725749	1.18	19102387	103.3	80	120	In (IS)	
Ho (IS)	165	2	14811597	0.59	14511718	102.1	80	120	Ho (IS)	
Ho (IS)	165	3	23916690	0.64	23609138	101.3	80	120	Ho (IS)	
Ir (IS)	193	2	9314318	0.24	9828030	94.8	80	120	Ir (IS)	
Ir (IS)	193	3	11316512	0.61	11858846	95.4	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Low Level Continuing Calibration Verification (CCV) - US EPA Method 6020

Sample Name	**CCVL 1856860**
Data File Name	**109LCCV.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-27T04:14:14-06:00**
Type	**CRI**
VialNumber	**1101**
Dilution	**1**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**075CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	Units	ExpectedValue	%Recovery	%QC Low	%QC High	Analyte	QC Flag
Li	7	6	3	5.14911	ug/l	5	103.0	80	120	Li	
Be	9	6	3	0.50957	ug/l	0.5	101.9	80	120	Be	
B	11	6	3	89.01974	ug/l	100	89.0	80	120	B	
Na	23	45	2	99.52801	ug/l	100	99.5	80	120	Na	
Mg	24	45	2	60.59884	ug/l	50	121.2	80	120	Mg	FAILED
Al	27	45	2	62.60262	ug/l	50	125.2	80	120	Al	FAILED
P	31	45	2	103.50866	ug/l	100	103.5	80	120	P	
K	39	45	2	106.42707	ug/l	100	106.4	80	120	K	
Ca	44	45	3	248.13678	ug/l	200	124.1	80	120	Ca	FAILED
Ti	47	45	3	5.50972	ug/l	5	110.2	80	120	Ti	
V	51	45	2	9.65523	ug/l	10	96.6	80	120	V	
Cr	52	45	2	10.06539	ug/l	10	100.7	80	120	Cr	
Mn	55	72	2	4.25958	ug/l	4	106.5	80	120	Mn	
Fe	57	72	2	63.68567	ug/l	50	127.4	80	120	Fe	FAILED
Co	59	72	2	2.12485	ug/l	2	106.2	80	120	Co	
Ni	60	72	2	5.60307	ug/l	5	112.1	80	120	Ni	
Cu	63	72	2	4.48966	ug/l	3	149.7	80	120	Cu	FAILED
Zn	66	72	2	21.92111	ug/l	20	109.6	80	120	Zn	
As	75	72	2	10.63240	ug/l	10	106.3	80	120	As	
Se	78	72	2	5.13438	ug/l	5	102.7	80	120	Se	
Sr	88	72	3	5.19829	ug/l	5	104.0	80	120	Sr	
Y	89	72	2	5.00504	ug/l	5	100.1	80	120	Y	
Zr	90	72	2	5.01433	ug/l	5	100.3	80	120	Zr	
Nb	93	72	2	18.82535	ug/l	25	75.3	80	120	Nb	FAILED
Mo	95	72	3	5.01619	ug/l	5	100.3	80	120	Mo	
Ru	101	72	2	10.11265	ug/l	10	101.1	80	120	Ru	
Rh	103	72	2	9.96728	ug/l	10	99.7	80	120	Rh	
Pd	105	72	2	0.53357	ug/l	0.5	106.7	80	120	Pd	
Ag	107	115	3	1.98073	ug/l	2	99.0	80	120	Ag	
Cd	111	115	3	0.48301	ug/l	0.5	96.6	80	120	Cd	
Sn	118	115	3	1.76302	ug/l	2	88.2	80	120	Sn	
Sb	121	115	3	4.72050	ug/l	5	94.4	80	120	Sb	
Te	125	165	2	10.45527	ug/l	10	104.6	80	120	Te	
Cs	133	165	2	1.01034	ug/l	1	101.0	80	120	Cs	
Ba	137	165	3	2.06221	ug/l	2	103.1	80	120	Ba	
La	139	165	2	2.00451	ug/l	2	100.2	80	120	La	
Ce	140	165	2	9.90641	ug/l	10	99.1	80	120	Ce	
Pr	141	165	2	1.96611	ug/l	2	98.3	80	120	Pr	
Nd	146	165	2	1.96515	ug/l	2	98.3	80	120	Nd	
Sm	147	165	3	9.90981	ug/l	10	99.1	80	120	Sm	
Hf	178	165	2	9.05466	ug/l	10	90.5	80	120	Hf	
Ta	181	165	2	6.45953	ug/l	10	64.6	80	120	Ta	FAILED
W	182	165	2	4.39584	ug/l	5	87.9	80	120	W	
Re	185	193	3	9.34835	ug/l	10	93.5	80	120	Re	
Pt	195	193	2	1.01503	ug/l	1	101.5	80	120	Pt	
Au	197	193	3	4.79885	ug/l	5	96.0	80	120	Au	
Tl	205	193	3	1.82855	ug/l	2	91.4	80	120	Tl	
Pb	208	193	3	2.76847	ug/l	3	92.3	80	120	Pb	
Bi	209	193	2	18.76487	ug/l	20	93.8	80	120	Bi	
Th	232	193	3	1.80262	ug/l	2	90.1	80	120	Th	
U	238	193	3	0.89011	ug/l	1	89.0	80	120	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	5268004	0.08	4941712	106.6	80	120	Li (IS)	
Sc (IS)	45	2	216375	1.27	186699	115.9	80	120	Sc (IS)	
Sc (IS)	45	3	3753250	0.18	3281398	114.4	80	120	Sc (IS)	
Ge (IS)	72	2	477228	0.62	410530	116.2	80	120	Ge (IS)	
Ge (IS)	72	3	2847481	0.76	2540877	112.1	80	120	Ge (IS)	
In (IS)	115	3	20759627	0.08	19102387	108.7	80	120	In (IS)	
Ho (IS)	165	2	14951785	0.62	14511718	103.0	80	120	Ho (IS)	
Ho (IS)	165	3	24235543	0.33	23609138	102.7	80	120	Ho (IS)	
Ir (IS)	193	2	9876980	0.94	9828030	100.5	80	120	Ir (IS)	
Ir (IS)	193	3	11902431	0.78	11858846	100.4	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Continuing Calibration Verification (CCV) - US EPA Method 6020

Sample Name	**CCV 1856861**
Data File Name	**110_CCV.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-27T04:20:59-06:00**
Type	**CCV**
VialNumber	**1102**
Dilution	**1**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**075CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	Units	ExpectedValue	%Recovery	%QC Low	%QC High	Analyte	QC Flag
Li	7	6	3	101.57170	ug/l	100	101.6	90	110	Li	
Be	9	6	3	101.96294	ug/l	100	102.0	90	110	Be	
B	11	6	3	196.31295	ug/l	200	98.2	90	110	B	
Na	23	45	2	2438.45343	ug/l	2500	97.5	90	110	Na	
Mg	24	45	2	2446.70583	ug/l	2500	97.9	90	110	Mg	
Al	27	45	2	2635.24868	ug/l	2500	105.4	90	110	Al	
P	31	45	2	2477.86724	ug/l	2500	99.1	90	110	P	
K	39	45	2	2529.40079	ug/l	2500	101.2	90	110	K	
Ca	44	45	3	2528.81773	ug/l	2500	101.2	90	110	Ca	
Ti	47	45	3	101.53286	ug/l	100	101.5	90	110	Ti	
V	51	45	2	97.76577	ug/l	100	97.8	90	110	V	
Cr	52	45	2	100.34205	ug/l	100	100.3	90	110	Cr	
Mn	55	72	2	99.21386	ug/l	100	99.2	90	110	Mn	
Fe	57	72	2	2533.82630	ug/l	2500	101.4	90	110	Fe	
Co	59	72	2	101.56150	ug/l	100	101.6	90	110	Co	
Ni	60	72	2	102.04218	ug/l	100	102.0	90	110	Ni	
Cu	63	72	2	103.44825	ug/l	100	103.4	90	110	Cu	
Zn	66	72	2	99.60775	ug/l	100	99.6	90	110	Zn	
As	75	72	2	102.77111	ug/l	100	102.8	90	110	As	
Se	78	72	2	51.16841	ug/l	50	102.3	90	110	Se	
Sr	88	72	3	101.36550	ug/l	100	101.4	90	110	Sr	
Y	89	72	2	100.04998	ug/l	100	100.0	90	110	Y	
Zr	90	72	2	99.42510	ug/l	100	99.4	90	110	Zr	
Nb	93	72	2	49.80954	ug/l	50	99.6	90	110	Nb	
Mo	95	72	3	48.32274	ug/l	50	96.6	90	110	Mo	
Ru	101	72	2	95.28148	ug/l	100	95.3	90	110	Ru	
Rh	103	72	2	98.12383	ug/l	100	98.1	90	110	Rh	
Pd	105	72	2	9.81832	ug/l	10	98.2	90	110	Pd	
Ag	107	115	3	19.85729	ug/l	20	99.3	90	110	Ag	
Cd	111	115	3	97.11724	ug/l	100	97.1	90	110	Cd	
Sn	118	115	3	99.42190	ug/l	100	99.4	90	110	Sn	
Sb	121	115	3	49.63830	ug/l	50	99.3	90	110	Sb	
Te	125	165	2	101.56341	ug/l	100	101.6	90	110	Te	
Cs	133	165	2	104.74605	ug/l	100	104.7	90	110	Cs	
Ba	137	165	3	103.53265	ug/l	100	103.5	90	110	Ba	
La	139	165	2	102.81725	ug/l	100	102.8	90	110	La	
Ce	140	165	2	102.24136	ug/l	100	102.2	90	110	Ce	
Pr	141	165	2	102.48378	ug/l	100	102.5	90	110	Pr	
Nd	146	165	2	97.09151	ug/l	100	97.1	90	110	Nd	
Sm	147	165	3	102.99291	ug/l	100	103.0	90	110	Sm	
Hf	178	165	2	98.11072	ug/l	100	98.1	90	110	Hf	
Ta	181	165	2	96.54028	ug/l	100	96.5	90	110	Ta	
W	182	165	2	97.26184	ug/l	100	97.3	90	110	W	
Re	185	193	3	101.60965	ug/l	100	101.6	90	110	Re	
Pt	195	193	2	9.99513	ug/l	10	100.0	90	110	Pt	
Au	197	193	3	100.44398	ug/l	100	100.4	90	110	Au	
Tl	205	193	3	20.03894	ug/l	20	100.2	90	110	Tl	
Pb	208	193	3	100.11381	ug/l	100	100.1	90	110	Pb	
Bi	209	193	2	100.81423	ug/l	100	100.8	90	110	Bi	
Th	232	193	3	98.54341	ug/l	100	98.5	90	110	Th	
U	238	193	3	99.09228	ug/l	100	99.1	90	110	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	5015485	1.02	4941712	101.5	80	120	Li (IS)	
Sc (IS)	45	2	213752	0.84	186699	114.5	80	120	Sc (IS)	
Sc (IS)	45	3	3612672	1.58	3281398	110.1	80	120	Sc (IS)	
Ge (IS)	72	2	492210	0.59	410530	119.9	80	120	Ge (IS)	
Ge (IS)	72	3	2809370	1.61	2540877	110.6	80	120	Ge (IS)	
In (IS)	115	3	20141956	2.30	19102387	105.4	80	120	In (IS)	
Ho (IS)	165	2	15103998	0.51	14511718	104.1	80	120	Ho (IS)	
Ho (IS)	165	3	23944206	2.28	23609138	101.4	80	120	Ho (IS)	
Ir (IS)	193	2	9895449	0.62	9828030	100.7	80	120	Ir (IS)	
Ir (IS)	193	3	11725321	2.09	11858846	98.9	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Continuing Calibration Blank (CCB) - US EPA Method 6020

Sample Name	**CCB 1854886**
Data File Name	**111_CCB.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-27T04:27:47-06:00**
Type	**CCB**
VialNumber	**4**
Dilution	**1**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**075CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	Units	QC High	Analyte	QC Flag
Li	7	6	3	0.10998	ug/l	1.388	Li	
Be	9	6	3	0.01599	ug/l	0.7	Be	
B	11	6	3	-3.58359	ug/l	20	B	
Na	23	45	2	-2.51653	ug/l	30	Na	
Mg	24	45	2	2.26182	ug/l	11.18	Mg	
Al	27	45	2	1.44993	ug/l	25.8	Al	
P	31	45	2	-0.59371	ug/l	16.46	P	
K	39	45	2	-0.23862	ug/l	83.2	K	
Ca	44	45	3	-4.67688	ug/l	136.2	Ca	
Ti	47	45	3	0.09246	ug/l	4.2	Ti	
V	51	45	2	-0.10266	ug/l	4.74	V	
Cr	52	45	2	0.04050	ug/l	6.52	Cr	
Mn	55	72	2	0.03968	ug/l	0.49	Mn	
Fe	57	72	2	2.88803	ug/l	40.7	Fe	
Co	59	72	2	0.03798	ug/l	0.434	Co	
Ni	60	72	2	0.04362	ug/l	0.8	Ni	
Cu	63	72	2	0.97810	ug/l	0.902	Cu	FAILED
Zn	66	72	2	0.06751	ug/l	16.58	Zn	
As	75	72	2	0.07232	ug/l	2.36	As	
Se	78	72	2	-0.16278	ug/l	3.18	Se	
Sr	88	72	3	0.01012	ug/l	2	Sr	
Y	89	72	2	0.03586	ug/l	0.424	Y	
Zr	90	72	2	0.05281	ug/l	0.496	Zr	
Nb	93	72	2	0.51965	ug/l	4.62	Nb	
Mo	95	72	3	0.06026	ug/l	2	Mo	
Ru	101	72	2	0.03991	ug/l	2	Ru	
Rh	103	72	2	0.03781	ug/l	1.634	Rh	
Pd	105	72	2	0.00503	ug/l	0.08	Pd	
Ag	107	115	3	0.00062	ug/l	1.54	Ag	
Cd	111	115	3	0.01297	ug/l	0.4	Cd	
Sn	118	115	3	0.01474	ug/l	2	Sn	
Sb	121	115	3	-0.00127	ug/l	3.34	Sb	
Te	125	165	2	0.08153	ug/l	1.072	Te	
Cs	133	165	2	0.04748	ug/l	0.106	Cs	
Ba	137	165	3	0.01174	ug/l	0.446	Ba	
La	139	165	2	0.03902	ug/l	0.102	La	
Ce	140	165	2	0.04069	ug/l	1.772	Ce	
Pr	141	165	2	0.03919	ug/l	0.084	Pr	
Nd	146	165	2	0.03691	ug/l	0.208	Nd	
Sm	147	165	3	0.00913	ug/l	0.652	Sm	
Hf	178	165	2	0.06831	ug/l	2.26	Hf	
Ta	181	165	2	0.05968	ug/l	1.46	Ta	
W	182	165	2	0.30586	ug/l	4	W	
Re	185	193	3	0.00687	ug/l	0.05	Re	
Pt	195	193	2	0.00511	ug/l	0.12	Pt	
Au	197	193	3	0.15328	ug/l	1	Au	
Tl	205	193	3	0.03184	ug/l	1.1	Tl	
Pb	208	193	3	0.01295	ug/l	0.346	Pb	
Bi	209	193	2	0.09220	ug/l	1.464	Bi	
Th	232	193	3	0.08555	ug/l	1.104	Th	
U	238	193	3	0.01069	ug/l	0.462	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	5007450	0.32	4941712	101.3	80	120	Li (IS)	
Sc (IS)	45	2	202742	0.59	186699	108.6	80	120	Sc (IS)	
Sc (IS)	45	3	3529026	0.26	3281398	107.5	80	120	Sc (IS)	
Ge (IS)	72	2	445130	0.32	410530	108.4	80	120	Ge (IS)	
Ge (IS)	72	3	2682151	0.95	2540877	105.6	80	120	Ge (IS)	
In (IS)	115	3	19759670	0.54	19102387	103.4	80	120	In (IS)	
Ho (IS)	165	2	14499616	0.65	14511718	99.9	80	120	Ho (IS)	
Ho (IS)	165	3	23503484	0.66	23609138	99.6	80	120	Ho (IS)	
Ir (IS)	193	2	9576326	0.65	9828030	97.4	80	120	Ir (IS)	
Ir (IS)	193	3	11647766	0.48	11858846	98.2	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Sample Name	**160-36593-B-14-A**
Data File Name	**112SMPL.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-27T04:34:32-06:00**
Type	**Sample**
VialNumber	**3209**
Dilution	**2**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**075CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	FinalConcentration	Units	High Value	Analyte	QC Flag
Li	7	6	3	12.08567	24.17135	ug/l	1000	Li	
Be	9	6	3	0.83371	1.66743	ug/l	1000	Be	
B	11	6	3	-1.30814	-2.61627	ug/l	2000	B	
Na	23	45	2	436.54700	873.09400	ug/l	50000	Na	
Mg	24	45	2	23593.32116	47186.64232	ug/l	50000	Mg	
Al	27	45	2	23835.20134	47670.40269	ug/l	100000	Al	
P	31	45	2	3124.08007	6248.16014	ug/l	100000	P	
K	39	45	2	6303.80132	12607.60265	ug/l	100000	K	
Ca	44	45	3	20590.74130	41181.48260	ug/l	100000	Ca	
Ti	47	45	3	1600.06088	3200.12177	ug/l	2000	Ti	
V	51	45	2	69.42595	138.85190	ug/l	2000	V	
Cr	52	45	2	29.99894	59.99788	ug/l	2000	Cr	
Mn	55	72	2	310.54048	621.08097	ug/l	5000	Mn	
Fe	57	72	2	52417.47340	104834.94680	ug/l	100000	Fe	
Co	59	72	2	20.03509	40.07019	ug/l	2000	Co	
Ni	60	72	2	37.13578	74.27156	ug/l	2000	Ni	
Cu	63	72	2	4332.65558	8665.31117	ug/l	2000	Cu	FAILED
Zn	66	72	2	60.21424	120.42847	ug/l	5000	Zn	
As	75	72	2	6.71486	13.42973	ug/l	2000	As	
Se	78	72	2	7.51029	15.02058	ug/l	1000	Se	
Sr	88	72	3	154.63299	309.26598	ug/l	2000	Sr	
Y	89	72	2	18.02508	36.05016	ug/l	200	Y	
Zr	90	72	2	6.17403	12.34806	ug/l	2000	Zr	
Nb	93	72	2	0.60411	1.20822	ug/l	100	Nb	
Mo	95	72	3	10.30039	20.60078	ug/l	1000	Mo	
Ru	101	72	2	-0.00540	-0.01080	ug/l	200	Ru	
Rh	103	72	2	-0.00823	-0.01647	ug/l	200	Rh	
Pd	105	72	2	0.03012	0.06024	ug/l	20	Pd	
Ag	107	115	3	0.43756	0.87511	ug/l	400	Ag	
Cd	111	115	3	0.05193	0.10385	ug/l	2000	Cd	
Sn	118	115	3	9.76368	19.52736	ug/l	2000	Sn	
Sb	121	115	3	0.62725	1.25450	ug/l	1000	Sb	
Te	125	165	2	0.61527	1.23053	ug/l	200	Te	
Cs	133	165	2	2.76607	5.53215	ug/l	2000	Cs	
Ba	137	165	3	203.43939	406.87878	ug/l	5000	Ba	
La	139	165	2	36.60309	73.20618	ug/l	200	La	
Ce	140	165	2	78.22298	156.44595	ug/l	200	Ce	
Pr	141	165	2	9.35401	18.70801	ug/l	200	Pr	
Nd	146	165	2	38.17065	76.34129	ug/l	200	Nd	
Sm	147	165	3	7.23594	14.47189	ug/l	2000	Sm	
Hf	178	165	2	0.38089	0.76179	ug/l	200	Hf	
Ta	181	165	2	0.03199	0.06397	ug/l	200	Ta	
W	182	165	2	0.79276	1.58552	ug/l	2000	W	
Re	185	193	3	0.13071	0.26142	ug/l	200	Re	
Pt	195	193	2	0.00611	0.01222	ug/l	200	Pt	
Au	197	193	3	0.03905	0.07810	ug/l	2000	Au	
Tl	205	193	3	0.32639	0.65278	ug/l	400	Tl	
Pb	208	193	3	6.73101	13.46203	ug/l	5000	Pb	
Bi	209	193	2	1.63336	3.26672	ug/l	2000	Bi	
Th	232	193	3	31.62109	63.24219	ug/l	2000	Th	
U	238	193	3	9.12271	18.24542	ug/l	2000	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	5026536	1.02	4941712	101.7	80	120	Li (IS)	
Sc (IS)	45	2	227813	0.34	186699	122.0	80	120	Sc (IS)	FAILED
Sc (IS)	45	3	3962917	0.47	3281398	120.8	80	120	Sc (IS)	FAILED
Ge (IS)	72	2	471600	0.20	410530	114.9	80	120	Ge (IS)	
Ge (IS)	72	3	2807520	0.70	2540877	110.5	80	120	Ge (IS)	
In (IS)	115	3	19482655	0.12	19102387	102.0	80	120	In (IS)	
Ho (IS)	165	2	14958773	1.37	14511718	103.1	80	120	Ho (IS)	
Ho (IS)	165	3	23653085	0.57	23609138	100.2	80	120	Ho (IS)	
Ir (IS)	193	2	9436241	0.38	9828030	96.0	80	120	Ir (IS)	
Ir (IS)	193	3	11301100	0.17	11858846	95.3	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Sample Name	**160-36593-B-15-A**
Data File Name	**113SMPL.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-27T04:41:14-06:00**
Type	**Sample**
VialNumber	**3210**
Dilution	**2**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**075CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	FinalConcentration	Units	High Value	Analyte	QC Flag
Li	7	6	3	19.32157	38.64314	ug/l	1000	Li	
Be	9	6	3	0.87288	1.74576	ug/l	1000	Be	
B	11	6	3	1.80122	3.60244	ug/l	2000	B	
Na	23	45	2	389.01544	778.03089	ug/l	50000	Na	
Mg	24	45	2	34334.58579	68669.17159	ug/l	50000	Mg	
Al	27	45	2	41773.90952	83547.81905	ug/l	100000	Al	
P	31	45	2	1859.40277	3718.80553	ug/l	100000	P	
K	39	45	2	6774.79692	13549.59383	ug/l	100000	K	
Ca	44	45	3	18902.54212	37805.08423	ug/l	100000	Ca	
Ti	47	45	3	1676.18794	3352.37588	ug/l	2000	Ti	
V	51	45	2	113.53032	227.06065	ug/l	2000	V	
Cr	52	45	2	30.64393	61.28785	ug/l	2000	Cr	
Mn	55	72	2	273.35929	546.71857	ug/l	5000	Mn	
Fe	57	72	2	83530.27216	167060.54432	ug/l	100000	Fe	
Co	59	72	2	20.35418	40.70836	ug/l	2000	Co	
Ni	60	72	2	40.90756	81.81513	ug/l	2000	Ni	
Cu	63	72	2	5063.77322	10127.54644	ug/l	2000	Cu	FAILED
Zn	66	72	2	78.09378	156.18756	ug/l	5000	Zn	
As	75	72	2	37.76463	75.52926	ug/l	2000	As	
Se	78	72	2	19.04101	38.08202	ug/l	1000	Se	
Sr	88	72	3	395.51852	791.03705	ug/l	2000	Sr	
Y	89	72	2	16.44760	32.89520	ug/l	200	Y	
Zr	90	72	2	6.83423	13.66846	ug/l	2000	Zr	
Nb	93	72	2	0.36191	0.72381	ug/l	100	Nb	
Mo	95	72	3	23.29981	46.59962	ug/l	1000	Mo	
Ru	101	72	2	-0.00373	-0.00746	ug/l	200	Ru	
Rh	103	72	2	-0.00666	-0.01331	ug/l	200	Rh	
Pd	105	72	2	0.03910	0.07820	ug/l	20	Pd	
Ag	107	115	3	0.33696	0.67392	ug/l	400	Ag	
Cd	111	115	3	0.10026	0.20052	ug/l	2000	Cd	
Sn	118	115	3	9.43700	18.87401	ug/l	2000	Sn	
Sb	121	115	3	4.76110	9.52219	ug/l	1000	Sb	
Te	125	165	2	0.66052	1.32103	ug/l	200	Te	
Cs	133	165	2	4.54951	9.09902	ug/l	2000	Cs	
Ba	137	165	3	354.23881	708.47762	ug/l	5000	Ba	
La	139	165	2	56.98036	113.96072	ug/l	200	La	
Ce	140	165	2	114.19738	228.39477	ug/l	200	Ce	
Pr	141	165	2	13.13264	26.26529	ug/l	200	Pr	
Nd	146	165	2	51.93630	103.87261	ug/l	200	Nd	
Sm	147	165	3	8.81676	17.63352	ug/l	2000	Sm	
Hf	178	165	2	0.25057	0.50114	ug/l	200	Hf	
Ta	181	165	2	0.02234	0.04468	ug/l	200	Ta	
W	182	165	2	2.32988	4.65976	ug/l	2000	W	
Re	185	193	3	0.00346	0.00692	ug/l	200	Re	
Pt	195	193	2	0.00598	0.01196	ug/l	200	Pt	
Au	197	193	3	0.05715	0.11429	ug/l	2000	Au	
Tl	205	193	3	0.46453	0.92907	ug/l	400	Tl	
Pb	208	193	3	21.28060	42.56120	ug/l	5000	Pb	
Bi	209	193	2	2.87077	5.74154	ug/l	2000	Bi	
Th	232	193	3	28.67626	57.35251	ug/l	2000	Th	
U	238	193	3	6.56179	13.12357	ug/l	2000	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	5260899	2.42	4941712	106.5	80	120	Li (IS)	
Sc (IS)	45	2	245115	0.70	186699	131.3	80	120	Sc (IS)	FAILED
Sc (IS)	45	3	4365759	3.07	3281398	133.0	80	120	Sc (IS)	FAILED
Ge (IS)	72	2	485217	0.30	410530	118.2	80	120	Ge (IS)	
Ge (IS)	72	3	2898922	2.11	2540877	114.1	80	120	Ge (IS)	
In (IS)	115	3	19957769	3.85	19102387	104.5	80	120	In (IS)	
Ho (IS)	165	2	14825912	0.41	14511718	102.2	80	120	Ho (IS)	
Ho (IS)	165	3	23888833	3.57	23609138	101.2	80	120	Ho (IS)	
Ir (IS)	193	2	9184455	1.15	9828030	93.5	80	120	Ir (IS)	
Ir (IS)	193	3	11309544	2.79	11858846	95.4	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Sample Name	**160-36593-B-16-A**
Data File Name	**114SMPL.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-27T04:47:58-06:00**
Type	**Sample**
VialNumber	**3211**
Dilution	**2**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**075CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	FinalConcentration	Units	High Value	Analyte	QC Flag
Li	7	6	3	21.16481	42.32962	ug/l	1000	Li	
Be	9	6	3	0.91864	1.83729	ug/l	1000	Be	
B	11	6	3	2.05389	4.10778	ug/l	2000	B	
Na	23	45	2	413.26378	826.52755	ug/l	50000	Na	
Mg	24	45	2	35663.24264	71326.48528	ug/l	50000	Mg	
Al	27	45	2	42604.86675	85209.73350	ug/l	100000	Al	
P	31	45	2	2147.08671	4294.17342	ug/l	100000	P	
K	39	45	2	6453.60287	12907.20574	ug/l	100000	K	
Ca	44	45	3	25894.01990	51788.03981	ug/l	100000	Ca	
Ti	47	45	3	1741.57368	3483.14736	ug/l	2000	Ti	
V	51	45	2	102.47009	204.94017	ug/l	2000	V	
Cr	52	45	2	25.96766	51.93533	ug/l	2000	Cr	
Mn	55	72	2	272.77309	545.54618	ug/l	5000	Mn	
Fe	57	72	2	74591.99379	149183.98759	ug/l	100000	Fe	
Co	59	72	2	16.05736	32.11471	ug/l	2000	Co	
Ni	60	72	2	37.21641	74.43282	ug/l	2000	Ni	
Cu	63	72	2	4293.79930	8587.59859	ug/l	2000	Cu	FAILED
Zn	66	72	2	71.97394	143.94788	ug/l	5000	Zn	
As	75	72	2	31.37143	62.74286	ug/l	2000	As	
Se	78	72	2	20.23493	40.46986	ug/l	1000	Se	
Sr	88	72	3	512.29343	1024.58686	ug/l	2000	Sr	
Y	89	72	2	15.80095	31.60191	ug/l	200	Y	
Zr	90	72	2	7.40471	14.80942	ug/l	2000	Zr	
Nb	93	72	2	0.45478	0.90956	ug/l	100	Nb	
Mo	95	72	3	19.58804	39.17608	ug/l	1000	Mo	
Ru	101	72	2	-0.00455	-0.00909	ug/l	200	Ru	
Rh	103	72	2	-0.00703	-0.01406	ug/l	200	Rh	
Pd	105	72	2	0.05016	0.10033	ug/l	20	Pd	
Ag	107	115	3	0.44191	0.88383	ug/l	400	Ag	
Cd	111	115	3	0.05954	0.11909	ug/l	2000	Cd	
Sn	118	115	3	10.56907	21.13813	ug/l	2000	Sn	
Sb	121	115	3	2.78011	5.56021	ug/l	1000	Sb	
Te	125	165	2	1.07140	2.14280	ug/l	200	Te	
Cs	133	165	2	4.50555	9.01111	ug/l	2000	Cs	
Ba	137	165	3	337.23975	674.47951	ug/l	5000	Ba	
La	139	165	2	51.31696	102.63393	ug/l	200	La	
Ce	140	165	2	105.10673	210.21347	ug/l	200	Ce	
Pr	141	165	2	12.26054	24.52108	ug/l	200	Pr	
Nd	146	165	2	48.17575	96.35150	ug/l	200	Nd	
Sm	147	165	3	8.20229	16.40457	ug/l	2000	Sm	
Hf	178	165	2	0.27105	0.54209	ug/l	200	Hf	
Ta	181	165	2	0.03180	0.06360	ug/l	200	Ta	
W	182	165	2	2.36573	4.73147	ug/l	2000	W	
Re	185	193	3	0.00847	0.01694	ug/l	200	Re	
Pt	195	193	2	0.00825	0.01650	ug/l	200	Pt	
Au	197	193	3	0.04447	0.08894	ug/l	2000	Au	
Tl	205	193	3	0.45625	0.91250	ug/l	400	Tl	
Pb	208	193	3	19.42099	38.84199	ug/l	5000	Pb	
Bi	209	193	2	2.83061	5.66122	ug/l	2000	Bi	
Th	232	193	3	31.61197	63.22394	ug/l	2000	Th	
U	238	193	3	7.97545	15.95091	ug/l	2000	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	5130788	0.19	4941712	103.8	80	120	Li (IS)	
Sc (IS)	45	2	240475	1.47	186699	128.8	80	120	Sc (IS)	FAILED
Sc (IS)	45	3	4214365	0.52	3281398	128.4	80	120	Sc (IS)	FAILED
Ge (IS)	72	2	477858	0.37	410530	116.4	80	120	Ge (IS)	
Ge (IS)	72	3	2853507	0.38	2540877	112.3	80	120	Ge (IS)	
In (IS)	115	3	19439066	0.79	19102387	101.8	80	120	In (IS)	
Ho (IS)	165	2	14606808	1.75	14511718	100.7	80	120	Ho (IS)	
Ho (IS)	165	3	23511628	0.43	23609138	99.6	80	120	Ho (IS)	
Ir (IS)	193	2	9183136	1.02	9828030	93.4	80	120	Ir (IS)	
Ir (IS)	193	3	11064339	0.71	11858846	93.3	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Sample Name	**160-36593-B-17-A**
Data File Name	**115SMPL.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-27T04:54:42-06:00**
Type	**Sample**
VialNumber	**3212**
Dilution	**2**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**075CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	FinalConcentration	Units	High Value	Analyte	QC Flag
Li	7	6	3	17.21673	34.43346	ug/l	1000	Li	
Be	9	6	3	1.22221	2.44442	ug/l	1000	Be	
B	11	6	3	3.74796	7.49591	ug/l	2000	B	
Na	23	45	2	406.19836	812.39672	ug/l	50000	Na	
Mg	24	45	2	30790.69085	61581.38169	ug/l	50000	Mg	
Al	27	45	2	39070.37529	78140.75058	ug/l	100000	Al	
P	31	45	2	2592.98697	5185.97394	ug/l	100000	P	
K	39	45	2	6522.32586	13044.65173	ug/l	100000	K	
Ca	44	45	3	18976.16986	37952.33973	ug/l	100000	Ca	
Ti	47	45	3	1761.14917	3522.29834	ug/l	2000	Ti	
V	51	45	2	140.67717	281.35435	ug/l	2000	V	
Cr	52	45	2	39.89872	79.79744	ug/l	2000	Cr	
Mn	55	72	2	252.22242	504.44485	ug/l	5000	Mn	
Fe	57	72	2	129592.87793	259185.75587	ug/l	100000	Fe	FAILED
Co	59	72	2	27.74473	55.48946	ug/l	2000	Co	
Ni	60	72	2	48.96202	97.92404	ug/l	2000	Ni	
Cu	63	72	2	11931.91558	23863.83116	ug/l	2000	Cu	FAILED
Zn	66	72	2	68.03343	136.06687	ug/l	5000	Zn	
As	75	72	2	102.39583	204.79166	ug/l	2000	As	
Se	78	72	2	67.03109	134.06218	ug/l	1000	Se	
Sr	88	72	3	298.57612	597.15224	ug/l	2000	Sr	
Y	89	72	2	13.05517	26.11034	ug/l	200	Y	
Zr	90	72	2	7.60333	15.20665	ug/l	2000	Zr	
Nb	93	72	2	0.37776	0.75552	ug/l	100	Nb	
Mo	95	72	3	38.61142	77.22284	ug/l	1000	Mo	
Ru	101	72	2	-0.00437	-0.00875	ug/l	200	Ru	
Rh	103	72	2	-0.00720	-0.01439	ug/l	200	Rh	
Pd	105	72	2	0.03300	0.06600	ug/l	20	Pd	
Ag	107	115	3	6.54900	13.09800	ug/l	400	Ag	
Cd	111	115	3	0.16595	0.33189	ug/l	2000	Cd	
Sn	118	115	3	9.92845	19.85690	ug/l	2000	Sn	
Sb	121	115	3	7.19505	14.39010	ug/l	1000	Sb	
Te	125	165	2	3.18188	6.36375	ug/l	200	Te	
Cs	133	165	2	4.75365	9.50730	ug/l	2000	Cs	
Ba	137	165	3	334.73738	669.47477	ug/l	5000	Ba	
La	139	165	2	39.49932	78.99865	ug/l	200	La	
Ce	140	165	2	76.73892	153.47783	ug/l	200	Ce	
Pr	141	165	2	9.07754	18.15507	ug/l	200	Pr	
Nd	146	165	2	36.31693	72.63386	ug/l	200	Nd	
Sm	147	165	3	6.42219	12.84438	ug/l	2000	Sm	
Hf	178	165	2	0.24575	0.49151	ug/l	200	Hf	
Ta	181	165	2	0.02238	0.04477	ug/l	200	Ta	
W	182	165	2	52.17740	104.35481	ug/l	2000	W	
Re	185	193	3	0.01485	0.02971	ug/l	200	Re	
Pt	195	193	2	0.01071	0.02142	ug/l	200	Pt	
Au	197	193	3	0.10220	0.20440	ug/l	2000	Au	
Tl	205	193	3	0.79928	1.59855	ug/l	400	Tl	
Pb	208	193	3	23.89041	47.78083	ug/l	5000	Pb	
Bi	209	193	2	5.44768	10.89536	ug/l	2000	Bi	
Th	232	193	3	27.35694	54.71387	ug/l	2000	Th	
U	238	193	3	9.70069	19.40139	ug/l	2000	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	5133723	0.26	4941712	103.9	80	120	Li (IS)	
Sc (IS)	45	2	247231	0.68	186699	132.4	80	120	Sc (IS)	FAILED
Sc (IS)	45	3	4308132	0.45	3281398	131.3	80	120	Sc (IS)	FAILED
Ge (IS)	72	2	472461	0.74	410530	115.1	80	120	Ge (IS)	
Ge (IS)	72	3	2841982	0.44	2540877	111.9	80	120	Ge (IS)	
In (IS)	115	3	19502993	1.19	19102387	102.1	80	120	In (IS)	
Ho (IS)	165	2	14703617	0.40	14511718	101.3	80	120	Ho (IS)	
Ho (IS)	165	3	23668975	0.87	23609138	100.3	80	120	Ho (IS)	
Ir (IS)	193	2	9223458	0.32	9828030	93.8	80	120	Ir (IS)	
Ir (IS)	193	3	11049649	0.90	11858846	93.2	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Sample Name	**160-36593-B-18-B**
Data File Name	**116SMPL.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-27T05:01:31-06:00**
Type	**Sample**
VialNumber	**3301**
Dilution	**2**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**075CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	FinalConcentration	Units	High Value	Analyte	QC Flag
Li	7	6	3	16.08438	32.16876	ug/l	1000	Li	
Be	9	6	3	1.16563	2.33125	ug/l	1000	Be	
B	11	6	3	0.52259	1.04517	ug/l	2000	B	
Na	23	45	2	490.16686	980.33372	ug/l	50000	Na	
Mg	24	45	2	31563.25029	63126.50057	ug/l	50000	Mg	
Al	27	45	2	40207.34839	80414.69677	ug/l	100000	Al	
P	31	45	2	2530.96966	5061.93932	ug/l	100000	P	
K	39	45	2	7269.55499	14539.10999	ug/l	100000	K	
Ca	44	45	3	15970.11952	31940.23904	ug/l	100000	Ca	
Ti	47	45	3	1028.25900	2056.51801	ug/l	2000	Ti	
V	51	45	2	120.83297	241.66593	ug/l	2000	V	
Cr	52	45	2	38.48208	76.96417	ug/l	2000	Cr	
Mn	55	72	2	350.96736	701.93473	ug/l	5000	Mn	
Fe	57	72	2	106887.01551	213774.03102	ug/l	100000	Fe	FAILED
Co	59	72	2	23.73135	47.46270	ug/l	2000	Co	
Ni	60	72	2	47.31025	94.62049	ug/l	2000	Ni	
Cu	63	72	2	9320.69179	18641.38358	ug/l	2000	Cu	FAILED
Zn	66	72	2	111.04954	222.09907	ug/l	5000	Zn	
As	75	72	2	47.29370	94.58739	ug/l	2000	As	
Se	78	72	2	22.25436	44.50871	ug/l	1000	Se	
Sr	88	72	3	296.23793	592.47587	ug/l	2000	Sr	
Y	89	72	2	20.17845	40.35689	ug/l	200	Y	
Zr	90	72	2	5.49245	10.98491	ug/l	2000	Zr	
Nb	93	72	2	0.10589	0.21177	ug/l	100	Nb	
Mo	95	72	3	29.14392	58.28785	ug/l	1000	Mo	
Ru	101	72	2	-0.00482	-0.00964	ug/l	200	Ru	
Rh	103	72	2	-0.00665	-0.01329	ug/l	200	Rh	
Pd	105	72	2	0.04396	0.08791	ug/l	20	Pd	
Ag	107	115	3	0.52165	1.04330	ug/l	400	Ag	
Cd	111	115	3	0.12544	0.25088	ug/l	2000	Cd	
Sn	118	115	3	10.21546	20.43093	ug/l	2000	Sn	
Sb	121	115	3	1.81851	3.63703	ug/l	1000	Sb	
Te	125	165	2	1.43649	2.87297	ug/l	200	Te	
Cs	133	165	2	4.51919	9.03838	ug/l	2000	Cs	
Ba	137	165	3	363.78656	727.57312	ug/l	5000	Ba	
La	139	165	2	72.22876	144.45751	ug/l	200	La	
Ce	140	165	2	144.87470	289.74939	ug/l	200	Ce	
Pr	141	165	2	16.68259	33.36518	ug/l	200	Pr	
Nd	146	165	2	65.11625	130.23249	ug/l	200	Nd	
Sm	147	165	3	10.85595	21.71190	ug/l	2000	Sm	
Hf	178	165	2	0.16559	0.33118	ug/l	200	Hf	
Ta	181	165	2	0.01498	0.02996	ug/l	200	Ta	
W	182	165	2	3.51385	7.02771	ug/l	2000	W	
Re	185	193	3	0.02155	0.04310	ug/l	200	Re	
Pt	195	193	2	0.00977	0.01955	ug/l	200	Pt	
Au	197	193	3	0.08115	0.16229	ug/l	2000	Au	
Tl	205	193	3	0.72968	1.45936	ug/l	400	Tl	
Pb	208	193	3	22.77857	45.55713	ug/l	5000	Pb	
Bi	209	193	2	4.92922	9.85843	ug/l	2000	Bi	
Th	232	193	3	29.34617	58.69235	ug/l	2000	Th	
U	238	193	3	11.59688	23.19377	ug/l	2000	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	4982820	0.54	4941712	100.8	80	120	Li (IS)	
Sc (IS)	45	2	233617	0.55	186699	125.1	80	120	Sc (IS)	FAILED
Sc (IS)	45	3	4057151	0.29	3281398	123.6	80	120	Sc (IS)	FAILED
Ge (IS)	72	2	474183	0.93	410530	115.5	80	120	Ge (IS)	
Ge (IS)	72	3	2799078	0.23	2540877	110.2	80	120	Ge (IS)	
In (IS)	115	3	19091449	1.16	19102387	99.9	80	120	In (IS)	
Ho (IS)	165	2	14639926	1.01	14511718	100.9	80	120	Ho (IS)	
Ho (IS)	165	3	23056501	0.35	23609138	97.7	80	120	Ho (IS)	
Ir (IS)	193	2	9118128	0.73	9828030	92.8	80	120	Ir (IS)	
Ir (IS)	193	3	10781380	0.28	11858846	90.9	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Sample Name	**MB 160-453196/1-A**
Data File Name	**117SMPL.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-27T05:08:18-06:00**
Type	**Sample**
VialNumber	**3302**
Dilution	**2**
Comment	**453196**
Operator	**LP 7700**
ISTDRefDataFileName	**075CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	FinalConcentration	Units	High Value	Analyte	QC Flag
Li	7	6	3	0.23537	0.47074	ug/l	1000	Li	
Be	9	6	3	-0.00631	-0.01262	ug/l	1000	Be	
B	11	6	3	-5.90024	-11.80047	ug/l	2000	B	
Na	23	45	2	-4.65308	-9.30616	ug/l	50000	Na	
Mg	24	45	2	2.82363	5.64725	ug/l	50000	Mg	
Al	27	45	2	4.66272	9.32543	ug/l	100000	Al	
P	31	45	2	10.84556	21.69111	ug/l	100000	P	
K	39	45	2	-2.19356	-4.38713	ug/l	100000	K	
Ca	44	45	3	0.24001	0.48001	ug/l	100000	Ca	
Ti	47	45	3	0.30667	0.61334	ug/l	2000	Ti	
V	51	45	2	-0.09892	-0.19784	ug/l	2000	V	
Cr	52	45	2	0.00165	0.00331	ug/l	2000	Cr	
Mn	55	72	2	0.00274	0.00549	ug/l	5000	Mn	
Fe	57	72	2	4.64454	9.28908	ug/l	100000	Fe	
Co	59	72	2	-0.01041	-0.02083	ug/l	2000	Co	
Ni	60	72	2	-0.00803	-0.01606	ug/l	2000	Ni	
Cu	63	72	2	2.27050	4.54100	ug/l	2000	Cu	
Zn	66	72	2	0.16807	0.33613	ug/l	5000	Zn	
As	75	72	2	-0.00367	-0.00734	ug/l	2000	As	
Se	78	72	2	-0.07618	-0.15237	ug/l	1000	Se	
Sr	88	72	3	0.02960	0.05920	ug/l	2000	Sr	
Y	89	72	2	-0.00558	-0.01116	ug/l	200	Y	
Zr	90	72	2	-0.00903	-0.01807	ug/l	2000	Zr	
Nb	93	72	2	-0.09776	-0.19551	ug/l	100	Nb	
Mo	95	72	3	0.01213	0.02425	ug/l	1000	Mo	
Ru	101	72	2	-0.00626	-0.01252	ug/l	200	Ru	
Rh	103	72	2	-0.00895	-0.01790	ug/l	200	Rh	
Pd	105	72	2	-0.00118	-0.00236	ug/l	20	Pd	
Ag	107	115	3	-0.00571	-0.01143	ug/l	400	Ag	
Cd	111	115	3	-0.00758	-0.01516	ug/l	2000	Cd	
Sn	118	115	3	-0.06982	-0.13964	ug/l	2000	Sn	
Sb	121	115	3	-0.01376	-0.02753	ug/l	1000	Sb	
Te	125	165	2	-0.03730	-0.07460	ug/l	200	Te	
Cs	133	165	2	-0.00471	-0.00942	ug/l	2000	Cs	
Ba	137	165	3	0.01954	0.03909	ug/l	5000	Ba	
La	139	165	2	-0.00225	-0.00451	ug/l	200	La	
Ce	140	165	2	0.00019	0.00039	ug/l	200	Ce	
Pr	141	165	2	-0.00508	-0.01017	ug/l	200	Pr	
Nd	146	165	2	-0.00401	-0.00803	ug/l	200	Nd	
Sm	147	165	3	-0.00638	-0.01276	ug/l	2000	Sm	
Hf	178	165	2	-0.01823	-0.03646	ug/l	200	Hf	
Ta	181	165	2	0.00032	0.00063	ug/l	200	Ta	
W	182	165	2	0.08704	0.17407	ug/l	2000	W	
Re	185	193	3	-0.00549	-0.01098	ug/l	200	Re	
Pt	195	193	2	0.00255	0.00510	ug/l	200	Pt	
Au	197	193	3	-0.02393	-0.04786	ug/l	2000	Au	
Tl	205	193	3	-0.00235	-0.00470	ug/l	400	Tl	
Pb	208	193	3	-0.02001	-0.04001	ug/l	5000	Pb	
Bi	209	193	2	0.00316	0.00631	ug/l	2000	Bi	
Th	232	193	3	0.00027	0.00053	ug/l	2000	Th	
U	238	193	3	-0.00461	-0.00922	ug/l	2000	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	4883751	3.06	4941712	98.8	80	120	Li (IS)	
Sc (IS)	45	2	204862	0.20	186699	109.7	80	120	Sc (IS)	
Sc (IS)	45	3	3519900	4.27	3281398	107.3	80	120	Sc (IS)	
Ge (IS)	72	2	452395	0.48	410530	110.2	80	120	Ge (IS)	
Ge (IS)	72	3	2763173	3.11	2540877	108.7	80	120	Ge (IS)	
In (IS)	115	3	19674896	4.72	19102387	103.0	80	120	In (IS)	
Ho (IS)	165	2	14537299	0.54	14511718	100.2	80	120	Ho (IS)	
Ho (IS)	165	3	23256911	4.48	23609138	98.5	80	120	Ho (IS)	
Ir (IS)	193	2	9475853	0.61	9828030	96.4	80	120	Ir (IS)	
Ir (IS)	193	3	11424281	5.05	11858846	96.3	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Sample Name	**LCS 160-453196/2-A**
Data File Name	**118SMPL.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-27T05:15:02-06:00**
Type	**Sample**
VialNumber	**3303**
Dilution	**2**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**075CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	FinalConcentration	Units	High Value	Analyte	QC Flag
Li	7	6	3	51.25172	102.50344	ug/l	1000	Li	
Be	9	6	3	49.91503	99.83006	ug/l	1000	Be	
B	11	6	3	90.63856	181.27712	ug/l	2000	B	
Na	23	45	2	4987.05626	9974.11252	ug/l	50000	Na	
Mg	24	45	2	4995.10786	9990.21571	ug/l	50000	Mg	
Al	27	45	2	4966.30599	9932.61198	ug/l	100000	Al	
P	31	45	2	500.36776	1000.73552	ug/l	100000	P	
K	39	45	2	5030.53983	10061.07967	ug/l	100000	K	
Ca	44	45	3	5117.53456	10235.06911	ug/l	100000	Ca	
Ti	47	45	3	507.39824	1014.79648	ug/l	2000	Ti	
V	51	45	2	489.20146	978.40292	ug/l	2000	V	
Cr	52	45	2	492.44770	984.89540	ug/l	2000	Cr	
Mn	55	72	2	518.11893	1036.23786	ug/l	5000	Mn	
Fe	57	72	2	5198.43594	10396.87189	ug/l	100000	Fe	
Co	59	72	2	517.60728	1035.21456	ug/l	2000	Co	
Ni	60	72	2	533.17483	1066.34966	ug/l	2000	Ni	
Cu	63	72	2	521.58931	1043.17862	ug/l	2000	Cu	
Zn	66	72	2	492.96700	985.93399	ug/l	5000	Zn	
As	75	72	2	502.33340	1004.66679	ug/l	2000	As	
Se	78	72	2	249.83283	499.66566	ug/l	1000	Se	
Sr	88	72	3	510.71452	1021.42904	ug/l	2000	Sr	
Y	89	72	2	-0.00081	-0.00161	ug/l	200	Y	
Zr	90	72	2	515.23351	1030.46703	ug/l	2000	Zr	
Nb	93	72	2	0.31598	0.63196	ug/l	100	Nb	
Mo	95	72	3	254.97433	509.94867	ug/l	1000	Mo	
Ru	101	72	2	-0.00586	-0.01171	ug/l	200	Ru	
Rh	103	72	2	0.01432	0.02864	ug/l	200	Rh	
Pd	105	72	2	0.02901	0.05801	ug/l	20	Pd	
Ag	107	115	3	99.80017	199.60034	ug/l	400	Ag	
Cd	111	115	3	505.45876	1010.91751	ug/l	2000	Cd	
Sn	118	115	3	499.46587	998.93173	ug/l	2000	Sn	
Sb	121	115	3	252.61052	505.22105	ug/l	1000	Sb	
Te	125	165	2	0.07078	0.14156	ug/l	200	Te	
Cs	133	165	2	-0.00443	-0.00886	ug/l	2000	Cs	
Ba	137	165	3	502.45244	1004.90488	ug/l	5000	Ba	
La	139	165	2	0.79789	1.59578	ug/l	200	La	
Ce	140	165	2	0.01627	0.03255	ug/l	200	Ce	
Pr	141	165	2	-0.00078	-0.00156	ug/l	200	Pr	
Nd	146	165	2	0.00145	0.00290	ug/l	200	Nd	
Sm	147	165	3	512.95667	1025.91333	ug/l	2000	Sm	
Hf	178	165	2	0.31771	0.63542	ug/l	200	Hf	
Ta	181	165	2	0.36842	0.73683	ug/l	200	Ta	
W	182	165	2	485.23413	970.46825	ug/l	2000	W	
Re	185	193	3	0.00659	0.01317	ug/l	200	Re	
Pt	195	193	2	0.00472	0.00944	ug/l	200	Pt	
Au	197	193	3	-0.01361	-0.02721	ug/l	2000	Au	
Tl	205	193	3	100.78217	201.56435	ug/l	400	Tl	
Pb	208	193	3	505.59887	1011.19774	ug/l	5000	Pb	
Bi	209	193	2	524.09216	1048.18432	ug/l	2000	Bi	
Th	232	193	3	504.53145	1009.06289	ug/l	2000	Th	
U	238	193	3	507.74791	1015.49581	ug/l	2000	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	4531275	0.24	4941712	91.7	80	120	Li (IS)	
Sc (IS)	45	2	195580	0.28	186699	104.8	80	120	Sc (IS)	
Sc (IS)	45	3	3323138	0.25	3281398	101.3	80	120	Sc (IS)	
Ge (IS)	72	2	433742	0.58	410530	105.7	80	120	Ge (IS)	
Ge (IS)	72	3	2597549	0.13	2540877	102.2	80	120	Ge (IS)	
In (IS)	115	3	18604173	0.90	19102387	97.4	80	120	In (IS)	
Ho (IS)	165	2	14130079	0.21	14511718	97.4	80	120	Ho (IS)	
Ho (IS)	165	3	23003600	0.21	23609138	97.4	80	120	Ho (IS)	
Ir (IS)	193	2	8969671	0.41	9828030	91.3	80	120	Ir (IS)	
Ir (IS)	193	3	11159581	0.29	11858846	94.1	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Sample Name	**180-99027-C-2-A**
Data File Name	**119SMPL.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-27T05:21:44-06:00**
Type	**Sample**
VialNumber	**3304**
Dilution	**2**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**075CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	FinalConcentration	Units	High Value	Analyte	QC Flag
Li	7	6	3	2.06752	4.13504	ug/l	1000	Li	
Be	9	6	3	0.25924	0.51847	ug/l	1000	Be	
B	11	6	3	1478.52773	2957.05545	ug/l	2000	B	
Na	23	45	2	35780.77969	71561.55937	ug/l	50000	Na	
Mg	24	45	2	4911.16806	9822.33611	ug/l	50000	Mg	
Al	27	45	2	464.60314	929.20628	ug/l	100000	Al	
P	31	45	2	5.66326	11.32651	ug/l	100000	P	
K	39	45	2	7513.61744	15027.23488	ug/l	100000	K	
Ca	44	45	3	19651.29452	39302.58903	ug/l	100000	Ca	
Ti	47	45	3	0.48349	0.96699	ug/l	2000	Ti	
V	51	45	2	-0.18063	-0.36127	ug/l	2000	V	
Cr	52	45	2	0.15663	0.31326	ug/l	2000	Cr	
Mn	55	72	2	95.16604	190.33208	ug/l	5000	Mn	
Fe	57	72	2	9.51010	19.02020	ug/l	100000	Fe	
Co	59	72	2	3.33652	6.67304	ug/l	2000	Co	
Ni	60	72	2	4.10648	8.21297	ug/l	2000	Ni	
Cu	63	72	2	1.59749	3.19499	ug/l	2000	Cu	
Zn	66	72	2	7.15614	14.31228	ug/l	5000	Zn	
As	75	72	2	0.80050	1.60100	ug/l	2000	As	
Se	78	72	2	5.43367	10.86734	ug/l	1000	Se	
Sr	88	72	3	155.42541	310.85083	ug/l	2000	Sr	
Y	89	72	2	20.02463	40.04926	ug/l	200	Y	
Zr	90	72	2	0.07788	0.15577	ug/l	2000	Zr	
Nb	93	72	2	-0.13716	-0.27433	ug/l	100	Nb	
Mo	95	72	3	0.11243	0.22485	ug/l	1000	Mo	
Ru	101	72	2	-0.00514	-0.01028	ug/l	200	Ru	
Rh	103	72	2	-0.00876	-0.01753	ug/l	200	Rh	
Pd	105	72	2	0.03341	0.06682	ug/l	20	Pd	
Ag	107	115	3	0.00758	0.01516	ug/l	400	Ag	
Cd	111	115	3	0.08797	0.17593	ug/l	2000	Cd	
Sn	118	115	3	0.27203	0.54406	ug/l	2000	Sn	
Sb	121	115	3	0.02434	0.04869	ug/l	1000	Sb	
Te	125	165	2	-0.02705	-0.05409	ug/l	200	Te	
Cs	133	165	2	0.21804	0.43607	ug/l	2000	Cs	
Ba	137	165	3	87.96802	175.93603	ug/l	5000	Ba	
La	139	165	2	34.60414	69.20828	ug/l	200	La	
Ce	140	165	2	66.73523	133.47046	ug/l	200	Ce	
Pr	141	165	2	8.06105	16.12210	ug/l	200	Pr	
Nd	146	165	2	31.17817	62.35634	ug/l	200	Nd	
Sm	147	165	3	6.81597	13.63194	ug/l	2000	Sm	
Hf	178	165	2	-0.01484	-0.02968	ug/l	200	Hf	
Ta	181	165	2	-0.01648	-0.03296	ug/l	200	Ta	
W	182	165	2	0.76498	1.52996	ug/l	2000	W	
Re	185	193	3	0.07702	0.15404	ug/l	200	Re	
Pt	195	193	2	0.00178	0.00355	ug/l	200	Pt	
Au	197	193	3	-0.02414	-0.04828	ug/l	2000	Au	
Tl	205	193	3	0.20880	0.41760	ug/l	400	Tl	
Pb	208	193	3	0.20738	0.41476	ug/l	5000	Pb	
Bi	209	193	2	0.11561	0.23122	ug/l	2000	Bi	
Th	232	193	3	0.15175	0.30349	ug/l	2000	Th	
U	238	193	3	0.25190	0.50381	ug/l	2000	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	4710340	0.58	4941712	95.3	80	120	Li (IS)	
Sc (IS)	45	2	195661	1.59	186699	104.8	80	120	Sc (IS)	
Sc (IS)	45	3	3496689	0.73	3281398	106.6	80	120	Sc (IS)	
Ge (IS)	72	2	448293	0.47	410530	109.2	80	120	Ge (IS)	
Ge (IS)	72	3	2719963	0.64	2540877	107.0	80	120	Ge (IS)	
In (IS)	115	3	19218240	0.35	19102387	100.6	80	120	In (IS)	
Ho (IS)	165	2	14433615	0.57	14511718	99.5	80	120	Ho (IS)	
Ho (IS)	165	3	23145449	0.63	23609138	98.0	80	120	Ho (IS)	
Ir (IS)	193	2	9134437	0.78	9828030	92.9	80	120	Ir (IS)	
Ir (IS)	193	3	10877803	0.37	11858846	91.7	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Sample Name	**180-99027-C-4-A**
Data File Name	**120SMPL.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-27T05:28:28-06:00**
Type	**Sample**
VialNumber	**3305**
Dilution	**2**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**075CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	FinalConcentration	Units	High Value	Analyte	QC Flag
Li	7	6	3	0.36278	0.72556	ug/l	1000	Li	
Be	9	6	3	0.00715	0.01430	ug/l	1000	Be	
B	11	6	3	11.08353	22.16706	ug/l	2000	B	
Na	23	45	2	1035.93668	2071.87337	ug/l	50000	Na	
Mg	24	45	2	66.39882	132.79764	ug/l	50000	Mg	
Al	27	45	2	4.48661	8.97322	ug/l	100000	Al	
P	31	45	2	6.13143	12.26286	ug/l	100000	P	
K	39	45	2	141.68804	283.37609	ug/l	100000	K	
Ca	44	45	3	93.97532	187.95065	ug/l	100000	Ca	
Ti	47	45	3	0.26270	0.52540	ug/l	2000	Ti	
V	51	45	2	-0.13923	-0.27846	ug/l	2000	V	
Cr	52	45	2	0.05979	0.11958	ug/l	2000	Cr	
Mn	55	72	2	1.04514	2.09027	ug/l	5000	Mn	
Fe	57	72	2	3.21167	6.42333	ug/l	100000	Fe	
Co	59	72	2	0.05625	0.11249	ug/l	2000	Co	
Ni	60	72	2	0.10299	0.20598	ug/l	2000	Ni	
Cu	63	72	2	1.05133	2.10266	ug/l	2000	Cu	
Zn	66	72	2	0.86548	1.73095	ug/l	5000	Zn	
As	75	72	2	0.04192	0.08383	ug/l	2000	As	
Se	78	72	2	-0.08772	-0.17544	ug/l	1000	Se	
Sr	88	72	3	0.67815	1.35631	ug/l	2000	Sr	
Y	89	72	2	-0.00031	-0.00063	ug/l	200	Y	
Zr	90	72	2	0.02140	0.04279	ug/l	2000	Zr	
Nb	93	72	2	-0.14230	-0.28460	ug/l	100	Nb	
Mo	95	72	3	0.03349	0.06698	ug/l	1000	Mo	
Ru	101	72	2	-0.00385	-0.00771	ug/l	200	Ru	
Rh	103	72	2	-0.00803	-0.01607	ug/l	200	Rh	
Pd	105	72	2	-0.00025	-0.00050	ug/l	20	Pd	
Ag	107	115	3	0.00148	0.00296	ug/l	400	Ag	
Cd	111	115	3	0.01123	0.02246	ug/l	2000	Cd	
Sn	118	115	3	0.04977	0.09953	ug/l	2000	Sn	
Sb	121	115	3	-0.00201	-0.00402	ug/l	1000	Sb	
Te	125	165	2	-0.03033	-0.06066	ug/l	200	Te	
Cs	133	165	2	0.00332	0.00664	ug/l	2000	Cs	
Ba	137	165	3	1.27540	2.55080	ug/l	5000	Ba	
La	139	165	2	0.00496	0.00992	ug/l	200	La	
Ce	140	165	2	0.01193	0.02386	ug/l	200	Ce	
Pr	141	165	2	-0.00322	-0.00643	ug/l	200	Pr	
Nd	146	165	2	0.00166	0.00331	ug/l	200	Nd	
Sm	147	165	3	0.00443	0.00886	ug/l	2000	Sm	
Hf	178	165	2	-0.02052	-0.04104	ug/l	200	Hf	
Ta	181	165	2	-0.01477	-0.02954	ug/l	200	Ta	
W	182	165	2	0.24190	0.48380	ug/l	2000	W	
Re	185	193	3	-0.00064	-0.00128	ug/l	200	Re	
Pt	195	193	2	0.00083	0.00165	ug/l	200	Pt	
Au	197	193	3	-0.02344	-0.04688	ug/l	2000	Au	
Tl	205	193	3	0.04059	0.08118	ug/l	400	Tl	
Pb	208	193	3	0.02144	0.04289	ug/l	5000	Pb	
Bi	209	193	2	0.04563	0.09126	ug/l	2000	Bi	
Th	232	193	3	0.03248	0.06496	ug/l	2000	Th	
U	238	193	3	0.00794	0.01589	ug/l	2000	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	4653696	0.46	4941712	94.2	80	120	Li (IS)	
Sc (IS)	45	2	196447	0.99	186699	105.2	80	120	Sc (IS)	
Sc (IS)	45	3	3349843	0.63	3281398	102.1	80	120	Sc (IS)	
Ge (IS)	72	2	442502	0.71	410530	107.8	80	120	Ge (IS)	
Ge (IS)	72	3	2644695	0.55	2540877	104.1	80	120	Ge (IS)	
In (IS)	115	3	19197789	0.54	19102387	100.5	80	120	In (IS)	
Ho (IS)	165	2	14206678	0.56	14511718	97.9	80	120	Ho (IS)	
Ho (IS)	165	3	22939010	1.09	23609138	97.2	80	120	Ho (IS)	
Ir (IS)	193	2	9349862	0.82	9828030	95.1	80	120	Ir (IS)	
Ir (IS)	193	3	11270788	0.93	11858846	95.0	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Sample Name	**180-99027-C-6-A**
Data File Name	**121SMPL.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-27T05:35:14-06:00**
Type	**Sample**
VialNumber	**3306**
Dilution	**2**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**075CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	FinalConcentration	Units	High Value	Analyte	QC Flag
Li	7	6	3	1.90036	3.80072	ug/l	1000	Li	
Be	9	6	3	0.15009	0.30018	ug/l	1000	Be	
B	11	6	3	1474.66398	2949.32796	ug/l	2000	B	
Na	23	45	2	36817.55139	73635.10277	ug/l	50000	Na	
Mg	24	45	2	5407.37587	10814.75174	ug/l	50000	Mg	
Al	27	45	2	299.21980	598.43959	ug/l	100000	Al	
P	31	45	2	6.05329	12.10657	ug/l	100000	P	
K	39	45	2	7501.03012	15002.06024	ug/l	100000	K	
Ca	44	45	3	20125.57141	40251.14282	ug/l	100000	Ca	
Ti	47	45	3	0.40676	0.81352	ug/l	2000	Ti	
V	51	45	2	-0.10641	-0.21282	ug/l	2000	V	
Cr	52	45	2	0.15611	0.31223	ug/l	2000	Cr	
Mn	55	72	2	105.25715	210.51429	ug/l	5000	Mn	
Fe	57	72	2	16.10321	32.20641	ug/l	100000	Fe	
Co	59	72	2	3.06563	6.13125	ug/l	2000	Co	
Ni	60	72	2	4.25772	8.51544	ug/l	2000	Ni	
Cu	63	72	2	1.00030	2.00061	ug/l	2000	Cu	
Zn	66	72	2	7.17794	14.35588	ug/l	5000	Zn	
As	75	72	2	0.54542	1.09083	ug/l	2000	As	
Se	78	72	2	4.37557	8.75114	ug/l	1000	Se	
Sr	88	72	3	155.90231	311.80462	ug/l	2000	Sr	
Y	89	72	2	17.04662	34.09325	ug/l	200	Y	
Zr	90	72	2	0.02196	0.04393	ug/l	2000	Zr	
Nb	93	72	2	-0.14523	-0.29046	ug/l	100	Nb	
Mo	95	72	3	0.00472	0.00945	ug/l	1000	Mo	
Ru	101	72	2	-0.00532	-0.01063	ug/l	200	Ru	
Rh	103	72	2	-0.00868	-0.01737	ug/l	200	Rh	
Pd	105	72	2	0.02745	0.05489	ug/l	20	Pd	
Ag	107	115	3	-0.00593	-0.01187	ug/l	400	Ag	
Cd	111	115	3	0.05519	0.11038	ug/l	2000	Cd	
Sn	118	115	3	0.06299	0.12599	ug/l	2000	Sn	
Sb	121	115	3	-0.00176	-0.00353	ug/l	1000	Sb	
Te	125	165	2	-0.03027	-0.06053	ug/l	200	Te	
Cs	133	165	2	0.23470	0.46941	ug/l	2000	Cs	
Ba	137	165	3	83.88068	167.76136	ug/l	5000	Ba	
La	139	165	2	26.90240	53.80481	ug/l	200	La	
Ce	140	165	2	47.15634	94.31268	ug/l	200	Ce	
Pr	141	165	2	6.21269	12.42538	ug/l	200	Pr	
Nd	146	165	2	24.19493	48.38987	ug/l	200	Nd	
Sm	147	165	3	5.23253	10.46506	ug/l	2000	Sm	
Hf	178	165	2	-0.01531	-0.03062	ug/l	200	Hf	
Ta	181	165	2	-0.00963	-0.01925	ug/l	200	Ta	
W	182	165	2	0.04849	0.09699	ug/l	2000	W	
Re	185	193	3	0.08438	0.16877	ug/l	200	Re	
Pt	195	193	2	0.00396	0.00792	ug/l	200	Pt	
Au	197	193	3	-0.02451	-0.04903	ug/l	2000	Au	
Tl	205	193	3	0.09297	0.18595	ug/l	400	Tl	
Pb	208	193	3	0.14806	0.29613	ug/l	5000	Pb	
Bi	209	193	2	0.01601	0.03203	ug/l	2000	Bi	
Th	232	193	3	0.01502	0.03003	ug/l	2000	Th	
U	238	193	3	0.12567	0.25135	ug/l	2000	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	4566216	0.38	4941712	92.4	80	120	Li (IS)	
Sc (IS)	45	2	189017	0.74	186699	101.2	80	120	Sc (IS)	
Sc (IS)	45	3	3375956	0.56	3281398	102.9	80	120	Sc (IS)	
Ge (IS)	72	2	434792	0.76	410530	105.9	80	120	Ge (IS)	
Ge (IS)	72	3	2657731	0.54	2540877	104.6	80	120	Ge (IS)	
In (IS)	115	3	18909106	1.09	19102387	99.0	80	120	In (IS)	
Ho (IS)	165	2	13983664	1.21	14511718	96.4	80	120	Ho (IS)	
Ho (IS)	165	3	22996943	0.49	23609138	97.4	80	120	Ho (IS)	
Ir (IS)	193	2	8942952	1.04	9828030	91.0	80	120	Ir (IS)	
Ir (IS)	193	3	10923786	0.75	11858846	92.1	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Low Level Continuing Calibration Verification (CCV) - US EPA Method 6020

Sample Name	**CCVL 1856860**
Data File Name	**122LCCV.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-27T05:41:59-06:00**
Type	**CRI**
VialNumber	**1101**
Dilution	**1**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**075CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	Units	ExpectedValue	%Recovery	%QC Low	%QC High	Analyte	QC Flag
Li	7	6	3	5.19730	ug/l	5	103.9	80	120	Li	
Be	9	6	3	0.51068	ug/l	0.5	102.1	80	120	Be	
B	11	6	3	105.26089	ug/l	100	105.3	80	120	B	
Na	23	45	2	103.45356	ug/l	100	103.5	80	120	Na	
Mg	24	45	2	58.11823	ug/l	50	116.2	80	120	Mg	
Al	27	45	2	60.19088	ug/l	50	120.4	80	120	Al	FAILED
P	31	45	2	104.91858	ug/l	100	104.9	80	120	P	
K	39	45	2	110.41309	ug/l	100	110.4	80	120	K	
Ca	44	45	3	248.88089	ug/l	200	124.4	80	120	Ca	FAILED
Ti	47	45	3	5.15956	ug/l	5	103.2	80	120	Ti	
V	51	45	2	9.75045	ug/l	10	97.5	80	120	V	
Cr	52	45	2	10.18837	ug/l	10	101.9	80	120	Cr	
Mn	55	72	2	4.26586	ug/l	4	106.6	80	120	Mn	
Fe	57	72	2	54.88824	ug/l	50	109.8	80	120	Fe	
Co	59	72	2	2.11096	ug/l	2	105.5	80	120	Co	
Ni	60	72	2	5.49637	ug/l	5	109.9	80	120	Ni	
Cu	63	72	2	3.71043	ug/l	3	123.7	80	120	Cu	FAILED
Zn	66	72	2	22.39219	ug/l	20	112.0	80	120	Zn	
As	75	72	2	10.55516	ug/l	10	105.6	80	120	As	
Se	78	72	2	4.86125	ug/l	5	97.2	80	120	Se	
Sr	88	72	3	5.30202	ug/l	5	106.0	80	120	Sr	
Y	89	72	2	5.13881	ug/l	5	102.8	80	120	Y	
Zr	90	72	2	5.09868	ug/l	5	102.0	80	120	Zr	
Nb	93	72	2	18.89807	ug/l	25	75.6	80	120	Nb	FAILED
Mo	95	72	3	5.02584	ug/l	5	100.5	80	120	Mo	
Ru	101	72	2	10.21677	ug/l	10	102.2	80	120	Ru	
Rh	103	72	2	10.22535	ug/l	10	102.3	80	120	Rh	
Pd	105	72	2	0.54399	ug/l	0.5	108.8	80	120	Pd	
Ag	107	115	3	1.97631	ug/l	2	98.8	80	120	Ag	
Cd	111	115	3	0.49580	ug/l	0.5	99.2	80	120	Cd	
Sn	118	115	3	1.77815	ug/l	2	88.9	80	120	Sn	
Sb	121	115	3	4.79970	ug/l	5	96.0	80	120	Sb	
Te	125	165	2	10.11535	ug/l	10	101.2	80	120	Te	
Cs	133	165	2	0.99495	ug/l	1	99.5	80	120	Cs	
Ba	137	165	3	2.05055	ug/l	2	102.5	80	120	Ba	
La	139	165	2	1.94748	ug/l	2	97.4	80	120	La	
Ce	140	165	2	9.64955	ug/l	10	96.5	80	120	Ce	
Pr	141	165	2	1.94259	ug/l	2	97.1	80	120	Pr	
Nd	146	165	2	1.93785	ug/l	2	96.9	80	120	Nd	
Sm	147	165	3	9.91640	ug/l	10	99.2	80	120	Sm	
Hf	178	165	2	8.91042	ug/l	10	89.1	80	120	Hf	
Ta	181	165	2	6.22894	ug/l	10	62.3	80	120	Ta	FAILED
W	182	165	2	4.42152	ug/l	5	88.4	80	120	W	
Re	185	193	3	9.38144	ug/l	10	93.8	80	120	Re	
Pt	195	193	2	1.00780	ug/l	1	100.8	80	120	Pt	
Au	197	193	3	4.75542	ug/l	5	95.1	80	120	Au	
Tl	205	193	3	1.85979	ug/l	2	93.0	80	120	Tl	
Pb	208	193	3	2.81379	ug/l	3	93.8	80	120	Pb	
Bi	209	193	2	18.68644	ug/l	20	93.4	80	120	Bi	
Th	232	193	3	1.80268	ug/l	2	90.1	80	120	Th	
U	238	193	3	0.90061	ug/l	1	90.1	80	120	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	4617020	0.54	4941712	93.4	80	120	Li (IS)	
Sc (IS)	45	2	193155	0.45	186699	103.5	80	120	Sc (IS)	
Sc (IS)	45	3	3289377	0.67	3281398	100.2	80	120	Sc (IS)	
Ge (IS)	72	2	429579	0.78	410530	104.6	80	120	Ge (IS)	
Ge (IS)	72	3	2552568	0.47	2540877	100.5	80	120	Ge (IS)	
In (IS)	115	3	18854650	0.06	19102387	98.7	80	120	In (IS)	
Ho (IS)	165	2	14187683	0.37	14511718	97.8	80	120	Ho (IS)	
Ho (IS)	165	3	22733858	0.60	23609138	96.3	80	120	Ho (IS)	
Ir (IS)	193	2	9397966	0.88	9828030	95.6	80	120	Ir (IS)	
Ir (IS)	193	3	11258841	0.82	11858846	94.9	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Continuing Calibration Verification (CCV) - US EPA Method 6020

Sample Name	**CCV 1856861**
Data File Name	**123_CCV.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-27T05:48:43-06:00**
Type	**CCV**
VialNumber	**1102**
Dilution	**1**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**075CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	Units	ExpectedValue	%Recovery	%QC Low	%QC High	Analyte	QC Flag
Li	7	6	3	102.08619	ug/l	100	102.1	90	110	Li	
Be	9	6	3	102.77320	ug/l	100	102.8	90	110	Be	
B	11	6	3	210.59856	ug/l	200	105.3	90	110	B	
Na	23	45	2	2481.91232	ug/l	2500	99.3	90	110	Na	
Mg	24	45	2	2500.92620	ug/l	2500	100.0	90	110	Mg	
Al	27	45	2	2720.16300	ug/l	2500	108.8	90	110	Al	
P	31	45	2	2554.30435	ug/l	2500	102.2	90	110	P	
K	39	45	2	2590.77111	ug/l	2500	103.6	90	110	K	
Ca	44	45	3	2550.06035	ug/l	2500	102.0	90	110	Ca	
Ti	47	45	3	101.13922	ug/l	100	101.1	90	110	Ti	
V	51	45	2	99.03447	ug/l	100	99.0	90	110	V	
Cr	52	45	2	100.80045	ug/l	100	100.8	90	110	Cr	
Mn	55	72	2	99.28702	ug/l	100	99.3	90	110	Mn	
Fe	57	72	2	2539.83614	ug/l	2500	101.6	90	110	Fe	
Co	59	72	2	101.46412	ug/l	100	101.5	90	110	Co	
Ni	60	72	2	101.49825	ug/l	100	101.5	90	110	Ni	
Cu	63	72	2	99.13972	ug/l	100	99.1	90	110	Cu	
Zn	66	72	2	100.22871	ug/l	100	100.2	90	110	Zn	
As	75	72	2	103.66816	ug/l	100	103.7	90	110	As	
Se	78	72	2	51.27761	ug/l	50	102.6	90	110	Se	
Sr	88	72	3	104.28854	ug/l	100	104.3	90	110	Sr	
Y	89	72	2	101.90522	ug/l	100	101.9	90	110	Y	
Zr	90	72	2	101.59900	ug/l	100	101.6	90	110	Zr	
Nb	93	72	2	50.30746	ug/l	50	100.6	90	110	Nb	
Mo	95	72	3	49.46258	ug/l	50	98.9	90	110	Mo	
Ru	101	72	2	97.89678	ug/l	100	97.9	90	110	Ru	
Rh	103	72	2	100.66627	ug/l	100	100.7	90	110	Rh	
Pd	105	72	2	10.14812	ug/l	10	101.5	90	110	Pd	
Ag	107	115	3	19.96109	ug/l	20	99.8	90	110	Ag	
Cd	111	115	3	98.81965	ug/l	100	98.8	90	110	Cd	
Sn	118	115	3	101.35693	ug/l	100	101.4	90	110	Sn	
Sb	121	115	3	50.54601	ug/l	50	101.1	90	110	Sb	
Te	125	165	2	101.64397	ug/l	100	101.6	90	110	Te	
Cs	133	165	2	104.12651	ug/l	100	104.1	90	110	Cs	
Ba	137	165	3	103.94176	ug/l	100	103.9	90	110	Ba	
La	139	165	2	102.62088	ug/l	100	102.6	90	110	La	
Ce	140	165	2	102.03314	ug/l	100	102.0	90	110	Ce	
Pr	141	165	2	102.23697	ug/l	100	102.2	90	110	Pr	
Nd	146	165	2	97.30139	ug/l	100	97.3	90	110	Nd	
Sm	147	165	3	104.90159	ug/l	100	104.9	90	110	Sm	
Hf	178	165	2	99.57204	ug/l	100	99.6	90	110	Hf	
Ta	181	165	2	96.94281	ug/l	100	96.9	90	110	Ta	
W	182	165	2	98.66544	ug/l	100	98.7	90	110	W	
Re	185	193	3	102.97096	ug/l	100	103.0	90	110	Re	
Pt	195	193	2	10.03605	ug/l	10	100.4	90	110	Pt	
Au	197	193	3	101.77031	ug/l	100	101.8	90	110	Au	
Tl	205	193	3	20.46785	ug/l	20	102.3	90	110	Tl	
Pb	208	193	3	102.50094	ug/l	100	102.5	90	110	Pb	
Bi	209	193	2	103.00177	ug/l	100	103.0	90	110	Bi	
Th	232	193	3	101.02594	ug/l	100	101.0	90	110	Th	
U	238	193	3	101.77276	ug/l	100	101.8	90	110	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	4389085	0.66	4941712	88.8	80	120	Li (IS)	
Sc (IS)	45	2	183852	0.93	186699	98.5	80	120	Sc (IS)	
Sc (IS)	45	3	3212476	0.53	3281398	97.9	80	120	Sc (IS)	
Ge (IS)	72	2	433064	0.51	410530	105.5	80	120	Ge (IS)	
Ge (IS)	72	3	2515967	0.58	2540877	99.0	80	120	Ge (IS)	
In (IS)	115	3	18342508	0.37	19102387	96.0	80	120	In (IS)	
Ho (IS)	165	2	13894126	0.40	14511718	95.7	80	120	Ho (IS)	
Ho (IS)	165	3	22360296	0.39	23609138	94.7	80	120	Ho (IS)	
Ir (IS)	193	2	9148478	1.01	9828030	93.1	80	120	Ir (IS)	
Ir (IS)	193	3	11002246	0.80	11858846	92.8	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Continuing Calibration Blank (CCB) - US EPA Method 6020

Sample Name	**CCB 1854886**
Data File Name	**124_CCB.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-27T05:55:27-06:00**
Type	**CCB**
VialNumber	**4**
Dilution	**1**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**075CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	Units	QC High	Analyte	QC Flag
Li	7	6	3	0.03244	ug/l	1.388	Li	
Be	9	6	3	0.01768	ug/l	0.7	Be	
B	11	6	3	2.06014	ug/l	20	B	
Na	23	45	2	-2.62116	ug/l	30	Na	
Mg	24	45	2	1.33217	ug/l	11.18	Mg	
Al	27	45	2	0.59093	ug/l	25.8	Al	
P	31	45	2	0.58912	ug/l	16.46	P	
K	39	45	2	0.36304	ug/l	83.2	K	
Ca	44	45	3	-4.68569	ug/l	136.2	Ca	
Ti	47	45	3	0.03407	ug/l	4.2	Ti	
V	51	45	2	-0.10413	ug/l	4.74	V	
Cr	52	45	2	0.00408	ug/l	6.52	Cr	
Mn	55	72	2	0.01176	ug/l	0.49	Mn	
Fe	57	72	2	1.40461	ug/l	40.7	Fe	
Co	59	72	2	0.01472	ug/l	0.434	Co	
Ni	60	72	2	0.01431	ug/l	0.8	Ni	
Cu	63	72	2	0.46498	ug/l	0.902	Cu	
Zn	66	72	2	0.02255	ug/l	16.58	Zn	
As	75	72	2	0.02475	ug/l	2.36	As	
Se	78	72	2	-0.22947	ug/l	3.18	Se	
Sr	88	72	3	0.00677	ug/l	2	Sr	
Y	89	72	2	0.00941	ug/l	0.424	Y	
Zr	90	72	2	0.03178	ug/l	0.496	Zr	
Nb	93	72	2	0.45935	ug/l	4.62	Nb	
Mo	95	72	3	0.04160	ug/l	2	Mo	
Ru	101	72	2	0.01295	ug/l	2	Ru	
Rh	103	72	2	0.00895	ug/l	1.634	Rh	
Pd	105	72	2	0.00209	ug/l	0.08	Pd	
Ag	107	115	3	-0.00105	ug/l	1.54	Ag	
Cd	111	115	3	0.00626	ug/l	0.4	Cd	
Sn	118	115	3	0.02201	ug/l	2	Sn	
Sb	121	115	3	-0.00668	ug/l	3.34	Sb	
Te	125	165	2	0.01568	ug/l	1.072	Te	
Cs	133	165	2	0.02260	ug/l	0.106	Cs	
Ba	137	165	3	0.00796	ug/l	0.446	Ba	
La	139	165	2	0.01184	ug/l	0.102	La	
Ce	140	165	2	0.01211	ug/l	1.772	Ce	
Pr	141	165	2	0.01143	ug/l	0.084	Pr	
Nd	146	165	2	0.01225	ug/l	0.208	Nd	
Sm	147	165	3	0.00541	ug/l	0.652	Sm	
Hf	178	165	2	0.05302	ug/l	2.26	Hf	
Ta	181	165	2	0.04809	ug/l	1.46	Ta	
W	182	165	2	0.27068	ug/l	4	W	
Re	185	193	3	0.00386	ug/l	0.05	Re	
Pt	195	193	2	0.00423	ug/l	0.12	Pt	
Au	197	193	3	0.11477	ug/l	1	Au	
Tl	205	193	3	0.02753	ug/l	1.1	Tl	
Pb	208	193	3	0.01034	ug/l	0.346	Pb	
Bi	209	193	2	0.05922	ug/l	1.464	Bi	
Th	232	193	3	0.10235	ug/l	1.104	Th	
U	238	193	3	0.00632	ug/l	0.462	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	4468518	0.19	4941712	90.4	80	120	Li (IS)	
Sc (IS)	45	2	187327	0.34	186699	100.3	80	120	Sc (IS)	
Sc (IS)	45	3	3176543	0.19	3281398	96.8	80	120	Sc (IS)	
Ge (IS)	72	2	410338	0.79	410530	100.0	80	120	Ge (IS)	
Ge (IS)	72	3	2465235	0.36	2540877	97.0	80	120	Ge (IS)	
In (IS)	115	3	18573947	0.76	19102387	97.2	80	120	In (IS)	
Ho (IS)	165	2	13939088	0.46	14511718	96.1	80	120	Ho (IS)	
Ho (IS)	165	3	22353679	0.53	23609138	94.7	80	120	Ho (IS)	
Ir (IS)	193	2	9271292	0.68	9828030	94.3	80	120	Ir (IS)	
Ir (IS)	193	3	11138876	0.20	11858846	93.9	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Sample Name	**180-99027-C-8-A**
Data File Name	**125SMPL.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-27T06:02:13-06:00**
Type	**Sample**
VialNumber	**3307**
Dilution	**2**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**075CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	FinalConcentration	Units	High Value	Analyte	QC Flag
Li	7	6	3	0.37831	0.75662	ug/l	1000	Li	
Be	9	6	3	0.01049	0.02098	ug/l	1000	Be	
B	11	6	3	5.82243	11.64487	ug/l	2000	B	
Na	23	45	2	1200.00422	2400.00844	ug/l	50000	Na	
Mg	24	45	2	129.94332	259.88663	ug/l	50000	Mg	
Al	27	45	2	10.23644	20.47288	ug/l	100000	Al	
P	31	45	2	6.08730	12.17461	ug/l	100000	P	
K	39	45	2	99.20586	198.41172	ug/l	100000	K	
Ca	44	45	3	160.49346	320.98691	ug/l	100000	Ca	
Ti	47	45	3	0.22641	0.45283	ug/l	2000	Ti	
V	51	45	2	-0.11464	-0.22927	ug/l	2000	V	
Cr	52	45	2	0.03105	0.06210	ug/l	2000	Cr	
Mn	55	72	2	2.97063	5.94125	ug/l	5000	Mn	
Fe	57	72	2	16.78967	33.57934	ug/l	100000	Fe	
Co	59	72	2	0.08176	0.16352	ug/l	2000	Co	
Ni	60	72	2	0.19521	0.39041	ug/l	2000	Ni	
Cu	63	72	2	0.51273	1.02546	ug/l	2000	Cu	
Zn	66	72	2	1.02993	2.05985	ug/l	5000	Zn	
As	75	72	2	-0.03716	-0.07433	ug/l	2000	As	
Se	78	72	2	-0.32497	-0.64995	ug/l	1000	Se	
Sr	88	72	3	1.29700	2.59399	ug/l	2000	Sr	
Y	89	72	2	0.00967	0.01934	ug/l	200	Y	
Zr	90	72	2	-0.00031	-0.00062	ug/l	2000	Zr	
Nb	93	72	2	0.06543	0.13085	ug/l	100	Nb	
Mo	95	72	3	0.00904	0.01809	ug/l	1000	Mo	
Ru	101	72	2	-0.00314	-0.00628	ug/l	200	Ru	
Rh	103	72	2	-0.00602	-0.01205	ug/l	200	Rh	
Pd	105	72	2	0.00043	0.00087	ug/l	20	Pd	
Ag	107	115	3	-0.00521	-0.01043	ug/l	400	Ag	
Cd	111	115	3	0.00282	0.00565	ug/l	2000	Cd	
Sn	118	115	3	0.00914	0.01827	ug/l	2000	Sn	
Sb	121	115	3	-0.00801	-0.01602	ug/l	1000	Sb	
Te	125	165	2	-0.01249	-0.02498	ug/l	200	Te	
Cs	133	165	2	0.00418	0.00836	ug/l	2000	Cs	
Ba	137	165	3	2.15203	4.30407	ug/l	5000	Ba	
La	139	165	2	0.01849	0.03699	ug/l	200	La	
Ce	140	165	2	0.03530	0.07061	ug/l	200	Ce	
Pr	141	165	2	0.00103	0.00205	ug/l	200	Pr	
Nd	146	165	2	0.01267	0.02534	ug/l	200	Nd	
Sm	147	165	3	0.00197	0.00394	ug/l	2000	Sm	
Hf	178	165	2	0.00475	0.00951	ug/l	200	Hf	
Ta	181	165	2	-0.00131	-0.00262	ug/l	200	Ta	
W	182	165	2	0.03299	0.06598	ug/l	2000	W	
Re	185	193	3	0.00431	0.00862	ug/l	200	Re	
Pt	195	193	2	0.00407	0.00814	ug/l	200	Pt	
Au	197	193	3	0.01972	0.03944	ug/l	2000	Au	
Tl	205	193	3	0.01135	0.02269	ug/l	400	Tl	
Pb	208	193	3	0.07435	0.14871	ug/l	5000	Pb	
Bi	209	193	2	0.01441	0.02883	ug/l	2000	Bi	
Th	232	193	3	0.01599	0.03197	ug/l	2000	Th	
U	238	193	3	0.00348	0.00696	ug/l	2000	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	4462090	0.57	4941712	90.3	80	120	Li (IS)	
Sc (IS)	45	2	183917	0.46	186699	98.5	80	120	Sc (IS)	
Sc (IS)	45	3	3160985	0.50	3281398	96.3	80	120	Sc (IS)	
Ge (IS)	72	2	419367	0.20	410530	102.2	80	120	Ge (IS)	
Ge (IS)	72	3	2527588	0.47	2540877	99.5	80	120	Ge (IS)	
In (IS)	115	3	18579884	0.58	19102387	97.3	80	120	In (IS)	
Ho (IS)	165	2	13895106	0.70	14511718	95.8	80	120	Ho (IS)	
Ho (IS)	165	3	22490883	0.71	23609138	95.3	80	120	Ho (IS)	
Ir (IS)	193	2	9079427	0.22	9828030	92.4	80	120	Ir (IS)	
Ir (IS)	193	3	10994592	1.06	11858846	92.7	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Sample Report

Sample Name	**180-99027-C-10-A**
Data File Name	**126SMPL.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-27T06:08:56-06:00**
Type	**Sample**
VialNumber	**3308**
Dilution	**2**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**075CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	FinalConcentration	Units	High Value	Analyte	QC Flag
Li	7	6	3	2.77432	5.54865	ug/l	1000	Li	
Be	9	6	3	0.22303	0.44607	ug/l	1000	Be	
B	11	6	3	2293.03911	4586.07823	ug/l	2000	B	FAILED
Na	23	45	2	40170.70815	80341.41631	ug/l	50000	Na	
Mg	24	45	2	8756.76147	17513.52295	ug/l	50000	Mg	
Al	27	45	2	447.89639	895.79278	ug/l	100000	Al	
P	31	45	2	3.29454	6.58908	ug/l	100000	P	
K	39	45	2	7376.61923	14753.23846	ug/l	100000	K	
Ca	44	45	3	42117.65244	84235.30488	ug/l	100000	Ca	
Ti	47	45	3	0.37766	0.75532	ug/l	2000	Ti	
V	51	45	2	-0.08133	-0.16267	ug/l	2000	V	
Cr	52	45	2	0.07923	0.15846	ug/l	2000	Cr	
Mn	55	72	2	162.76102	325.52205	ug/l	5000	Mn	
Fe	57	72	2	9.10429	18.20858	ug/l	100000	Fe	
Co	59	72	2	5.97424	11.94848	ug/l	2000	Co	
Ni	60	72	2	6.66831	13.33661	ug/l	2000	Ni	
Cu	63	72	2	2.29871	4.59743	ug/l	2000	Cu	
Zn	66	72	2	10.37591	20.75181	ug/l	5000	Zn	
As	75	72	2	0.79270	1.58540	ug/l	2000	As	
Se	78	72	2	4.82037	9.64074	ug/l	1000	Se	
Sr	88	72	3	203.81991	407.63982	ug/l	2000	Sr	
Y	89	72	2	18.01675	36.03350	ug/l	200	Y	
Zr	90	72	2	0.02115	0.04231	ug/l	2000	Zr	
Nb	93	72	2	-0.02215	-0.04430	ug/l	100	Nb	
Mo	95	72	3	-0.00579	-0.01157	ug/l	1000	Mo	
Ru	101	72	2	-0.00505	-0.01010	ug/l	200	Ru	
Rh	103	72	2	-0.00802	-0.01604	ug/l	200	Rh	
Pd	105	72	2	0.03783	0.07567	ug/l	20	Pd	
Ag	107	115	3	0.01587	0.03174	ug/l	400	Ag	
Cd	111	115	3	0.11044	0.22088	ug/l	2000	Cd	
Sn	118	115	3	-0.04896	-0.09792	ug/l	2000	Sn	
Sb	121	115	3	-0.01078	-0.02156	ug/l	1000	Sb	
Te	125	165	2	-0.00865	-0.01730	ug/l	200	Te	
Cs	133	165	2	0.41113	0.82227	ug/l	2000	Cs	
Ba	137	165	3	64.43223	128.86446	ug/l	5000	Ba	
La	139	165	2	34.83542	69.67084	ug/l	200	La	
Ce	140	165	2	79.87902	159.75805	ug/l	200	Ce	
Pr	141	165	2	9.28083	18.56166	ug/l	200	Pr	
Nd	146	165	2	36.25628	72.51255	ug/l	200	Nd	
Sm	147	165	3	7.80532	15.61064	ug/l	2000	Sm	
Hf	178	165	2	0.02683	0.05366	ug/l	200	Hf	
Ta	181	165	2	-0.00132	-0.00264	ug/l	200	Ta	
W	182	165	2	-0.03878	-0.07756	ug/l	2000	W	
Re	185	193	3	0.13447	0.26893	ug/l	200	Re	
Pt	195	193	2	0.00227	0.00453	ug/l	200	Pt	
Au	197	193	3	-0.00766	-0.01532	ug/l	2000	Au	
Tl	205	193	3	0.10639	0.21279	ug/l	400	Tl	
Pb	208	193	3	0.19353	0.38707	ug/l	5000	Pb	
Bi	209	193	2	0.00433	0.00866	ug/l	2000	Bi	
Th	232	193	3	0.00592	0.01185	ug/l	2000	Th	
U	238	193	3	0.20595	0.41190	ug/l	2000	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	4483090	0.55	4941712	90.7	80	120	Li (IS)	
Sc (IS)	45	2	185760	1.70	186699	99.5	80	120	Sc (IS)	
Sc (IS)	45	3	3310211	0.21	3281398	100.9	80	120	Sc (IS)	
Ge (IS)	72	2	423239	0.55	410530	103.1	80	120	Ge (IS)	
Ge (IS)	72	3	2597853	0.17	2540877	102.2	80	120	Ge (IS)	
In (IS)	115	3	18341453	0.51	19102387	96.0	80	120	In (IS)	
Ho (IS)	165	2	13825116	0.86	14511718	95.3	80	120	Ho (IS)	
Ho (IS)	165	3	22789922	0.36	23609138	96.5	80	120	Ho (IS)	
Ir (IS)	193	2	8851847	0.89	9828030	90.1	80	120	Ir (IS)	
Ir (IS)	193	3	10847407	0.55	11858846	91.5	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Sample Name	**180-99027-C-12-A**
Data File Name	**127SMPL.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-27T06:15:41-06:00**
Type	**Sample**
VialNumber	**3309**
Dilution	**2**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**075CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	FinalConcentration	Units	High Value	Analyte	QC Flag
Li	7	6	3	1.86634	3.73268	ug/l	1000	Li	
Be	9	6	3	0.14591	0.29183	ug/l	1000	Be	
B	11	6	3	890.12489	1780.24979	ug/l	2000	B	
Na	23	45	2	6218.71872	12437.43743	ug/l	50000	Na	
Mg	24	45	2	4790.99886	9581.99772	ug/l	50000	Mg	
Al	27	45	2	123.98718	247.97437	ug/l	100000	Al	
P	31	45	2	4.53806	9.07612	ug/l	100000	P	
K	39	45	2	1063.45487	2126.90974	ug/l	100000	K	
Ca	44	45	3	20332.69195	40665.38389	ug/l	100000	Ca	
Ti	47	45	3	0.31476	0.62953	ug/l	2000	Ti	
V	51	45	2	-0.11411	-0.22822	ug/l	2000	V	
Cr	52	45	2	0.07981	0.15962	ug/l	2000	Cr	
Mn	55	72	2	96.38591	192.77182	ug/l	5000	Mn	
Fe	57	72	2	5.81323	11.62646	ug/l	100000	Fe	
Co	59	72	2	3.74995	7.49989	ug/l	2000	Co	
Ni	60	72	2	5.07624	10.15249	ug/l	2000	Ni	
Cu	63	72	2	1.60407	3.20815	ug/l	2000	Cu	
Zn	66	72	2	6.93856	13.87712	ug/l	5000	Zn	
As	75	72	2	0.10132	0.20265	ug/l	2000	As	
Se	78	72	2	0.57064	1.14129	ug/l	1000	Se	
Sr	88	72	3	68.10352	136.20705	ug/l	2000	Sr	
Y	89	72	2	2.93138	5.86275	ug/l	200	Y	
Zr	90	72	2	-0.00662	-0.01323	ug/l	2000	Zr	
Nb	93	72	2	-0.06491	-0.12982	ug/l	100	Nb	
Mo	95	72	3	-0.01151	-0.02302	ug/l	1000	Mo	
Ru	101	72	2	-0.00484	-0.00968	ug/l	200	Ru	
Rh	103	72	2	-0.00795	-0.01590	ug/l	200	Rh	
Pd	105	72	2	0.00464	0.00929	ug/l	20	Pd	
Ag	107	115	3	-0.00168	-0.00337	ug/l	400	Ag	
Cd	111	115	3	0.07274	0.14549	ug/l	2000	Cd	
Sn	118	115	3	-0.04294	-0.08588	ug/l	2000	Sn	
Sb	121	115	3	-0.01488	-0.02976	ug/l	1000	Sb	
Te	125	165	2	-0.03370	-0.06741	ug/l	200	Te	
Cs	133	165	2	0.09620	0.19240	ug/l	2000	Cs	
Ba	137	165	3	67.88255	135.76509	ug/l	5000	Ba	
La	139	165	2	4.99607	9.99215	ug/l	200	La	
Ce	140	165	2	11.47117	22.94234	ug/l	200	Ce	
Pr	141	165	2	1.41259	2.82518	ug/l	200	Pr	
Nd	146	165	2	5.45858	10.91715	ug/l	200	Nd	
Sm	147	165	3	1.14557	2.29114	ug/l	2000	Sm	
Hf	178	165	2	-0.00606	-0.01212	ug/l	200	Hf	
Ta	181	165	2	-0.00404	-0.00808	ug/l	200	Ta	
W	182	165	2	-0.05221	-0.10441	ug/l	2000	W	
Re	185	193	3	0.05888	0.11775	ug/l	200	Re	
Pt	195	193	2	0.00149	0.00298	ug/l	200	Pt	
Au	197	193	3	-0.01262	-0.02524	ug/l	2000	Au	
Tl	205	193	3	0.02695	0.05390	ug/l	400	Tl	
Pb	208	193	3	0.10330	0.20660	ug/l	5000	Pb	
Bi	209	193	2	0.00167	0.00333	ug/l	2000	Bi	
Th	232	193	3	-0.00882	-0.01764	ug/l	2000	Th	
U	238	193	3	0.06198	0.12395	ug/l	2000	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	4510150	0.27	4941712	91.3	80	120	Li (IS)	
Sc (IS)	45	2	186538	0.45	186699	99.9	80	120	Sc (IS)	
Sc (IS)	45	3	3266889	0.62	3281398	99.6	80	120	Sc (IS)	
Ge (IS)	72	2	423981	0.83	410530	103.3	80	120	Ge (IS)	
Ge (IS)	72	3	2599619	0.55	2540877	102.3	80	120	Ge (IS)	
In (IS)	115	3	18524599	1.28	19102387	97.0	80	120	In (IS)	
Ho (IS)	165	2	13797026	0.83	14511718	95.1	80	120	Ho (IS)	
Ho (IS)	165	3	22803580	0.52	23609138	96.6	80	120	Ho (IS)	
Ir (IS)	193	2	9031956	0.61	9828030	91.9	80	120	Ir (IS)	
Ir (IS)	193	3	11090608	1.05	11858846	93.5	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Sample Name	**180-99027-C-14-A**
Data File Name	**128SMPL.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-27T06:22:26-06:00**
Type	**Sample**
VialNumber	**3310**
Dilution	**2**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**075CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	FinalConcentration	Units	High Value	Analyte	QC Flag
Li	7	6	3	1.98122	3.96245	ug/l	1000	Li	
Be	9	6	3	0.45660	0.91320	ug/l	1000	Be	
B	11	6	3	1544.44848	3088.89696	ug/l	2000	B	
Na	23	45	2	37144.03954	74288.07909	ug/l	50000	Na	
Mg	24	45	2	7898.19893	15796.39787	ug/l	50000	Mg	
Al	27	45	2	572.06693	1144.13386	ug/l	100000	Al	
P	31	45	2	6.93427	13.86855	ug/l	100000	P	
K	39	45	2	5783.13336	11566.26672	ug/l	100000	K	
Ca	44	45	3	20132.79230	40265.58460	ug/l	100000	Ca	
Ti	47	45	3	0.39442	0.78885	ug/l	2000	Ti	
V	51	45	2	-0.08476	-0.16953	ug/l	2000	V	
Cr	52	45	2	0.08256	0.16512	ug/l	2000	Cr	
Mn	55	72	2	125.93507	251.87014	ug/l	5000	Mn	
Fe	57	72	2	5.92935	11.85869	ug/l	100000	Fe	
Co	59	72	2	5.67584	11.35168	ug/l	2000	Co	
Ni	60	72	2	6.72652	13.45304	ug/l	2000	Ni	
Cu	63	72	2	1.00448	2.00896	ug/l	2000	Cu	
Zn	66	72	2	14.66405	29.32810	ug/l	5000	Zn	
As	75	72	2	0.57952	1.15905	ug/l	2000	As	
Se	78	72	2	4.87097	9.74195	ug/l	1000	Se	
Sr	88	72	3	150.11491	300.22983	ug/l	2000	Sr	
Y	89	72	2	14.25537	28.51074	ug/l	200	Y	
Zr	90	72	2	0.01287	0.02573	ug/l	2000	Zr	
Nb	93	72	2	-0.08602	-0.17204	ug/l	100	Nb	
Mo	95	72	3	-0.01418	-0.02836	ug/l	1000	Mo	
Ru	101	72	2	-0.00550	-0.01101	ug/l	200	Ru	
Rh	103	72	2	-0.00963	-0.01926	ug/l	200	Rh	
Pd	105	72	2	0.02511	0.05022	ug/l	20	Pd	
Ag	107	115	3	0.00595	0.01189	ug/l	400	Ag	
Cd	111	115	3	0.10688	0.21377	ug/l	2000	Cd	
Sn	118	115	3	-0.03382	-0.06765	ug/l	2000	Sn	
Sb	121	115	3	-0.01238	-0.02477	ug/l	1000	Sb	
Te	125	165	2	-0.01583	-0.03165	ug/l	200	Te	
Cs	133	165	2	0.37257	0.74513	ug/l	2000	Cs	
Ba	137	165	3	130.15321	260.30642	ug/l	5000	Ba	
La	139	165	2	22.37715	44.75430	ug/l	200	La	
Ce	140	165	2	58.93689	117.87378	ug/l	200	Ce	
Pr	141	165	2	6.54590	13.09179	ug/l	200	Pr	
Nd	146	165	2	26.02954	52.05908	ug/l	200	Nd	
Sm	147	165	3	5.61568	11.23137	ug/l	2000	Sm	
Hf	178	165	2	0.01341	0.02681	ug/l	200	Hf	
Ta	181	165	2	-0.00401	-0.00802	ug/l	200	Ta	
W	182	165	2	-0.05777	-0.11554	ug/l	2000	W	
Re	185	193	3	0.08737	0.17473	ug/l	200	Re	
Pt	195	193	2	0.00113	0.00226	ug/l	200	Pt	
Au	197	193	3	-0.01877	-0.03754	ug/l	2000	Au	
Tl	205	193	3	0.07280	0.14560	ug/l	400	Tl	
Pb	208	193	3	0.29414	0.58828	ug/l	5000	Pb	
Bi	209	193	2	0.00132	0.00263	ug/l	2000	Bi	
Th	232	193	3	-0.00623	-0.01246	ug/l	2000	Th	
U	238	193	3	0.25637	0.51273	ug/l	2000	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	4451064	0.09	4941712	90.1	80	120	Li (IS)	
Sc (IS)	45	2	183882	0.23	186699	98.5	80	120	Sc (IS)	
Sc (IS)	45	3	3291615	0.81	3281398	100.3	80	120	Sc (IS)	
Ge (IS)	72	2	422432	0.51	410530	102.9	80	120	Ge (IS)	
Ge (IS)	72	3	2591406	0.77	2540877	102.0	80	120	Ge (IS)	
In (IS)	115	3	18338351	0.33	19102387	96.0	80	120	In (IS)	
Ho (IS)	165	2	13762471	0.10	14511718	94.8	80	120	Ho (IS)	
Ho (IS)	165	3	22615104	0.71	23609138	95.8	80	120	Ho (IS)	
Ir (IS)	193	2	8828017	0.96	9828030	89.8	80	120	Ir (IS)	
Ir (IS)	193	3	10875940	0.80	11858846	91.7	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Sample Name	**180-99027-C-16-A**
Data File Name	**129SMPL.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-27T06:29:13-06:00**
Type	**Sample**
VialNumber	**3311**
Dilution	**2**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**075CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	FinalConcentration	Units	High Value	Analyte	QC Flag
Li	7	6	3	1.80907	3.61814	ug/l	1000	Li	
Be	9	6	3	0.21142	0.42283	ug/l	1000	Be	
B	11	6	3	225.76491	451.52982	ug/l	2000	B	
Na	23	45	2	2372.45812	4744.91623	ug/l	50000	Na	
Mg	24	45	2	2920.24496	5840.48993	ug/l	50000	Mg	
Al	27	45	2	91.10796	182.21592	ug/l	100000	Al	
P	31	45	2	6.24690	12.49381	ug/l	100000	P	
K	39	45	2	1040.98717	2081.97434	ug/l	100000	K	
Ca	44	45	3	5437.67752	10875.35504	ug/l	100000	Ca	
Ti	47	45	3	0.36880	0.73760	ug/l	2000	Ti	
V	51	45	2	-0.08697	-0.17395	ug/l	2000	V	
Cr	52	45	2	0.07298	0.14596	ug/l	2000	Cr	
Mn	55	72	2	43.58948	87.17895	ug/l	5000	Mn	
Fe	57	72	2	5.49450	10.98901	ug/l	100000	Fe	
Co	59	72	2	2.18418	4.36836	ug/l	2000	Co	
Ni	60	72	2	3.15881	6.31763	ug/l	2000	Ni	
Cu	63	72	2	0.68791	1.37582	ug/l	2000	Cu	
Zn	66	72	2	5.66492	11.32984	ug/l	5000	Zn	
As	75	72	2	0.01183	0.02366	ug/l	2000	As	
Se	78	72	2	-0.09533	-0.19065	ug/l	1000	Se	
Sr	88	72	3	40.65834	81.31669	ug/l	2000	Sr	
Y	89	72	2	1.15502	2.31004	ug/l	200	Y	
Zr	90	72	2	-0.00151	-0.00303	ug/l	2000	Zr	
Nb	93	72	2	-0.08905	-0.17809	ug/l	100	Nb	
Mo	95	72	3	-0.01618	-0.03236	ug/l	1000	Mo	
Ru	101	72	2	-0.00650	-0.01300	ug/l	200	Ru	
Rh	103	72	2	-0.00914	-0.01828	ug/l	200	Rh	
Pd	105	72	2	0.00286	0.00571	ug/l	20	Pd	
Ag	107	115	3	-0.00193	-0.00387	ug/l	400	Ag	
Cd	111	115	3	0.03962	0.07923	ug/l	2000	Cd	
Sn	118	115	3	-0.01367	-0.02733	ug/l	2000	Sn	
Sb	121	115	3	-0.01373	-0.02747	ug/l	1000	Sb	
Te	125	165	2	-0.03382	-0.06763	ug/l	200	Te	
Cs	133	165	2	0.04188	0.08377	ug/l	2000	Cs	
Ba	137	165	3	76.64887	153.29775	ug/l	5000	Ba	
La	139	165	2	1.58891	3.17782	ug/l	200	La	
Ce	140	165	2	4.02912	8.05824	ug/l	200	Ce	
Pr	141	165	2	0.44998	0.89996	ug/l	200	Pr	
Nd	146	165	2	1.79675	3.59351	ug/l	200	Nd	
Sm	147	165	3	0.37346	0.74693	ug/l	2000	Sm	
Hf	178	165	2	-0.01282	-0.02565	ug/l	200	Hf	
Ta	181	165	2	0.05097	0.10195	ug/l	200	Ta	
W	182	165	2	-0.05333	-0.10666	ug/l	2000	W	
Re	185	193	3	0.00672	0.01343	ug/l	200	Re	
Pt	195	193	2	0.00013	0.00026	ug/l	200	Pt	
Au	197	193	3	-0.02048	-0.04097	ug/l	2000	Au	
Tl	205	193	3	0.01271	0.02542	ug/l	400	Tl	
Pb	208	193	3	0.08318	0.16637	ug/l	5000	Pb	
Bi	209	193	2	0.00019	0.00038	ug/l	2000	Bi	
Th	232	193	3	-0.01653	-0.03307	ug/l	2000	Th	
U	238	193	3	0.05700	0.11399	ug/l	2000	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	4445774	0.53	4941712	90.0	80	120	Li (IS)	
Sc (IS)	45	2	181161	2.49	186699	97.0	80	120	Sc (IS)	
Sc (IS)	45	3	3200865	0.85	3281398	97.5	80	120	Sc (IS)	
Ge (IS)	72	2	415886	1.70	410530	101.3	80	120	Ge (IS)	
Ge (IS)	72	3	2547918	0.62	2540877	100.3	80	120	Ge (IS)	
In (IS)	115	3	18441670	0.33	19102387	96.5	80	120	In (IS)	
Ho (IS)	165	2	13784830	2.34	14511718	95.0	80	120	Ho (IS)	
Ho (IS)	165	3	22875212	0.35	23609138	96.9	80	120	Ho (IS)	
Ir (IS)	193	2	9013486	3.17	9828030	91.7	80	120	Ir (IS)	
Ir (IS)	193	3	11008304	0.36	11858846	92.8	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Sample Name	**180-99027-C-18-A**
Data File Name	**130SMPL.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-27T06:35:57-06:00**
Type	**Sample**
VialNumber	**3312**
Dilution	**2**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**075CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	FinalConcentration	Units	High Value	Analyte	QC Flag
Li	7	6	3	1.95110	3.90219	ug/l	1000	Li	
Be	9	6	3	0.05612	0.11225	ug/l	1000	Be	
B	11	6	3	1595.44727	3190.89454	ug/l	2000	B	
Na	23	45	2	38094.28640	76188.57280	ug/l	50000	Na	
Mg	24	45	2	4153.29900	8306.59800	ug/l	50000	Mg	
Al	27	45	2	385.23261	770.46523	ug/l	100000	Al	
P	31	45	2	6.29507	12.59014	ug/l	100000	P	
K	39	45	2	9272.15099	18544.30197	ug/l	100000	K	
Ca	44	45	3	25708.87174	51417.74347	ug/l	100000	Ca	
Ti	47	45	3	0.19833	0.39667	ug/l	2000	Ti	
V	51	45	2	-0.04656	-0.09312	ug/l	2000	V	
Cr	52	45	2	0.15182	0.30364	ug/l	2000	Cr	
Mn	55	72	2	79.28469	158.56938	ug/l	5000	Mn	
Fe	57	72	2	5.68592	11.37184	ug/l	100000	Fe	
Co	59	72	2	1.82161	3.64323	ug/l	2000	Co	
Ni	60	72	2	0.99867	1.99734	ug/l	2000	Ni	
Cu	63	72	2	0.50835	1.01671	ug/l	2000	Cu	
Zn	66	72	2	1.93941	3.87882	ug/l	5000	Zn	
As	75	72	2	0.61610	1.23219	ug/l	2000	As	
Se	78	72	2	4.21584	8.43168	ug/l	1000	Se	
Sr	88	72	3	193.10185	386.20370	ug/l	2000	Sr	
Y	89	72	2	23.00172	46.00345	ug/l	200	Y	
Zr	90	72	2	0.00166	0.00332	ug/l	2000	Zr	
Nb	93	72	2	-0.11096	-0.22192	ug/l	100	Nb	
Mo	95	72	3	-0.01087	-0.02175	ug/l	1000	Mo	
Ru	101	72	2	-0.00675	-0.01351	ug/l	200	Ru	
Rh	103	72	2	-0.00766	-0.01533	ug/l	200	Rh	
Pd	105	72	2	0.04176	0.08352	ug/l	20	Pd	
Ag	107	115	3	-0.00922	-0.01843	ug/l	400	Ag	
Cd	111	115	3	0.02729	0.05457	ug/l	2000	Cd	
Sn	118	115	3	0.18039	0.36079	ug/l	2000	Sn	
Sb	121	115	3	-0.00194	-0.00387	ug/l	1000	Sb	
Te	125	165	2	-0.03020	-0.06041	ug/l	200	Te	
Cs	133	165	2	0.07600	0.15201	ug/l	2000	Cs	
Ba	137	165	3	27.79864	55.59727	ug/l	5000	Ba	
La	139	165	2	29.72761	59.45522	ug/l	200	La	
Ce	140	165	2	39.19381	78.38762	ug/l	200	Ce	
Pr	141	165	2	7.74720	15.49439	ug/l	200	Pr	
Nd	146	165	2	30.45378	60.90755	ug/l	200	Nd	
Sm	147	165	3	5.88063	11.76127	ug/l	2000	Sm	
Hf	178	165	2	-0.00613	-0.01226	ug/l	200	Hf	
Ta	181	165	2	0.00062	0.00124	ug/l	200	Ta	
W	182	165	2	-0.09032	-0.18064	ug/l	2000	W	
Re	185	193	3	0.08253	0.16506	ug/l	200	Re	
Pt	195	193	2	0.00196	0.00392	ug/l	200	Pt	
Au	197	193	3	-0.02328	-0.04657	ug/l	2000	Au	
Tl	205	193	3	0.07592	0.15185	ug/l	400	Tl	
Pb	208	193	3	0.23658	0.47317	ug/l	5000	Pb	
Bi	209	193	2	-0.00355	-0.00711	ug/l	2000	Bi	
Th	232	193	3	-0.01648	-0.03295	ug/l	2000	Th	
U	238	193	3	0.03856	0.07713	ug/l	2000	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	4477162	0.16	4941712	90.6	80	120	Li (IS)	
Sc (IS)	45	2	181688	0.37	186699	97.3	80	120	Sc (IS)	
Sc (IS)	45	3	3242427	0.43	3281398	98.8	80	120	Sc (IS)	
Ge (IS)	72	2	419704	0.74	410530	102.2	80	120	Ge (IS)	
Ge (IS)	72	3	2592219	0.37	2540877	102.0	80	120	Ge (IS)	
In (IS)	115	3	18521981	0.45	19102387	97.0	80	120	In (IS)	
Ho (IS)	165	2	13824776	0.48	14511718	95.3	80	120	Ho (IS)	
Ho (IS)	165	3	23021700	0.53	23609138	97.5	80	120	Ho (IS)	
Ir (IS)	193	2	8962873	0.24	9828030	91.2	80	120	Ir (IS)	
Ir (IS)	193	3	10969972	0.82	11858846	92.5	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Sample Name	**180-99027-C-18-A SD**
Data File Name	**131SMPL.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-27T06:42:41-06:00**
Type	**Sample**
VialNumber	**3401**
Dilution	**10**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**075CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	FinalConcentration	Units	High Value	Analyte	QC Flag
Li	7	6	3	0.53082	5.30824	ug/l	1000	Li	
Be	9	6	3	0.00856	0.08558	ug/l	1000	Be	
B	11	6	3	331.52929	3315.29286	ug/l	2000	B	
Na	23	45	2	7854.05467	78540.54668	ug/l	50000	Na	
Mg	24	45	2	909.28324	9092.83237	ug/l	50000	Mg	
Al	27	45	2	78.10057	781.00572	ug/l	100000	Al	
P	31	45	2	1.04430	10.44298	ug/l	100000	P	
K	39	45	2	1910.01231	19100.12314	ug/l	100000	K	
Ca	44	45	3	5143.71821	51437.18207	ug/l	100000	Ca	
Ti	47	45	3	0.06404	0.64040	ug/l	2000	Ti	
V	51	45	2	-0.08357	-0.83568	ug/l	2000	V	
Cr	52	45	2	0.02248	0.22477	ug/l	2000	Cr	
Mn	55	72	2	16.47975	164.79750	ug/l	5000	Mn	
Fe	57	72	2	2.03353	20.33535	ug/l	100000	Fe	
Co	59	72	2	0.36867	3.68670	ug/l	2000	Co	
Ni	60	72	2	0.32301	3.23008	ug/l	2000	Ni	
Cu	63	72	2	0.24432	2.44316	ug/l	2000	Cu	
Zn	66	72	2	0.57771	5.77709	ug/l	5000	Zn	
As	75	72	2	0.13938	1.39379	ug/l	2000	As	
Se	78	72	2	0.89046	8.90462	ug/l	1000	Se	
Sr	88	72	3	39.02076	390.20757	ug/l	2000	Sr	
Y	89	72	2	4.71524	47.15241	ug/l	200	Y	
Zr	90	72	2	-0.01175	-0.11751	ug/l	2000	Zr	
Nb	93	72	2	-0.12144	-1.21436	ug/l	100	Nb	
Mo	95	72	3	-0.01179	-0.11790	ug/l	1000	Mo	
Ru	101	72	2	-0.00602	-0.06021	ug/l	200	Ru	
Rh	103	72	2	-0.00755	-0.07553	ug/l	200	Rh	
Pd	105	72	2	0.00921	0.09209	ug/l	20	Pd	
Ag	107	115	3	-0.01017	-0.10170	ug/l	400	Ag	
Cd	111	115	3	-0.00020	-0.00203	ug/l	2000	Cd	
Sn	118	115	3	-0.01643	-0.16433	ug/l	2000	Sn	
Sb	121	115	3	-0.01572	-0.15716	ug/l	1000	Sb	
Te	125	165	2	-0.03379	-0.33786	ug/l	200	Te	
Cs	133	165	2	0.01131	0.11307	ug/l	2000	Cs	
Ba	137	165	3	5.62706	56.27058	ug/l	5000	Ba	
La	139	165	2	5.73036	57.30364	ug/l	200	La	
Ce	140	165	2	7.47794	74.77944	ug/l	200	Ce	
Pr	141	165	2	1.60924	16.09243	ug/l	200	Pr	
Nd	146	165	2	6.22835	62.28348	ug/l	200	Nd	
Sm	147	165	3	1.17112	11.71115	ug/l	2000	Sm	
Hf	178	165	2	-0.01515	-0.15148	ug/l	200	Hf	
Ta	181	165	2	-0.00165	-0.01650	ug/l	200	Ta	
W	182	165	2	-0.11121	-1.11214	ug/l	2000	W	
Re	185	193	3	0.01161	0.11605	ug/l	200	Re	
Pt	195	193	2	0.00219	0.02194	ug/l	200	Pt	
Au	197	193	3	-0.02431	-0.24306	ug/l	2000	Au	
Tl	205	193	3	0.01075	0.10754	ug/l	400	Tl	
Pb	208	193	3	0.02306	0.23057	ug/l	5000	Pb	
Bi	209	193	2	-0.00605	-0.06047	ug/l	2000	Bi	
Th	232	193	3	-0.02246	-0.22460	ug/l	2000	Th	
U	238	193	3	0.00452	0.04523	ug/l	2000	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	4574817	0.55	4941712	92.6	80	120	Li (IS)	
Sc (IS)	45	2	183657	3.28	186699	98.4	80	120	Sc (IS)	
Sc (IS)	45	3	3244646	0.37	3281398	98.9	80	120	Sc (IS)	
Ge (IS)	72	2	419978	1.80	410530	102.3	80	120	Ge (IS)	
Ge (IS)	72	3	2616339	0.44	2540877	103.0	80	120	Ge (IS)	
In (IS)	115	3	18800434	0.56	19102387	98.4	80	120	In (IS)	
Ho (IS)	165	2	13762930	2.52	14511718	94.8	80	120	Ho (IS)	
Ho (IS)	165	3	23056962	0.43	23609138	97.7	80	120	Ho (IS)	
Ir (IS)	193	2	9069811	2.91	9828030	92.3	80	120	Ir (IS)	
Ir (IS)	193	3	11217830	0.25	11858846	94.6	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Sample Name	**180-99027-C-18-B MS**
Data File Name	**132SMPL.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-27T06:49:24-06:00**
Type	**Sample**
VialNumber	**3402**
Dilution	**2**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**075CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	FinalConcentration	Units	High Value	Analyte	QC Flag
Li	7	6	3	51.70572	103.41144	ug/l	1000	Li	
Be	9	6	3	50.36649	100.73298	ug/l	1000	Be	
B	11	6	3	1705.58421	3411.16843	ug/l	2000	B	
Na	23	45	2	43024.93891	86049.87783	ug/l	50000	Na	
Mg	24	45	2	8985.59857	17971.19714	ug/l	50000	Mg	
Al	27	45	2	5161.01060	10322.02120	ug/l	100000	Al	
P	31	45	2	518.75775	1037.51550	ug/l	100000	P	
K	39	45	2	13991.42915	27982.85831	ug/l	100000	K	
Ca	44	45	3	30237.49398	60474.98795	ug/l	100000	Ca	
Ti	47	45	3	498.39344	996.78688	ug/l	2000	Ti	
V	51	45	2	487.36107	974.72214	ug/l	2000	V	
Cr	52	45	2	483.88721	967.77443	ug/l	2000	Cr	
Mn	55	72	2	579.73462	1159.46924	ug/l	5000	Mn	
Fe	57	72	2	4942.07682	9884.15363	ug/l	100000	Fe	
Co	59	72	2	497.17621	994.35242	ug/l	2000	Co	
Ni	60	72	2	510.72551	1021.45101	ug/l	2000	Ni	
Cu	63	72	2	498.41384	996.82768	ug/l	2000	Cu	
Zn	66	72	2	487.94242	975.88483	ug/l	5000	Zn	
As	75	72	2	500.49329	1000.98658	ug/l	2000	As	
Se	78	72	2	248.74220	497.48439	ug/l	1000	Se	
Sr	88	72	3	700.39485	1400.78971	ug/l	2000	Sr	
Y	89	72	2	23.24523	46.49047	ug/l	200	Y	
Zr	90	72	2	513.14306	1026.28612	ug/l	2000	Zr	
Nb	93	72	2	0.25623	0.51247	ug/l	100	Nb	
Mo	95	72	3	254.51563	509.03125	ug/l	1000	Mo	
Ru	101	72	2	-0.00439	-0.00878	ug/l	200	Ru	
Rh	103	72	2	0.01231	0.02462	ug/l	200	Rh	
Pd	105	72	2	0.07403	0.14807	ug/l	20	Pd	
Ag	107	115	3	95.24985	190.49969	ug/l	400	Ag	
Cd	111	115	3	495.54286	991.08572	ug/l	2000	Cd	
Sn	118	115	3	501.76600	1003.53200	ug/l	2000	Sn	
Sb	121	115	3	255.07481	510.14962	ug/l	1000	Sb	
Te	125	165	2	0.08421	0.16842	ug/l	200	Te	
Cs	133	165	2	0.07685	0.15371	ug/l	2000	Cs	
Ba	137	165	3	513.16647	1026.33294	ug/l	5000	Ba	
La	139	165	2	30.81255	61.62509	ug/l	200	La	
Ce	140	165	2	39.21436	78.42872	ug/l	200	Ce	
Pr	141	165	2	7.79176	15.58351	ug/l	200	Pr	
Nd	146	165	2	30.88359	61.76719	ug/l	200	Nd	
Sm	147	165	3	503.77099	1007.54199	ug/l	2000	Sm	
Hf	178	165	2	0.35505	0.71009	ug/l	200	Hf	
Ta	181	165	2	0.32595	0.65191	ug/l	200	Ta	
W	182	165	2	497.42852	994.85705	ug/l	2000	W	
Re	185	193	3	0.09284	0.18569	ug/l	200	Re	
Pt	195	193	2	0.00480	0.00960	ug/l	200	Pt	
Au	197	193	3	-0.01779	-0.03557	ug/l	2000	Au	
Tl	205	193	3	97.99801	195.99602	ug/l	400	Tl	
Pb	208	193	3	493.44280	986.88561	ug/l	5000	Pb	
Bi	209	193	2	499.98194	999.96387	ug/l	2000	Bi	
Th	232	193	3	501.85237	1003.70475	ug/l	2000	Th	
U	238	193	3	511.31715	1022.63431	ug/l	2000	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	4170637	0.35	4941712	84.4	80	120	Li (IS)	
Sc (IS)	45	2	177073	0.15	186699	94.8	80	120	Sc (IS)	
Sc (IS)	45	3	3093287	0.43	3281398	94.3	80	120	Sc (IS)	
Ge (IS)	72	2	401755	0.77	410530	97.9	80	120	Ge (IS)	
Ge (IS)	72	3	2416620	0.61	2540877	95.1	80	120	Ge (IS)	
In (IS)	115	3	17490220	0.64	19102387	91.6	80	120	In (IS)	
Ho (IS)	165	2	13374753	0.55	14511718	92.2	80	120	Ho (IS)	
Ho (IS)	165	3	22272378	0.60	23609138	94.3	80	120	Ho (IS)	
Ir (IS)	193	2	8618303	0.81	9828030	87.7	80	120	Ir (IS)	
Ir (IS)	193	3	10701815	1.97	11858846	90.2	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Sample Name	**180-99027-C-18-C MSD**
Data File Name	**133SMPL.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-27T06:56:09-06:00**
Type	**Sample**
VialNumber	**3403**
Dilution	**2**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**075CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	FinalConcentration	Units	High Value	Analyte	QC Flag
Li	7	6	3	52.01501	104.03003	ug/l	1000	Li	
Be	9	6	3	50.50517	101.01033	ug/l	1000	Be	
B	11	6	3	1713.09533	3426.19066	ug/l	2000	B	
Na	23	45	2	43152.67236	86305.34473	ug/l	50000	Na	
Mg	24	45	2	9036.71478	18073.42956	ug/l	50000	Mg	
Al	27	45	2	5178.56756	10357.13512	ug/l	100000	Al	
P	31	45	2	506.17144	1012.34289	ug/l	100000	P	
K	39	45	2	13920.21396	27840.42792	ug/l	100000	K	
Ca	44	45	3	30356.80191	60713.60381	ug/l	100000	Ca	
Ti	47	45	3	501.45601	1002.91201	ug/l	2000	Ti	
V	51	45	2	492.02244	984.04489	ug/l	2000	V	
Cr	52	45	2	487.49578	974.99157	ug/l	2000	Cr	
Mn	55	72	2	587.49871	1174.99742	ug/l	5000	Mn	
Fe	57	72	2	5018.90870	10037.81740	ug/l	100000	Fe	
Co	59	72	2	506.25751	1012.51503	ug/l	2000	Co	
Ni	60	72	2	516.35098	1032.70195	ug/l	2000	Ni	
Cu	63	72	2	502.19180	1004.38360	ug/l	2000	Cu	
Zn	66	72	2	492.88228	985.76455	ug/l	5000	Zn	
As	75	72	2	506.03308	1012.06615	ug/l	2000	As	
Se	78	72	2	254.50790	509.01580	ug/l	1000	Se	
Sr	88	72	3	698.20757	1396.41514	ug/l	2000	Sr	
Y	89	72	2	23.33896	46.67792	ug/l	200	Y	
Zr	90	72	2	516.88664	1033.77329	ug/l	2000	Zr	
Nb	93	72	2	0.09727	0.19453	ug/l	100	Nb	
Mo	95	72	3	254.40881	508.81762	ug/l	1000	Mo	
Ru	101	72	2	-0.00375	-0.00751	ug/l	200	Ru	
Rh	103	72	2	0.01270	0.02539	ug/l	200	Rh	
Pd	105	72	2	0.06979	0.13959	ug/l	20	Pd	
Ag	107	115	3	96.14994	192.29987	ug/l	400	Ag	
Cd	111	115	3	499.52363	999.04726	ug/l	2000	Cd	
Sn	118	115	3	504.25406	1008.50811	ug/l	2000	Sn	
Sb	121	115	3	255.65546	511.31092	ug/l	1000	Sb	
Te	125	165	2	0.06956	0.13912	ug/l	200	Te	
Cs	133	165	2	0.07784	0.15569	ug/l	2000	Cs	
Ba	137	165	3	510.89806	1021.79613	ug/l	5000	Ba	
La	139	165	2	30.85563	61.71126	ug/l	200	La	
Ce	140	165	2	39.22644	78.45287	ug/l	200	Ce	
Pr	141	165	2	7.78767	15.57533	ug/l	200	Pr	
Nd	146	165	2	30.80934	61.61867	ug/l	200	Nd	
Sm	147	165	3	504.77834	1009.55668	ug/l	2000	Sm	
Hf	178	165	2	0.10472	0.20944	ug/l	200	Hf	
Ta	181	165	2	0.24866	0.49733	ug/l	200	Ta	
W	182	165	2	503.25853	1006.51707	ug/l	2000	W	
Re	185	193	3	0.09369	0.18739	ug/l	200	Re	
Pt	195	193	2	0.00480	0.00960	ug/l	200	Pt	
Au	197	193	3	-0.02022	-0.04044	ug/l	2000	Au	
Tl	205	193	3	99.42109	198.84218	ug/l	400	Tl	
Pb	208	193	3	501.15221	1002.30442	ug/l	5000	Pb	
Bi	209	193	2	509.44423	1018.88846	ug/l	2000	Bi	
Th	232	193	3	511.18569	1022.37138	ug/l	2000	Th	
U	238	193	3	515.68743	1031.37486	ug/l	2000	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	4206281	0.27	4941712	85.1	80	120	Li (IS)	
Sc (IS)	45	2	177960	0.42	186699	95.3	80	120	Sc (IS)	
Sc (IS)	45	3	3104275	0.64	3281398	94.6	80	120	Sc (IS)	
Ge (IS)	72	2	399741	0.55	410530	97.4	80	120	Ge (IS)	
Ge (IS)	72	3	2436194	0.22	2540877	95.9	80	120	Ge (IS)	
In (IS)	115	3	17479847	0.36	19102387	91.5	80	120	In (IS)	
Ho (IS)	165	2	13358731	1.24	14511718	92.1	80	120	Ho (IS)	
Ho (IS)	165	3	22331247	0.43	23609138	94.6	80	120	Ho (IS)	
Ir (IS)	193	2	8583863	0.72	9828030	87.3	80	120	Ir (IS)	
Ir (IS)	193	3	10577708	0.79	11858846	89.2	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Sample Name	**180-99027-C-18-A PDS**
Data File Name	**134SMPL.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-27T07:02:54-06:00**
Type	**Sample**
VialNumber	**3404**
Dilution	**2**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**075CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	FinalConcentration	Units	High Value	Analyte	QC Flag
Li	7	6	3	54.53252	109.06504	ug/l	1000	Li	
Be	9	6	3	5.44247	10.88494	ug/l	1000	Be	
B	11	6	3	2654.75974	5309.51948	ug/l	2000	B	FAILED
Na	23	45	2	37198.15327	74396.30654	ug/l	50000	Na	
Mg	24	45	2	4041.01488	8082.02976	ug/l	50000	Mg	
Al	27	45	2	360.76968	721.53936	ug/l	100000	Al	
P	31	45	2	6.08911	12.17822	ug/l	100000	P	
K	39	45	2	9060.26675	18120.53350	ug/l	100000	K	
Ca	44	45	3	25150.27642	50300.55285	ug/l	100000	Ca	
Ti	47	45	3	51.54607	103.09214	ug/l	2000	Ti	
V	51	45	2	103.49471	206.98942	ug/l	2000	V	
Cr	52	45	2	104.83824	209.67648	ug/l	2000	Cr	
Mn	55	72	2	121.24315	242.48630	ug/l	5000	Mn	
Fe	57	72	2	6.08193	12.16386	ug/l	100000	Fe	
Co	59	72	2	22.66887	45.33774	ug/l	2000	Co	
Ni	60	72	2	54.36573	108.73147	ug/l	2000	Ni	
Cu	63	72	2	32.18193	64.36386	ug/l	2000	Cu	
Zn	66	72	2	214.27302	428.54603	ug/l	5000	Zn	
As	75	72	2	110.62044	221.24088	ug/l	2000	As	
Se	78	72	2	57.98676	115.97353	ug/l	1000	Se	
Sr	88	72	3	247.09567	494.19135	ug/l	2000	Sr	
Y	89	72	2	23.01623	46.03246	ug/l	200	Y	
Zr	90	72	2	51.16721	102.33442	ug/l	2000	Zr	
Nb	93	72	2	0.14027	0.28055	ug/l	100	Nb	
Mo	95	72	3	50.74999	101.49998	ug/l	1000	Mo	
Ru	101	72	2	-0.00383	-0.00767	ug/l	200	Ru	
Rh	103	72	2	-0.00794	-0.01588	ug/l	200	Rh	
Pd	105	72	2	0.04417	0.08834	ug/l	20	Pd	
Ag	107	115	3	19.55932	39.11863	ug/l	400	Ag	
Cd	111	115	3	5.21570	10.43139	ug/l	2000	Cd	
Sn	118	115	3	20.16586	40.33171	ug/l	2000	Sn	
Sb	121	115	3	52.01456	104.02912	ug/l	1000	Sb	
Te	125	165	2	-0.00180	-0.00360	ug/l	200	Te	
Cs	133	165	2	0.07558	0.15115	ug/l	2000	Cs	
Ba	137	165	3	47.77069	95.54137	ug/l	5000	Ba	
La	139	165	2	29.25000	58.49999	ug/l	200	La	
Ce	140	165	2	38.56086	77.12172	ug/l	200	Ce	
Pr	141	165	2	7.71198	15.42396	ug/l	200	Pr	
Nd	146	165	2	30.41164	60.82327	ug/l	200	Nd	
Sm	147	165	3	113.24072	226.48144	ug/l	2000	Sm	
Hf	178	165	2	0.10377	0.20755	ug/l	200	Hf	
Ta	181	165	2	0.34449	0.68897	ug/l	200	Ta	
W	182	165	2	52.33058	104.66116	ug/l	2000	W	
Re	185	193	3	0.08368	0.16736	ug/l	200	Re	
Pt	195	193	2	0.00114	0.00228	ug/l	200	Pt	
Au	197	193	3	-0.01774	-0.03548	ug/l	2000	Au	
Tl	205	193	3	21.40416	42.80832	ug/l	400	Tl	
Pb	208	193	3	30.76100	61.52200	ug/l	5000	Pb	
Bi	209	193	2	0.10011	0.20021	ug/l	2000	Bi	
Th	232	193	3	21.81347	43.62693	ug/l	2000	Th	
U	238	193	3	9.84640	19.69280	ug/l	2000	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	4365098	2.89	4941712	88.3	80	120	Li (IS)	
Sc (IS)	45	2	183166	0.97	186699	98.1	80	120	Sc (IS)	
Sc (IS)	45	3	3184474	3.18	3281398	97.0	80	120	Sc (IS)	
Ge (IS)	72	2	419299	0.56	410530	102.1	80	120	Ge (IS)	
Ge (IS)	72	3	2532999	2.83	2540877	99.7	80	120	Ge (IS)	
In (IS)	115	3	18435538	3.90	19102387	96.5	80	120	In (IS)	
Ho (IS)	165	2	13879851	0.18	14511718	95.6	80	120	Ho (IS)	
Ho (IS)	165	3	22880376	3.12	23609138	96.9	80	120	Ho (IS)	
Ir (IS)	193	2	9053255	0.16	9828030	92.1	80	120	Ir (IS)	
Ir (IS)	193	3	11031804	3.72	11858846	93.0	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Low Level Continuing Calibration Verification (CCV) - US EPA Method 6020

Sample Name	**CCVL 1856860**
Data File Name	**135LCCV.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-27T07:09:37-06:00**
Type	**CRI**
VialNumber	**1101**
Dilution	**1**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**075CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	Units	ExpectedValue	%Recovery	%QC Low	%QC High	Analyte	QC Flag
Li	7	6	3	5.21289	ug/l	5	104.3	80	120	Li	
Be	9	6	3	0.52506	ug/l	0.5	105.0	80	120	Be	
B	11	6	3	130.57412	ug/l	100	130.6	80	120	B	FAILED
Na	23	45	2	112.12287	ug/l	100	112.1	80	120	Na	
Mg	24	45	2	58.12895	ug/l	50	116.3	80	120	Mg	
Al	27	45	2	58.70017	ug/l	50	117.4	80	120	Al	
P	31	45	2	104.20580	ug/l	100	104.2	80	120	P	
K	39	45	2	111.53181	ug/l	100	111.5	80	120	K	
Ca	44	45	3	253.95159	ug/l	200	127.0	80	120	Ca	FAILED
Ti	47	45	3	5.20573	ug/l	5	104.1	80	120	Ti	
V	51	45	2	9.67854	ug/l	10	96.8	80	120	V	
Cr	52	45	2	10.23741	ug/l	10	102.4	80	120	Cr	
Mn	55	72	2	4.28880	ug/l	4	107.2	80	120	Mn	
Fe	57	72	2	55.19969	ug/l	50	110.4	80	120	Fe	
Co	59	72	2	2.10364	ug/l	2	105.2	80	120	Co	
Ni	60	72	2	5.49450	ug/l	5	109.9	80	120	Ni	
Cu	63	72	2	3.48515	ug/l	3	116.2	80	120	Cu	
Zn	66	72	2	22.07368	ug/l	20	110.4	80	120	Zn	
As	75	72	2	10.66282	ug/l	10	106.6	80	120	As	
Se	78	72	2	5.08907	ug/l	5	101.8	80	120	Se	
Sr	88	72	3	5.31895	ug/l	5	106.4	80	120	Sr	
Y	89	72	2	5.10036	ug/l	5	102.0	80	120	Y	
Zr	90	72	2	4.99502	ug/l	5	99.9	80	120	Zr	
Nb	93	72	2	18.71843	ug/l	25	74.9	80	120	Nb	FAILED
Mo	95	72	3	5.14047	ug/l	5	102.8	80	120	Mo	
Ru	101	72	2	10.19047	ug/l	10	101.9	80	120	Ru	
Rh	103	72	2	10.16680	ug/l	10	101.7	80	120	Rh	
Pd	105	72	2	0.52890	ug/l	0.5	105.8	80	120	Pd	
Ag	107	115	3	2.00411	ug/l	2	100.2	80	120	Ag	
Cd	111	115	3	0.53636	ug/l	0.5	107.3	80	120	Cd	
Sn	118	115	3	1.84798	ug/l	2	92.4	80	120	Sn	
Sb	121	115	3	4.86311	ug/l	5	97.3	80	120	Sb	
Te	125	165	2	9.55511	ug/l	10	95.6	80	120	Te	
Cs	133	165	2	0.96456	ug/l	1	96.5	80	120	Cs	
Ba	137	165	3	2.03614	ug/l	2	101.8	80	120	Ba	
La	139	165	2	1.91697	ug/l	2	95.8	80	120	La	
Ce	140	165	2	9.63314	ug/l	10	96.3	80	120	Ce	
Pr	141	165	2	1.93539	ug/l	2	96.8	80	120	Pr	
Nd	146	165	2	1.92335	ug/l	2	96.2	80	120	Nd	
Sm	147	165	3	9.83310	ug/l	10	98.3	80	120	Sm	
Hf	178	165	2	8.89256	ug/l	10	88.9	80	120	Hf	
Ta	181	165	2	6.31961	ug/l	10	63.2	80	120	Ta	FAILED
W	182	165	2	4.87483	ug/l	5	97.5	80	120	W	
Re	185	193	3	9.37347	ug/l	10	93.7	80	120	Re	
Pt	195	193	2	1.00950	ug/l	1	100.9	80	120	Pt	
Au	197	193	3	4.76101	ug/l	5	95.2	80	120	Au	
Tl	205	193	3	1.95249	ug/l	2	97.6	80	120	Tl	
Pb	208	193	3	2.85496	ug/l	3	95.2	80	120	Pb	
Bi	209	193	2	18.84312	ug/l	20	94.2	80	120	Bi	
Th	232	193	3	1.82188	ug/l	2	91.1	80	120	Th	
U	238	193	3	0.92050	ug/l	1	92.0	80	120	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	4510276	0.39	4941712	91.3	80	120	Li (IS)	
Sc (IS)	45	2	185962	1.52	186699	99.6	80	120	Sc (IS)	
Sc (IS)	45	3	3192610	0.65	3281398	97.3	80	120	Sc (IS)	
Ge (IS)	72	2	419343	0.72	410530	102.1	80	120	Ge (IS)	
Ge (IS)	72	3	2518254	0.96	2540877	99.1	80	120	Ge (IS)	
In (IS)	115	3	18875229	0.29	19102387	98.8	80	120	In (IS)	
Ho (IS)	165	2	14051466	0.08	14511718	96.8	80	120	Ho (IS)	
Ho (IS)	165	3	22887919	1.58	23609138	96.9	80	120	Ho (IS)	
Ir (IS)	193	2	9429554	0.58	9828030	95.9	80	120	Ir (IS)	
Ir (IS)	193	3	11389624	0.97	11858846	96.0	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Continuing Calibration Verification (CCV) - US EPA Method 6020

Sample Name	**CCV 1856861**
Data File Name	**136_CCV.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-27T07:16:21-06:00**
Type	**CCV**
VialNumber	**1102**
Dilution	**1**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**075CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	Units	ExpectedValue	%Recovery	%QC Low	%QC High	Analyte	QC Flag
Li	7	6	3	101.74732	ug/l	100	101.7	90	110	Li	
Be	9	6	3	102.68244	ug/l	100	102.7	90	110	Be	
B	11	6	3	229.49520	ug/l	200	114.7	90	110	B	FAILED
Na	23	45	2	2468.46698	ug/l	2500	98.7	90	110	Na	
Mg	24	45	2	2485.96132	ug/l	2500	99.4	90	110	Mg	
Al	27	45	2	2641.32735	ug/l	2500	105.7	90	110	Al	
P	31	45	2	2491.83871	ug/l	2500	99.7	90	110	P	
K	39	45	2	2512.80103	ug/l	2500	100.5	90	110	K	
Ca	44	45	3	2560.99931	ug/l	2500	102.4	90	110	Ca	
Ti	47	45	3	101.62382	ug/l	100	101.6	90	110	Ti	
V	51	45	2	97.62576	ug/l	100	97.6	90	110	V	
Cr	52	45	2	99.24963	ug/l	100	99.2	90	110	Cr	
Mn	55	72	2	98.49575	ug/l	100	98.5	90	110	Mn	
Fe	57	72	2	2531.41620	ug/l	2500	101.3	90	110	Fe	
Co	59	72	2	100.99042	ug/l	100	101.0	90	110	Co	
Ni	60	72	2	101.08828	ug/l	100	101.1	90	110	Ni	
Cu	63	72	2	98.95387	ug/l	100	99.0	90	110	Cu	
Zn	66	72	2	100.96033	ug/l	100	101.0	90	110	Zn	
As	75	72	2	102.76509	ug/l	100	102.8	90	110	As	
Se	78	72	2	51.70631	ug/l	50	103.4	90	110	Se	
Sr	88	72	3	103.18592	ug/l	100	103.2	90	110	Sr	
Y	89	72	2	101.47342	ug/l	100	101.5	90	110	Y	
Zr	90	72	2	100.92757	ug/l	100	100.9	90	110	Zr	
Nb	93	72	2	50.13937	ug/l	50	100.3	90	110	Nb	
Mo	95	72	3	49.04822	ug/l	50	98.1	90	110	Mo	
Ru	101	72	2	98.65905	ug/l	100	98.7	90	110	Ru	
Rh	103	72	2	101.92489	ug/l	100	101.9	90	110	Rh	
Pd	105	72	2	10.29109	ug/l	10	102.9	90	110	Pd	
Ag	107	115	3	19.90772	ug/l	20	99.5	90	110	Ag	
Cd	111	115	3	98.50621	ug/l	100	98.5	90	110	Cd	
Sn	118	115	3	101.11178	ug/l	100	101.1	90	110	Sn	
Sb	121	115	3	50.47590	ug/l	50	101.0	90	110	Sb	
Te	125	165	2	99.13993	ug/l	100	99.1	90	110	Te	
Cs	133	165	2	100.55315	ug/l	100	100.6	90	110	Cs	
Ba	137	165	3	98.89683	ug/l	100	98.9	90	110	Ba	
La	139	165	2	99.13271	ug/l	100	99.1	90	110	La	
Ce	140	165	2	99.65482	ug/l	100	99.7	90	110	Ce	
Pr	141	165	2	99.82875	ug/l	100	99.8	90	110	Pr	
Nd	146	165	2	94.47886	ug/l	100	94.5	90	110	Nd	
Sm	147	165	3	102.91048	ug/l	100	102.9	90	110	Sm	
Hf	178	165	2	98.61953	ug/l	100	98.6	90	110	Hf	
Ta	181	165	2	98.62691	ug/l	100	98.6	90	110	Ta	
W	182	165	2	99.33824	ug/l	100	99.3	90	110	W	
Re	185	193	3	101.46876	ug/l	100	101.5	90	110	Re	
Pt	195	193	2	9.97535	ug/l	10	99.8	90	110	Pt	
Au	197	193	3	99.74373	ug/l	100	99.7	90	110	Au	
Tl	205	193	3	20.21295	ug/l	20	101.1	90	110	Tl	
Pb	208	193	3	101.75630	ug/l	100	101.8	90	110	Pb	
Bi	209	193	2	101.14560	ug/l	100	101.1	90	110	Bi	
Th	232	193	3	100.81695	ug/l	100	100.8	90	110	Th	
U	238	193	3	101.62833	ug/l	100	101.6	90	110	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	4305915	1.01	4941712	87.1	80	120	Li (IS)	
Sc (IS)	45	2	182380	2.68	186699	97.7	80	120	Sc (IS)	
Sc (IS)	45	3	3126843	0.23	3281398	95.3	80	120	Sc (IS)	
Ge (IS)	72	2	425708	2.42	410530	103.7	80	120	Ge (IS)	
Ge (IS)	72	3	2516972	1.00	2540877	99.1	80	120	Ge (IS)	
In (IS)	115	3	18473302	0.86	19102387	96.7	80	120	In (IS)	
Ho (IS)	165	2	14116715	1.89	14511718	97.3	80	120	Ho (IS)	
Ho (IS)	165	3	23079466	0.47	23609138	97.8	80	120	Ho (IS)	
Ir (IS)	193	2	9467376	1.88	9828030	96.3	80	120	Ir (IS)	
Ir (IS)	193	3	11428340	0.38	11858846	96.4	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Continuing Calibration Blank (CCB) - US EPA Method 6020

Sample Name	**CCB 1854886**
Data File Name	**137_CCB.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-27T07:23:06-06:00**
Type	**CCB**
VialNumber	**4**
Dilution	**1**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**075CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	Units	QC High	Analyte	QC Flag
Li	7	6	3	0.02383	ug/l	1.388	Li	
Be	9	6	3	0.01323	ug/l	0.7	Be	
B	11	6	3	17.24513	ug/l	20	B	
Na	23	45	2	1.73442	ug/l	30	Na	
Mg	24	45	2	0.88689	ug/l	11.18	Mg	
Al	27	45	2	0.44632	ug/l	25.8	Al	
P	31	45	2	-0.01699	ug/l	16.46	P	
K	39	45	2	2.66608	ug/l	83.2	K	
Ca	44	45	3	-2.24453	ug/l	136.2	Ca	
Ti	47	45	3	0.03316	ug/l	4.2	Ti	
V	51	45	2	-0.15080	ug/l	4.74	V	
Cr	52	45	2	0.01129	ug/l	6.52	Cr	
Mn	55	72	2	0.01424	ug/l	0.49	Mn	
Fe	57	72	2	0.62187	ug/l	40.7	Fe	
Co	59	72	2	0.01767	ug/l	0.434	Co	
Ni	60	72	2	0.01783	ug/l	0.8	Ni	
Cu	63	72	2	0.13733	ug/l	0.902	Cu	
Zn	66	72	2	0.05147	ug/l	16.58	Zn	
As	75	72	2	0.01339	ug/l	2.36	As	
Se	78	72	2	-0.04003	ug/l	3.18	Se	
Sr	88	72	3	0.00862	ug/l	2	Sr	
Y	89	72	2	0.00747	ug/l	0.424	Y	
Zr	90	72	2	0.03186	ug/l	0.496	Zr	
Nb	93	72	2	0.46288	ug/l	4.62	Nb	
Mo	95	72	3	0.05869	ug/l	2	Mo	
Ru	101	72	2	0.01191	ug/l	2	Ru	
Rh	103	72	2	0.01035	ug/l	1.634	Rh	
Pd	105	72	2	0.00243	ug/l	0.08	Pd	
Ag	107	115	3	0.00079	ug/l	1.54	Ag	
Cd	111	115	3	0.01330	ug/l	0.4	Cd	
Sn	118	115	3	0.07431	ug/l	2	Sn	
Sb	121	115	3	0.00351	ug/l	3.34	Sb	
Te	125	165	2	0.00968	ug/l	1.072	Te	
Cs	133	165	2	0.01749	ug/l	0.106	Cs	
Ba	137	165	3	0.00886	ug/l	0.446	Ba	
La	139	165	2	0.01043	ug/l	0.102	La	
Ce	140	165	2	0.00974	ug/l	1.772	Ce	
Pr	141	165	2	0.00936	ug/l	0.084	Pr	
Nd	146	165	2	0.01064	ug/l	0.208	Nd	
Sm	147	165	3	0.00472	ug/l	0.652	Sm	
Hf	178	165	2	0.04777	ug/l	2.26	Hf	
Ta	181	165	2	0.03629	ug/l	1.46	Ta	
W	182	165	2	0.40460	ug/l	4	W	
Re	185	193	3	0.00230	ug/l	0.05	Re	
Pt	195	193	2	0.00204	ug/l	0.12	Pt	
Au	197	193	3	0.14097	ug/l	1	Au	
Tl	205	193	3	0.05193	ug/l	1.1	Tl	
Pb	208	193	3	0.03546	ug/l	0.346	Pb	
Bi	209	193	2	0.07047	ug/l	1.464	Bi	
Th	232	193	3	0.12087	ug/l	1.104	Th	
U	238	193	3	0.00720	ug/l	0.462	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	4388346	0.50	4941712	88.8	80	120	Li (IS)	
Sc (IS)	45	2	176198	0.24	186699	94.4	80	120	Sc (IS)	
Sc (IS)	45	3	3102302	0.78	3281398	94.5	80	120	Sc (IS)	
Ge (IS)	72	2	394130	0.38	410530	96.0	80	120	Ge (IS)	
Ge (IS)	72	3	2437760	0.47	2540877	95.9	80	120	Ge (IS)	
In (IS)	115	3	18333875	0.68	19102387	96.0	80	120	In (IS)	
Ho (IS)	165	2	13638158	0.93	14511718	94.0	80	120	Ho (IS)	
Ho (IS)	165	3	22774859	0.53	23609138	96.5	80	120	Ho (IS)	
Ir (IS)	193	2	9240287	0.42	9828030	94.0	80	120	Ir (IS)	
Ir (IS)	193	3	11319287	0.26	11858846	95.5	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Sample Name	**180-99027-C-20-A**
Data File Name	**138SMPL.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-27T07:29:53-06:00**
Type	**Sample**
VialNumber	**3405**
Dilution	**2**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**075CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	FinalConcentration	Units	High Value	Analyte	QC Flag
Li	7	6	3	0.18312	0.36624	ug/l	1000	Li	
Be	9	6	3	-0.00050	-0.00100	ug/l	1000	Be	
B	11	6	3	12.00116	24.00233	ug/l	2000	B	
Na	23	45	2	124.24526	248.49051	ug/l	50000	Na	
Mg	24	45	2	1.45290	2.90580	ug/l	50000	Mg	
Al	27	45	2	2.39531	4.79063	ug/l	100000	Al	
P	31	45	2	5.41937	10.83874	ug/l	100000	P	
K	39	45	2	3.14393	6.28787	ug/l	100000	K	
Ca	44	45	3	33.35297	66.70594	ug/l	100000	Ca	
Ti	47	45	3	0.11929	0.23858	ug/l	2000	Ti	
V	51	45	2	-0.21210	-0.42420	ug/l	2000	V	
Cr	52	45	2	0.02130	0.04260	ug/l	2000	Cr	
Mn	55	72	2	0.04710	0.09420	ug/l	5000	Mn	
Fe	57	72	2	0.71471	1.42941	ug/l	100000	Fe	
Co	59	72	2	-0.00279	-0.00559	ug/l	2000	Co	
Ni	60	72	2	0.01163	0.02326	ug/l	2000	Ni	
Cu	63	72	2	0.13182	0.26365	ug/l	2000	Cu	
Zn	66	72	2	1.23718	2.47435	ug/l	5000	Zn	
As	75	72	2	-0.01588	-0.03177	ug/l	2000	As	
Se	78	72	2	-0.11248	-0.22496	ug/l	1000	Se	
Sr	88	72	3	0.04508	0.09016	ug/l	2000	Sr	
Y	89	72	2	-0.00337	-0.00674	ug/l	200	Y	
Zr	90	72	2	0.00094	0.00188	ug/l	2000	Zr	
Nb	93	72	2	0.07042	0.14083	ug/l	100	Nb	
Mo	95	72	3	0.01755	0.03510	ug/l	1000	Mo	
Ru	101	72	2	-0.00453	-0.00907	ug/l	200	Ru	
Rh	103	72	2	-0.00505	-0.01011	ug/l	200	Rh	
Pd	105	72	2	-0.00035	-0.00071	ug/l	20	Pd	
Ag	107	115	3	-0.00524	-0.01048	ug/l	400	Ag	
Cd	111	115	3	0.00101	0.00202	ug/l	2000	Cd	
Sn	118	115	3	0.17453	0.34906	ug/l	2000	Sn	
Sb	121	115	3	-0.00692	-0.01383	ug/l	1000	Sb	
Te	125	165	2	-0.02660	-0.05320	ug/l	200	Te	
Cs	133	165	2	-0.00291	-0.00582	ug/l	2000	Cs	
Ba	137	165	3	0.01568	0.03136	ug/l	5000	Ba	
La	139	165	2	-0.00244	-0.00488	ug/l	200	La	
Ce	140	165	2	-0.00168	-0.00336	ug/l	200	Ce	
Pr	141	165	2	-0.00369	-0.00738	ug/l	200	Pr	
Nd	146	165	2	-0.00328	-0.00657	ug/l	200	Nd	
Sm	147	165	3	-0.00185	-0.00370	ug/l	2000	Sm	
Hf	178	165	2	0.00763	0.01527	ug/l	200	Hf	
Ta	181	165	2	-0.00664	-0.01328	ug/l	200	Ta	
W	182	165	2	0.10072	0.20143	ug/l	2000	W	
Re	185	193	3	-0.00365	-0.00730	ug/l	200	Re	
Pt	195	193	2	0.00237	0.00474	ug/l	200	Pt	
Au	197	193	3	0.02082	0.04163	ug/l	2000	Au	
Tl	205	193	3	0.01850	0.03699	ug/l	400	Tl	
Pb	208	193	3	0.01463	0.02925	ug/l	5000	Pb	
Bi	209	193	2	0.02119	0.04238	ug/l	2000	Bi	
Th	232	193	3	0.01770	0.03539	ug/l	2000	Th	
U	238	193	3	-0.00115	-0.00231	ug/l	2000	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	4430644	0.38	4941712	89.7	80	120	Li (IS)	
Sc (IS)	45	2	179207	0.41	186699	96.0	80	120	Sc (IS)	
Sc (IS)	45	3	3126533	0.48	3281398	95.3	80	120	Sc (IS)	
Ge (IS)	72	2	402502	0.46	410530	98.0	80	120	Ge (IS)	
Ge (IS)	72	3	2505334	0.21	2540877	98.6	80	120	Ge (IS)	
In (IS)	115	3	18688906	0.68	19102387	97.8	80	120	In (IS)	
Ho (IS)	165	2	13860694	0.51	14511718	95.5	80	120	Ho (IS)	
Ho (IS)	165	3	22954414	0.33	23609138	97.2	80	120	Ho (IS)	
Ir (IS)	193	2	9369248	0.36	9828030	95.3	80	120	Ir (IS)	
Ir (IS)	193	3	11428521	0.40	11858846	96.4	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Low Level Continuing Calibration Verification (CCV) - US EPA Method 6020

Sample Name	**CCVL 1856860**
Data File Name	**139LCCV.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-27T07:36:37-06:00**
Type	**CRI**
VialNumber	**1101**
Dilution	**1**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**075CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	Units	ExpectedValue	%Recovery	%QC Low	%QC High	Analyte	QC Flag
Li	7	6	3	5.18348	ug/l	5	103.7	80	120	Li	
Be	9	6	3	0.50825	ug/l	0.5	101.6	80	120	Be	
B	11	6	3	105.91659	ug/l	100	105.9	80	120	B	
Na	23	45	2	105.06652	ug/l	100	105.1	80	120	Na	
Mg	24	45	2	58.06254	ug/l	50	116.1	80	120	Mg	
Al	27	45	2	58.39792	ug/l	50	116.8	80	120	Al	
P	31	45	2	103.43354	ug/l	100	103.4	80	120	P	
K	39	45	2	107.10216	ug/l	100	107.1	80	120	K	
Ca	44	45	3	253.09143	ug/l	200	126.5	80	120	Ca	FAILED
Ti	47	45	3	5.15016	ug/l	5	103.0	80	120	Ti	
V	51	45	2	9.77687	ug/l	10	97.8	80	120	V	
Cr	52	45	2	10.27925	ug/l	10	102.8	80	120	Cr	
Mn	55	72	2	4.19002	ug/l	4	104.8	80	120	Mn	
Fe	57	72	2	54.70004	ug/l	50	109.4	80	120	Fe	
Co	59	72	2	2.12801	ug/l	2	106.4	80	120	Co	
Ni	60	72	2	5.49859	ug/l	5	110.0	80	120	Ni	
Cu	63	72	2	3.37555	ug/l	3	112.5	80	120	Cu	
Zn	66	72	2	22.51167	ug/l	20	112.6	80	120	Zn	
As	75	72	2	10.64476	ug/l	10	106.4	80	120	As	
Se	78	72	2	5.10558	ug/l	5	102.1	80	120	Se	
Sr	88	72	3	5.36185	ug/l	5	107.2	80	120	Sr	
Y	89	72	2	5.10740	ug/l	5	102.1	80	120	Y	
Zr	90	72	2	5.25791	ug/l	5	105.2	80	120	Zr	
Nb	93	72	2	19.08362	ug/l	25	76.3	80	120	Nb	FAILED
Mo	95	72	3	5.05981	ug/l	5	101.2	80	120	Mo	
Ru	101	72	2	10.48483	ug/l	10	104.8	80	120	Ru	
Rh	103	72	2	10.38266	ug/l	10	103.8	80	120	Rh	
Pd	105	72	2	0.53158	ug/l	0.5	106.3	80	120	Pd	
Ag	107	115	3	1.96137	ug/l	2	98.1	80	120	Ag	
Cd	111	115	3	0.50227	ug/l	0.5	100.5	80	120	Cd	
Sn	118	115	3	1.84018	ug/l	2	92.0	80	120	Sn	
Sb	121	115	3	4.82243	ug/l	5	96.4	80	120	Sb	
Te	125	165	2	9.38517	ug/l	10	93.9	80	120	Te	
Cs	133	165	2	0.97561	ug/l	1	97.6	80	120	Cs	
Ba	137	165	3	1.97129	ug/l	2	98.6	80	120	Ba	
La	139	165	2	1.90708	ug/l	2	95.4	80	120	La	
Ce	140	165	2	9.54893	ug/l	10	95.5	80	120	Ce	
Pr	141	165	2	1.93187	ug/l	2	96.6	80	120	Pr	
Nd	146	165	2	1.91253	ug/l	2	95.6	80	120	Nd	
Sm	147	165	3	9.88992	ug/l	10	98.9	80	120	Sm	
Hf	178	165	2	9.27487	ug/l	10	92.7	80	120	Hf	
Ta	181	165	2	6.56547	ug/l	10	65.7	80	120	Ta	FAILED
W	182	165	2	4.58801	ug/l	5	91.8	80	120	W	
Re	185	193	3	9.35445	ug/l	10	93.5	80	120	Re	
Pt	195	193	2	0.99469	ug/l	1	99.5	80	120	Pt	
Au	197	193	3	4.80470	ug/l	5	96.1	80	120	Au	
Tl	205	193	3	1.88154	ug/l	2	94.1	80	120	Tl	
Pb	208	193	3	2.82680	ug/l	3	94.2	80	120	Pb	
Bi	209	193	2	18.77496	ug/l	20	93.9	80	120	Bi	
Th	232	193	3	1.82032	ug/l	2	91.0	80	120	Th	
U	238	193	3	0.92502	ug/l	1	92.5	80	120	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	4418587	0.29	4941712	89.4	80	120	Li (IS)	
Sc (IS)	45	2	179024	0.49	186699	95.9	80	120	Sc (IS)	
Sc (IS)	45	3	3092716	0.38	3281398	94.2	80	120	Sc (IS)	
Ge (IS)	72	2	402069	0.44	410530	97.9	80	120	Ge (IS)	
Ge (IS)	72	3	2444804	0.25	2540877	96.2	80	120	Ge (IS)	
In (IS)	115	3	18437445	0.91	19102387	96.5	80	120	In (IS)	
Ho (IS)	165	2	13740236	0.39	14511718	94.7	80	120	Ho (IS)	
Ho (IS)	165	3	22727954	0.99	23609138	96.3	80	120	Ho (IS)	
Ir (IS)	193	2	9309274	0.42	9828030	94.7	80	120	Ir (IS)	
Ir (IS)	193	3	11358727	1.09	11858846	95.8	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Continuing Calibration Verification (CCV) - US EPA Method 6020

Sample Name	**CCV 1856861**
Data File Name	**140_CCV.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-27T07:43:19-06:00**
Type	**CCV**
VialNumber	**1102**
Dilution	**1**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**075CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	Units	ExpectedValue	%Recovery	%QC Low	%QC High	Analyte	QC Flag
Li	7	6	3	102.06146	ug/l	100	102.1	90	110	Li	
Be	9	6	3	103.46927	ug/l	100	103.5	90	110	Be	
B	11	6	3	213.89142	ug/l	200	106.9	90	110	B	
Na	23	45	2	2528.17213	ug/l	2500	101.1	90	110	Na	
Mg	24	45	2	2534.08324	ug/l	2500	101.4	90	110	Mg	
Al	27	45	2	2707.87848	ug/l	2500	108.3	90	110	Al	
P	31	45	2	2561.53452	ug/l	2500	102.5	90	110	P	
K	39	45	2	2565.36580	ug/l	2500	102.6	90	110	K	
Ca	44	45	3	2579.51169	ug/l	2500	103.2	90	110	Ca	
Ti	47	45	3	102.12912	ug/l	100	102.1	90	110	Ti	
V	51	45	2	99.06846	ug/l	100	99.1	90	110	V	
Cr	52	45	2	101.59702	ug/l	100	101.6	90	110	Cr	
Mn	55	72	2	99.14662	ug/l	100	99.1	90	110	Mn	
Fe	57	72	2	2533.50137	ug/l	2500	101.3	90	110	Fe	
Co	59	72	2	101.90206	ug/l	100	101.9	90	110	Co	
Ni	60	72	2	101.12826	ug/l	100	101.1	90	110	Ni	
Cu	63	72	2	98.96159	ug/l	100	99.0	90	110	Cu	
Zn	66	72	2	101.59435	ug/l	100	101.6	90	110	Zn	
As	75	72	2	103.26602	ug/l	100	103.3	90	110	As	
Se	78	72	2	50.14967	ug/l	50	100.3	90	110	Se	
Sr	88	72	3	104.30179	ug/l	100	104.3	90	110	Sr	
Y	89	72	2	102.23168	ug/l	100	102.2	90	110	Y	
Zr	90	72	2	101.87126	ug/l	100	101.9	90	110	Zr	
Nb	93	72	2	51.02247	ug/l	50	102.0	90	110	Nb	
Mo	95	72	3	49.02635	ug/l	50	98.1	90	110	Mo	
Ru	101	72	2	99.82302	ug/l	100	99.8	90	110	Ru	
Rh	103	72	2	103.11059	ug/l	100	103.1	90	110	Rh	
Pd	105	72	2	10.39322	ug/l	10	103.9	90	110	Pd	
Ag	107	115	3	19.74818	ug/l	20	98.7	90	110	Ag	
Cd	111	115	3	98.46178	ug/l	100	98.5	90	110	Cd	
Sn	118	115	3	101.95523	ug/l	100	102.0	90	110	Sn	
Sb	121	115	3	50.40892	ug/l	50	100.8	90	110	Sb	
Te	125	165	2	99.52149	ug/l	100	99.5	90	110	Te	
Cs	133	165	2	100.64255	ug/l	100	100.6	90	110	Cs	
Ba	137	165	3	100.54002	ug/l	100	100.5	90	110	Ba	
La	139	165	2	100.96174	ug/l	100	101.0	90	110	La	
Ce	140	165	2	101.22352	ug/l	100	101.2	90	110	Ce	
Pr	141	165	2	100.78655	ug/l	100	100.8	90	110	Pr	
Nd	146	165	2	95.88088	ug/l	100	95.9	90	110	Nd	
Sm	147	165	3	104.11726	ug/l	100	104.1	90	110	Sm	
Hf	178	165	2	100.65245	ug/l	100	100.7	90	110	Hf	
Ta	181	165	2	100.04328	ug/l	100	100.0	90	110	Ta	
W	182	165	2	101.04157	ug/l	100	101.0	90	110	W	
Re	185	193	3	102.26912	ug/l	100	102.3	90	110	Re	
Pt	195	193	2	10.11165	ug/l	10	101.1	90	110	Pt	
Au	197	193	3	100.86963	ug/l	100	100.9	90	110	Au	
Tl	205	193	3	20.38725	ug/l	20	101.9	90	110	Tl	
Pb	208	193	3	102.89348	ug/l	100	102.9	90	110	Pb	
Bi	209	193	2	102.01794	ug/l	100	102.0	90	110	Bi	
Th	232	193	3	101.73713	ug/l	100	101.7	90	110	Th	
U	238	193	3	103.26315	ug/l	100	103.3	90	110	U	

QC ISTD Table

Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	4274405	0.16	4941712	86.5	80	120	Li (IS)	
Sc (IS)	45	2	174406	1.43	186699	93.4	80	120	Sc (IS)	
Sc (IS)	45	3	3073655	0.39	3281398	93.7	80	120	Sc (IS)	
Ge (IS)	72	2	412662	0.50	410530	100.5	80	120	Ge (IS)	
Ge (IS)	72	3	2478957	0.32	2540877	97.6	80	120	Ge (IS)	
In (IS)	115	3	18256676	0.77	19102387	95.6	80	120	In (IS)	
Ho (IS)	165	2	13663089	1.42	14511718	94.2	80	120	Ho (IS)	
Ho (IS)	165	3	22430835	0.44	23609138	95.0	80	120	Ho (IS)	
Ir (IS)	193	2	9192265	0.98	9828030	93.5	80	120	Ir (IS)	
Ir (IS)	193	3	11171537	0.95	11858846	94.2	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Continuing Calibration Blank (CCB) - US EPA Method 6020

Sample Name	**CCB 1854886**
Data File Name	**141_CCB.D**
DataPath	**C:\ICPMH\1\DATA\122619B1.B**
Acq Date Time	**2019-12-27T07:50:06-06:00**
Type	**CCB**
VialNumber	**4**
Dilution	**1**
Comment	
Operator	**LP 7700**
ISTDRefDataFileName	**075CALB.D**

QC Analyte Table

Element	m/z	ISTD	Tune Step	Meas Value	Units	QC High	Analyte	QC Flag
Li	7	6	3	0.01184	ug/l	1.388	Li	
Be	9	6	3	0.02495	ug/l	0.7	Be	
B	11	6	3	7.76563	ug/l	20	B	
Na	23	45	2	-0.22482	ug/l	30	Na	
Mg	24	45	2	1.14191	ug/l	11.18	Mg	
Al	27	45	2	0.71339	ug/l	25.8	Al	
P	31	45	2	0.52540	ug/l	16.46	P	
K	39	45	2	2.25507	ug/l	83.2	K	
Ca	44	45	3	-2.93589	ug/l	136.2	Ca	
Ti	47	45	3	0.03950	ug/l	4.2	Ti	
V	51	45	2	-0.13485	ug/l	4.74	V	
Cr	52	45	2	0.02621	ug/l	6.52	Cr	
Mn	55	72	2	0.01980	ug/l	0.49	Mn	
Fe	57	72	2	0.84300	ug/l	40.7	Fe	
Co	59	72	2	0.02473	ug/l	0.434	Co	
Ni	60	72	2	0.02107	ug/l	0.8	Ni	
Cu	63	72	2	0.10310	ug/l	0.902	Cu	
Zn	66	72	2	0.05084	ug/l	16.58	Zn	
As	75	72	2	0.02133	ug/l	2.36	As	
Se	78	72	2	-0.22048	ug/l	3.18	Se	
Sr	88	72	3	0.01827	ug/l	2	Sr	
Y	89	72	2	0.02099	ug/l	0.424	Y	
Zr	90	72	2	0.03758	ug/l	0.496	Zr	
Nb	93	72	2	0.55607	ug/l	4.62	Nb	
Mo	95	72	3	0.05418	ug/l	2	Mo	
Ru	101	72	2	0.03136	ug/l	2	Ru	
Rh	103	72	2	0.01910	ug/l	1.634	Rh	
Pd	105	72	2	0.00254	ug/l	0.08	Pd	
Ag	107	115	3	0.00078	ug/l	1.54	Ag	
Cd	111	115	3	0.01679	ug/l	0.4	Cd	
Sn	118	115	3	0.03885	ug/l	2	Sn	
Sb	121	115	3	0.00072	ug/l	3.34	Sb	
Te	125	165	2	0.07082	ug/l	1.072	Te	
Cs	133	165	2	0.02545	ug/l	0.106	Cs	
Ba	137	165	3	0.01350	ug/l	0.446	Ba	
La	139	165	2	0.01991	ug/l	0.102	La	
Ce	140	165	2	0.02065	ug/l	1.772	Ce	
Pr	141	165	2	0.01824	ug/l	0.084	Pr	
Nd	146	165	2	0.01907	ug/l	0.208	Nd	
Sm	147	165	3	0.01276	ug/l	0.652	Sm	
Hf	178	165	2	0.06019	ug/l	2.26	Hf	
Ta	181	165	2	0.05562	ug/l	1.46	Ta	
W	182	165	2	0.36307	ug/l	4	W	
Re	185	193	3	0.00937	ug/l	0.05	Re	
Pt	195	193	2	0.00433	ug/l	0.12	Pt	
Au	197	193	3	0.16194	ug/l	1	Au	
Tl	205	193	3	0.03759	ug/l	1.1	Tl	
Pb	208	193	3	0.02951	ug/l	0.346	Pb	
Bi	209	193	2	0.06553	ug/l	1.464	Bi	
Th	232	193	3	0.12292	ug/l	1.104	Th	
U	238	193	3	0.01615	ug/l	0.462	U	

QC ISTD Table

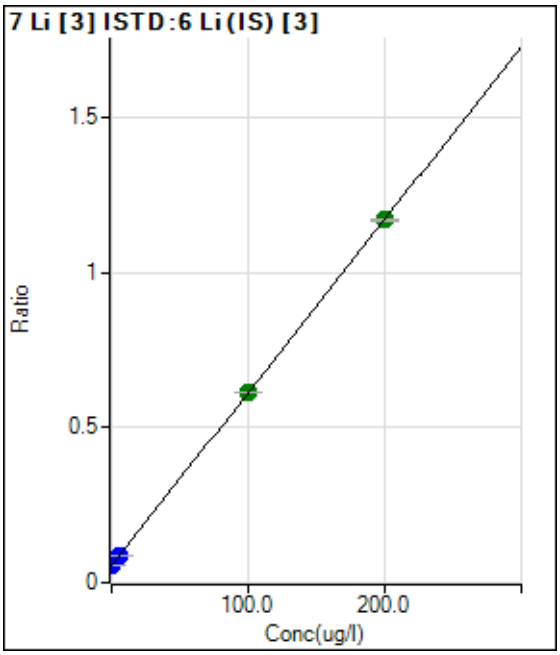
Element	m/z	Tune Step	CPS	%RSD	Reference CPS	%Recovery	Lower Limit	Upper Limit	Analyte	QC Flag
Li (IS)	6	3	4427453	0.45	4941712	89.6	80	120	Li (IS)	
Sc (IS)	45	2	177516	0.64	186699	95.1	80	120	Sc (IS)	
Sc (IS)	45	3	3109939	0.17	3281398	94.8	80	120	Sc (IS)	
Ge (IS)	72	2	394994	0.32	410530	96.2	80	120	Ge (IS)	
Ge (IS)	72	3	2431931	0.80	2540877	95.7	80	120	Ge (IS)	
In (IS)	115	3	18583970	1.44	19102387	97.3	80	120	In (IS)	
Ho (IS)	165	2	13684032	0.64	14511718	94.3	80	120	Ho (IS)	
Ho (IS)	165	3	22922122	0.30	23609138	97.1	80	120	Ho (IS)	
Ir (IS)	193	2	9356073	0.32	9828030	95.2	80	120	Ir (IS)	
Ir (IS)	193	3	11453566	0.47	11858846	96.6	80	120	Ir (IS)	

TuneStep	TuneFile
2	**he.u**
3	**nogas.u**

Calibration for 004CALS.D

Batch Folder:	C:¥ICPMH¥1¥DATA¥122619B1.B¥
Analysis File:	122619B1.batch.xml
DA Date-Time:	12/26/2019 4:41:09 PM
Calibration Title:	
Calibration Method:	External Calibration
VIS Interpolation Fit:	
Tune Step:	#1 he.u
	#2 nogas.u

Level	Standard Data File	Sample Name	Acq. Date-Time
1	003CALB.D	ICIS 1854886	12/26/2019 4:18:31 PM
2	004CALS.D	IC 1856860	12/26/2019 4:25:15 PM
3	005CALS.D	IC 1856861	12/26/2019 4:31:58 PM
4	006CALS.D	IC 1856862	12/26/2019 4:38:41 PM
5			
6			
7			



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	350601.56	0.0554	P	0.9
2	☐	5.000	5.133	536321.30	0.0840	P	0.3
3	☐	100.000	100.249	3879194.01	0.6147	A	0.2
4	☐	200.000	199.872	7426182.32	1.1705	A	0.2
5	☐						
6	☐						
7	☐						

y = 0.0056 * x + 0.0554

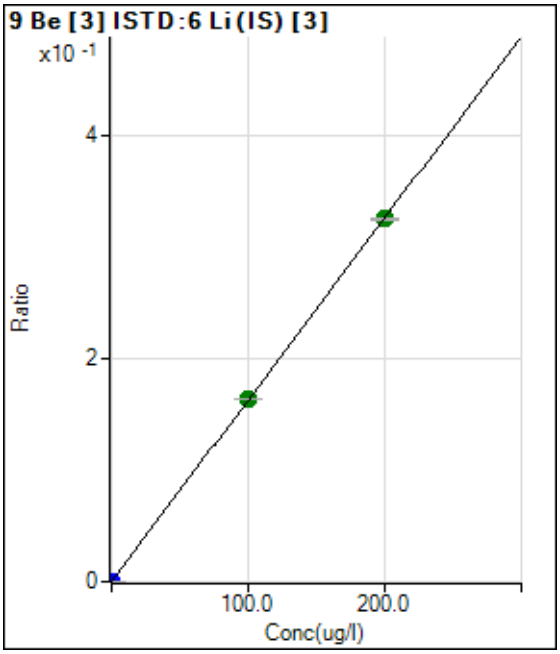
R = 1.0000

DL = 0.258

BEC = 9.931

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	164.45	0.0000	P	20.3
2	☐	0.500	0.485	5209.83	0.0008	P	2.5
3	☐	100.000	100.696	1036618.86	0.1643	A	0.6
4	☐	200.000	199.652	2066142.92	0.3257	A	0.7
5	☐						
6	☐						
7	☐						

y = 0.0016 * x + 2.5980E-005

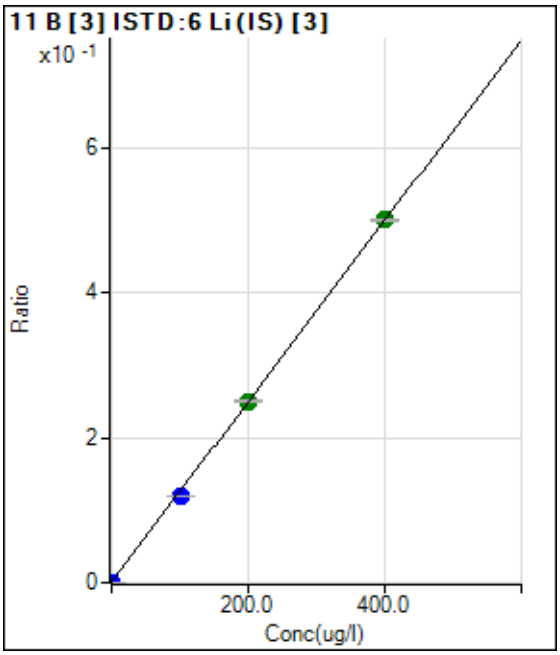
R = 1.0000

DL = 0.009684

BEC = 0.01593

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	7212.81	0.0011	P	2.3
2	☐	100.000	94.559	757856.57	0.1188	P	0.8
3	☐	200.000	200.372	1580001.59	0.2504	A	0.6
4	☐	400.000	401.174	3173024.43	0.5001	A	0.3
5	☐						
6	☐						
7	☐						

y = 0.0012 * x + 0.0011

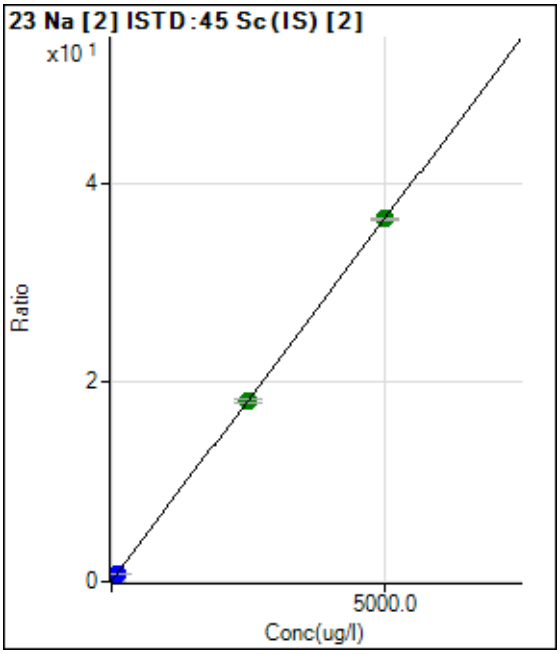
R = 0.9999

DL = 0.06346

BEC = 0.9164

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	16871.65	0.0753	P	2.1
2	☐	100.000	103.631	185237.32	0.8282	P	1.1
3	☐	2500.000	2490.258	4163724.04	18.1675	A	2.5
4	☐	5000.000	5004.798	8288140.15	36.4362	A	0.8
5	☐						
6	☐						
7	☐						

y = 0.0073 * x + 0.0753

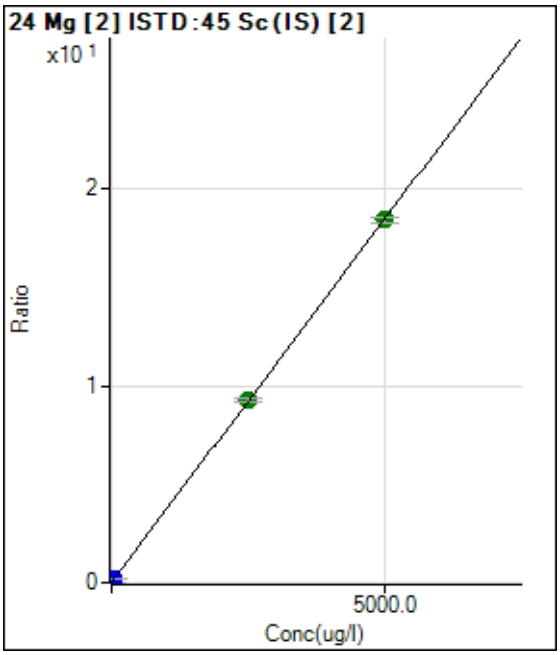
R = 1.0000

DL = 0.6387

BEC = 10.36

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	467.80	0.0021	P	6.0
2	☐	50.000	57.176	47666.39	0.2131	P	1.4
3	☐	2500.000	2514.318	2127198.56	9.2821	A	2.9
4	☐	5000.000	4992.769	4192200.88	18.4297	A	1.3
5	☐						
6	☐						
7	☐						

y = 0.0037 * x + 0.0021

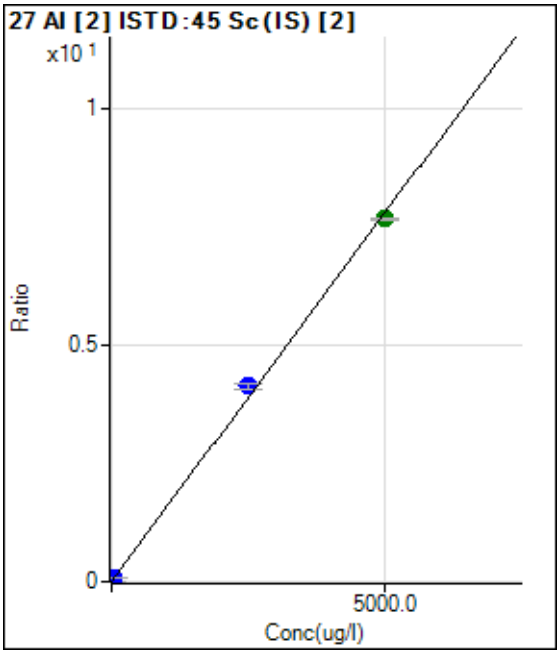
R = 1.0000

DL = 0.1013

BEC = 0.5654

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	356.76	0.0016	P	20.4
2	☐	50.000	59.197	20947.16	0.0937	P	1.2
3	☐	2500.000	2649.386	944608.46	4.1216	P	2.5
4	☐	5000.000	4925.215	1742575.06	7.6607	A	0.7
5	☐						
6	☐						
7	☐						

y = 0.0016 * x + 0.0016

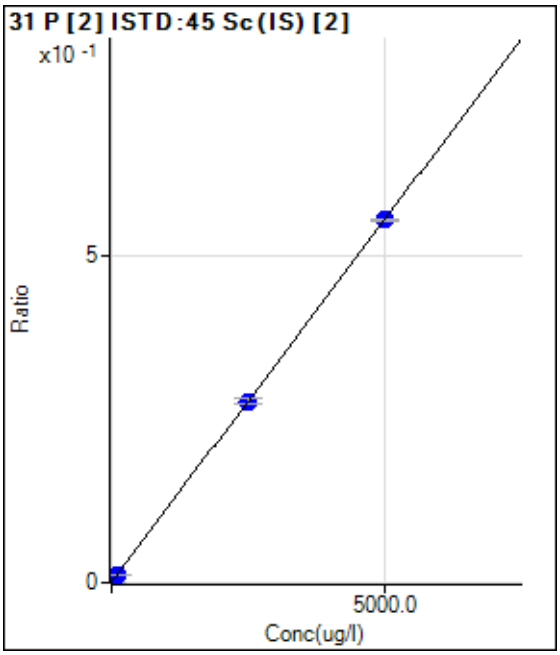
R = 0.9993

DL = 0.6258

BEC = 1.025

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	187.79	0.0008	P	25.9
2	☐	100.000	105.774	2812.56	0.0126	P	2.9
3	☐	2500.000	2498.729	63745.64	0.2781	P	2.6
4	☐	5000.000	5000.520	126420.54	0.5558	P	0.4
5	☐						
6	☐						
7	☐						

y = 1.1097E−004 * x + 8.3752E−004

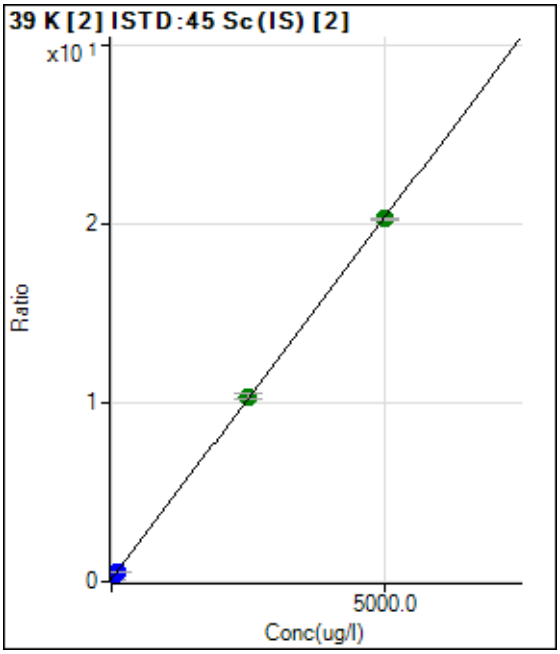
R = 1.0000

DL = 5.853

BEC = 7.547

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	32670.52	0.1458	P	1.0
2	☐	100.000	108.274	130353.39	0.5828	P	0.6
3	☐	2500.000	2530.960	2374695.07	10.3612	A	2.4
4	☐	5000.000	4984.354	4609371.28	20.2636	A	0.6
5	☐						
6	☐						
7	☐						

y = 0.0040 * x + 0.1458

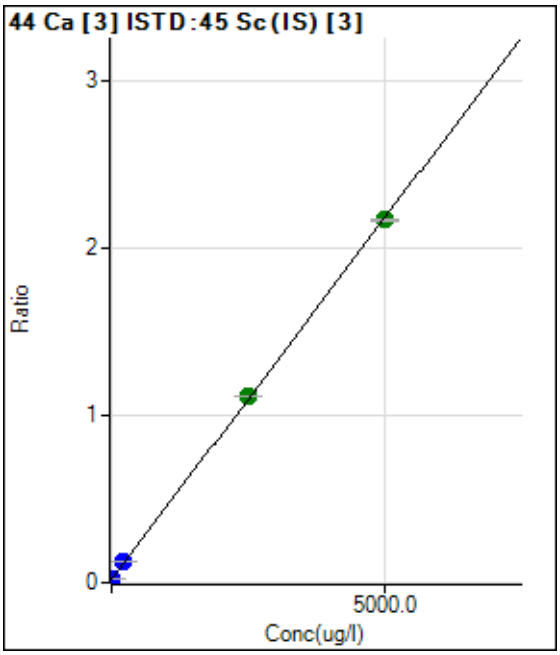
R = 1.0000

DL = 1.068

BEC = 36.11

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	70584.52	0.0178	P	0.3
2	☐	200.000	246.326	493052.08	0.1243	P	0.2
3	☐	2500.000	2540.669	4442349.03	1.1164	A	0.4
4	☐	5000.000	4977.812	8727002.72	2.1702	A	0.7
5	☐						
6	☐						
7	☐						

y = 4.3240E-004 * x + 0.0178

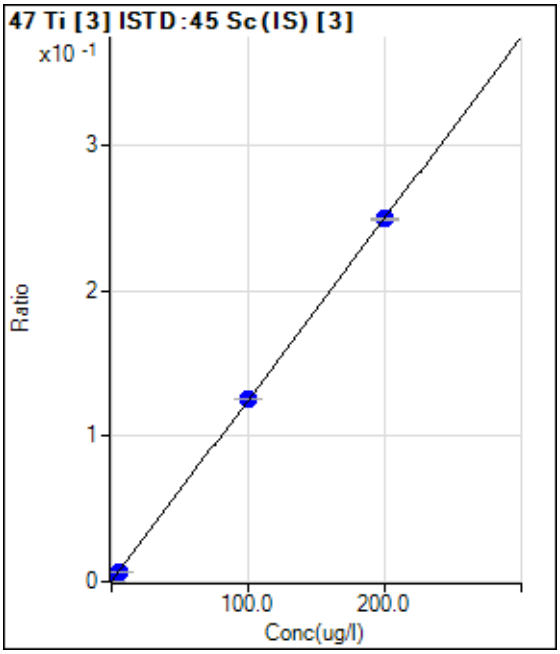
R = 0.9999

DL = 0.3891

BEC = 41.15

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	773.80	0.0002	P	8.6
2	☐	5.000	5.076	25921.67	0.0065	P	0.9
3	☐	100.000	100.406	499790.89	0.1256	P	0.4
4	☐	200.000	199.795	1004256.96	0.2497	P	0.5
5	☐						
6	☐						
7	☐						

y = 0.0012 * x + 1.9505E-004

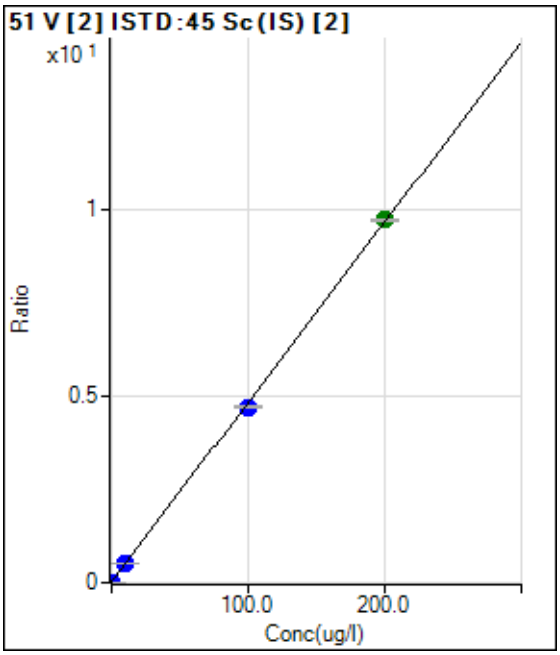
R = 1.0000

DL = 0.04042

BEC = 0.1562

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	4534.11	0.0202	P	4.6
2	☐	10.000	9.923	111536.95	0.4987	P	2.0
3	☐	100.000	97.265	1079651.53	4.7103	P	1.8
4	☐	200.000	201.371	2213314.99	9.7301	A	0.8
5	☐						
6	☐						
7	☐						

y = 0.0482 * x + 0.0202

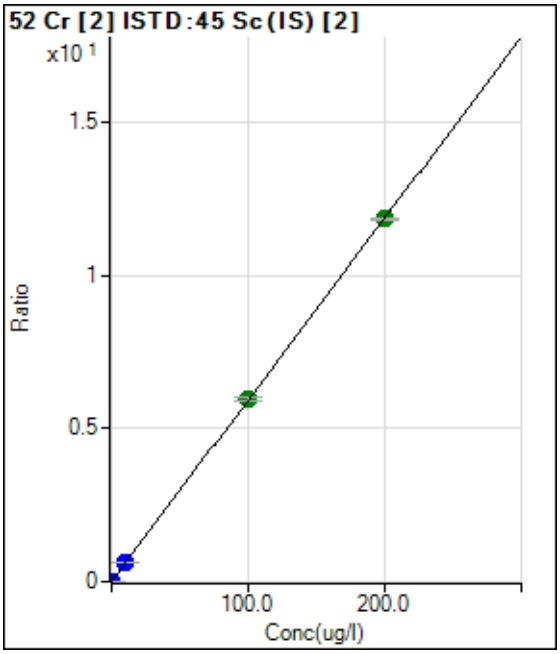
R = 0.9998

DL = 0.05799

BEC = 0.4196

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1869.07	0.0083	P	5.1
2	☐	10.000	10.346	138939.74	0.6212	P	1.6
3	☐	100.000	100.401	1364943.66	5.9556	A	2.5
4	☐	200.000	199.782	2693777.98	11.8423	A	0.9
5	☐						
6	☐						
7	☐						

y = 0.0592 * x + 0.0083

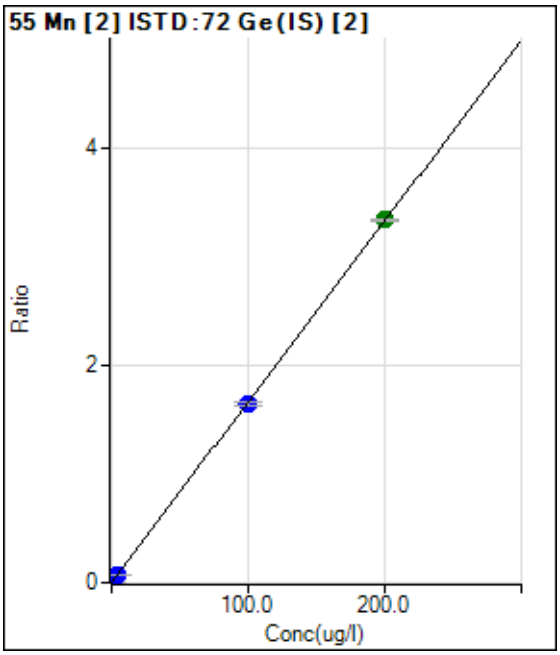
R = 1.0000

DL = 0.02164

BEC = 0.1408

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	350.02	0.0008	P	12.3
2	☐	4.000	4.233	34297.13	0.0711	P	2.5
3	☐	100.000	98.528	834923.67	1.6374	P	2.2
4	☐	200.000	200.731	1725757.25	3.3351	A	0.4
5	☐						
6	☐						
7	☐						

y = 0.0166 * x + 7.6362E-004

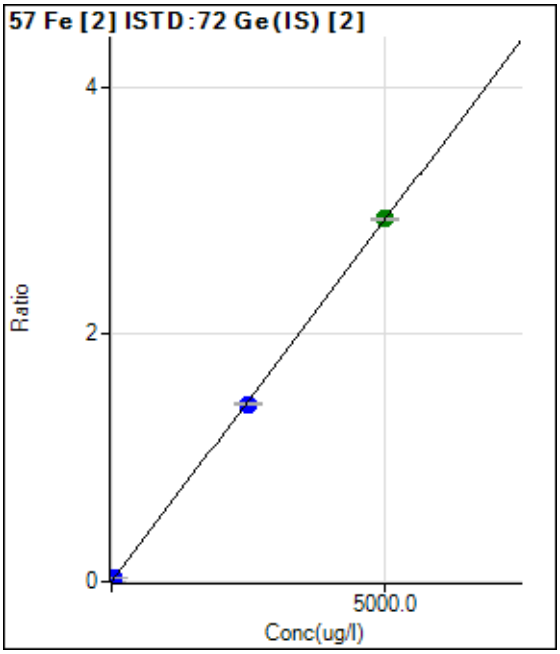
R = 1.0000

DL = 0.01693

BEC = 0.04597

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	485.59	0.0011	P	10.8
2	☐	50.000	52.451	15307.18	0.0317	P	3.2
3	☐	2500.000	2457.333	732975.31	1.4374	P	1.7
4	☐	5000.000	5021.309	1519277.53	2.9361	A	0.6
5	☐						
6	☐						
7	☐						

y = 5.8451E-004 * x + 0.0011

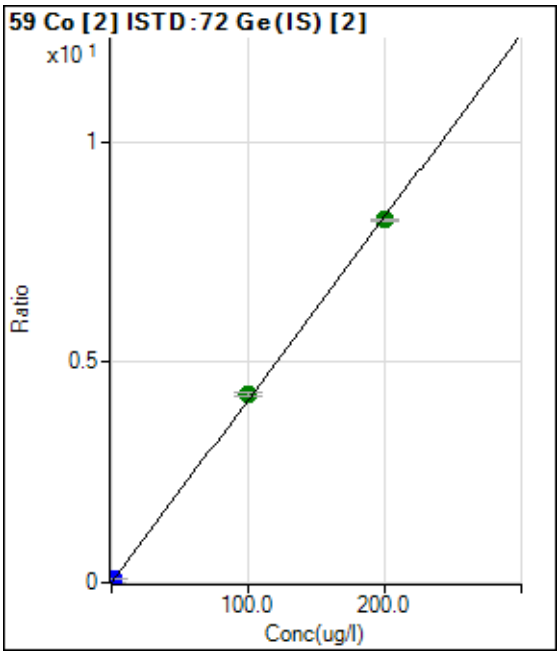
R = 0.9999

DL = 0.5858

BEC = 1.812

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	577.82	0.0013	P	2.2
2	☐	2.000	2.135	43337.21	0.0898	P	2.0
3	☐	100.000	103.169	2182930.69	4.2812	A	2.6
4	☐	200.000	198.414	4259949.90	8.2324	A	0.3
5	☐						
6	☐						
7	☐						

y = 0.0415 * x + 0.0013

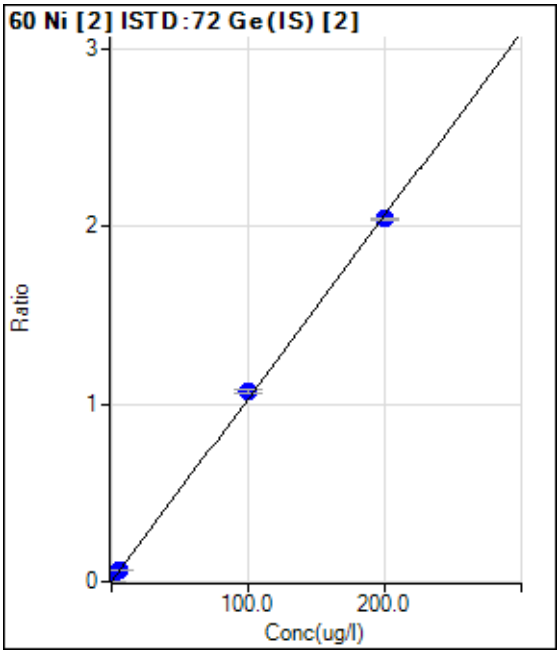
R = 0.9998

DL = 0.002009

BEC = 0.03037

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	158.90	0.0003	P	18.0
2	☐	5.000	5.875	29340.68	0.0608	P	0.8
3	☐	100.000	103.584	543712.88	1.0663	P	2.3
4	☐	200.000	198.186	1055520.63	2.0398	P	0.4
5	☐						
6	☐						
7	☐						

y = 0.0103 * x + 3.4614E-004

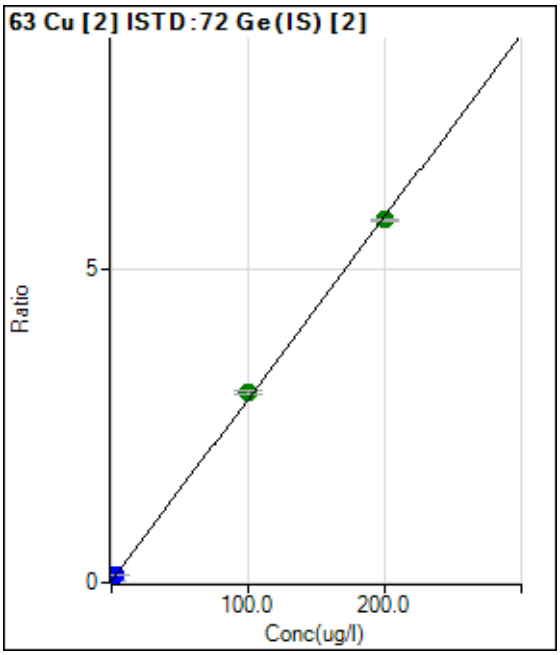
R = 0.9997

DL = 0.01813

BEC = 0.03364

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	10452.39	0.0228	P	0.3
2	☐	3.000	3.138	54908.17	0.1138	P	1.2
3	☐	100.000	103.395	1540394.61	3.0208	A	1.7
4	☐	200.000	198.301	2987042.98	5.7726	A	0.4
5	☐						
6	☐						
7	☐						

y = 0.0290 * x + 0.0228

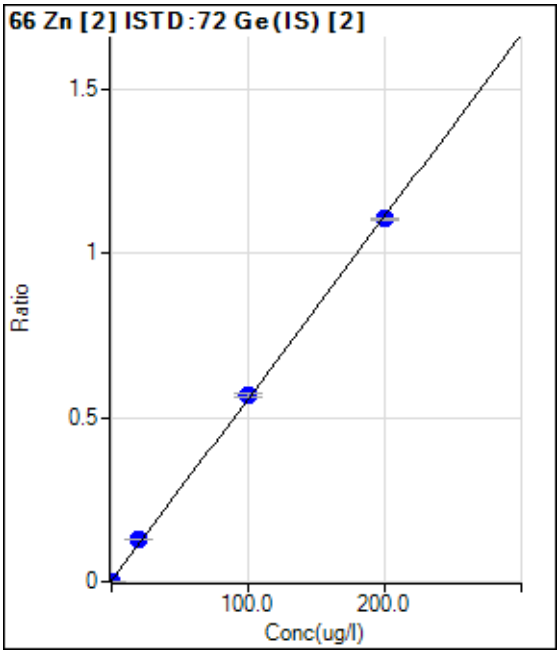
R = 0.9998

DL = 0.007122

BEC = 0.786

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1164.54	0.0025	P	6.5
2	☐	20.000	22.682	62027.24	0.1285	P	1.4
3	☐	100.000	102.026	290326.01	0.5693	P	1.6
4	☐	200.000	198.719	572554.07	1.1065	P	0.4
5	☐						
6	☐						
7	☐						

y = 0.0056 * x + 0.0025

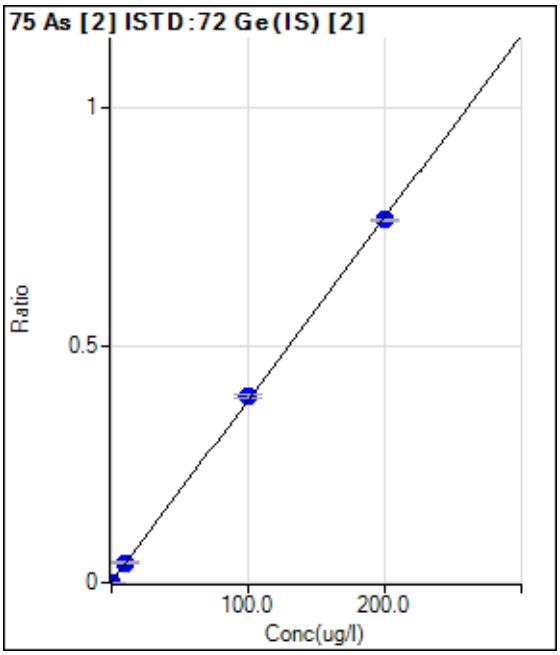
R = 0.9999

DL = 0.08965

BEC = 0.4571

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	290.02	0.0006	P	11.3
2	☐	10.000	10.900	20518.26	0.0425	P	2.5
3	☐	100.000	102.250	200703.73	0.3936	P	1.8
4	☐	200.000	198.830	395721.26	0.7647	P	0.6
5	☐						
6	☐						
7	☐						

y = 0.0038 * x + 6.3221E-004

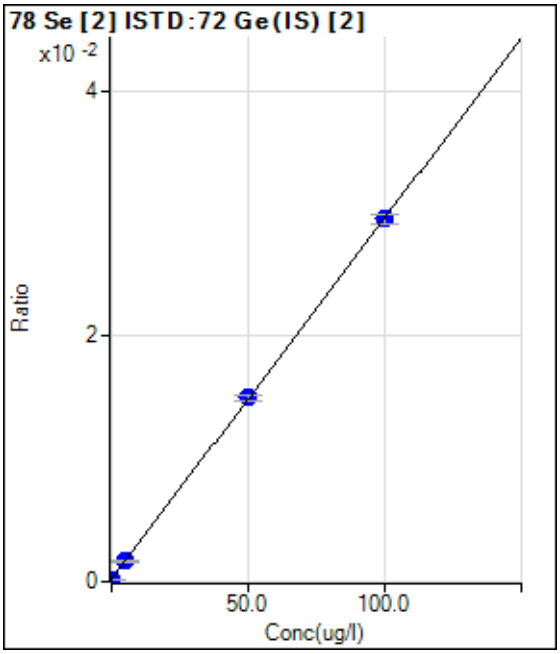
R = 0.9999

DL = 0.0558

BEC = 0.1645

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	86.67	0.0002	P	10.1
2	☐	5.000	5.031	805.61	0.0017	P	4.6
3	☐	50.000	50.268	7636.43	0.0150	P	3.4
4	☐	100.000	99.864	15301.75	0.0296	P	2.3
5	☐						
6	☐						
7	☐						

y = 2.9420E-004 * x + 1.8898E-004

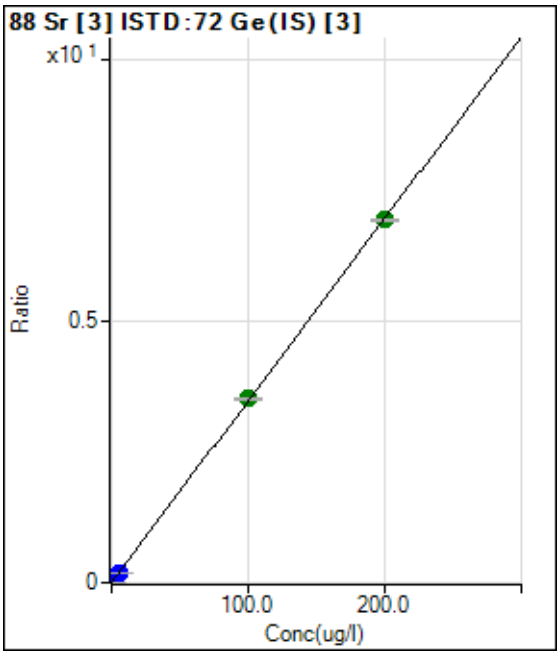
R = 1.0000

DL = 0.1955

BEC = 0.6423

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1214.54	0.0004	P	9.4
2	☐	5.000	5.156	539287.33	0.1796	P	0.3
3	☐	100.000	101.153	10776528.87	3.5155	A	0.6
4	☐	200.000	199.419	21332529.13	6.9302	A	0.4
5	☐						
6	☐						
7	☐						

y = 0.0347 * x + 4.1632E-004

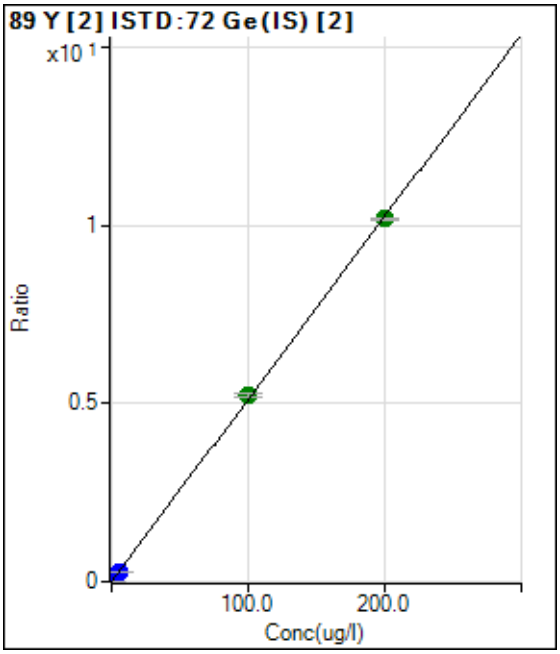
R = 1.0000

DL = 0.003386

BEC = 0.01198

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	187.79	0.0004	P	8.5
2	☐	5.000	5.176	128064.40	0.2654	P	1.8
3	☐	100.000	102.245	2669460.66	5.2350	A	1.9
4	☐	200.000	198.873	5268766.27	10.1820	A	0.8
5	☐						
6	☐						
7	☐						

y = 0.0512 * x + 4.0956E-004

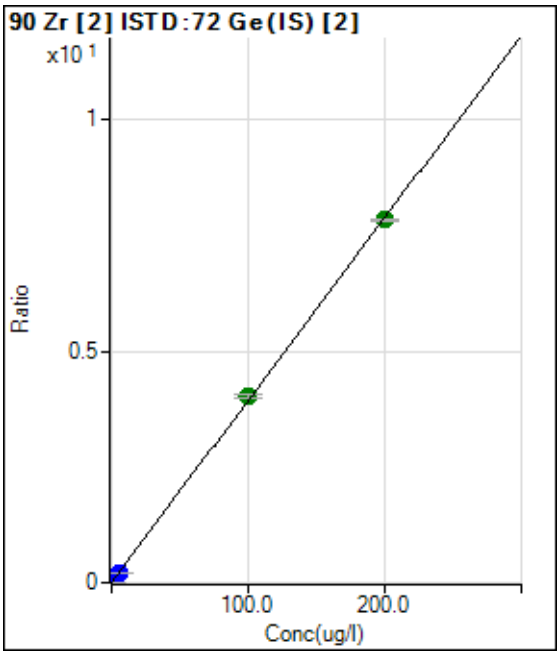
R = 0.9999

DL = 0.002032

BEC = 0.008

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	764.50	0.0017	P	10.0
2	☐	5.000	5.150	98609.23	0.2044	P	2.1
3	☐	100.000	101.979	2047698.01	4.0157	A	1.9
4	☐	200.000	199.007	4054185.36	7.8348	A	0.2
5	☐						
6	☐						
7	☐						

y = 0.0394 * x + 0.0017

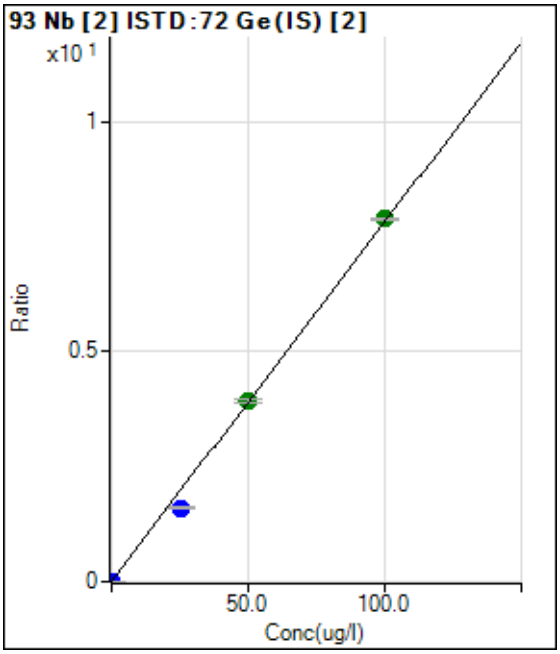
R = 0.9999

DL = 0.01271

BEC = 0.04233

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	2205.80	0.0048	P	4.9
2	☐	25.000	20.500	775116.50	1.6064	P	0.8
3	☐	50.000	50.320	2007193.08	3.9362	A	1.7
4	☐	100.000	100.965	4084291.74	7.8929	A	0.7
5	☐						
6	☐						
7	☐						

y = 0.0781 * x + 0.0048

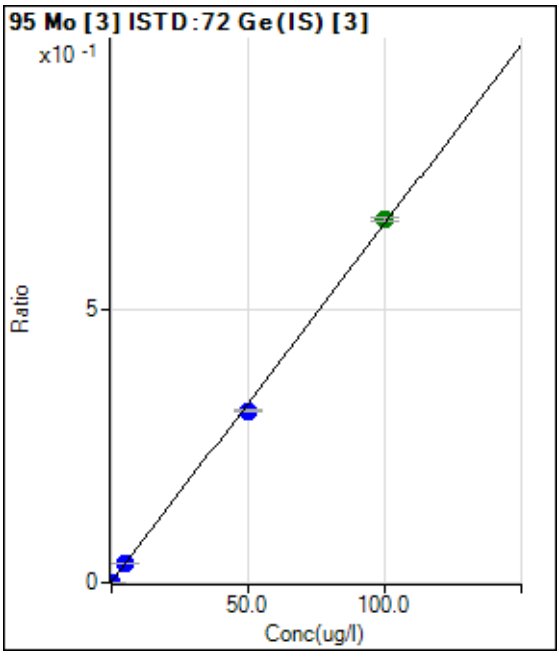
R = 0.9987

DL = 0.008993

BEC = 0.06156

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	3597.20	0.0012	P	3.0
2	☐	5.000	4.991	102034.79	0.0340	P	1.5
3	☐	50.000	47.767	964489.59	0.3146	P	0.7
4	☐	100.000	101.117	2045940.94	0.6647	A	1.1
5	☐						
6	☐						
7	☐						

y = 0.0066 * x + 0.0012

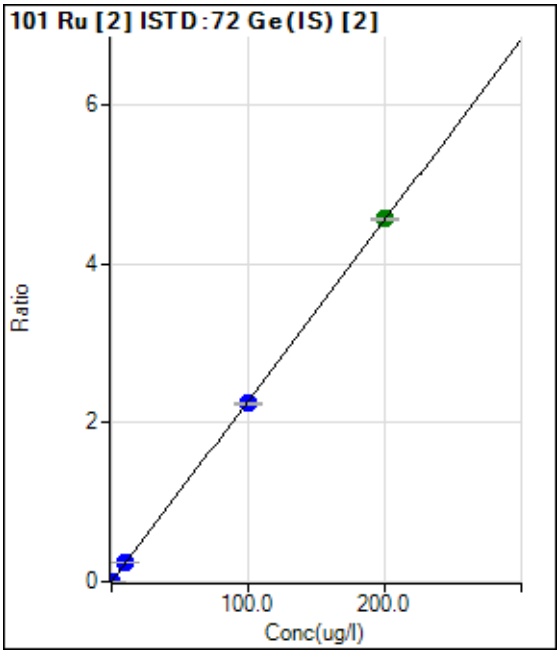
R = 0.9996

DL = 0.01711

BEC = 0.1879

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	122.23	0.0003	P	22.9
2	☐	10.000	10.661	116992.99	0.2425	P	0.8
3	☐	100.000	98.430	1140416.03	2.2364	P	1.7
4	☐	200.000	200.752	2360076.88	4.5609	A	0.3
5	☐						
6	☐						
7	☐						

y = 0.0227 * x + 2.6663E-004

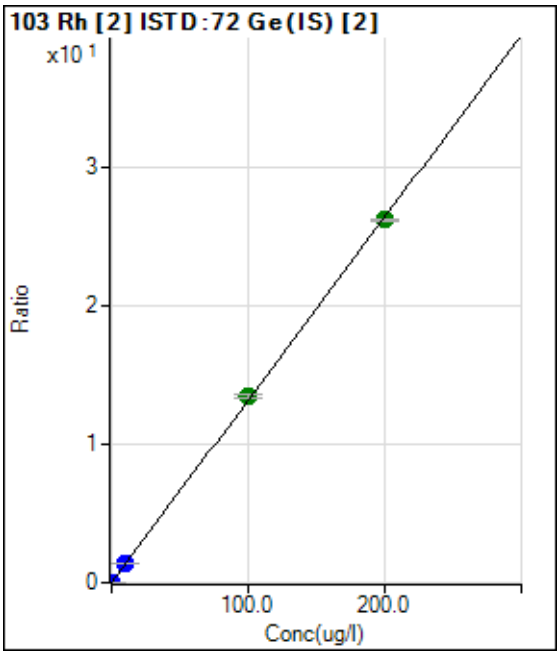
R = 0.9999

DL = 0.008078

BEC = 0.01174

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	861.17	0.0019	P	2.8
2	☐	10.000	10.539	671007.66	1.3906	P	0.3
3	☐	100.000	102.543	6890872.05	13.5134	A	1.9
4	☐	200.000	198.701	13548677.02	26.1837	A	0.7
5	☐						
6	☐						
7	☐						

y = 0.1318 * x + 0.0019

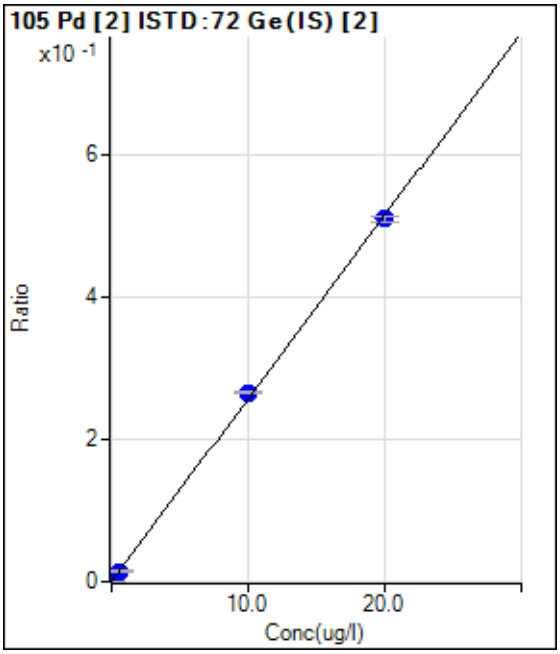
R = 0.9999

DL = 0.001211

BEC = 0.01425

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	100.01	0.0002	P	20.4
2	☐	0.500	0.568	7153.99	0.0148	P	3.9
3	☐	10.000	10.345	135727.47	0.2661	P	0.7
4	☐	20.000	19.826	263818.65	0.5098	P	1.4
5	☐						
6	☐						
7	☐						

y = 0.0257 * x + 2.1821E-004

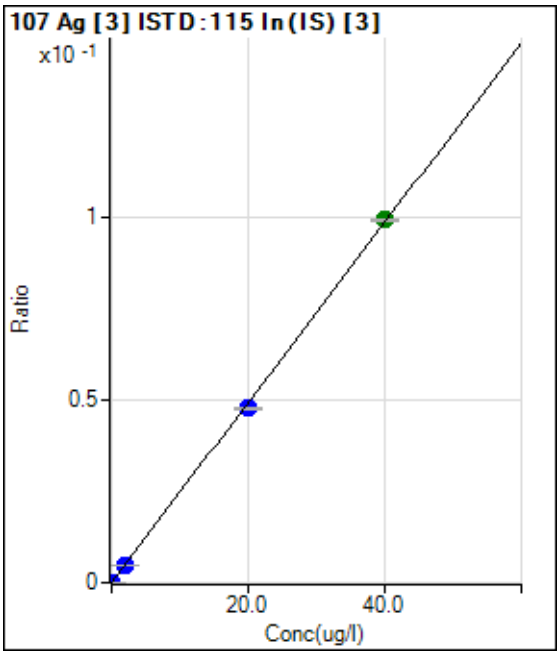
R = 0.9998

DL = 0.005195

BEC = 0.008489

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1843.51	0.0001	P	2.7
2	☐	2.000	1.938	108775.76	0.0048	P	0.7
3	☐	20.000	19.361	1058010.49	0.0476	P	0.6
4	☐	40.000	40.323	2189191.51	0.0991	A	0.8
5	☐						
6	☐						
7	☐						

y = 0.0025 * x + 8.3546E-005

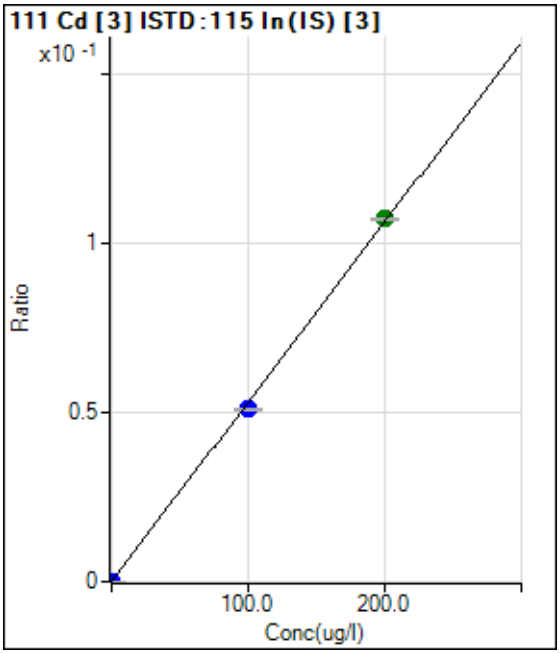
R = 0.9998

DL = 0.002706

BEC = 0.03402

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	192.37	0.0000	P	9.6
2	☐	0.500	0.488	6010.42	0.0003	P	2.4
3	☐	100.000	96.053	1132309.37	0.0510	P	0.5
4	☐	200.000	201.973	2367361.07	0.1072	A	0.4
5	☐						
6	☐						
7	☐						

y = 5.3050E-004 * x + 8.7176E-006

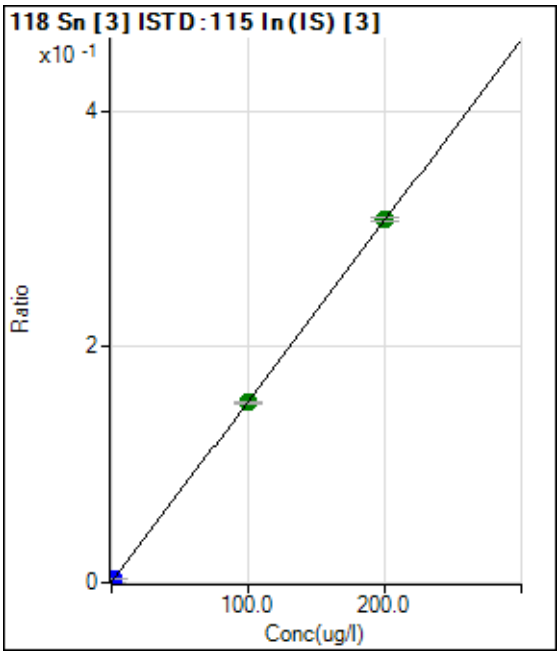
R = 0.9997

DL = 0.004712

BEC = 0.01643

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	10496.43	0.0005	P	2.6
2	☐	2.000	1.700	69228.90	0.0031	P	1.1
3	☐	100.000	99.221	3391012.87	0.1526	A	0.3
4	☐	200.000	200.393	6799664.20	0.3078	A	1.1
5	☐						
6	☐						
7	☐						

y = 0.0015 * x + 4.7570E-004

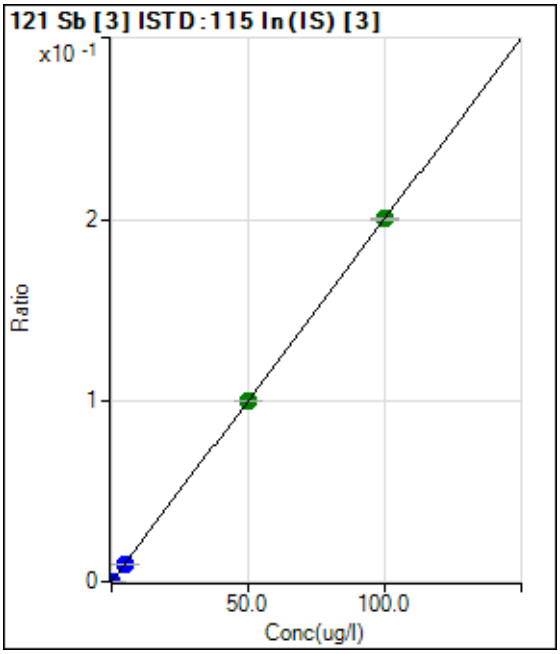
R = 1.0000

DL = 0.02448

BEC = 0.3102

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1319.01	0.0001	P	9.4
2	☐	5.000	4.698	212424.99	0.0095	P	1.4
3	☐	50.000	49.824	2215572.85	0.0997	A	0.6
4	☐	100.000	100.103	4425031.08	0.2003	A	0.6
5	☐						
6	☐						
7	☐						

y = 0.0020 * x + 5.9783E-005

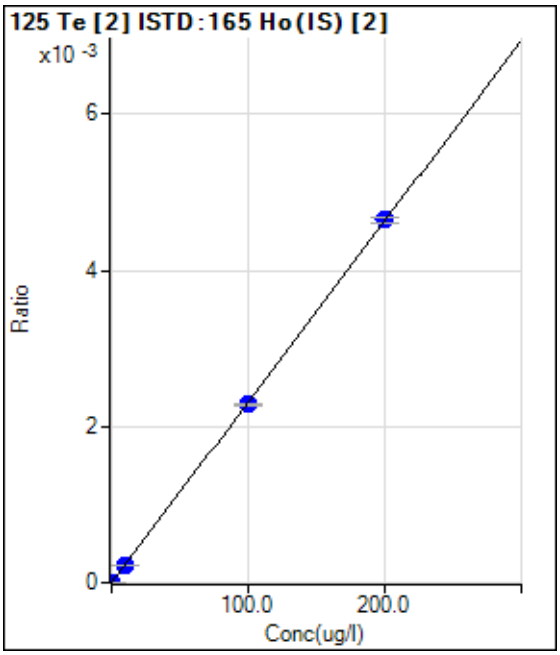
R = 1.0000

DL = 0.008452

BEC = 0.02989

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	2.22	0.0000	P	86.6
2	☐	10.000	9.533	3610.56	0.0002	P	6.7
3	☐	100.000	98.474	37622.89	0.0023	P	1.6
4	☐	200.000	200.786	75662.22	0.0046	P	1.2
5	☐						
6	☐						
7	☐						

y = 2.3137E-005 * x + 1.3733E-007

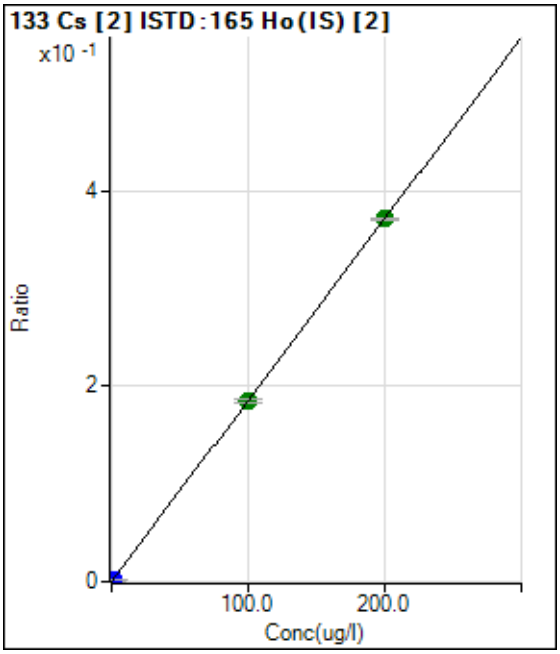
R = 1.0000

DL = 0.01542

BEC = 0.005936

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	118.90	0.0000	P	11.2
2	☐	1.000	0.963	29381.28	0.0018	P	2.1
3	☐	100.000	99.852	3063331.48	0.1855	A	1.5
4	☐	200.000	200.074	6054595.81	0.3717	A	0.3
5	☐						
6	☐						
7	☐						

y = 0.0019 * x + 7.3162E-006

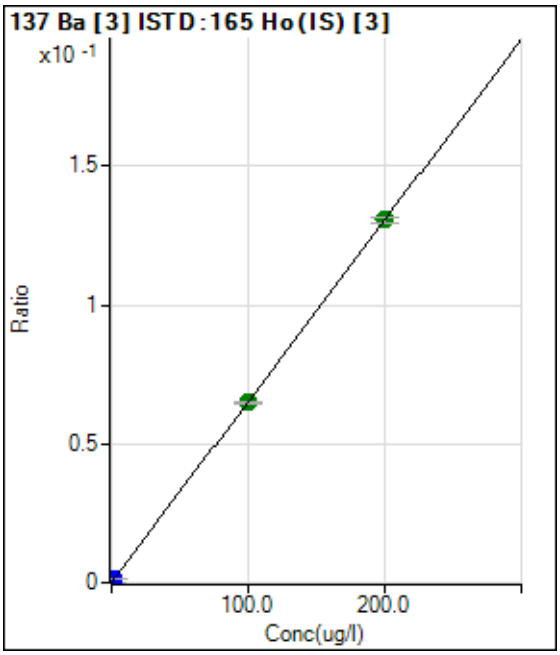
R = 1.0000

DL = 0.001319

BEC = 0.003938

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	708.94	0.0000	P	5.7
2	☐	2.000	1.920	35037.69	0.0013	P	0.4
3	☐	100.000	99.351	1778354.28	0.0648	A	0.4
4	☐	200.000	200.325	3601522.00	0.1306	A	1.5
5	☐						
6	☐						
7	☐						

y = 6.5166E-004 * x + 2.5991E-005

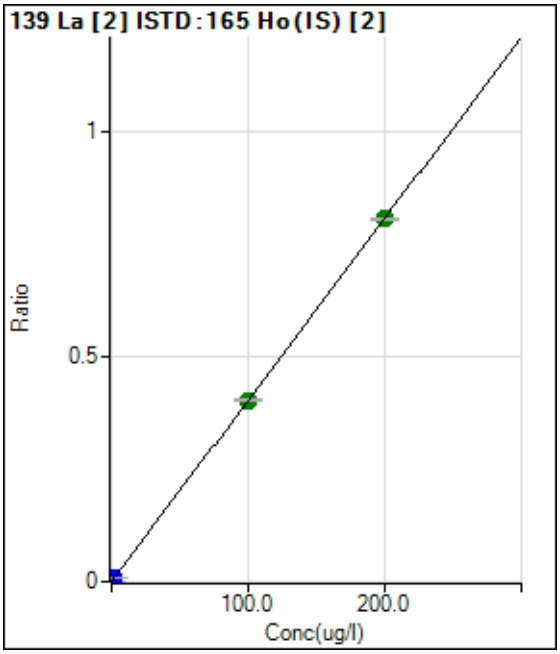
R = 1.0000

DL = 0.006799

BEC = 0.03988

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	250.02	0.0000	P	6.0
2	☐	2.000	1.880	124436.79	0.0076	P	1.1
3	☐	100.000	100.087	6671774.97	0.4041	A	1.2
4	☐	200.000	199.958	13147529.66	0.8073	A	0.4
5	☐						
6	☐						
7	☐						

y = 0.0040 * x + 1.5389E-005

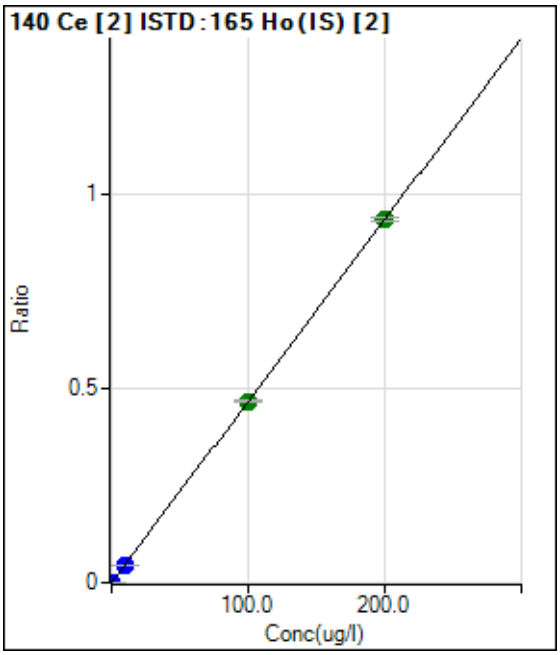
R = 1.0000

DL = 0.0006811

BEC = 0.003812

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	373.36	0.0000	P	4.4
2	☐	10.000	9.429	719847.10	0.0440	P	0.7
3	☐	100.000	100.031	7703496.83	0.4666	A	1.8
4	☐	200.000	200.013	15193802.83	0.9329	A	0.9
5	☐						
6	☐						
7	☐						

y = 0.0047 * x + 2.2986E-005

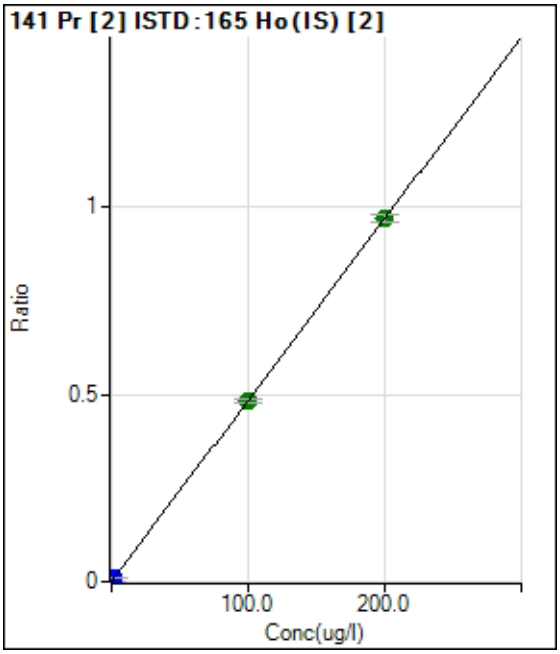
R = 1.0000

DL = 0.0006479

BEC = 0.004928

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	327.80	0.0000	P	5.4
2	☐	2.000	1.895	150521.45	0.0092	P	1.8
3	☐	100.000	99.915	7992231.55	0.4841	A	1.8
4	☐	200.000	200.044	15783304.49	0.9692	A	2.0
5	☐						
6	☐						
7	☐						

y = 0.0048 * x + 2.0173E-005

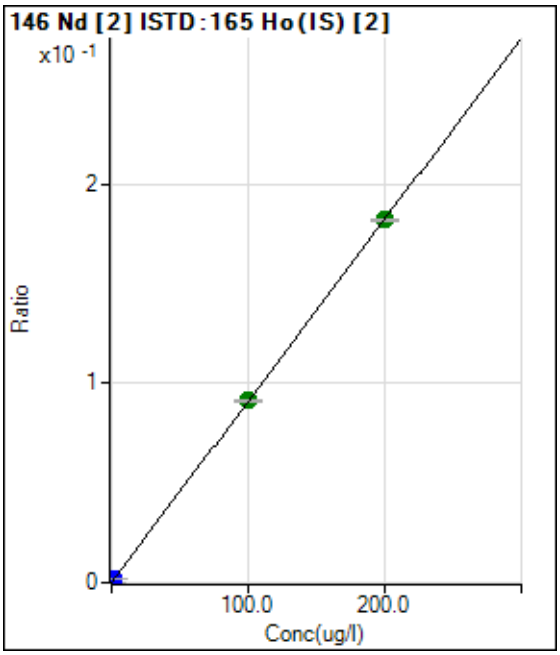
R = 1.0000

DL = 0.0006778

BEC = 0.004164

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	70.00	0.0000	P	5.5
2	☐	2.000	1.855	27701.84	0.0017	P	1.9
3	☐	100.000	100.210	1506687.65	0.0913	A	1.3
4	☐	200.000	199.896	2964562.84	0.1820	A	0.4
5	☐						
6	☐						
7	☐						

y = 9.1057E-004 * x + 4.3104E-006

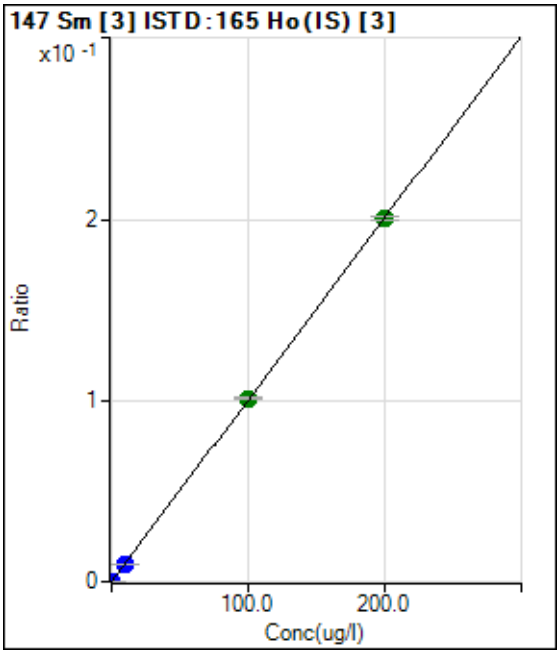
R = 1.0000

DL = 0.0007867

BEC = 0.004734

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	111.12	0.0000	P	18.4
2	☐	10.000	9.554	262947.14	0.0096	P	0.8
3	☐	100.000	100.820	2776316.76	0.1011	A	0.9
4	☐	200.000	199.612	5522049.92	0.2002	A	1.2
5	☐						
6	☐						
7	☐						

y = 0.0010 * x + 4.0790E-006

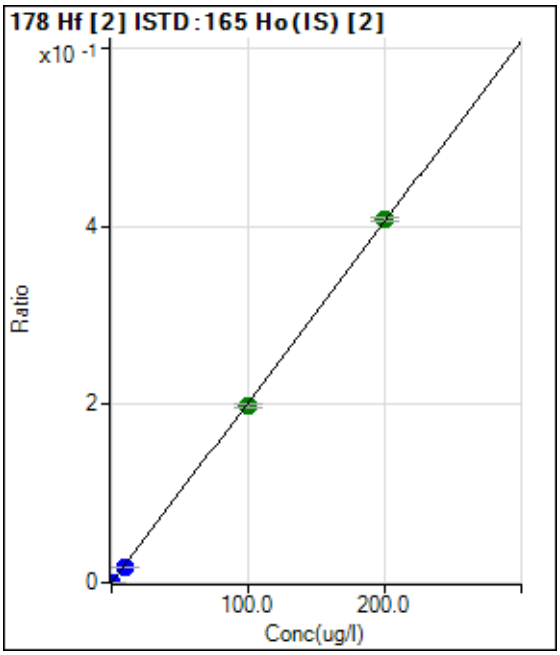
R = 1.0000

DL = 0.002248

BEC = 0.004067

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	777.83	0.0000	P	6.9
2	☐	10.000	8.786	292165.46	0.0179	P	1.3
3	☐	100.000	98.086	3283692.14	0.1989	A	1.8
4	☐	200.000	201.018	6637387.40	0.4075	A	1.0
5	☐						
6	☐						
7	☐						

y = 0.0020 * x + 4.7862E-005

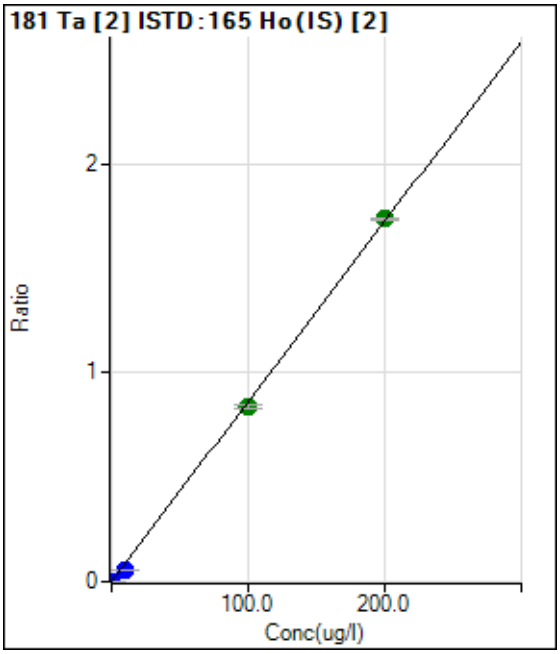
R = 0.9999

DL = 0.004904

BEC = 0.02361

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	24067.82	0.0015	P	2.0
2	☐	10.000	6.379	923337.69	0.0564	P	1.4
3	☐	100.000	97.164	13846463.40	0.8387	A	2.3
4	☐	200.000	201.599	28315815.69	1.7385	A	0.2
5	☐						
6	☐						
7	☐						

y = 0.0086 * x + 0.0015

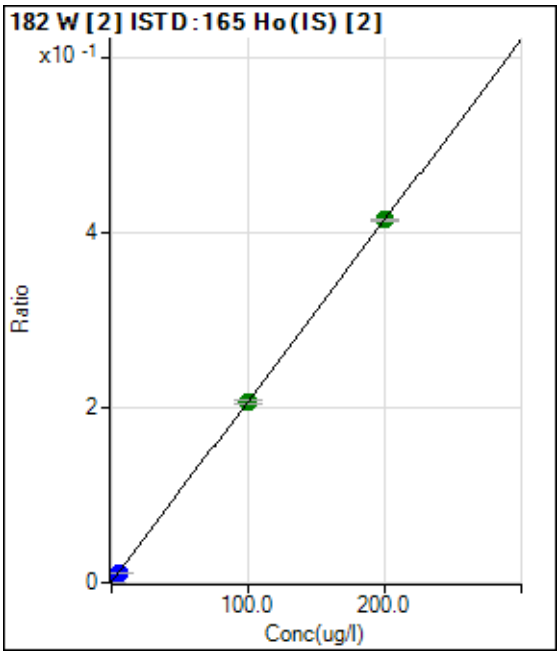
R = 0.9998

DL = 0.01039

BEC = 0.172

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	12905.70	0.0008	P	2.8
2	☐	5.000	4.414	162224.17	0.0099	P	0.5
3	☐	100.000	99.595	3411345.33	0.2066	A	2.3
4	☐	200.000	200.217	6752232.19	0.4146	A	0.4
5	☐						
6	☐						
7	☐						

y = 0.0021 * x + 7.9447E-004

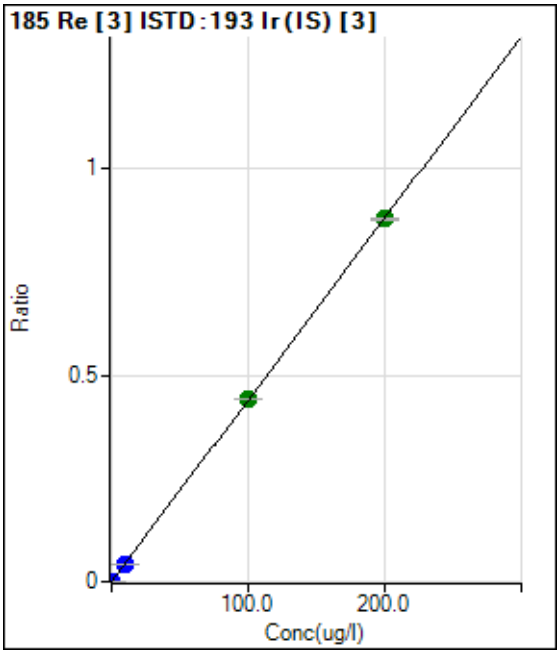
R = 1.0000

DL = 0.03273

BEC = 0.3844

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	204.46	0.0000	P	26.9
2	☐	10.000	9.209	552544.77	0.0406	P	0.6
3	☐	100.000	100.602	5995634.63	0.4429	A	0.7
4	☐	200.000	199.739	11942470.66	0.8793	A	0.7
5	☐						
6	☐						
7	☐						

y = 0.0044 * x + 1.5040E-005

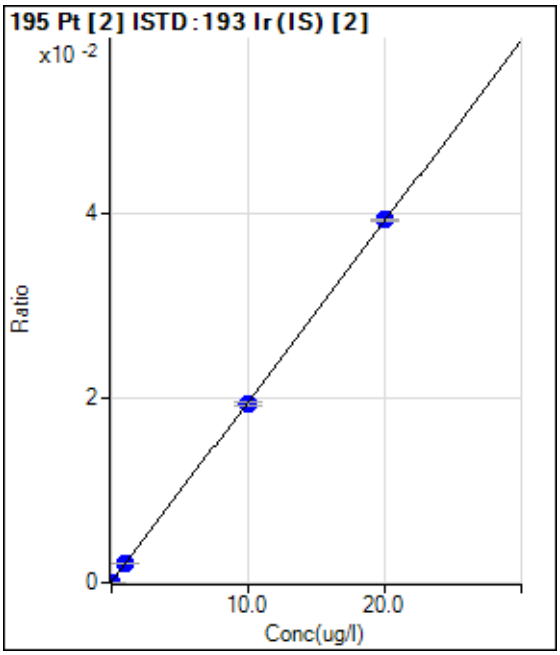
R = 1.0000

DL = 0.002757

BEC = 0.003417

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	420.02	0.0000	P	12.2
2	☐	1.000	1.008	22070.54	0.0020	P	2.0
3	☐	10.000	9.854	214144.99	0.0193	P	1.8
4	☐	20.000	20.073	423489.79	0.0393	P	0.9
5	☐						
6	☐						
7	☐						

y = 0.0020 * x + 3.8184E-005

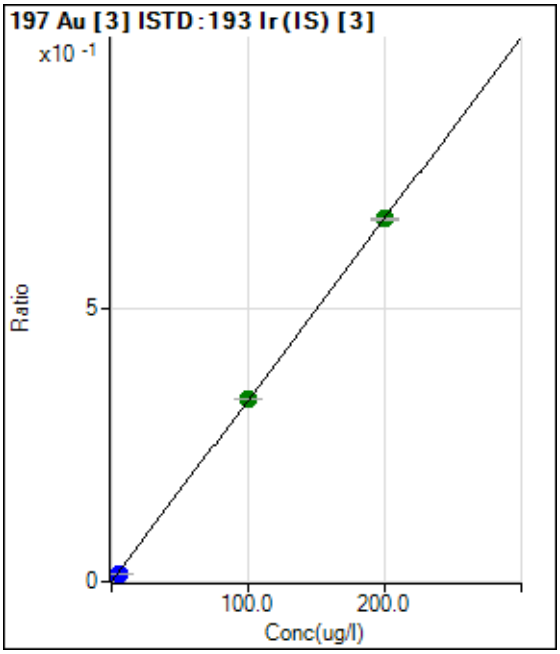
R = 1.0000

DL = 0.007158

BEC = 0.01951

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	712.27	0.0001	P	6.3
2	☐	5.000	4.695	213080.88	0.0156	P	0.6
3	☐	100.000	100.255	4506430.14	0.3329	A	0.2
4	☐	200.000	199.880	9013083.82	0.6636	A	0.6
5	☐						
6	☐						
7	☐						

y = 0.0033 * x + 5.2415E-005

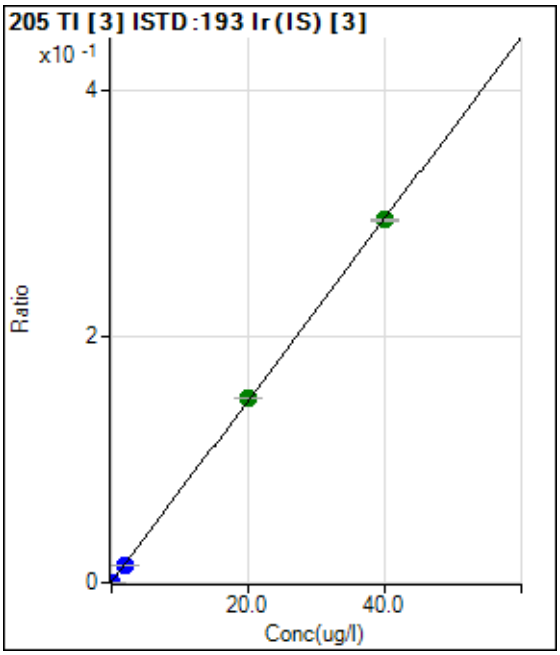
R = 1.0000

DL = 0.002995

BEC = 0.01579

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	4419.73	0.0003	P	10.9
2	☐	2.000	1.843	190054.73	0.0139	P	0.5
3	☐	20.000	20.251	2030757.40	0.1500	A	0.2
4	☐	40.000	39.882	4008058.72	0.2951	A	0.9
5	☐						
6	☐						
7	☐						

y = 0.0074 * x + 3.2534E-004

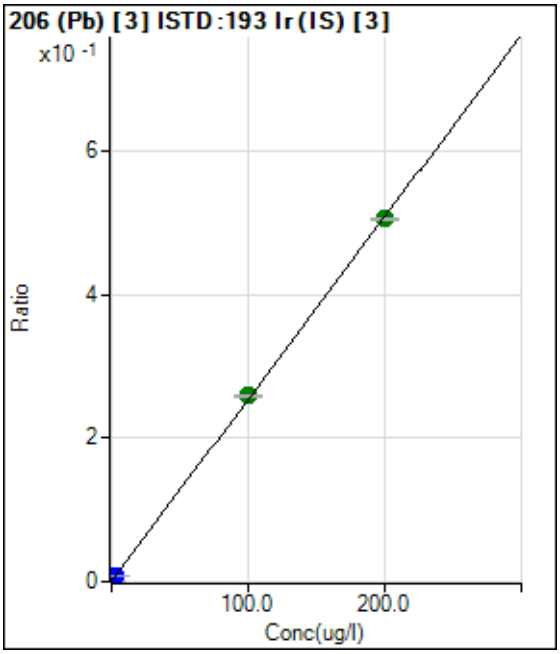
R = 1.0000

DL = 0.01433

BEC = 0.04402

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	5840.25	0.0004	P	3.5
2	☐	3.000	2.743	100635.20	0.0074	P	1.0
3	☐	100.000	101.930	3505372.20	0.2589	A	0.7
4	☐	200.000	199.039	6861667.47	0.5052	A	0.5
5	☐						
6	☐						
7	☐						

y = 0.0025 * x + 4.2975E-004

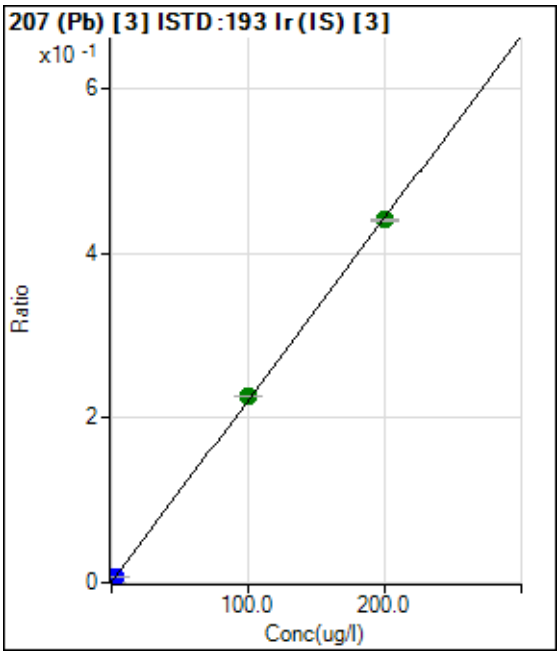
R = 0.9999

DL = 0.01756

BEC = 0.1695

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	5813.53	0.0004	P	2.6
2	☐	3.000	2.718	87710.28	0.0064	P	1.2
3	☐	100.000	102.058	3060414.54	0.2261	A	0.4
4	☐	200.000	198.975	5980599.15	0.4403	A	0.4
5	☐						
6	☐						
7	☐						

y = 0.0022 * x + 4.2774E-004

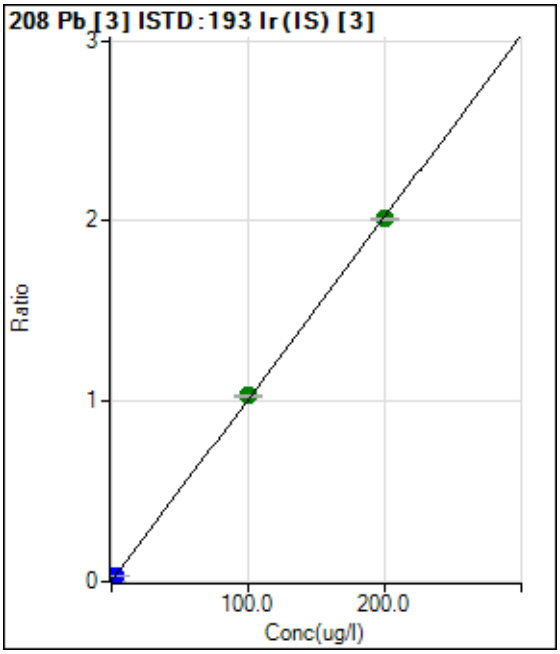
R = 0.9999

DL = 0.01493

BEC = 0.1935

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	22830.41	0.0017	P	1.3
2	☐	3.000	2.747	400608.17	0.0294	P	0.4
3	☐	100.000	101.823	13934109.76	1.0292	A	0.2
4	☐	200.000	199.092	27311647.23	2.0108	A	0.8
5	☐						
6	☐						
7	☐						

y = 0.0101 * x + 0.0017

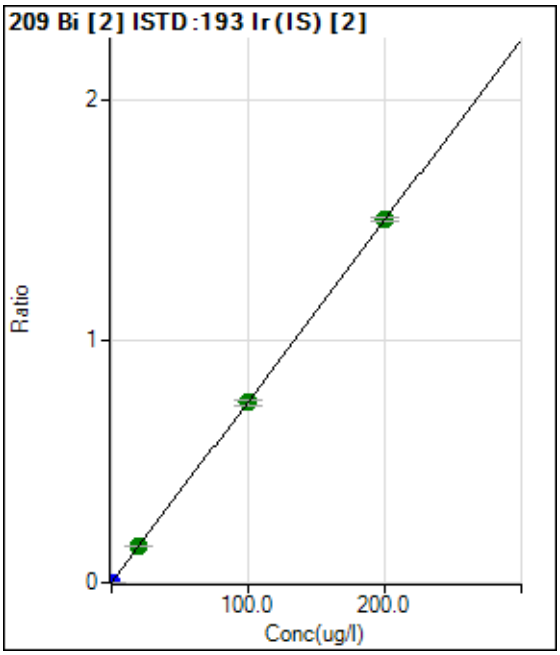
R = 0.9999

DL = 0.006284

BEC = 0.1665

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	9355.37	0.0009	P	1.7
2	☐	20.000	20.321	1678732.27	0.1530	A	0.2
3	☐	100.000	99.292	8243418.84	0.7441	A	3.1
4	☐	200.000	200.322	16157749.06	1.5004	A	0.9
5	☐						
6	☐						
7	☐						

y = 0.0075 * x + 8.5058E-004

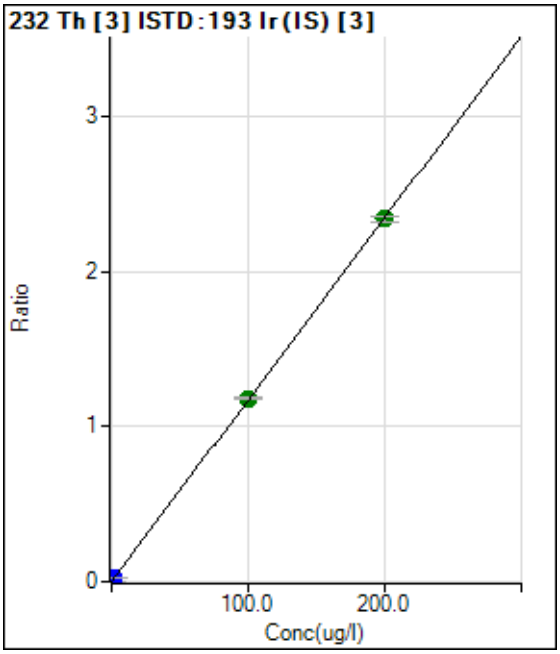
R = 1.0000

DL = 0.005772

BEC = 0.1136

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	8383.75	0.0006	P	2.2
2	☐	2.000	1.756	289165.23	0.0212	P	0.3
3	☐	100.000	100.801	16020525.87	1.1833	A	0.8
4	☐	200.000	199.602	31816598.69	2.3426	A	1.4
5	☐						
6	☐						
7	☐						

y = 0.0117 * x + 6.1686E-004

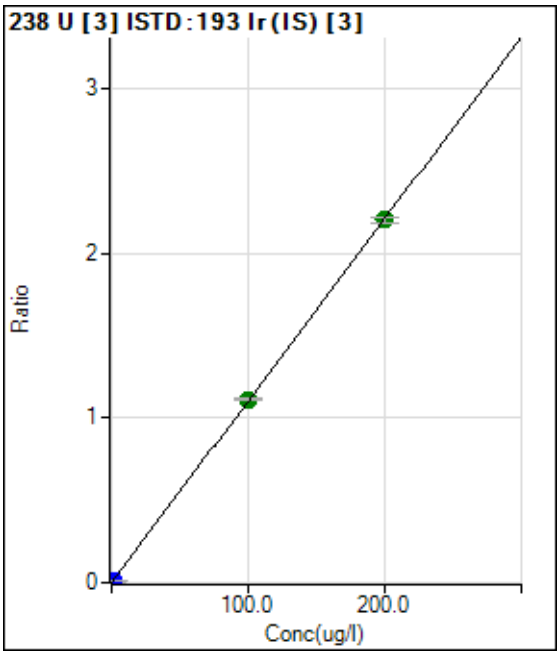
R = 1.0000

DL = 0.003498

BEC = 0.05257

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	743.39	0.0001	P	6.7
2	☐	1.000	0.897	135872.63	0.0100	P	0.2
3	☐	100.000	100.878	15099523.11	1.1153	A	0.8
4	☐	200.000	199.562	29966125.67	2.2063	A	1.3
5	☐						
6	☐						
7	☐						

y = 0.0111 * x + 5.4711E-005

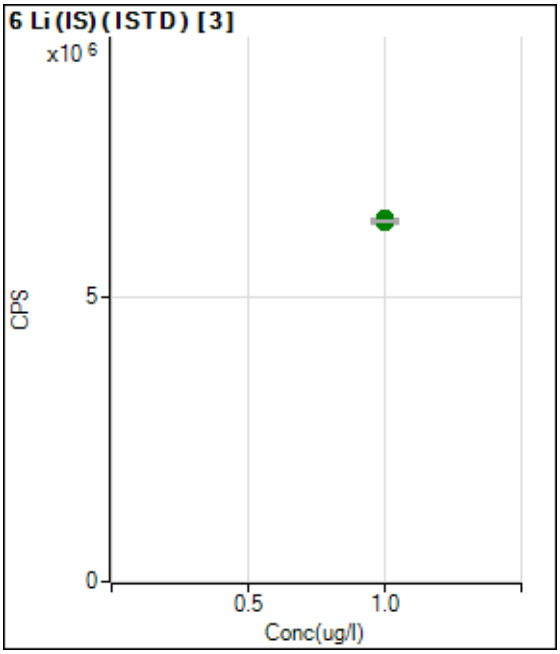
R = 1.0000

DL = 0.0009953

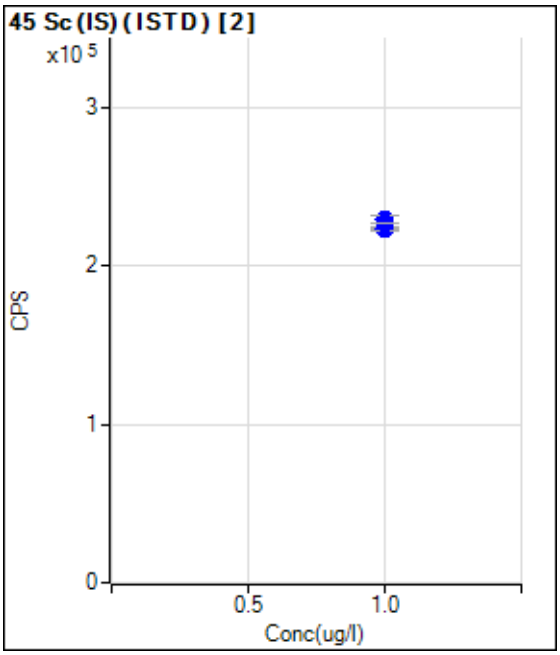
BEC = 0.004949

Weight: None

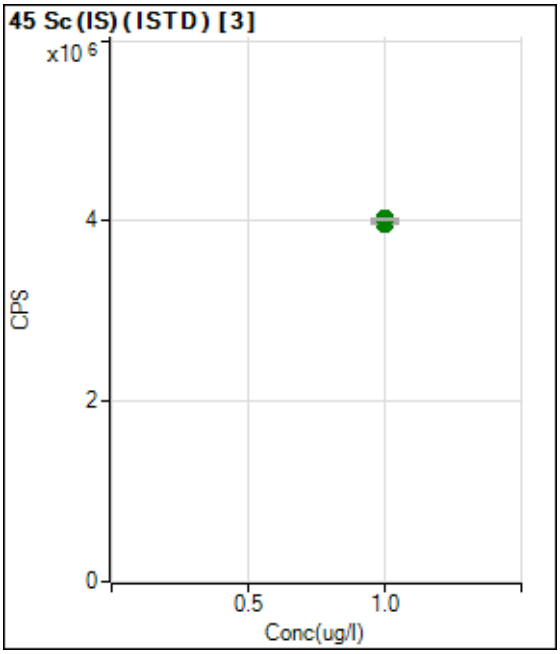
Min Conc: <None>



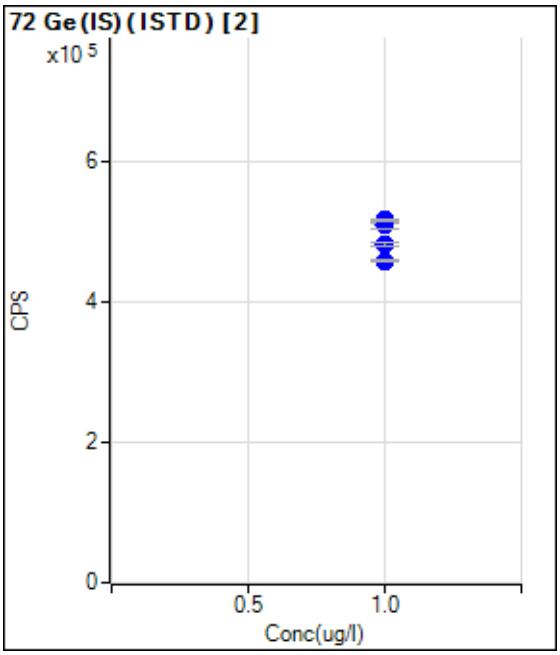
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		6327919.89		A	0.2
2	☐	1.000		6381641.00		A	0.1
3	☐	1.000		6310620.16		A	0.3
4	☐	1.000		6344334.47		A	0.2
5	☐	1.000					
6	☐	1.000					
7	☐	1.000					



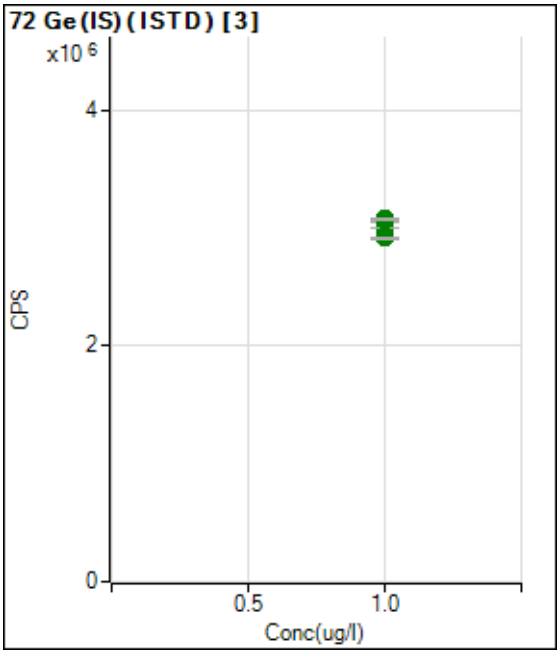
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		224145.97		P	1.0
2	☐	1.000		223677.61		P	0.7
3	☐	1.000		229270.06		P	2.2
4	☐	1.000		227471.29		P	0.1
5	☐	1.000					
6	☐	1.000					
7	☐	1.000					



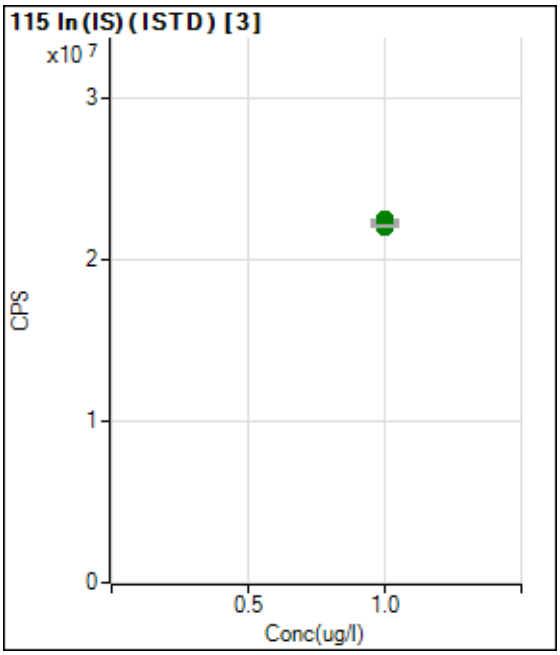
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		3966854.32		A	0.4
2	☐	1.000		3966454.91		A	0.4
3	☐	1.000		3979232.93		A	0.3
4	☐	1.000		4021329.59		A	0.4
5	☐	1.000					
6	☐	1.000					
7	☐	1.000					



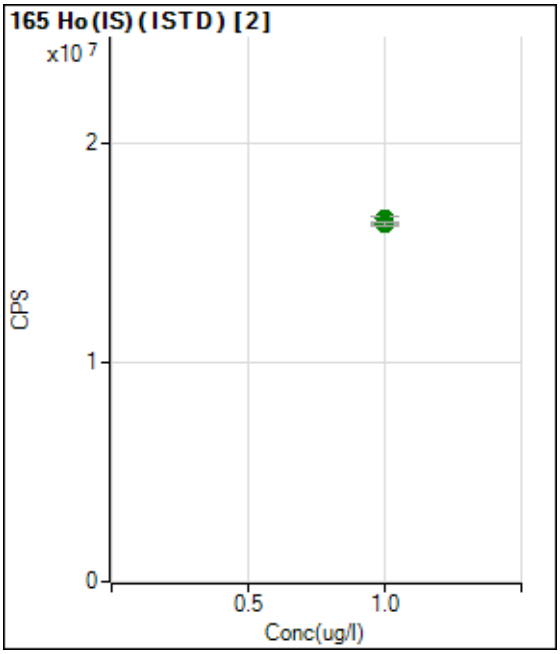
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		458626.75		P	0.8
2	☐	1.000		482539.37		P	0.8
3	☐	1.000		510031.52		P	1.6
4	☐	1.000		517457.67		P	0.4
5	☐	1.000					
6	☐	1.000					
7	☐	1.000					



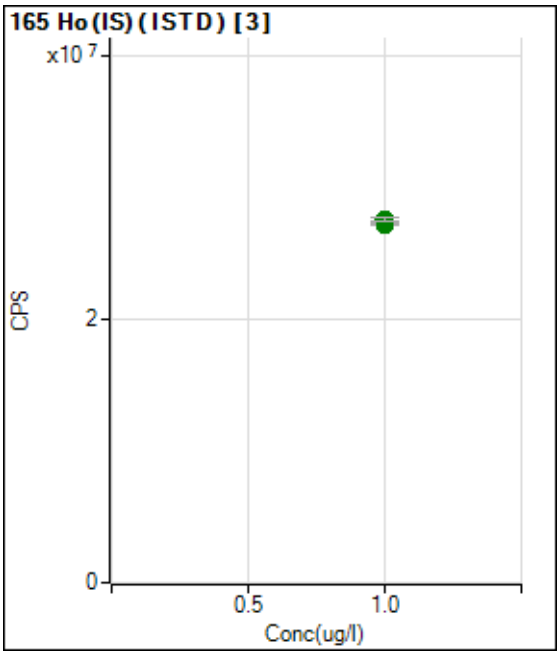
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		2917719.19		A	0.4
2	☐	1.000		3002731.76		A	0.4
3	☐	1.000		3065479.57		A	0.4
4	☐	1.000		3078211.86		A	0.5
5	☐	1.000					
6	☐	1.000					
7	☐	1.000					



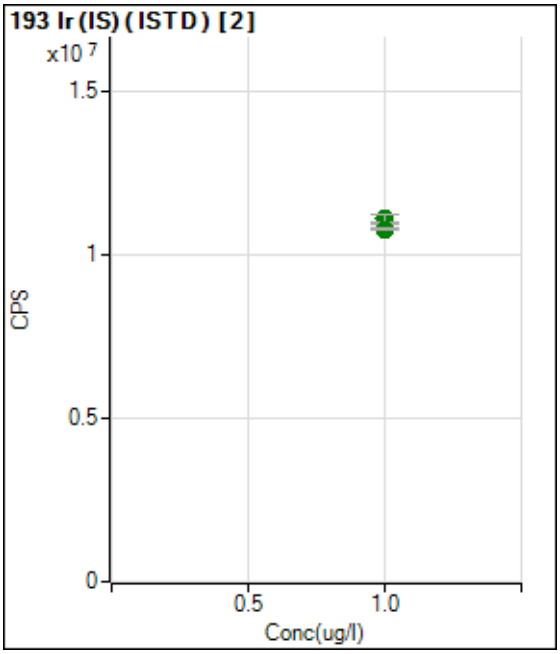
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		22065637.44		A	0.2
2	☐	1.000		22460969.35		A	0.6
3	☐	1.000		22216767.44		A	0.6
4	☐	1.000		22092869.64		A	0.6
5	☐	1.000					
6	☐	1.000					
7	☐	1.000					



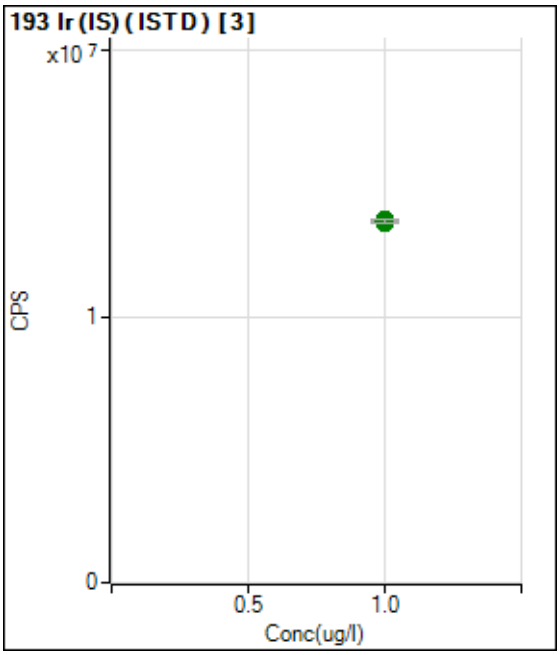
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		16245217.68		A	0.9
2	☐	1.000		16358786.56		A	0.2
3	☐	1.000		16513562.39		A	1.6
4	☐	1.000		16287001.42		A	0.7
5	☐	1.000					
6	☐	1.000					
7	☐	1.000					



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		27266962.93		A	0.9
2	☐	1.000		27432432.09		A	0.9
3	☐	1.000		27456844.59		A	0.2
4	☐	1.000		27585670.14		A	1.0
5	☐	1.000					
6	☐	1.000					
7	☐	1.000					



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		10999174.84		A	0.3
2	☐	1.000		10974359.70		A	0.4
3	☐	1.000		11082552.06		A	2.1
4	☐	1.000		10769026.09		A	0.6
5	☐	1.000					
6	☐	1.000					
7	☐	1.000					

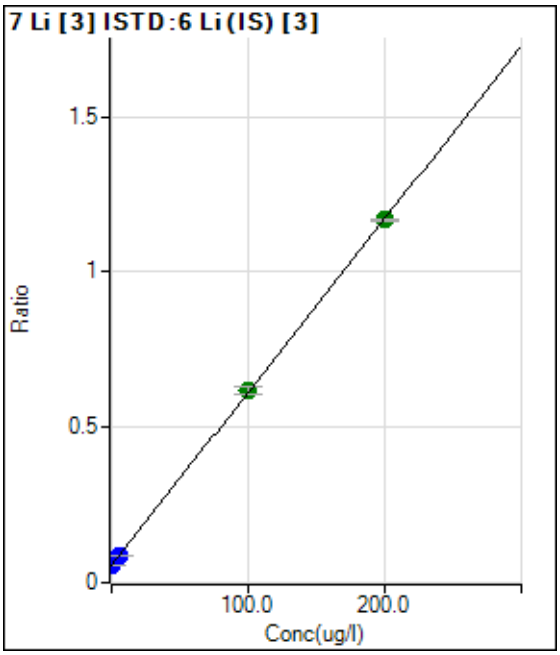


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		13591604.10		A	0.7
2	☐	1.000		13625741.88		A	0.8
3	☐	1.000		13538446.74		A	0.2
4	☐	1.000		13582966.46		A	0.9
5	☐	1.000					
6	☐	1.000					
7	☐	1.000					

Calibration for 076CALS.D

Batch Folder: C:¥ICPMH¥1¥DATA¥122619B1.B¥
Analysis File: 122619B1.batch.xml
DA Date-Time: 12/27/2019 12:47:39 AM
Calibration Title:
Calibration Method: External Calibration
VIS Interpolation Fit:
Tune Step: #1 he.u
#2 nogas.u

Level	Standard Data File	Sample Name	Acq. Date-Time
1	075CALB.D	ICIS 1854886	12/27/2019 12:24:53 AM
2	076CALS.D	IC 1856860	12/27/2019 12:31:37 AM
3	077CALS.D	IC 1856861	12/27/2019 12:38:21 AM
4	078CALS.D	IC 1856862	12/27/2019 12:45:03 AM
5			
6			
7			



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	277928.24	0.0562	P	0.6
2	☐	5.000	5.131	425702.34	0.0848	P	0.9
3	☐	100.000	100.919	3028036.45	0.6184	A	3.4
4	☐	200.000	199.537	5751348.46	1.1677	A	0.7
5	☐						
6	☐						
7	☐						

y = 0.0056 * x + 0.0562

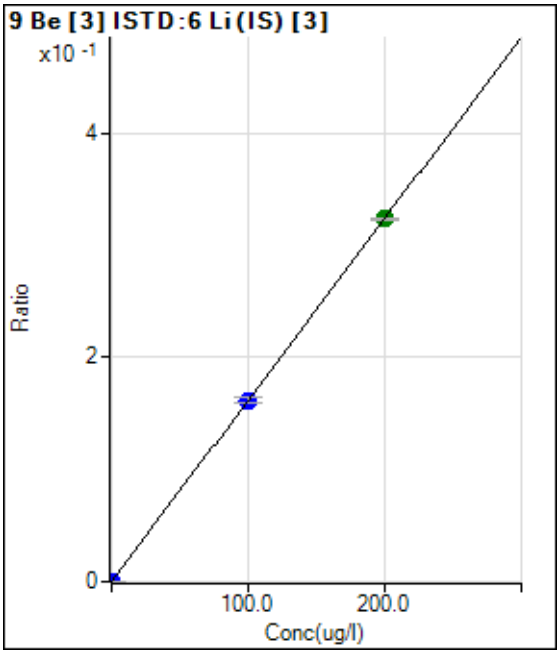
R = 1.0000

DL = 0.1719

BEC = 10.1

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	105.56	0.0000	P	35.1
2	☐	0.500	0.492	4102.85	0.0008	P	5.8
3	☐	100.000	100.061	793030.26	0.1619	P	3.1
4	☐	200.000	199.969	1593907.82	0.3236	A	0.8
5	☐						
6	☐						
7	☐						

y = 0.0016 * x + 2.1368E-005

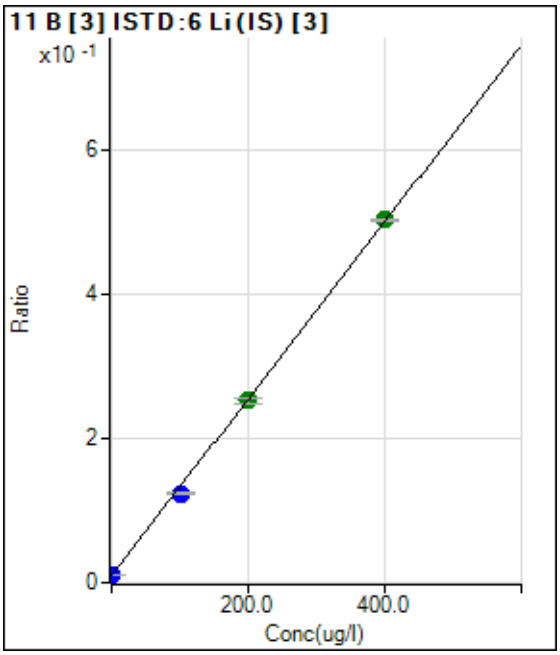
R = 1.0000

DL = 0.01389

BEC = 0.01321

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	47707.88	0.0097	P	0.6
2	☐	100.000	93.210	621146.20	0.1238	P	3.8
3	☐	200.000	198.362	1237035.33	0.2526	A	3.1
4	☐	400.000	402.516	2475711.30	0.5026	A	0.9
5	☐						
6	☐						
7	☐						

y = 0.0012 * x + 0.0097

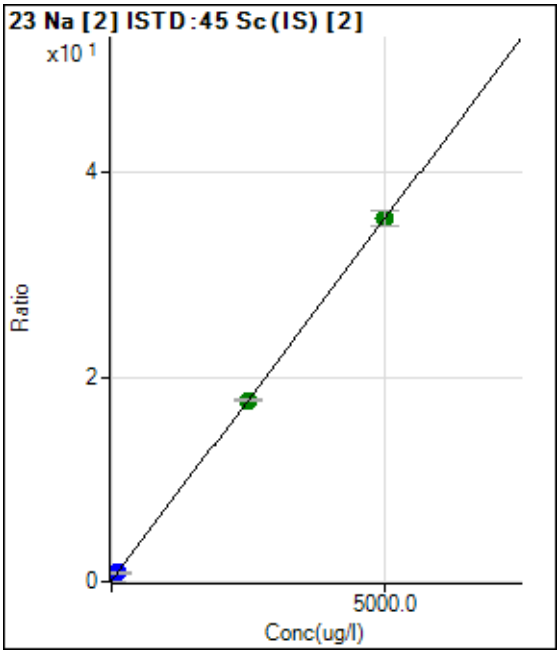
R = 0.9998

DL = 0.1413

BEC = 7.883

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	16816.07	0.0901	P	3.2
2	☐	100.000	107.172	159422.36	0.8474	P	1.7
3	☐	2500.000	2494.110	3377022.00	17.7138	A	1.1
4	☐	5000.000	5002.802	6788720.59	35.4407	A	4.3
5	☐						
6	☐						
7	☐						

y = 0.0071 * x + 0.0901

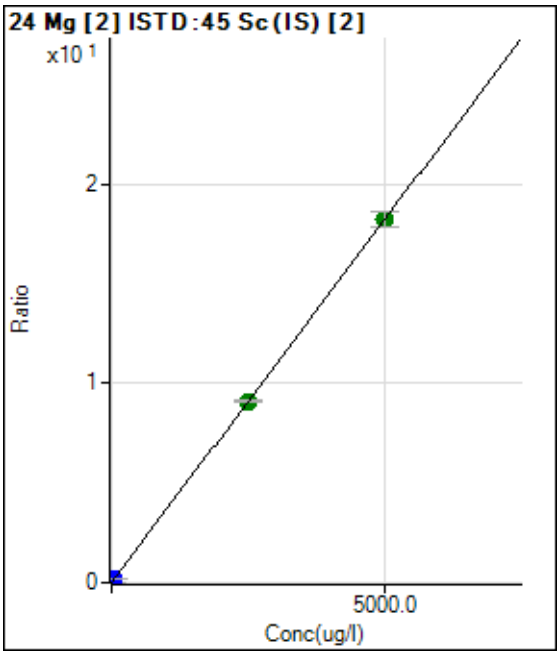
R = 1.0000

DL = 1.237

BEC = 12.75

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	446.70	0.0024	P	2.5
2	☐	50.000	57.499	39798.71	0.2115	P	1.1
3	☐	2500.000	2500.980	1734588.27	9.0988	A	1.4
4	☐	5000.000	4999.435	3483535.54	18.1860	A	4.4
5	☐						
6	☐						
7	☐						

y = 0.0036 * x + 0.0024

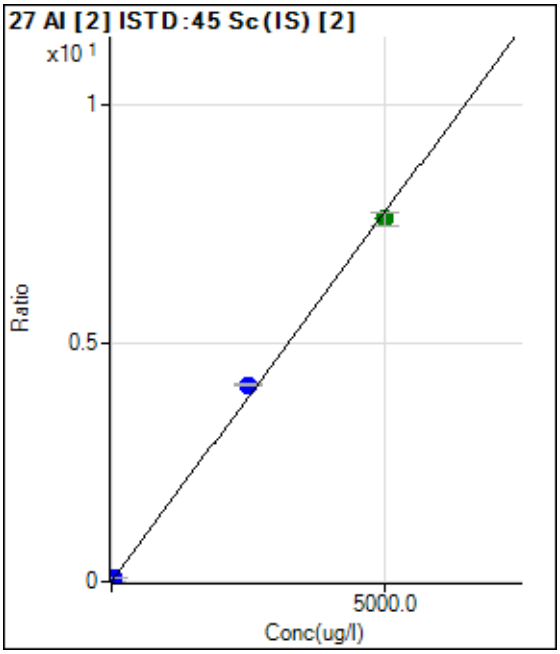
R = 1.0000

DL = 0.04877

BEC = 0.6578

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	287.79	0.0015	P	7.3
2	☐	50.000	59.451	17612.52	0.0936	P	3.0
3	☐	2500.000	2668.481	788279.44	4.1349	P	1.4
4	☐	5000.000	4915.665	1459042.15	7.6156	A	3.7
5	☐						
6	☐						
7	☐						

y = 0.0015 * x + 0.0015

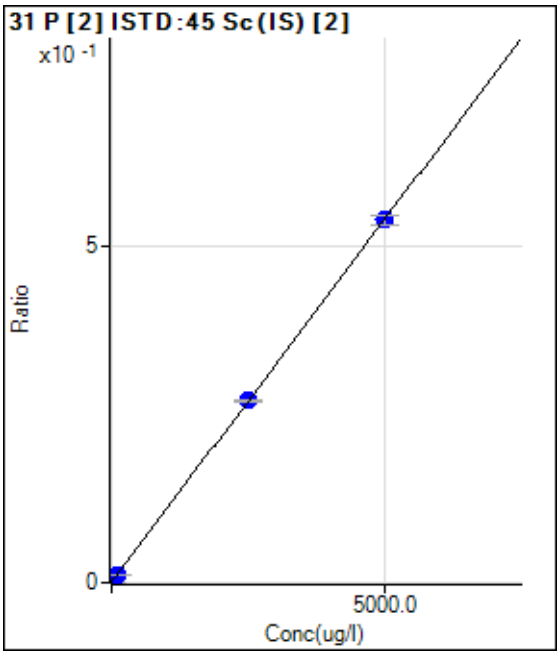
R = 0.9991

DL = 0.2194

BEC = 0.995

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	112.23	0.0006	P	16.7
2	☐	100.000	101.529	2168.01	0.0115	P	3.9
3	☐	2500.000	2506.520	51533.86	0.2703	P	1.4
4	☐	5000.000	4996.709	103146.93	0.5383	P	2.8
5	☐						
6	☐						
7	☐						

y = 1.0761E-004 * x + 6.0105E-004

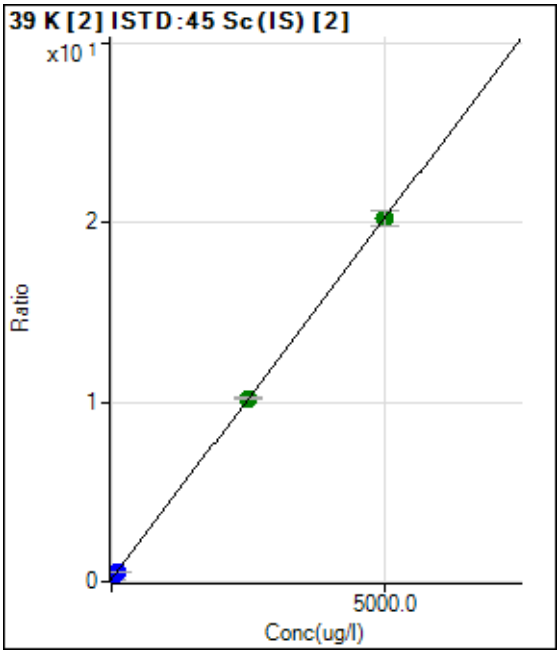
R = 1.0000

DL = 2.806

BEC = 5.586

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	28044.72	0.1502	P	0.8
2	☐	100.000	106.664	108762.20	0.5782	P	2.6
3	☐	2500.000	2508.871	1947667.59	10.2162	A	1.0
4	☐	5000.000	4995.431	3868129.07	20.1926	A	4.1
5	☐						
6	☐						
7	☐						

y = 0.0040 * x + 0.1502

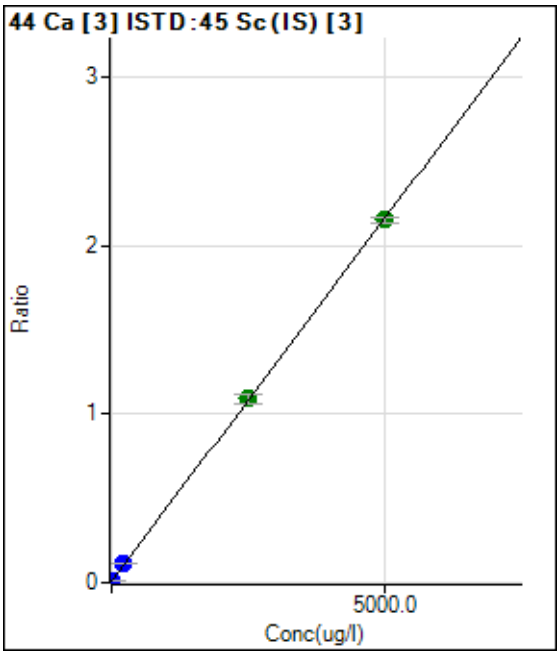
R = 1.0000

DL = 0.9246

BEC = 37.44

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	24994.80	0.0076	P	1.4
2	☐	200.000	246.817	384284.71	0.1138	P	4.4
3	☐	2500.000	2526.002	3674554.98	1.0944	A	5.3
4	☐	5000.000	4985.126	7342841.56	2.1523	A	1.4
5	☐						
6	☐						
7	☐						

y = 4.3022E−004 * x + 0.0076

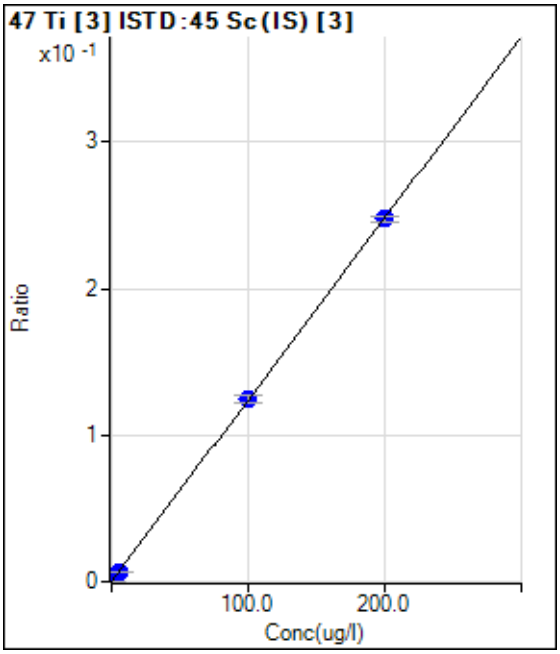
R = 1.0000

DL = 0.7615

BEC = 17.71

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	490.01	0.0001	P	6.5
2	☐	5.000	4.981	21342.85	0.0063	P	4.7
3	☐	100.000	100.539	418815.44	0.1247	P	5.0
4	☐	200.000	199.731	844730.73	0.2476	P	1.8
5	☐						
6	☐						
7	☐						

y = 0.0012 * x + 1.4935E−004

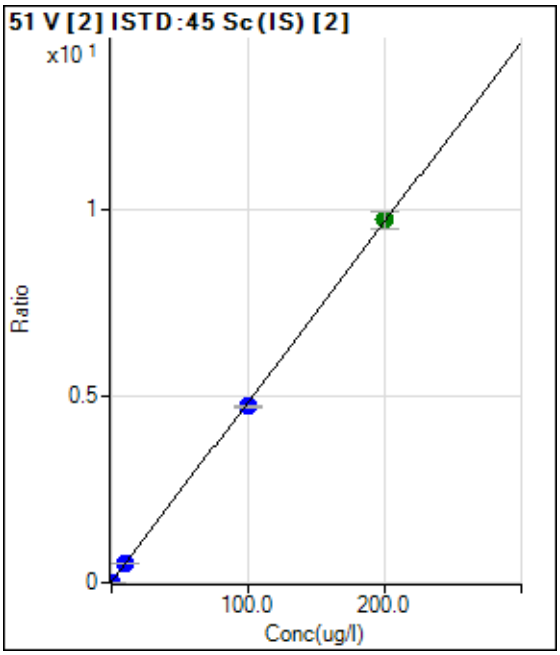
R = 1.0000

DL = 0.02349

BEC = 0.1205

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	4529.66	0.0243	P	1.0
2	☐	10.000	9.854	93850.70	0.4989	P	2.3
3	☐	100.000	97.560	900480.05	4.7233	P	1.1
4	☐	200.000	201.227	1861172.12	9.7166	A	4.4
5	☐						
6	☐						
7	☐						

y = 0.0482 * x + 0.0243

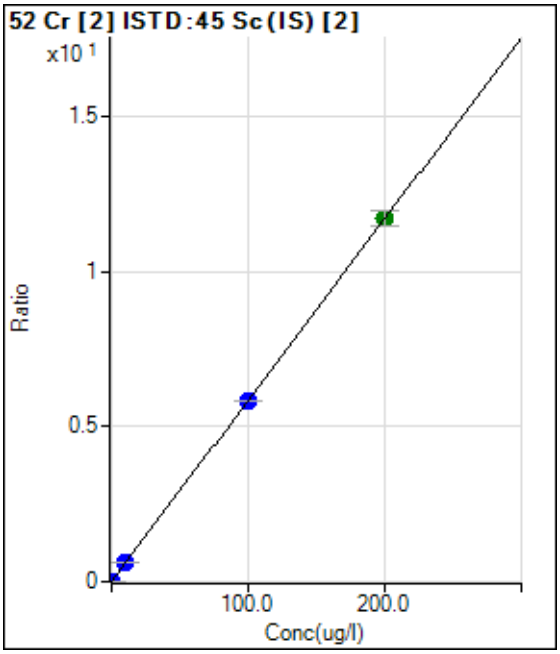
R = 0.9999

DL = 0.01561

BEC = 0.5037

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1517.91	0.0081	P	5.2
2	☐	10.000	10.457	116496.36	0.6192	P	2.6
3	☐	100.000	99.670	1111978.19	5.8326	P	0.7
4	☐	200.000	200.142	2241938.20	11.7040	A	4.3
5	☐						
6	☐						
7	☐						

y = 0.0584 * x + 0.0081

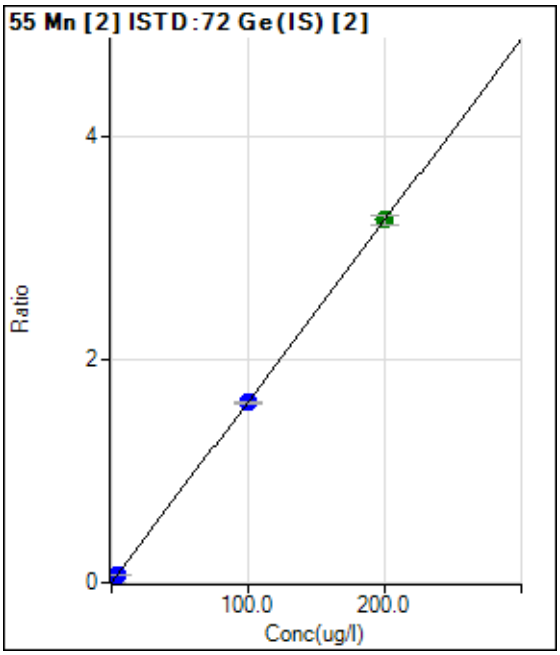
R = 1.0000

DL = 0.02188

BEC = 0.1391

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	408.91	0.0010	P	26.4
2	☐	4.000	4.301	29652.34	0.0709	P	1.0
3	☐	100.000	99.432	711552.24	1.6178	P	0.9
4	☐	200.000	200.278	1464910.77	3.2577	A	2.8
5	☐						
6	☐						
7	☐						

y = 0.0163 * x + 9.9500E-004

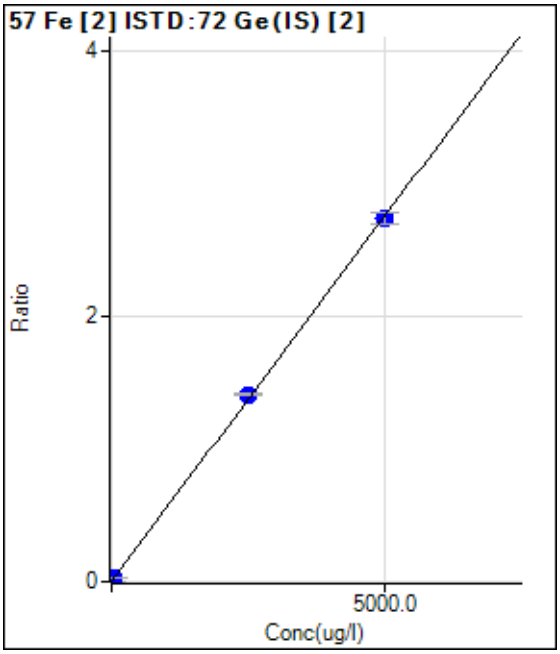
R = 1.0000

DL = 0.04838

BEC = 0.06119

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	378.91	0.0009	P	15.3
2	☐	50.000	55.796	13206.56	0.0316	P	1.7
3	☐	2500.000	2564.818	620471.28	1.4108	P	0.3
4	☐	5000.000	4967.533	1228208.99	2.7315	P	3.1
5	☐						
6	☐						
7	☐						

y = 5.4968E-004 * x + 9.2368E-004

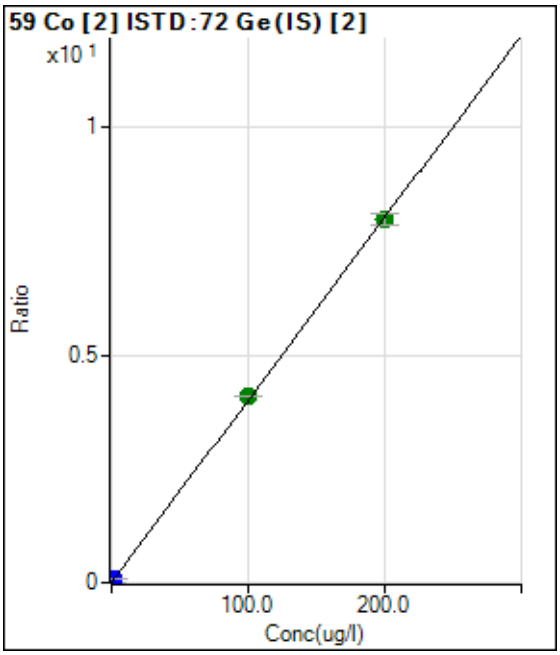
R = 0.9999

DL = 0.7732

BEC = 1.68

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	577.81	0.0014	P	8.2
2	☐	2.000	2.179	37072.99	0.0887	P	1.3
3	☐	100.000	102.262	1802096.05	4.0975	A	0.2
4	☐	200.000	198.867	3582319.81	7.9669	A	3.1
5	☐						
6	☐						
7	☐						

y = 0.0401 * x + 0.0014

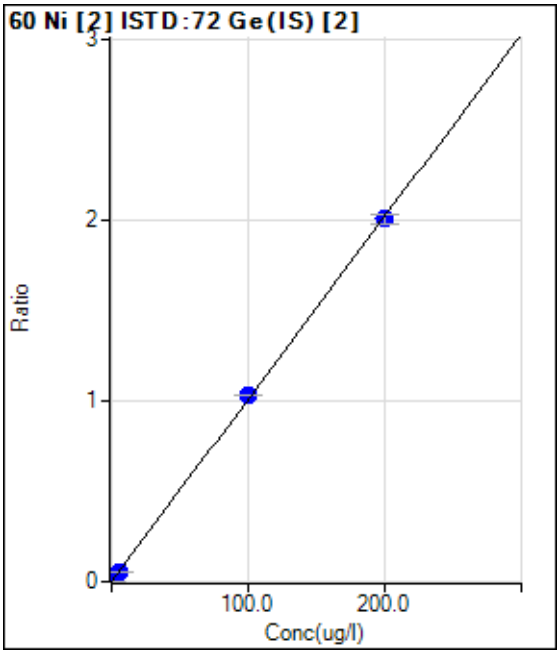
R = 0.9999

DL = 0.008679

BEC = 0.03513

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	130.01	0.0003	P	11.1
2	☐	5.000	5.606	23752.21	0.0568	P	1.7
3	☐	100.000	102.303	453635.34	1.0314	P	0.7
4	☐	200.000	198.833	901333.42	2.0044	P	2.7
5	☐						
6	☐						
7	☐						

y = 0.0101 * x + 3.1652E-004

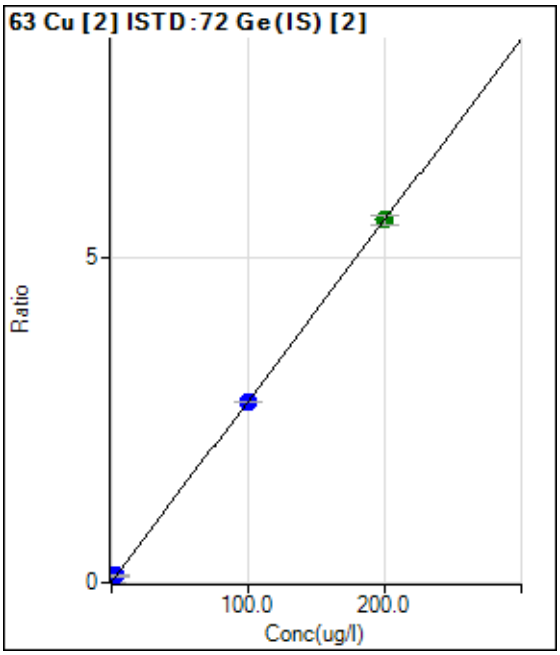
R = 0.9999

DL = 0.01045

BEC = 0.0314

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	4454.08	0.0109	P	5.4
2	☐	3.000	3.341	43310.57	0.1036	P	1.0
3	☐	100.000	99.771	1222953.04	2.7806	P	0.5
4	☐	200.000	200.110	2502878.69	5.5661	A	3.0
5	☐						
6	☐						
7	☐						

y = 0.0278 * x + 0.0109

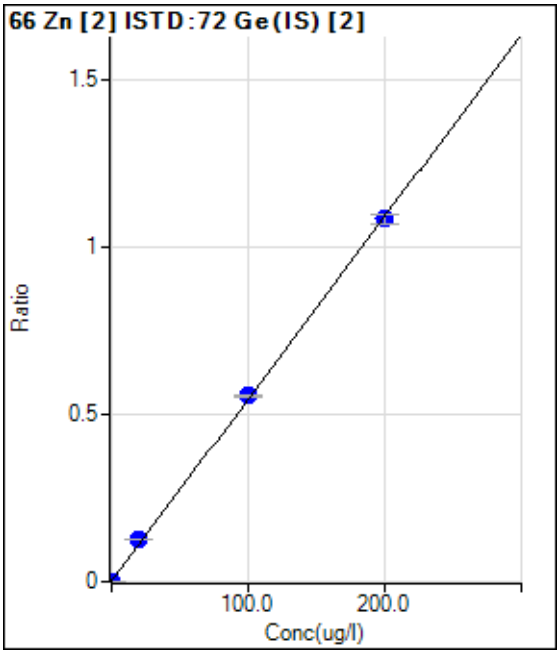
R = 1.0000

DL = 0.06365

BEC = 0.3909

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	600.04	0.0015	P	2.2
2	☐	20.000	22.867	52706.14	0.1261	P	1.7
3	☐	100.000	101.660	244310.12	0.5555	P	0.8
4	☐	200.000	198.883	488075.85	1.0854	P	2.9
5	☐						
6	☐						
7	☐						

y = 0.0054 * x + 0.0015

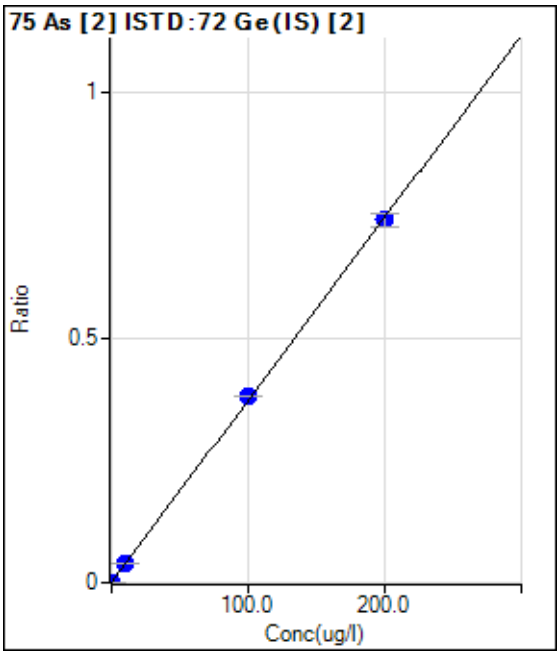
R = 0.9999

DL = 0.01775

BEC = 0.2682

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	212.23	0.0005	P	12.4
2	☐	10.000	10.648	16769.75	0.0401	P	2.3
3	☐	100.000	102.223	167437.09	0.3807	P	0.4
4	☐	200.000	198.856	332770.26	0.7401	P	3.6
5	☐						
6	☐						
7	☐						

y = 0.0037 * x + 5.1713E-004

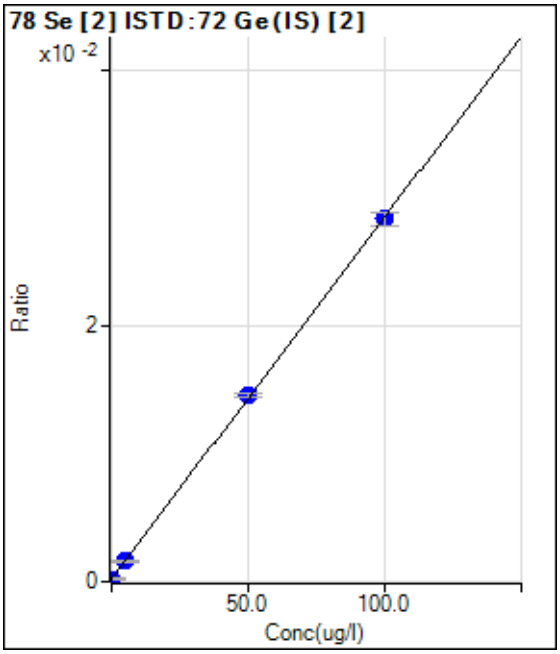
R = 0.9999

DL = 0.05171

BEC = 0.139

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	84.45	0.0002	P	32.3
2	☐	5.000	4.965	673.38	0.0016	P	4.3
3	☐	50.000	50.761	6405.87	0.0146	P	1.7
4	☐	100.000	99.621	12765.21	0.0284	P	4.0
5	☐						
6	☐						
7	☐						

y = 2.8289E-004 * x + 2.0584E-004

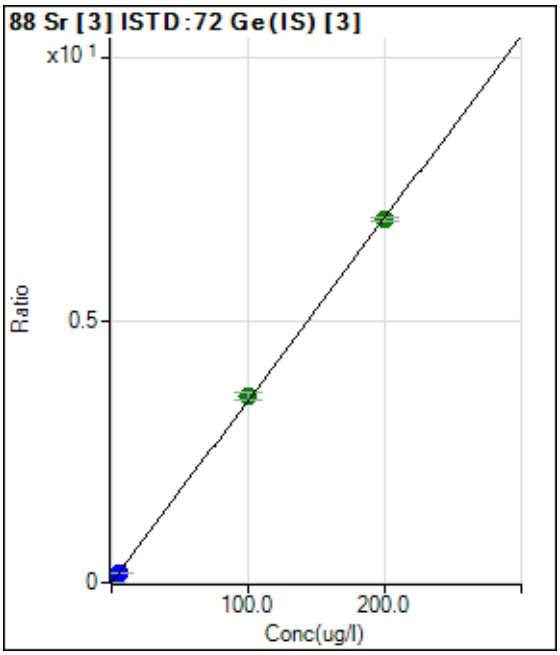
R = 0.9999

DL = 0.7059

BEC = 0.7276

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1400.11	0.0006	P	8.6
2	☐	5.000	5.135	469137.71	0.1790	P	3.3
3	☐	100.000	101.918	9380318.68	3.5427	A	4.4
4	☐	200.000	199.038	18673086.11	6.9180	A	0.9
5	☐						
6	☐						
7	☐						

y = 0.0348 * x + 5.5098E-004

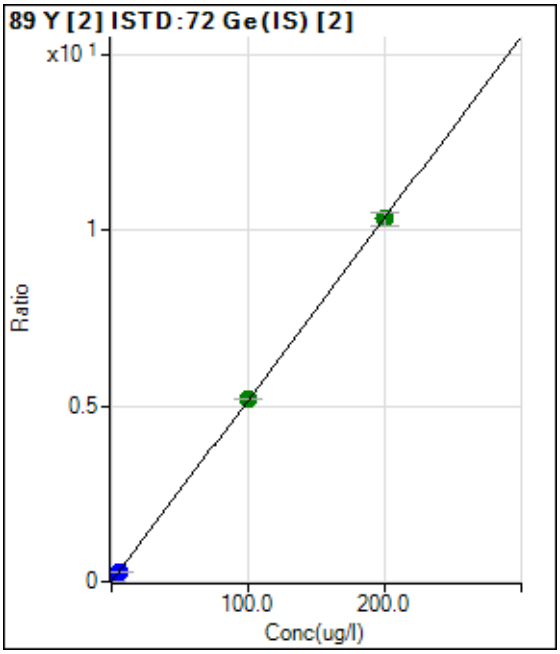
R = 0.9999

DL = 0.004076

BEC = 0.01585

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	221.12	0.0005	P	12.6
2	☐	5.000	5.198	112474.38	0.2691	P	1.8
3	☐	100.000	100.678	2287733.28	5.2017	A	0.7
4	☐	200.000	199.656	4637877.01	10.3151	A	3.5
5	☐						
6	☐						
7	☐						

y = 0.0517 * x + 5.3878E-004

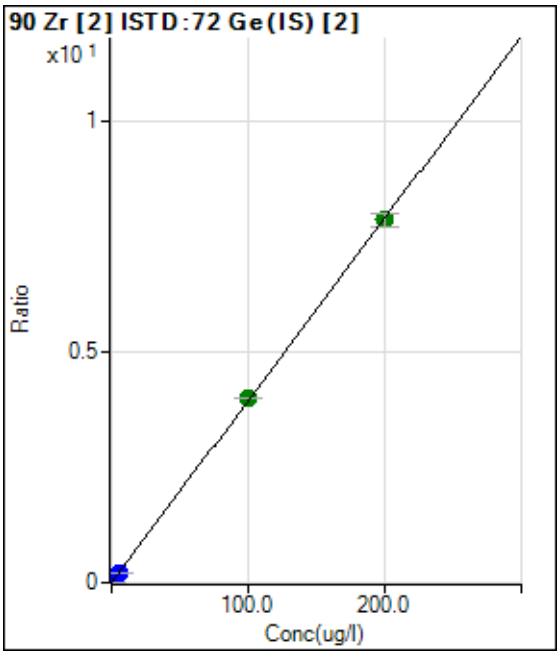
R = 1.0000

DL = 0.003929

BEC = 0.01043

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	543.37	0.0013	P	14.7
2	☐	5.000	5.318	88167.56	0.2109	P	1.8
3	☐	100.000	101.423	1758525.71	3.9984	A	0.6
4	☐	200.000	199.281	3531689.43	7.8550	A	3.6
5	☐						
6	☐						
7	☐						

y = 0.0394 * x + 0.0013

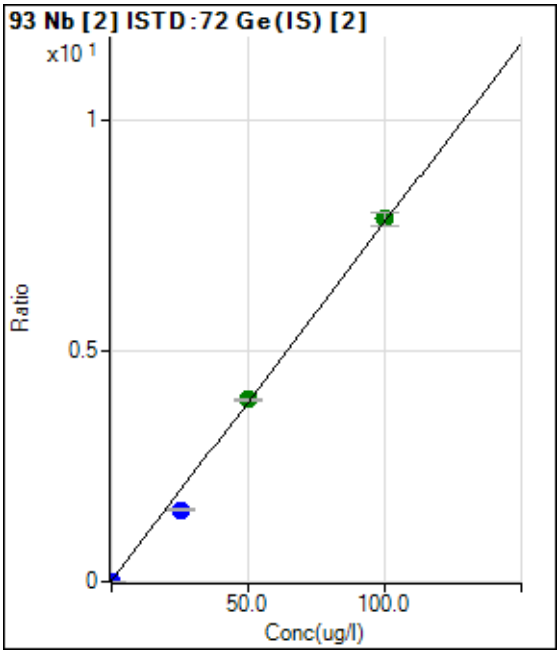
R = 1.0000

DL = 0.01477

BEC = 0.0336

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	6106.91	0.0149	P	7.2
2	☐	25.000	19.772	647004.26	1.5478	P	1.9
3	☐	50.000	50.581	1731296.07	3.9364	A	0.5
4	☐	100.000	101.016	3528024.98	7.8466	A	3.4
5	☐						
6	☐						
7	☐						

y = 0.0775 * x + 0.0149

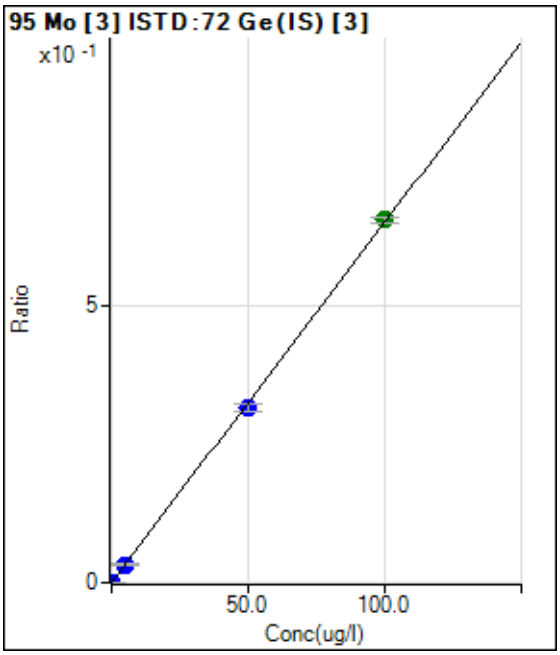
R = 0.9982

DL = 0.04174

BEC = 0.1919

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1002.30	0.0004	P	5.5
2	☐	5.000	4.930	85171.74	0.0325	P	3.5
3	☐	50.000	48.547	838407.03	0.3166	P	3.7
4	☐	100.000	100.730	1771742.56	0.6564	A	1.4
5	☐						
6	☐						
7	☐						

y = 0.0065 * x + 3.9443E-004

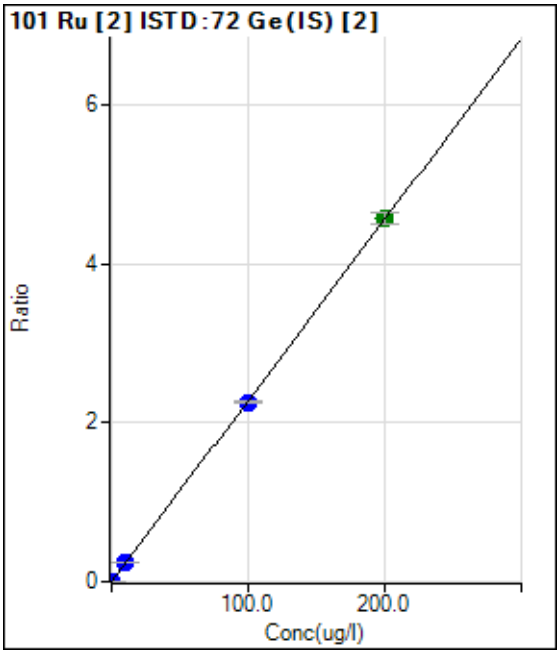
R = 0.9998

DL = 0.009942

BEC = 0.06056

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	97.78	0.0002	P	31.1
2	☐	10.000	10.624	101326.03	0.2424	P	1.7
3	☐	100.000	99.042	992989.32	2.2577	P	0.8
4	☐	200.000	200.448	2054484.15	4.5690	A	3.1
5	☐						
6	☐						
7	☐						

y = 0.0228 * x + 2.3854E-004

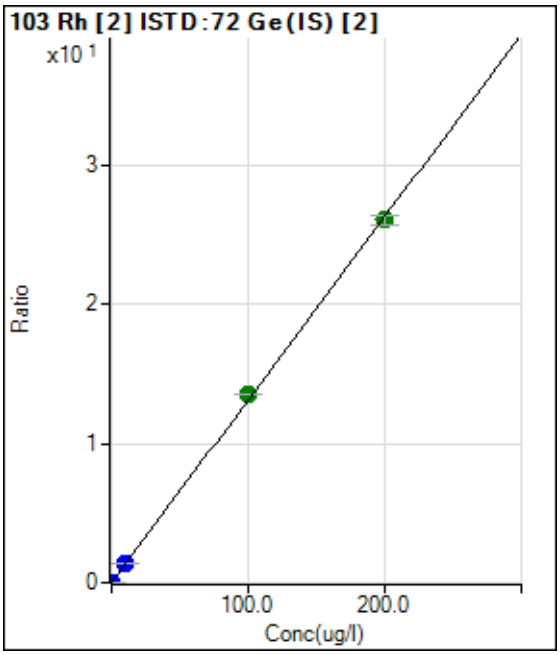
R = 1.0000

DL = 0.009758

BEC = 0.01047

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1033.41	0.0025	P	14.5
2	☐	10.000	10.528	578572.22	1.3841	P	1.5
3	☐	100.000	102.914	5940768.38	13.5078	A	0.6
4	☐	200.000	198.517	11715326.36	26.0535	A	3.0
5	☐						
6	☐						
7	☐						

y = 0.1312 * x + 0.0025

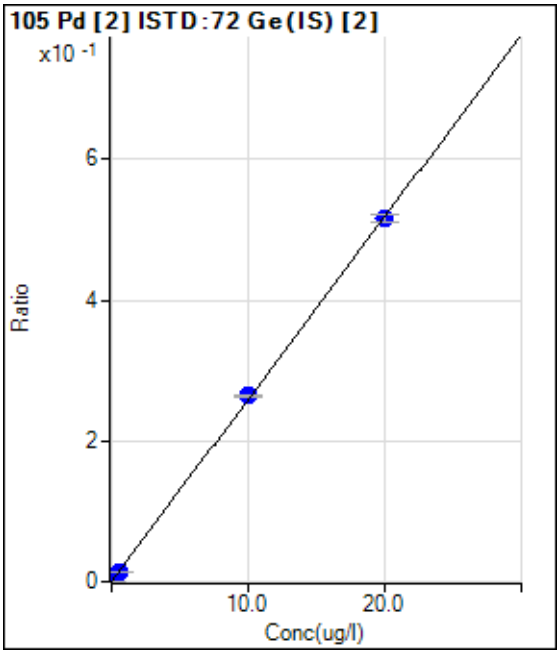
R = 0.9998

DL = 0.008339

BEC = 0.01917

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	37.78	0.0001	P	9.7
2	☐	0.500	0.540	5885.73	0.0141	P	1.5
3	☐	10.000	10.196	116118.86	0.2640	P	0.4
4	☐	20.000	19.901	231713.76	0.5152	P	2.3
5	☐						
6	☐						
7	☐						

y = 0.0259 * x + 9.1997E-005

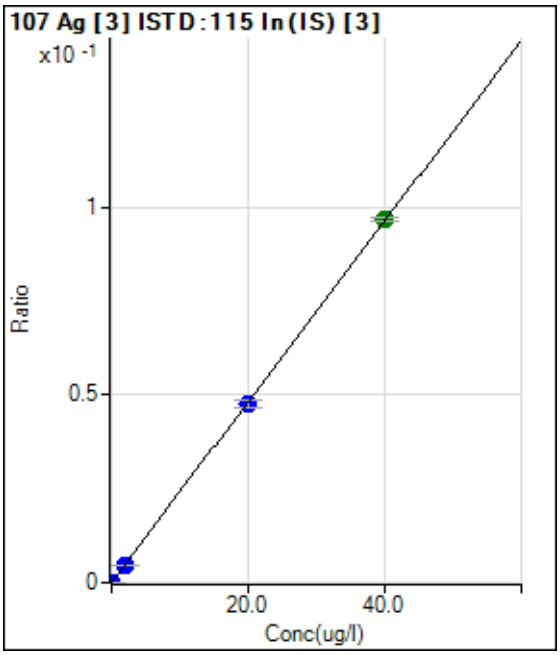
R = 0.9999

DL = 0.001034

BEC = 0.003554

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1083.42	0.0001	P	0.6
2	☐	2.000	1.954	93805.34	0.0048	P	4.0
3	☐	20.000	19.698	922890.99	0.0474	P	4.3
4	☐	40.000	40.153	1887375.13	0.0966	A	1.1
5	☐						
6	☐						
7	☐						

y = 0.0024 * x + 5.6717E-005

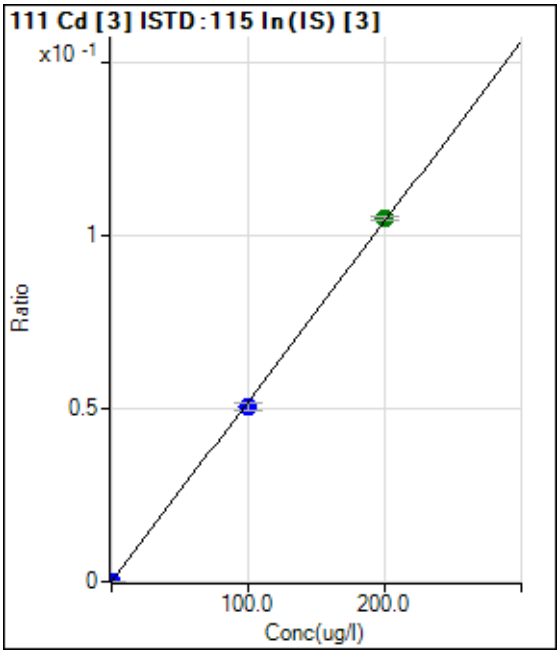
R = 1.0000

DL = 0.0004342

BEC = 0.02359

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	147.52	0.0000	P	18.3
2	☐	0.500	0.486	5154.68	0.0003	P	6.2
3	☐	100.000	97.219	986218.77	0.0507	P	4.5
4	☐	200.000	201.391	2050882.89	0.1050	A	1.1
5	☐						
6	☐						
7	☐						

y = 5.2124E-004 * x + 7.7212E-006

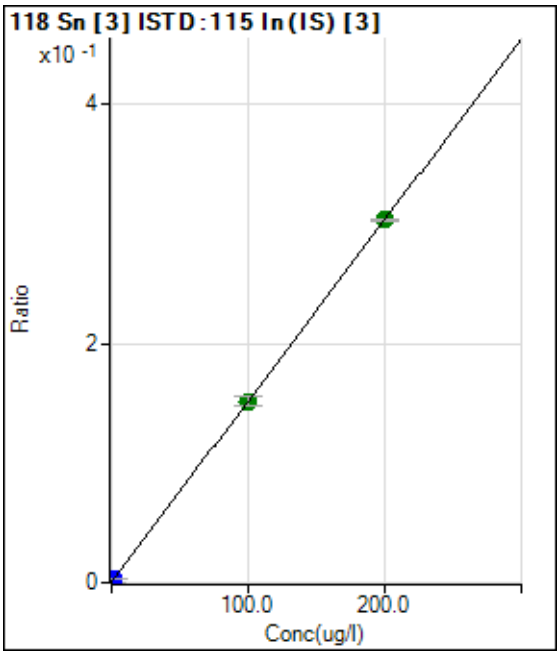
R = 0.9998

DL = 0.008119

BEC = 0.01481

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	8095.62	0.0004	P	1.9
2	☐	2.000	1.733	60081.95	0.0030	P	5.0
3	☐	100.000	99.802	2947468.50	0.1515	A	5.0
4	☐	200.000	200.102	5925774.08	0.3033	A	0.6
5	☐						
6	☐						
7	☐						

y = 0.0015 * x + 4.2379E-004

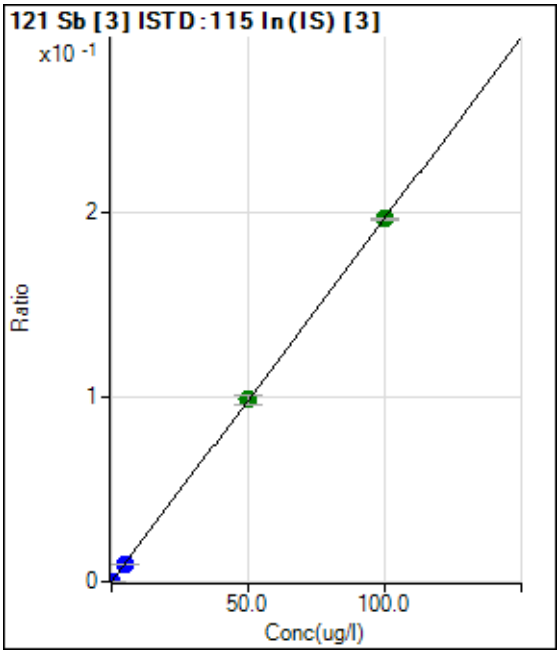
R = 1.0000

DL = 0.01602

BEC = 0.28

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1315.67	0.0001	P	1.9
2	☐	5.000	4.735	184416.11	0.0094	P	5.1
3	☐	50.000	50.094	1912134.99	0.0983	A	5.0
4	☐	100.000	99.966	3830440.05	0.1961	A	0.5
5	☐						
6	☐						
7	☐						

y = 0.0020 * x + 6.8872E-005

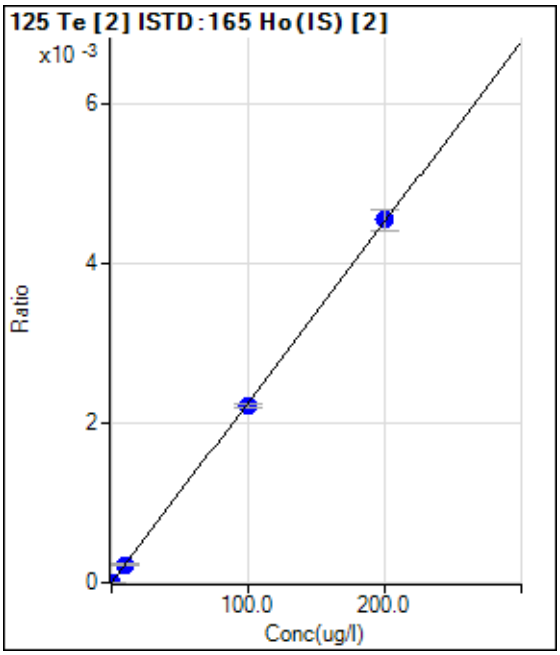
R = 1.0000

DL = 0.001974

BEC = 0.03513

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	12.22	0.0000	P	56.5
2	☐	10.000	9.882	3214.91	0.0002	P	8.1
3	☐	100.000	97.618	32219.65	0.0022	P	2.1
4	☐	200.000	201.197	66191.72	0.0045	P	6.0
5	☐						
6	☐						
7	☐						

y = 2.2557E-005 * x + 8.4133E-007

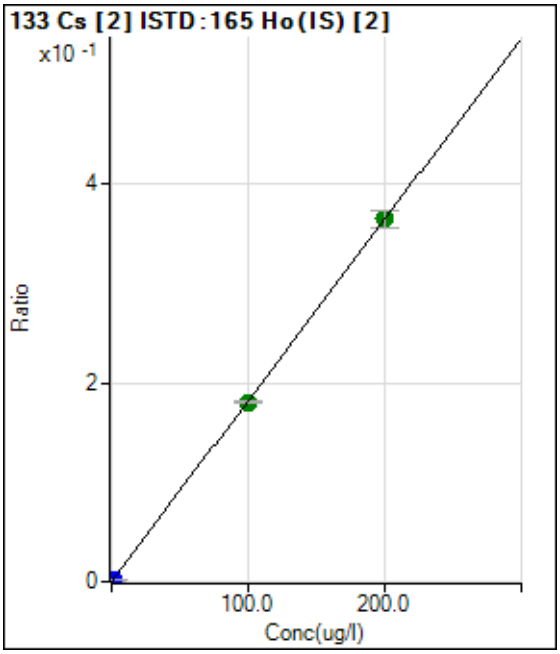
R = 0.9999

DL = 0.06322

BEC = 0.0373

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	270.02	0.0000	P	17.9
2	☐	1.000	0.962	25433.46	0.0018	P	0.5
3	☐	100.000	99.268	2643897.20	0.1807	A	1.3
4	☐	200.000	200.366	5321222.84	0.3648	A	4.8
5	☐						
6	☐						
7	☐						

y = 0.0018 * x + 1.8602E-005

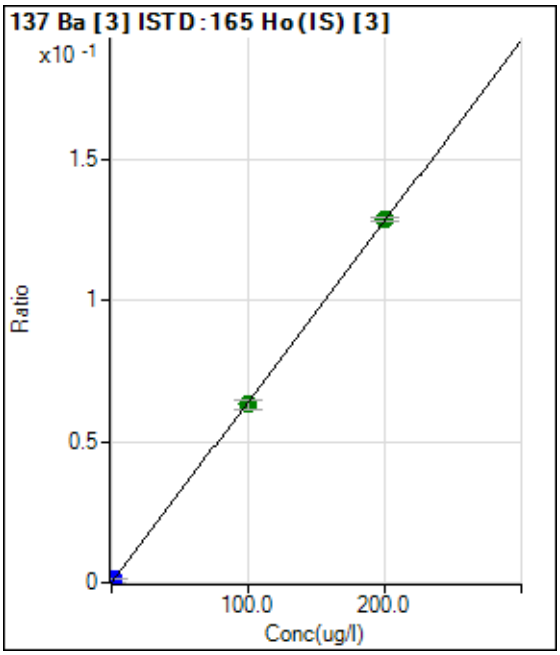
R = 1.0000

DL = 0.005497

BEC = 0.01022

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	693.38	0.0000	P	7.1
2	☐	2.000	1.919	30610.26	0.0013	P	4.7
3	☐	100.000	98.525	1536094.20	0.0632	A	5.8
4	☐	200.000	200.738	3162040.65	0.1287	A	1.2
5	☐						
6	☐						
7	☐						

y = 6.4093E-004 * x + 2.9357E-005

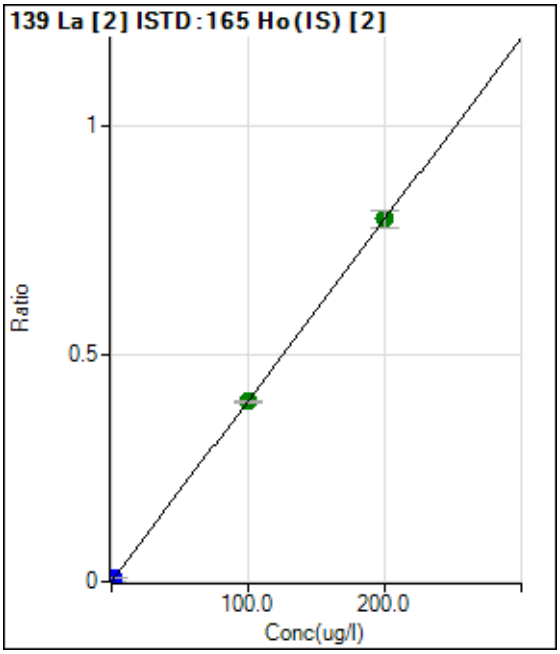
R = 1.0000

DL = 0.009825

BEC = 0.0458

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	367.80	0.0000	P	0.5
2	☐	2.000	1.898	108803.19	0.0076	P	1.3
3	☐	100.000	99.450	5789030.12	0.3958	A	1.1
4	☐	200.000	200.276	11625452.19	0.7970	A	4.7
5	☐						
6	☐						
7	☐						

y = 0.0040 * x + 2.5345E-005

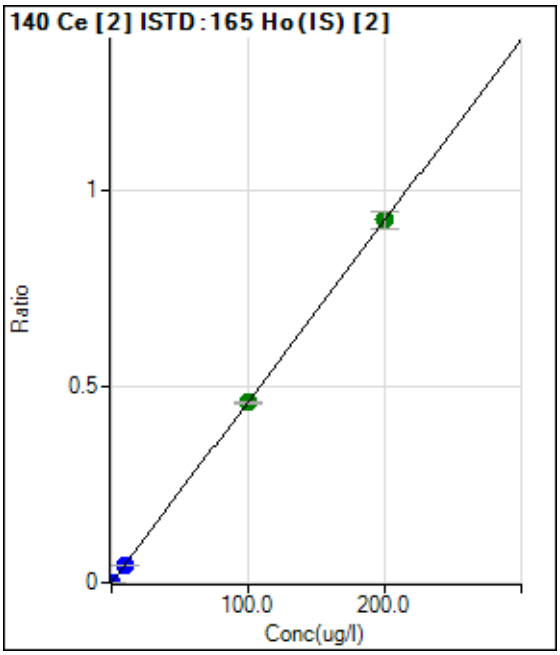
R = 1.0000

DL = 9.458E-05

BEC = 0.006369

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	478.92	0.0000	P	4.4
2	☐	10.000	9.592	635731.54	0.0443	P	1.8
3	☐	100.000	99.350	6702678.58	0.4582	A	1.6
4	☐	200.000	200.345	13478176.05	0.9240	A	4.7
5	☐						
6	☐						
7	☐						

y = 0.0046 * x + 3.3006E-005

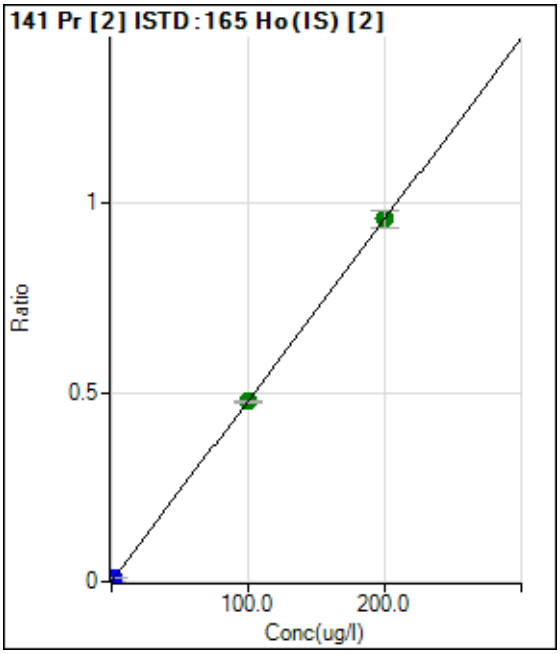
R = 1.0000

DL = 0.0009432

BEC = 0.007157

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	437.80	0.0000	P	8.2
2	☐	2.000	1.929	133078.72	0.0093	P	1.9
3	☐	100.000	99.423	6963588.86	0.4761	A	1.5
4	☐	200.000	200.289	13987577.01	0.9590	A	5.0
5	☐						
6	☐						
7	☐						

y = 0.0048 * x + 3.0164E-005

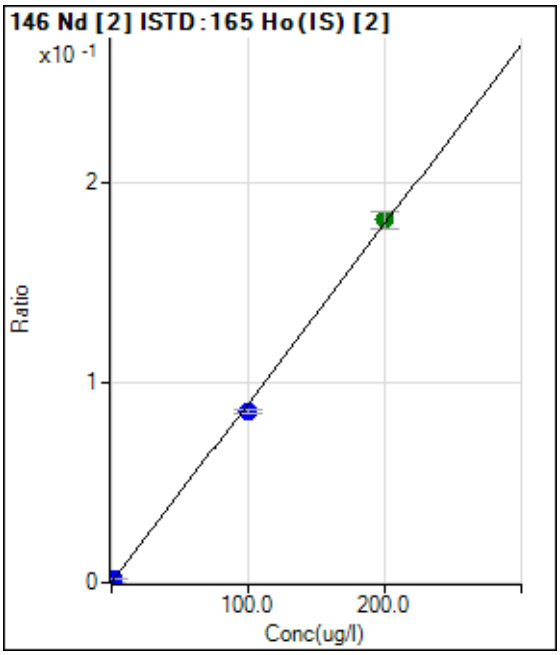
R = 1.0000

DL = 0.00155

BEC = 0.0063

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	105.56	0.0000	P	27.1
2	☐	2.000	1.923	24871.71	0.0017	P	1.8
3	☐	100.000	95.229	1249534.23	0.0854	P	2.0
4	☐	200.000	202.386	2648107.41	0.1815	A	4.8
5	☐						
6	☐						
7	☐						

y = 8.9700E-004 * x + 7.2729E-006

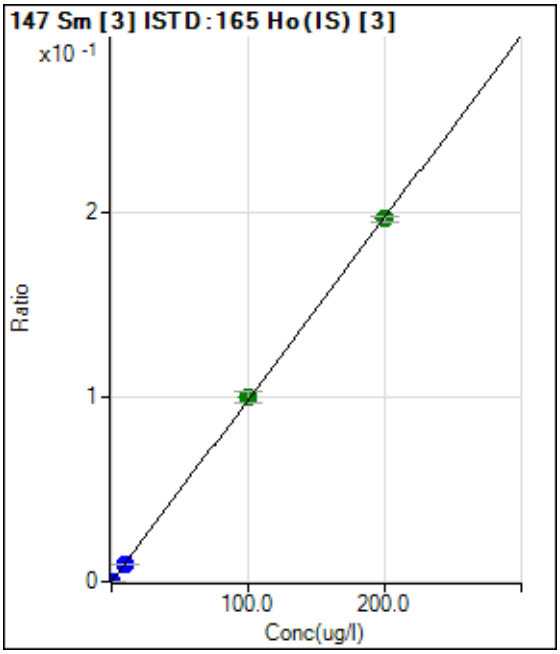
R = 0.9995

DL = 0.006588

BEC = 0.008108

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	176.68	0.0000	P	10.8
2	☐	10.000	9.611	230625.06	0.0095	P	4.7
3	☐	100.000	101.326	2430002.76	0.0999	A	5.8
4	☐	200.000	199.356	4831226.28	0.1966	A	1.3
5	☐						
6	☐						
7	☐						

y = 9.8625E-004 * x + 7.4885E-006

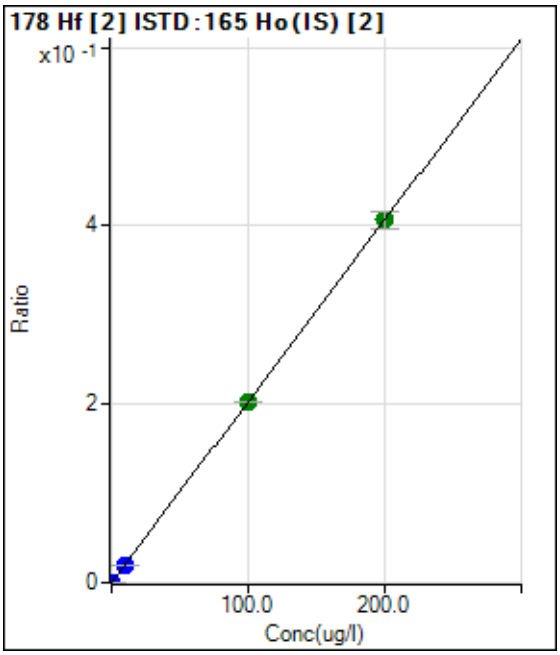
R = 1.0000

DL = 0.002454

BEC = 0.007593

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	755.61	0.0001	P	3.9
2	☐	10.000	9.392	274616.32	0.0191	P	2.1
3	☐	100.000	99.646	2960874.09	0.2024	A	0.6
4	☐	200.000	200.207	5930958.11	0.4066	A	4.7
5	☐						
6	☐						
7	☐						

y = 0.0020 * x + 5.2067E-005

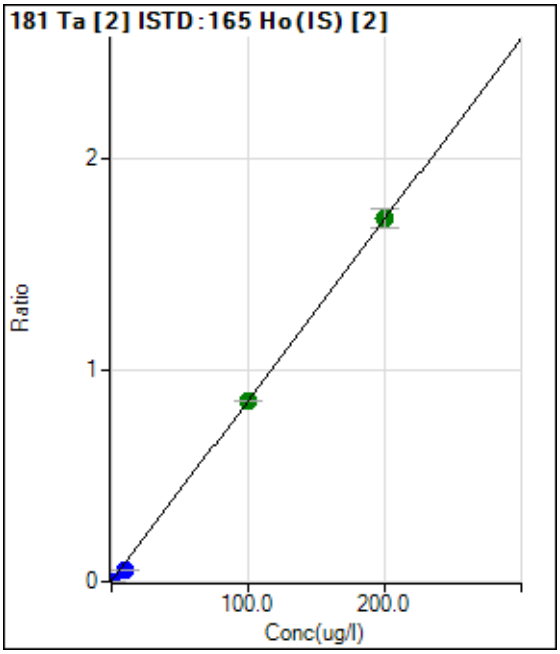
R = 1.0000

DL = 0.00298

BEC = 0.02564

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	22008.16	0.0015	P	2.1
2	☐	10.000	6.698	844693.91	0.0588	P	0.8
3	☐	100.000	99.741	12504466.06	0.8548	A	0.8
4	☐	200.000	200.294	25012233.52	1.7150	A	5.3
5	☐						
6	☐						
7	☐						

y = 0.0086 * x + 0.0015

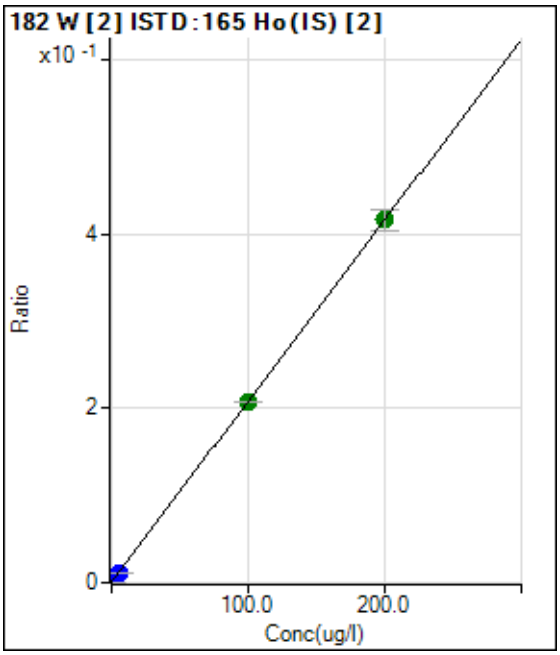
R = 0.9999

DL = 0.01121

BEC = 0.1773

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	10086.21	0.0007	P	1.5
2	☐	5.000	4.559	145685.20	0.0101	P	2.0
3	☐	100.000	99.463	3026048.60	0.2069	A	0.5
4	☐	200.000	200.280	6064213.94	0.4158	A	5.5
5	☐						
6	☐						
7	☐						

y = 0.0021 * x + 6.9507E-004

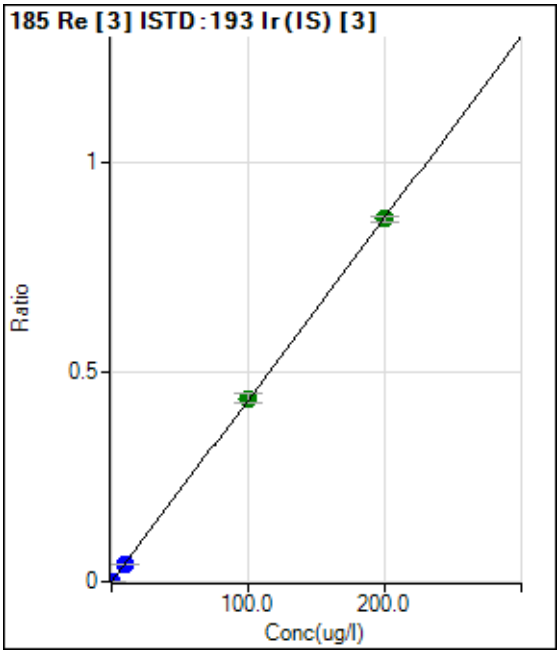
R = 1.0000

DL = 0.01539

BEC = 0.3353

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	306.69	0.0000	P	7.2
2	☐	10.000	9.189	488036.27	0.0399	P	3.0
3	☐	100.000	100.899	5221674.89	0.4382	A	4.7
4	☐	200.000	199.591	10444282.34	0.8668	A	1.7
5	☐						
6	☐						
7	☐						

y = 0.0043 * x + 2.5866E-005

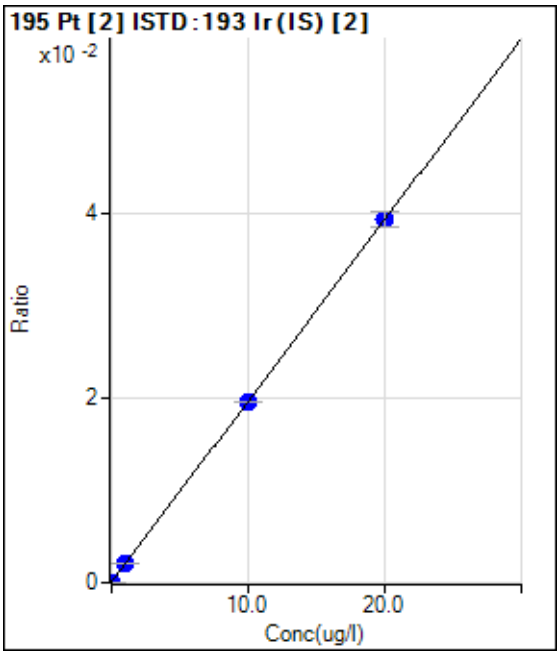
R = 1.0000

DL = 0.001278

BEC = 0.005956

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	346.69	0.0000	P	17.1
2	☐	1.000	1.008	19777.37	0.0020	P	2.1
3	☐	10.000	9.991	193504.56	0.0197	P	0.3
4	☐	20.000	20.004	386161.78	0.0394	P	4.3
5	☐						
6	☐						
7	☐						

y = 0.0020 * x + 3.5323E-005

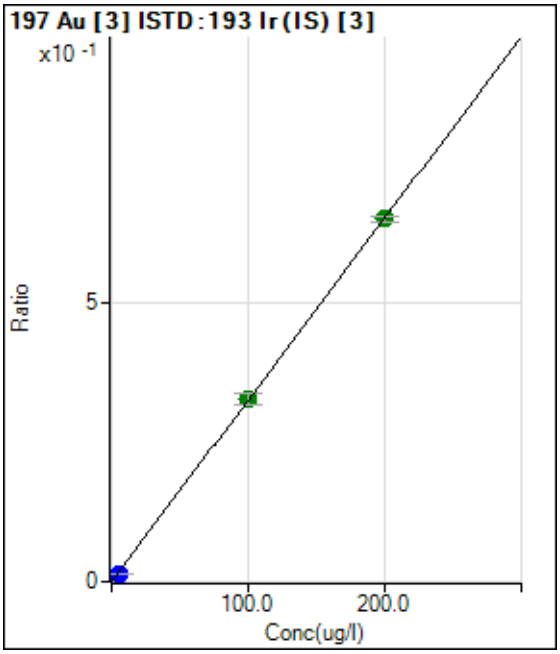
R = 1.0000

DL = 0.009191

BEC = 0.01797

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1444.57	0.0001	P	2.2
2	☐	5.000	4.632	185584.36	0.0152	P	2.1
3	☐	100.000	100.550	3895076.54	0.3270	A	5.9
4	☐	200.000	199.734	7825590.79	0.6495	A	1.7
5	☐						
6	☐						
7	☐						

y = 0.0033 * x + 1.2181E-004

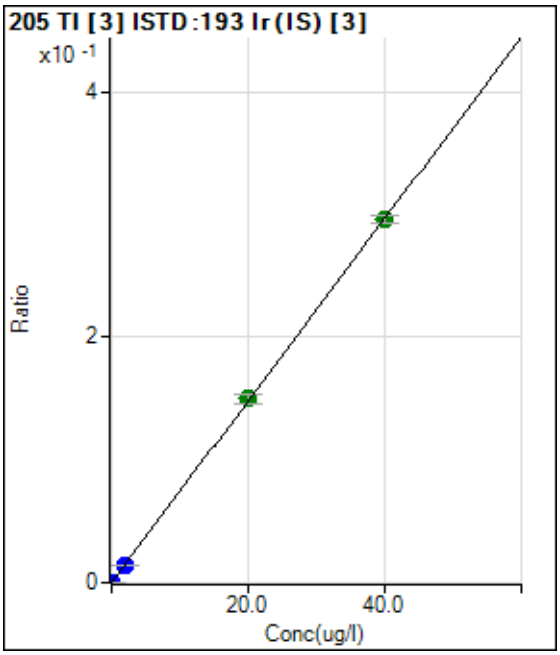
R = 1.0000

DL = 0.002501

BEC = 0.03747

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1287.89	0.0001	P	3.9
2	☐	2.000	1.815	165741.20	0.0136	P	3.0
3	☐	20.000	20.224	1787006.94	0.1500	A	5.3
4	☐	40.000	39.897	3564271.55	0.2958	A	2.1
5	☐						
6	☐						
7	☐						

y = 0.0074 * x + 1.0862E-004

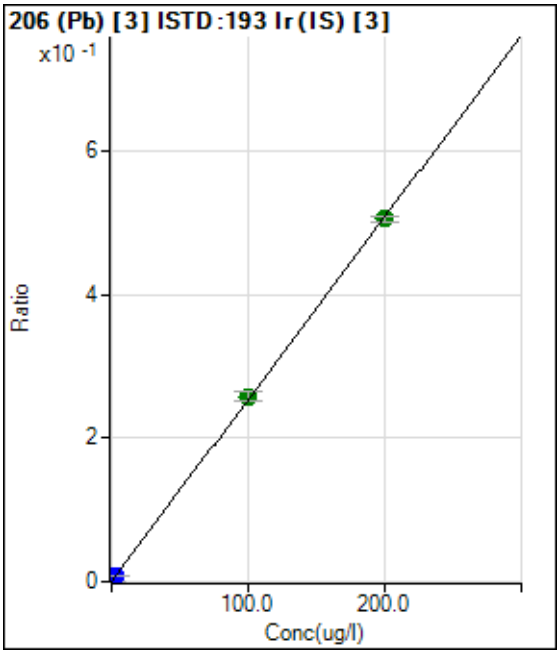
R = 1.0000

DL = 0.001708

BEC = 0.01465

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	3311.62	0.0003	P	4.6
2	☐	3.000	2.767	89271.34	0.0073	P	2.6
3	☐	100.000	101.641	3077277.87	0.2583	A	5.8
4	☐	200.000	199.183	6097083.03	0.5060	A	1.5
5	☐						
6	☐						
7	☐						

y = 0.0025 * x + 2.7921E-004

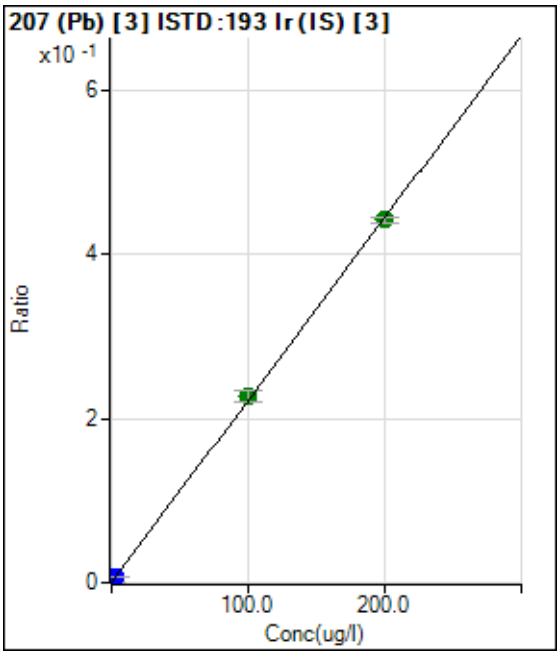
R = 0.9999

DL = 0.01514

BEC = 0.11

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	3532.78	0.0003	P	5.4
2	☐	3.000	2.801	79575.76	0.0065	P	3.7
3	☐	100.000	102.089	2700547.67	0.2268	A	6.4
4	☐	200.000	198.959	5321707.21	0.4417	A	1.8
5	☐						
6	☐						
7	☐						

y = 0.0022 * x + 2.9795E-004

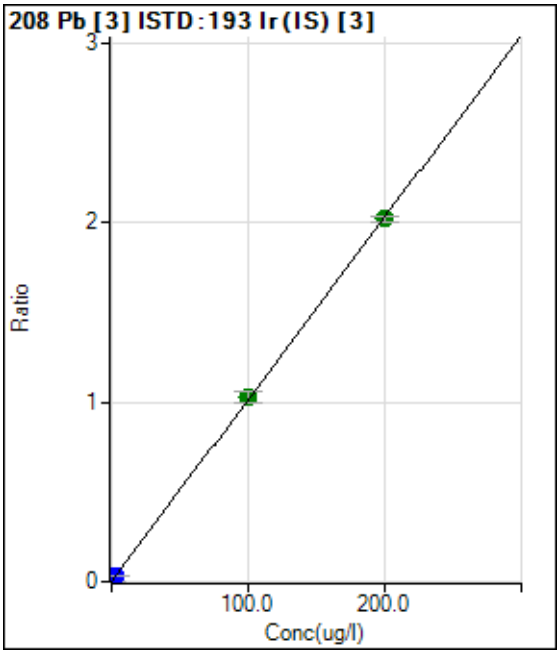
R = 0.9999

DL = 0.02181

BEC = 0.1343

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	13390.49	0.0011	P	2.4
2	☐	3.000	2.774	357904.11	0.0293	P	2.9
3	☐	100.000	101.528	12284925.86	1.0315	A	6.1
4	☐	200.000	199.239	24376804.36	2.0231	A	1.6
5	☐						
6	☐						
7	☐						

y = 0.0101 * x + 0.0011

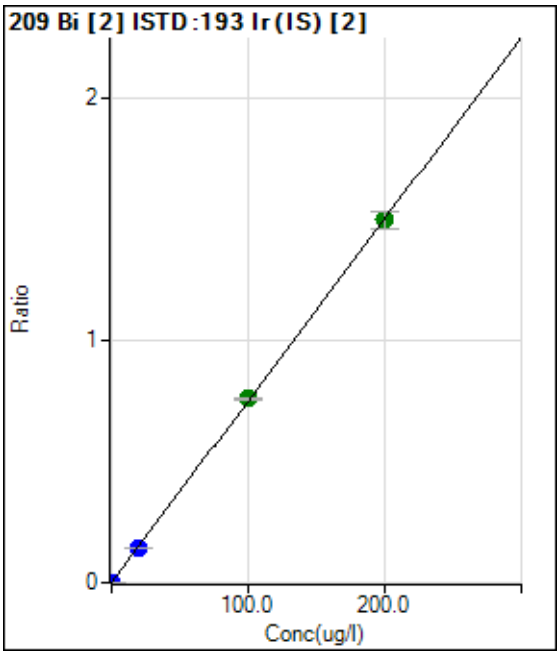
R = 0.9999

DL = 0.008008

BEC = 0.1113

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	6159.28	0.0006	P	1.2
2	☐	20.000	18.764	1386710.83	0.1414	P	2.1
3	☐	100.000	101.042	7463190.79	0.7589	A	0.9
4	☐	200.000	199.603	14701699.50	1.4986	A	4.5
5	☐						
6	☐						
7	☐						

y = 0.0075 * x + 6.2665E-004

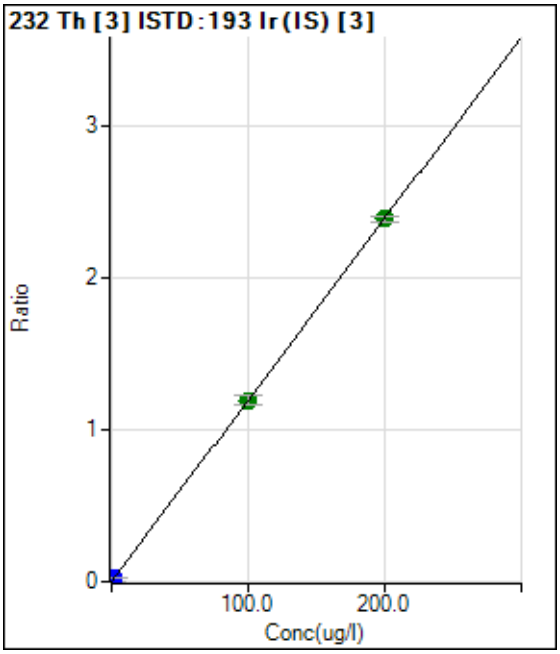
R = 0.9999

DL = 0.002984

BEC = 0.0835

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	5232.24	0.0004	P	3.1
2	☐	2.000	1.736	259225.46	0.0212	P	3.2
3	☐	100.000	100.113	14276153.95	1.1985	A	5.7
4	☐	200.000	199.946	28836035.40	2.3932	A	1.6
5	☐						
6	☐						
7	☐						

y = 0.0120 * x + 4.4125E-004

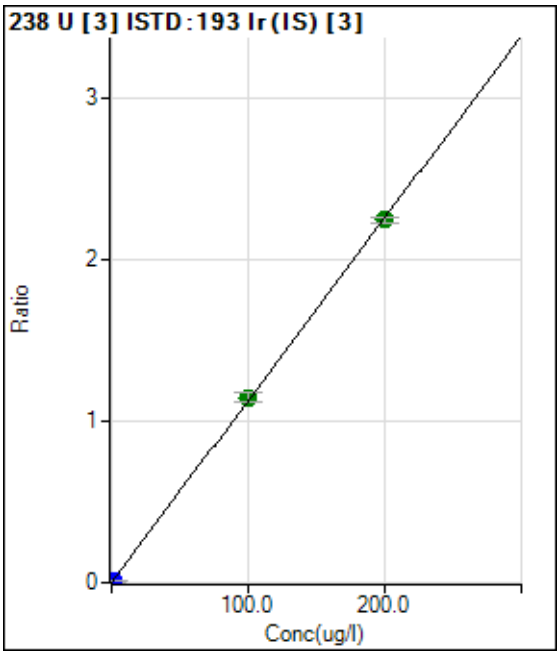
R = 1.0000

DL = 0.003391

BEC = 0.03687

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	938.97	0.0001	P	9.9
2	☐	1.000	0.896	124346.26	0.0102	P	3.7
3	☐	100.000	101.762	13660324.10	1.1468	A	5.8
4	☐	200.000	199.119	27038049.04	2.2439	A	1.5
5	☐						
6	☐						
7	☐						

y = 0.0113 * x + 7.9194E-005

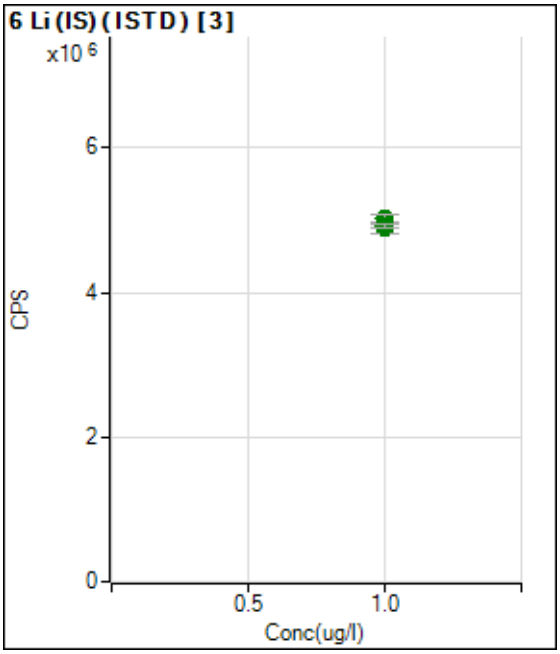
R = 0.9999

DL = 0.002095

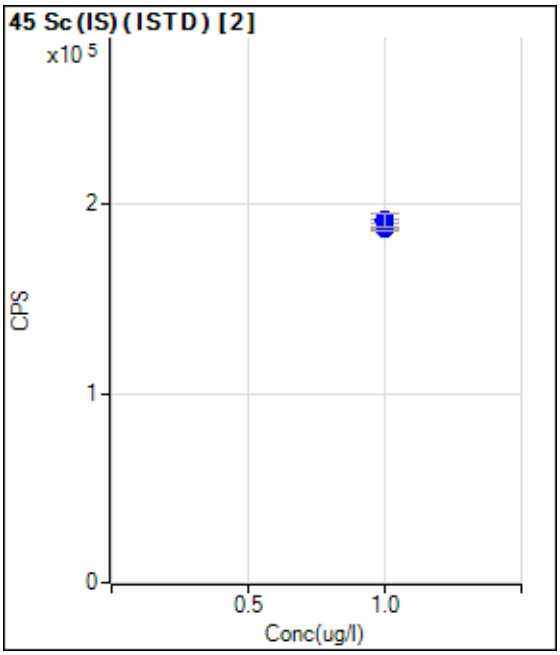
BEC = 0.007028

Weight: None

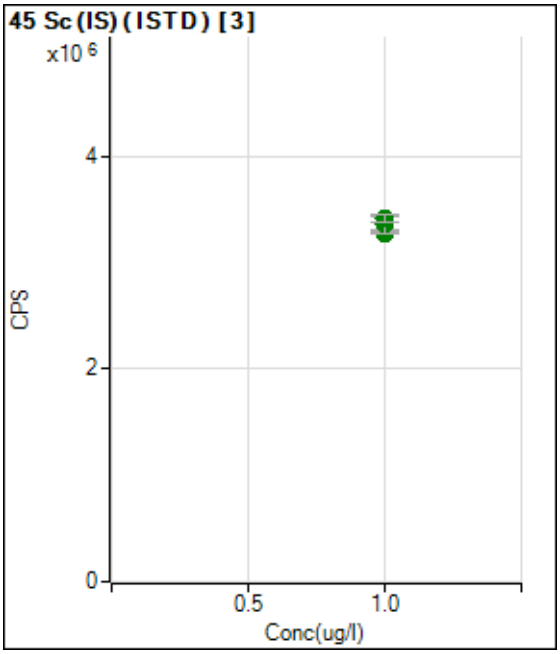
Min Conc: <None>



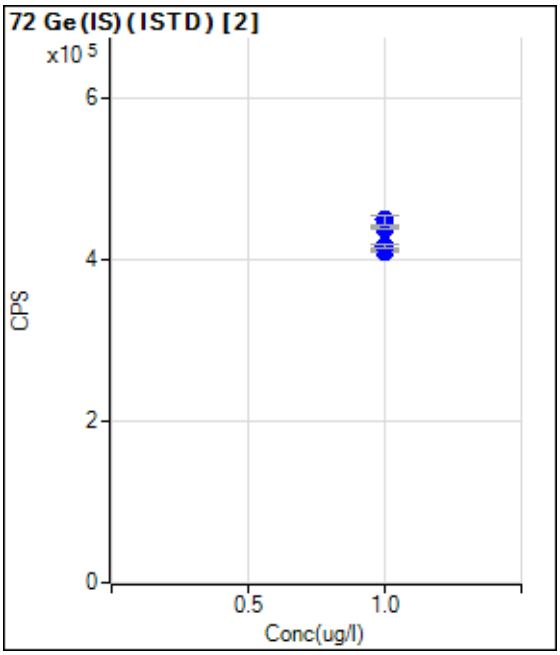
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		4941711.79		A	0.2
2	☐	1.000		5019571.57		A	2.4
3	☐	1.000		4900801.11		A	3.6
4	☐	1.000		4925733.37		A	0.9
5	☐	1.000					
6	☐	1.000					
7	☐	1.000					



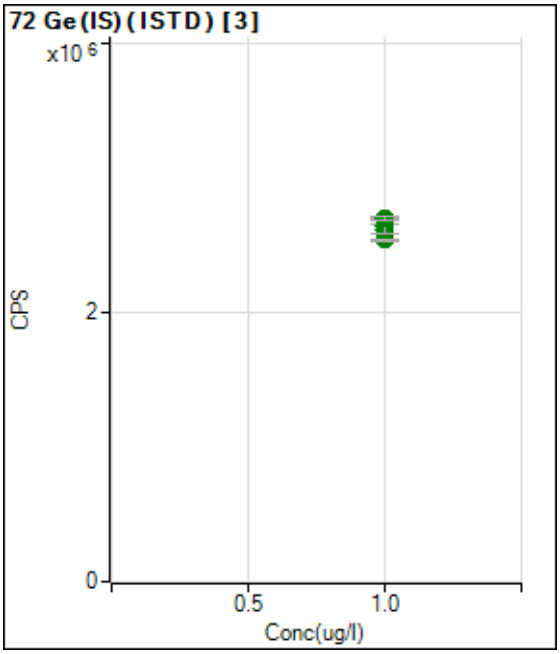
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		186699.42		P	0.6
2	☐	1.000		188178.69		P	1.9
3	☐	1.000		190657.13		P	1.1
4	☐	1.000		191752.30		P	3.6
5	☐	1.000					
6	☐	1.000					
7	☐	1.000					



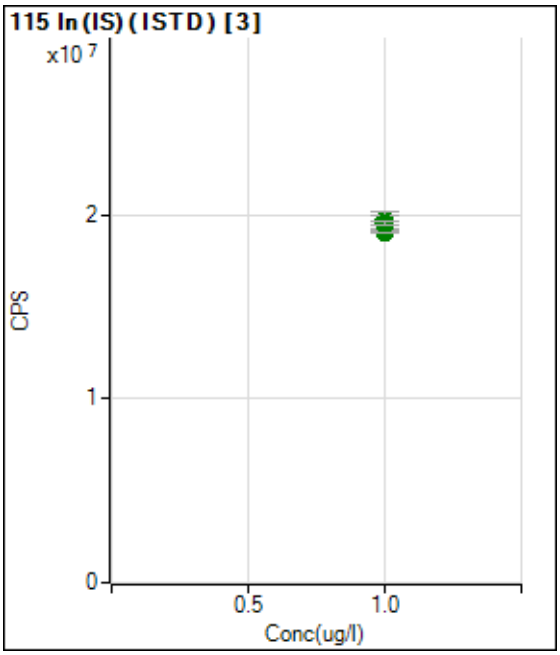
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		3281397.69		A	0.4
2	☐	1.000		3380347.62		A	3.7
3	☐	1.000		3363765.12		A	5.1
4	☐	1.000		3412200.23		A	2.0
5	☐	1.000					
6	☐	1.000					
7	☐	1.000					



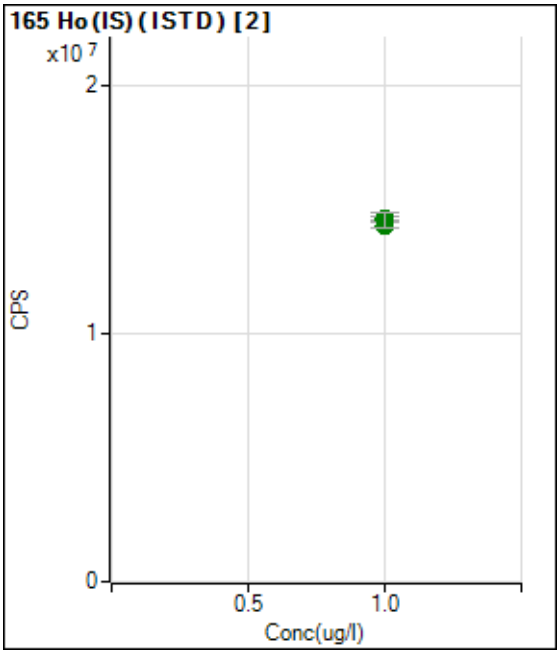
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		410529.82		P	0.7
2	☐	1.000		418055.93		P	1.0
3	☐	1.000		439811.24		P	0.5
4	☐	1.000		449918.62		P	2.9
5	☐	1.000					
6	☐	1.000					
7	☐	1.000					



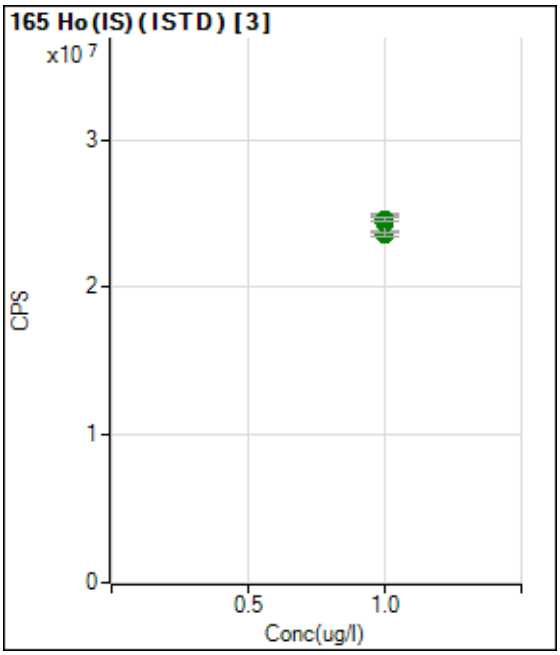
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		2540877.17		A	0.3
2	☐	1.000		2621882.17		A	2.5
3	☐	1.000		2650996.16		A	4.2
4	☐	1.000		2699375.55		A	1.1
5	☐	1.000					
6	☐	1.000					
7	☐	1.000					



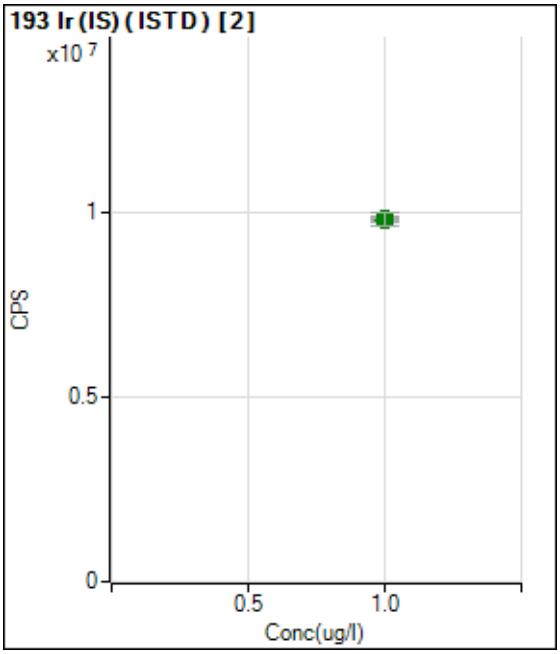
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		19102386.79		A	0.7
2	☐	1.000		19749789.11		A	4.6
3	☐	1.000		19486515.98		A	4.7
4	☐	1.000		19537425.95		A	1.2
5	☐	1.000					
6	☐	1.000					
7	☐	1.000					



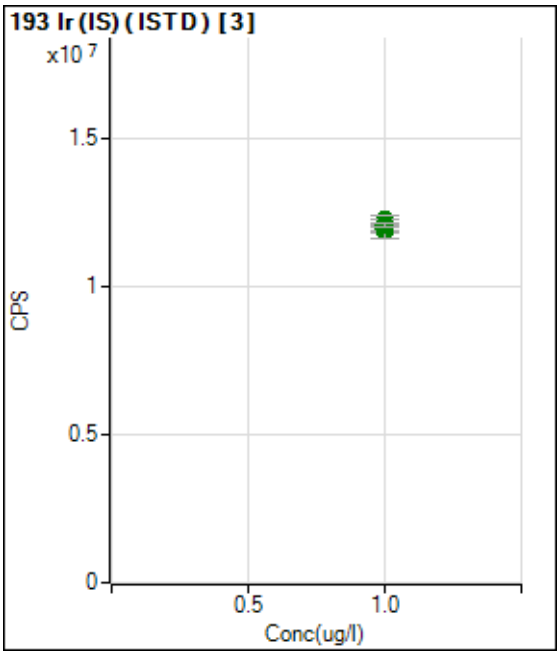
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		14511718.12		A	0.4
2	☐	1.000		14362259.09		A	1.4
3	☐	1.000		14629068.53		A	1.2
4	☐	1.000		14606228.53		A	4.3
5	☐	1.000					
6	☐	1.000					
7	☐	1.000					



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		23609137.98		A	1.0
2	☐	1.000		24342989.08		A	4.2
3	☐	1.000		24360108.80		A	4.9
4	☐	1.000		24573103.80		A	1.0
5	☐	1.000					
6	☐	1.000					
7	☐	1.000					



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		9828029.78		A	1.2
2	☐	1.000		9805927.70		A	1.6
3	☐	1.000		9834022.15		A	0.6
4	☐	1.000		9821265.41		A	3.8
5	☐	1.000					
6	☐	1.000					
7	☐	1.000					



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		11858845.66		A	0.5
2	☐	1.000		12228777.60		A	2.9
3	☐	1.000		11937071.07		A	5.6
4	☐	1.000		12050985.51		A	1.4
5	☐	1.000					
6	☐	1.000					
7	☐	1.000					

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une Ste	Mass	Name	R	a	b (blank)	DL	BEC	Units
3	7	Li	0.999999	0.005579	0.055406	0.257972	9.930944	ug/l
3	9	Be	0.99999	0.001631	2.6E-05	0.009684	0.015929	ug/l
3	11	B	0.999876	0.001244	0.00114	0.063462	0.916382	ug/l
2	23	Na	0.999996	0.007265	0.07528	0.638675	10.36175	ug/l
2	24	Mg	0.999994	0.003691	0.002087	0.101254	0.565429	ug/l
2	27	Al	0.999259	0.001555	0.001594	0.625798	1.024839	ug/l
2	31	P	0.999999	0.000111	0.000838	5.853239	7.546952	ug/l
2	39	K	0.99997	0.004036	0.145763	1.067652	36.11391	ug/l
3	44	Ca	0.999929	0.000432	0.017794	0.38909	41.15053	ug/l
3	47	Ti	0.999997	0.001249	0.000195	0.040424	0.156164	ug/l
2	51	V	0.999841	0.048219	0.020231	0.057985	0.419567	ug/l
2	52	Cr	0.999996	0.059235	0.00834	0.021638	0.140802	ug/l
2	55	Mn	0.999951	0.016611	0.000764	0.016927	0.045971	ug/l
2	57	Fe	0.999938	0.000585	0.001059	0.585802	1.812491	ug/l
2	59	Co	0.999792	0.041485	0.00126	0.002009	0.030372	ug/l
2	60	Ni	0.999742	0.010291	0.000346	0.018134	0.033636	ug/l
2	63	Cu	0.99976	0.028995	0.022791	0.007122	0.786021	ug/l
2	66	Zn	0.999856	0.005555	0.00254	0.089652	0.457149	ug/l
2	75	As	0.999896	0.003843	0.000632	0.055805	0.164507	ug/l
2	78	Se	0.999994	0.000294	0.000189	0.195539	0.642334	ug/l
3	88	Sr	0.999973	0.03475	0.000416	0.003386	0.01198	ug/l
2	89	Y	0.999895	0.051196	0.00041	0.002032	0.008	ug/l
2	90	Zr	0.999919	0.039361	0.001666	0.012707	0.042328	ug/l
2	93	Nb	0.998692	0.078127	0.00481	0.008993	0.061565	ug/l
3	95	Mo	0.999574	0.006561	0.001233	0.01711	0.187916	ug/l
2	101	Ru	0.999934	0.022718	0.000267	0.008078	0.011736	ug/l
2	103	Rh	0.999866	0.131764	0.001878	0.001211	0.014252	ug/l
2	105	Pd	0.999759	0.025705	0.000218	0.005195	0.008489	ug/l
3	107	Ag	0.999788	0.002455	8.35E-05	0.002706	0.034025	ug/l
3	111	Cd	0.999681	0.000531	8.72E-06	0.004712	0.016433	ug/l
3	118	Sn	0.999988	0.001534	0.000476	0.024485	0.3102	ug/l
3	121	Sb	0.999995	0.002	5.98E-05	0.008452	0.029887	ug/l
2	125	Te	0.999953	2.31E-05	1.37E-07	0.015421	0.005936	ug/l
2	133	Cs	1	0.001858	7.32E-06	0.001319	0.003938	ug/l
3	137	Ba	0.999992	0.000652	2.6E-05	0.006799	0.039884	ug/l
2	139	La	1	0.004037	1.54E-05	0.000681	0.003812	ug/l
2	140	Ce	0.999996	0.004664	2.3E-05	0.000648	0.004928	ug/l
2	141	Pr	1	0.004845	2.02E-05	0.000678	0.004164	ug/l
2	146	Nd	0.999999	0.000911	4.31E-06	0.000787	0.004734	ug/l
3	147	Sm	0.99998	0.001003	4.08E-06	0.002248	0.004067	ug/l
2	178	Hf	0.999924	0.002027	4.79E-05	0.004904	0.023611	ug/l
2	181	Ta	0.999769	0.008616	0.001482	0.010389	0.171962	ug/l
2	182	W	0.999995	0.002067	0.000794	0.032729	0.384411	ug/l
3	185	Re	0.999982	0.004402	1.5E-05	0.002757	0.003417	ug/l
2	195	Pt	0.999953	0.001957	3.82E-05	0.007158	0.019508	ug/l
3	197	Au	0.999997	0.00332	5.24E-05	0.002995	0.015789	ug/l
3	205	Tl	0.999951	0.007391	0.000325	0.01433	0.044019	ug/l
3	206	(Pb)	0.999917	0.002536	0.00043	0.017564	0.169466	ug/l
3	207	(Pb)	0.999905	0.002211	0.000428	0.014934	0.193484	ug/l
3	208	Pb	0.999926	0.010091	0.00168	0.006284	0.16646	ug/l
2	209	Bi	0.999986	0.007486	0.000851	0.005772	0.113624	ug/l
3	232	Th	0.999984	0.011733	0.000617	0.003498	0.052574	ug/l
3	238	U	0.999983	0.011056	5.47E-05	0.000995	0.004949	ug/l
3	6	Li (IS)						ug/l
2	45	Sc (IS)						ug/l
3	45	Sc (IS)						ug/l
2	72	Ge (IS)						ug/l
3	72	Ge (IS)						ug/l
3	115	In (IS)						ug/l
2	165	Ho (IS)						ug/l
3	165	Ho (IS)						ug/l
2	193	Ir (IS)						ug/l
3	193	Ir (IS)						ug/l

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Metals Y Intercept

Analyst: LKP
Instrument: 7700
Calibration File: 122619B1
Matrix: Water
Units:

Date: 12/27/2019

Element	MDL	3XMDL	Y-Intercept	Pass/Fail
LI	2.00	6.00	0.055406	PASS
BE	0.20	0.60	2.6E-05	PASS
B	45.00	135.00	0.00114	PASS
NA	20.00	60.00	0.07528	PASS
MG	20.00	60.00	0.002087	PASS
AL	20.00	60.00	0.001594	PASS
P	45.00	135.00	0.000838	PASS
K	45.00	135.00	0.145763	PASS
CA	45.00	135.00	0.017794	PASS
TI	2.00	6.00	0.000195	PASS
V	4.00	12.00	0.020231	PASS
CR	4.00	12.00	0.00834	PASS
MN	0.90	2.70	0.000764	PASS
FE	20.00	60.00	0.001059	PASS
CO	0.90	2.70	0.00126	PASS
NI	2.00	6.00	0.000346	PASS
CU	0.40	1.20	0.022791	PASS
ZN	7.50	22.50	0.00254	PASS
AS	4.00	12.00	0.000632	PASS
SE	2.00	6.00	0.000189	PASS
SR	2.00	6.00	0.000416	PASS
Y	2.00	6.00	0.00041	PASS
ZR	2.00	6.00	0.001666	PASS
NB	10.00	30.00	0.00481	PASS
MO	2.00	6.00	0.001233	PASS
RU	4.00	12.00	0.000267	PASS
RH	4.00	12.00	0.001878	PASS
PD	0.20	0.60	0.000218	PASS
AG	0.90	2.70	8.35E-05	PASS
CD	0.20	0.60	8.72E-06	PASS
SN	1.20	3.60	0.000476	PASS
SB	2.00	6.00	5.98E-05	PASS
TE	7.50	22.50	1.37E-07	PASS
CS	0.20	0.60	7.32E-06	PASS
BA	0.90	2.70	2.6E-05	PASS
LA	0.90	2.70	1.54E-05	PASS
CE	4.00	12.00	2.3E-05	PASS
PR	0.90	2.70	2.02E-05	PASS
ND	0.90	2.70	4.31E-06	PASS
SM	4.00	12.00	4.08E-06	PASS
HF	4.00	12.00	4.79E-05	PASS
TA	4.00	12.00	0.001482	PASS
W	2.00	6.00	0.000794	PASS
RE	0.40	1.20	1.5E-05	PASS
PT	0.40	1.20	3.82E-05	PASS
AU	5.00	15.00	5.24E-05	PASS
TL	0.90	2.70	0.000325	PASS
(PB 206)	1.00	3.00	0.00043	PASS
(PB 207)	1.00	3.00	0.000428	PASS
PB	1.00	3.00	0.00168	PASS
BI	7.50	22.50	0.000851	PASS
TH	0.90	2.70	0.000617	PASS
U	0.40	1.20	5.47E-05	PASS

Analyst:
Instrument: 7700
Calibration File: 122619B1
Matrix: Soil
Units: PPB

Element	MDL	3XMDL	Y-Intercept	Pass/Fail
LI	4.00	12.00	0.055406	PASS
BE	0.40	1.20	0.000026	PASS
B	45.00	135.00	0.001140	PASS
NA	75.00	225.00	0.075280	PASS
MG	25.00	75.00	0.002087	PASS
AL	20.00	60.00	0.001594	PASS
P	200.00	600.00	0.000838	PASS
K	40.00	120.00	0.145763	PASS
CA	100.00	300.00	0.017794	PASS
TI	2.40	7.20	0.000195	PASS
V	4.00	12.00	0.020231	PASS
CR	4.50	13.50	0.008340	PASS
MN	2.00	6.00	0.000764	PASS
FE	20.00	60.00	0.001059	PASS
CO	0.75	2.25	0.001260	PASS
NI	2.00	6.00	0.000346	PASS
CU	4.00	12.00	0.022791	PASS
ZN	20.00	60.00	0.002540	PASS
AS	4.00	12.00	0.000632	PASS
SE	3.20	9.60	0.000189	PASS
SR	2.40	7.20	0.000416	PASS
Y	4.00	12.00	0.000410	PASS
ZR	4.00	12.00	0.001666	PASS
NB	12.00	36.00	0.004810	PASS
MO	2.00	6.00	0.001233	PASS
RU	4.00	12.00	0.000267	PASS
RH	4.00	12.00	0.001878	PASS
PD	0.40	1.20	0.000218	PASS
AG	0.75	2.25	0.000084	PASS
CD	0.24	0.72	0.000009	PASS
SN	0.90	2.70	0.000476	PASS
SB	2.00	6.00	0.000060	PASS
TE	4.00	12.00	0.000000	PASS
CS	2.00	6.00	0.000007	PASS
BA	5.00	15.00	0.000026	PASS
LA	0.75	2.25	0.000015	PASS
CE	4.00	12.00	0.000023	PASS
PR	0.75	2.25	0.000020	PASS
ND	0.75	2.25	0.000004	PASS
SM	4.00	12.00	0.000004	PASS
HF	4.00	12.00	0.000048	PASS
TA	4.00	12.00	0.001482	PASS
W	10.00	30.00	0.000794	PASS
RE	4.00	12.00	0.000015	PASS
PT	0.40	1.20	0.000038	PASS
AU	2.00	6.00	0.000052	PASS
TL	2.00	6.00	0.000325	PASS
(PB 206)	1.25	3.75	0.000430	PASS
(PB 207)	1.25	3.75	0.000428	PASS
PB	1.25	3.75	0.001680	PASS
BI	7.50	22.50	0.000851	PASS
TH	0.90	2.70	0.000617	PASS
U	0.40	1.20	0.000055	PASS

122619B1-2

une Ste	Mass	Name	R	a	b (blank)	DL	BEC	Units
3	7	Li	0.999983	0.00557	0.056241	0.171945	10.09723	ug/l
3	9	Be	1	0.001618	2.14E-05	0.013889	0.013205	ug/l
3	11	B	0.999809	0.001225	0.009654	0.141283	7.882622	ug/l
2	23	Na	0.999997	0.007066	0.090066	1.237115	12.74614	ug/l
2	24	Mg	0.999999	0.003637	0.002392	0.04877	0.657772	ug/l
2	27	Al	0.999054	0.001549	0.001541	0.219353	0.995016	ug/l
2	31	P	0.999999	0.000108	0.000601	2.806163	5.585696	ug/l
2	39	K	0.999997	0.004012	0.150213	0.924596	37.43951	ug/l
3	44	Ca	0.999954	0.00043	0.007617	0.761542	17.70576	ug/l
3	47	Ti	0.999994	0.001239	0.000149	0.023488	0.120541	ug/l
2	51	V	0.999875	0.048166	0.024261	0.015606	0.503699	ug/l
2	52	Cr	0.999994	0.058438	0.008132	0.021877	0.139149	ug/l
2	55	Mn	0.999991	0.016261	0.000995	0.048378	0.06119	ug/l
2	57	Fe	0.999863	0.00055	0.000924	0.773232	1.680396	ug/l
2	59	Co	0.999895	0.040054	0.001407	0.008679	0.035128	ug/l
2	60	Ni	0.999894	0.010079	0.000317	0.010452	0.031404	ug/l
2	63	Cu	0.999997	0.027761	0.010852	0.063649	0.39092	ug/l
2	66	Zn	0.99987	0.00545	0.001462	0.017745	0.268218	ug/l
2	75	As	0.999899	0.003719	0.000517	0.051713	0.139044	ug/l
2	78	Se	0.999949	0.000283	0.000206	0.705903	0.727633	ug/l
3	88	Sr	0.999924	0.034755	0.000551	0.004076	0.015854	ug/l
2	89	Y	0.999991	0.051661	0.000539	0.003929	0.010429	ug/l
2	90	Zr	0.99996	0.03941	0.001324	0.014768	0.033596	ug/l
2	93	Nb	0.998209	0.077529	0.01488	0.041744	0.191929	ug/l
3	95	Mo	0.999822	0.006513	0.000394	0.009942	0.060562	ug/l
2	101	Ru	0.999971	0.022793	0.000239	0.009758	0.010465	ug/l
2	103	Rh	0.999823	0.131228	0.002515	0.008339	0.019169	ug/l
2	105	Pd	0.999923	0.025885	9.2E-05	0.001034	0.003554	ug/l
3	107	Ag	0.999953	0.002405	5.67E-05	0.000434	0.023586	ug/l
3	111	Cd	0.999841	0.000521	7.72E-06	0.008119	0.014813	ug/l
3	118	Sn	0.999999	0.001514	0.000424	0.01602	0.279968	ug/l
3	121	Sb	0.999995	0.001961	6.89E-05	0.001974	0.035129	ug/l
2	125	Te	0.99988	2.26E-05	8.41E-07	0.063222	0.037298	ug/l
2	133	Cs	0.999989	0.001821	1.86E-05	0.005497	0.010217	ug/l
3	137	Ba	0.999956	0.000641	2.94E-05	0.009825	0.045804	ug/l
2	139	La	0.999994	0.003979	2.53E-05	9.46E-05	0.006369	ug/l
2	140	Ce	0.999991	0.004612	3.3E-05	0.000943	0.007157	ug/l
2	141	Pr	0.999993	0.004788	3.02E-05	0.00155	0.0063	ug/l
2	146	Nd	0.999535	0.000897	7.27E-06	0.006588	0.008108	ug/l
3	147	Sm	0.999956	0.000986	7.49E-06	0.002454	0.007593	ug/l
2	178	Hf	0.999995	0.002031	5.21E-05	0.00298	0.025641	ug/l
2	181	Ta	0.999888	0.008555	0.001517	0.011209	0.177288	ug/l
2	182	W	0.999994	0.002073	0.000695	0.01539	0.335332	ug/l
3	185	Re	0.99997	0.004343	2.59E-05	0.001278	0.005956	ug/l
2	195	Pt	1	0.001966	3.53E-05	0.009191	0.017968	ug/l
3	197	Au	0.999991	0.003251	0.000122	0.002501	0.037467	ug/l
3	205	Tl	0.999955	0.007412	0.000109	0.001708	0.014655	ug/l
3	206	(Pb)	0.99994	0.002539	0.000279	0.015135	0.109971	ug/l
3	207	(Pb)	0.999904	0.002218	0.000298	0.021805	0.13431	ug/l
3	208	Pb	0.999948	0.010148	0.001129	0.008008	0.111262	ug/l
2	209	Bi	0.999948	0.007505	0.000627	0.002984	0.083498	ug/l
3	232	Th	0.999999	0.011967	0.000441	0.003391	0.036873	ug/l
3	238	U	0.999934	0.011269	7.92E-05	0.002095	0.007028	ug/l
3	6	Li (IS)						ug/l
2	45	Sc (IS)						ug/l
3	45	Sc (IS)						ug/l
2	72	Ge (IS)						ug/l
3	72	Ge (IS)						ug/l
3	115	In (IS)						ug/l
2	165	Ho (IS)						ug/l
3	165	Ho (IS)						ug/l
2	193	Ir (IS)						ug/l
3	193	Ir (IS)						ug/l

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Metals Y Intercept

Analyst: LKP
Instrument: 7700
Calibration File: 122619B1
Matrix: Water
Units: PPB

Date: 12/27/2019

Analyst:
Instrument: 7700
Calibration File: 122619B1
Matrix: Soil
Units: PPB

Element	MDL	3XMDL	Y-Intercept	Pass/Fail
LI	2.00	6.00	0.056241	PASS
BE	0.20	0.60	2.14E-05	PASS
B	45.00	135.00	0.009654	PASS
NA	20.00	60.00	0.090066	PASS
MG	20.00	60.00	0.002392	PASS
AL	20.00	60.00	0.001541	PASS
P	45.00	135.00	0.000601	PASS
K	45.00	135.00	0.150213	PASS
CA	45.00	135.00	0.007617	PASS
TI	2.00	6.00	0.000149	PASS
V	4.00	12.00	0.024261	PASS
CR	4.00	12.00	0.008132	PASS
MN	0.90	2.70	0.000995	PASS
FE	20.00	60.00	0.000924	PASS
CO	0.90	2.70	0.001407	PASS
NI	2.00	6.00	0.000317	PASS
CU	0.40	1.20	0.010852	PASS
ZN	7.50	22.50	0.001462	PASS
AS	4.00	12.00	0.000517	PASS
SE	2.00	6.00	0.000206	PASS
SR	2.00	6.00	0.000551	PASS
Y	2.00	6.00	0.000539	PASS
ZR	2.00	6.00	0.001324	PASS
NB	10.00	30.00	0.01488	PASS
MO	2.00	6.00	0.000394	PASS
RU	4.00	12.00	0.000239	PASS
RH	4.00	12.00	0.002515	PASS
PD	0.20	0.60	9.2E-05	PASS
AG	0.90	2.70	5.67E-05	PASS
CD	0.20	0.60	7.72E-06	PASS
SN	1.20	3.60	0.000424	PASS
SB	2.00	6.00	6.89E-05	PASS
TE	7.50	22.50	8.41E-07	PASS
CS	0.20	0.60	1.86E-05	PASS
BA	0.90	2.70	2.94E-05	PASS
LA	0.90	2.70	2.53E-05	PASS
CE	4.00	12.00	3.3E-05	PASS
PR	0.90	2.70	3.02E-05	PASS
ND	0.90	2.70	7.27E-06	PASS
SM	4.00	12.00	7.49E-06	PASS
HF	4.00	12.00	5.21E-05	PASS
TA	4.00	12.00	0.001517	PASS
W	2.00	6.00	0.000695	PASS
RE	0.40	1.20	2.59E-05	PASS
PT	0.40	1.20	3.53E-05	PASS
AU	5.00	15.00	0.000122	PASS
TL	0.90	2.70	0.000109	PASS
(PB 206)	1.00	3.00	0.000279	PASS
(PB 207)	1.00	3.00	0.000298	PASS
PB	1.00	3.00	0.001129	PASS
BI	7.50	22.50	0.000627	PASS
TH	0.90	2.70	0.000441	PASS
U	0.40	1.20	7.92E-05	PASS

Element	MDL	3XMDL	Y-Intercept	Pass/Fail
LI	4.00	12.00	0.056241	PASS
BE	0.40	1.20	0.000021	PASS
B	45.00	135.00	0.009654	PASS
NA	75.00	225.00	0.090066	PASS
MG	25.00	75.00	0.002392	PASS
AL	20.00	60.00	0.001541	PASS
P	200.00	600.00	0.000601	PASS
K	40.00	120.00	0.150213	PASS
CA	100.00	300.00	0.007617	PASS
TI	2.40	7.20	0.000149	PASS
V	4.00	12.00	0.024261	PASS
CR	4.50	13.50	0.008132	PASS
MN	2.00	6.00	0.000995	PASS
FE	20.00	60.00	0.000924	PASS
CO	0.75	2.25	0.001407	PASS
NI	2.00	6.00	0.000317	PASS
CU	4.00	12.00	0.010852	PASS
ZN	20.00	60.00	0.001462	PASS
AS	4.00	12.00	0.000517	PASS
SE	3.20	9.60	0.000206	PASS
SR	2.40	7.20	0.000551	PASS
Y	4.00	12.00	0.000539	PASS
ZR	4.00	12.00	0.001324	PASS
NB	12.00	36.00	0.014880	PASS
MO	2.00	6.00	0.000394	PASS
RU	4.00	12.00	0.000239	PASS
RH	4.00	12.00	0.002515	PASS
PD	0.40	1.20	0.000092	PASS
AG	0.75	2.25	0.000057	PASS
CD	0.24	0.72	0.000008	PASS
SN	0.90	2.70	0.000424	PASS
SB	2.00	6.00	0.000069	PASS
TE	4.00	12.00	0.000001	PASS
CS	2.00	6.00	0.000019	PASS
BA	5.00	15.00	0.000029	PASS
LA	0.75	2.25	0.000025	PASS
CE	4.00	12.00	0.000033	PASS
PR	0.75	2.25	0.000030	PASS
ND	0.75	2.25	0.000007	PASS
SM	4.00	12.00	0.000007	PASS
HF	4.00	12.00	0.000052	PASS
TA	4.00	12.00	0.001517	PASS
W	10.00	30.00	0.000695	PASS
RE	4.00	12.00	0.000026	PASS
PT	0.40	1.20	0.000035	PASS
AU	2.00	6.00	0.000122	PASS
TL	2.00	6.00	0.000109	PASS
(PB 206)	1.25	3.75	0.000279	PASS
(PB 207)	1.25	3.75	0.000298	PASS
PB	1.25	3.75	0.001129	PASS
BI	7.50	22.50	0.000627	PASS
TH	0.90	2.70	0.000441	PASS
U	0.40	1.20	0.000079	PASS

File: 122619B1
Tune: 1848646
Rinse: 1843378

P/A: 1844732
IS: 1848675

1st reviewed on 12/27/19 by FLC:

	Method	Type	Vial	Sample	Comment	Dil/Lvl	ISTD Conc
1		Keyword		Start of TUNE			
2		Keyword		TN_6020.U			
3		Keyword		1307			
4		Keyword		End of TUNE			
5		Keyword		Start of SMPL			
6	C:\ICPMH\1\METHODS\MET_2014.m	6-Blank	1	RINSE		1.000	Level 1
7	C:\ICPMH\1\METHODS\MET_2014.m	CalBlk	4	ICIS 1854886		Level 1	Level 1
8	C:\ICPMH\1\METHODS\MET_2014.m	CalStd	1101	IC 1856860		Level 2	Level 1
9	C:\ICPMH\1\METHODS\MET_2014.m	CalStd	1102	IC 1856861		Level 3	Level 1
10	C:\ICPMH\1\METHODS\MET_2014.m	CalStd	1103	IC 1856862		Level 4	Level 1
11	C:\ICPMH\1\METHODS\MET_2014.m	ICV	1104	ICV 1856859		1.000	Level 1
12	C:\ICPMH\1\METHODS\MET_2014.m	ICB	4	ICB 1854886		1.000	Level 1
13	C:\ICPMH\1\METHODS\MET_2014.m	CRI	1101	CRI 1856860		1.000	Level 1
14	C:\ICPMH\1\METHODS\MET_2014.m	ICSA	1105	ICSA 1856863		1.000	Level 1
15	C:\ICPMH\1\METHODS\MET_2014.m	ICSAB	1106	ICSAB 1856864		1.000	Level 1
16	C:\ICPMH\1\METHODS\MET_2014.m	Sample	1301	LRC 1856174		1.000	Level 1
17	C:\ICPMH\1\METHODS\MET_2014.m	Sample	1302	LRC 1856175		1.000	Level 1
18	C:\ICPMH\1\METHODS\MET_2014.m	CCV	1102	CCV 1856861	(455415)	1.000	Level 1
19	C:\ICPMH\1\METHODS\MET_2014.m	CCB	4	CCB 1854886		1.000	Level 1
20	C:\ICPMH\1\METHODS\MET_2014.m	Sample	2101	MB 160-454797/1-A	454797	2.000	Level 1
21	C:\ICPMH\1\METHODS\MET_2014.m	Sample	2102	160-36005-A-17-E MDLV		2.000	Level 1
22	C:\ICPMH\1\METHODS\MET_2014.m	Sample	2103	160-36007-A-16-A LOQV		2.000	Level 1
23	C:\ICPMH\1\METHODS\MET_2014.m	Sample	2104	MB 160-454924/1-A	454924	2.000	Level 1
24	C:\ICPMH\1\METHODS\MET_2014.m	Sample	2105	LCS 160-454924/2-A		2.000	Level 1
25	C:\ICPMH\1\METHODS\MET_2014.m	Sample	2106	280-131107-E-1-B		2.000	Level 1
26	C:\ICPMH\1\METHODS\MET_2014.m	Sample	2107	280-131107-E-2-D		2.000	Level 1
27	C:\ICPMH\1\METHODS\MET_2014.m	Sample	2108	280-131107-E-2-D SD		10.00	Level 1
28	C:\ICPMH\1\METHODS\MET_2014.m	Sample	2109	280-131107-E-2-E MS		2.000	Level 1
29	C:\ICPMH\1\METHODS\MET_2014.m	Sample	2110	280-131107-E-2-F MSD		2.000	Level 1
30	C:\ICPMH\1\METHODS\MET_2014.m	Sample	2111	280-131107-E-3-B		2.000	Level 1
31	C:\ICPMH\1\METHODS\MET_2014.m	Sample	2112	280-131107-E-4-B		2.000	Level 1
32	C:\ICPMH\1\METHODS\MET_2014.m	Sample	2201	280-131107-E-6-B		2.000	Level 1
33	C:\ICPMH\1\METHODS\MET_2014.m	Sample	2202	MB 160-454230/1-A	454230	2.000	Level 1

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02/18/2020

	Method	Type	Vial	Sample	Comment	Dil/Lvl	ISTD Conc
34	C:\ICPMH\1\METHODS\MET_2014.m	Sample	2203	LCS 160-454230/2-A		2.000	Level 1
35	C:\ICPMH\1\METHODS\MET_2014.m	Sample	2204	280-131840-I-1-A		2.000	Level 1
36	C:\ICPMH\1\METHODS\MET_2014.m	Sample	2205	280-131840-I-2-A		2.000	Level 1
37	C:\ICPMH\1\METHODS\MET_2014.m	Sample	2206	280-131840-I-2-A SD		10.00	Level 1
38	C:\ICPMH\1\METHODS\MET_2014.m	Sample	2207	280-131840-I-2-B MS		2.000	Level 1
39	C:\ICPMH\1\METHODS\MET_2014.m	Sample	2208	280-131840-I-2-C MSD		2.000	Level 1
40	C:\ICPMH\1\METHODS\MET_2014.m	Sample	2209	280-131840-I-2-A PDS		2.000	Level 1
41	C:\ICPMH\1\METHODS\MET_2014.m	Sample	2210	160-36457-A-149-B	453793	10.00	Level 1
42	C:\ICPMH\1\METHODS\MET_2014.m	Sample	2211	160-36457-A-155-A		10.00	Level 1
43	C:\ICPMH\1\METHODS\MET_2014.m	Sample	2212	160-36457-A-157-A		10.00	Level 1
44	C:\ICPMH\1\METHODS\MET_2014.m	Sample	2301	160-36457-A-159-A	453794	10.00	Level 1
45	C:\ICPMH\1\METHODS\MET_2014.m	Sample	2302	160-36457-A-160-A		10.00	Level 1
46	C:\ICPMH\1\METHODS\MET_2014.m	Sample	2303	160-36457-A-162-A		10.00	Level 1
47	C:\ICPMH\1\METHODS\MET_2014.m	Sample	2304	160-36457-A-163-A		10.00	Level 1
48	C:\ICPMH\1\METHODS\MET_2014.m	Sample	2305	160-36457-A-164-A		10.00	Level 1
49	C:\ICPMH\1\METHODS\MET_2014.m	Sample	2306	160-36457-A-165-A		10.00	Level 1
50	C:\ICPMH\1\METHODS\MET_2014.m	Sample	2307	MB 160-454546/1-A	454546	2.000	Level 1
51	C:\ICPMH\1\METHODS\MET_2014.m	Sample	2308	LCS 160-454546/2-A		2.000	Level 1
52	C:\ICPMH\1\METHODS\MET_2014.m	Sample	2309	280-131980-A-1-B		20.00	Level 1
53	C:\ICPMH\1\METHODS\MET_2014.m	Sample	2310	280-131980-A-1-B SD		100.0	Level 1
54	C:\ICPMH\1\METHODS\MET_2014.m	Sample	2311	280-131980-A-1-C MS		20.00	Level 1
55	C:\ICPMH\1\METHODS\MET_2014.m	Sample	2312	280-131980-A-1-D MSD		20.00	Level 1
56	C:\ICPMH\1\METHODS\MET_2014.m	Sample	2401	280-131980-A-1-B PDS		20.00	Level 1
57	C:\ICPMH\1\METHODS\MET_2014.m	Sample	2402	280-131980-A-2-B		2.000	Level 1
58	C:\ICPMH\1\METHODS\MET_2014.m	Sample	2403	280-131980-A-3-B		20.00	Level 1
59	C:\ICPMH\1\METHODS\MET_2014.m	Sample	2404	280-131980-A-4-B		20.00	Level 1
60	C:\ICPMH\1\METHODS\MET_2014.m	Sample	2405	280-131980-A-5-B		2.000	Level 1
61	C:\ICPMH\1\METHODS\MET_2014.m	Sample	2406	280-131980-A-6-B		2.000	Level 1
62	C:\ICPMH\1\METHODS\MET_2014.m	Sample	2407	280-131980-A-7-D		2.000	Level 1
63	C:\ICPMH\1\METHODS\MET_2014.m	CRI	1101	CCVL 1856860		1.000	Level 1
64	C:\ICPMH\1\METHODS\MET_2014.m	CCV	1102	CCV 1856861		1.000	Level 1
65	C:\ICPMH\1\METHODS\MET_2014.m	CCB	4	CCB 1854886		1.000	Level 1
66	C:\ICPMH\1\METHODS\MET_2014.m	6-Blank	1	RINSE		1.000	Level 1

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	Method	Type	Vial	Sample	Comment	Dil/Lvl	ISTD Conc
67	C:\ICPMH\1\METHODS\MET_2014.m	CalBlk	4	ICIS 1854886		Level 1	Level 1
68	C:\ICPMH\1\METHODS\MET_2014.m	CalStd	1101	IC 1856860		Level 2	Level 1
69	C:\ICPMH\1\METHODS\MET_2014.m	CalStd	1102	IC 1856861		Level 3	Level 1
70	C:\ICPMH\1\METHODS\MET_2014.m	CalStd	1103	IC 1856862		Level 4	Level 1
71	C:\ICPMH\1\METHODS\MET_2014.m	ICV	1104	ICV 1856859		1.000	Level 1
72	C:\ICPMH\1\METHODS\MET_2014.m	ICB	4	ICB 1854886		1.000	Level 1
73	C:\ICPMH\1\METHODS\MET_2014.m	CRI	1101	CRI 1856860		1.000	Level 1
74	C:\ICPMH\1\METHODS\MET_2014.m	ICSA	1105	ICSA 1856863		1.000	Level 1
75	C:\ICPMH\1\METHODS\MET_2014.m	ICSAB	1106	ICSAB 1856864		1.000	Level 1
76	C:\ICPMH\1\METHODS\MET_2014.m	CCV	1102	CCV 1856861	(455416)	1.000	Level 1
77	C:\ICPMH\1\METHODS\MET_2014.m	CCB	4	CCB 1854886		1.000	Level 1
78	C:\ICPMH\1\METHODS\MET_2014.m	Sample	3101	MB 160-453801/1-A	453801	2.000	Level 1
79	C:\ICPMH\1\METHODS\MET_2014.m	Sample	3102	LCS 160-453801/2-A		2.000	Level 1
80	C:\ICPMH\1\METHODS\MET_2014.m	Sample	3103	LCSSRM 160-453801/3-A		10.00	Level 1
81	C:\ICPMH\1\METHODS\MET_2014.m	Sample	3104	160-36593-B-1-A		2.000	Level 1
82	C:\ICPMH\1\METHODS\MET_2014.m	Sample	3105	160-36593-B-1-A SD		10.00	Level 1
83	C:\ICPMH\1\METHODS\MET_2014.m	Sample	3106	160-36593-B-1-B DU		2.000	Level 1
84	C:\ICPMH\1\METHODS\MET_2014.m	Sample	3107	160-36593-A-1-E MS		2.000	Level 1
85	C:\ICPMH\1\METHODS\MET_2014.m	Sample	3108	160-36593-A-1-F MSD		2.000	Level 1
86	C:\ICPMH\1\METHODS\MET_2014.m	Sample	3109	160-36593-B-2-A		2.000	Level 1
87	C:\ICPMH\1\METHODS\MET_2014.m	Sample	3110	160-36593-B-3-A		2.000	Level 1
88	C:\ICPMH\1\METHODS\MET_2014.m	Sample	3111	160-36593-B-4-A	All	2.000	Level 1
89	C:\ICPMH\1\METHODS\MET_2014.m	Sample	3112	160-36593-B-5-A		2.000	Level 1
90	C:\ICPMH\1\METHODS\MET_2014.m	Sample	3201	160-36593-B-6-A		2.000	Level 1
91	C:\ICPMH\1\METHODS\MET_2014.m	Sample	3202	160-36593-B-7-A		2.000	Level 1
92	C:\ICPMH\1\METHODS\MET_2014.m	Sample	3203	160-36593-B-8-A		2.000	Level 1
93	C:\ICPMH\1\METHODS\MET_2014.m	Sample	3204	160-36593-B-9-A		2.000	Level 1
94	C:\ICPMH\1\METHODS\MET_2014.m	Sample	3205	160-36593-B-10-A		2.000	Level 1
95	C:\ICPMH\1\METHODS\MET_2014.m	Sample	3206	160-36593-B-11-A		2.000	Level 1
96	C:\ICPMH\1\METHODS\MET_2014.m	Sample	3207	160-36593-B-12-A		2.000	Level 1
97	C:\ICPMH\1\METHODS\MET_2014.m	Sample	3208	160-36593-B-13-A		2.000	Level 1
98	C:\ICPMH\1\METHODS\MET_2014.m	Sample	3209	160-36593-B-14-A		2.000	Level 1
99	C:\ICPMH\1\METHODS\MET_2014.m	Sample	3210	160-36593-B-15-A		2.000	Level 1

	Method	Type	Vial	Sample	Comment	Dil/Lvl	ISTD Conc
100	C:\ICPMH\1\METHODS\MET_2014.m	Sample	3211	160-36593-B-16-A		2.000	Level 1
101	C:\ICPMH\1\METHODS\MET_2014.m	Sample	3212	160-36593-B-17-A		2.000	Level 1
102	C:\ICPMH\1\METHODS\MET_2014.m	Sample	3301	160-36593-B-18-B		2.000	Level 1
103	C:\ICPMH\1\METHODS\MET_2014.m	Sample	3302	MB 160-453196/1-A	453196	2.000	Level 1
104	C:\ICPMH\1\METHODS\MET_2014.m	Sample	3303	LCS 160-453196/2-A		2.000	Level 1
105	C:\ICPMH\1\METHODS\MET_2014.m	Sample	3304	180-99027-C-2-A		2.000	Level 1
106	C:\ICPMH\1\METHODS\MET_2014.m	Sample	3305	180-99027-C-4-A		2.000	Level 1
107	C:\ICPMH\1\METHODS\MET_2014.m	Sample	3306	180-99027-C-6-A		2.000	Level 1
108	C:\ICPMH\1\METHODS\MET_2014.m	Sample	3307	180-99027-C-8-A		2.000	Level 1
109	C:\ICPMH\1\METHODS\MET_2014.m	Sample	3308	180-99027-C-10-A		2.000	Level 1
110	C:\ICPMH\1\METHODS\MET_2014.m	Sample	3309	180-99027-C-12-A		2.000	Level 1
111	C:\ICPMH\1\METHODS\MET_2014.m	Sample	3310	180-99027-C-14-A		2.000	Level 1
112	C:\ICPMH\1\METHODS\MET_2014.m	Sample	3311	180-99027-C-16-A		2.000	Level 1
113	C:\ICPMH\1\METHODS\MET_2014.m	Sample	3312	180-99027-C-18-A		2.000	Level 1
114	C:\ICPMH\1\METHODS\MET_2014.m	Sample	3401	180-99027-C-18-A SD		10.00	Level 1
115	C:\ICPMH\1\METHODS\MET_2014.m	Sample	3402	180-99027-C-18-B MS		2.000	Level 1
116	C:\ICPMH\1\METHODS\MET_2014.m	Sample	3403	180-99027-C-18-C MSD		2.000	Level 1
117	C:\ICPMH\1\METHODS\MET_2014.m	Sample	3404	180-99027-C-18-A PDS		2.000	Level 1
118	C:\ICPMH\1\METHODS\MET_2014.m	Sample	3405	180-99027-C-20-A		2.000	Level 1
119		Keyword		End of SMPL			
120		Keyword		Start of CCV			
121	C:\ICPMH\1\METHODS\MET_2014.m	CRI	1101	CCVL 1856860		1.000	Level 1
122	C:\ICPMH\1\METHODS\MET_2014.m	CCV	1102	CCV 1856861		1.000	Level 1
123	C:\ICPMH\1\METHODS\MET_2014.m	CCB	4	CCB 1854886		1.000	Level 1
124		Keyword		End of CCV			
125		Keyword		Start of TERM			
126		Keyword					
127		Keyword		End of TERM			
128		Keyword		End of Sequence			
129		Keyword		Start of CALIB			
130		Keyword		End of CALIB			
131		Keyword		Start of BLANK			
132		Keyword		End of BLANK			

All

	Method	Type	Vial	Sample	Comment	Dil/Lvl	ISTD Conc
133		Keyword		Start of ERRTERM			
134		Keyword		End of ERRTERM			

GENERAL CHEMISTRY

COVER PAGE
GENERAL CHEMISTRY

Lab Name: Eurofins TestAmerica, St. Louis Job Number: 160-36593-1

SDG No.:

Project: ACMS - Yerington OU-4b_OU-5_SOIL

Client Sample ID	Lab Sample ID
STSB32_0-0.5	160-36593-1
STSB32_0.5-3	160-36593-2
STSB32_3-6	160-36593-3
STSB32_6-15	160-36593-4
STSB34_0-0.5	160-36593-5
STSB34_0.5-3	160-36593-6
STSB34_3-6	160-36593-7
STSB34_6-15	160-36593-8
STSB34-FD_3-6	160-36593-9
STSB33_0-0.5	160-36593-10
STSB33_0.5-3	160-36593-11
STSB33-FD_0.5-3	160-36593-12
STSB33_3-6	160-36593-13
STSB33_6-15	160-36593-14
STSB35_0.5-3	160-36593-15
STSB35_0-0.5	160-36593-16
STSB35_3-6	160-36593-17
STSB35_6-15	160-36593-18

Comments:

9-IN
DETECTION LIMITS
GENERAL CHEMISTRY

Lab Name: Eurofins TestAmerica, St. Louis Job Number: 160-36593-1

SDG Number:

Matrix: Solid Instrument ID: NOEQUIP

Method: Moisture RL Date: 01/28/2011 14:43

Analyte	Wavelength/ Mass	RL (%)	
Percent Moisture		0.1	
Percent Solids		0.1	

9-IN
CALIBRATION BLANK DETECTION LIMITS
GENERAL CHEMISTRY

Lab Name: Eurofins TestAmerica, St. Louis Job Number: 160-36593-1

SDG Number:

Matrix: Solid Instrument ID: NOEQUIP

Method: Moisture XRL Date: 01/28/2011 14:42

Analyte	Wavelength/ Mass	XRL (%)	
Percent Moisture		0.1	
Percent Solids		0.1	

13-IN
ANALYSIS RUN LOG
GENERAL CHEMISTRY

Lab Name: Eurofins TestAmerica, St. Louis Job No.: 160-36593-1

SDG No.:

Instrument ID: NOEQUIP Analysis Method: Moisture

Start Date: 12/05/2019 14:09 End Date: 12/05/2019 14:09

Lab Sample Id	D/F	Type	Time	Analytes																							
				% Sol	Moist																						
160-36593-1	1	T	14:09	X	X																						
160-36593-1 DU	1	T	14:09	X	X																						
160-36593-2	1	T	14:09	X	X																						
160-36593-3	1	T	14:09	X	X																						
160-36593-4	1	T	14:09	X	X																						
160-36593-5	1	T	14:09	X	X																						
160-36593-6	1	T	14:09	X	X																						
160-36593-7	1	T	14:09	X	X																						
160-36593-8	1	T	14:09	X	X																						
160-36593-9	1	T	14:09	X	X																						
160-36593-10	1	T	14:09	X	X																						
160-36593-11	1	T	14:09	X	X																						
160-36593-12	1	T	14:09	X	X																						
160-36593-13	1	T	14:09	X	X																						
160-36593-14	1	T	14:09	X	X																						
160-36593-15	1	T	14:09	X	X																						
160-36593-16	1	T	14:09	X	X																						
160-36593-17	1	T	14:09	X	X																						
160-36593-18	1	T	14:09	X	X																						

Prep Types:
T = Total/NA

GENERAL CHEMISTRY BATCH WORKSHEET

Lab Name: Eurofins TestAmerica, St. Loui Job No.: 160-36593-1

SDG No.:

Batch Number: 453177 Batch Start Date: 12/05/19 14:09 Batch Analyst: Oetter, David R

Batch Method: Moisture Batch End Date: 12/06/19 09:30

Lab Sample ID	Client Sample ID	Method Chain	Basis	DISH#	DishWeight	SampleMassWet	SampleMassDry		
160-36593-A-1	STSB32_0-0.5	Moisture	T	1	1.0071 g	12.8186 g	12.0268 g		
160-36593-A-1 DU	STSB32_0-0.5	Moisture	T	2	1.0143 g	12.1906 g	11.4978 g		
160-36593-A-2	STSB32_0.5-3	Moisture	T	3	0.9889 g	12.2573 g	11.7398 g		
160-36593-A-3	STSB32_3-6	Moisture	T	4	1.0148 g	11.6789 g	10.9635 g		
160-36593-A-4	STSB32_6-15	Moisture	T	5	1.0062 g	11.6574 g	10.6941 g		
160-36593-A-5	STSB34_0-0.5	Moisture	T	6	0.9864 g	10.6616 g	10.1638 g		
160-36593-A-6	STSB34_0.5-3	Moisture	T	7	0.9911 g	10.9556 g	10.3880 g		
160-36593-A-7	STSB34_3-6	Moisture	T	8	0.9929 g	12.1310 g	11.5443 g		
160-36593-A-8	STSB34_6-15	Moisture	T	9	1.0000 g	13.7308 g	10.9189 g		
160-36593-A-9	STSB34-FD_3-6	Moisture	T	10	1.0025 g	14.0592 g	13.3721 g		
160-36593-A-10	STSB33_0-0.5	Moisture	T	11	0.9900 g	11.6395 g	11.0934 g		
160-36593-A-11	STSB33_0.5-3	Moisture	T	12	1.0116 g	12.0866 g	11.4244 g		
160-36593-A-12	STSB33-FD_0.5-3	Moisture	T	13	1.0066 g	10.8363 g	10.2964 g		
160-36593-A-13	STSB33_3-6	Moisture	T	14	1.0121 g	11.7635 g	11.0384 g		
160-36593-A-14	STSB33_6-15	Moisture	T	15	1.0204 g	10.9941 g	10.3460 g		
160-36593-A-15	STSB35_0.5-3	Moisture	T	16	0.9931 g	12.5509 g	12.0321 g		
160-36593-A-16	STSB35_0-0.5	Moisture	T	17	1.0088 g	12.4609 g	11.5885 g		
160-36593-A-17	STSB35_3-6	Moisture	T	18	1.0052 g	11.7988 g	11.1845 g		
160-36593-A-18	STSB35_6-15	Moisture	T	19	0.9985 g	12.7845 g	11.9105 g		

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.

GENERAL CHEMISTRY BATCH WORKSHEET

Lab Name: Eurofins TestAmerica, St. Loui Job No.: 160-36593-1

SDG No.:

Batch Number: 453177 Batch Start Date: 12/05/19 14:09 Batch Analyst: Oetter, David R

Batch Method: Moisture Batch End Date: 12/06/19 09:30

Batch Notes	
Balance ID	0034150065
Batch Comment	TRAY B-2
Date samples were placed in the oven	12/05/2019
Oven Temp In	104.1 Degrees C
Time samples were place in the oven	14:52
Date samples were removed from oven	12/06/2019
Oven Temp Out	104 Degrees C
Time Samples were removed from oven	09:30
Oven ID	OC
Thermometer ID	A142186

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.

GAMMA SPECTROSCOPY

Method 901.1
Ra-226

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

Prep Batch: 453329

Fill Geometry, 21-Day In-Growth

Gamma Spectroscopy Analysis Detail Report
Prep Batch: 453329

Lab Id: MB 160-453329/1-A | Analyzed: 12/27/19 07:39 | Ts: 30 | Sigma: 2
Client ID: | Detector: GV9 | Decay Corrected: No | Ingrowth:

Analyte	MB Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Radium-226	-0.001468	0.147	0.147	U	pCi/g	1.00	0.256	455404
Radium-228	0.006121	0.0488	0.0488	U	pCi/g	1.00	0.188	455404

Lab Id: LCS 160-453329/2-A | Analyzed: 12/27/19 07:38 | Ts: 30 | Sigma: 2
Client ID: | Detector: GV12 | Decay Corrected: No | Ingrowth:

Analyte	LCS Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Americium-241	99.53	1.48	11.7		pCi/g		1.14	455401
Cesium-137	30.32	0.768	3.19		pCi/g		0.310	455401
Cobalt-60	11.88	0.389	1.25		pCi/g		0.161	455401

Lab Id: 160-36593-1 | Analyzed: 12/27/19 07:44 | Ts: 30 | Sigma: 2
Client ID: STSB32_0-0.5 | Detector: GV8 | Decay Corrected: No | Ingrowth:

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Radium-226	3.01	0.306	0.438		pCi/g	1.00	0.166	455403
Radium-228	0.910	0.232	0.250		pCi/g	1.00	0.185	455403

Lab Id: 160-36593-1 DU | Analyzed: 12/27/19 08:18 | Ts: 30 | Sigma: 2
Client ID: STSB32_0-0.5 | Detector: GV5 | Decay Corrected: No | Ingrowth:

Analyte	DU Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Radium-226	3.248	0.340	0.479		pCi/g	1.00	0.181	455402
Radium-228	1.268	0.355	0.378		pCi/g	1.00	0.238	455402

Lab Id: 160-36593-2 | Analyzed: 12/27/19 08:16 | Ts: 30 | Sigma: 2
Client ID: STSB32_0.5-3 | Detector: GV9 | Decay Corrected: No | Ingrowth:

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Radium-226	2.49	0.225	0.343		pCi/g	1.00	0.127	455404
Radium-228	0.754	0.253	0.264		pCi/g	1.00	0.319	455404

Lab Id: 160-36593-3 | Analyzed: 12/27/19 08:17 | Ts: 30 | Sigma: 2
Client ID: STSB32_3-6 | Detector: GV12 | Decay Corrected: No | Ingrowth:

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Radium-226	3.31	0.335	0.475		pCi/g	1.00	0.208	455401
Radium-228	1.03	0.383	0.397		pCi/g	1.00	0.360	455401

Gamma Spectroscopy Analysis Detail Report
Prep Batch: 453329

Lab Id: 160-36593-4 | Analyzed: 12/27/19 08:19 | Ts: 30 | Sigma: 2
Client ID: STSB32_6-15 | Detector: GV8 | Decay Corrected: No | Ingrowth:

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Radium-226	3.17	0.360	0.488		pCi/g	1.00	0.162	455403
Radium-228	1.36	0.287	0.319		pCi/g	1.00	0.336	455403

Lab Id: 160-36593-5 | Analyzed: 12/27/19 08:58 | Ts: 30 | Sigma: 2
Client ID: STSB34_0-0.5 | Detector: GV8 | Decay Corrected: No | Ingrowth:

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Radium-226	1.84	0.237	0.305		pCi/g	1.00	0.145	455403
Radium-228	1.07	0.248	0.271		pCi/g	1.00	0.170	455403

Lab Id: 160-36593-6 | Analyzed: 12/27/19 09:03 | Ts: 30 | Sigma: 2
Client ID: STSB34_0.5-3 | Detector: GV5 | Decay Corrected: No | Ingrowth:

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Radium-226	2.34	0.284	0.374		pCi/g	1.00	0.158	455402
Radium-228	0.930	0.224	0.243		pCi/g	1.00	0.289	455402

Lab Id: 160-36593-7 | Analyzed: 12/27/19 09:30 | Ts: 30 | Sigma: 2
Client ID: STSB34_3-6 | Detector: GV9 | Decay Corrected: No | Ingrowth:

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Radium-226	1.90	0.223	0.298		pCi/g	1.00	0.146	455404
Radium-228	0.863	0.161	0.184		pCi/g	1.00	0.169	455404

Lab Id: 160-36593-8 | Analyzed: 12/27/19 09:31 | Ts: 30 | Sigma: 2
Client ID: STSB34_6-15 | Detector: GV12 | Decay Corrected: No | Ingrowth:

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Radium-226	2.76	0.387	0.478		pCi/g	1.00	0.270	455401
Radium-228	1.56	0.424	0.452		pCi/g	1.00	0.330	455401

Lab Id: 160-36593-9 | Analyzed: 12/27/19 09:35 | Ts: 30 | Sigma: 2
Client ID: STSB34-FD_3-6 | Detector: GV5 | Decay Corrected: No | Ingrowth:

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Radium-226	2.15	0.285	0.362		pCi/g	1.00	0.178	455402
Radium-228	0.982	0.244	0.263		pCi/g	1.00	0.215	455402

Gamma Spectroscopy Analysis Detail Report
Prep Batch: 453329

Lab Id: 160-36593-10 Analyzed: 12/27/19 09:34 Ts: 30 Sigma: 2
Client ID: STSB33_0-0.5 Detector: GV8 Decay Corrected: No Ingrowth:

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Radium-226	1.48	0.212	0.262		pCi/g	1.00	0.131	455403
Radium-228	0.714	0.192	0.206		pCi/g	1.00	0.223	455403

Lab Id: 160-36593-11 Analyzed: 12/27/19 10:11 Ts: 30 Sigma: 2
Client ID: STSB33_0.5-3 Detector: GV9 Decay Corrected: No Ingrowth:

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Radium-226	1.60	0.199	0.260		pCi/g	1.00	0.113	455404
Radium-228	1.05	0.194	0.222		pCi/g	1.00	0.169	455404

Lab Id: 160-36593-12 Analyzed: 12/27/19 10:12 Ts: 30 Sigma: 2
Client ID: STSB33-FD_0.5-3 Detector: GV12 Decay Corrected: No Ingrowth:

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Radium-226	1.58	0.239	0.288		pCi/g	1.00	0.209	455401
Radium-228	0.820	0.362	0.371		pCi/g	1.00	0.345	455401

Lab Id: 160-36593-13 Analyzed: 12/27/19 10:14 Ts: 30 Sigma: 2
Client ID: STSB33_3-6 Detector: GV5 Decay Corrected: No Ingrowth:

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Radium-226	1.20	0.285	0.311		pCi/g	1.00	0.316	455402
Radium-228	1.95	0.532	0.568		pCi/g	1.00	0.691	455402

Lab Id: 160-36593-14 Analyzed: 12/27/19 10:15 Ts: 30 Sigma: 2
Client ID: STSB33_6-15 Detector: GV8 Decay Corrected: No Ingrowth:

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Radium-226	1.68	0.244	0.300		pCi/g	1.00	0.133	455403
Radium-228	1.40	0.249	0.288		pCi/g	1.00	0.130	455403

Lab Id: 160-36593-15 Analyzed: 12/27/19 10:53 Ts: 30 Sigma: 2
Client ID: STSB35_0.5-3 Detector: GV9 Decay Corrected: No Ingrowth:

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Radium-226	1.71	0.203	0.270		pCi/g	1.00	0.133	455404
Radium-228	0.715	0.265	0.275		pCi/g	1.00	0.253	455404

Gamma Spectroscopy Analysis Detail Report
Prep Batch: 453329

Lab Id: 160-36593-16 | Analyzed: 12/27/19 10:54 | Ts: 30 | Sigma: 2
Client ID: STSB35_0-0.5 | Detector: GV8 | Decay Corrected: No | Ingrowth:

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Radium-226	3.54	0.400	0.543		pCi/g	1.00	0.214	455403
Radium-228	0.952	0.352	0.365		pCi/g	1.00	0.497	455403

Lab Id: 160-36593-17 | Analyzed: 12/27/19 11:37 | Ts: 30 | Sigma: 2
Client ID: STSB35_3-6 | Detector: GV9 | Decay Corrected: No | Ingrowth:

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Radium-226	2.34	0.225	0.332		pCi/g	1.00	0.132	455404
Radium-228	0.700	0.278	0.287		pCi/g	1.00	0.271	455404

Lab Id: 160-36593-18 | Analyzed: 12/27/19 11:37 | Ts: 30 | Sigma: 2
Client ID: STSB35_6-15 | Detector: GV12 | Decay Corrected: No | Ingrowth:

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Radium-226	5.62	0.426	0.714		pCi/g	1.00	0.214	455401
Radium-228	1.15	0.333	0.353		pCi/g	1.00	0.354	455401

Quality Control Summary

Method Blank ID:	Analyte	Parent Result	Spike Added	MB Result	Qualifier	Unit	% Rec	% Rec Limits	RPD	RER	DER	DER Limit	Z Factor
MB 160-453329/1-A	Radium-226			-0.001468	U	pCi/g							-.02
MB 160-453329/1-A	Radium-228			0.006121	U	pCi/g							.2508
Lab Control Sample ID:	**Analyte**	**Parent Result**	**Spike Added**	**LCS Result**	**Qualifier**	**Unit**	**% Rec**	**% Rec Limits**	**RPD**	**RER**	**DER**	**DER Limit**	**Z Factor**
LCS 160-453329/2-A	Americium-241		96.6	99.53		pCi/g	103	75 - 125					.4843
LCS 160-453329/2-A	Cesium-137		27.3	30.32		pCi/g	111	75 - 125					1.7994
LCS 160-453329/2-A	Cobalt-60		10.7	11.88		pCi/g	111	75 - 125					1.7409
Duplicate ID:	**Analyte**	**Parent Result**	**Spike Added**	**DU Result**	**Qualifier**	**Unit**	**% Rec**	**% Rec Limits**	**RPD**	**RER**	**DER**	**DER Limit**	**Z Factor**
160-36593-1	Radium-226	3.01		3.248		pCi/g			7	0.25	0.72	2	.7191
160-36593-1	Radium-228	0.910		1.268		pCi/g			33	0.57	1.58	2	1.5797

Glossary:

Ts = Count Duration, Sample

GAMMA SPECTROSCOPY BATCH WORKSHEET

Lab Name: Eurofins TestAmerica, St. Loui Job No.: 160-36593-1

SDG No.:

Batch Number: 453329 Batch Start Date: 12/06/19 13:38 Batch Analyst: Slama, Kurt R

Batch Method: Fill_Geo-21 Batch End Date: 12/06/19 14:24

Lab Sample ID	Client Sample ID	Method Chain	Basis	TareWeight	GrossWeight	InitialAmount	IngDecDate1	IngDecDate3	Geometry
MB 160-453329/1		Fill_Geo-21, 901.1				291.18 g	12/06/2019 14:24	12/27/2019 14:24	tuna can
LCS 160-453329/2		Fill_Geo-21, 901.1				341.9 g	12/06/2019 14:24	12/27/2019 14:24	tuna can
160-36593-A-1-A	STSB32_0-0.5	Fill_Geo-21, 901.1	T	46.3 g	454.6 g	408.3 g	12/06/2019 14:24	12/27/2019 14:24	tuna can
160-36593-A-1-B DU	STSB32_0-0.5	Fill_Geo-21, 901.1	T	46.3 g	454.6 g	408.3 g	12/06/2019 14:24	12/27/2019 14:24	tuna can
160-36593-A-2-A	STSB32_0.5-3	Fill_Geo-21, 901.1	T	45.9 g	479.9 g	434 g	12/06/2019 14:24	12/27/2019 14:24	tuna can
160-36593-A-3-A	STSB32_3-6	Fill_Geo-21, 901.1	T	46.2 g	446.7 g	400.5 g	12/06/2019 14:24	12/27/2019 14:24	tuna can
160-36593-A-4-A	STSB32_6-15	Fill_Geo-21, 901.1	T	46.2 g	324.1 g	277.9 g	12/06/2019 14:24	12/27/2019 14:24	tuna can
160-36593-A-5-A	STSB34_0-0.5	Fill_Geo-21, 901.1	T	46.6 g	478.6 g	432 g	12/06/2019 14:24	12/27/2019 14:24	tuna can
160-36593-A-6-A	STSB34_0.5-3	Fill_Geo-21, 901.1	T	46.4 g	457.5 g	411.1 g	12/06/2019 14:24	12/27/2019 14:24	tuna can
160-36593-A-7-A	STSB34_3-6	Fill_Geo-21, 901.1	T	45.7 g	471.4 g	425.7 g	12/06/2019 14:24	12/27/2019 14:24	tuna can
160-36593-A-8-A	STSB34_6-15	Fill_Geo-21, 901.1	T	46.1 g	304.4 g	258.3 g	12/06/2019 14:24	12/27/2019 14:24	tuna can
160-36593-A-9-A	STSB34-FD_3-6	Fill_Geo-21, 901.1	T	46.7 g	438.5 g	391.8 g	12/06/2019 14:24	12/27/2019 14:24	tuna can
160-36593-A-10-A	STSB33_0-0.5	Fill_Geo-21, 901.1	T	47.0 g	472.5 g	425.5 g	12/06/2019 14:24	12/27/2019 14:24	tuna can
160-36593-A-11-A	STSB33_0.5-3	Fill_Geo-21, 901.1	T	46.6 g	370.6 g	324 g	12/06/2019 14:24	12/27/2019 14:24	tuna can
160-36593-A-12-A	STSB33-FD_0.5-3	Fill_Geo-21, 901.1	T	46.8 g	395.2 g	348.4 g	12/06/2019 14:24	12/27/2019 14:24	tuna can
160-36593-A-13-A	STSB33_3-6	Fill_Geo-21, 901.1	T	46.7 g	339.0 g	292.3 g	12/06/2019 14:24	12/27/2019 14:24	tuna can
160-36593-A-14-A	STSB33_6-15	Fill_Geo-21, 901.1	T	46.7 g	363.9 g	317.2 g	12/06/2019 14:24	12/27/2019 14:24	tuna can
160-36593-A-15-A	STSB35_0.5-3	Fill_Geo-21, 901.1	T	46.5 g	465.7 g	419.2 g	12/06/2019 14:24	12/27/2019 14:24	tuna can
160-36593-A-16-A	STSB35_0-0.5	Fill_Geo-21, 901.1	T	46.6 g	330.6 g	284 g	12/06/2019 14:24	12/27/2019 14:24	tuna can
160-36593-A-17-A	STSB35_3-6	Fill_Geo-21, 901.1	T	46.7 g	464.4 g	417.7 g	12/06/2019 14:24	12/27/2019 14:24	tuna can
160-36593-A-18-A	STSB35_6-15	Fill_Geo-21, 901.1	T	46.6 g	428.3 g	381.7 g	12/06/2019 14:24	12/27/2019 14:24	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.: 160-36593-1

SDG No.:

Batch Number: 453329 Batch Start Date: 12/06/19 13:38 Batch Analyst: Slama, Kurt R

Batch Method: Fill_Geo-21 Batch End Date: 12/06/19 14:24

Lab Sample ID	Client Sample ID	Method Chain	Basis	Tuna Can LCS 00009					
MB 160-453329/1		Fill_Geo-21, 901.1							
LCS 160-453329/2		Fill_Geo-21, 901.1		# g					
160-36593-A-1-A	STSB32_0-0.5	Fill_Geo-21, 901.1	T						
160-36593-A-1-B DU	STSB32_0-0.5	Fill_Geo-21, 901.1	T						
160-36593-A-2-A	STSB32_0.5-3	Fill_Geo-21, 901.1	T						
160-36593-A-3-A	STSB32_3-6	Fill_Geo-21, 901.1	T						
160-36593-A-4-A	STSB32_6-15	Fill_Geo-21, 901.1	T						
160-36593-A-5-A	STSB34_0-0.5	Fill_Geo-21, 901.1	T						
160-36593-A-6-A	STSB34_0.5-3	Fill_Geo-21, 901.1	T						
160-36593-A-7-A	STSB34_3-6	Fill_Geo-21, 901.1	T						
160-36593-A-8-A	STSB34_6-15	Fill_Geo-21, 901.1	T						
160-36593-A-9-A	STSB34-FD_3-6	Fill_Geo-21, 901.1	T						
160-36593-A-10-A	STSB33_0-0.5	Fill_Geo-21, 901.1	T						
160-36593-A-11-A	STSB33_0.5-3	Fill_Geo-21, 901.1	T						
160-36593-A-12-A	STSB33-FD_0.5-3	Fill_Geo-21, 901.1	T						
160-36593-A-13-A	STSB33_3-6	Fill_Geo-21, 901.1	T						
160-36593-A-14-A	STSB33_6-15	Fill_Geo-21, 901.1	T						
160-36593-A-15-A	STSB35_0.5-3	Fill_Geo-21, 901.1	T						
160-36593-A-16-A	STSB35_0-0.5	Fill_Geo-21, 901.1	T						
160-36593-A-17-A	STSB35_3-6	Fill_Geo-21, 901.1	T						
160-36593-A-18-A	STSB35_6-15	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.: 160-36593-1

SDG No.:

Batch Number: 453329 Batch Start Date: 12/06/19 13:38 Batch Analyst: Slama, Kurt R

Batch Method: Fill_Geo-21 Batch End Date: 12/06/19 14:24

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.

Test America St. Louis Spectrum ID: 9_Gamma_20193881

Sample Description: 453329_Gamma_MB 160-453329~1-A
Detector: Detector # 9
Batch ID: 453329
Work Order Number: Gamma
Lot Number: MB 160-453329~1-A

Decay to Time: 12/27/2019 07:39 Live Time: 1800 sec
Acquisition Time: 12/27/2019 07:39:17 Real Time: 1801 sec
Analysis Time: 12/27/2019 08:09 Dead Time: 0.08 %
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_2019-12-07_1444.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	1.571E+00	104.8	1.647E+00	1.649E+00	5.675E+00
NA-22	0.000E+00	1.#INF	7.223E-02	7.223E-02	3.764E-01
K-40	-4.175E+00	103.7	4.329E+00	4.334E+00	8.406E+00
Sc-46	0.000E+00	1.#INF	7.691E-02	7.691E-02	5.552E-01
CR-51	1.873E+00	193.5	3.623E+00	3.625E+00	1.227E+01
MN-54	-2.699E-01	68.5	1.849E-01	1.854E-01	7.684E-01
FE-59	-2.749E-02	1868.1	5.136E-01	5.136E-01	5.919E-01
Co-56	-1.978E-01	96.4	1.907E-01	1.910E-01	7.766E-01
CO-57	1.018E-01	106.4	1.083E-01	1.084E-01	3.705E-01
CO-58	1.080E-01	159.9	1.727E-01	1.728E-01	6.281E-01
CO-60	-3.528E-02	846.3	2.985E-01	2.986E-01	7.304E-01
ZN-65	0.000E+00	1.#INF	9.073E-02	9.073E-02	1.828E+00
NB-94	-3.843E-01	40.4	1.554E-01	1.567E-01	1.066E+00
ZR-95	0.000E+00	1.#INF	6.238E-02	6.238E-02	4.597E-01
NB-95	-1.489E-01	144.1	2.145E-01	2.147E-01	7.596E-01
RU-103	9.113E-03	1811.1	1.650E-01	1.650E-01	4.491E-01
RH-106	1.191E+00	198.2	2.360E+00	2.361E+00	8.328E+00
AG-108M	1.136E-01	136.0	1.545E-01	1.546E-01	4.091E-01
AG-110M	3.597E-01	30.2	1.085E-01	1.100E-01	1.155E+00
SN-113	-2.997E-01	115.0	3.447E-01	3.451E-01	1.177E+00
SB-124	2.932E-02	688.1	2.017E-01	2.018E-01	1.293E+00
SB-125	7.064E-01	33.3	2.355E-01	2.382E-01	5.553E-01
I-131	-7.667E-02	151.5	1.162E-01	1.163E-01	5.738E-01
Gd-153	-1.649E-01	279.4	4.608E-01	4.609E-01	1.593E+00
Ga-68	-1.051E+01	117.9	1.239E+01	1.240E+01	2.826E+01
Tc-99m	0.000E+00	1.#INF	6.892E-02	6.892E-02	6.629E-01
BA-133	0.000E+00	1.#INF	1.411E-01	1.411E-01	4.546E-01
CS-134	1.802E-01	126.0	2.271E-01	2.273E-01	9.279E-01
CS-137	-1.939E-01	117.6	2.280E-01	2.282E-01	7.965E-01
CE-139	1.444E-01	121.3	1.752E-01	1.758E-01	5.963E-01
Ba-140	1.382E-01	589.5	8.146E-01	8.146E-01	2.154E+00
La-140	-5.137E-01	110.4	5.671E-01	5.678E-01	1.211E+00
CE-141	7.666E-03	4506.6	3.455E-01	3.455E-01	1.200E+00

CE-144	9.598E-01	147.4	1.415E+00	1.415E+00	4.814E+00
PM-144	1.490E-01	90.4	1.347E-01	1.349E-01	5.130E-01
EU-152	1.009E+00	31.6	3.190E-01	3.234E-01	9.811E-01
EU-154	3.319E-01	187.3	6.216E-01	6.219E-01	8.194E-01
EU-155	1.026E-01	342.8	3.519E-01	3.519E-01	2.279E+00
HF-181	2.121E-01	118.4	2.511E-01	2.513E-01	8.417E-01
Ta-182	0.000E+00	1.#INF	1.868E-01	1.868E-01	1.363E+00
Hg-203	4.741E-02	302.0	1.432E-01	1.432E-01	5.157E-01
TL-208	-1.190E-01	129.1	1.536E-01	1.537E-01	7.530E-01
PM-146	2.567E-01	45.8	1.176E-01	1.183E-01	8.026E-01
Y-88	-5.216E-03	11430.8	5.962E-01	5.962E-01	5.109E-01
Cd-113m	-1.283E+03	192.4	2.468E+03	2.469E+03	8.621E+03
Cd-109	0.000E+00	1.#INF	1.480E+00	1.480E+00	1.667E+01
Cf-251	4.790E-01	126.2	6.047E-01	6.062E-01	1.628E+00
Cf-249	3.667E-01	92.2	3.381E-01	3.386E-01	8.359E-01
Sn-126	1.341E+00	125.7	1.686E+00	1.687E+00	5.752E+00
PB-210	-6.260E+00	106.6	6.671E+00	6.682E+00	1.886E+01
PB-212	2.129E-01	218.6	4.654E-01	4.656E-01	1.594E+00
PB-214	-5.351E-02	639.2	3.421E-01	3.421E-01	1.261E+00
BI-207	4.748E-01	35.4	1.679E-01	1.695E-01	4.374E-01
BI-212	4.365E-01	911.0	3.977E+00	3.977E+00	1.421E+01
U-235	0.000E+00	1.#INF	2.464E-01	2.464E-01	5.300E+00
BI-214	-1.582E-02	4991.1	7.895E-01	7.895E-01	2.758E+00
BI-210M	-2.865E-03	10462.4	2.997E-01	2.997E-01	1.074E+00
AC-228	6.595E-02	398.8	2.630E-01	2.630E-01	2.024E+00
TH-227	1.410E+00	76.7	1.082E+00	1.086E+00	4.206E+00
TH-229	5.668E-01	224.5	1.273E+00	1.273E+00	8.062E+00
TH-234	1.271E+00	243.8	3.098E+00	3.099E+00	1.059E+01
PA-231	-5.045E+00	224.0	1.130E+01	1.131E+01	3.844E+01
PA-233	0.000E+00	1.#INF	1.985E-01	1.985E-01	3.214E+00
PA-234	1.337E+00	31.6	4.227E-01	4.282E-01	2.224E+00
PA-234M	-5.150E-01	6186.1	3.186E+01	3.186E+01	9.860E+01
AM-241	-4.927E-01	115.3	5.680E-01	5.685E-01	1.925E+00
Np-237	8.069E-01	168.2	1.357E+00	1.358E+00	4.617E+00
Ir-192	-7.725E-02	97.9	7.561E-02	7.575E-02	1.378E+00
Cs-136	0.000E+00	1.#INF	5.101E-02	5.101E-02	7.038E-01
Np-239	3.372E-01	130.3	4.394E-01	4.399E-01	1.513E+00
Nd-147	5.272E-01	101.5	5.351E-01	5.360E-01	2.490E+00
TL-210	0.000E+00	1.#INF	3.580E-02	3.580E-02	8.431E-01
Kr-85	0.000E+00	1.#INF	5.922E+00	5.922E+00	2.675E+02
Total	1.923E+01				

Analyst: Caleb Quinn

Sample description
453329_Gamma_MB 160-453329~1-A

Spectrum Filename: C:\User\SPC\Det9\9_Gamma_20193881.An1

Acquisition information
Start time: 12/27/2019 7:39:17 AM
Live time: 1800
Real time: 1801
Dead time: 0.08 %
Detector ID: 9

Detector system
Ge9 S/N09363993

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

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	12/27/2019 7:39:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	9_2019-12-07_1444.PBC 12/7/2019 2:44:35 PM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 0 cutoff: 5.00E+01 %

***** 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
64.28	9.	125.71	1.02	3.987E-02	64.28	9.700	PBC<MDA	Sn126
86.49	10.	168.18	1.04	5.008E-02	86.49	13.100	PBC<MDA	Np237
					86.54	30.700	3.442E-01	EU155
					86.94	9.040	1.166E+00	Sn126
86.54	5.	342.84	1.04	5.010E-02	86.49	13.100	PBC<MDA	Np237
					86.54	30.700	1.735E-01	EU155
					86.94	9.040	5.879E-01	Sn126
91.10	9.	175.42	1.04	5.124E-02	91.10	28.300	PBC<MDA	Nd147
92.59	7.	243.82	1.04	5.156E-02	92.59	5.584	PBC<MDA	TH234
106.13	7.	130.32	1.05	5.323E-02	106.13	22.700	PBC<MDA	Np239
121.78	8.	94.43	1.07	5.305E-02	121.78	28.580	PBC<MDA	EU152
					122.06	85.600	1.018E-01	CO57
122.06	8.	106.38	1.07	5.303E-02	121.78	28.580	PBC<MDA	EU152
					122.06	85.600	1.018E-01	CO57
123.10	2.	479.29	1.07	5.296E-02	123.10	40.790	PBC<MDA	EU154
131.29	2.	695.99	1.08	5.216E-02	131.29	18.000	PBC<MDA	PA234
133.02	8.	147.39	1.08	5.195E-02	133.02	43.300	PBC<MDA	HF181
					133.54	11.090	7.252E-01	CE144
133.54	10.	147.39	1.08	5.189E-02	133.02	43.300	PBC<MDA	HF181
					133.54	11.090	9.598E-01	CE144
136.30	3.	561.90	1.08	5.152E-02	136.30	5.850	PBC<MDA	HF181
					136.47	10.680	2.710E-01	CO57
165.85	10.	121.33	1.11	4.736E-02	165.85	79.900	PBC<MDA	CE139

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
176.60	7.	126.24	1.12	4.549E-02	176.60	17.000	PBC<MDA	Cf251
210.85	4.	224.54	1.15	4.052E-02	210.85	2.990	PBC<MDA	TH229
235.97	11.	115.25	1.18	3.760E-02	235.97	12.300	PBC<MDA	TH227
238.63	6.	218.60	1.18	3.732E-02	238.63	43.300	PBC<MDA	PB212
256.24	7.	101.37	1.20	3.558E-02	256.24	7.000	PBC<MDA	TH227
277.28	3.	209.57	1.21	3.372E-02	277.28	6.310	PBC<MDA	TL208
279.20	2.	302.03	1.22	3.356E-02	279.20	81.460	PBC<MDA	Hg203
284.30	1.	789.51	1.22	3.315E-02	284.30	6.140	PBC<MDA	I131
320.08	10.	193.45	1.25	3.056E-02	320.08	9.940	PBC<MDA	CR51
333.44	9.	141.20	1.27	2.970E-02	333.44	15.510	PBC<MDA	Cf249
338.32	1.	929.73	1.27	2.940E-02	338.32	12.010	PBC<MDA	AC228
351.93	-1.	639.20	1.28	2.860E-02	351.93	37.600	PBC<MDA	PB214
383.84	6.	105.03	1.31	2.691E-02	383.84	8.940	PBC<MDA	BA133
387.95	6.	118.59	1.31	2.671E-02	387.95	66.000	PBC<MDA	Cf249
427.88	9.	33.33	1.35	2.491E-02	427.88	29.600	6.781E-01	SB125
433.94	2.	265.73	1.35	2.466E-02	433.94	90.480	PBC<MDA	AG108M
453.88	2.	412.40	1.37	2.388E-02	453.88	65.000	PBC<MDA	PM146
463.37	5.	95.05	1.38	2.352E-02	463.37	10.470	PBC<MDA	SB125
468.06	5.	112.69	1.38	2.335E-02	468.06	51.750	PBC<MDA	Ir192
477.60	7.	104.84	1.39	2.301E-02	477.60	10.520	PBC<MDA	BE7
482.00	7.	118.37	1.40	2.286E-02	482.00	80.500	PBC<MDA	HF181
511.86	55.	19.16	2.67	2.188E-02	511.86	20.000	6.981E+00	RH106
531.00	5.	102.15	1.44	2.130E-02	531.00	13.000	PBC<MDA	Nd147
537.26	1.	589.48	1.44	2.112E-02	537.26	24.390	PBC<MDA	Ba140
600.50	3.	375.50	1.50	1.946E-02	600.50	17.860	PBC<MDA	SB125
604.71	9.	126.04	1.50	1.936E-02	604.71	97.620	PBC<MDA	CS134
614.28	5.	135.95	1.51	1.913E-02	614.28	89.850	PBC<MDA	AG108M
618.06	5.	149.01	1.51	1.904E-02	618.06	99.100	PBC<MDA	PM144
621.92	4.	198.20	1.51	1.896E-02	621.92	9.930	PBC<MDA	RH106
636.97	1.	624.50	1.53	1.862E-02	636.97	7.170	PBC<MDA	I131
657.76	10.	31.62	1.54	1.818E-02	657.76	94.640	3.229E-01	AG110M
696.54	4.	102.31	1.58	1.741E-02	696.54	99.000	PBC<MDA	PM144
727.17	1.	911.04	1.60	1.686E-02	727.17	7.550	PBC<MDA	BI212
735.72	6.	45.82	1.61	1.671E-02	735.72	22.500	PBC<MDA	PM146
747.16	2.	210.95	1.62	1.651E-02	747.16	34.000	PBC<MDA	PM146
763.94	11.	30.15	1.63	1.624E-02	763.94	22.280	1.689E+00	AG110M
778.92	10.	31.62	1.64	1.600E-02	778.92	12.940	2.684E+00	EU152
795.87	2.	308.22	1.66	1.574E-02	795.87	85.530	PBC<MDA	CS134
810.78	3.	159.86	1.67	1.551E-02	810.78	99.460	PBC<MDA	CO58
871.10	6.	40.82	1.71	1.468E-02	871.10	99.890	PBC<MDA	NB94
880.53	6.	87.27	1.72	1.456E-02	880.53	6.000	PBC<MDA	PA234
911.07	-1.	558.56	1.75	1.418E-02	911.07	29.000	PBC<MDA	AC228
946.02	10.	31.62	1.77	1.377E-02	946.02	13.400	3.010E+00	PA234
968.97	1.	504.75	1.79	1.352E-02	968.97	17.460	PBC<MDA	AC228
996.33	2.	208.49	1.81	1.323E-02	996.33	10.600	PBC<MDA	EU154
1004.77	3.	206.16	1.82	1.314E-02	1004.77	18.010	PBC<MDA	EU154
1037.84	1.	796.87	1.84	1.281E-02	1037.84	14.130	PBC<MDA	Co56
1063.66	8.	35.36	1.86	1.257E-02	1063.66	74.500	4.748E-01	BI207

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1112.07	3.	188.75	1.89	1.213E-02	1112.07	13.644	PBC<MDA	EU152
1120.29	-3.	234.24	1.90	1.206E-02	1120.29	15.100	PBC<MDA	BI214
					1120.55	99.987	PBC<MDA	Sc46
1460.83	-8.	103.69	2.13	9.749E-03	1460.83	10.670	PBC<MDA	K40
1690.98	1.	945.38	2.27	8.649E-03	1690.98	47.790	PBC<MDA	SB124

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	185.80	46.54	55.	-12.	-0.007	106.58	0.998
TH-227	200.20	50.14	84.	-13.	-0.007	104.69	1.001s
AM-241	237.77	59.54	84.	-12.	-0.006	115.29	1.010s
TH-234	252.77	63.29	96.	-5.	-0.003	299.27	1.014s
Sn-126	256.74	64.28	64.	9.	0.005	125.71	1.015s
BA-133	323.56	80.99	37.	-4.	-0.002	329.11	1.031s
Np-237	345.55	86.49	124.	10.	0.005	168.18	1.036s
EU-155	345.76	86.54	133.	5.	0.003	342.84	1.036s
Sn-126	347.35	86.94	138.	0.	0.000	1000.00	1.037s
Sn-126	349.87	87.57	138.	0.	0.000	1000.00	1.037s
Cd-109	351.75	88.04	138.	0.	0.000	1000.00	1.038s
Nd-147	363.99	91.10	116.	9.	0.005	175.42	1.041s
TH-234	369.94	92.59	125.	7.	0.004	243.82	1.042s
Gd-153	389.58	97.50	83.	-5.	-0.003	279.39	1.047s
Np-239	397.58	99.50	87.	0.	0.000	1000.00	1.049s
Gd-153	412.37	103.20	87.	0.	0.000	1000.00	1.052
Np-239	414.37	103.70	87.	0.	0.000	1000.00	1.053s
EU-155	420.82	105.31	87.	0.	0.000	1000.00	1.054s
Np-239	424.09	106.13	42.	7.	0.004	130.32	1.055s
EU-152	486.67	121.78	27.	8.	0.005	94.43	1.070s
CO-57	487.80	122.06	35.	8.	0.005	106.38	1.070s
EU-154	491.95	123.10	39.	2.	0.001	479.29	1.071s
PA-234	524.72	131.29	56.	2.	0.001	695.99	1.079s
HF-181	531.64	133.02	58.	8.	0.004	147.39	1.081s
CE-144	533.69	133.54	102.	10.	0.006	147.39	1.081s
HF-181	544.74	136.30	112.	3.	0.001	561.90	1.084s
CO-57	545.43	136.47	115.	0.	0.000	1000.00	1.084s
Tc-99m	561.57	140.51	115.	0.	0.000	1000.00	1.088s
U-235	574.67	143.79	115.	0.	0.000	1000.00	1.091s
Ba-140	650.15	162.66	66.	-13.	-0.007	123.32	1.108s
U-235	653.03	163.38	77.	-7.	-0.004	186.22	1.109s
CE-139	662.92	165.85	66.	10.	0.005	121.33	1.111s
Cf-251	705.90	176.60	18.	7.	0.004	126.24	1.122s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
U-235	742.37	185.72	40.	-10.	-0.006	119.11	1.130
U-235	820.80	205.33	36.	-4.	-0.002	281.56	1.148s
TH-229	842.87	210.85	20.	4.	0.002	224.54	1.153s
Cf-251	907.45	227.00	28.	-2.	-0.001	522.81	1.168
TH-227	943.33	235.97	72.	11.	0.006	115.25	1.176s
PB-212	953.97	238.63	88.	6.	0.003	218.60	1.179s
EU-152	978.21	244.69	68.	-17.	-0.009	98.15	1.185s
TH-227	1024.39	256.24	12.	7.	0.004	101.37	1.195
Cd-113m	1054.23	263.70	41.	-5.	-0.003	192.42	1.202s
TL-208	1108.55	277.28	16.	3.	0.002	209.57	1.215s
Hg-203	1116.22	279.20	24.	2.	0.001	302.03	1.216s
I-131	1136.61	284.30	16.	1.	0.001	789.51	1.221s
PB-214	1179.77	295.09	131.	-14.	-0.008	46.62	1.231s
TL-210	1183.41	296.00	137.	-3.	-0.001	660.68	1.231s
PA-233	1200.12	300.18	158.	-11.	-0.006	159.11	1.235s
PA-231	1210.00	302.65	169.	-8.	-0.005	224.05	1.237s
Ba-140	1218.80	304.85	177.	0.	0.000	1000.00	1.240s
BI-210M	1218.99	304.90	177.	0.	0.000	1000.00	1.240s
Ir-192	1233.16	308.44	177.	0.	0.000	1000.00	1.243s
PA-233	1247.44	312.01	177.	0.	0.000	1000.00	1.246s
Ir-192	1265.35	316.49	187.	-12.	-0.007	160.07	1.250s
CR-51	1279.73	320.08	191.	10.	0.006	193.45	1.253s
La-140	1314.43	328.76	95.	-11.	-0.006	131.96	1.261s
Cf-249	1333.15	333.44	73.	9.	0.005	141.20	1.265
AC-228	1352.66	338.32	69.	1.	0.001	929.73	1.270s
Cs-136	1361.66	340.57	66.	0.	0.000	1000.00	1.272s
EU-152	1376.53	344.29	66.	0.	0.000	1000.00	1.275s
HF-181	1382.70	345.83	66.	0.	0.000	1000.00	1.276s
PB-214	1407.11	351.93	22.	-1.	-0.001	639.20	1.282
BA-133	1423.37	356.00	6.	0.	0.000	1000.00	1.285s
I-131	1457.31	364.48	20.	-6.	-0.003	151.54	1.293s
BA-133	1534.73	383.84	20.	6.	0.004	105.03	1.310s
Cf-249	1551.17	387.95	26.	6.	0.004	118.59	1.314s
SN-113	1566.12	391.69	51.	-9.	-0.005	115.02	1.317s
SB-125	1710.86	427.88	0.	9.	0.005	33.33	1.349s
AG-108M	1735.10	433.94	9.	2.	0.001	265.73	1.354s
PM-146	1814.87	453.88	18.	2.	0.001	412.40	1.372s
SB-125	1852.82	463.37	8.	5.	0.003	95.05	1.380s
Ir-192	1871.59	468.06	12.	5.	0.003	112.69	1.384s
BE-7	1909.73	477.60	22.	7.	0.004	104.84	1.392s
HF-181	1927.34	482.00	29.	7.	0.004	118.37	1.396s
RH-106	2046.81	511.86	28.	55.	0.031	19.16	2.672s
Kr-85	2055.27	513.98	83.	0.	0.000	1000.00	1.424s
Nd-147	2123.35	531.00	4.	5.	0.003	102.15	1.438s
Ba-140	2148.39	537.26	14.	1.	0.001	589.48	1.444s
CS-134	2252.30	563.24	24.	-6.	-0.003	124.66	1.466s
CS-134	2276.64	569.32	23.	-9.	-0.005	80.18	1.471s
PA-234	2277.24	569.47	33.	0.	0.000	1000.00	1.471s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
TL-208	2331.45	583.02	19.	-6.	-0.003	150.69	1.482s
SB-125	2401.36	600.50	77.	3.	0.002	375.50	1.497s
SB-124	2410.29	602.73	80.	0.	0.000	1000.00	1.499s
CS-134	2418.21	604.71	60.	9.	0.005	126.04	1.500s
AG-108M	2456.49	614.28	23.	5.	0.003	135.95	1.508s
PM-144	2471.62	618.06	28.	5.	0.003	149.01	1.512s
RH-106	2487.04	621.92	30.	4.	0.002	198.20	1.515s
SB-125	2542.94	635.89	14.	-3.	-0.002	185.59	1.526s
I-131	2547.28	636.97	19.	1.	0.001	624.50	1.527s
AG-110M	2630.43	657.76	0.	10.	0.006	31.62	1.544s
CS-137	2646.03	661.66	17.	-5.	-0.003	117.60	1.548s
PM-144	2785.58	696.54	8.	4.	0.002	102.31	1.576s
NB-94	2809.93	702.63	41.	-12.	-0.007	40.44	1.581s
SB-124	2890.57	722.79	24.	-2.	-0.001	281.42	1.598s
AG-108M	2891.17	722.94	26.	0.	0.000	1000.00	1.598s
EU-154	2892.86	723.36	26.	0.	0.000	1000.00	1.598s
ZR-95	2896.22	724.20	32.	-8.	-0.005	100.86	1.599s
BI-212	2908.11	727.17	41.	1.	0.001	911.04	1.601s
PM-146	2942.31	735.72	0.	6.	0.003	45.82	1.608s
PM-146	2988.08	747.16	5.	2.	0.001	210.95	1.617s
ZR-95	3026.36	756.73	0.	0.	0.000	1000.00	1.625s
AG-110M	3055.23	763.94	0.	11.	0.006	30.15	1.631s
NB-95	3062.61	765.79	17.	-4.	-0.002	144.12	1.632s
PA-234M	3065.10	766.41	7.	0.	0.000	1000.00	1.633s
EU-152	3115.14	778.92	0.	10.	0.006	31.62	1.643s
BI-212	3141.15	785.42	20.	-5.	-0.003	105.74	1.648s
CS-134	3182.96	795.87	18.	2.	0.001	308.22	1.656s
TL-210	3197.88	799.60	20.	0.	0.000	1000.00	1.659s
CS-134	3207.29	801.95	29.	-8.	-0.004	101.55	1.661s
CO-58	3242.59	810.78	10.	3.	0.002	159.86	1.668s
La-140	3262.58	815.77	13.	0.	0.000	1000.00	1.672s
Cs-136	3273.50	818.50	13.	0.	0.000	1000.00	1.674s
MN-54	3338.91	834.85	15.	-7.	-0.004	68.50	1.687s
Co-56	3386.61	846.77	15.	-5.	-0.003	96.41	1.696s
TL-208	3441.80	860.56	16.	-10.	-0.006	53.74	1.707s
NB-94	3483.94	871.10	0.	6.	0.003	40.82	1.715s
EU-154	3492.47	873.23	12.	-4.	-0.002	124.27	1.717s
PA-234	3521.68	880.53	11.	6.	0.003	87.27	1.722s
AG-110M	3538.30	884.68	17.	0.	0.000	1000.00	1.725s
Sc-46	3556.69	889.28	6.	0.	0.000	1000.00	1.729s
Y-88	3591.74	898.04	20.	-12.	-0.007	86.38	1.736s
AC-228	3643.88	911.07	7.	-1.	-0.001	558.56	1.746s
AG-110M	3749.60	937.49	10.	-3.	-0.002	238.82	1.766s
PA-234	3783.72	946.02	0.	10.	0.006	31.62	1.772s
EU-152	3856.11	964.11	14.	-2.	-0.001	323.11	1.786s
AC-228	3875.56	968.97	19.	1.	0.001	504.75	1.790s
EU-154	3985.03	996.33	11.	2.	0.001	208.49	1.810s
EU-154	4018.82	1004.77	5.	3.	0.001	206.16	1.816s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Co-56	4151.13	1037.84	5.	1.	0.000	796.87	1.841s
Cs-136	4192.07	1048.07	0.	0.	0.000	1000.00	1.848s
RH-106	4201.23	1050.36	7.	-1.	0.000	456.95	1.850s
BI-207	4254.46	1063.66	0.	8.	0.004	35.36	1.860s
Ga-68	4309.44	1077.40	11.	-7.	-0.004	117.90	1.870s
EU-152	4448.20	1112.07	11.	3.	0.001	188.75	1.895s
ZN-65	4462.09	1115.55	14.	0.	0.000	1000.00	1.897s
BI-214	4481.06	1120.29	17.	-3.	-0.002	234.24	1.901s
Sc-46	4482.12	1120.55	14.	0.	0.000	1000.00	1.901s
Ta-182	4485.12	1121.30	3.	0.	0.000	1000.00	1.901s
CO-60	4692.96	1173.24	22.	-14.	-0.008	51.01	1.938s
Ta-182	4756.25	1189.05	0.	0.	0.000	1000.00	1.949s
Ta-182	4885.75	1221.41	6.	-2.	-0.001	343.80	1.972s
Co-56	4953.27	1238.28	6.	-3.	-0.002	247.23	1.984s
NA-22	5098.35	1274.53	0.	0.	0.000	1000.00	2.008s
EU-154	5098.39	1274.54	0.	0.	0.000	1000.00	2.008s
FE-59	5166.65	1291.60	11.	-5.	-0.003	154.24	2.020s
TL-210	5252.32	1313.00	0.	0.	0.000	1000.00	2.034s
CO-60	5330.37	1332.50	6.	-1.	0.000	846.32	2.047s
AG-110M	5537.69	1384.30	6.	-4.	-0.002	160.96	2.082s
EU-152	5632.56	1408.00	0.	0.	0.000	1000.00	2.097s
K-40	5844.03	1460.83	8.	-8.	-0.004	103.69	2.131s
La-140	6385.95	1596.21	12.	-8.	-0.004	110.40	2.215s
SB-124	6765.35	1690.98	6.	1.	0.000	945.38	2.272s
BI-214	7059.65	1764.49	14.	-6.	-0.003	143.31	2.314s

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	1.5710E+00				5.31E+01	
			477.60	1.571E+00	?(	5.675E+00 1.05E+02 1.05E+01	G
K-40	N	-4.1748E+00				4.66E+11	
			1460.83	-4.175E+00	?(P	8.406E+00 1.04E+02 1.07E+01	G
CR-51	F	1.8729E+00				2.77E+01	
			320.08	1.873E+00	?(P	1.227E+01 1.93E+02 9.94E+00	G
MN-54	C	-2.6987E-01				3.12E+02	
			834.85	-2.699E-01	?(P	7.684E-01 6.85E+01 1.00E+02	G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
FE-59	F	-2.7494E-02					4.45E+01	
			1099.25	-2.749E-02	%(P	5.919E-01	1.87E+03	5.65E+01 G
			1291.60	-6.370E-01	+	2.197E+00	1.54E+02	4.32E+01 G
Co-56	C	-1.9784E-01					7.73E+01	
			846.77	-1.978E-01	?(P	7.766E-01	9.64E+01	9.99E+01 G
			1238.28	-2.140E-01	+ P	1.054E+00	2.47E+02	6.61E+01 G
			1037.84	2.046E-01	+	4.135E+00	7.97E+02	1.41E+01 G
			1771.35	2.156E-01	%	8.459E+00	1.04E+03	1.55E+01 A
CO-57	C	1.0179E-01					2.72E+02	
			122.06	1.018E-01	?(	3.705E-01	1.06E+02	8.56E+01 G
			136.47	0.000E+00	-	5.322E+00	1.00E+03	1.07E+01 G
CO-58	C	1.0801E-01					7.09E+01	
			810.78	1.080E-01	?(	6.281E-01	1.60E+02	9.95E+01 G
CO-60	F	-3.5276E-02					1.93E+03	
			1332.50	-3.528E-02	?(	7.304E-01	8.46E+02	1.00E+02 G
			1173.24	-6.536E-01	+ P	1.167E+00	5.10E+01	9.99E+01 G
NB-94	I	-3.8426E-01					7.41E+06	
			702.63	-3.843E-01	?(P	1.066E+00	4.04E+01	9.79E+01 G
			871.10	2.273E-01	+	2.792E-01	4.08E+01	9.99E+01 G
NB-95	I	-1.4886E-01					6.40E+01	
			765.79	-1.489E-01	?(	7.596E-01	1.44E+02	9.98E+01 G
RU-103	I	9.1126E-03					3.93E+01	
			497.05	9.113E-03	%(	4.491E-01	1.81E+03	9.09E+01 G
			610.30	2.869E-01	%	2.210E+01	2.20E+03	5.75E+00 GA
RH-106	I	1.1910E+00					3.74E+02	
			621.92	1.191E+00	?(	8.328E+00	1.98E+02	9.93E+00 G
			1050.36	-2.339E+00	+	4.179E+01	4.57E+02	1.56E+00 G
			511.86	6.981E+00	?	3.474E+00	1.92E+01	2.00E+01 GA
AG-108M	C	1.1360E-01					1.53E+05	
			433.94	5.810E-02	?(	4.091E-01	2.66E+02	9.05E+01 G
			722.94	0.000E+00	-	9.562E-01	1.00E+03	9.08E+01 G
			614.28	1.695E-01	&(	8.067E-01	1.36E+02	8.98E+01 G
AG-110M	F	3.5970E-01					2.50E+02	
			884.68	0.000E+00	?(	1.155E+00	1.00E+03	7.27E+01 G
			657.76	3.229E-01	?(	2.380E-01	3.16E+01	9.46E+01 G
			937.49	-3.497E-01	+	2.034E+00	2.39E+02	3.44E+01 G
			1384.30	-8.235E-01	+	3.100E+00	1.61E+02	2.43E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
			763.94	1.689E+00	?(	1.132E+00	3.02E+01	2.23E+01 G
SN-113	F	-2.9969E-01					1.15E+02	
			391.69	-2.997E-01	?(	1.177E+00	1.15E+02	6.40E+01 G
SB-124	F	2.9321E-02					6.02E+01	
			602.73	0.000E+00	?(	1.293E+00	1.00E+03	9.83E+01 G
			1690.98	8.961E-02	?(	1.941E+00	9.45E+02	4.78E+01 G
			722.79	-7.588E-01	+	7.679E+00	2.81E+02	1.08E+01 G
SB-125	I	7.0641E-01					1.01E+03	
			427.88	6.781E-01	?(	5.553E-01	3.33E+01	2.96E+01 G
			600.50	5.329E-01	?(	6.956E+00	3.76E+02	1.79E+01 G
			635.89	-7.904E-01	-	5.308E+00	1.86E+02	1.13E+01 G
			463.37	1.082E+00	&(	3.585E+00	9.51E+01	1.05E+01 G
I-131	I	-7.6672E-02					8.02E+00	
			364.48	-1.462E-01	?(	5.738E-01	1.52E+02	8.17E+01 G
			284.30	2.729E-01	?(	5.827E+00	7.90E+02	6.14E+00 G
			636.97	4.161E-01	?(	9.580E+00	6.24E+02	7.17E+00 G
Gd-153	F	-1.6492E-01					2.42E+02	
			97.50	-1.649E-01	&(	1.593E+00	2.79E+02	3.00E+01 G
			103.20	0.000E+00	+	2.223E+00	1.00E+03	2.18E+01 G
Ga-68	C	-1.0509E+01					4.71E-02	
			1077.40	-1.051E+01	?(	2.826E+01	1.18E+02	3.30E+00 G
CS-134	I	1.8016E-01					7.54E+02	
			795.87	8.255E-02	?(	9.279E-01	3.08E+02	8.55E+01 G
			604.71	2.657E-01	?(	1.144E+00	1.26E+02	9.76E+01 G
			569.32	-1.666E+00	+	4.501E+00	8.02E+01	1.54E+01 G
			801.95	-3.269E+00	&	1.136E+01	1.02E+02	8.69E+00 G
			563.24	-2.009E+00	+ P	8.354E+00	1.25E+02	8.35E+00 G
CS-137	I	-1.9386E-01					1.10E+04	
			661.66	-1.939E-01	?(	7.965E-01	1.18E+02	8.52E+01 G
CE-139	F	1.4442E-01					1.38E+02	
			165.85	1.444E-01	(P	5.963E-01	1.21E+02	7.99E+01 G
Ba-140	I	1.3818E-01					1.28E+01	
			537.26	1.382E-01	?(P	2.154E+00	5.89E+02	2.44E+01 G
			162.66	-2.502E+00	+ P	7.724E+00	1.23E+02	6.22E+00 G
			304.85	0.000E+00	-	2.654E+01	1.00E+03	4.29E+00 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
La-140	I	-5.1373E-01					1.28E+01	
			1596.21	-5.137E-01	?(	1.211E+00	1.10E+02	9.54E+01 G
			487.02	-4.110E-02	% P	1.624E+00	1.14E+03	4.55E+01 G
			328.76	-9.797E-01	+	4.392E+00	1.32E+02	2.03E+01 G
			815.77	0.000E+00	+	3.015E+00	1.00E+03	2.33E+01 G
CE-141	I	7.6664E-03					3.25E+01	
			145.44	7.666E-03	%(	1.200E+00	4.51E+03	4.82E+01 G
CE-144	I	9.5976E-01					2.85E+02	
			133.54	9.598E-01	?(	4.814E+00	1.47E+02	1.11E+01 G
PM-144	C	1.4900E-01					3.63E+02	
			696.54	1.433E-01	(P	5.130E-01	1.02E+02	9.90E+01 G
			618.06	1.547E-01	?(	8.062E-01	1.49E+02	9.91E+01 G
EU-152	F	1.0088E+00					4.94E+03	
			121.78	3.047E-01	?(	9.811E-01	9.44E+01	2.86E+01 G
			344.29	0.000E+00	-	2.928E+00	1.00E+03	2.65E+01 G
			1112.07	8.950E-01	?(	6.175E+00	1.89E+02	1.36E+01 G
			778.92	2.684E+00	(	1.978E+00	3.16E+01	1.29E+01 G
			964.11	-4.672E-01	-	5.588E+00	3.23E+02	1.46E+01 G
			244.69	-3.391E+00	+	8.216E+00	9.82E+01	7.58E+00 G
			1408.00	0.000E+00	-	1.941E+00	1.00E+03	2.10E+01 GA
EU-154	I	3.3191E-01					3.14E+03	
			123.10	4.804E-02	?(	8.194E-01	4.79E+02	4.08E+01 G
			1274.54	0.000E+00	-	1.069E+00	1.00E+03	3.52E+01 G
			723.36	0.000E+00	-	4.298E+00	1.00E+03	2.02E+01 G
			873.23	-1.339E+00	+	5.894E+00	1.24E+02	1.23E+01 G
			1004.77	6.260E-01	?(	3.163E+00	2.06E+02	1.80E+01 G
			996.33	9.246E-01	?(	7.104E+00	2.08E+02	1.06E+01 G
EU-155	I	1.0263E-01					1.81E+03	
			105.31	0.000E+00	?(	2.279E+00	1.00E+03	2.12E+01 G
			86.54	1.735E-01	?(	2.041E+00	3.43E+02	3.07E+01 G
HF-181	F	2.1211E-01					4.24E+01	
			482.00	2.059E-01	?(	8.417E-01	1.18E+02	8.05E+01 G
			133.02	1.855E-01	?(	9.398E-01	1.47E+02	4.33E+01 G
			345.83	0.000E+00	-	5.165E+00	1.00E+03	1.51E+01 G
			136.30	4.946E-01	?(	9.603E+00	5.62E+02	5.85E+00 G
Hg-203	F	4.7412E-02					4.66E+01	
			279.20	4.741E-02	?(	5.157E-01	3.02E+02	8.15E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	N	-1.1898E-01				6.98E+02		
			583.02	-1.832E-01	?(P	7.530E-01	1.51E+02	8.45E+01 G
			277.28	7.411E-01	?(P	5.599E+00	2.10E+02	6.31E+00 G
			860.56	-3.017E+00	+ P	6.443E+00	5.37E+01	1.24E+01 G
PM-146	C	2.5665E-01				2.02E+03		
			453.88	7.550E-02	?(P	8.026E-01	4.12E+02	6.50E+01 G
			747.16	2.273E-01	?(P	1.268E+00	2.11E+02	3.40E+01 G
			735.72	8.244E-01	?(P	1.089E+00	4.58E+01	2.25E+01 G
Y-88	F	-5.2159E-03				1.07E+02		
			1836.06	-5.216E-03	%(P	5.109E-01	1.14E+04	9.92E+01 G
			898.04	-4.991E-01	+	9.737E-01	8.64E+01	9.37E+01 G
Cd-113m		-1.2826E+03				5.33E+03		
			263.70	-1.283E+03	&(	8.621E+03	1.92E+02	6.00E-03 K
Cf-251	T	4.7896E-01				3.28E+05		
			176.60	4.790E-01	&(	1.628E+00	1.26E+02	1.70E+01 G
			227.00	-4.571E-01	+	6.255E+00	5.23E+02	6.30E+00 GA
Cf-249	T	3.6670E-01				1.28E+05		
			387.95	2.036E-01	(	8.359E-01	1.19E+02	6.60E+01 G
			333.44	1.061E+00	?(	5.120E+00	1.41E+02	1.55E+01 G
Sn-126		1.3409E+00				3.65E+07		
			87.57	0.000E+00	-	1.689E+00	1.00E+03	3.75E+01 GA
			64.28	1.341E+00	?(	5.752E+00	1.26E+02	9.70E+00 G
			86.94	0.000E+00	-	7.032E+00	1.00E+03	9.04E+00 GA
PB-210	N	-6.2598E+00				8.14E+03		
			46.54	-6.260E+00	?(P	1.886E+01	1.07E+02	4.25E+00 G
PB-212	N	2.1291E-01				6.98E+02		
			238.63	2.129E-01	(P	1.594E+00	2.19E+02	4.33E+01 G
			300.03	-5.056E-07	&	3.067E+01	1.75E+09	3.28E+00 GA
PB-214	N	-5.3515E-02				5.84E+05		
			351.93	-5.351E-02	&(P	1.261E+00	6.39E+02	3.76E+01 G
			295.09	-1.276E+00	+ P	4.989E+00	4.66E+01	1.93E+01 G
			242.00	8.872E-04	%	9.685E+00	3.13E+05	7.43E+00 GA
BI-207	C	4.7477E-01				1.18E+04		
			1063.66	4.748E-01	?(	4.374E-01	3.54E+01	7.45E+01 G
			569.70	4.683E-03	%	8.340E-01	4.92E+03	9.77E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
BI-212	N	4.3655E-01					6.98E+02	
			727.17	4.365E-01	?(	1.421E+01	9.11E+02	7.55E+00 G
			785.42	-1.275E+01	+ P	6.383E+01	1.06E+02	1.28E+00 GA
BI-214	N	-1.5818E-02					5.84E+05	
			609.31	-1.582E-02	%(P	2.758E+00	4.99E+03	4.61E+01 G
			1120.29	-8.999E-01	+ P	6.679E+00	2.34E+02	1.51E+01 G
			1764.49	-2.589E+00	+ P	8.701E+00	1.43E+02	1.54E+01 G
BI-210M	T	-2.8648E-03					1.10E+09	
			265.83	-2.865E-03	%(P	1.074E+00	1.05E+04	5.00E+01 G
			304.90	0.000E+00	+	4.067E+00	1.00E+03	2.80E+01 G
AC-228	N	6.5948E-02					2.10E+03	
			911.07	-1.266E-01	?(P	2.024E+00	5.59E+02	2.90E+01 G
			968.97	2.933E-01	?(P	5.430E+00	5.05E+02	1.75E+01 G
			338.32	2.004E-01	?(P	6.499E+00	9.30E+02	1.20E+01 G
			93.35	-1.520E-01	% P	1.090E+01	2.05E+03	5.56E+00 XA
TH-227	N	1.4105E+00					7.95E+03	
			256.24	1.605E+00	?(	4.206E+00	1.01E+02	7.00E+00 G
			235.97	1.300E+00	?(	5.086E+00	1.15E+02	1.23E+01 G
			50.14	-3.023E+00	+ P	1.085E+01	1.05E+02	8.00E+00 G
TH-229	N	5.6677E-01					2.68E+06	
			193.51	-2.946E-01	%(	8.062E+00	1.04E+03	4.40E+00 G
			210.85	1.834E+00	&(	1.080E+01	2.25E+02	2.99E+00 G
TH-234	N	1.2706E+00					1.63E+12	
			92.59	1.271E+00	?(P	1.059E+01	2.44E+02	5.58E+00 G
			63.29	-1.742E+00	+	1.798E+01	2.99E+02	3.81E+00 G
PA-231	N	-5.0451E+00					1.20E+07	
			302.65	-5.045E+00	?(	3.844E+01	2.24E+02	2.88E+00 G
			300.07	6.741E-07	&	4.089E+01	1.75E+09	2.46E+00 G
PA-234	N	1.3366E+00					1.63E+12	
			131.29	9.058E-02	?(	2.224E+00	6.96E+02	1.80E+01 G
			946.02	3.010E+00	?(	2.219E+00	3.16E+01	1.34E+01 G
			569.47	0.000E+00	&	9.824E+00	1.00E+03	8.20E+00 G
			883.24	1.370E-01	%	8.656E+00	1.69E+03	9.60E+00 G
			880.53	3.809E+00	?	1.140E+01	8.73E+01	6.00E+00 GA
PA-234M	N	-5.1496E-01					1.63E+12	
			1001.00	-5.150E-01	%(P	9.860E+01	6.19E+03	8.37E-01 G
			766.41	0.000E+00	+	1.720E+02	1.00E+03	2.94E-01 G

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

AM-241   T  -4.9266E-01                                      1.58E+05
                          59.54-4.927E-01 &(  1.925E+00 1.15E+02 3.59E+01 G

Np-237   F   8.0694E-01                                      2.14E+06
                          86.49 8.069E-01 ?(  4.617E+00 1.68E+02 1.31E+01 G

Ir-192   F  -7.7247E-02                                      7.40E+01
                         316.49-2.547E-01 ?(  1.378E+00 1.60E+02 8.70E+01 G
                         468.06 2.212E-01 ?(  8.759E-01 1.13E+02 5.18E+01 G
                         308.44 0.000E+00 +   3.615E+00 1.00E+03 3.18E+01 G

Np-239   T   3.3720E-01                                      2.36E+00
                         103.70 0.000E+00 -   2.018E+00 1.00E+03 2.40E+01 X
                         106.13 3.372E-01 &(  1.513E+00 1.30E+02 2.27E+01 G
                          99.50 0.000E+00 -   3.254E+00 1.00E+03 1.50E+01 X

Nd-147       5.2723E-01                                      1.11E+01
                         531.00 9.361E-01 ?(  2.490E+00 1.02E+02 1.30E+01 G
                          91.10 3.394E-01 ?(  2.029E+00 1.75E+02 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.
   @ - 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

- -

********** 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	55.	-12.	-0.007	106.58	-6.260E+00	P
TH-227	50.14	84.	-13.	-0.007	104.69	-3.023E+00	P
AM-241	59.54	84.	-12.	-0.006	115.29	-4.927E-01	
TH-234	63.29	96.	-5.	-0.003	299.27	-1.742E+00	
Sn-126	64.28	64.	9.	0.005	125.71	1.341E+00	
BA-133	80.99	37.	-4.	-0.002	329.11	-1.361E-01	P
Np-237	86.49	124.	10.	0.005	168.18	8.069E-01	
EU-155	86.54	133.	5.	0.003	342.84	1.735E-01	
Nd-147	91.10	116.	9.	0.005	175.42	3.394E-01	
TH-234	92.59	125.	7.	0.004	243.82	1.271E+00	P
Gd-153	97.50	83.	-5.	-0.003	279.39	-1.649E-01	
Np-239	106.13	42.	7.	0.004	130.32	3.372E-01	
CO-57	122.06	35.	8.	0.005	106.38	1.018E-01	
EU-154	123.10	39.	2.	0.001	479.29	4.804E-02	
PA-234	131.29	56.	2.	0.001	695.99	9.058E-02	
HF-181	133.02	58.	8.	0.004	147.39	1.855E-01	
CE-144	133.54	102.	10.	0.006	147.39	9.598E-01	
HF-181	136.30	112.	3.	0.001	561.90	4.946E-01	
Ba-140	162.66	66.	-13.	-0.007	123.32	-2.502E+00	P
U-235	163.38	77.	-7.	-0.004	186.22	-1.595E+00	
CE-139	165.85	66.	10.	0.005	121.33	1.444E-01	P
Cf-251	176.60	18.	7.	0.004	126.24	4.790E-01	
U-235	185.72	40.	-10.	-0.006	119.11	-2.415E-01	
U-235	205.33	36.	-4.	-0.002	281.56	-1.144E+00	P
TH-229	210.85	20.	4.	0.002	224.54	1.834E+00	
Cf-251	227.00	28.	-2.	-0.001	522.81	-4.571E-01	
TH-227	235.97	72.	11.	0.006	115.25	1.300E+00	
PB-212	238.63	88.	6.	0.003	218.60	2.129E-01	P
TH-227	256.24	12.	7.	0.004	101.37	1.605E+00	
Cd-113m	263.70	41.	-5.	-0.003	192.42	-1.283E+03	
TL-208	277.28	16.	3.	0.002	209.57	7.411E-01	P
Hg-203	279.20	24.	2.	0.001	302.03	4.741E-02	
I-131	284.30	16.	1.	0.001	789.51	2.729E-01	
PB-214	295.09	131.	-14.	-0.008	46.62	-1.276E+00	P
TL-210	296.00	137.	-3.	-0.001	660.68	-5.498E-02	
PA-233	300.18	158.	-11.	-0.006	159.11	-3.187E+00	
PA-231	302.65	169.	-8.	-0.005	224.05	-5.045E+00	
Ir-192	316.49	187.	-12.	-0.007	160.07	-2.547E-01	
CR-51	320.08	191.	10.	0.006	193.45	1.873E+00	P
La-140	328.76	95.	-11.	-0.006	131.96	-9.797E-01	
Cf-249	333.44	73.	9.	0.005	141.20	1.061E+00	
AC-228	338.32	69.	1.	0.001	929.73	2.004E-01	P
PB-214	351.93	22.	-1.	-0.001	639.20	-5.351E-02	P

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
I-131	364.48	20.	-6.	-0.003	151.54	-1.462E-01	
BA-133	383.84	20.	6.	0.004	105.03	1.488E+00	
Cf-249	387.95	26.	6.	0.004	118.59	2.036E-01	
SN-113	391.69	51.	-9.	-0.005	115.02	-2.997E-01	
AG-108M	433.94	9.	2.	0.001	265.73	5.810E-02	
PM-146	453.88	18.	2.	0.001	412.40	7.550E-02	P
Ir-192	468.06	12.	5.	0.003	112.69	2.212E-01	
BE-7	477.60	22.	7.	0.004	104.84	1.571E+00	
HF-181	482.00	29.	7.	0.004	118.37	2.059E-01	
RH-106	511.86	28.	55.	0.031	19.16	6.981E+00	
Nd-147	531.00	4.	5.	0.003	102.15	9.361E-01	
Ba-140	537.26	14.	1.	0.001	589.48	1.382E-01	P
CS-134	563.24	24.	-6.	-0.003	124.66	-2.009E+00	P
CS-134	569.32	23.	-9.	-0.005	80.18	-1.666E+00	
TL-208	583.02	19.	-6.	-0.003	150.69	-1.832E-01	P
CS-134	604.71	60.	9.	0.005	126.04	2.657E-01	
AG-108M	614.28	23.	5.	0.003	135.95	1.695E-01	
PM-144	618.06	28.	5.	0.003	149.01	1.547E-01	
RH-106	621.92	30.	4.	0.002	198.20	1.191E+00	
I-131	636.97	19.	1.	0.001	624.50	4.161E-01	
AG-110M	657.76	0.	10.	0.006	31.62	3.229E-01	
CS-137	661.66	17.	-5.	-0.003	117.60	-1.939E-01	
PM-144	696.54	8.	4.	0.002	102.31	1.433E-01	P
NB-94	702.63	41.	-12.	-0.007	40.44	-3.843E-01	P
SB-124	722.79	24.	-2.	-0.001	281.42	-7.588E-01	
ZR-95	724.20	32.	-8.	-0.005	100.86	-6.326E-01	
BI-212	727.17	41.	1.	0.001	911.04	4.365E-01	
PM-146	735.72	0.	6.	0.003	45.82	8.244E-01	P
PM-146	747.16	5.	2.	0.001	210.95	2.273E-01	P
AG-110M	763.94	0.	11.	0.006	30.15	1.689E+00	
NB-95	765.79	17.	-4.	-0.002	144.12	-1.489E-01	
BI-212	785.42	20.	-5.	-0.003	105.74	-1.275E+01	P
CS-134	795.87	18.	2.	0.001	308.22	8.255E-02	
CS-134	801.95	29.	-8.	-0.004	101.55	-3.269E+00	
CO-58	810.78	10.	3.	0.002	159.86	1.080E-01	
MN-54	834.85	15.	-7.	-0.004	68.50	-2.699E-01	P
Co-56	846.77	15.	-5.	-0.003	96.41	-1.978E-01	P
TL-208	860.56	16.	-10.	-0.006	53.74	-3.017E+00	P
NB-94	871.10	0.	6.	0.003	40.82	2.273E-01	
EU-154	873.23	12.	-4.	-0.002	124.27	-1.339E+00	
PA-234	880.53	11.	6.	0.003	87.27	3.809E+00	
Y-88	898.04	20.	-12.	-0.007	86.38	-4.991E-01	
AC-228	911.07	7.	-1.	-0.001	558.56	-1.266E-01	P
AG-110M	937.49	10.	-3.	-0.002	238.82	-3.497E-01	
PA-234	946.02	0.	10.	0.006	31.62	3.010E+00	
AC-228	968.97	19.	1.	0.001	504.75	2.933E-01	P
EU-154	996.33	11.	2.	0.001	208.49	9.246E-01	
EU-154	1004.77	5.	3.	0.001	206.16	6.260E-01	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
Co-56	1037.84	5.	1.	0.000	796.87	2.046E-01		
RH-106	1050.36	7.	-1.	0.000	456.95	-2.339E+00		
Ga-68	1077.40	11.	-7.	-0.004	117.90	-1.051E+01		
BI-214	1120.29	17.	-3.	-0.002	234.24	-8.999E-01		P
CO-60	1173.24	22.	-14.	-0.008	51.01	-6.536E-01		P
Ta-182	1221.41	6.	-2.	-0.001	343.80	-3.045E-01		
Co-56	1238.28	6.	-3.	-0.002	247.23	-2.140E-01		P
FE-59	1291.60	11.	-5.	-0.003	154.24	-6.370E-01		
CO-60	1332.50	6.	-1.	0.000	846.32	-3.528E-02		
AG-110M	1384.30	6.	-4.	-0.002	160.96	-8.235E-01		
K-40	1460.83	8.	-8.	-0.004	103.69	-4.175E+00		P
La-140	1596.21	12.	-8.	-0.004	110.40	-5.137E-01		
SB-124	1690.98	6.	1.	0.000	945.38	8.961E-02		
BI-214	1764.49	14.	-6.	-0.003	143.31	-2.589E+00		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	1.5710E+00	1.5710E+00	1.048E+02%	5.68E+00
NA-22	#A	0.0000E+00	0.0000E+00	1.000E+03%	3.76E-01
K-40	#A	-4.1748E+00	-4.1748E+00	1.037E+02%	8.41E+00
Sc-46	#A	0.0000E+00	0.0000E+00	7.071E+02%	5.55E-01
CR-51	#A	1.8729E+00	1.8729E+00	1.935E+02%	1.23E+01
MN-54	#A	-2.6987E-01	-2.6987E-01	6.850E+01%	7.68E-01
FE-59	#A	-2.7494E-02	-2.7494E-02	1.868E+03%	5.92E-01
Co-56	#A	-1.9784E-01	-1.9784E-01	9.641E+01%	7.77E-01
CO-57	#A	1.0179E-01	1.0179E-01	1.064E+02%	3.70E-01
CO-58	#A	1.0801E-01	1.0801E-01	1.599E+02%	6.28E-01
CO-60	#A	-3.5276E-02	-3.5276E-02	8.463E+02%	7.30E-01
ZN-65	#A	0.0000E+00	0.0000E+00	1.000E+03%	1.83E+00
NB-94	#A	-3.8426E-01	-3.8426E-01	4.044E+01%	1.07E+00
ZR-95	#A	0.0000E+00	0.0000E+00	1.000E+03%	4.60E-01
NB-95	#A	-1.4886E-01	-1.4886E-01	1.441E+02%	7.60E-01
RU-103	#A	9.1125E-03	9.1126E-03	1.811E+03%	4.49E-01
RH-106	#A	1.1910E+00	1.1910E+00	1.982E+02%	8.33E+00
AG-108M	#A	1.1360E-01	1.1360E-01	1.360E+02%	4.09E-01
AG-110M	#A	3.5970E-01	3.5970E-01	3.015E+01%	1.16E+00
SN-113	#A	-2.9969E-01	-2.9969E-01	1.150E+02%	1.18E+00
SB-124	#A	2.9321E-02	2.9321E-02	6.881E+02%	1.29E+00
SB-125	#	7.0641E-01	7.0641E-01	3.333E+01%	5.55E-01
I-131	#A	-7.6671E-02	-7.6672E-02	1.515E+02%	5.74E-01
Gd-153	#A	-1.6492E-01	-1.6492E-01	2.794E+02%	1.59E+00
Ga-68	#A	-1.0478E+01	-1.0509E+01	1.179E+02%	2.83E+01
Tc-99m	#A	0.0000E+00	0.0000E+00	1.000E+03%	6.63E-01

BA-133	#A	0.0000E+00	0.0000E+00	1.000E+03%	4.55E-01
CS-134	#A	1.8016E-01	1.8016E-01	1.260E+02%	9.28E-01
CS-137	#A	-1.9386E-01	-1.9386E-01	1.176E+02%	7.97E-01
CE-139	#A	1.4442E-01	1.4442E-01	1.213E+02%	5.96E-01
Ba-140	#A	1.3818E-01	1.3818E-01	5.895E+02%	2.15E+00
La-140	#A	-5.1372E-01	-5.1373E-01	1.104E+02%	1.21E+00
CE-141	#A	7.6664E-03	7.6664E-03	4.507E+03%	1.20E+00
CE-144	#A	9.5976E-01	9.5976E-01	1.474E+02%	4.81E+00
PM-144	#A	1.4900E-01	1.4900E-01	9.038E+01%	5.13E-01
EU-152	#C	1.0088E+00	1.0088E+00	3.162E+01%	9.81E-01
EU-154	#A	3.3191E-01	3.3191E-01	1.873E+02%	8.19E-01
EU-155	#A	1.0263E-01	1.0263E-01	3.428E+02%	2.28E+00
HF-181	#A	2.1211E-01	2.1211E-01	1.184E+02%	8.42E-01
Ta-182	#A	0.0000E+00	0.0000E+00	7.071E+02%	1.36E+00
Hg-203	#A	4.7412E-02	4.7412E-02	3.020E+02%	5.16E-01
TL-208	#A	-1.1898E-01	-1.1898E-01	1.291E+02%	7.53E-01
PM-146	#A	2.5665E-01	2.5665E-01	4.582E+01%	8.03E-01
Y-88	#A	-5.2159E-03	-5.2159E-03	1.143E+04%	5.11E-01
Cd-113m	#A	-1.2826E+03	-1.2826E+03	1.924E+02%	8.62E+03
Cd-109	#A	0.0000E+00	0.0000E+00	1.000E+03%	1.67E+01
Cf-251	#A	4.7896E-01	4.7896E-01	1.262E+02%	1.63E+00
Cf-249	#A	3.6670E-01	3.6670E-01	9.220E+01%	8.36E-01
Sn-126	#A	1.3409E+00	1.3409E+00	1.257E+02%	5.75E+00
PB-210	#A	-6.2598E+00	-6.2598E+00	1.066E+02%	1.89E+01
PB-212	#A	2.1291E-01	2.1291E-01	2.186E+02%	1.59E+00
PB-214	#A	-5.3515E-02	-5.3515E-02	6.392E+02%	1.26E+00
BI-207	#	4.7477E-01	4.7477E-01	3.536E+01%	4.37E-01
BI-212	#A	4.3655E-01	4.3655E-01	9.110E+02%	1.42E+01
U-235	#A	0.0000E+00	0.0000E+00	1.000E+03%	5.30E+00
BI-214	#A	-1.5818E-02	-1.5818E-02	4.991E+03%	2.76E+00
BI-210M	#A	-2.8648E-03	-2.8648E-03	1.046E+04%	1.07E+00
AC-228	#A	6.5948E-02	6.5948E-02	3.988E+02%	2.02E+00
TH-227	#A	1.4105E+00	1.4105E+00	7.674E+01%	4.21E+00
TH-229	#A	5.6677E-01	5.6677E-01	2.245E+02%	8.06E+00
TH-234	#A	1.2706E+00	1.2706E+00	2.438E+02%	1.06E+01
PA-231	#A	-5.0451E+00	-5.0451E+00	2.240E+02%	3.84E+01
PA-233	#A	0.0000E+00	0.0000E+00	1.000E+03%	3.21E+00
PA-234	#A	1.3366E+00	1.3366E+00	3.162E+01%	2.22E+00
PA-234M	#A	-5.1496E-01	-5.1496E-01	6.186E+03%	9.86E+01
AM-241	#A	-4.9266E-01	-4.9266E-01	1.153E+02%	1.92E+00
Np-237	#A	8.0694E-01	8.0694E-01	1.682E+02%	4.62E+00
Ir-192	#A	-7.7246E-02	-7.7247E-02	9.788E+01%	1.38E+00
Cs-136	#A	0.0000E+00	0.0000E+00	5.774E+02%	7.04E-01
Np-239	#A	3.3718E-01	3.3720E-01	1.303E+02%	1.51E+00
Nd-147	#A	5.2723E-01	5.2723E-01	1.015E+02%	2.49E+00
TL-210	#A	0.0000E+00	0.0000E+00	1.000E+03%	8.43E-01
Kr-85	#A	0.0000E+00	0.0000E+00	1.000E+03%	2.67E+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 (   25.1 to  1999.3 keV)     0.000E+00  Bq/Sample
Total Decayed Activity (   25.1 to  1999.3 keV) 0.0000000E+00  Bq/Sample
```
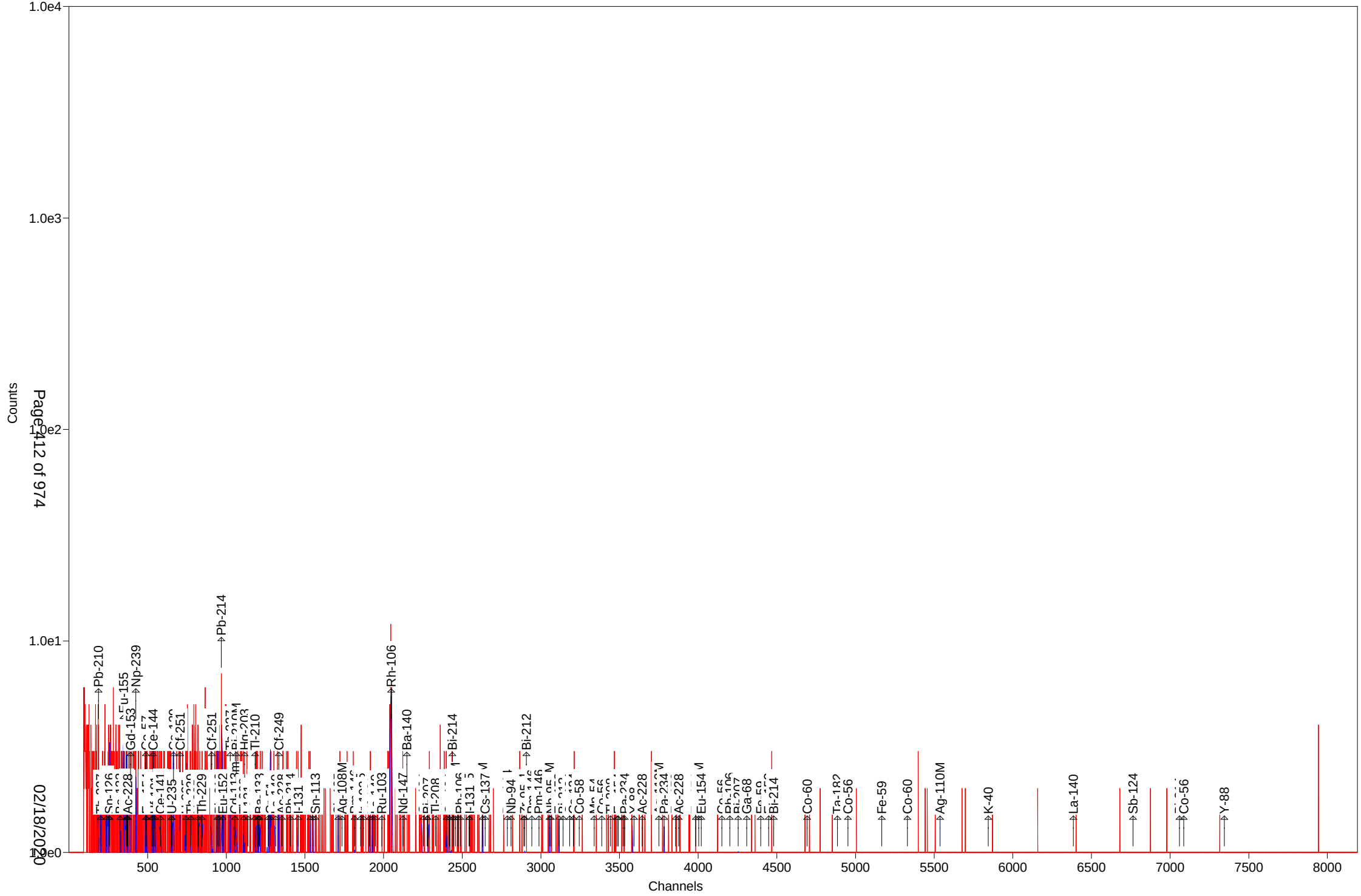

(Page 20 of 20)

453329_Gamma_MB 160-453329~1-A. 9_Gamma_20193881.spc.



Test America St. Louis Spectrum ID: 12_Gamma_20193734

Sample Description: 453329_Gamma_LCS 160-453329~2-A
Detector: Detector #12
Batch ID: 453329
Work Order Number: Gamma
Lot Number: LCS 160-453329~2-A

Decay to Time: 12/27/2019 07:38 Live Time: 1800 sec
Acquisition Time: 12/27/2019 07:38:44 Real Time: 1806 sec
Analysis Time: 12/27/2019 08:09 Dead Time: 0.35 %
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_2019-12-07_1443.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	-1.664E+01	103.2	1.716E+01	1.718E+01	5.691E+01
NA-22	6.088E-01	64.6	3.932E-01	3.944E-01	1.292E+00
K-40	1.245E+01	24.3	3.018E+00	3.083E+00	5.395E+00
Sc-46	-1.970E+00	77.7	1.530E+00	1.533E+00	5.072E+00
CR-51	-7.935E+00	226.1	1.794E+01	1.794E+01	5.961E+01
MN-54	1.291E+00	84.0	1.085E+00	1.087E+00	2.454E+00
FE-59	6.991E-01	242.1	1.692E+00	1.693E+00	6.039E+00
Co-56	6.636E-01	85.3	5.663E-01	5.673E-01	3.251E+00
CO-57	8.337E-01	101.2	8.437E-01	8.448E-01	2.799E+00
CO-58	1.402E+00	81.6	1.144E+00	1.146E+00	3.803E+00
CO-60	1.503E+02	1.6	2.463E+00	7.880E+00	2.031E+00
ZN-65	0.000E+00	1.#INF	1.801E+00	1.801E+00	9.931E+00
NB-94	-9.425E-01	129.4	1.220E+00	1.221E+00	2.765E+00
ZR-95	-1.583E+00	141.4	2.238E+00	2.240E+00	5.086E+00
NB-95	-2.954E-01	286.8	8.470E-01	8.472E-01	2.894E+00
RU-103	-2.708E-01	508.0	1.375E+00	1.375E+00	3.369E+00
RH-106	1.122E+01	92.0	1.032E+01	1.034E+01	2.710E+01
AG-108M	7.372E-01	82.2	6.063E-01	6.074E-01	3.412E+00
AG-110M	1.932E+00	66.6	1.286E+00	1.290E+00	5.645E+00
SN-113	-1.069E+00	207.4	2.218E+00	2.218E+00	7.396E+00
SB-124	1.047E+00	77.2	8.080E-01	8.097E-01	5.742E+00
SB-125	1.317E-01	681.3	8.974E-01	8.975E-01	1.070E+01
I-131	3.739E-01	366.0	1.368E+00	1.369E+00	3.338E+00
Gd-153	-2.603E+00	143.2	3.726E+00	3.730E+00	1.236E+01
Ga-68	2.195E+01	242.6	5.325E+01	5.327E+01	1.142E+02
Tc-99m	-8.536E-01	156.9	1.339E+00	1.340E+00	4.443E+00
BA-133	6.043E-01	425.7	2.572E+00	2.573E+00	5.918E+00
CS-134	9.131E-01	83.0	7.582E-01	7.597E-01	4.478E+00
CS-137	3.835E+02	1.3	4.859E+00	2.017E+01	3.918E+00
CE-139	-3.607E-01	256.9	9.268E-01	9.270E-01	3.096E+00
Ba-140	8.658E-01	510.3	4.418E+00	4.419E+00	1.047E+01
La-140	7.224E-01	172.4	1.245E+00	1.246E+00	1.243E+00
CE-141	-1.584E+00	153.8	2.436E+00	2.437E+00	8.080E+00

CE-144	0.000E+00	1.#INF	1.891E+00	1.891E+00	3.475E+01
PM-144	5.314E-01	213.5	1.135E+00	1.135E+00	2.593E+00
EU-152	8.802E+00	33.0	2.909E+00	2.944E+00	8.207E+00
EU-154	2.323E+00	79.6	1.849E+00	1.853E+00	5.582E+00
EU-155	-7.853E-01	686.0	5.387E+00	5.387E+00	1.792E+01
HF-181	-2.197E+00	104.7	2.299E+00	2.302E+00	7.625E+00
Ta-182	2.542E+00	173.0	4.399E+00	4.400E+00	1.481E+01
Hg-203	1.161E+00	88.2	1.023E+00	1.025E+00	3.395E+00
TL-208	1.475E+00	90.3	1.332E+00	1.334E+00	3.107E+00
PM-146	2.020E-01	1060.1	2.142E+00	2.142E+00	5.229E+00
Y-88	7.548E-02	89.9	6.782E-02	6.796E-02	1.883E+00
Cd-113m	-2.658E+03	467.2	1.242E+04	1.242E+04	4.178E+04
Cd-109	0.000E+00	1.#INF	2.712E+01	2.712E+01	9.048E+01
Cf-251	-2.177E+00	215.8	4.699E+00	4.700E+00	1.192E+01
Cf-249	-1.901E+00	102.3	1.946E+00	1.948E+00	6.460E+00
Sn-126	-1.980E+01	240.4	4.760E+01	4.762E+01	1.572E+02
PB-210	1.107E+04	1.2	1.295E+02	7.031E+02	2.301E+02
PB-212	5.580E+00	22.2	1.239E+00	1.273E+00	3.848E+00
PB-214	7.355E+00	24.0	1.766E+00	1.805E+00	5.327E+00
BI-207	-2.249E+00	108.6	2.443E+00	2.446E+00	5.153E+00
BI-212	-1.688E+01	86.5	1.459E+01	1.462E+01	4.856E+01
U-235	6.617E-01	135.6	8.972E-01	8.979E-01	3.510E+01
BI-214	4.403E+00	77.8	3.425E+00	3.432E+00	1.183E+01
BI-210M	1.845E+00	86.7	1.600E+00	1.603E+00	5.307E+00
AC-228	1.818E+01	26.7	4.860E+00	4.947E+00	9.774E+00
TH-227	4.602E+00	129.8	5.972E+00	5.977E+00	3.364E+01
TH-229	-4.289E+00	471.2	2.021E+01	2.021E+01	5.132E+01
TH-234	-1.973E+01	46.0	9.069E+00	9.135E+00	6.335E+01
PA-231	0.000E+00	1.#INF	1.328E+01	1.328E+01	1.930E+02
PA-233	0.000E+00	1.#INF	1.479E+00	1.479E+00	1.580E+01
PA-234	6.057E+00	85.6	5.185E+00	5.194E+00	1.584E+01
PA-234M	-1.629E+02	126.5	2.060E+02	2.061E+02	6.885E+02
AM-241	1.259E+03	0.7	9.370E+00	7.389E+01	1.437E+01
Np-237	-5.551E+00	149.7	8.310E+00	8.315E+00	2.757E+01
Ir-192	-1.983E-02	104.1	2.063E-02	2.066E-02	6.712E+00
Cs-136	-1.518E+00	87.2	1.324E+00	1.327E+00	4.404E+00
Np-239	3.189E+00	141.4	4.508E+00	4.512E+00	1.496E+01
Nd-147	-5.494E+00	173.2	9.513E+00	9.519E+00	2.230E+01
TL-210	-9.734E-01	115.9	1.128E+00	1.129E+00	3.781E+00
Kr-85	0.000E+00	1.#INF	1.613E+02	1.613E+02	9.465E+02
Total	1.299E+04				

Analyst: Caleb Quinn

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Sample description
453329_Gamma_LCS 160-453329~2-A

Spectrum Filename: C:\User\SPC\Det12\12_Gamma_20193734.An1

Acquisition information
Start time: 12/27/2019 7:38:44 AM
Live time: 1800
Real time: 1806
Dead time: 0.35 %
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	12/27/2019 7:38:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	12_2019-12-07_1443.PBC 12/7/2019 2:43:53 PM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 26 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 0.1080

***** 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
28.19	22.	70.47	0.31	4.185E-03				
32.10	118.	27.98	0.67	7.138E-03				
36.75	251.	22.61	0.64	1.065E-02				
46.57	15285.	1.17	0.80	1.804E-02	46.54	4.250	1.107E+04	PB210
59.58	23023.	0.74	0.86	2.817E-02	59.54	35.900	1.265E+03	AM241
77.05	105.	31.66	0.88	3.389E-02				
79.55	70.	49.90	0.88	3.442E-02				
86.88	17.	384.83	0.89	3.566E-02	86.49	13.100	PBC<MDA	Np237
					86.54	30.700	8.737E-01	EU155
					86.94	9.040	2.962E+00	Sn126
87.51	38.	95.74	0.89	3.575E-02	87.57	37.500	PBC<MDA	Sn126
88.84	81.	47.56	0.37	3.592E-02	88.04	3.790	3.308E+01	Cd109
93.33	53.	128.97	0.90	3.645E-02	93.35	5.561	PBC<MDA	AC228
106.13	49.	141.38	0.91	3.729E-02	106.13	22.700	PBC<MDA	Np239
121.78	48.	99.13	0.93	3.725E-02	121.78	28.580	PBC<MDA	EU152
					122.06	85.600	8.335E-01	CO57
122.06	48.	101.19	0.93	3.724E-02	121.78	28.580	PBC<MDA	EU152
					122.06	85.600	8.337E-01	CO57
131.29	48.	119.76	0.94	3.683E-02	131.29	18.000	PBC<MDA	PA234
133.02	45.	167.54	0.94	3.673E-02	133.02	43.300	PBC<MDA	HF181
163.38	33.	135.60	0.97	3.428E-02	163.38	5.080	PBC<MDA	U235
184.15	39.	53.56	0.74	3.230E-02				
185.72	-8.	478.34	0.99	3.215E-02	185.72	54.000	PBC<MDA	U235
205.33	5.	912.16	1.01	3.030E-02	205.33	5.010	PBC<MDA	U235
226.69	33.	140.24	1.03	2.839E-02	227.00	6.300	PBC<MDA	Cf251
235.97	43.	129.78	1.04	2.764E-02	235.97	12.300	PBC<MDA	TH227
238.53	105.	27.07	0.66	2.744E-02	238.63	43.300	4.922E+00	PB212

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
241.84	44.	129.38	1.05	2.716E-02	242.00	7.430	PBC<MDA	PB214
265.83	42.	86.72	1.07	2.539E-02	265.83	50.000	PBC<MDA	BI210M
279.20	42.	88.17	1.09	2.449E-02	279.20	81.460	PBC<MDA	Hg203
295.20	63.	58.64	1.34	2.350E-02	295.09	19.300	PBC<MDA	PB214
302.30	16.	425.72	1.11	2.304E-02	302.65	2.880	PBC<MDA	PA231
					302.85	18.330	2.148E+00	BA133
351.73	127.	27.34	0.67	2.056E-02	351.93	37.600	9.125E+00	PB214
364.48	11.	366.01	1.17	2.001E-02	364.48	81.700	PBC<MDA	I131
413.35	42.	58.10	0.43	1.817E-02				
433.94	6.	663.60	1.24	1.751E-02	433.94	90.480	PBC<MDA	AG108M
468.06	32.	131.56	1.27	1.653E-02	468.06	51.750	PBC<MDA	Ir192
511.86	139.	22.74	2.56	1.546E-02	511.86	20.000	2.498E+01	RH106
537.26	6.	510.31	1.34	1.491E-02	537.26	24.390	PBC<MDA	Ba140
569.47	16.	136.56	1.37	1.428E-02	569.32	15.380	PBC<MDA	CS134
					569.47	8.200	7.513E+00	PA234
					569.70	97.740	6.305E-01	BI207
569.70	23.	88.81	1.37	1.427E-02	569.32	15.380	5.776E+00	CS134
					569.47	8.200	1.083E+01	PA234
					569.70	97.740	9.093E-01	BI207
583.02	31.	90.31	1.38	1.403E-02	583.02	84.500	PBC<MDA	TL208
600.50	5.	888.93	1.40	1.373E-02	600.50	17.860	PBC<MDA	SB125
609.48	23.	174.60	1.41	1.358E-02	609.31	46.090	PBC<MDA	BI214
610.46	31.	131.31	1.41	1.357E-02	610.30	5.750	PBC<MDA	RU103
614.28	16.	254.30	1.41	1.350E-02	614.28	89.850	PBC<MDA	AG108M
657.76	33.	379.55	1.45	1.284E-02	657.76	94.640	PBC<MDA	AG110M
661.56	7523.	1.27	1.41	1.279E-02	661.66	85.210	3.835E+02	CS137
696.54	12.	213.54	1.49	1.232E-02	696.54	99.000	PBC<MDA	PM144
722.79	25.	77.17	1.51	1.199E-02	722.79	10.810	PBC<MDA	SB124
					722.94	90.840	1.257E+00	AG108M
					723.36	20.220	5.651E+00	EU154
722.94	25.	82.24	1.51	1.199E-02	722.79	10.810	1.057E+01	SB124
					722.94	90.840	1.258E+00	AG108M
					723.36	20.220	5.652E+00	EU154
723.36	10.	200.68	1.51	1.199E-02	722.79	10.810	PBC<MDA	SB124
					722.94	90.840	5.280E-01	AG108M
					723.36	20.220	2.373E+00	EU154
763.94	24.	66.57	1.55	1.152E-02	763.94	22.280	PBC<MDA	AG110M
778.92	57.	33.05	1.56	1.136E-02	778.92	12.940	2.141E+01	EU152
785.42	21.	109.11	1.57	1.129E-02	785.42	1.280	PBC<MDA	BI212
801.95	29.	83.04	1.58	1.113E-02	801.95	8.690	PBC<MDA	CS134
810.78	28.	81.62	1.59	1.104E-02	810.78	99.460	PBC<MDA	CO58
815.77	14.	172.35	1.60	1.099E-02	815.77	23.280	PBC<MDA	La140
834.00	25.	84.00	1.61	1.081E-02	834.85	99.980	PBC<MDA	MN54
883.24	26.	85.60	1.66	1.038E-02	883.24	9.600	PBC<MDA	PA234
898.04	19.	145.87	1.67	1.025E-02	898.04	93.700	PBC<MDA	Y88
910.86	110.	26.74	0.43	1.015E-02	911.07	29.000	2.080E+01	AC228
937.49	31.	96.83	1.71	9.939E-03	937.49	34.360	PBC<MDA	AG110M
946.02	5.	631.14	1.72	9.873E-03	946.02	13.400	PBC<MDA	PA234

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
968.47	42.	47.09	3.33	9.703E-03	968.97	17.460	PBC<MDA	AC228
1004.77	35.	82.65	1.77	9.450E-03	1004.77	18.010	PBC<MDA	EU154
1037.84	30.	85.92	1.80	9.228E-03	1037.84	14.130	PBC<MDA	Co56
1050.36	21.	91.97	1.81	9.147E-03	1050.36	1.560	PBC<MDA	RH106
1077.40	10.	242.62	1.83	8.978E-03	1077.40	3.300	PBC<MDA	Ga68
1099.25	7.	345.28	1.85	8.846E-03	1099.25	56.500	PBC<MDA	FE59
1112.07	22.	104.93	1.86	8.770E-03	1112.07	13.644	PBC<MDA	EU152
1120.22	28.	77.79	1.87	8.722E-03	1120.29	15.100	PBC<MDA	BI214
					1120.55	99.987	1.758E+00	Sc46
1120.55	27.	83.30	1.87	8.721E-03	1120.29	15.100	1.132E+01	BI214
					1120.55	99.987	1.709E+00	Sc46
1121.63	14.	173.01	1.87	8.716E-03	1121.30	34.900	PBC<MDA	Ta182
1173.07	2309.	2.29	1.79	8.427E-03	1173.24	99.900	1.524E+02	CO60
1238.28	7.	198.98	1.97	8.090E-03	1238.28	66.070	PBC<MDA	Co56
1274.53	9.	64.59	2.00	7.914E-03	1274.53	99.940	PBC<MDA	NA22
					1274.54	35.190	1.729E+00	EU154
1291.60	3.	339.41	2.02	7.834E-03	1291.60	43.200	PBC<MDA	FE59
1313.00	12.	83.83	2.04	7.735E-03	1313.00	21.000	PBC<MDA	TL210
1332.37	2039.	2.34	2.07	7.648E-03	1332.50	99.980	1.481E+02	CO60
1460.83	17.	24.25	2.16	7.112E-03	1460.83	10.670	1.245E+01	K40
1596.21	2.	304.14	2.27	6.616E-03	1596.21	95.400	PBC<MDA	La140

********** 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	
112.46	28.19	99.	22.	5.217E+03	70.47	0.311	-	c
128.08	32.10	386.	118.	1.646E+04	27.98	0.672	-	s
146.67	36.75	990.	251.	2.356E+04	22.61	0.637	-	
307.66	77.25	502.	104.	3.079E+03	31.90	0.882	-	sD
317.68	79.75	583.	68.	1.962E+03	52.04	0.885	-	sD
354.64	88.84	627.	58.	1.601E+03	62.98	0.894	-	sc
735.90	184.15	187.	39.	1.218E+03	53.56	0.744	-	s
1652.34	413.35	178.	42.	2.330E+03	58.10	0.432	-	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	185.93	46.57	4571.	15285.	8.491	1.17	0.804
TH-227	200.18	50.14	26874.	-129.	-0.071	180.53	0.855s
AM-241	237.74	59.54	3086.	22920.	12.734	0.74	0.865D
TH-234	252.74	63.29	31095.	-128.	-0.071	139.73	0.868s
Sn-126	256.71	64.28	31352.	-104.	-0.058	240.40	0.869s
BA-133	323.50	80.99	2121.	-57.	-0.032	114.77	0.887
Np-237	345.49	86.49	2409.	-47.	-0.026	149.70	0.892s
EU-155	345.70	86.54	2226.	-30.	-0.017	223.16	0.892
Sn-126	347.29	86.94	2179.	17.	0.010	384.83	0.892
Sn-126	349.81	87.57	2158.	38.	0.021	95.74	0.893D
Cd-109	351.68	88.04	2196.	0.	0.000	1000.00	0.894A
Nd-147	363.92	91.10	2196.	0.	0.000	1000.00	0.897s
TH-234	369.87	92.59	2413.	-72.	-0.040	45.97	0.898s
AC-228	372.91	93.35	2302.	53.	0.029	128.97	0.899
Gd-153	389.50	97.50	2720.	-52.	-0.029	143.16	0.903s
Np-239	397.50	99.50	2772.	-52.	-0.029	144.22	0.905
Gd-153	412.29	103.20	2824.	-52.	-0.029	144.94	0.909s
Np-239	414.29	103.70	2876.	-52.	-0.029	146.18	0.909s
EU-155	420.73	105.31	2928.	-11.	-0.006	685.96	0.911s
Np-239	424.00	106.13	2334.	49.	0.027	141.38	0.912s
EU-152	486.56	121.78	1100.	48.	0.027	99.13	0.928s
CO-57	487.69	122.06	1148.	48.	0.027	101.19	0.928s
EU-154	491.84	123.10	1033.	-46.	-0.026	99.56	0.929s
PA-234	524.60	131.29	1598.	48.	0.026	119.76	0.938s
HF-181	531.51	133.02	2877.	45.	0.025	167.54	0.939s
CE-144	533.57	133.54	2922.	0.	0.000	1000.00	0.940s
HF-181	544.61	136.30	2922.	0.	0.000	1000.00	0.943
CO-57	545.30	136.47	2888.	-48.	-0.027	158.89	0.943
Tc-99m	561.44	140.51	2840.	-48.	-0.027	156.91	0.947s
U-235	574.53	143.79	2798.	-32.	-0.018	236.40	0.950
CE-141	581.15	145.44	2847.	-49.	-0.027	153.79	0.952
Ba-140	649.99	162.66	1267.	-48.	-0.026	106.67	0.969s
U-235	652.87	163.38	972.	33.	0.018	135.60	0.970s
CE-139	662.76	165.85	1021.	-18.	-0.010	256.93	0.973s
Cf-251	705.72	176.60	638.	-22.	-0.012	215.85	0.983s
U-235	742.18	185.72	821.	-8.	-0.005	478.34	0.992s
TH-229	773.32	193.51	719.	-11.	-0.006	471.18	1.000s
U-235	820.59	205.33	675.	5.	0.003	912.16	1.012
TH-229	842.65	210.85	737.	-50.	-0.028	102.27	1.018s
Cf-251	907.22	227.00	590.	33.	0.018	140.24	1.034
TH-227	943.09	235.97	1571.	43.	0.024	129.78	1.043s
PB-212	953.73	238.63	291.	119.	0.066	22.21	1.045D
PB-214	967.18	242.00	1579.	44.	0.024	129.38	1.049s
EU-152	977.96	244.69	1679.	-45.	-0.025	128.24	1.051

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Cd-113m	1053.96	263.70	583.	-7.	-0.004	467.23	1.070
BI-210M	1062.48	265.83	647.	42.	0.023	86.72	1.072s
TL-208	1108.27	277.28	741.	-44.	-0.025	88.00	1.084s
Hg-203	1115.93	279.20	654.	42.	0.023	88.17	1.086s
I-131	1136.32	284.30	469.	-24.	-0.014	167.79	1.091s
PB-214	1179.91	295.20	334.	63.	0.035	58.64	1.337s
TL-210	1183.11	296.00	2444.	-41.	-0.023	170.88	1.102
PB-212	1199.22	300.03	2403.	-41.	-0.023	168.85	1.106
PA-231	1199.38	300.07	2362.	-40.	-0.022	174.63	1.106s
PA-233	1199.82	300.18	2393.	0.	0.000	1000.00	1.107s
PA-231	1209.70	302.65	2393.	0.	0.000	1000.00	1.109s
BA-133	1210.50	302.85	2409.	16.	0.009	425.72	1.109s
Ba-140	1218.49	304.85	2393.	0.	0.000	1000.00	1.111
BI-210M	1218.68	304.90	2393.	0.	0.000	1000.00	1.111
Ir-192	1232.85	308.44	2393.	0.	0.000	1000.00	1.115s
PA-233	1247.13	312.01	2393.	0.	0.000	1000.00	1.118s
Ir-192	1265.04	316.49	2472.	-44.	-0.024	161.24	1.123s
CR-51	1279.41	320.08	2499.	-31.	-0.017	226.06	1.126
Cf-249	1332.81	333.44	438.	-8.	-0.005	483.56	1.139s
AC-228	1352.33	338.32	999.	-11.	-0.006	401.44	1.144
Cs-136	1361.32	340.57	1010.	0.	0.000	1000.00	1.146s
EU-152	1376.18	344.29	1010.	0.	0.000	1000.00	1.150s
HF-181	1382.35	345.83	1028.	-35.	-0.019	131.28	1.151
PB-214	1406.76	351.93	235.	99.	0.055	24.02	1.158D
I-131	1456.95	364.48	420.	11.	0.006	366.01	1.170s
BA-133	1534.35	383.84	1018.	-42.	-0.023	108.71	1.189
Cf-249	1550.79	387.95	951.	-43.	-0.024	102.34	1.193
SN-113	1565.74	391.69	1158.	-23.	-0.013	207.45	1.196
AG-108M	1734.69	433.94	412.	6.	0.003	663.60	1.238s
SB-125	1852.39	463.37	909.	-6.	-0.004	674.52	1.266s
Ir-192	1871.16	468.06	852.	32.	0.018	131.56	1.271s
BE-7	1909.29	477.60	1374.	-51.	-0.028	103.15	1.280s
HF-181	1926.90	482.00	1426.	-51.	-0.029	104.67	1.284s
La-140	1946.98	487.02	1239.	-47.	-0.026	106.96	1.289s
RU-103	1987.11	497.05	328.	-7.	-0.004	507.96	1.298s
RH-106	2046.35	511.86	430.	139.	0.077	22.74	2.563s
Kr-85	2054.81	513.98	559.	0.	0.000	1000.00	1.315s
Nd-147	2122.88	531.00	264.	-19.	-0.011	173.16	1.331s
Ba-140	2147.92	537.26	199.	6.	0.003	510.31	1.337
CS-134	2276.15	569.32	212.	-23.	-0.013	90.71	1.367s
PA-234	2276.75	569.47	226.	16.	0.009	136.56	1.368s
BI-207	2277.68	569.70	194.	23.	0.013	88.81	1.368s
TL-208	2330.96	583.02	186.	31.	0.017	90.31	1.381s
SB-125	2400.87	600.50	851.	5.	0.003	888.93	1.397s
SB-124	2409.79	602.73	856.	0.	0.000	1000.00	1.399
CS-134	2417.71	604.71	856.	0.	0.000	1000.00	1.401s
BI-214	2436.11	609.31	786.	23.	0.013	174.60	1.405s
RU-103	2440.06	610.30	809.	31.	0.017	131.31	1.406s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
AG-108M	2455.99	614.28	840.	16.	0.009	254.30	1.410
SB-125	2542.43	635.89	196.	-15.	-0.009	131.73	1.430s
AG-110M	2629.92	657.76	7867.	33.	0.018	379.55	1.451s
CS-137	2645.13	661.56	253.	7523.	4.179	1.27	1.413
PM-144	2785.05	696.54	135.	12.	0.006	213.54	1.487s
NB-94	2809.41	702.63	149.	-20.	-0.011	129.40	1.493s
SB-124	2890.04	722.79	169.	25.	0.014	77.17	1.512s
AG-108M	2890.65	722.94	193.	25.	0.014	82.24	1.512s
EU-154	2892.34	723.36	211.	10.	0.006	200.68	1.512s
ZR-95	2895.69	724.20	221.	0.	0.000	1000.00	1.513s
BI-212	2907.58	727.17	267.	-27.	-0.015	86.46	1.516s
PM-146	2941.78	735.72	117.	-9.	-0.005	266.55	1.524s
PM-146	2987.55	747.16	131.	-3.	-0.001	911.38	1.535s
ZR-95	3025.83	756.73	140.	-18.	-0.010	141.42	1.543
AG-110M	3054.69	763.94	117.	24.	0.013	66.57	1.550
NB-95	3062.08	765.79	150.	-6.	-0.003	286.78	1.552s
PA-234M	3064.57	766.41	157.	-2.	-0.001	763.05	1.552s
EU-152	3114.61	778.92	65.	57.	0.031	33.05	1.564s
BI-212	3140.62	785.42	112.	21.	0.012	109.11	1.570s
CS-134	3182.43	795.87	255.	-12.	-0.007	190.39	1.579s
TL-210	3197.35	799.60	241.	-19.	-0.011	115.89	1.583s
CS-134	3206.76	801.95	279.	29.	0.016	83.04	1.585s
CO-58	3242.06	810.78	242.	28.	0.015	81.62	1.593s
La-140	3262.05	815.77	269.	14.	0.008	172.35	1.598s
Cs-136	3272.97	818.50	326.	-30.	-0.017	87.22	1.600s
MN-54	3338.38	834.85	93.	25.	0.014	84.00	1.615s
Co-56	3386.08	846.77	165.	-21.	-0.012	136.24	1.626s
TL-208	3441.27	860.56	175.	-13.	-0.007	225.43	1.638s
NB-94	3483.41	871.10	222.	-5.	-0.003	423.79	1.648
EU-154	3491.95	873.23	258.	-18.	-0.010	125.09	1.650s
PA-234	3532.00	883.24	226.	26.	0.014	85.60	1.659s
AG-110M	3537.78	884.68	251.	0.	0.000	1000.00	1.660s
Sc-46	3556.17	889.28	386.	-37.	-0.020	77.67	1.664s
Y-88	3591.22	898.04	155.	19.	0.011	145.87	1.672s
AC-228	3642.53	910.86	111.	110.	0.061	26.74	0.432s
AG-110M	3749.09	937.49	180.	31.	0.017	96.83	1.708s
PA-234	3783.21	946.02	205.	5.	0.003	631.14	1.716s
EU-152	3855.60	964.11	349.	-38.	-0.021	71.20	1.732s
AC-228	3873.04	968.47	73.	42.	0.023	47.09	3.330s
EU-154	3984.54	996.33	384.	-37.	-0.020	77.20	1.761s
PA-234M	4003.22	1001.00	421.	-23.	-0.013	126.45	1.765s
EU-154	4018.33	1004.77	396.	35.	0.019	82.65	1.768
Co-56	4150.66	1037.84	123.	30.	0.017	85.92	1.798s
Cs-136	4191.60	1048.07	171.	-12.	-0.007	156.79	1.807s
RH-106	4200.76	1050.36	176.	21.	0.012	91.97	1.809s
BI-207	4253.99	1063.66	165.	-27.	-0.015	108.63	1.820s
Ga-68	4308.98	1077.40	112.	10.	0.006	242.62	1.833s
FE-59	4396.44	1099.25	123.	7.	0.004	345.28	1.852s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
EU-152	4447.76	1112.07	247.	22.	0.012	104.93	1.863s
ZN-65	4461.66	1115.55	269.	0.	0.000	1000.00	1.866s
BI-214	4480.63	1120.29	217.	28.	0.015	77.79	1.870
Sc-46	4481.68	1120.55	236.	27.	0.015	83.30	1.870
Ta-182	4484.69	1121.30	283.	14.	0.008	173.01	1.871s
CO-60	4691.90	1173.07	74.	2309.	1.283	2.29	1.787
Ta-182	4755.86	1189.05	64.	-3.	-0.002	608.88	1.930s
Co-56	4952.92	1238.28	34.	7.	0.004	198.98	1.972
NA-22	5098.03	1274.53	11.	9.	0.005	64.59	2.003s
EU-154	5098.08	1274.54	20.	0.	0.000	1000.00	2.003s
FE-59	5166.35	1291.60	23.	3.	0.002	339.41	2.017s
TL-210	5252.04	1313.00	17.	12.	0.007	83.83	2.036s
CO-60	5329.59	1332.37	29.	2039.	1.133	2.34	2.074
AG-110M	5537.48	1384.30	17.	-3.	-0.002	327.45	2.096s
EU-152	5632.39	1408.00	18.	-4.	-0.002	261.01	2.115s
K-40	5843.92	1460.83	0.	17.	0.009	24.25	2.159
La-140	6386.02	1596.21	6.	2.	0.001	304.14	2.269s
SB-124	6765.58	1690.98	13.	-4.	-0.002	246.63	2.345s
BI-214	7060.00	1764.49	30.	-8.	-0.005	98.08	2.403
Co-56	7087.48	1771.35	41.	-1.	-0.001	911.04	2.408s
Y-88	7346.69	1836.06	13.	-9.	-0.005	104.98	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	-1.6638E+01				5.31E+01	
			477.60	-1.664E+01	*(	5.691E+01 1.03E+02 1.05E+01	G
NA-22	C	6.0876E-01				9.50E+02	
			1274.53	6.088E-01	?(	1.292E+00 6.46E+01 9.99E+01	G
K-40	N	1.2445E+01				4.66E+11	
			1460.83	1.245E+01	?(	5.395E+00 2.43E+01 1.07E+01	G
Sc-46	F	-1.9700E+00				8.38E+01	
			889.28	-1.970E+00	?(	5.072E+00 7.77E+01 1.00E+02	G
			1120.55	1.709E+00	+	4.736E+00 8.33E+01 1.00E+02	G
CR-51	F	-7.9349E+00				2.77E+01	
			320.08	-7.935E+00	&(	5.961E+01 2.26E+02 9.94E+00	G

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Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
MN-54	C	1.2912E+00					3.12E+02	
			834.85	1.291E+00	&(	2.454E+00	8.40E+01	1.00E+02 G
FE-59	F	6.9908E-01					4.45E+01	
			1099.25	8.152E-01	&(	6.039E+00	3.45E+02	5.65E+01 G
			1291.60	5.472E-01	?(	4.087E+00	3.39E+02	4.32E+01 G
Co-56	C	6.6359E-01					7.73E+01	
			846.77	-1.091E+00	?(	3.251E+00	1.36E+02	9.99E+01 G
			1238.28	7.276E-01	?(	3.106E+00	1.99E+02	6.61E+01 G
			1037.84	1.278E+01	&(	2.314E+01	8.59E+01	1.41E+01 G
			1771.35	-5.927E-01	+	1.929E+01	9.11E+02	1.55E+01 A
CO-57	C	8.3373E-01					2.72E+02	
			122.06	8.337E-01	(	2.799E+00	1.01E+02	8.56E+01 G
			136.47	-6.842E+00	+	3.606E+01	1.59E+02	1.07E+01 G
CO-58	C	1.4015E+00					7.09E+01	
			810.78	1.402E+00	?(	3.803E+00	8.16E+01	9.95E+01 G
CO-60	F	1.5027E+02					1.93E+03	
			1332.50	1.481E+02	(	2.031E+00	2.34E+00	1.00E+02 G
			1173.24	1.524E+02	(	2.818E+00	2.29E+00	9.99E+01 G
NB-94	I	-9.4249E-01					7.41E+06	
			702.63	-9.425E-01	?(	2.765E+00	1.29E+02	9.79E+01 G
			871.10	-2.653E-01	+	3.828E+00	4.24E+02	9.99E+01 G
ZR-95	I	-1.5826E+00					6.40E+01	
			756.73	-1.583E+00	&(	5.086E+00	1.41E+02	5.45E+01 G
			724.20	0.000E+00	&	7.563E+00	1.00E+03	4.42E+01 G
NB-95	I	-2.9537E-01					6.40E+01	
			765.79	-2.954E-01	&(	2.894E+00	2.87E+02	9.98E+01 G
RU-103	I	-2.7077E-01					3.93E+01	
			497.05	-2.708E-01	?(	3.369E+00	5.08E+02	9.09E+01 G
			610.30	2.202E+01	?	9.631E+01	1.31E+02	5.75E+00 GA
RH-106	I	1.1221E+01					3.74E+02	
			621.92	1.394E-01	&(	2.710E+01	8.16E+03	9.93E+00 G
			1050.36	8.176E+01	?(	2.512E+02	9.20E+01	1.56E+00 G
			511.86	2.498E+01		1.785E+01	2.27E+01	2.00E+01 GA
AG-108M	C	7.3716E-01					1.53E+05	
			433.94	2.104E-01	?(	3.412E+00	6.64E+02	9.05E+01 G
			722.94	1.258E+00	&(	3.442E+00	8.22E+01	9.08E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
			614.28	7.415E-01	?(	6.308E+00	2.54E+02	8.98E+01 G
AG-110M	F	1.9315E+00					2.50E+02	
			884.68	0.000E+00	&(	5.645E+00	1.00E+03	7.27E+01 G
			657.76	1.512E+00	&(	1.901E+01	3.80E+02	9.46E+01 G
			937.49	5.043E+00	(	1.061E+01	9.68E+01	3.44E+01 G
			1384.30	-9.244E-01	+	6.756E+00	3.27E+02	2.43E+01 G
			763.94	5.216E+00	&(	1.148E+01	6.66E+01	2.23E+01 G
SN-113	F	-1.0691E+00					1.15E+02	
			391.69	-1.069E+00	?(	7.396E+00	2.07E+02	6.40E+01 G
SB-124	F	1.0470E+00					6.02E+01	
			602.73	0.000E+00	?(	5.742E+00	1.00E+03	9.83E+01 G
			1690.98	-6.763E-01	+	3.559E+00	2.47E+02	4.78E+01 G
			722.79	1.056E+01	?(	2.709E+01	7.72E+01	1.08E+01 G
SB-125	I	1.3173E-01					1.01E+03	
			427.88	-4.242E-01	%(	1.070E+01	1.03E+03	2.96E+01 G
			600.50	1.053E+00	?(	3.142E+01	8.89E+02	1.79E+01 G
			635.89	-5.721E+00	+	2.537E+01	1.32E+02	1.13E+01 G
			463.37	-2.017E+00	+	4.562E+01	6.75E+02	1.05E+01 G
I-131	I	3.7387E-01					8.02E+00	
			364.48	3.739E-01	?(	3.338E+00	3.66E+02	8.17E+01 G
			284.30	-9.112E+00	&	3.882E+01	1.68E+02	6.14E+00 G
			636.97	-6.875E-01	%	4.203E+01	1.79E+03	7.17E+00 G
Gd-153	F	-2.6030E+00					2.42E+02	
			97.50	-2.603E+00	?(	1.236E+01	1.43E+02	3.00E+01 G
			103.20	-3.571E+00	+	1.716E+01	1.45E+02	2.18E+01 G
Ga-68	C	2.1949E+01					4.71E-02	
			1077.40	2.195E+01	?(	1.142E+02	2.43E+02	3.30E+00 G
Tc-99m	I	-8.5358E-01					2.51E-01	
			140.51	-8.536E-01	&(	4.443E+00	1.57E+02	8.93E+01 G
BA-133	F	6.0426E-01					3.85E+03	
			356.00	1.482E-01	&(	5.918E+00	1.19E+03	6.20E+01 G
			302.85	2.148E+00	?(	3.044E+01	4.26E+02	1.83E+01 G
			383.84	-1.355E+01	+	4.892E+01	1.09E+02	8.94E+00 GA
			80.99	-2.689E+00	+	1.023E+01	1.15E+02	3.41E+01 GA
CS-134	I	9.1308E-01					7.54E+02	
			795.87	-6.967E-01	&(	4.478E+00	1.90E+02	8.55E+01 G
			604.71	0.000E+00	+	5.793E+00	1.00E+03	9.76E+01 G
			569.32	-5.902E+00	&	1.786E+01	9.07E+01	1.54E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
			801.95	1.676E+01	?(	4.625E+01	8.30E+01	8.69E+00 G
			563.24	-4.622E-01	%	3.031E+01	2.76E+03	8.35E+00 G
CS-137	I	3.8351E+02					1.10E+04	
			661.66	3.835E+02	(	3.918E+00	1.27E+00	8.52E+01 G
CE-139	F	-3.6074E-01					1.38E+02	
			165.85	-3.607E-01	(	3.096E+00	2.57E+02	7.99E+01 G
Ba-140	I	8.6584E-01					1.28E+01	
			537.26	8.658E-01	&(	1.047E+01	5.10E+02	2.44E+01 G
			162.66	-1.238E+01	+	4.383E+01	1.07E+02	6.22E+00 G
			304.85	0.000E+00	-	1.303E+02	1.00E+03	4.29E+00 G
La-140	I	7.2236E-01					1.28E+01	
			1596.21	1.760E-01	?(	1.243E+00	3.04E+02	9.54E+01 G
			487.02	-3.576E+00	+	1.269E+01	1.07E+02	4.55E+01 G
			328.76	3.160E-01	&	1.696E+01	1.60E+03	2.03E+01 G
			815.77	2.961E+00	?(	1.720E+01	1.72E+02	2.33E+01 G
CE-141	I	-1.5840E+00					3.25E+01	
			145.44	-1.584E+00	&(	8.080E+00	1.54E+02	4.82E+01 G
PM-144	C	5.3140E-01					3.63E+02	
			696.54	5.314E-01	&(	2.593E+00	2.14E+02	9.90E+01 G
			618.06	-3.182E-07	%	5.799E+00	5.42E+08	9.91E+01 G
EU-152	F	8.8022E+00					4.94E+03	
			121.78	2.496E+00	&(	8.207E+00	9.91E+01	2.86E+01 G
			344.29	0.000E+00	-	1.513E+01	1.00E+03	2.65E+01 G
			1112.07	1.005E+01	&(	3.529E+01	1.05E+02	1.36E+01 G
			778.92	2.141E+01	&(	1.526E+01	3.30E+01	1.29E+01 G
			964.11	-1.488E+01	+	3.505E+01	7.12E+01	1.46E+01 G
			244.69	-1.237E+01	+	5.266E+01	1.28E+02	7.58E+00 G
			1408.00	-1.445E+00	-	8.118E+00	2.61E+02	2.10E+01 GA
EU-154	I	2.3231E+00					3.14E+03	
			123.10	-1.690E+00	&(	5.582E+00	9.96E+01	4.08E+01 G
			1274.54	0.000E+00	+	4.698E+00	1.00E+03	3.52E+01 G
			723.36	2.373E+00	&(	1.612E+01	2.01E+02	2.02E+01 G
			873.23	-8.006E+00	+	3.360E+01	1.25E+02	1.23E+01 G
			1004.77	1.136E+01	?(	3.116E+01	8.27E+01	1.80E+01 G
			996.33	-2.025E+01	+	5.183E+01	7.72E+01	1.06E+01 G
EU-155	I	-7.8534E-01					1.81E+03	
			105.31	-7.853E-01	&(	1.792E+01	6.86E+02	2.12E+01 G
			86.54	-1.525E+00	&	1.131E+01	2.23E+02	3.07E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
HF-181	F	-2.1968E+00					4.24E+01	
			482.00	-2.197E+00	?(	7.625E+00	1.05E+02	8.05E+01 G
			133.02	1.588E+00	+	8.825E+00	1.68E+02	4.33E+01 G
			345.83	-6.165E+00	&	2.693E+01	1.31E+02	1.51E+01 G
			136.30	0.000E+00	+	6.620E+01	1.00E+03	5.85E+00 G
Ta-182	F	2.5425E+00					1.14E+02	
			1121.30	2.542E+00	?(	1.481E+01	1.73E+02	3.49E+01 G
			1221.41	2.517E-01	%	7.521E+00	1.37E+03	2.70E+01 G
			1189.05	-1.233E+00	&	1.644E+01	6.09E+02	1.62E+01 G
Hg-203	F	1.1606E+00					4.66E+01	
			279.20	1.161E+00	(	3.395E+00	8.82E+01	8.15E+01 G
TL-208	N	1.4746E+00					6.98E+02	
			583.02	1.475E+00	(	3.107E+00	9.03E+01	8.45E+01 G
			277.28	-1.588E+01	+	4.635E+01	8.80E+01	6.31E+00 G
			860.56	-5.499E+00	&	2.722E+01	2.25E+02	1.24E+01 G
PM-146	C	2.0204E-01					2.02E+03	
			453.88	2.020E-01	&(	5.229E+00	1.06E+03	6.50E+01 G
			747.16	-3.721E-01	+	7.811E+00	9.11E+02	3.40E+01 G
			735.72	-1.807E+00	+	1.106E+01	2.67E+02	2.25E+01 G
Y-88	F	7.5477E-02					1.07E+02	
			1836.06	-8.910E-01	?(	1.883E+00	1.05E+02	9.92E+01 G
			898.04	1.099E+00	&(	3.512E+00	1.46E+02	9.37E+01 G
Cd-113m		-2.6584E+03					5.33E+03	
			263.70	-2.658E+03	&(	4.178E+04	4.67E+02	6.00E-03 K
Cf-251	T	-2.1770E+00					3.28E+05	
			176.60	-2.177E+00	?(	1.192E+01	2.16E+02	1.70E+01 G
			227.00	1.015E+01	?	3.602E+01	1.40E+02	6.30E+00 GA
Cf-249	T	-1.9014E+00					1.28E+05	
			387.95	-1.901E+00	&(	6.460E+00	1.02E+02	6.60E+01 G
			333.44	-1.421E+00	+	1.677E+01	4.84E+02	1.55E+01 G
Sn-126		-1.9802E+01					3.65E+07	
			87.57	1.589E+00	}	9.082E+00	9.57E+01	3.75E+01 GA
			64.28	-1.980E+01	&(	1.572E+02	2.40E+02	9.70E+00 G
			86.94	2.962E+00	+	3.795E+01	3.85E+02	9.04E+00 GA
PB-210	N	1.1069E+04					8.14E+03	
			46.54	1.107E+04	(P	2.301E+02	1.17E+00	4.25E+00 G

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Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PB-212	N	5.5801E+00					6.98E+02	
			238.63	5.580E+00	(	3.848E+00	2.22E+01	4.33E+01 G
			300.03	-3.009E+01	-	1.687E+02	1.69E+02	3.28E+00 GA
PB-214	N	7.3550E+00					5.84E+05	
			351.93	7.139E+00	(	5.327E+00	2.40E+01	3.76E+01 G
			295.09	7.777E+00	(P	1.076E+01	5.86E+01	1.93E+01 G
			242.00	1.204E+01	&	5.172E+01	1.29E+02	7.43E+00 GA
BI-207	C	-2.2490E+00					1.18E+04	
			1063.66	-2.249E+00	(	5.153E+00	1.09E+02	7.45E+01 G
			569.70	9.093E-01	+	2.694E+00	8.88E+01	9.77E+01 G
BI-212	N	-1.6877E+01					6.98E+02	
			727.17	-1.688E+01	(	4.856E+01	8.65E+01	7.55E+00 G
			785.42	8.070E+01	*	1.999E+02	1.09E+02	1.28E+00 GA
U-235	N	6.6166E-01					2.57E+11	
			143.79	-4.470E+00	?(	3.510E+01	2.36E+02	1.10E+01 G
			205.33	1.952E+00	?(	4.529E+01	9.12E+02	5.01E+00 G
			163.38	1.046E+01	&(	4.722E+01	1.36E+02	5.08E+00 G
			185.72	-2.707E-01	& P	4.361E+00	4.78E+02	5.40E+01 GA
BI-214	N	4.4026E+00					5.84E+05	
			609.31	2.031E+00	?(P	1.183E+01	1.75E+02	4.61E+01 G
			1120.29	1.164E+01	?(	3.008E+01	7.78E+01	1.51E+01 G
			1764.49	-5.047E+00	+	1.689E+01	9.81E+01	1.54E+01 G
BI-210M	T	1.8449E+00					1.10E+09	
			265.83	1.845E+00	&(	5.307E+00	8.67E+01	5.00E+01 G
			304.90	0.000E+00	-	1.996E+01	1.00E+03	2.80E+01 G
AC-228	N	1.8180E+01					2.10E+03	
			911.07	2.080E+01	@(	9.774E+00	2.67E+01	2.90E+01 G
			968.97	1.383E+01	*(	1.393E+01	4.71E+01	1.75E+01 G
			338.32	-2.439E+00	-	3.276E+01	4.01E+02	1.20E+01 G
			93.35	1.450E+01	?	6.202E+01	1.29E+02	5.56E+00 XA
TH-227	N	4.6016E+00					7.95E+03	
			256.24	2.029E-01	&(	3.364E+01	6.49E+03	7.00E+00 G
			235.97	7.105E+00	?(	3.062E+01	1.30E+02	1.23E+01 G
			50.14	-4.071E+01	+	2.427E+02	1.81E+02	8.00E+00 G
TH-229	N	-4.2887E+00					2.68E+06	
			193.51	-4.289E+00	?(	5.132E+01	4.71E+02	4.40E+00 G
			210.85	-3.127E+01	+	8.058E+01	1.02E+02	2.99E+00 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-234	N	-1.9729E+01					1.63E+12	
			92.59	-1.973E+01	?(P	6.335E+01	4.60E+01	5.58E+00 G
			63.29	-6.275E+01	+ P	4.037E+02	1.40E+02	3.81E+00 G
PA-234	N	6.0566E+00					1.63E+12	
			131.29	3.985E+00	&(	1.584E+01	1.20E+02	1.80E+01 G
			946.02	2.100E+00	?(	2.915E+01	6.31E+02	1.34E+01 G
			569.47	7.513E+00	?(	3.452E+01	1.37E+02	8.20E+00 G
			883.24	1.422E+01	?(	4.054E+01	8.56E+01	9.60E+00 G
			880.53	4.452E-01	%	7.964E+01	5.27E+03	6.00E+00 GA
PA-234M	N	-1.6289E+02					1.63E+12	
			1001.00	-1.629E+02	&(	6.885E+02	1.26E+02	8.37E-01 G
			766.41	-3.835E+01	+	1.005E+03	7.63E+02	2.94E-01 G
AM-241	T	1.2591E+03					1.58E+05	
			59.54	1.259E+03	(	1.437E+01	7.44E-01	3.59E+01 G
Np-237	F	-5.5508E+00					2.14E+06	
			86.49	-5.551E+00	?(	2.757E+01	1.50E+02	1.31E+01 G
Ir-192	F	-1.9827E-02					7.40E+01	
			316.49	-1.254E+00	*(	6.712E+00	1.61E+02	8.70E+01 G
			468.06	2.056E+00	&(	9.009E+00	1.32E+02	5.18E+01 G
			308.44	0.000E+00	+	1.776E+01	1.00E+03	3.18E+01 G
Cs-136	F	-1.5184E+00					1.30E+01	
			818.50	-1.518E+00	(	4.404E+00	8.72E+01	1.00E+02 G
			1048.07	-9.096E-01	&	4.824E+00	1.57E+02	8.00E+01 G
			340.57	0.000E+00	+	8.478E+00	1.00E+03	4.69E+01 G
Np-239	T	3.1889E+00					2.36E+00	
			103.70	-3.244E+00	&	1.572E+01	1.46E+02	2.40E+01 X
			106.13	3.189E+00	*(	1.496E+01	1.41E+02	2.27E+01 G
			99.50	-5.197E+00	&	2.485E+01	1.44E+02	1.50E+01 X
Nd-147		-5.4941E+00					1.11E+01	
			531.00	-5.494E+00	&(	2.230E+01	1.73E+02	1.30E+01 G
			91.10	0.000E+00	+	1.199E+01	1.00E+03	2.83E+01 G
TL-210	N	-9.7343E-01					5.84E+05	
			799.60	-9.734E-01	&(	3.781E+00	1.16E+02	9.90E+01 G
			296.00	-1.232E+00	&	6.991E+00	1.71E+02	7.90E+01 G
			1313.00	4.196E+00	?	7.498E+00	8.38E+01	2.10E+01 GA

(- This peak used in the nuclide activity average.

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  * - 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	26874.	-129.	-0.071	180.53	-4.071E+01	
TH-234	63.29	31095.	-128.	-0.071	139.73	-6.275E+01	P
Np-237	86.49	2409.	-47.	-0.026	149.70	-5.551E+00	
EU-155	86.54	2226.	-30.	-0.017	223.16	-1.525E+00	
TH-234	92.59	2413.	-72.	-0.040	45.97	-1.973E+01	P
Gd-153	97.50	2720.	-52.	-0.029	143.16	-2.603E+00	
Np-239	99.50	2772.	-52.	-0.029	144.22	-5.197E+00	
Gd-153	103.20	2824.	-52.	-0.029	144.94	-3.571E+00	
Np-239	103.70	2876.	-52.	-0.029	146.18	-3.244E+00	
EU-155	105.31	2928.	-11.	-0.006	685.96	-7.853E-01	
Np-239	106.13	2334.	49.	0.027	141.38	3.189E+00	
CO-57	122.06	1148.	48.	0.027	101.19	8.337E-01	
EU-154	123.10	1033.	-46.	-0.026	99.56	-1.690E+00	
PA-234	131.29	1598.	48.	0.026	119.76	3.985E+00	
HF-181	133.02	2877.	45.	0.025	167.54	1.588E+00	
CO-57	136.47	2888.	-48.	-0.027	158.89	-6.842E+00	
Tc-99m	140.51	2840.	-48.	-0.027	156.91	-8.536E-01	
U-235	143.79	2798.	-32.	-0.018	236.40	-4.470E+00	
CE-141	145.44	2847.	-49.	-0.027	153.79	-1.584E+00	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Ba-140	162.66	1267.	-48.	-0.026	106.67	-1.238E+01	
U-235	163.38	972.	33.	0.018	135.60	1.046E+01	
CE-139	165.85	1021.	-18.	-0.010	256.93	-3.607E-01	
U-235	185.72	821.	-8.	-0.005	478.34	-2.707E-01	P
TH-229	193.51	719.	-11.	-0.006	471.18	-4.289E+00	
U-235	205.33	675.	5.	0.003	912.16	1.952E+00	
TH-229	210.85	737.	-50.	-0.028	102.27	-3.127E+01	
TH-227	235.97	1571.	43.	0.024	129.78	7.105E+00	
Cd-113m	263.70	583.	-7.	-0.004	467.23	-2.658E+03	
BI-210M	265.83	647.	42.	0.023	86.72	1.845E+00	
TL-208	277.28	741.	-44.	-0.025	88.00	-1.588E+01	
Hg-203	279.20	654.	42.	0.023	88.17	1.161E+00	
I-131	284.30	469.	-24.	-0.014	167.79	-9.112E+00	
TL-210	296.00	2444.	-41.	-0.023	170.88	-1.232E+00	
PA-231	300.07	2362.	-40.	-0.022	174.63	-3.846E+01	
Ir-192	316.49	2472.	-44.	-0.024	161.24	-1.254E+00	
CR-51	320.08	2499.	-31.	-0.017	226.06	-7.935E+00	
Cf-249	333.44	438.	-8.	-0.005	483.56	-1.421E+00	
HF-181	345.83	1028.	-35.	-0.019	131.28	-6.165E+00	
I-131	364.48	420.	11.	0.006	366.01	3.739E-01	
Cf-249	387.95	951.	-43.	-0.024	102.34	-1.901E+00	
SN-113	391.69	1158.	-23.	-0.013	207.45	-1.069E+00	
AG-108M	433.94	412.	6.	0.003	663.60	2.104E-01	
SB-125	463.37	909.	-6.	-0.004	674.52	-2.017E+00	
Ir-192	468.06	852.	32.	0.018	131.56	2.056E+00	
BE-7	477.60	1374.	-51.	-0.028	103.15	-1.664E+01	
HF-181	482.00	1426.	-51.	-0.029	104.67	-2.197E+00	
La-140	487.02	1239.	-47.	-0.026	106.96	-3.576E+00	
RH-106	511.86	430.	139.	0.077	22.74	2.498E+01	
Nd-147	531.00	264.	-19.	-0.011	173.16	-5.494E+00	
Ba-140	537.26	199.	6.	0.003	510.31	8.658E-01	
CS-134	569.32	212.	-23.	-0.013	90.71	-5.902E+00	
PA-234	569.47	226.	16.	0.009	136.56	7.513E+00	
BI-207	569.70	194.	23.	0.013	88.81	9.093E-01	
TL-208	583.02	186.	31.	0.017	90.31	1.475E+00	
SB-125	600.50	851.	5.	0.003	888.93	1.053E+00	
AG-108M	614.28	840.	16.	0.009	254.30	7.415E-01	
SB-125	635.89	196.	-15.	-0.009	131.73	-5.721E+00	
AG-110M	657.76	7867.	33.	0.018	379.55	1.512E+00	
PM-144	696.54	135.	12.	0.006	213.54	5.314E-01	
NB-94	702.63	149.	-20.	-0.011	129.40	-9.425E-01	
SB-124	722.79	169.	25.	0.014	77.17	1.056E+01	
AG-108M	722.94	193.	25.	0.014	82.24	1.258E+00	
EU-154	723.36	211.	10.	0.006	200.68	2.373E+00	
BI-212	727.17	267.	-27.	-0.015	86.46	-1.688E+01	
PM-146	735.72	117.	-9.	-0.005	266.55	-1.807E+00	
PM-146	747.16	131.	-3.	-0.001	911.38	-3.721E-01	
ZR-95	756.73	140.	-18.	-0.010	141.42	-1.583E+00	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
AG-110M	763.94	117.	24.	0.013	66.57	5.216E+00	
NB-95	765.79	150.	-6.	-0.003	286.78	-2.954E-01	
PA-234M	766.41	157.	-2.	-0.001	763.05	-3.835E+01	
BI-212	785.42	112.	21.	0.012	109.11	8.070E+01	
CS-134	795.87	255.	-12.	-0.007	190.39	-6.967E-01	
TL-210	799.60	241.	-19.	-0.011	115.89	-9.734E-01	
CS-134	801.95	279.	29.	0.016	83.04	1.676E+01	
CO-58	810.78	242.	28.	0.015	81.62	1.402E+00	
La-140	815.77	269.	14.	0.008	172.35	2.961E+00	
Cs-136	818.50	326.	-30.	-0.017	87.22	-1.518E+00	
Co-56	846.77	165.	-21.	-0.012	136.24	-1.091E+00	
TL-208	860.56	175.	-13.	-0.007	225.43	-5.499E+00	
NB-94	871.10	222.	-5.	-0.003	423.79	-2.653E-01	
EU-154	873.23	258.	-18.	-0.010	125.09	-8.006E+00	
PA-234	883.24	226.	26.	0.014	85.60	1.422E+01	
Sc-46	889.28	386.	-37.	-0.020	77.67	-1.970E+00	
Y-88	898.04	155.	19.	0.011	145.87	1.099E+00	
AG-110M	937.49	180.	31.	0.017	96.83	5.043E+00	
PA-234	946.02	205.	5.	0.003	631.14	2.100E+00	
EU-154	996.33	384.	-37.	-0.020	77.20	-2.025E+01	
PA-234M	1001.00	421.	-23.	-0.013	126.45	-1.629E+02	
EU-154	1004.77	396.	35.	0.019	82.65	1.136E+01	
Co-56	1037.84	123.	30.	0.017	85.92	1.278E+01	
Cs-136	1048.07	171.	-12.	-0.007	156.79	-9.096E-01	
RH-106	1050.36	176.	21.	0.012	91.97	8.176E+01	
BI-207	1063.66	165.	-27.	-0.015	108.63	-2.249E+00	
Ga-68	1077.40	112.	10.	0.006	242.62	2.195E+01	
FE-59	1099.25	123.	7.	0.004	345.28	8.152E-01	
Sc-46	1120.55	236.	27.	0.015	83.30	1.709E+00	
Co-56	1238.28	34.	7.	0.004	198.98	7.276E-01	
NA-22	1274.53	11.	9.	0.005	64.59	6.088E-01	
FE-59	1291.60	23.	3.	0.002	339.41	5.472E-01	
TL-210	1313.00	17.	12.	0.007	83.83	4.196E+00	
AG-110M	1384.30	17.	-3.	-0.002	327.45	-9.244E-01	
La-140	1596.21	6.	2.	0.001	304.14	1.760E-01	
SB-124	1690.98	13.	-4.	-0.002	246.63	-6.763E-01	
Co-56	1771.35	41.	-1.	-0.001	911.04	-5.927E-01	
Y-88	1836.06	13.	-9.	-0.005	104.98	-8.910E-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 1 Sigma Counting	MDA Bq/Sample
BE-7	#A	-1.6638E+01	-1.6638E+01	1.032E+02%	5.69E+01
NA-22	#A	6.0876E-01	6.0876E-01	6.459E+01%	1.29E+00
K-40	#	1.2445E+01	1.2445E+01	2.425E+01%	5.40E+00
Sc-46	#A	-1.9700E+00	-1.9700E+00	7.767E+01%	5.07E+00
CR-51	#A	-7.9348E+00	-7.9349E+00	2.261E+02%	5.96E+01
MN-54	#A	1.2912E+00	1.2912E+00	8.400E+01%	2.45E+00
FE-59	#A	6.9908E-01	6.9908E-01	2.421E+02%	6.04E+00
Co-56	#A	6.6358E-01	6.6359E-01	8.533E+01%	3.25E+00
CO-57	#A	8.3373E-01	8.3373E-01	1.012E+02%	2.80E+00
CO-58	#A	1.4015E+00	1.4015E+00	8.162E+01%	3.80E+00
CO-60		1.5027E+02	1.5027E+02	1.639E+00%	2.03E+00
ZN-65	#A	0.0000E+00	0.0000E+00	1.000E+03%	9.93E+00
NB-94	#A	-9.4249E-01	-9.4249E-01	1.294E+02%	2.77E+00
ZR-95	#A	-1.5826E+00	-1.5826E+00	1.414E+02%	5.09E+00
NB-95	#A	-2.9536E-01	-2.9537E-01	2.868E+02%	2.89E+00
RU-103	#A	-2.7076E-01	-2.7077E-01	5.080E+02%	3.37E+00
RH-106	#A	1.1221E+01	1.1221E+01	9.197E+01%	2.71E+01
AG-108M	#A	7.3716E-01	7.3716E-01	8.224E+01%	3.41E+00
AG-110M	#A	1.9315E+00	1.9315E+00	6.657E+01%	5.64E+00
SN-113	#A	-1.0691E+00	-1.0691E+00	2.074E+02%	7.40E+00
SB-124	#A	1.0470E+00	1.0470E+00	7.717E+01%	5.74E+00
SB-125	#A	1.3173E-01	1.3173E-01	6.813E+02%	1.07E+01
I-131	#A	3.7385E-01	3.7387E-01	3.660E+02%	3.34E+00
Gd-153	#A	-2.6030E+00	-2.6030E+00	1.432E+02%	1.24E+01
Ga-68	#A	2.1785E+01	2.1949E+01	2.426E+02%	1.14E+02
Tc-99m	#A	-8.5238E-01	-8.5358E-01	1.569E+02%	4.44E+00
BA-133	A	6.0426E-01	6.0426E-01	4.257E+02%	5.92E+00
CS-134	#A	9.1308E-01	9.1308E-01	8.304E+01%	4.48E+00
CS-137		3.8351E+02	3.8351E+02	1.267E+00%	3.92E+00
CE-139	#A	-3.6074E-01	-3.6074E-01	2.569E+02%	3.10E+00
Ba-140	#A	8.6582E-01	8.6584E-01	5.103E+02%	1.05E+01
La-140	#A	7.2234E-01	7.2236E-01	1.724E+02%	1.24E+00
CE-141	#A	-1.5840E+00	-1.5840E+00	1.538E+02%	8.08E+00
CE-144	#A	0.0000E+00	0.0000E+00	1.000E+03%	3.48E+01
PM-144	#A	5.3140E-01	5.3140E-01	2.135E+02%	2.59E+00
EU-152	#C	8.8022E+00	8.8022E+00	3.305E+01%	8.21E+00
EU-154	#A	2.3231E+00	2.3231E+00	7.959E+01%	5.58E+00
EU-155	#A	-7.8534E-01	-7.8534E-01	6.860E+02%	1.79E+01
HF-181	#A	-2.1968E+00	-2.1968E+00	1.047E+02%	7.63E+00
Ta-182	#A	2.5425E+00	2.5425E+00	1.730E+02%	1.48E+01
Hg-203	#A	1.1606E+00	1.1606E+00	8.817E+01%	3.39E+00
TL-208	#A	1.4746E+00	1.4746E+00	9.031E+01%	3.11E+00
PM-146	#A	2.0204E-01	2.0204E-01	1.060E+03%	5.23E+00

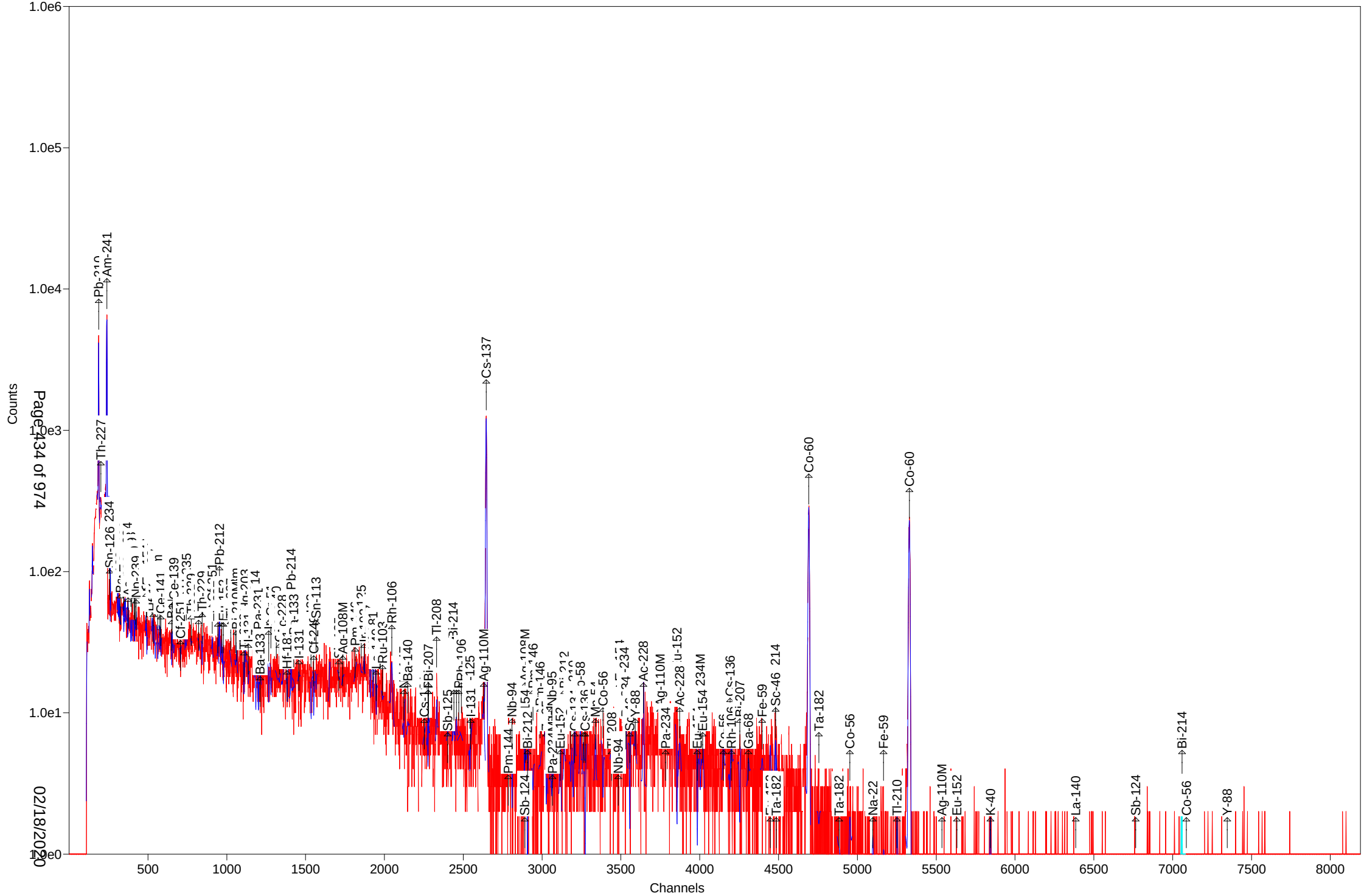
Y-88	#A	7.5476E-02	7.5477E-02	8.986E+01%	1.88E+00
Cd-113m	#A	-2.6584E+03	-2.6584E+03	4.672E+02%	4.18E+04
Cd-109	#A	0.0000E+00	0.0000E+00	1.000E+03%	9.05E+01
Cf-251	#A	-2.1770E+00	-2.1770E+00	2.158E+02%	1.19E+01
Cf-249	#A	-1.9014E+00	-1.9014E+00	1.023E+02%	6.46E+00
Sn-126	#A	-1.9802E+01	-1.9802E+01	2.404E+02%	1.57E+02
PB-210		1.1069E+04	1.1069E+04	1.170E+00%	2.30E+02
PB-212		5.5801E+00	5.5801E+00	2.221E+01%	3.85E+00
PB-214		7.3550E+00	7.3550E+00	2.402E+01%	5.33E+00
BI-207	#A	-2.2490E+00	-2.2490E+00	1.086E+02%	5.15E+00
BI-212	#A	-1.6877E+01	-1.6877E+01	8.646E+01%	4.86E+01
U-235	#A	6.6166E-01	6.6166E-01	1.356E+02%	3.51E+01
BI-214	#A	4.4026E+00	4.4026E+00	7.779E+01%	1.18E+01
BI-210M	#A	1.8449E+00	1.8449E+00	8.672E+01%	5.31E+00
AC-228	#	1.8180E+01	1.8180E+01	2.674E+01%	9.77E+00
TH-227	#A	4.6016E+00	4.6016E+00	1.298E+02%	3.36E+01
TH-229	#A	-4.2887E+00	-4.2887E+00	4.712E+02%	5.13E+01
TH-234	#A	-1.9729E+01	-1.9729E+01	4.597E+01%	6.34E+01
PA-231	#A	0.0000E+00	0.0000E+00	1.000E+03%	1.93E+02
PA-233	#A	0.0000E+00	0.0000E+00	7.071E+02%	1.58E+01
PA-234	#A	6.0566E+00	6.0566E+00	8.560E+01%	1.58E+01
PA-234M	#A	-1.6289E+02	-1.6289E+02	1.265E+02%	6.89E+02
AM-241		1.2591E+03	1.2591E+03	7.442E-01%	1.44E+01
Np-237	#A	-5.5508E+00	-5.5508E+00	1.497E+02%	2.76E+01
Ir-192	#A	-1.9827E-02	-1.9827E-02	1.041E+02%	6.71E+00
Cs-136	#A	-1.5184E+00	-1.5184E+00	8.722E+01%	4.40E+00
Np-239	#A	3.1885E+00	3.1889E+00	1.414E+02%	1.50E+01
Nd-147	#A	-5.4939E+00	-5.4941E+00	1.732E+02%	2.23E+01
TL-210	#A	-9.7343E-01	-9.7343E-01	1.159E+02%	3.78E+00
Kr-85	#A	0.0000E+00	0.0000E+00	1.000E+03%	9.47E+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) 1.289E+04 Bq/Sample
Total Decayed Activity (25.1 to 1999.1 keV) 1.2893921E+04 Bq/Sample

453329_Gamma_LCS 160-453329~2-A. 12_Gamma_20193734.spc.



Sample Description: 453329_Gamma_160-36593-A-1-C
Detector: Detector # 8
Batch ID: 453329
Work Order Number: Gamma
Lot Number: 160-36593-A-1-C

Decay to Time: 12/27/2019 07:44 Live Time: 1800 sec
Acquisition Time: 12/27/2019 07:44:18 Real Time: 1843 sec
Analysis Time: 12/27/2019 08:15 Dead Time: 2.35 %
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_2019-12-07_1517.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	1.579E+00	266.6	4.210E+00	4.211E+00	1.457E+01
NA-22	3.204E-01	150.0	4.806E-01	4.809E-01	1.710E+00
K-40	2.759E+02	5.6	1.548E+01	2.095E+01	1.050E+01
Sc-46	2.896E-01	259.6	7.518E-01	7.520E-01	2.599E+00
CR-51	5.147E+00	201.5	1.037E+01	1.038E+01	3.466E+01
MN-54	2.574E-02	2819.0	7.256E-01	7.256E-01	1.745E+00
FE-59	-2.663E+00	52.9	1.409E+00	1.416E+00	4.862E+00
Co-56	1.661E+00	24.0	3.988E-01	4.078E-01	2.126E+00
CO-57	1.702E-01	247.6	4.214E-01	4.215E-01	1.421E+00
CO-58	1.734E-01	374.8	6.497E-01	6.498E-01	2.265E+00
CO-60	-3.866E-01	252.2	9.752E-01	9.754E-01	1.900E+00
ZN-65	-7.054E-02	3414.7	2.409E+00	2.409E+00	8.313E+00
NB-94	-3.469E-01	358.1	1.242E+00	1.242E+00	1.624E+00
ZR-95	9.360E-01	98.4	9.213E-01	9.225E-01	2.188E+00
NB-95	-7.653E-02	1055.5	8.078E-01	8.078E-01	2.795E+00
RU-103	-3.196E-01	208.7	6.671E-01	6.673E-01	1.609E+00
RH-106	4.374E+00	91.1	3.985E+00	3.991E+00	9.720E+00
AG-108M	8.388E-02	684.5	5.742E-01	5.742E-01	1.402E+00
AG-110M	-1.557E+00	56.8	8.838E-01	8.874E-01	4.517E+00
SN-113	8.010E-01	91.9	7.358E-01	7.369E-01	1.816E+00
SB-124	5.653E-01	199.5	1.128E+00	1.128E+00	5.227E+00
SB-125	1.913E+00	108.3	2.073E+00	2.075E+00	4.345E+00
I-131	1.041E+00	50.1	5.216E-01	5.244E-01	1.536E+00
Gd-153	-4.914E-01	547.9	2.692E+00	2.693E+00	8.980E+00
Ga-68	1.718E+01	145.5	2.499E+01	2.501E+01	5.780E+01
Tc-99m	-3.210E-02	2191.8	7.036E-01	7.036E-01	2.361E+00
BA-133	7.244E-01	245.6	1.779E+00	1.779E+00	5.953E+00
CS-134	-1.210E+00	51.0	6.170E-01	6.202E-01	3.187E+00
CS-137	-1.346E+00	100.8	1.357E+00	1.359E+00	2.795E+00
CE-139	2.777E-01	206.2	5.727E-01	5.733E-01	1.924E+00
Ba-140	1.439E+00	97.0	1.397E+00	1.399E+00	5.535E+00
La-140	6.101E-01	112.1	6.841E-01	6.848E-01	2.237E+00
CE-141	-9.622E-01	87.2	8.389E-01	8.403E-01	2.788E+00

CE-144	0.000E+00	1.#INF	1.833E+00	1.833E+00	1.863E+01
PM-144	-3.714E-01	192.4	7.147E-01	7.149E-01	1.673E+00
EU-152	9.429E-01	73.3	6.916E-01	6.933E-01	4.651E+00
EU-154	2.931E-01	202.3	5.930E-01	5.932E-01	2.942E+00
EU-155	9.361E-01	170.5	1.596E+00	1.597E+00	1.259E+01
HF-181	9.732E-01	91.9	8.946E-01	8.960E-01	1.973E+00
Ta-182	0.000E+00	1.#INF	2.990E+00	2.990E+00	1.113E+01
Hg-203	-6.549E-03	8818.2	5.775E-01	5.775E-01	1.978E+00
TL-208	4.253E+00	15.9	6.748E-01	7.099E-01	1.255E+00
PM-146	3.944E-01	123.0	4.851E-01	4.856E-01	2.024E+00
Y-88	3.094E-01	88.0	2.724E-01	2.730E-01	1.546E+00
Cd-113m	-9.909E+03	86.7	8.594E+03	8.618E+03	2.861E+04
Cd-109	-1.360E+01	165.0	2.243E+01	2.244E+01	7.454E+01
Cf-251	-5.352E-01	495.5	2.652E+00	2.653E+00	6.839E+00
Cf-249	5.158E-01	183.3	9.455E-01	9.458E-01	3.327E+00
Sn-126	6.262E+00	110.4	6.916E+00	6.924E+00	2.301E+01
PB-210	4.538E+01	37.7	1.712E+01	1.733E+01	5.526E+01
PB-212	9.298E+00	10.5	9.724E-01	1.143E+00	2.475E+00
PB-214	4.829E+01	4.1	1.962E+00	3.185E+00	3.141E+00
BI-207	7.824E-02	81.0	6.339E-02	6.351E-02	2.809E+00
BI-212	-8.998E+00	106.8	9.609E+00	9.620E+00	3.241E+01
U-235	4.851E+00	85.9	4.168E+00	4.176E+00	1.413E+01
BI-214	4.554E+01	5.1	2.311E+00	3.308E+00	2.504E+00
BI-210M	-1.335E-01	91.3	1.219E-01	1.222E-01	3.508E+00
AC-228	1.374E+01	12.7	1.752E+00	1.887E+00	2.791E+00
TH-227	3.184E+00	41.2	1.313E+00	1.327E+00	1.770E+01
TH-229	1.050E+01	93.6	9.823E+00	9.859E+00	2.500E+01
TH-234	-2.175E+01	46.1	1.003E+01	1.010E+01	4.931E+01
PA-231	0.000E+00	1.#INF	3.169E+00	3.169E+00	1.026E+02
PA-233	-1.577E+00	179.7	2.833E+00	2.835E+00	9.461E+00
PA-234	2.859E+00	93.3	2.667E+00	2.671E+00	1.138E+01
PA-234M	6.493E+01	81.9	5.318E+01	5.328E+01	3.669E+02
AM-241	1.343E+00	154.2	2.071E+00	2.072E+00	6.909E+00
Np-237	3.747E+00	168.8	6.325E+00	6.329E+00	2.103E+01
Ir-192	2.199E-01	95.1	2.090E-01	2.094E-01	4.289E+00
Cs-136	-8.924E-01	86.9	7.754E-01	7.771E-01	2.598E+00
Np-239	7.404E-01	471.4	3.490E+00	3.491E+00	1.164E+01
Nd-147	-7.863E-01	599.3	4.712E+00	4.713E+00	1.150E+01
TL-210	-2.175E-02	3369.2	7.329E-01	7.329E-01	2.560E+00
Kr-85	1.157E+02	124.7	1.444E+02	1.445E+02	4.876E+02
Total	7.005E+02				

Analyst: Caleb Quinn

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Sample description
453329_Gamma_160-36593-A-1-C

Spectrum Filename: C:\User\SPC\Det8\8_Gamma_20192227.An1

Acquisition information
Start time: 12/27/2019 7:44:18 AM
Live time: 1800
Real time: 1843
Dead time: 2.35 %
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	12/27/2019 7:44:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	8_2019-12-07_1517.PBC 12/7/2019 3:17:53 PM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 20 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 0.1495

***** 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	70.	37.73	1.01	2.005E-02	46.54	4.250	PBC<MDA	PB210
59.54	25.	154.23	1.02	2.881E-02	59.54	35.900	PBC<MDA	AM241
63.29	12.	319.81	1.03	3.093E-02	63.29	3.810	PBC<MDA	TH234
64.28	34.	110.45	1.03	3.146E-02	64.28	9.700	PBC<MDA	Sn126
74.73	268.	10.32	1.03	3.614E-02				
77.24	359.	8.74	1.04	3.703E-02				
86.49	35.	168.83	1.04	3.959E-02	86.49	13.100	PBC<MDA	Np237
					86.54	30.700	1.598E+00	EU155
					86.94	9.040	5.416E+00	Sn126
86.54	35.	170.51	1.04	3.961E-02	86.49	13.100	PBC<MDA	Np237
					86.54	30.700	1.598E+00	EU155
					86.94	9.040	5.416E+00	Sn126
92.89	83.	34.41	1.21	4.083E-02	92.59	5.584	PBC<MDA	TH234
					93.35	5.561	2.039E+01	AC228
106.13	13.	471.40	1.06	4.187E-02	106.13	22.700	PBC<MDA	Np239
122.06	11.	247.59	1.07	4.146E-02	121.78	28.580	PBC<MDA	EU152
					122.06	85.600	1.702E-01	CO57
143.79	25.	131.34	1.09	3.899E-02	143.79	10.960	PBC<MDA	U235
162.66	30.	97.05	1.10	3.593E-02	162.66	6.220	PBC<MDA	Ba140
163.38	27.	110.84	1.10	3.580E-02	163.38	5.080	PBC<MDA	U235
165.85	14.	206.24	1.10	3.629E-02	165.85	79.900	PBC<MDA	CE139
185.72	162.	19.49	1.39	3.329E-02	185.72	54.000	5.021E+00	U235

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
193.51	27.	93.58	1.13	3.226E-02	193.51	4.400	PBC<MDA	TH229
236.03	36.	41.23	1.16	2.768E-02	235.97	12.300	PBC<MDA	TH227
238.77	190.	11.96	1.23	2.743E-02	238.63	43.300	8.877E+00	PB212
242.06	164.	11.27	1.16	2.714E-02	242.00	7.430	4.510E+01	PB214
284.30	37.	50.10	1.19	2.393E-02	284.30	6.140	PBC<MDA	I131
295.35	385.	6.45	1.63	2.322E-02	295.09	19.300	4.702E+01	PB214
					296.00	79.000	1.167E+01	TL210
304.90	19.	175.12	1.21	2.265E-02	304.85	4.290	1.101E+01	Ba140
					304.90	28.000	1.686E+00	BI210M
308.44	20.	185.76	1.21	2.244E-02	308.44	31.750	PBC<MDA	Ir192
320.08	20.	201.52	1.22	2.179E-02	320.08	9.940	PBC<MDA	CR51
333.44	16.	183.29	1.23	2.110E-02	333.44	15.510	PBC<MDA	Cf249
338.67	70.	22.89	1.51	2.085E-02	338.32	12.010	1.545E+01	AC228
344.29	18.	143.99	1.24	2.057E-02	344.29	26.500	PBC<MDA	EU152
345.83	18.	148.83	1.24	2.049E-02	345.83	15.070	PBC<MDA	HF181
351.92	669.	4.78	1.55	2.021E-02	351.93	37.600	4.894E+01	PB214
356.00	16.	245.55	1.25	2.002E-02	356.00	62.050	PBC<MDA	BA133
364.48	2.	895.37	1.25	1.965E-02	364.48	81.700	PBC<MDA	I131
391.69	17.	91.86	1.27	1.855E-02	391.69	64.000	PBC<MDA	SN113
428.32	8.	198.96	1.30	1.728E-02	427.88	29.600	PBC<MDA	SB125
433.94	2.	684.52	1.30	1.708E-02	433.94	90.480	PBC<MDA	AG108M
463.37	11.	146.86	1.32	1.620E-02	463.37	10.470	PBC<MDA	SB125
468.06	13.	95.34	1.33	1.606E-02	468.06	51.750	PBC<MDA	Ir192
477.60	5.	266.57	1.33	1.580E-02	477.60	10.520	PBC<MDA	BE7
482.00	12.	107.95	1.34	1.569E-02	482.00	80.500	PBC<MDA	HF181
487.02	13.	112.13	1.34	1.555E-02	487.02	45.500	PBC<MDA	La140
511.86	17.	96.48	2.61	1.494E-02	511.86	20.000	PBC<MDA	RH106
513.98	13.	124.75	1.36	1.489E-02	513.98	0.430	PBC<MDA	Kr85
563.24	10.	120.67	1.39	1.381E-02	563.24	8.350	PBC<MDA	CS134
569.70	13.	81.02	1.40	1.368E-02	569.32	15.380	3.388E+00	CS134
					569.47	8.200	6.355E+00	PA234
					569.70	97.740	5.333E-01	BI207
583.31	87.	15.86	1.71	1.342E-02	583.02	84.500	4.253E+00	TL208
600.50	13.	280.72	1.42	1.310E-02	600.50	17.860	PBC<MDA	SB125
602.73	9.	379.60	1.42	1.306E-02	602.73	98.260	PBC<MDA	SB124
609.35	489.	5.07	1.74	1.294E-02	609.31	46.090	4.554E+01	BI214
					610.30	5.750	3.656E+02	RU103
621.92	10.	91.11	1.43	1.273E-02	621.92	9.930	PBC<MDA	RH106
635.62	4.	218.75	1.44	1.250E-02	635.89	11.310	PBC<MDA	SB125
657.76	13.	82.90	1.45	1.215E-02	657.76	94.640	PBC<MDA	AG110M
722.79	6.	199.51	1.50	1.123E-02	722.79	10.810	PBC<MDA	SB124
					722.94	90.840	3.449E-01	AG108M
					723.36	20.220	1.550E+00	EU154
724.20	1.	950.66	1.50	1.121E-02	724.20	44.150	PBC<MDA	ZR95
735.72	9.	123.02	1.51	1.107E-02	735.72	22.500	PBC<MDA	PM146
756.73	10.	98.43	1.52	1.081E-02	756.73	54.460	PBC<MDA	ZR95
766.41	17.	81.91	1.53	1.070E-02	765.79	99.790	PBC<MDA	NB95
					766.41	0.294	2.963E+02	PA234M

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
778.92	9.	92.03	1.53	1.055E-02	778.92	12.940	PBC<MDA	EU152
785.42	4.	357.33	1.54	1.048E-02	785.42	1.280	PBC<MDA	BI212
810.78	3.	374.76	1.55	1.020E-02	810.78	99.460	PBC<MDA	CO58
873.23	5.	202.29	1.59	9.584E-03	873.23	12.270	PBC<MDA	EU154
880.53	12.	93.70	1.60	9.517E-03	880.53	6.000	PBC<MDA	PA234
883.24	12.	96.50	1.60	9.493E-03	883.24	9.600	PBC<MDA	PA234
889.28	5.	259.58	1.60	9.438E-03	889.28	99.984	PBC<MDA	Sc46
898.04	10.	88.03	1.61	9.360E-03	898.04	93.700	PBC<MDA	Y88
911.39	60.	14.92	1.78	9.247E-03	911.07	29.000	1.236E+01	AC228
946.02	8.	93.26	1.64	8.957E-03	946.02	13.400	PBC<MDA	PA234
964.11	8.	178.05	1.65	8.814E-03	964.11	14.605	PBC<MDA	EU152
969.25	41.	26.76	2.00	8.776E-03	968.97	17.460	1.487E+01	AC228
1001.00	-2.	531.08	1.67	8.537E-03	1001.00	0.837	PBC<MDA	PA234M
1077.40	7.	145.45	1.72	8.017E-03	1077.40	3.300	PBC<MDA	Ga68
1120.55	121.	9.13	1.52	7.754E-03	1120.29	15.100	5.726E+01	BI214
					1120.55	99.987	8.649E+00	Sc46
					1121.30	34.900	2.479E+01	Ta182
1238.28	48.	24.01	1.81	7.114E-03	1238.28	66.070	5.635E+00	Co56
1274.53	4.	150.00	1.83	6.939E-03	1274.53	99.940	PBC<MDA	NA22
					1274.54	35.190	9.100E-01	EU154
1291.60	11.	87.98	1.84	6.860E-03	1291.60	43.200	PBC<MDA	FE59
1408.00	2.	460.07	1.90	6.366E-03	1408.00	21.005	PBC<MDA	EU152
1460.89	327.	5.61	2.21	6.165E-03	1460.83	10.670	2.759E+02	K40
1596.21	4.	246.86	1.99	5.706E-03	1596.21	95.400	PBC<MDA	La140
1690.98	2.	480.00	2.03	5.425E-03	1690.98	47.790	PBC<MDA	SB124
1764.97	76.	11.82	2.17	5.226E-03	1764.49	15.400	5.235E+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	
298.75	74.73	247.	268.	7.402E+03	10.32	1.034	-	sD
308.78	77.24	312.	359.	9.691E+03	8.74	1.036	-	sD
742.73	185.72	183.	185.	5.547E+03	16.94	1.386	-	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	310.	70.	0.039	37.73	1.012s
TH-227	200.36	50.14	526.	-4.	-0.002	741.05	1.015s
AM-241	237.95	59.54	730.	25.	0.014	154.23	1.022s
TH-234	252.96	63.29	777.	12.	0.007	319.81	1.025s
Sn-126	256.93	64.28	705.	34.	0.019	110.45	1.026s
BA-133	323.77	80.99	1539.	-24.	-0.013	166.94	1.039s
Np-237	345.77	86.49	1726.	35.	0.019	168.83	1.043s
EU-155	345.98	86.54	1761.	35.	0.019	170.51	1.043s
Sn-126	347.57	86.94	1921.	-37.	-0.021	168.32	1.044s
Sn-126	350.09	87.57	1884.	-37.	-0.021	166.64	1.044s
Cd-109	351.97	88.04	1847.	-37.	-0.021	164.95	1.044s
Nd-147	364.21	91.10	1810.	-37.	-0.021	162.95	1.047s
TH-234	370.17	92.59	1825.	-89.	-0.049	46.11	1.048
AC-228	371.38	92.89	222.	83.	0.046	34.41	1.211
Gd-153	389.81	97.50	1800.	-11.	-0.006	547.95	1.052s
Np-239	397.81	99.50	1811.	0.	0.000	1000.00	1.053s
Gd-153	412.62	103.20	1811.	0.	0.000	1000.00	1.056s
Np-239	414.62	103.70	1811.	0.	0.000	1000.00	1.057s
Np-239	424.34	106.13	1776.	13.	0.007	471.40	1.058s
EU-152	486.94	121.78	429.	-33.	-0.018	90.80	1.071s
CO-57	488.06	122.06	357.	11.	0.006	247.59	1.071s
EU-154	492.22	123.10	346.	0.	0.000	1000.00	1.072s
HF-181	531.92	133.02	1000.	0.	0.000	1000.00	1.079s
CE-144	533.98	133.54	1000.	0.	0.000	1000.00	1.080s
HF-181	545.02	136.30	1000.	0.	0.000	1000.00	1.082
CO-57	545.72	136.47	904.	-32.	-0.018	132.60	1.082
U-235	574.97	143.79	517.	25.	0.014	131.34	1.087s
CE-141	581.59	145.44	381.	-32.	-0.018	87.18	1.089s
Ba-140	650.47	162.66	413.	30.	0.017	97.05	1.102
U-235	653.35	163.38	446.	27.	0.015	110.84	1.102
CE-139	663.24	165.85	440.	14.	0.008	206.24	1.104
Cf-251	706.23	176.60	224.	-6.	-0.003	495.53	1.112s
U-235	742.71	185.72	484.	-52.	-0.029	59.61	1.119D
TH-229	773.87	193.51	172.	27.	0.015	93.58	1.125s
U-235	821.17	205.33	205.	-26.	-0.015	119.70	1.134s
TH-229	843.24	210.85	188.	-6.	-0.003	449.28	1.138s
Cf-251	907.84	227.00	204.	-22.	-0.012	128.89	1.151s
TH-227	943.73	235.97	93.	36.	0.020	41.23	1.157D
PB-212	954.37	238.63	116.	199.	0.110	10.46	1.159D
PB-214	967.84	242.00	88.	164.	0.091	11.27	1.162D
EU-152	978.62	244.69	837.	-27.	-0.015	77.33	1.164s
TH-227	1024.81	256.24	140.	-5.	-0.003	196.55	1.172s
Cd-113m	1054.65	263.70	264.	-27.	-0.015	86.74	1.178s
BI-210M	1063.18	265.83	272.	-26.	-0.015	91.33	1.179s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
TL-208	1108.99	277.28	207.	-24.	-0.014	85.73	1.188
I-131	1137.05	284.30	80.	37.	0.021	50.10	1.193s
PB-214	1181.27	295.35	58.	380.	0.211	6.57	1.633s
TL-210	1183.86	296.00	693.	-22.	-0.012	169.69	1.202s
PB-212	1199.98	300.03	671.	-22.	-0.012	166.60	1.205
PA-233	1200.58	300.18	646.	0.	0.000	1000.00	1.205
PA-231	1210.46	302.65	646.	0.	0.000	1000.00	1.207s
BA-133	1211.27	302.85	646.	0.	0.000	1000.00	1.207s
Ba-140	1219.26	304.85	646.	0.	0.000	1000.00	1.208s
BI-210M	1219.45	304.90	558.	19.	0.011	175.12	1.208s
Ir-192	1233.62	308.44	693.	20.	0.011	185.76	1.211
PA-233	1247.91	312.01	822.	-23.	-0.013	179.70	1.214s
Ir-192	1265.82	316.49	969.	-23.	-0.013	194.33	1.217
CR-51	1280.20	320.08	808.	20.	0.011	201.52	1.219s
La-140	1314.91	328.76	470.	-20.	-0.011	200.52	1.226s
Cf-249	1333.63	333.44	422.	16.	0.009	183.29	1.229
AC-228	1354.53	338.67	44.	70.	0.039	22.89	1.509s
Cs-136	1362.15	340.57	438.	0.	0.000	1000.00	1.234s
EU-152	1377.01	344.29	336.	18.	0.010	143.99	1.237s
HF-181	1383.19	345.83	360.	18.	0.010	148.83	1.238
PB-214	1407.55	351.92	75.	669.	0.372	4.78	1.555s
BA-133	1423.87	356.00	783.	16.	0.009	245.55	1.245s
I-131	1457.81	364.48	80.	2.	0.001	895.37	1.252
BA-133	1535.24	383.84	213.	-21.	-0.011	102.33	1.266
SN-113	1566.64	391.69	60.	17.	0.010	91.86	1.271s
SB-125	1711.39	427.88	64.	8.	0.004	198.96	1.297
AG-108M	1735.64	433.94	61.	2.	0.001	684.52	1.301s
PM-146	1815.41	453.88	61.	-3.	-0.001	599.35	1.315s
SB-125	1853.36	463.37	56.	11.	0.006	146.86	1.322
Ir-192	1872.14	468.06	71.	13.	0.007	95.34	1.325
BE-7	1910.28	477.60	77.	5.	0.003	266.57	1.332s
HF-181	1927.89	482.00	82.	12.	0.007	107.95	1.335
La-140	1947.98	487.02	102.	13.	0.007	112.13	1.339s
RU-103	1988.12	497.05	65.	-8.	-0.004	208.73	1.346s
RH-106	2047.36	511.86	126.	17.	0.009	96.48	2.606s
Kr-85	2055.83	513.98	132.	13.	0.007	124.75	1.357s
Nd-147	2123.91	531.00	61.	-3.	-0.001	599.35	1.369s
CS-134	2252.86	563.24	30.	10.	0.005	120.67	1.391s
CS-134	2277.20	569.32	70.	-15.	-0.008	83.00	1.395s
PA-234	2277.80	569.47	85.	0.	0.000	1000.00	1.395s
BI-207	2278.73	569.70	48.	13.	0.007	81.02	1.396s
TL-208	2333.17	583.31	24.	87.	0.048	15.86	1.712s
SB-125	2401.92	600.50	629.	13.	0.007	280.72	1.416
SB-124	2410.85	602.73	642.	9.	0.005	379.60	1.418s
CS-134	2418.76	604.71	651.	0.	0.000	1000.00	1.419s
BI-214	2437.31	609.35	27.	489.	0.272	5.07	1.736s
AG-108M	2457.05	614.28	646.	0.	0.000	1000.00	1.426s
RH-106	2487.60	621.92	17.	10.	0.006	91.11	1.431s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
SB-125	2543.49	635.89	30.	4.	0.002	218.75	1.440s
AG-110M	2630.98	657.76	55.	13.	0.007	82.90	1.455s
CS-137	2646.58	661.66	111.	-25.	-0.014	100.79	1.457
PM-144	2786.11	696.54	47.	-8.	-0.004	192.44	1.480
NB-94	2810.46	702.63	42.	-7.	-0.004	358.09	1.484s
SB-124	2891.09	722.79	77.	6.	0.004	199.51	1.497s
AG-108M	2891.70	722.94	83.	0.	0.000	1000.00	1.498s
EU-154	2893.39	723.36	83.	0.	0.000	1000.00	1.498s
ZR-95	2896.74	724.20	80.	1.	0.001	950.66	1.498s
BI-212	2908.63	727.17	100.	-14.	-0.008	106.79	1.500s
PM-146	2942.83	735.72	23.	9.	0.005	123.02	1.506s
PM-146	2988.59	747.16	56.	-13.	-0.007	125.22	1.513s
ZR-95	3026.87	756.73	19.	10.	0.006	98.43	1.519s
AG-110M	3055.73	763.94	99.	-21.	-0.012	69.75	1.524s
PA-234M	3065.60	766.41	86.	17.	0.009	81.91	1.526s
EU-152	3115.64	778.92	14.	9.	0.005	92.03	1.534s
BI-212	3141.64	785.42	37.	4.	0.002	357.33	1.538s
CS-134	3183.44	795.87	107.	-19.	-0.011	50.99	1.544
CS-134	3207.77	801.95	108.	-6.	-0.003	171.23	1.548s
CO-58	3243.06	810.78	69.	3.	0.002	374.76	1.554s
La-140	3263.04	815.77	72.	0.	0.000	1000.00	1.557s
Cs-136	3273.97	818.50	92.	-16.	-0.009	86.89	1.559s
Co-56	3387.05	846.77	56.	-17.	-0.010	76.08	1.577s
TL-208	3442.23	860.56	42.	-3.	-0.002	461.88	1.585s
NB-94	3484.36	871.10	53.	-16.	-0.009	70.66	1.592s
EU-154	3492.89	873.23	59.	5.	0.003	202.29	1.593s
PA-234	3522.10	880.53	54.	12.	0.006	93.70	1.598s
PA-234	3532.94	883.24	66.	12.	0.007	96.50	1.599s
AG-110M	3538.71	884.68	131.	-19.	-0.011	56.78	1.600s
Sc-46	3557.10	889.28	79.	5.	0.003	259.58	1.603s
Y-88	3592.14	898.04	14.	10.	0.005	88.03	1.608
AC-228	3645.55	911.39	5.	60.	0.033	14.92	1.778
AG-110M	3749.96	937.49	80.	-23.	-0.013	89.12	1.633s
PA-234	3784.07	946.02	10.	8.	0.004	93.26	1.638s
EU-152	3856.43	964.11	89.	8.	0.004	178.05	1.649s
AC-228	3876.97	969.25	14.	41.	0.023	26.76	2.001s
EU-154	3985.31	996.33	84.	-5.	-0.003	263.06	1.668s
PA-234M	4003.99	1001.00	91.	-2.	-0.001	531.08	1.671s
Co-56	4151.36	1037.84	45.	-14.	-0.008	108.68	1.693s
Cs-136	4192.29	1048.07	25.	-1.	-0.001	714.14	1.698s
RH-106	4201.45	1050.36	60.	-18.	-0.010	65.96	1.700s
BI-207	4254.65	1063.66	36.	-6.	-0.003	199.33	1.708s
Ga-68	4309.61	1077.40	20.	7.	0.004	145.45	1.716s
FE-59	4397.02	1099.25	61.	-21.	-0.012	52.93	1.728s
EU-152	4448.32	1112.07	155.	-9.	-0.005	198.45	1.736s
BI-214	4482.23	1120.55	0.	121.	0.067	9.13	1.524
Sc-46	4482.22	1120.55	127.	-5.	-0.003	311.79	1.740
Ta-182	4485.22	1121.30	122.	0.	0.000	1000.00	1.741

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
CO-60	4692.97	1173.24	38.	-17.	-0.009	66.96	1.770s
Ta-182	4756.23	1189.05	40.	-6.	-0.003	235.31	1.779
Co-56	4953.16	1238.28	16.	48.	0.026	24.01	1.806
NA-22	5098.16	1274.53	16.	4.	0.002	150.00	1.826
EU-154	5098.20	1274.54	20.	0.	0.000	1000.00	1.826
FE-59	5166.43	1291.60	16.	11.	0.006	87.98	1.835s
TL-210	5252.05	1313.00	32.	-16.	-0.009	85.56	1.847s
CO-60	5330.06	1332.50	19.	-5.	-0.003	252.25	1.857s
AG-110M	5537.25	1384.30	27.	-8.	-0.004	157.30	1.884s
EU-152	5632.07	1408.00	16.	2.	0.001	460.07	1.896s
K-40	5843.62	1460.89	4.	327.	0.181	5.61	2.209
La-140	6384.93	1596.21	17.	4.	0.002	246.86	1.990s
SB-124	6764.03	1690.98	11.	2.	0.001	480.00	2.034s
BI-214	7059.99	1764.97	2.	76.	0.042	11.82	2.167
Co-56	7085.51	1771.35	97.	-10.	-0.006	140.16	2.070s

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	1.5793E+00				5.31E+01	
			477.60	1.579E+00	?(	1.457E+01 2.67E+02 1.05E+01	G
NA-22	C	3.2042E-01				9.50E+02	
			1274.53	3.204E-01	?(	1.710E+00 1.50E+02 9.99E+01	G
K-40	N	2.7586E+02				4.66E+11	
			1460.83	2.759E+02	(P	1.050E+01 5.61E+00 1.07E+01	G
Sc-46	F	2.8963E-01				8.38E+01	
			889.28	2.896E-01	&(	2.599E+00 2.60E+02 1.00E+02	G
			1120.55	-3.703E-01	+	3.961E+00 3.12E+02 1.00E+02	G
CR-51	F	5.1466E+00				2.77E+01	
			320.08	5.147E+00	*(P	3.466E+01 2.02E+02 9.94E+00	G
MN-54	C	2.5740E-02				3.12E+02	
			834.85	2.574E-02	%(P	1.745E+00 2.82E+03 1.00E+02	G
FE-59	F	-2.6629E+00				4.45E+01	
			1099.25	-2.663E+00	?(P	4.862E+00 5.29E+01 5.65E+01	G
			1291.60	2.062E+00	+	4.002E+00 8.80E+01 4.32E+01	G

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Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Co-56	C 1.6608E+00					7.73E+01	
		846.77	-9.669E-01	?(P	2.126E+00	7.61E+01	9.99E+01 G
		1238.28	5.635E+00	?(P	2.545E+00	2.40E+01	6.61E+01 G
		1037.84	-6.650E+00	+	1.614E+01	1.09E+02	1.41E+01 G
		1771.35	-7.014E+00	+	3.344E+01	1.40E+02	1.55E+01 A
CO-57	C 1.7021E-01					2.72E+02	
		122.06	1.702E-01	?(	1.421E+00	2.48E+02	8.56E+01 G
		136.47	-4.209E+00	+	1.858E+01	1.33E+02	1.07E+01 G
CO-58	C 1.7337E-01					7.09E+01	
		810.78	1.734E-01	?(	2.265E+00	3.75E+02	9.95E+01 G
CO-60	F -3.8660E-01					1.93E+03	
		1332.50	-3.866E-01	?(P	1.900E+00	2.52E+02	1.00E+02 G
		1173.24	-1.261E+00	+ P	2.343E+00	6.70E+01	9.99E+01 G
ZN-65	F -7.0541E-02					2.44E+02	
		1115.55	-7.054E-02	%(	8.313E+00	3.41E+03	5.06E+01 G
NB-94	I -3.4686E-01					7.41E+06	
		702.63	-3.469E-01	?(P	1.624E+00	3.58E+02	9.79E+01 G
		871.10	-9.064E-01	+	2.128E+00	7.07E+01	9.99E+01 G
ZR-95	I 9.3598E-01					6.40E+01	
		756.73	9.360E-01	?(P	2.188E+00	9.84E+01	5.45E+01 G
		724.20	1.496E-01	-	4.971E+00	9.51E+02	4.42E+01 G
NB-95	I -7.6533E-02					6.40E+01	
		765.79	-7.653E-02	%(	2.795E+00	1.06E+03	9.98E+01 G
RU-103	I -3.1961E-01					3.93E+01	
		497.05	-3.196E-01	?(	1.609E+00	2.09E+02	9.09E+01 G
		610.30	-1.121E+00	%	9.066E+01	2.40E+03	5.75E+00 GA
RH-106	I 4.3738E+00					3.74E+02	
		621.92	4.374E+00	?(	9.720E+00	9.11E+01	9.93E+00 G
		1050.36	-7.706E+01	+	1.680E+02	6.60E+01	1.56E+00 G
		511.86	3.162E+00	?	1.023E+01	9.65E+01	2.00E+01 GA
AG-108M	C 8.3878E-02					1.53E+05	
		433.94	8.388E-02	&(	1.402E+00	6.85E+02	9.05E+01 G
		722.94	0.000E+00	-	2.459E+00	1.00E+03	9.08E+01 G
		614.28	0.000E+00	-	5.826E+00	1.00E+03	8.98E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
AG-110M	F	-1.5565E+00					2.50E+02	
			884.68	-1.557E+00	?(P	4.517E+00	5.68E+01	7.27E+01 G
			657.76	6.465E-01	+	1.798E+00	8.29E+01	9.46E+01 G
			937.49	-4.067E+00	+	7.952E+00	8.91E+01	3.44E+01 G
			1384.30	-2.714E+00	+	9.479E+00	1.57E+02	2.43E+01 G
			763.94	-4.928E+00	+	1.139E+01	6.97E+01	2.23E+01 G
SN-113	F	8.0102E-01					1.15E+02	
			391.69	8.010E-01	&(	1.816E+00	9.19E+01	6.40E+01 G
SB-124	F	5.6533E-01					6.02E+01	
			602.73	4.100E-01	?(	5.227E+00	3.80E+02	9.83E+01 G
			1690.98	3.572E-01	?(	3.943E+00	4.80E+02	4.78E+01 G
			722.79	2.898E+00	?(	1.991E+01	2.00E+02	1.08E+01 G
SB-125	I	1.9131E+00					1.01E+03	
			427.88	8.691E-01	?(	4.345E+00	1.99E+02	2.96E+01 G
			600.50	3.015E+00	(P	2.839E+01	2.81E+02	1.79E+01 G
			635.89	1.441E+00	?(	1.115E+01	2.19E+02	1.13E+01 G
			463.37	3.495E+00	(	1.235E+01	1.47E+02	1.05E+01 G
I-131	I	1.0411E+00					8.02E+00	
			364.48	6.793E-02	(P	1.536E+00	8.95E+02	8.17E+01 G
			284.30	1.399E+01	*(	1.678E+01	5.01E+01	6.14E+00 G
			636.97	1.035E-01	&	1.995E+01	5.36E+03	7.17E+00 G
Gd-153	F	-4.9138E-01					2.42E+02	
			97.50	-4.914E-01	?(	8.980E+00	5.48E+02	3.00E+01 G
			103.20	0.000E+00	&	1.227E+01	1.00E+03	2.18E+01 G
Ga-68	C	1.7180E+01					4.71E-02	
			1077.40	1.718E+01	(	5.780E+01	1.45E+02	3.30E+00 G
Tc-99m	I	-3.2102E-02					2.51E-01	
			140.51	-3.210E-02	%(	2.361E+00	2.19E+03	8.93E+01 G
BA-133	F	7.2444E-01					3.85E+03	
			356.00	7.244E-01	?(	5.953E+00	2.46E+02	6.20E+01 G
			302.85	0.000E+00	-	1.613E+01	1.00E+03	1.83E+01 G
			383.84	-6.802E+00	+	2.329E+01	1.02E+02	8.94E+00 GA
			80.99	-1.013E+00	+ P	7.920E+00	1.67E+02	3.41E+01 GA
CS-134	I	-1.2102E+00					7.54E+02	
			795.87	-1.210E+00	?(P	3.187E+00	5.10E+01	8.55E+01 G
			604.71	0.000E+00	+	5.313E+00	1.00E+03	9.76E+01 G
			569.32	-3.958E+00	+	1.100E+01	8.30E+01	1.54E+01 G
			801.95	-3.590E+00	+ P	3.172E+01	1.71E+02	8.69E+00 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
			563.24	4.657E+00	+	1.367E+01	1.21E+02	8.35E+00 G
CS-137	I	-1.3465E+00					1.10E+04	
			661.66	-1.346E+00	&(P	2.795E+00	1.01E+02	8.52E+01 G
CE-139	F	2.7769E-01					1.38E+02	
			165.85	2.777E-01	&(	1.924E+00	2.06E+02	7.99E+01 G
Ba-140	I	1.4393E+00					1.28E+01	
			537.26	-1.058E-01	%(	5.535E+00	2.12E+03	2.44E+01 G
			162.66	7.498E+00	(	2.423E+01	9.70E+01	6.22E+00 G
			304.85	0.000E+00	-	6.927E+01	1.00E+03	4.29E+00 G
La-140	I	6.1008E-01					1.28E+01	
			1596.21	4.082E-01	?(	2.237E+00	2.47E+02	9.54E+01 G
			487.02	1.033E+00	?(	3.913E+00	1.12E+02	4.55E+01 G
			328.76	-2.588E+00	+ P	1.331E+01	2.01E+02	2.03E+01 G
			815.77	0.000E+00	-	9.934E+00	1.00E+03	2.33E+01 G
CE-141	I	-9.6223E-01					3.25E+01	
			145.44	-9.622E-01	?(	2.788E+00	8.72E+01	4.82E+01 G
PM-144	C	-3.7138E-01					3.63E+02	
			696.54	-3.714E-01	?(	1.673E+00	1.92E+02	9.90E+01 G
			618.06	-4.228E-02	& P	5.313E+00	2.58E+03	9.91E+01 G
EU-152	F	9.4291E-01					4.94E+03	
			121.78	-1.541E+00	?(	4.651E+00	9.08E+01	2.86E+01 G
			344.29	1.860E+00	+	8.984E+00	1.44E+02	2.65E+01 G
			1112.07	-4.696E+00	+	3.169E+01	1.98E+02	1.36E+01 G
			778.92	3.758E+00	?(	8.197E+00	9.20E+01	1.29E+01 G
			964.11	3.309E+00	&(	2.018E+01	1.78E+02	1.46E+01 G
			244.69	-7.334E+00	+ P	3.745E+01	7.73E+01	7.58E+00 G
			1408.00	8.310E-01	?	8.870E+00	4.60E+02	2.10E+01 GA
EU-154	I	2.9312E-01					3.14E+03	
			123.10	0.000E+00	?(	2.942E+00	1.00E+03	4.08E+01 G
			1274.54	0.000E+00	?(	5.358E+00	1.00E+03	3.52E+01 G
			723.36	0.000E+00	?(	1.105E+01	1.00E+03	2.02E+01 G
			873.23	2.591E+00	?(	1.816E+01	2.02E+02	1.23E+01 G
			1004.77	-1.208E-01	%	1.704E+01	4.04E+03	1.80E+01 G
			996.33	-3.058E+00	+	2.777E+01	2.63E+02	1.06E+01 G
EU-155	I	9.3610E-01					1.81E+03	
			105.31	-2.279E-02	%(P	1.259E+01	1.13E+04	2.12E+01 G
			86.54	1.598E+00	&(	9.060E+00	1.71E+02	3.07E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
HF-181	F	9.7315E-01					4.24E+01	
			482.00	5.403E-01	&(	1.973E+00	1.08E+02	8.05E+01 G
			133.02	0.000E+00	-	4.765E+00	1.00E+03	4.33E+01 G
			345.83	3.285E+00	?(	1.640E+01	1.49E+02	1.51E+01 G
			136.30	0.000E+00	-	3.562E+01	1.00E+03	5.85E+00 G
Hg-203	F	-6.5487E-03					4.66E+01	
			279.20	-6.549E-03	&(	1.978E+00	8.82E+03	8.15E+01 G
TL-208	N	4.2533E+00					6.98E+02	
			583.02	4.253E+00	(P	1.255E+00	1.59E+01	8.45E+01 G
			277.28	-8.815E+00	-	2.517E+01	8.57E+01	6.31E+00 G
			860.56	-1.383E+00	-	1.517E+01	4.62E+02	1.24E+01 G
PM-146	C	3.9438E-01					2.02E+03	
			453.88	-1.384E-01	?(	2.024E+00	5.99E+02	6.50E+01 G
			747.16	-1.944E+00	+	5.620E+00	1.25E+02	3.40E+01 G
			735.72	1.933E+00	?(	5.626E+00	1.23E+02	2.25E+01 G
Y-88	F	3.0944E-01					1.07E+02	
			1836.06	2.224E-02	%(P	1.546E+00	2.81E+03	9.92E+01 G
			898.04	6.135E-01	(	1.276E+00	8.80E+01	9.37E+01 G
Cd-113m		-9.9085E+03					5.33E+03	
			263.70	-9.908E+03	&(	2.861E+04	8.67E+01	6.00E-03 K
Cd-109	F	-1.3598E+01					4.53E+02	
			88.04	-1.360E+01	&(	7.454E+01	1.65E+02	3.79E+00 G
Cf-251	T	-5.3524E-01					3.28E+05	
			176.60	-5.352E-01	&(	6.839E+00	4.96E+02	1.70E+01 G
			227.00	-6.801E+00	&	2.141E+01	1.29E+02	6.30E+00 GA
Cf-249	T	5.1584E-01					1.28E+05	
			387.95	-1.346E-03	%(	3.327E+00	7.23E+04	6.60E+01 G
			333.44	2.717E+00	?(	1.671E+01	1.83E+02	1.55E+01 G
Sn-126		6.2620E+00					3.65E+07	
			87.57	-1.377E+00	-	7.626E+00	1.67E+02	3.75E+01 GA
			64.28	6.262E+00	?(	2.301E+01	1.10E+02	9.70E+00 G
			86.94	-5.729E+00	+	3.205E+01	1.68E+02	9.04E+00 GA
PB-210	N	4.5381E+01					8.14E+03	
			46.54	4.538E+01	*(P	5.526E+01	3.77E+01	4.25E+00 G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

PB-212   N   9.2977E+00                                     6.98E+02
                         238.63 9.298E+00  (P 2.475E+00 1.05E+01 4.33E+01 G
                         300.03-1.637E+01 -   9.111E+01 1.67E+02 3.28E+00 GA

PB-214   N   4.8289E+01                                     5.84E+05
                         351.93 4.894E+01  (P 3.141E+00 4.78E+00 3.76E+01 G
                         295.09 4.702E+01 *(P 4.748E+00 6.57E+00 1.93E+01 G
                         242.00 4.510E+01     1.281E+01 1.13E+01 7.43E+00 GA

BI-207   C   7.8237E-02                                     1.18E+04
                        1063.66-5.188E-01 &(P 2.809E+00 1.99E+02 7.45E+01 G
                         569.70 5.333E-01 &(  1.449E+00 8.10E+01 9.77E+01 G

BI-212   N  -8.9978E+00                                     6.98E+02
                         727.17-8.998E+00  (  3.241E+01 1.07E+02 7.55E+00 G
                         785.42 1.519E+01 &   1.292E+02 3.57E+02 1.28E+00 GA

U-235    N   4.8507E+00                                     2.57E+11
                         143.79 3.223E+00  (P 1.413E+01 1.31E+02 1.10E+01 G
                         205.33-9.390E+00 + P 2.498E+01 1.20E+02 5.01E+00 G
                         163.38 8.362E+00 &(P 3.090E+01 1.11E+02 5.08E+00 G
                                                          Energy duplication
                         185.72-1.613E+00 - P 3.252E+00 5.96E+01 5.40E+01 GA

BI-214   N   4.5544E+01                                     5.84E+05
                         609.31 4.554E+01  (P 2.504E+00 5.07E+00 4.61E+01 G
                        1120.29 5.726E+01 + P 3.497E+00 9.13E+00 1.51E+01 G
                        1764.49 5.235E+01 + P 6.606E+00 1.18E+01 1.54E+01 G

BI-210M  T  -1.3348E-01                                     1.10E+09
                         265.83-1.153E+00 ?(  3.508E+00 9.13E+01 5.00E+01 G
                         304.90 1.686E+00 ?(  9.886E+00 1.75E+02 2.80E+01 G

AC-228   N   1.3744E+01                                     2.10E+03
                         911.07 1.236E+01  (  2.791E+00 1.49E+01 2.90E+01 G
                         968.97 1.487E+01  (  7.304E+00 2.68E+01 1.75E+01 G
                         338.32 1.545E+01 *(  7.484E+00 2.29E+01 1.20E+01 G
                          93.35 2.039E+01 +   1.764E+01 3.44E+01 5.56E+00 XA

TH-227   N   3.1837E+00                                     7.95E+03
                         256.24-1.588E+00 &(P 1.770E+01 1.97E+02 7.00E+00 G
                         235.97 5.899E+00  (  7.776E+00 4.12E+01 1.23E+01 G
                          50.14-1.344E+00 +   3.359E+01 7.41E+02 8.00E+00 G

TH-229   N   1.0497E+01                                     2.68E+06
                         193.51 1.050E+01 &(  2.500E+01 9.36E+01 4.40E+00 G
                         210.85-3.691E+00 -   4.097E+01 4.49E+02 2.99E+00 G
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Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-234	N	-2.1752E+01					1.63E+12	
			92.59	-2.175E+01	(P	4.931E+01	4.61E+01	5.58E+00 G
			63.29	5.837E+00	+ P	6.252E+01	3.20E+02	3.81E+00 G
PA-233	C	-1.5767E+00					7.82E+08	
			312.01	-1.577E+00	?(	9.461E+00	1.80E+02	3.60E+01 G
			300.18	0.000E+00	+	4.735E+01	1.00E+03	6.20E+00 G
PA-234	N	2.8594E+00					1.63E+12	
			131.29	-3.040E-01	%(	1.138E+01	1.12E+03	1.80E+01 G
			946.02	3.727E+00	?(	8.076E+00	9.33E+01	1.34E+01 G
			569.47	0.000E+00	-	2.261E+01	1.00E+03	8.20E+00 G
			883.24	7.580E+00	?(	2.469E+01	9.65E+01	9.60E+00 G
			880.53	1.137E+01	? P	3.597E+01	9.37E+01	6.00E+00 GA
PA-234M	N	6.4927E+01					1.63E+12	
			1001.00	-1.636E+01	&(P	3.669E+02	5.31E+02	8.37E-01 G
			766.41	2.963E+02	?(	8.114E+02	8.19E+01	2.94E-01 G
AM-241	T	1.3426E+00					1.58E+05	
			59.54	1.343E+00	(P	6.909E+00	1.54E+02	3.59E+01 G
Np-237	F	3.7466E+00					2.14E+06	
			86.49	3.747E+00	&(	2.103E+01	1.69E+02	1.31E+01 G
Ir-192	F	2.1985E-01					7.40E+01	
			316.49	-6.613E-01	(	4.289E+00	1.94E+02	8.70E+01 G
			468.06	8.709E-01	(	2.799E+00	9.53E+01	5.18E+01 G
			308.44	1.574E+00	(	9.778E+00	1.86E+02	3.18E+01 G
Cs-136	F	-8.9240E-01					1.30E+01	
			818.50	-8.924E-01	?(	2.598E+00	8.69E+01	1.00E+02 G
			1048.07	-8.460E-02	+	2.200E+00	7.14E+02	8.00E+01 G
			340.57	0.000E+00	+	5.724E+00	1.00E+03	4.69E+01 G
Np-239	T	7.4040E-01					2.36E+00	
			103.70	0.000E+00	&	1.114E+01	1.00E+03	2.40E+01 X
			106.13	7.404E-01	?(	1.164E+01	4.71E+02	2.27E+01 G
			99.50	0.000E+00	&	1.794E+01	1.00E+03	1.50E+01 X
Nd-147		-7.8626E-01					1.11E+01	
			531.00	-7.863E-01	&(	1.150E+01	5.99E+02	1.30E+01 G
			91.10	-1.800E+00	+	9.747E+00	1.63E+02	2.83E+01 G
TL-210	N	-2.1753E-02					5.84E+05	
			799.60	-2.175E-02	%(	2.560E+00	3.37E+03	9.90E+01 G
			296.00	-6.707E-01	+	3.803E+00	1.70E+02	7.90E+01 G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          1313.00-6.151E+00 +   1.137E+01 8.56E+01 2.10E+01 GA

Kr-85    I   1.1573E+02                                        3.92E+03
                          513.98 1.157E+02 ?(  4.876E+02 1.25E+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	310.	70.	0.039	37.73	4.538E+01	P
AM-241	59.54	730.	25.	0.014	154.23	1.343E+00	P
TH-234	63.29	777.	12.	0.007	319.81	5.837E+00	P
Sn-126	64.28	705.	34.	0.019	110.45	6.262E+00	
BA-133	80.99	1539.	-24.	-0.013	166.94	-1.013E+00	P
Np-237	86.49	1726.	35.	0.019	168.83	3.747E+00	
EU-155	86.54	1761.	35.	0.019	170.51	1.598E+00	
Sn-126	86.94	1921.	-37.	-0.021	168.32	-5.729E+00	
Sn-126	87.57	1884.	-37.	-0.021	166.64	-1.377E+00	
Cd-109	88.04	1847.	-37.	-0.021	164.95	-1.360E+01	
Nd-147	91.10	1810.	-37.	-0.021	162.95	-1.800E+00	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
TH-234	92.59	1825.	-89.	-0.049	46.11	-2.175E+01	P
Gd-153	97.50	1800.	-11.	-0.006	547.95	-4.914E-01	
Np-239	106.13	1776.	13.	0.007	471.40	7.404E-01	
EU-152	121.78	429.	-33.	-0.018	90.80	-1.541E+00	
CO-57	122.06	357.	11.	0.006	247.59	1.702E-01	
CO-57	136.47	904.	-32.	-0.018	132.60	-4.209E+00	
U-235	143.79	517.	25.	0.014	131.34	3.223E+00	P
CE-141	145.44	381.	-32.	-0.018	87.18	-9.622E-01	
Ba-140	162.66	413.	30.	0.017	97.05	7.498E+00	
U-235	163.38	446.	27.	0.015	110.84	8.362E+00	P
CE-139	165.85	440.	14.	0.008	206.24	2.777E-01	
Cf-251	176.60	224.	-6.	-0.003	495.53	-5.352E-01	
U-235	185.72	484.	-52.	-0.029	59.61	-1.613E+00	P
TH-229	193.51	172.	27.	0.015	93.58	1.050E+01	
U-235	205.33	205.	-26.	-0.015	119.70	-9.390E+00	P
TH-229	210.85	188.	-6.	-0.003	449.28	-3.691E+00	
Cf-251	227.00	204.	-22.	-0.012	128.89	-6.801E+00	
EU-152	244.69	837.	-27.	-0.015	77.33	-7.334E+00	P
Cd-113m	263.70	264.	-27.	-0.015	86.74	-9.908E+03	
BI-210M	265.83	272.	-26.	-0.015	91.33	-1.153E+00	
I-131	284.30	80.	37.	0.021	50.10	1.399E+01	
TL-210	296.00	693.	-22.	-0.012	169.69	-6.707E-01	
BI-210M	304.90	558.	19.	0.011	175.12	1.686E+00	
PA-233	312.01	822.	-23.	-0.013	179.70	-1.577E+00	
CR-51	320.08	808.	20.	0.011	201.52	5.147E+00	P
La-140	328.76	470.	-20.	-0.011	200.52	-2.588E+00	P
Cf-249	333.44	422.	16.	0.009	183.29	2.717E+00	
EU-152	344.29	336.	18.	0.010	143.99	1.860E+00	
HF-181	345.83	360.	18.	0.010	148.83	3.285E+00	
BA-133	356.00	783.	16.	0.009	245.55	7.244E-01	
I-131	364.48	80.	2.	0.001	895.37	6.793E-02	P
BA-133	383.84	213.	-21.	-0.011	102.33	-6.802E+00	
SN-113	391.69	60.	17.	0.010	91.86	8.010E-01	
AG-108M	433.94	61.	2.	0.001	684.52	8.388E-02	
PM-146	453.88	61.	-3.	-0.001	599.35	-1.384E-01	
BE-7	477.60	77.	5.	0.003	266.57	1.579E+00	
HF-181	482.00	82.	12.	0.007	107.95	5.403E-01	
La-140	487.02	102.	13.	0.007	112.13	1.033E+00	
RU-103	497.05	65.	-8.	-0.004	208.73	-3.196E-01	
RH-106	511.86	126.	17.	0.009	96.48	3.162E+00	
Kr-85	513.98	132.	13.	0.007	124.75	1.157E+02	
Nd-147	531.00	61.	-3.	-0.001	599.35	-7.863E-01	
CS-134	563.24	30.	10.	0.005	120.67	4.657E+00	
CS-134	569.32	70.	-15.	-0.008	83.00	-3.958E+00	
BI-207	569.70	48.	13.	0.007	81.02	5.333E-01	
SB-124	602.73	642.	9.	0.005	379.60	4.100E-01	
RH-106	621.92	17.	10.	0.006	91.11	4.374E+00	
AG-110M	657.76	55.	13.	0.007	82.90	6.465E-01	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
CS-137	661.66	111.	-25.	-0.014	100.79	-1.346E+00	P
PM-144	696.54	47.	-8.	-0.004	192.44	-3.714E-01	
NB-94	702.63	42.	-7.	-0.004	358.09	-3.469E-01	P
SB-124	722.79	77.	6.	0.004	199.51	2.898E+00	
ZR-95	724.20	80.	1.	0.001	950.66	1.496E-01	
BI-212	727.17	100.	-14.	-0.008	106.79	-8.998E+00	
PM-146	735.72	23.	9.	0.005	123.02	1.933E+00	
PM-146	747.16	56.	-13.	-0.007	125.22	-1.944E+00	
ZR-95	756.73	19.	10.	0.006	98.43	9.360E-01	P
AG-110M	763.94	99.	-21.	-0.012	69.75	-4.928E+00	
PA-234M	766.41	86.	17.	0.009	81.91	2.963E+02	
EU-152	778.92	14.	9.	0.005	92.03	3.758E+00	
BI-212	785.42	37.	4.	0.002	357.33	1.519E+01	
CS-134	795.87	107.	-19.	-0.011	50.99	-1.210E+00	P
CS-134	801.95	108.	-6.	-0.003	171.23	-3.590E+00	P
CO-58	810.78	69.	3.	0.002	374.76	1.734E-01	
Cs-136	818.50	92.	-16.	-0.009	86.89	-8.924E-01	
Co-56	846.77	56.	-17.	-0.010	76.08	-9.669E-01	P
NB-94	871.10	53.	-16.	-0.009	70.66	-9.064E-01	
EU-154	873.23	59.	5.	0.003	202.29	2.591E+00	
PA-234	880.53	54.	12.	0.006	93.70	1.137E+01	P
PA-234	883.24	66.	12.	0.007	96.50	7.580E+00	
AG-110M	884.68	131.	-19.	-0.011	56.78	-1.557E+00	P
Sc-46	889.28	79.	5.	0.003	259.58	2.896E-01	
Y-88	898.04	14.	10.	0.005	88.03	6.135E-01	
AG-110M	937.49	80.	-23.	-0.013	89.12	-4.067E+00	
PA-234	946.02	10.	8.	0.004	93.26	3.727E+00	
EU-152	964.11	89.	8.	0.004	178.05	3.309E+00	
EU-154	996.33	84.	-5.	-0.003	263.06	-3.058E+00	
PA-234M	1001.00	91.	-2.	-0.001	531.08	-1.636E+01	P
Co-56	1037.84	45.	-14.	-0.008	108.68	-6.650E+00	
Cs-136	1048.07	25.	-1.	-0.001	714.14	-8.460E-02	
RH-106	1050.36	60.	-18.	-0.010	65.96	-7.706E+01	
BI-207	1063.66	36.	-6.	-0.003	199.33	-5.188E-01	P
Ga-68	1077.40	20.	7.	0.004	145.45	1.718E+01	
FE-59	1099.25	61.	-21.	-0.012	52.93	-2.663E+00	P
EU-152	1112.07	155.	-9.	-0.005	198.45	-4.696E+00	
Sc-46	1120.55	127.	-5.	-0.003	311.79	-3.703E-01	
CO-60	1173.24	38.	-17.	-0.009	66.96	-1.261E+00	P
Ta-182	1189.05	40.	-6.	-0.003	235.31	-2.793E+00	
Co-56	1238.28	16.	48.	0.026	24.01	5.635E+00	P
NA-22	1274.53	16.	4.	0.002	150.00	3.204E-01	
FE-59	1291.60	16.	11.	0.006	87.98	2.062E+00	
TL-210	1313.00	32.	-16.	-0.009	85.56	-6.151E+00	
CO-60	1332.50	19.	-5.	-0.003	252.25	-3.866E-01	P
AG-110M	1384.30	27.	-8.	-0.004	157.30	-2.714E+00	
EU-152	1408.00	16.	2.	0.001	460.07	8.310E-01	
La-140	1596.21	17.	4.	0.002	246.86	4.082E-01	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
SB-124	1690.98	11.	2.	0.001	480.00	3.572E-01	
Co-56	1771.35	97.	-10.	-0.006	140.16	-7.014E+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	1.5793E+00	1.5793E+00	2.666E+02%	1.46E+01
NA-22	#A	3.2042E-01	3.2042E-01	1.500E+02%	1.71E+00
K-40		2.7586E+02	2.7586E+02	5.610E+00%	1.05E+01
Sc-46	#A	2.8963E-01	2.8963E-01	2.596E+02%	2.60E+00
CR-51	#A	5.1466E+00	5.1466E+00	2.015E+02%	3.47E+01
MN-54	#A	2.5740E-02	2.5740E-02	2.819E+03%	1.75E+00
FE-59	#A	-2.6629E+00	-2.6629E+00	5.293E+01%	4.86E+00
Co-56	#A	1.6608E+00	1.6608E+00	2.401E+01%	2.13E+00
CO-57	#A	1.7021E-01	1.7021E-01	2.476E+02%	1.42E+00
CO-58	#A	1.7337E-01	1.7337E-01	3.748E+02%	2.27E+00
CO-60	#A	-3.8660E-01	-3.8660E-01	2.522E+02%	1.90E+00
ZN-65	#A	-7.0541E-02	-7.0541E-02	3.415E+03%	8.31E+00
NB-94	#A	-3.4686E-01	-3.4686E-01	3.581E+02%	1.62E+00
ZR-95	#A	9.3597E-01	9.3598E-01	9.843E+01%	2.19E+00
NB-95	#A	-7.6533E-02	-7.6533E-02	1.056E+03%	2.79E+00
RU-103	#A	-3.1961E-01	-3.1961E-01	2.087E+02%	1.61E+00
RH-106	#A	4.3738E+00	4.3738E+00	9.111E+01%	9.72E+00
AG-108M	#A	8.3878E-02	8.3878E-02	6.845E+02%	1.40E+00
AG-110M	#A	-1.5565E+00	-1.5565E+00	5.678E+01%	4.52E+00
SN-113	#A	8.0102E-01	8.0102E-01	9.186E+01%	1.82E+00
SB-124	#A	5.6533E-01	5.6533E-01	1.995E+02%	5.23E+00
SB-125	A	1.9131E+00	1.9131E+00	1.083E+02%	4.34E+00
I-131	#A	1.0411E+00	1.0411E+00	5.010E+01%	1.54E+00
Gd-153	#A	-4.9138E-01	-4.9138E-01	5.479E+02%	8.98E+00
Ga-68	#A	1.7127E+01	1.7180E+01	1.455E+02%	5.78E+01
Tc-99m	#A	-3.2083E-02	-3.2102E-02	2.192E+03%	2.36E+00
BA-133	#A	7.2444E-01	7.2444E-01	2.456E+02%	5.95E+00
CS-134	#A	-1.2102E+00	-1.2102E+00	5.099E+01%	3.19E+00
CS-137	#A	-1.3465E+00	-1.3465E+00	1.008E+02%	2.79E+00
CE-139	#A	2.7769E-01	2.7769E-01	2.062E+02%	1.92E+00
Ba-140	#A	1.4393E+00	1.4393E+00	9.705E+01%	5.53E+00
La-140	#A	6.1007E-01	6.1008E-01	1.121E+02%	2.24E+00
CE-141	#A	-9.6222E-01	-9.6223E-01	8.718E+01%	2.79E+00
CE-144	#A	0.0000E+00	0.0000E+00	1.000E+03%	1.86E+01
PM-144	#A	-3.7138E-01	-3.7138E-01	1.924E+02%	1.67E+00
EU-152	#A	9.4291E-01	9.4291E-01	7.334E+01%	4.65E+00
EU-154	#A	2.9312E-01	2.9312E-01	2.023E+02%	2.94E+00
EU-155	#A	9.3610E-01	9.3610E-01	1.705E+02%	1.26E+01

HF-181 #A	9.7315E-01	9.7315E-01	9.193E+01%		1.97E+00
Ta-182 #A	0.0000E+00	0.0000E+00	1.000E+03%		1.11E+01
Hg-203 #A	-6.5487E-03	-6.5487E-03	8.818E+03%		1.98E+00
TL-208 #	4.2533E+00	4.2533E+00	1.586E+01%		1.25E+00
PM-146 #A	3.9438E-01	3.9438E-01	1.230E+02%		2.02E+00
Y-88 #A	3.0944E-01	3.0944E-01	8.803E+01%		1.55E+00
Cd-113m#A	-9.9085E+03	-9.9085E+03	8.674E+01%		2.86E+04
Cd-109 #A	-1.3598E+01	-1.3598E+01	1.650E+02%		7.45E+01
Cf-251 #A	-5.3524E-01	-5.3524E-01	4.955E+02%		6.84E+00
Cf-249 #A	5.1584E-01	5.1584E-01	1.833E+02%		3.33E+00
Sn-126 #A	6.2620E+00	6.2620E+00	1.104E+02%		2.30E+01
PB-210 #A	4.5381E+01	4.5381E+01	3.773E+01%		5.53E+01
PB-212	9.2977E+00	9.2977E+00	1.046E+01%		2.47E+00
PB-214	4.8289E+01	4.8289E+01	4.062E+00%		3.14E+00
BI-207 #A	7.8237E-02	7.8237E-02	8.102E+01%		2.81E+00
BI-212 #A	-8.9978E+00	-8.9978E+00	1.068E+02%		3.24E+01
U-235 #A	4.8507E+00	4.8507E+00	8.593E+01%		1.41E+01
BI-214	4.5544E+01	4.5544E+01	5.075E+00%		2.50E+00
BI-210M#A	-1.3348E-01	-1.3348E-01	9.133E+01%		3.51E+00
AC-228	1.3744E+01	1.3744E+01	1.275E+01%		2.79E+00
TH-227 A	3.1837E+00	3.1837E+00	4.123E+01%		1.77E+01
TH-229 #A	1.0497E+01	1.0497E+01	9.358E+01%		2.50E+01
TH-234 #A	-2.1752E+01	-2.1752E+01	4.611E+01%		4.93E+01
PA-231 #A	0.0000E+00	0.0000E+00	1.000E+03%		1.03E+02
PA-233 #A	-1.5767E+00	-1.5767E+00	1.797E+02%		9.46E+00
PA-234 #A	2.8594E+00	2.8594E+00	9.326E+01%		1.14E+01
PA-234M#A	6.4927E+01	6.4927E+01	8.191E+01%		3.67E+02
AM-241 #A	1.3426E+00	1.3426E+00	1.542E+02%		6.91E+00
Np-237 #A	3.7466E+00	3.7466E+00	1.688E+02%		2.10E+01
Ir-192 A	2.1985E-01	2.1985E-01	9.508E+01%		4.29E+00
Cs-136 #A	-8.9239E-01	-8.9240E-01	8.689E+01%		2.60E+00
Np-239 #A	7.4036E-01	7.4040E-01	4.714E+02%		1.16E+01
Nd-147 #A	-7.8625E-01	-7.8626E-01	5.993E+02%		1.15E+01
TL-210 #A	-2.1753E-02	-2.1753E-02	3.369E+03%		2.56E+00
Kr-85 #A	1.1573E+02	1.1573E+02	1.247E+02%		4.88E+02

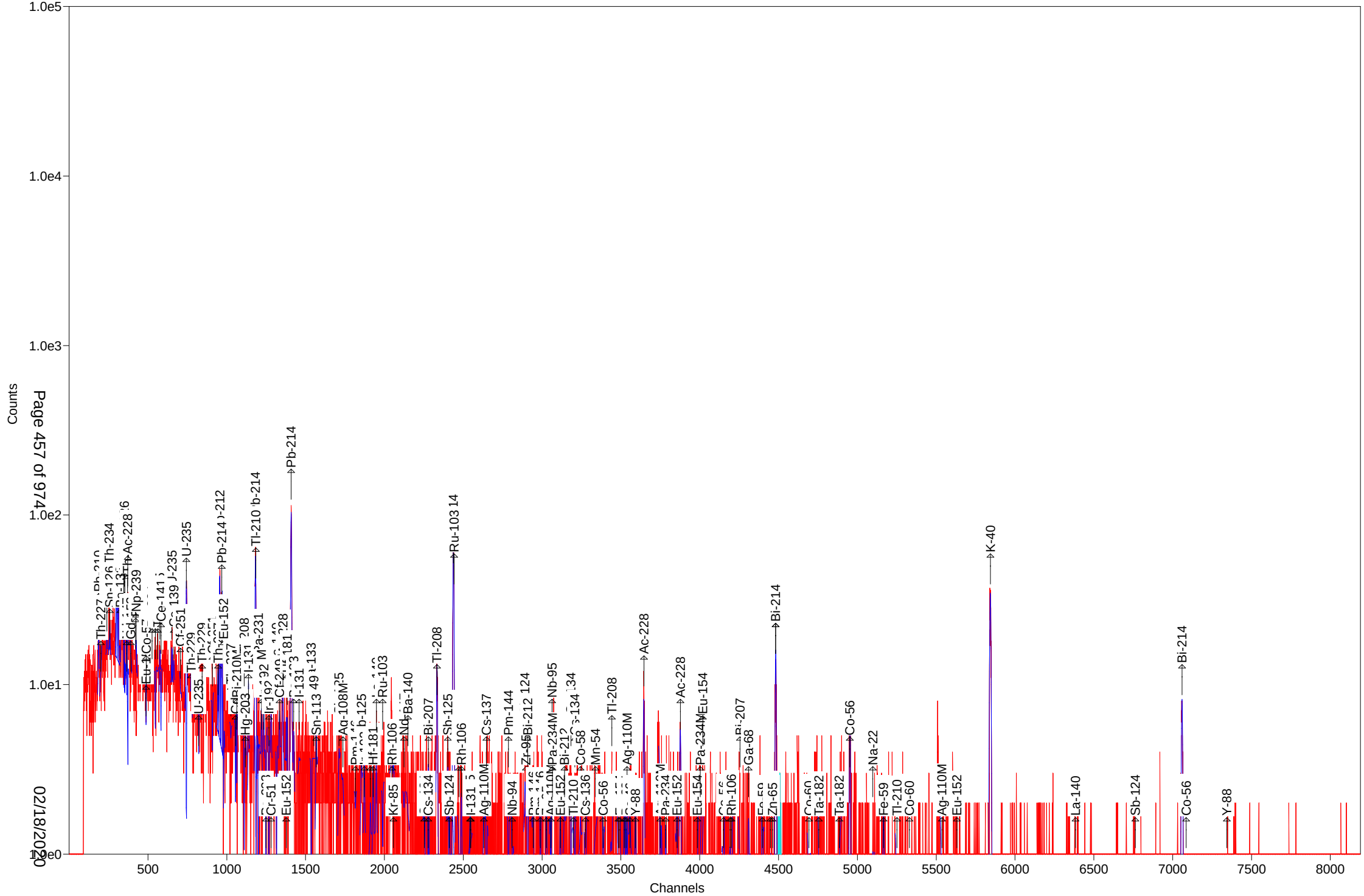
- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line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

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

Total Activity (37.5 to 2000.0 keV) 3.970E+02 Bq/Sample
Total Decayed Activity (37.5 to 2000.0 keV) 3.9699042E+02 Bq/Sample

The library has energies which are not separable.

453329_Gamma_160-36593-A-1-C. 8_Gamma_20192227.spc.



Test America St. Louis Spectrum ID: 5_Gamma_20193406

Sample Description: 453329_Gamma_160-36593-A-1-D DU
Detector: Detector # 5
Batch ID: 453329
Work Order Number: Gamma
Lot Number: 160-36593-A-1-D DU

Decay to Time: 12/27/2019 08:17 Live Time: 1800 sec
Acquisition Time: 12/27/2019 08:18:36 Real Time: 1807 sec
Analysis Time: 12/27/2019 08:49 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_2019-12-07_1448.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	-7.635E+00	64.3	4.906E+00	4.922E+00	2.318E+01
NA-22	-8.415E-01	90.9	7.646E-01	7.657E-01	2.600E+00
K-40	3.318E+02	5.6	1.856E+01	2.516E+01	1.076E+01
Sc-46	-2.200E-02	70.7	1.556E-02	1.560E-02	3.324E+00
CR-51	-3.121E+00	245.1	7.651E+00	7.653E+00	2.037E+01
MN-54	6.921E-01	95.7	6.627E-01	6.636E-01	1.565E+00
FE-59	-2.205E+00	86.9	1.916E+00	1.919E+00	4.282E+00
Co-56	3.273E+00	25.9	8.476E-01	8.641E-01	1.588E+00
CO-57	-2.769E-01	95.4	2.641E-01	2.645E-01	1.370E+00
CO-58	3.800E-01	192.7	7.321E-01	7.324E-01	2.535E+00
CO-60	8.353E-01	116.0	9.689E-01	9.698E-01	2.193E+00
ZN-65	-2.123E+00	140.1	2.975E+00	2.977E+00	1.006E+01
NB-94	-4.942E-02	1276.1	6.307E-01	6.307E-01	1.816E+00
ZR-95	-1.112E+00	128.4	1.428E+00	1.429E+00	3.467E+00
NB-95	3.924E-01	226.5	8.889E-01	8.891E-01	3.054E+00
RU-103	-1.706E-01	347.3	5.925E-01	5.926E-01	1.830E+00
RH-106	6.600E-01	300.0	1.980E+00	1.980E+00	6.054E+01
AG-108M	5.189E-01	117.4	6.093E-01	6.099E-01	1.524E+00
AG-110M	5.651E-01	107.8	6.089E-01	6.096E-01	3.895E+00
SN-113	-1.036E+00	114.9	1.190E+00	1.191E+00	3.993E+00
SB-124	-3.739E-01	248.5	9.292E-01	9.294E-01	6.143E+00
SB-125	2.810E+00	64.0	1.797E+00	1.803E+00	4.773E+00
I-131	5.743E-01	97.5	5.601E-01	5.608E-01	1.454E+00
Gd-153	5.349E-01	233.0	1.246E+00	1.247E+00	4.210E+00
Ga-68	6.030E+00	554.2	3.342E+01	3.342E+01	7.842E+01
Tc-99m	4.390E-01	125.4	5.504E-01	5.510E-01	1.840E+00
BA-133	-5.559E-01	357.8	1.989E+00	1.989E+00	6.676E+00
CS-134	1.437E+00	64.9	9.324E-01	9.353E-01	2.768E+00
CS-137	6.378E-02	1077.7	6.874E-01	6.874E-01	2.428E+00
CE-139	1.849E-01	316.1	5.845E-01	5.848E-01	1.975E+00
Ba-140	-5.786E-01	474.1	2.743E+00	2.744E+00	7.004E+00
La-140	-8.906E-01	86.7	7.723E-01	7.738E-01	3.073E+00
CE-141	-4.243E-01	241.5	1.025E+00	1.025E+00	3.446E+00

CE-144	0.000E+00	1.#INF	1.959E+00	1.959E+00	1.527E+01
PM-144	-1.574E-01	454.8	7.159E-01	7.160E-01	1.780E+00
EU-152	2.352E+00	49.9	1.173E+00	1.179E+00	3.997E+00
EU-154	2.005E+00	84.3	1.690E+00	1.693E+00	2.904E+00
EU-155	-1.914E+00	151.0	2.891E+00	2.893E+00	9.643E+00
HF-181	-1.052E+00	96.9	1.019E+00	1.020E+00	3.409E+00
Ta-182	4.193E+00	60.2	2.525E+00	2.534E+00	9.521E+00
Hg-203	-5.471E-01	124.8	6.826E-01	6.833E-01	1.757E+00
TL-208	3.457E+00	24.3	8.386E-01	8.576E-01	1.631E+00
PM-146	1.497E+00	52.2	7.815E-01	7.853E-01	1.940E+00
Y-88	9.670E-02	829.3	8.020E-01	8.020E-01	1.914E+00
Cd-113m	-9.073E+03	94.7	8.597E+03	8.616E+03	2.874E+04
Cd-109	0.000E+00	1.#INF	1.811E+01	1.811E+01	6.082E+01
Cf-251	-2.417E+00	116.4	2.812E+00	2.820E+00	7.537E+00
Cf-249	1.346E-01	763.3	1.027E+00	1.027E+00	3.520E+00
Sn-126	-6.134E+00	99.1	6.079E+00	6.088E+00	2.025E+01
PB-210	3.973E+01	31.1	1.236E+01	1.258E+01	3.257E+01
PB-212	9.924E+00	10.3	1.022E+00	1.207E+00	2.464E+00
PB-214	4.935E+01	4.4	2.174E+00	3.362E+00	3.227E+00
BI-207	7.405E-01	112.9	8.358E-01	8.366E-01	1.983E+00
BI-212	-4.272E-01	2414.8	1.032E+01	1.032E+01	3.621E+01
U-235	2.494E+00	167.9	4.189E+00	4.191E+00	1.509E+01
BI-214	4.907E+01	5.2	2.568E+00	3.619E+00	2.737E+00
BI-210M	-1.052E+00	103.7	1.091E+00	1.093E+00	3.654E+00
AC-228	1.915E+01	14.0	2.682E+00	2.855E+00	3.592E+00
TH-227	-1.210E+00	638.2	7.722E+00	7.722E+00	2.015E+01
TH-229	-7.308E-01	299.6	2.189E+00	2.190E+00	3.012E+01
TH-234	6.047E+00	91.4	5.525E+00	5.536E+00	1.841E+01
PA-231	1.597E+01	132.1	2.110E+01	2.111E+01	7.098E+01
PA-233	-1.941E+00	106.5	2.067E+00	2.070E+00	8.564E+00
PA-234	1.764E+00	99.7	1.759E+00	1.761E+00	9.187E+00
PA-234M	4.157E+01	282.2	1.173E+02	1.173E+02	3.782E+02
AM-241	-4.332E-01	338.5	1.466E+00	1.466E+00	4.809E+00
Np-237	0.000E+00	1.#INF	5.801E+00	5.801E+00	1.932E+01
Ir-192	-4.624E-02	72.3	3.342E-02	3.353E-02	2.281E+00
Cs-136	5.909E-01	123.6	7.303E-01	7.311E-01	2.497E+00
Np-239	1.651E+00	153.3	2.532E+00	2.534E+00	8.452E+00
Nd-147	-5.837E+00	93.3	5.446E+00	5.456E+00	1.347E+01
TL-210	3.896E-01	179.9	7.011E-01	7.015E-01	2.643E+00
Kr-85	-7.379E+01	235.2	1.735E+02	1.736E+02	5.930E+02
Total	6.033E+02				

Analyst: Caleb Quinn

Sample description
453329_Gamma_160-36593-A-1-D DU

Spectrum Filename: C:\User\SPC\Det5\5_Gamma_20193406.An1

Acquisition information
Start time: 12/27/2019 8:18:36 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	12/27/2019 8:17:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	5_2019-12-07_1448.PBC 12/7/2019 2:48:46 PM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 23 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 0.1015

***** 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
46.57	54.	31.10	0.93	1.790E-02	46.54	4.250	3.973E+01	PB210
63.29	-14.	183.62	0.80	2.712E-02	63.29	3.810	PBC<MDA	TH234
74.76	247.	9.87	0.81	3.150E-02				
77.09	369.	6.95	0.81	3.219E-02				
87.16	93.	21.42	0.83	3.447E-02	86.49	13.100	1.146E+01	Np237
					86.54	30.700	4.887E+00	EU155
					86.94	9.040	1.656E+01	Sn126
					87.57	37.500	3.980E+00	Sn126
89.74	53.	34.11	0.83	3.488E-02				
92.58	21.	91.37	0.83	3.527E-02	92.59	5.584	PBC<MDA	TH234
93.34	30.	143.01	0.83	3.536E-02	93.35	5.561	PBC<MDA	AC228
97.50	10.	233.00	0.84	3.577E-02	97.50	30.000	PBC<MDA	Gd153
106.13	24.	153.33	0.84	3.620E-02	106.13	22.700	PBC<MDA	Np239
121.78	21.	106.10	0.86	3.584E-02	121.78	28.580	PBC<MDA	EU152
					122.06	85.600	3.760E-01	CO57
123.10	13.	171.66	0.86	3.575E-02	123.10	40.790	PBC<MDA	EU154
136.47	6.	477.96	0.88	3.457E-02	136.30	5.850	PBC<MDA	HF181
					136.47	10.680	9.531E-01	CO57
140.51	23.	125.39	0.88	3.411E-02	140.51	89.300	PBC<MDA	Tc99m
143.79	14.	213.04	0.88	3.371E-02	143.79	10.960	PBC<MDA	U235
165.85	8.	316.05	0.91	3.133E-02	165.85	79.900	PBC<MDA	CE139
186.09	137.	14.72	0.77	2.849E-02	185.72	54.000	4.934E+00	U235

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
205.33	8.	259.66	0.94	2.626E-02	205.33	5.010	PBC<MDA	U235
210.85	4.	499.65	0.95	2.569E-02	210.85	2.990	PBC<MDA	TH229
238.58	179.	10.31	0.98	2.320E-02	238.63	43.300	9.916E+00	PB212
242.00	174.	10.75	0.98	2.293E-02	242.00	7.430	5.669E+01	PB214
295.16	342.	7.25	1.17	1.945E-02	295.09	19.300	5.062E+01	PB214
					296.00	79.000	1.240E+01	TL210
302.65	16.	132.06	1.04	1.904E-02	302.65	2.880	PBC<MDA	PA231
					302.85	18.330	2.511E+00	BA133
328.76	15.	100.03	1.07	1.778E-02	328.76	20.300	PBC<MDA	La140
338.02	50.	33.01	0.60	1.736E-02	338.32	12.010	1.342E+01	AC228
344.29	17.	116.73	1.08	1.711E-02	344.29	26.500	PBC<MDA	EU152
351.89	554.	5.00	1.08	1.680E-02	351.93	37.600	4.870E+01	PB214
364.48	14.	97.51	1.10	1.632E-02	364.48	81.700	PBC<MDA	I131
383.84	16.	115.12	1.12	1.563E-02	383.84	8.940	PBC<MDA	BA133
387.95	2.	763.33	1.12	1.549E-02	387.95	66.000	PBC<MDA	Cf249
427.88	10.	144.68	1.16	1.428E-02	427.88	29.600	PBC<MDA	SB125
433.94	12.	117.44	1.16	1.411E-02	433.94	90.480	PBC<MDA	AG108M
453.88	25.	52.20	1.18	1.360E-02	453.88	65.000	PBC<MDA	PM146
463.37	12.	102.42	1.19	1.336E-02	463.37	10.470	PBC<MDA	SB125
468.06	12.	103.42	1.20	1.325E-02	468.06	51.750	PBC<MDA	Ir192
511.86	77.	16.89	2.48	1.230E-02	511.86	20.000	1.747E+01	RH106
563.24	12.	92.64	1.28	1.135E-02	563.24	8.350	PBC<MDA	CS134
582.91	53.	23.03	0.81	1.104E-02	583.02	84.500	3.159E+00	TL208
609.26	433.	5.23	1.35	1.063E-02	609.31	46.090	4.907E+01	BI214
					610.30	5.750	3.939E+02	RU103
635.89	10.	73.39	1.34	1.026E-02	635.89	11.310	PBC<MDA	SB125
657.76	2.	624.50	1.36	9.974E-03	657.76	94.640	PBC<MDA	AG110M
747.16	8.	139.21	1.44	8.965E-03	747.16	34.000	PBC<MDA	PM146
765.79	6.	226.51	1.45	8.781E-03	765.79	99.790	PBC<MDA	NB95
					766.41	0.294	1.333E+02	PA234M
766.41	2.	590.23	1.45	8.776E-03	765.79	99.790	PBC<MDA	NB95
					766.41	0.294	5.024E+01	PA234M
778.92	11.	49.85	1.46	8.657E-03	778.92	12.940	PBC<MDA	EU152
785.42	1.	992.39	1.47	8.597E-03	785.42	1.280	PBC<MDA	BI212
795.87	12.	90.82	1.48	8.503E-03	795.87	85.530	PBC<MDA	CS134
799.60	6.	179.94	1.48	8.469E-03	799.60	98.960	PBC<MDA	TL210
810.78	6.	192.66	1.49	8.371E-03	810.78	99.460	PBC<MDA	CO58
818.50	9.	123.58	1.50	8.305E-03	818.50	100.000	PBC<MDA	Cs136
834.85	10.	95.75	1.51	8.168E-03	834.85	99.980	PBC<MDA	MN54
846.77	7.	138.29	1.52	8.072E-03	846.77	99.935	PBC<MDA	Co56
873.23	1.	866.03	1.54	7.866E-03	873.23	12.270	PBC<MDA	EU154
880.53	11.	90.01	1.54	7.812E-03	880.53	6.000	PBC<MDA	PA234
883.24	11.	99.69	1.55	7.791E-03	883.24	9.600	PBC<MDA	PA234
884.68	3.	357.12	1.55	7.781E-03	884.68	72.680	PBC<MDA	AG110M
898.04	-1.	758.02	1.56	7.684E-03	898.04	93.700	PBC<MDA	Y88
910.66	76.	14.01	1.95	7.591E-03	911.07	29.000	1.915E+01	AC228
968.83	30.	27.08	0.37	7.209E-03	968.97	17.460	1.324E+01	AC228
996.33	13.	84.27	1.63	7.042E-03	996.33	10.600	PBC<MDA	EU154

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1001.00	4.	282.18	1.64	7.014E-03	1001.00	0.837	PBC<MDA	PA234M
1037.84	10.	104.36	1.66	6.805E-03	1037.84	14.130	PBC<MDA	Co56
1050.36	3.	300.00	1.67	6.736E-03	1050.36	1.560	PBC<MDA	RH106
1063.66	7.	112.88	1.68	6.666E-03	1063.66	74.500	PBC<MDA	BI207
1077.40	2.	554.15	1.69	6.594E-03	1077.40	3.300	PBC<MDA	Ga68
1120.09	12.	120.12	1.72	6.381E-03	1120.29	15.100	PBC<MDA	BI214
					1120.55	99.987	PBC<MDA	Sc46
1120.55	10.	95.95	1.72	6.380E-03	1120.29	15.100	PBC<MDA	BI214
					1120.55	99.987	9.033E-01	Sc46
1121.90	13.	84.79	1.72	6.376E-03	1121.30	34.900	PBC<MDA	Ta182
1189.05	11.	85.57	1.77	6.069E-03	1189.05	16.200	PBC<MDA	Ta182
1238.28	49.	25.90	1.80	5.866E-03	1238.28	66.070	6.977E+00	Co56
1291.60	9.	88.62	1.84	5.661E-03	1291.60	43.200	PBC<MDA	FE59
1332.50	8.	116.00	1.87	5.514E-03	1332.50	99.980	PBC<MDA	CO60
1384.30	7.	107.76	1.90	5.340E-03	1384.30	24.290	PBC<MDA	AG110M
1408.00	9.	85.44	1.91	5.264E-03	1408.00	21.005	PBC<MDA	EU152
1460.71	325.	5.60	1.49	5.104E-03	1460.83	10.670	3.318E+02	K40
1690.98	1.	427.57	2.08	4.511E-03	1690.98	47.790	PBC<MDA	SB124
1764.52	73.	12.26	1.24	4.351E-03	1764.49	15.400	6.033E+01	BI214
1836.06	1.	829.35	2.15	4.208E-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 Channel	Centroid Energy	Background Counts	Net Area Counts	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide
298.66	74.77	173.	247.	7.838E+03	9.87	0.813	- D
308.00	77.10	144.	369.	1.146E+04	6.95	0.815	- D
358.58	89.74	171.	37.	1.072E+03	52.04	0.828	- sD
744.33	186.09	88.	137.	4.804E+03	14.72	0.770	-

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	185.83	46.57	81.	54.	0.030	31.10	0.933
AM-241	237.72	59.54	266.	-7.	-0.004	338.48	0.797s
TH-234	252.74	63.29	318.	-14.	-0.008	183.62	0.801
Sn-126	256.71	64.28	413.	-30.	-0.016	99.11	0.802s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BA-133	323.61	80.99	454.	-34.	-0.019	76.39	0.819
Np-237	345.63	86.49	1089.	0.	0.000	158.30	0.825A
EU-155	345.84	86.54	1024.	-32.	-0.018	143.90	0.825s
Sn-126	347.43	86.94	935.	-32.	-0.018	137.57	0.825s
Sn-126	349.95	87.57	883.	-32.	-0.018	133.70	0.826s
Cd-109	351.83	88.04	915.	0.	0.000	1000.00	0.826A
Nd-147	364.08	91.10	915.	0.	0.000	1000.00	0.829s
TH-234	370.05	92.59	180.	21.	0.012	91.37	0.831D
AC-228	373.09	93.35	927.	30.	0.017	143.01	0.832s
Gd-153	389.70	97.50	285.	10.	0.006	233.00	0.836s
Np-239	397.71	99.50	295.	0.	0.000	1000.00	0.838s
Gd-153	412.52	103.20	449.	-26.	-0.014	118.25	0.842
Np-239	414.52	103.70	475.	-26.	-0.014	121.43	0.842s
EU-155	420.98	105.31	784.	-26.	-0.015	151.05	0.844s
Np-239	424.25	106.13	689.	24.	0.014	153.33	0.845
EU-152	486.90	121.78	232.	21.	0.012	106.10	0.861s
CO-57	488.03	122.06	245.	-24.	-0.013	95.39	0.861s
EU-154	492.18	123.10	249.	13.	0.007	171.66	0.862s
PA-234	524.99	131.29	477.	-18.	-0.010	176.38	0.871s
HF-181	531.91	133.02	494.	0.	0.000	1000.00	0.872
CE-144	533.97	133.54	494.	0.	0.000	1000.00	0.873
HF-181	545.02	136.30	494.	0.	0.000	1000.00	0.876s
CO-57	545.72	136.47	455.	6.	0.004	477.96	0.876s
Tc-99m	561.88	140.51	416.	23.	0.013	125.39	0.880s
U-235	574.99	143.79	439.	14.	0.008	213.04	0.883s
CE-141	581.61	145.44	437.	-12.	-0.007	241.48	0.885s
Ba-140	650.54	162.66	366.	-25.	-0.014	112.18	0.902s
U-235	653.42	163.38	392.	-5.	-0.003	422.65	0.903s
CE-139	663.32	165.85	343.	8.	0.005	316.05	0.905s
Cf-251	706.34	176.60	200.	-22.	-0.012	116.36	0.916
U-235	742.85	185.72	332.	-23.	-0.013	111.95	0.925
TH-229	774.03	193.51	183.	-7.	-0.004	330.63	0.933s
U-235	821.35	205.33	131.	8.	0.004	259.66	0.945s
TH-229	843.44	210.85	147.	4.	0.002	499.65	0.950s
TH-227	943.98	235.97	787.	-23.	-0.013	177.60	0.975s
PB-212	954.64	238.63	81.	179.	0.100	10.30	0.978D
PB-214	968.10	242.00	87.	174.	0.097	10.73	0.981D
EU-152	978.89	244.69	767.	-23.	-0.013	171.88	0.984s
TH-227	1025.11	256.24	128.	-3.	-0.002	638.16	0.995s
Cd-113m	1054.97	263.70	186.	-21.	-0.012	94.75	1.002s
BI-210M	1063.50	265.83	207.	-20.	-0.011	103.75	1.005s
Hg-203	1117.00	279.20	114.	-16.	-0.009	124.77	1.017s
I-131	1137.41	284.30	121.	-20.	-0.011	103.14	1.022
PB-214	1180.88	295.16	63.	342.	0.190	7.25	1.172
TL-210	1184.24	296.00	654.	10.	0.005	382.22	1.034s
PA-231	1210.86	302.65	209.	16.	0.009	132.06	1.040s
BA-133	1211.66	302.85	325.	-21.	-0.012	121.01	1.040s
Ba-140	1219.66	304.85	315.	-21.	-0.012	118.96	1.042s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-210M	1219.85	304.90	336.	-21.	-0.012	122.81	1.042s
Ir-192	1234.03	308.44	358.	-22.	-0.012	126.15	1.046
PA-233	1248.32	312.01	464.	-23.	-0.013	106.51	1.049s
Ir-192	1266.25	316.49	182.	-19.	-0.011	100.99	1.053s
CR-51	1280.63	320.08	186.	-10.	-0.006	245.13	1.057s
La-140	1315.35	328.76	62.	15.	0.008	100.03	1.065s
Cf-249	1334.08	333.44	66.	-3.	-0.002	509.90	1.070s
AC-228	1352.42	338.02	55.	50.	0.028	33.01	0.599s
EU-152	1377.49	344.29	184.	17.	0.009	116.73	1.080s
HF-181	1383.66	345.83	137.	-19.	-0.010	91.02	1.082s
PB-214	1407.91	351.89	53.	554.	0.308	5.00	1.085
BA-133	1424.36	356.00	678.	-10.	-0.006	357.80	1.091s
I-131	1458.32	364.48	48.	14.	0.008	97.51	1.099
BA-133	1535.78	383.84	162.	16.	0.009	115.12	1.117s
Cf-249	1552.22	387.95	178.	2.	0.001	763.33	1.121
SN-113	1567.19	391.69	213.	-18.	-0.010	114.86	1.125
SB-125	1711.99	427.88	52.	10.	0.006	144.68	1.158s
AG-108M	1736.25	433.94	48.	12.	0.007	117.44	1.164s
PM-146	1816.05	453.88	36.	25.	0.014	52.20	1.182s
SB-125	1854.01	463.37	67.	12.	0.007	102.42	1.191s
Ir-192	1872.79	468.06	77.	12.	0.007	103.42	1.195s
BE-7	1910.94	477.59	137.	-19.	-0.010	64.26	1.204s
HF-181	1928.56	482.00	172.	-20.	-0.011	96.86	1.208s
La-140	1948.65	487.02	57.	-16.	-0.009	74.05	1.212s
RU-103	1988.80	497.05	57.	-4.	-0.002	347.29	1.221s
RH-106	2048.06	511.86	47.	77.	0.043	16.89	2.485
Kr-85	2056.53	513.98	132.	-7.	-0.004	235.17	1.237s
Nd-147	2124.62	531.00	56.	-16.	-0.009	93.29	1.252s
Ba-140	2149.67	537.26	52.	-3.	-0.002	474.15	1.258
CS-134	2253.60	563.24	28.	12.	0.007	92.64	1.280s
CS-134	2277.94	569.32	48.	-12.	-0.007	84.65	1.286s
PA-234	2278.54	569.47	66.	-3.	-0.002	411.34	1.286s
BI-207	2279.47	569.70	69.	0.	0.000	1000.00	1.286s
TL-208	2331.43	582.69	28.	58.	0.032	24.26	0.815s
SB-125	2402.69	600.50	611.	-14.	-0.008	87.13	1.313s
SB-124	2411.61	602.73	597.	-14.	-0.008	253.36	1.315s
CS-134	2419.53	604.71	583.	-14.	-0.008	250.14	1.317s
BI-214	2437.72	609.26	21.	433.	0.240	5.23	1.347
RU-103	2441.89	610.30	550.	6.	0.003	540.50	1.322s
AG-108M	2457.82	614.28	556.	0.	0.000	1000.00	1.325s
PM-144	2472.94	618.06	580.	-15.	-0.008	148.68	1.328s
SB-125	2544.26	635.89	24.	10.	0.006	73.39	1.344s
I-131	2548.61	636.97	52.	-13.	-0.007	81.72	1.345s
AG-110M	2631.76	657.76	53.	2.	0.001	624.50	1.362s
PM-144	2786.90	696.54	35.	-3.	-0.001	454.83	1.395s
SB-124	2891.88	722.79	72.	-11.	-0.006	116.34	1.417s
AG-108M	2892.48	722.94	82.	0.	0.000	1000.00	1.417s
EU-154	2894.17	723.36	82.	0.	0.000	1000.00	1.418s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
PM-146	2943.61	735.72	35.	-11.	-0.006	116.76	1.428s
PM-146	2989.37	747.16	26.	8.	0.004	139.21	1.437s
ZR-95	3027.65	756.73	35.	-10.	-0.005	128.42	1.445s
AG-110M	3056.50	763.94	56.	-18.	-0.010	62.89	1.451s
NB-95	3063.89	765.79	95.	6.	0.003	226.51	1.453s
PA-234M	3066.38	766.41	94.	2.	0.001	590.23	1.453s
EU-152	3116.41	778.92	5.	11.	0.006	49.85	1.463s
BI-212	3142.41	785.42	38.	1.	0.001	992.39	1.468s
CS-134	3184.20	795.87	52.	12.	0.007	90.82	1.477
TL-210	3199.12	799.60	64.	6.	0.004	179.94	1.480
CS-134	3208.53	801.95	90.	-15.	-0.008	95.56	1.482
CO-58	3243.82	810.78	57.	6.	0.003	192.66	1.489s
La-140	3263.80	815.77	63.	0.	0.000	1000.00	1.493s
Cs-136	3274.72	818.50	55.	9.	0.005	123.58	1.495s
MN-54	3340.10	834.85	19.	10.	0.006	95.75	1.508s
Co-56	3387.78	846.77	19.	7.	0.004	138.29	1.518s
TL-208	3442.95	860.56	56.	-19.	-0.010	15.47	1.529s
NB-94	3485.08	871.10	35.	0.	0.000	1000.00	1.537s
EU-154	3493.61	873.23	37.	1.	0.001	866.03	1.539s
PA-234	3522.80	880.53	41.	11.	0.006	90.01	1.544
PA-234	3533.64	883.24	52.	11.	0.006	99.69	1.547
AG-110M	3539.41	884.68	63.	3.	0.002	357.12	1.547s
Sc-46	3557.79	889.28	88.	-13.	-0.007	103.96	1.551s
Y-88	3592.83	898.04	25.	-1.	-0.001	758.02	1.558s
AC-228	3643.32	910.66	6.	76.	0.042	14.01	1.952s
AG-110M	3750.60	937.49	47.	-17.	-0.010	86.38	1.589s
PA-234	3784.70	946.02	37.	-4.	-0.002	302.94	1.595s
EU-152	3857.05	964.11	76.	0.	0.000	1000.00	1.609s
AC-228	3875.90	968.83	9.	30.	0.017	27.08	0.366s
EU-154	3985.88	996.33	51.	13.	0.007	84.27	1.633s
PA-234M	4004.55	1001.00	64.	4.	0.002	282.18	1.636s
EU-154	4019.65	1004.77	102.	-16.	-0.009	92.28	1.639s
Co-56	4151.87	1037.84	20.	10.	0.006	104.36	1.664s
Cs-136	4192.77	1048.07	30.	0.	0.000	1000.00	1.671s
RH-106	4201.93	1050.36	39.	3.	0.002	300.00	1.673
BI-207	4255.11	1063.66	10.	7.	0.004	112.88	1.682s
Ga-68	4310.04	1077.40	25.	2.	0.001	554.15	1.692s
FE-59	4397.41	1099.25	30.	-15.	-0.008	86.88	1.708s
EU-152	4448.68	1112.07	159.	-15.	-0.008	50.07	1.717s
ZN-65	4462.56	1115.55	144.	-12.	-0.007	140.14	1.720s
BI-214	4481.51	1120.29	96.	12.	0.007	120.12	1.723s
Sc-46	4482.57	1120.55	44.	10.	0.006	95.95	1.723s
Ta-182	4485.56	1121.30	58.	13.	0.007	84.79	1.724s
CO-60	4693.21	1173.24	40.	-13.	-0.007	106.54	1.760s
Ta-182	4756.42	1189.05	15.	11.	0.006	85.57	1.771
Ta-182	4885.79	1221.41	32.	0.	0.000	1000.00	1.793
Co-56	4953.23	1238.28	21.	49.	0.027	25.90	1.804s
NA-22	5098.13	1274.53	27.	-9.	-0.005	90.85	1.828s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
EU-154	5098.17	1274.54	35.	0.	0.000	1000.00	1.828s
FE-59	5166.35	1291.60	11.	9.	0.005	88.62	1.840s
TL-210	5251.91	1313.00	37.	-17.	-0.009	85.04	1.854s
CO-60	5329.85	1332.50	17.	8.	0.005	116.00	1.866s
AG-110M	5536.88	1384.30	11.	7.	0.004	107.76	1.899s
EU-152	5631.62	1408.00	11.	9.	0.005	85.44	1.914s
K-40	5842.25	1460.71	3.	325.	0.181	5.60	1.492s
La-140	6383.73	1596.21	23.	-13.	-0.007	141.68	2.024s
SB-124	6762.39	1690.98	6.	1.	0.001	427.57	2.076s
BI-214	7056.18	1764.52	3.	73.	0.040	12.26	1.239s
Co-56	7083.46	1771.35	86.	-4.	-0.002	318.85	2.117s
Y-88	7341.96	1836.06	6.	1.	0.000	829.35	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	-7.6346E+00				5.31E+01	
			477.60	-7.635E+00	(P	2.318E+01 6.43E+01 1.05E+01	G
NA-22	C	-8.4154E-01				9.50E+02	
			1274.53	-8.415E-01	&(	2.600E+00 9.09E+01 9.99E+01	G
K-40	N	3.3177E+02				4.66E+11	
			1460.83	3.318E+02	(P	1.076E+01 5.60E+00 1.07E+01	G
Sc-46	F	-2.2001E-02				8.38E+01	
			889.28	-9.473E-01	?(	3.324E+00 1.04E+02 1.00E+02	G
			1120.55	9.033E-01	?(	2.938E+00 9.60E+01 1.00E+02	G
CR-51	F	-3.1212E+00				2.77E+01	
			320.08	-3.121E+00	?(P	2.037E+01 2.45E+02 9.94E+00	G
MN-54	C	6.9211E-01				3.12E+02	
			834.85	6.921E-01	?(P	1.565E+00 9.57E+01 1.00E+02	G
FE-59	F	-2.2048E+00				4.45E+01	
			1099.25	-2.205E+00	?(	4.282E+00 8.69E+01 5.65E+01	G
			1291.60	2.053E+00	+	4.073E+00 8.86E+01 4.32E+01	G
Co-56	C	3.2726E+00				7.73E+01	
			846.77	4.772E-01	?(P	1.588E+00 1.38E+02 9.99E+01	G
			1238.28	6.977E+00	@(	3.474E+00 2.59E+01 6.61E+01	G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
			1037.84	5.723E+00	?(P	1.364E+01	1.04E+02	1.41E+01 G
			1771.35	-3.448E+00	+	3.804E+01	3.19E+02	1.55E+01 A
CO-57	C	-2.7688E-01					2.72E+02	
			122.06	-4.303E-01	(	1.370E+00	9.54E+01	8.56E+01 G
			136.47	9.531E-01	&(	1.537E+01	4.78E+02	1.07E+01 G
CO-58	C	3.8001E-01					7.09E+01	
			810.78	3.800E-01	&(P	2.535E+00	1.93E+02	9.95E+01 G
CO-60	F	8.3532E-01					1.93E+03	
			1332.50	8.353E-01	?(P	2.193E+00	1.16E+02	1.00E+02 G
			1173.24	-1.217E+00	+ P	2.930E+00	1.07E+02	9.99E+01 G
ZN-65	F	-2.1231E+00					2.44E+02	
			1115.55	-2.123E+00	?(	1.006E+01	1.40E+02	5.06E+01 G
NB-94	I	-4.9420E-02					7.41E+06	
			702.63	-4.942E-02	%(P	1.816E+00	1.28E+03	9.79E+01 G
			871.10	0.000E+00	+	2.136E+00	1.00E+03	9.99E+01 G
ZR-95	I	-1.1118E+00					6.40E+01	
			756.73	-1.112E+00	?(	3.467E+00	1.28E+02	5.45E+01 G
			724.20	-2.336E-02	& P	6.159E+00	6.15E+03	4.42E+01 G
NB-95	I	3.9241E-01					6.40E+01	
			765.79	3.924E-01	?(	3.054E+00	2.27E+02	9.98E+01 G
RU-103	I	-1.7062E-01					3.93E+01	
			497.05	-1.706E-01	?(P	1.830E+00	3.47E+02	9.09E+01 G
			610.30	5.598E+00	?	1.019E+02	5.41E+02	5.75E+00 GA
RH-106	I	6.6001E-01					3.74E+02	
			621.92	-1.728E+00	%(	6.054E+01	1.04E+03	9.93E+00 G
			1050.36	1.586E+01	(	1.682E+02	3.00E+02	1.56E+00 G
			511.86	1.747E+01		7.802E+00	1.69E+01	2.00E+01 GA
AG-108M	C	5.1885E-01					1.53E+05	
			433.94	5.189E-01	(P	1.524E+00	1.17E+02	9.05E+01 G
			722.94	0.000E+00	-	2.986E+00	1.00E+03	9.08E+01 G
			614.28	0.000E+00	-	6.592E+00	1.00E+03	8.98E+01 G
AG-110M	F	5.6505E-01					2.50E+02	
			884.68	3.122E-01	&(	3.895E+00	3.57E+02	7.27E+01 G
			657.76	9.810E-02	?(	2.163E+00	6.25E+02	9.46E+01 G
			937.49	-3.809E+00	+	7.536E+00	8.64E+01	3.44E+01 G
			1384.30	3.141E+00	?(	7.679E+00	1.08E+02	2.43E+01 G
			763.94	-5.155E+00	+	1.068E+01	6.29E+01	2.23E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SN-113	F	-1.0361E+00					1.15E+02	
			391.69	-1.036E+00	&(	3.993E+00	1.15E+02	6.40E+01 G
SB-124	F	-3.7391E-01					6.02E+01	
			602.73	-7.229E-01	?(	6.143E+00	2.53E+02	9.83E+01 G
			1690.98	3.436E-01	?(	3.557E+00	4.28E+02	4.78E+01 G
			722.79	-5.948E+00	+	2.351E+01	1.16E+02	1.08E+01 G
SB-125	I	2.8101E+00					1.01E+03	
			427.88	1.314E+00	?(	4.773E+00	1.45E+02	2.96E+01 G
			600.50	-4.068E+00	+ P	3.408E+01	8.71E+01	1.79E+01 G
			635.89	5.001E+00	?(	1.227E+01	7.34E+01	1.13E+01 G
			463.37	4.672E+00	?(P	1.618E+01	1.02E+02	1.05E+01 G
I-131	I	5.7434E-01					8.02E+00	
			364.48	5.743E-01	&(	1.454E+00	9.75E+01	8.17E+01 G
			284.30	-9.215E+00	+	2.435E+01	1.03E+02	6.14E+00 G
			636.97	-1.000E+01	+	2.741E+01	8.17E+01	7.17E+00 G
Gd-153	F	5.3492E-01					2.42E+02	
			97.50	5.349E-01	?(	4.210E+00	2.33E+02	3.00E+01 G
			103.20	-1.814E+00	&	7.160E+00	1.18E+02	2.18E+01 G
Ga-68	C	6.0302E+00					4.71E-02	
			1077.40	6.030E+00	?(	7.842E+01	5.54E+02	3.30E+00 G
Tc-99m	I	4.3898E-01					2.51E-01	
			140.51	4.390E-01	*(	1.840E+00	1.25E+02	8.93E+01 G
BA-133	F	-5.5594E-01					3.85E+03	
			356.00	-5.559E-01	?(	6.676E+00	3.58E+02	6.20E+01 G
			302.85	-3.409E+00	+	1.381E+01	1.21E+02	1.83E+01 G
			383.84	6.360E+00	? P	2.462E+01	1.15E+02	8.94E+00 GA
			80.99	-1.651E+00	+ P	5.010E+00	7.64E+01	3.41E+01 GA
CS-134	I	1.4374E+00					7.54E+02	
			795.87	9.038E-01	?(P	2.768E+00	9.08E+01	8.55E+01 G
			604.71	-7.306E-01	-	6.131E+00	2.50E+02	9.76E+01 G
			569.32	-3.959E+00	+	1.127E+01	8.47E+01	1.54E+01 G
			801.95	-1.103E+01	+	3.544E+01	9.56E+01	8.69E+00 G
			563.24	6.903E+00	&(	1.604E+01	9.26E+01	8.35E+00 G
CS-137	I	6.3779E-02					1.10E+04	
			661.66	6.378E-02	%(P	2.428E+00	1.08E+03	8.52E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CE-139	F	1.8494E-01					1.38E+02	
			165.85	1.849E-01	?(	1.975E+00	3.16E+02	7.99E+01 G
Ba-140	I	-5.7859E-01					1.28E+01	
			537.26	-5.786E-01	?(	7.004E+00	4.74E+02	2.44E+01 G
			162.66	-7.036E+00	&	2.636E+01	1.12E+02	6.22E+00 G
			304.85	-1.467E+01	+	5.842E+01	1.19E+02	4.29E+00 G
La-140	I	-8.9064E-01					1.28E+01	
			1596.21	-1.580E+00	?(P	3.073E+00	1.42E+02	9.54E+01 G
			487.02	-1.565E+00	+ P	3.599E+00	7.41E+01	4.55E+01 G
			328.76	2.351E+00	&(	6.081E+00	1.00E+02	2.03E+01 G
			815.77	0.000E+00	+	1.138E+01	1.00E+03	2.33E+01 G
CE-141	I	-4.2426E-01					3.25E+01	
			145.44	-4.243E-01	?(	3.446E+00	2.41E+02	4.82E+01 G
PM-144	C	-1.5741E-01					3.63E+02	
			696.54	-1.574E-01	?(	1.780E+00	4.55E+02	9.90E+01 G
			618.06	-8.142E-01	+ P	6.133E+00	1.49E+02	9.91E+01 G
EU-152	F	2.3522E+00					4.94E+03	
			121.78	1.126E+00	(	3.997E+00	1.06E+02	2.86E+01 G
			344.29	2.058E+00	?(	8.073E+00	1.17E+02	2.65E+01 G
			1112.07	-9.550E+00	+ P	3.903E+01	5.01E+01	1.36E+01 G
			778.92	5.664E+00	?(	6.336E+00	4.99E+01	1.29E+01 G
			964.11	0.000E+00	-	2.277E+01	1.00E+03	1.46E+01 G
			244.69	-7.407E+00	+	4.252E+01	1.72E+02	7.58E+00 G
			1408.00	4.723E+00	?	9.008E+00	8.54E+01	2.10E+01 GA
EU-154	I	2.0050E+00					3.14E+03	
			123.10	5.016E-01	&(	2.904E+00	1.72E+02	4.08E+01 G
			1274.54	0.000E+00	&	8.386E+00	1.00E+03	3.52E+01 G
			723.36	0.000E+00	-	1.342E+01	1.00E+03	2.02E+01 G
			873.23	5.756E-01	?(	1.788E+01	8.66E+02	1.23E+01 G
			1004.77	-7.109E+00	+	2.201E+01	9.23E+01	1.80E+01 G
			996.33	9.445E+00	(	2.674E+01	8.43E+01	1.06E+01 G
EU-155	I	-1.9140E+00					1.81E+03	
			105.31	-1.914E+00	*(	9.643E+00	1.51E+02	2.12E+01 G
			86.54	-1.669E+00	+	7.998E+00	1.44E+02	3.07E+01 G
HF-181	F	-1.0516E+00					4.24E+01	
			482.00	-1.052E+00	?(	3.409E+00	9.69E+01	8.05E+01 G
			133.02	0.000E+00	+	3.906E+00	1.00E+03	4.33E+01 G
			345.83	-4.067E+00	+	1.239E+01	9.10E+01	1.51E+01 G
			136.30	0.000E+00	&	2.920E+01	1.00E+03	5.85E+00 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Ta-182	F	4.1928E+00					1.14E+02	
			1121.30	3.344E+00	?(	9.521E+00	8.48E+01	3.49E+01 G
			1221.41	0.000E+00	-	1.008E+01	1.00E+03	2.70E+01 G
			1189.05	6.022E+00	(	1.173E+01	8.56E+01	1.62E+01 G
Hg-203	F	-5.4705E-01					4.66E+01	
			279.20	-5.471E-01	?(	1.757E+00	1.25E+02	8.15E+01 G
TL-208	N	3.4567E+00					6.98E+02	
			583.02	3.457E+00	(	1.631E+00	2.43E+01	8.45E+01 G
			277.28	-1.895E-01	% P	2.439E+01	4.24E+03	6.31E+00 G
			860.56	-1.043E+01	- P	2.114E+01	1.55E+01	1.24E+01 G
PM-146	C	1.4971E+00					2.02E+03	
			453.88	1.540E+00	*(P	1.940E+00	5.22E+01	6.50E+01 G
			747.16	1.414E+00	?(P	4.845E+00	1.39E+02	3.40E+01 G
			735.72	-2.900E+00	-	8.197E+00	1.17E+02	2.25E+01 G
Y-88	F	9.6704E-02					1.07E+02	
			1836.06	9.670E-02	?(P	1.914E+00	8.29E+02	9.92E+01 G
			898.04	-1.058E-01	+ P	2.020E+00	7.58E+02	9.37E+01 G
Cd-113m		-9.0732E+03					5.33E+03	
			263.70	-9.073E+03	?(	2.874E+04	9.47E+01	6.00E-03 K
Cf-251	T	-2.4168E+00					3.28E+05	
			176.60	-2.417E+00	?(	7.537E+00	1.16E+02	1.70E+01 G
			227.00	2.432E-01	%	1.741E+01	2.58E+03	6.30E+00 GA
Cf-249	T	1.3458E-01					1.28E+05	
			387.95	1.346E-01	&(	3.520E+00	7.63E+02	6.60E+01 G
			333.44	-6.115E-01	+	8.269E+00	5.10E+02	1.55E+01 G
Sn-126		-6.1341E+00					3.65E+07	
			87.57	-1.360E+00	}	6.056E+00	1.34E+02	3.75E+01 GA
			64.28	-6.134E+00	?(	2.025E+01	9.91E+01	9.70E+00 G
			86.94	-5.659E+00	}	2.592E+01	1.38E+02	9.04E+00 GA
PB-210	N	3.9732E+01					8.14E+03	
			46.54	3.973E+01	(P	3.257E+01	3.11E+01	4.25E+00 G
PB-212	N	9.9241E+00					6.98E+02	
			238.63	9.924E+00	(P	2.464E+00	1.03E+01	4.33E+01 G
			300.03	-2.093E-01	% P	1.084E+02	1.05E+04	3.28E+00 GA

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PB-214	N	4.9353E+01					5.84E+05	
			351.93	4.870E+01	(P	3.227E+00	5.00E+00	3.76E+01 G
			295.09	5.062E+01	(P	5.874E+00	7.25E+00	1.93E+01 G
			242.00	5.674E+01	+ P	1.506E+01	1.07E+01	7.43E+00 GA
BI-207	C	7.4045E-01					1.18E+04	
			1063.66	7.405E-01	?(P	1.983E+00	1.13E+02	7.45E+01 G
			569.70	0.000E+00	-	2.098E+00	1.00E+03	9.77E+01 G
BI-212	N	-4.2721E-01					6.98E+02	
			727.17	-4.272E-01	%(P	3.621E+01	2.41E+03	7.55E+00 G
			785.42	6.635E+00	? P	1.581E+02	9.92E+02	1.28E+00 GA
U-235	N	2.4944E+00					2.57E+11	
			143.79	2.108E+00	*(	1.509E+01	2.13E+02	1.10E+01 G
			205.33	3.340E+00	(P	2.367E+01	2.60E+02	5.01E+00 G
			163.38	-1.640E+00	+ P	3.347E+01	4.23E+02	5.08E+00 G
			185.72	-8.450E-01	+	3.161E+00	1.12E+02	5.40E+01 GA
BI-214	N	4.9070E+01					5.84E+05	
			609.31	4.907E+01	(P	2.737E+00	5.23E+00	4.61E+01 G
			1120.29	6.851E+00	- P	2.786E+01	1.20E+02	1.51E+01 G
			1764.49	6.033E+01	+ P	9.193E+00	1.23E+01	1.54E+01 G
BI-210M	T	-1.0519E+00					1.10E+09	
			265.83	-1.052E+00	&(	3.654E+00	1.04E+02	5.00E+01 G
			304.90	-2.248E+00	+	9.241E+00	1.23E+02	2.80E+01 G
AC-228	N	1.9150E+01					2.10E+03	
			911.07	1.915E+01	@(P	3.592E+00	1.40E+01	2.90E+01 G
			968.97	1.324E+01	-	7.367E+00	2.71E+01	1.75E+01 G
			338.32	1.342E+01	- P	9.900E+00	3.30E+01	1.20E+01 G
			93.35	8.574E+00	-	4.084E+01	1.43E+02	5.56E+00 XA
TH-227	N	-1.2100E+00					7.95E+03	
			256.24	-1.210E+00	&(	2.015E+01	6.38E+02	7.00E+00 G
			235.97	-4.342E+00	+	2.575E+01	1.78E+02	1.23E+01 G
			50.14	5.793E-01	% P	2.359E+01	1.41E+03	8.00E+00 G
TH-229	N	-7.3078E-01					2.68E+06	
			193.51	-3.357E+00	?(	3.012E+01	3.31E+02	4.40E+00 G
			210.85	3.134E+00	?(	4.277E+01	5.00E+02	2.99E+00 G
TH-234	N	6.0474E+00					1.63E+12	
			92.59	6.047E+00	(P	1.841E+01	9.14E+01	5.58E+00 G
			63.29	-7.309E+00	+ P	4.610E+01	1.84E+02	3.81E+00 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PA-231	N	1.5974E+01					1.20E+07	
			302.65	1.597E+01	?(	7.098E+01	1.32E+02	2.88E+00 G
			300.07	-2.791E-01	% P	1.446E+02	1.05E+04	2.46E+00 G
PA-233	C	-1.9410E+00					7.82E+08	
			312.01	-1.941E+00	&(P	8.564E+00	1.07E+02	3.60E+01 G
			300.18	-1.108E-01	% P	5.739E+01	1.05E+04	6.20E+00 G
PA-234	N	1.7642E+00					1.63E+12	
			131.29	-1.554E+00	?(	9.187E+00	1.76E+02	1.80E+01 G
			946.02	-2.443E+00	+	1.758E+01	3.03E+02	1.34E+01 G
			569.47	-1.706E+00	+	2.452E+01	4.11E+02	8.20E+00 G
			883.24	7.986E+00	?(	2.699E+01	9.97E+01	9.60E+00 G
			880.53	1.273E+01	?	3.872E+01	9.00E+01	6.00E+00 GA
PA-234M	N	4.1574E+01					1.63E+12	
			1001.00	3.853E+01	?(P	3.782E+02	2.82E+02	8.37E-01 G
			766.41	5.024E+01	?(	1.030E+03	5.90E+02	2.94E-01 G
AM-241	T	-4.3321E-01					1.58E+05	
			59.54	-4.332E-01	?(P	4.809E+00	3.38E+02	3.59E+01 G
Ir-192	F	-4.6237E-02					7.40E+01	
			316.49	-6.744E-01	?(	2.281E+00	1.01E+02	8.70E+01 G
			468.06	1.010E+00	(	3.531E+00	1.03E+02	5.18E+01 G
			308.44	-2.008E+00	+	8.479E+00	1.26E+02	3.18E+01 G
Cs-136	F	5.9093E-01					1.30E+01	
			818.50	5.909E-01	&(	2.497E+00	1.24E+02	1.00E+02 G
			1048.07	0.000E+00	-	2.905E+00	1.00E+03	8.00E+01 G
			340.57	-3.430E-02	&	5.082E+00	4.33E+03	4.69E+01 G
Np-239	T	1.6510E+00					2.36E+00	
			103.70	-1.648E+00	&	6.681E+00	1.21E+02	2.40E+01 X
			106.13	1.651E+00	?(	8.452E+00	1.53E+02	2.27E+01 G
			99.50	0.000E+00	&	8.535E+00	1.00E+03	1.50E+01 X
Nd-147		-5.8369E+00					1.11E+01	
			531.00	-5.837E+00	?(	1.347E+01	9.33E+01	1.30E+01 G
			91.10	0.000E+00	+	8.039E+00	1.00E+03	2.83E+01 G
TL-210	N	3.8963E-01					5.84E+05	
			799.60	4.258E-01	?(	2.643E+00	1.80E+02	9.90E+01 G
			296.00	3.444E-01	?(	4.420E+00	3.82E+02	7.90E+01 G
			1313.00	-8.073E+00	&	1.478E+01	8.50E+01	2.10E+01 GA

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

Kr-85    I  -7.3792E+01                                      3.92E+03
                            513.98-7.379E+01 ?(  5.930E+02 2.35E+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	266.	-7.	-0.004	338.48	-4.332E-01	P
Sn-126	64.28	413.	-30.	-0.016	99.11	-6.134E+00	
BA-133	80.99	454.	-34.	-0.019	76.39	-1.651E+00	P
EU-155	86.54	1024.	-32.	-0.018	143.90	-1.669E+00	
Sn-126	86.94	935.	-32.	-0.018	137.57	-5.659E+00	
Sn-126	87.57	883.	-32.	-0.018	133.70	-1.360E+00	
Gd-153	97.50	285.	10.	0.006	233.00	5.349E-01	
Gd-153	103.20	449.	-26.	-0.014	118.25	-1.814E+00	
Np-239	103.70	475.	-26.	-0.014	121.43	-1.648E+00	
EU-155	105.31	784.	-26.	-0.015	151.05	-1.914E+00	
Np-239	106.13	689.	24.	0.014	153.33	1.651E+00	
EU-152	121.78	232.	21.	0.012	106.10	1.126E+00	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
CO-57	122.06	245.	-24.	-0.013	95.39	-4.303E-01	
EU-154	123.10	249.	13.	0.007	171.66	5.016E-01	
CO-57	136.47	455.	6.	0.004	477.96	9.531E-01	
Tc-99m	140.51	416.	23.	0.013	125.39	4.390E-01	
U-235	143.79	439.	14.	0.008	213.04	2.108E+00	
CE-141	145.44	437.	-12.	-0.007	241.48	-4.243E-01	
Ba-140	162.66	366.	-25.	-0.014	112.18	-7.036E+00	
U-235	163.38	392.	-5.	-0.003	422.65	-1.640E+00	P
CE-139	165.85	343.	8.	0.005	316.05	1.849E-01	
Cf-251	176.60	200.	-22.	-0.012	116.36	-2.417E+00	
U-235	185.72	332.	-23.	-0.013	111.95	-8.450E-01	
TH-229	193.51	183.	-7.	-0.004	330.63	-3.357E+00	
U-235	205.33	131.	8.	0.004	259.66	3.340E+00	P
TH-229	210.85	147.	4.	0.002	499.65	3.134E+00	
TH-227	235.97	787.	-23.	-0.013	177.60	-4.342E+00	
EU-152	244.69	767.	-23.	-0.013	171.88	-7.407E+00	
TH-227	256.24	128.	-3.	-0.002	638.16	-1.210E+00	
Cd-113m	263.70	186.	-21.	-0.012	94.75	-9.073E+03	
BI-210M	265.83	207.	-20.	-0.011	103.75	-1.052E+00	
Hg-203	279.20	114.	-16.	-0.009	124.77	-5.471E-01	
I-131	284.30	121.	-20.	-0.011	103.14	-9.215E+00	
TL-210	296.00	654.	10.	0.005	382.22	3.444E-01	
PA-231	302.65	209.	16.	0.009	132.06	1.597E+01	
BA-133	302.85	325.	-21.	-0.012	121.01	-3.409E+00	
Ba-140	304.85	315.	-21.	-0.012	118.96	-1.467E+01	
BI-210M	304.90	336.	-21.	-0.012	122.81	-2.248E+00	
Ir-192	308.44	358.	-22.	-0.012	126.15	-2.008E+00	
PA-233	312.01	464.	-23.	-0.013	106.51	-1.941E+00	P
Ir-192	316.49	182.	-19.	-0.011	100.99	-6.744E-01	
CR-51	320.08	186.	-10.	-0.006	245.13	-3.121E+00	P
La-140	328.76	62.	15.	0.008	100.03	2.351E+00	
Cf-249	333.44	66.	-3.	-0.002	509.90	-6.115E-01	
EU-152	344.29	184.	17.	0.009	116.73	2.058E+00	
HF-181	345.83	137.	-19.	-0.010	91.02	-4.067E+00	
BA-133	356.00	678.	-10.	-0.006	357.80	-5.559E-01	
I-131	364.48	48.	14.	0.008	97.51	5.743E-01	
BA-133	383.84	162.	16.	0.009	115.12	6.360E+00	P
Cf-249	387.95	178.	2.	0.001	763.33	1.346E-01	
SN-113	391.69	213.	-18.	-0.010	114.86	-1.036E+00	
SB-125	427.88	52.	10.	0.006	144.68	1.314E+00	
AG-108M	433.94	48.	12.	0.007	117.44	5.189E-01	P
PM-146	453.88	36.	25.	0.014	52.20	1.540E+00	P
SB-125	463.37	67.	12.	0.007	102.42	4.672E+00	P
Ir-192	468.06	77.	12.	0.007	103.42	1.010E+00	
BE-7	477.59	137.	-19.	-0.010	64.26	-7.635E+00	P
HF-181	482.00	172.	-20.	-0.011	96.86	-1.052E+00	
La-140	487.02	57.	-16.	-0.009	74.05	-1.565E+00	P
RU-103	497.05	57.	-4.	-0.002	347.29	-1.706E-01	P

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Kr-85	513.98	132.	-7.	-0.004	235.17	-7.379E+01	
Nd-147	531.00	56.	-16.	-0.009	93.29	-5.837E+00	
Ba-140	537.26	52.	-3.	-0.002	474.15	-5.786E-01	
CS-134	563.24	28.	12.	0.007	92.64	6.903E+00	
CS-134	569.32	48.	-12.	-0.007	84.65	-3.959E+00	
SB-125	600.50	611.	-14.	-0.008	87.13	-4.068E+00	P
SB-124	602.73	597.	-14.	-0.008	253.36	-7.229E-01	
CS-134	604.71	583.	-14.	-0.008	250.14	-7.306E-01	
RU-103	610.30	550.	6.	0.003	540.50	5.598E+00	
PM-144	618.06	580.	-15.	-0.008	148.68	-8.142E-01	P
SB-125	635.89	24.	10.	0.006	73.39	5.001E+00	
I-131	636.97	52.	-13.	-0.007	81.72	-1.000E+01	
AG-110M	657.76	53.	2.	0.001	624.50	9.810E-02	
PM-144	696.54	35.	-3.	-0.001	454.83	-1.574E-01	
SB-124	722.79	72.	-11.	-0.006	116.34	-5.948E+00	
PM-146	735.72	35.	-11.	-0.006	116.76	-2.900E+00	
PM-146	747.16	26.	8.	0.004	139.21	1.414E+00	P
ZR-95	756.73	35.	-10.	-0.005	128.42	-1.112E+00	
AG-110M	763.94	56.	-18.	-0.010	62.89	-5.155E+00	
NB-95	765.79	95.	6.	0.003	226.51	3.924E-01	
PA-234M	766.41	94.	2.	0.001	590.23	5.024E+01	
EU-152	778.92	5.	11.	0.006	49.85	5.664E+00	
BI-212	785.42	38.	1.	0.001	992.39	6.635E+00	P
CS-134	795.87	52.	12.	0.007	90.82	9.038E-01	P
TL-210	799.60	64.	6.	0.004	179.94	4.258E-01	
CS-134	801.95	90.	-15.	-0.008	95.56	-1.103E+01	
CO-58	810.78	57.	6.	0.003	192.66	3.800E-01	P
Cs-136	818.50	55.	9.	0.005	123.58	5.909E-01	
MN-54	834.85	19.	10.	0.006	95.75	6.921E-01	P
EU-154	873.23	37.	1.	0.001	866.03	5.756E-01	
AG-110M	884.68	63.	3.	0.002	357.12	3.122E-01	
Sc-46	889.28	88.	-13.	-0.007	103.96	-9.473E-01	
Y-88	898.04	25.	-1.	-0.001	758.02	-1.058E-01	P
AG-110M	937.49	47.	-17.	-0.010	86.38	-3.809E+00	
EU-154	996.33	51.	13.	0.007	84.27	9.445E+00	
PA-234M	1001.00	64.	4.	0.002	282.18	3.853E+01	P
EU-154	1004.77	102.	-16.	-0.009	92.28	-7.109E+00	
BI-207	1063.66	10.	7.	0.004	112.88	7.405E-01	P
Ga-68	1077.40	25.	2.	0.001	554.15	6.030E+00	
FE-59	1099.25	30.	-15.	-0.008	86.88	-2.205E+00	
EU-152	1112.07	159.	-15.	-0.008	50.07	-9.550E+00	P
ZN-65	1115.55	144.	-12.	-0.007	140.14	-2.123E+00	
Sc-46	1120.55	44.	10.	0.006	95.95	9.033E-01	
Ta-182	1121.30	58.	13.	0.007	84.79	3.344E+00	
CO-60	1173.24	40.	-13.	-0.007	106.54	-1.217E+00	P
Ta-182	1189.05	15.	11.	0.006	85.57	6.022E+00	
NA-22	1274.53	27.	-9.	-0.005	90.85	-8.415E-01	
FE-59	1291.60	11.	9.	0.005	88.62	2.053E+00	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
TL-210	1313.00	37.	-17.	-0.009	85.04	-8.073E+00		
CO-60	1332.50	17.	8.	0.005	116.00	8.353E-01		P
AG-110M	1384.30	11.	7.	0.004	107.76	3.141E+00		
EU-152	1408.00	11.	9.	0.005	85.44	4.723E+00		
La-140	1596.21	23.	-13.	-0.007	141.68	-1.580E+00		P
SB-124	1690.98	6.	1.	0.001	427.57	3.436E-01		
Y-88	1836.06	6.	1.	0.000	829.35	9.670E-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	-7.6345E+00	-7.6346E+00	6.426E+01%	2.32E+01
NA-22	#A	-8.4154E-01	-8.4154E-01	9.085E+01%	2.60E+00
K-40		3.3177E+02	3.3177E+02	5.596E+00%	1.08E+01
Sc-46	#A	-2.2000E-02	-2.2001E-02	7.074E+01%	3.32E+00
CR-51	#A	-3.1211E+00	-3.1212E+00	2.451E+02%	2.04E+01
MN-54	#A	6.9211E-01	6.9211E-01	9.575E+01%	1.57E+00
FE-59	#A	-2.2048E+00	-2.2048E+00	8.688E+01%	4.28E+00
Co-56	#C	3.2725E+00	3.2726E+00	2.590E+01%	1.59E+00
CO-57	#A	-2.7688E-01	-2.7688E-01	9.539E+01%	1.37E+00
CO-58	#A	3.8000E-01	3.8001E-01	1.927E+02%	2.53E+00
CO-60	#A	8.3532E-01	8.3532E-01	1.160E+02%	2.19E+00
ZN-65	#A	-2.1231E+00	-2.1231E+00	1.401E+02%	1.01E+01
NB-94	#A	-4.9420E-02	-4.9420E-02	1.276E+03%	1.82E+00
ZR-95	#A	-1.1118E+00	-1.1118E+00	1.284E+02%	3.47E+00
NB-95	#A	3.9241E-01	3.9241E-01	2.265E+02%	3.05E+00
RU-103	#A	-1.7062E-01	-1.7062E-01	3.473E+02%	1.83E+00
RH-106	A	6.6001E-01	6.6001E-01	3.000E+02%	6.05E+01
AG-108M	#A	5.1885E-01	5.1885E-01	1.174E+02%	1.52E+00
AG-110M	#A	5.6505E-01	5.6505E-01	1.078E+02%	3.89E+00
SN-113	#A	-1.0361E+00	-1.0361E+00	1.149E+02%	3.99E+00
SB-124	#A	-3.7391E-01	-3.7391E-01	2.485E+02%	6.14E+00
SB-125	#A	2.8101E+00	2.8101E+00	6.395E+01%	4.77E+00
I-131	#A	5.7428E-01	5.7434E-01	9.751E+01%	1.45E+00
Gd-153	#A	5.3492E-01	5.3492E-01	2.330E+02%	4.21E+00
Ga-68	#A	5.9324E+00	6.0302E+00	5.542E+02%	7.84E+01
Tc-99m	#A	4.3763E-01	4.3898E-01	1.254E+02%	1.84E+00
BA-133	#A	-5.5594E-01	-5.5594E-01	3.578E+02%	6.68E+00
CS-134	#A	1.4374E+00	1.4374E+00	6.486E+01%	2.77E+00
CS-137	#A	6.3779E-02	6.3779E-02	1.078E+03%	2.43E+00
CE-139	#A	1.8494E-01	1.8494E-01	3.161E+02%	1.97E+00
Ba-140	#A	-5.7856E-01	-5.7859E-01	4.741E+02%	7.00E+00
La-140	#A	-8.9059E-01	-8.9064E-01	8.671E+01%	3.07E+00
CE-141	#A	-4.2425E-01	-4.2426E-01	2.415E+02%	3.45E+00

CE-144 #A	0.0000E+00	0.0000E+00	1.000E+03%	1.53E+01
PM-144 #A	-1.5741E-01	-1.5741E-01	4.548E+02%	1.78E+00
EU-152 #A	2.3522E+00	2.3522E+00	4.985E+01%	4.00E+00
EU-154 #A	2.0050E+00	2.0050E+00	8.427E+01%	2.90E+00
EU-155 #A	-1.9140E+00	-1.9140E+00	1.510E+02%	9.64E+00
HF-181 #A	-1.0516E+00	-1.0516E+00	9.686E+01%	3.41E+00
Ta-182 #A	4.1928E+00	4.1928E+00	6.023E+01%	9.52E+00
Hg-203 #A	-5.4704E-01	-5.4705E-01	1.248E+02%	1.76E+00
TL-208	3.4566E+00	3.4567E+00	2.426E+01%	1.63E+00
PM-146 #A	1.4971E+00	1.4971E+00	5.220E+01%	1.94E+00
Y-88 #A	9.6703E-02	9.6704E-02	8.293E+02%	1.91E+00
Cd-113m#A	-9.0732E+03	-9.0732E+03	9.475E+01%	2.87E+04
Cd-109 #A	0.0000E+00	0.0000E+00	1.000E+03%	6.08E+01
Cf-251 #A	-2.4168E+00	-2.4168E+00	1.164E+02%	7.54E+00
Cf-249 #A	1.3458E-01	1.3458E-01	7.633E+02%	3.52E+00
Sn-126 #A	-6.1341E+00	-6.1341E+00	9.911E+01%	2.02E+01
PB-210	3.9732E+01	3.9732E+01	3.110E+01%	3.26E+01
PB-212	9.9241E+00	9.9241E+00	1.030E+01%	2.46E+00
PB-214	4.9353E+01	4.9353E+01	4.406E+00%	3.23E+00
BI-207 #A	7.4045E-01	7.4045E-01	1.129E+02%	1.98E+00
BI-212 #A	-4.2721E-01	-4.2721E-01	2.415E+03%	3.62E+01
U-235 #A	2.4944E+00	2.4944E+00	1.679E+02%	1.51E+01
BI-214	4.9070E+01	4.9070E+01	5.234E+00%	2.74E+00
BI-210M#A	-1.0519E+00	-1.0519E+00	1.037E+02%	3.65E+00
AC-228	1.9150E+01	1.9150E+01	1.401E+01%	3.59E+00
TH-227 #A	-1.2100E+00	-1.2100E+00	6.382E+02%	2.01E+01
TH-229 #A	-7.3078E-01	-7.3078E-01	2.996E+02%	3.01E+01
TH-234 A	6.0474E+00	6.0474E+00	9.137E+01%	1.84E+01
PA-231 #A	1.5974E+01	1.5974E+01	1.321E+02%	7.10E+01
PA-233 #A	-1.9410E+00	-1.9410E+00	1.065E+02%	8.56E+00
PA-234 #A	1.7642E+00	1.7642E+00	9.969E+01%	9.19E+00
PA-234M#A	4.1574E+01	4.1574E+01	2.822E+02%	3.78E+02
AM-241 #A	-4.3321E-01	-4.3321E-01	3.385E+02%	4.81E+00
Np-237 #A	0.0000E+00	0.0000E+00	1.000E+03%	1.93E+01
Ir-192 #A	-4.6236E-02	-4.6237E-02	7.228E+01%	2.28E+00
Cs-136 #A	5.9089E-01	5.9093E-01	1.236E+02%	2.50E+00
Np-239 #A	1.6505E+00	1.6510E+00	1.533E+02%	8.45E+00
Nd-147 #A	-5.8365E+00	-5.8369E+00	9.329E+01%	1.35E+01
TL-210 #A	3.8963E-01	3.8963E-01	1.799E+02%	2.64E+00
Kr-85 #A	-7.3792E+01	-7.3792E+01	2.352E+02%	5.93E+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)     5.025E+02  Bq/Sample
Total Decayed Activity (   37.6 to  2000.8 keV) 5.0245316E+02  Bq/Sample
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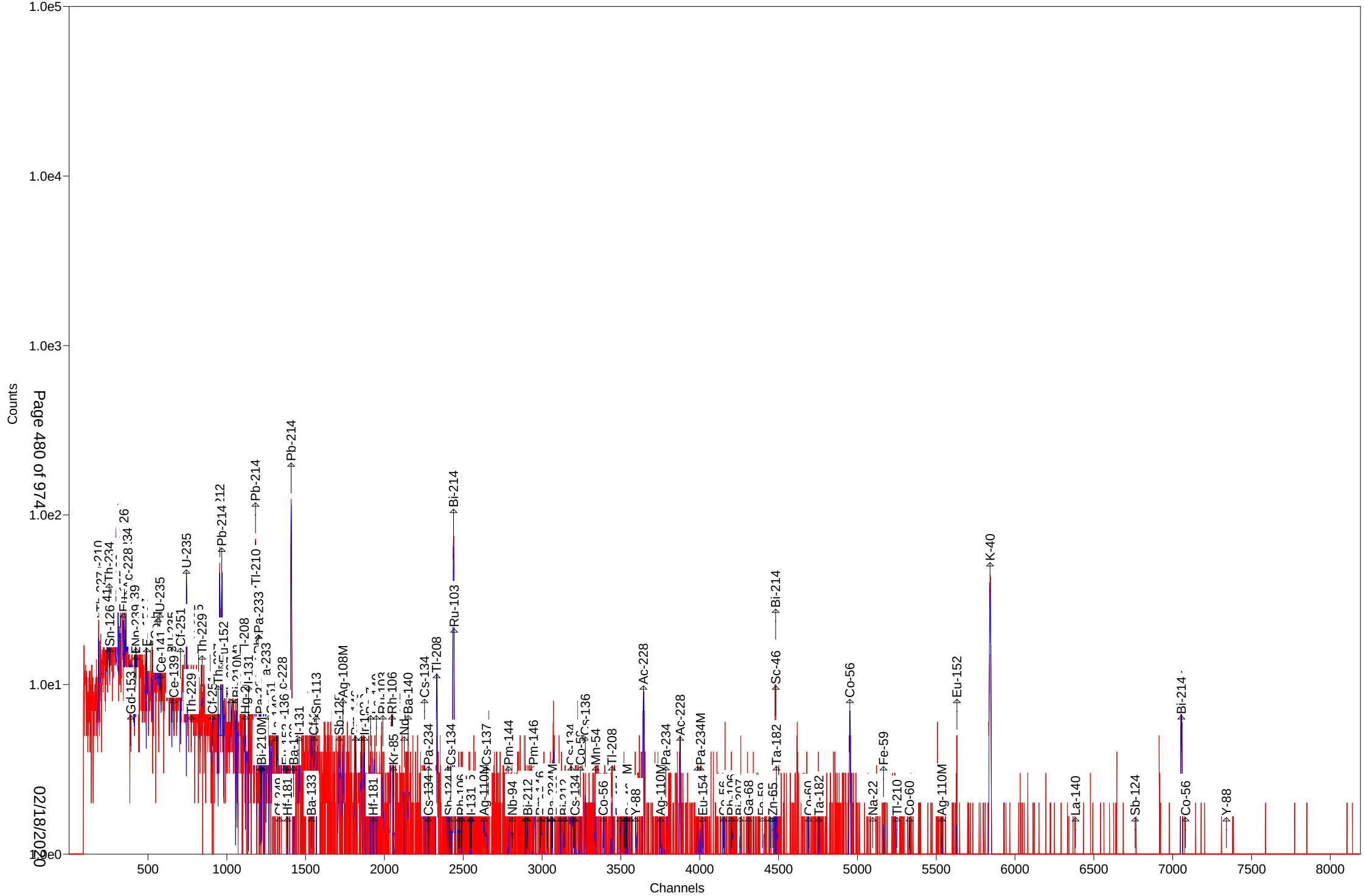
453329_Gamma_160-36593-A-1-D DU. 5_Gamma_20193406.spc.



Test America St. Louis Spectrum ID: 9_Gamma_20193882

Sample Description: 453329_Gamma_160-36593-A-2-B
Detector: Detector # 9
Batch ID: 453329
Work Order Number: Gamma
Lot Number: 160-36593-A-2-B

Decay to Time: 12/27/2019 08:16 Live Time: 1800 sec
Acquisition Time: 12/27/2019 08:16:50 Real Time: 1802 sec
Analysis Time: 12/27/2019 08:47 Dead Time: 0.13 %
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_2019-12-07_1444.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	4.302E+00	100.3	4.316E+00	4.322E+00	1.446E+01
NA-22	-5.108E-02	830.7	4.243E-01	4.243E-01	1.526E+00
K-40	2.846E+02	4.6	1.319E+01	1.965E+01	1.113E+01
Sc-46	-5.191E-01	107.5	5.579E-01	5.585E-01	1.883E+00
CR-51	-2.354E-01	1974.8	4.650E+00	4.650E+00	3.059E+01
MN-54	-3.798E-01	110.7	4.203E-01	4.208E-01	1.479E+00
FE-59	-8.104E-02	1360.9	1.103E+00	1.103E+00	2.672E+00
Co-56	-7.906E-01	54.0	4.268E-01	4.287E-01	1.695E+00
CO-57	-4.506E-01	92.3	4.161E-01	4.167E-01	1.382E+00
CO-58	5.760E-01	82.9	4.776E-01	4.786E-01	1.598E+00
CO-60	-8.643E-01	99.8	8.625E-01	8.635E-01	1.804E+00
ZN-65	-1.775E+00	112.1	1.989E+00	1.991E+00	6.665E+00
NB-94	-2.353E-02	2053.3	4.832E-01	4.832E-01	1.697E+00
ZR-95	6.862E-01	137.4	9.429E-01	9.436E-01	2.119E+00
NB-95	7.562E-01	66.2	5.006E-01	5.021E-01	1.655E+00
RU-103	-6.138E-01	89.3	5.479E-01	5.488E-01	1.289E+00
RH-106	-5.156E+00	244.1	1.259E+01	1.259E+01	4.207E+01
AG-108M	4.974E-01	93.0	4.625E-01	4.632E-01	1.092E+00
AG-110M	7.752E-01	113.0	8.756E-01	8.765E-01	2.172E+00
SN-113	6.357E-01	100.8	6.405E-01	6.413E-01	2.145E+00
SB-124	4.555E-01	262.9	1.197E+00	1.198E+00	4.007E+00
SB-125	1.392E+00	94.1	1.310E+00	1.312E+00	3.473E+00
I-131	5.148E-01	76.3	3.926E-01	3.935E-01	1.131E+00
Gd-153	1.253E+00	240.7	3.016E+00	3.017E+00	1.001E+01
Ga-68	1.057E+00	2086.9	2.206E+01	2.206E+01	4.943E+01
Tc-99m	-8.869E-02	801.3	7.107E-01	7.107E-01	2.373E+00
BA-133	-7.976E-01	183.8	1.466E+00	1.467E+00	4.888E+00
CS-134	-2.649E-01	76.6	2.028E-01	2.033E-01	2.420E+00
CS-137	-4.752E-01	129.6	6.157E-01	6.162E-01	2.080E+00
CE-139	-5.393E-01	86.7	4.675E-01	4.703E-01	1.625E+00
Ba-140	2.155E+00	85.8	1.848E+00	1.852E+00	3.628E+00
La-140	3.739E-02	414.2	1.549E-01	1.549E-01	1.444E+00
CE-141	8.328E-01	144.0	1.199E+00	1.200E+00	3.988E+00

CE-144	-3.628E+00	144.4	5.237E+00	5.240E+00	1.741E+01
PM-144	1.600E-01	295.5	4.728E-01	4.728E-01	1.626E+00
EU-152	1.500E-01	85.5	1.282E-01	1.285E-01	4.003E+00
EU-154	1.795E+00	59.6	1.070E+00	1.074E+00	2.604E+00
EU-155	7.501E-01	237.9	1.784E+00	1.785E+00	1.406E+01
HF-181	5.283E-01	100.0	5.284E-01	5.291E-01	1.772E+00
Ta-182	1.321E-01	2109.5	2.786E+00	2.786E+00	9.528E+00
Hg-203	-5.826E-01	81.6	4.752E-01	4.764E-01	1.579E+00
TL-208	4.287E+00	15.0	6.436E-01	6.810E-01	1.102E+00
PM-146	6.244E-01	97.6	6.092E-01	6.100E-01	1.448E+00
Y-88	7.573E-01	30.5	2.312E-01	2.353E-01	5.109E-01
Cd-113m	-3.007E+03	206.6	6.212E+03	6.215E+03	2.098E+04
Cd-109	1.020E+01	239.6	2.445E+01	2.445E+01	8.114E+01
Cf-251	-1.676E+00	141.4	2.370E+00	2.375E+00	6.035E+00
Cf-249	0.000E+00	1.#INF	2.637E-01	2.637E-01	2.347E+00
Sn-126	4.861E+00	111.8	5.434E+00	5.440E+00	1.808E+01
PB-210	3.482E+01	37.4	1.302E+01	1.318E+01	3.141E+01
PB-212	1.243E+01	6.6	8.264E-01	1.153E+00	1.753E+00
PB-214	4.253E+01	3.3	1.424E+00	2.629E+00	2.002E+00
BI-207	-1.385E-01	714.4	9.893E-01	9.893E-01	2.181E+00
BI-212	3.289E+01	15.9	5.218E+00	5.491E+00	7.827E+00
U-235	3.638E+00	146.1	5.316E+00	5.319E+00	1.767E+01
BI-214	4.003E+01	4.5	1.807E+00	2.755E+00	2.034E+00
BI-210M	-2.110E-01	365.2	7.705E-01	7.706E-01	2.540E+00
AC-228	1.211E+01	16.8	2.031E+00	2.123E+00	5.116E+00
TH-227	-6.618E+00	96.0	6.356E+00	6.368E+00	1.545E+01
TH-229	1.164E+00	292.9	3.410E+00	3.411E+00	2.393E+01
TH-234	9.232E+00	104.0	9.597E+00	9.611E+00	5.448E+01
PA-231	0.000E+00	1.#INF	3.841E+00	3.841E+00	1.015E+02
PA-233	0.000E+00	1.#INF	8.123E-01	8.123E-01	8.293E+00
PA-234	-2.219E+00	143.2	3.177E+00	3.179E+00	1.056E+01
PA-234M	1.497E+02	35.0	5.234E+01	5.288E+01	2.307E+02
AM-241	1.485E+00	109.1	1.621E+00	1.623E+00	5.391E+00
Np-237	2.973E+00	236.7	7.036E+00	7.038E+00	2.336E+01
Ir-192	2.086E-01	146.1	3.046E-01	3.049E-01	3.464E+00
Cs-136	-3.246E-01	165.2	5.362E-01	5.365E-01	1.828E+00
Np-239	-1.695E+00	236.8	4.013E+00	4.015E+00	1.332E+01
Nd-147	4.834E-01	169.1	8.174E-01	8.179E-01	8.080E+00
TL-210	-8.262E-01	81.9	6.766E-01	6.783E-01	2.253E+00
Kr-85	4.935E+00	2451.0	1.210E+02	1.210E+02	4.142E+02
Total	6.734E+02				

Analyst: Caleb Quinn

Sample description
453329_Gamma_160-36593-A-2-B

Spectrum Filename: C:\User\SPC\Det9\9_Gamma_20193882.An1

Acquisition information
Start time: 12/27/2019 8:16:50 AM
Live time: 1800
Real time: 1802
Dead time: 0.13 %
Detector ID: 9

Detector system
Ge9 S/N09363993

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	12/27/2019 8:16:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	9_2019-12-07_1444.PBC 12/7/2019 2:44:35 PM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 26 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 0.1609

***** 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
46.43	69.	37.39	1.03	2.577E-02	46.54	4.250	3.482E+01	PB210
59.54	35.	109.12	1.01	3.659E-02	59.54	35.900	PBC<MDA	AM241
63.29	35.	103.96	1.01	3.921E-02	63.29	3.810	PBC<MDA	TH234
64.28	34.	111.78	1.02	3.987E-02	64.28	9.700	PBC<MDA	Sn126
74.79	307.	8.75	1.03	4.573E-02				
77.22	548.	6.02	1.03	4.681E-02				
80.99	35.	242.60	1.03	4.830E-02	80.99	34.060	PBC<MDA	BA133
84.11	89.	29.47	0.90	4.937E-02				
86.54	35.	237.89	1.04	5.010E-02	86.49	13.100	PBC<MDA	Np237
					86.54	30.700	1.268E+00	EU155
					86.94	9.040	4.297E+00	Sn126
86.59	35.	236.69	1.04	5.008E-02	86.49	13.100	PBC<MDA	Np237
					86.54	30.700	1.268E+00	EU155
					86.94	9.040	4.297E+00	Sn126
86.94	35.	239.03	1.04	5.021E-02	86.49	13.100	PBC<MDA	Np237
					86.54	30.700	1.268E+00	EU155
					86.94	9.040	4.298E+00	Sn126
87.57	35.	240.05	1.04	5.038E-02	87.57	37.500	PBC<MDA	Sn126
88.14	35.	239.59	1.04	5.051E-02	88.04	3.790	PBC<MDA	Cd109
91.10	35.	240.11	1.04	5.124E-02	91.10	28.300	PBC<MDA	Nd147
92.59	35.	242.49	1.04	5.156E-02	92.59	5.584	PBC<MDA	TH234
93.35	73.	32.83	1.04	5.171E-02	93.35	5.561	PBC<MDA	AC228

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
97.50	35.	240.66	1.05	5.240E-02	97.50	30.000	PBC<MDA	Gd153
99.50	16.	525.93	1.05	5.266E-02	99.50	15.000	PBC<MDA	Np239
123.10	34.	89.83	1.07	5.296E-02	123.10	40.790	PBC<MDA	EU154
143.79	36.	146.11	1.09	5.039E-02	143.79	10.960	PBC<MDA	U235
145.44	36.	144.02	1.09	5.012E-02	145.44	48.200	PBC<MDA	CE141
162.66	22.	144.32	1.11	4.690E-02	162.66	6.220	PBC<MDA	Ba140
185.72	137.	24.20	1.13	4.403E-02	185.72	54.000	3.201E+00	U235
193.72	22.	58.97	0.52	4.284E-02	193.51	4.400	6.382E+00	TH229
205.34	23.	47.64	0.60	4.123E-02	205.33	5.010	PBC<MDA	U235
210.51	11.	292.94	1.15	4.052E-02	210.85	2.990	PBC<MDA	TH229
227.00	4.	747.22	1.17	3.858E-02	227.00	6.300	PBC<MDA	Cf251
235.97	26.	175.27	1.18	3.760E-02	235.97	12.300	PBC<MDA	TH227
238.52	348.	6.81	1.18	3.733E-02	238.63	43.300	1.198E+01	PB212
241.74	233.	9.10	1.18	3.700E-02	242.00	7.430	4.709E+01	PB214
277.28	21.	102.34	1.21	3.372E-02	277.28	6.310	PBC<MDA	TL208
295.02	479.	6.60	1.11	3.232E-02	295.09	19.300	4.268E+01	PB214
					296.00	79.000	1.045E+01	TL210
337.91	120.	20.35	0.90	2.940E-02	338.32	12.010	1.883E+01	AC228
351.69	830.	3.96	1.35	2.862E-02	351.93	37.600	4.288E+01	PB214
364.48	2.	921.05	1.29	2.791E-02	364.48	81.700	PBC<MDA	I131
383.84	11.	198.66	1.31	2.691E-02	383.84	8.940	PBC<MDA	BA133
391.69	19.	100.75	1.32	2.653E-02	391.69	64.000	PBC<MDA	SN113
433.94	20.	92.98	1.35	2.466E-02	433.94	90.480	PBC<MDA	AG108M
453.63	17.	97.56	1.37	2.388E-02	453.88	65.000	PBC<MDA	PM146
463.37	17.	94.15	1.38	2.352E-02	463.37	10.470	PBC<MDA	SB125
468.06	12.	146.07	1.38	2.335E-02	468.06	51.750	PBC<MDA	Ir192
477.60	19.	100.32	1.39	2.301E-02	477.60	10.520	PBC<MDA	BE7
482.00	18.	100.01	1.40	2.286E-02	482.00	80.500	PBC<MDA	HF181
487.02	5.	414.17	1.40	2.269E-02	487.02	45.500	PBC<MDA	La140
511.86	131.	12.96	2.67	2.188E-02	511.86	20.000	1.665E+01	RH106
537.26	15.	92.71	1.44	2.112E-02	537.26	24.390	PBC<MDA	Ba140
563.24	11.	118.97	1.47	2.040E-02	563.24	8.350	PBC<MDA	CS134
569.32	9.	122.22	1.47	2.024E-02	569.32	15.380	PBC<MDA	CS134
					569.47	8.200	3.013E+00	PA234
					569.70	97.740	2.529E-01	BI207
583.12	127.	15.01	1.42	1.989E-02	583.02	84.500	4.192E+00	TL208
600.50	16.	260.76	1.50	1.946E-02	600.50	17.860	PBC<MDA	SB125
602.73	16.	262.87	1.50	1.940E-02	602.73	98.260	PBC<MDA	SB124
604.71	12.	352.49	1.50	1.936E-02	604.71	97.620	PBC<MDA	CS134
609.14	639.	4.52	1.53	1.925E-02	609.31	46.090	4.003E+01	BI214
					610.30	5.750	3.212E+02	RU103
636.97	14.	76.26	1.53	1.862E-02	636.97	7.170	PBC<MDA	I131
696.54	5.	295.50	1.58	1.741E-02	696.54	99.000	PBC<MDA	PM144
727.13	75.	15.87	0.58	1.686E-02	727.17	7.550	3.289E+01	BI212
756.73	11.	137.42	1.62	1.635E-02	756.73	54.460	PBC<MDA	ZR95
765.15	22.	66.20	1.63	1.621E-02	765.79	99.790	PBC<MDA	NB95
766.41	29.	34.97	1.63	1.620E-02	766.41	0.294	PBC<MDA	PA234M
784.63	12.	91.62	1.65	1.590E-02	785.42	1.280	PBC<MDA	BI212

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
801.95	7.	270.26	1.66	1.565E-02	801.95	8.690	PBC<MDA	CS134
810.78	16.	82.92	1.67	1.551E-02	810.78	99.460	PBC<MDA	CO58
859.91	59.	13.26	0.34	1.482E-02	860.56	12.420	1.781E+01	TL208
873.23	11.	117.84	1.72	1.465E-02	873.23	12.270	PBC<MDA	EU154
884.68	6.	188.81	1.73	1.451E-02	884.68	72.680	PBC<MDA	AG110M
898.04	11.	113.55	1.74	1.434E-02	898.04	93.700	PBC<MDA	Y88
911.14	69.	26.66	1.75	1.418E-02	911.07	29.000	9.329E+00	AC228
964.11	11.	145.74	1.79	1.357E-02	964.11	14.605	PBC<MDA	EU152
969.06	19.	75.50	1.79	1.352E-02	968.97	17.460	PBC<MDA	AC228
1001.00	17.	82.60	1.81	1.318E-02	1001.00	0.837	PBC<MDA	PA234M
1004.77	12.	99.94	1.82	1.314E-02	1004.77	18.010	PBC<MDA	EU154
1120.00	157.	9.21	0.81	1.206E-02	1120.29	15.100	4.801E+01	BI214
					1120.55	99.987	7.252E+00	Sc46
					1121.30	34.900	2.079E+01	Ta182
1238.28	40.	48.37	1.98	1.114E-02	1238.28	66.070	3.058E+00	Co56
1313.00	2.	687.39	2.03	1.063E-02	1313.00	21.000	PBC<MDA	TL210
1384.30	9.	124.03	2.08	1.018E-02	1384.30	24.290	PBC<MDA	AG110M
1408.00	24.	39.18	2.10	1.004E-02	1408.00	21.005	6.232E+00	EU152
1460.55	533.	4.64	1.77	9.750E-03	1460.83	10.670	2.846E+02	K40
1764.28	129.	9.05	1.36	8.350E-03	1764.49	15.400	5.588E+01	BI214
1836.06	11.	30.53	2.35	8.079E-03	1836.06	99.200	7.573E-01	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	
298.76	74.79	208.	307.	6.720E+03	8.75	1.025	-	sD
308.46	77.22	270.	548.	1.171E+04	6.02	1.027	-	D
336.45	84.11	202.	87.	1.756E+03	25.56	1.034	-	D
820.83	205.34	46.	24.	5.700E+02	47.02	0.597	-	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	185.38	46.43	161.	69.	0.038	37.39	1.034
TH-227	200.20	50.14	570.	-32.	-0.018	80.57	1.001
AM-241	237.77	59.54	717.	35.	0.020	109.12	1.010s
TH-234	252.77	63.29	627.	35.	0.019	103.96	1.014s
Sn-126	256.74	64.28	698.	34.	0.019	111.78	1.015
BA-133	323.56	80.99	3498.	35.	0.019	242.60	1.031s
Np-237	345.55	86.49	3435.	35.	0.020	236.69	1.036s
EU-155	345.76	86.54	3470.	35.	0.020	237.89	1.036s
Sn-126	347.35	86.94	3505.	35.	0.020	239.03	1.037
Sn-126	349.87	87.57	3540.	35.	0.020	240.05	1.037
Cd-109	351.75	88.04	3530.	35.	0.020	239.59	1.038s
Nd-147	363.99	91.10	3565.	35.	0.020	240.11	1.041s
TH-234	369.94	92.59	3600.	35.	0.019	242.49	1.042s
AC-228	372.98	93.35	248.	73.	0.040	32.83	1.043D
Gd-153	389.58	97.50	3624.	35.	0.020	240.66	1.047
Np-239	397.58	99.50	3660.	16.	0.009	525.93	1.049s
Gd-153	412.37	103.20	3676.	0.	0.000	1000.00	1.052
Np-239	414.37	103.70	3676.	0.	0.000	1000.00	1.053
EU-155	420.82	105.31	3676.	0.	0.000	1000.00	1.054s
Np-239	424.09	106.13	3789.	-37.	-0.020	236.82	1.055s
EU-152	486.67	121.78	523.	-37.	-0.020	89.36	1.070s
CO-57	487.80	122.06	559.	-37.	-0.020	92.33	1.070s
EU-154	491.95	123.10	447.	34.	0.019	89.83	1.071s
PA-234	524.72	131.29	1423.	-37.	-0.021	143.18	1.079s
HF-181	531.64	133.02	1415.	-38.	-0.021	142.57	1.081s
CE-144	533.69	133.54	1452.	-38.	-0.021	144.37	1.081s
HF-181	544.74	136.30	1490.	-38.	-0.021	145.85	1.084s
CO-57	545.43	136.47	1528.	-38.	-0.021	147.66	1.084s
Tc-99m	561.57	140.51	1588.	-7.	-0.004	801.29	1.088s
U-235	574.67	143.79	1378.	36.	0.020	146.11	1.091s
CE-141	581.29	145.44	1342.	36.	0.020	144.02	1.092s
Ba-140	650.15	162.66	495.	22.	0.012	144.32	1.108s
U-235	653.03	163.38	517.	0.	0.000	1000.00	1.109s
CE-139	662.92	165.85	537.	-37.	-0.020	86.68	1.111s
Cf-251	705.90	176.60	304.	-23.	-0.013	141.40	1.122s
U-235	742.37	185.72	275.	137.	0.076	24.20	1.130s
TH-229	773.52	193.51	284.	-5.	-0.003	661.41	1.137s
U-235	820.80	205.33	292.	-33.	-0.018	96.76	1.148D
TH-229	842.87	210.85	268.	11.	0.006	292.94	1.153s
Cf-251	907.45	227.00	232.	4.	0.002	747.22	1.168s
TH-227	943.33	235.97	1015.	26.	0.014	175.27	1.176s
PB-212	953.97	238.63	107.	362.	0.201	6.65	1.179D
PB-214	967.43	242.00	106.	235.	0.131	9.00	1.182D
EU-152	978.21	244.69	1119.	-29.	-0.016	163.52	1.185s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
TH-227	1024.39	256.24	204.	-30.	-0.016	96.03	1.195s
Cd-113m	1054.23	263.70	268.	-11.	-0.006	206.55	1.202s
BI-210M	1062.75	265.83	270.	-7.	-0.004	365.19	1.204s
TL-208	1108.55	277.28	228.	21.	0.012	102.34	1.215
Hg-203	1116.22	279.20	259.	-29.	-0.016	81.57	1.216s
I-131	1136.61	284.30	156.	-3.	-0.002	817.18	1.221s
PB-214	1179.77	295.09	86.	470.	0.261	5.40	1.231D
TL-210	1183.41	296.00	1314.	-26.	-0.015	195.28	1.231s
PB-212	1199.52	300.03	1252.	-7.	-0.004	761.95	1.235
PA-231	1199.68	300.07	1245.	0.	0.000	1000.00	1.235
PA-233	1200.12	300.18	1245.	0.	0.000	1000.00	1.235
PA-231	1210.00	302.65	1245.	0.	0.000	1000.00	1.237s
BA-133	1210.81	302.85	1245.	0.	0.000	1000.00	1.238s
Ba-140	1218.80	304.85	1245.	0.	0.000	1000.00	1.240s
BI-210M	1218.99	304.90	1245.	0.	0.000	1000.00	1.240s
Ir-192	1233.16	308.44	1245.	0.	0.000	1000.00	1.243s
PA-233	1247.44	312.01	1245.	0.	0.000	1000.00	1.246s
Ir-192	1265.35	316.49	1245.	0.	0.000	1000.00	1.250
La-140	1314.43	328.76	729.	-27.	-0.015	140.78	1.261s
Cf-249	1333.15	333.44	701.	-27.	-0.015	137.70	1.265s
AC-228	1351.03	337.91	91.	120.	0.066	20.35	0.903s
Cs-136	1361.66	340.57	674.	-28.	-0.015	134.34	1.272s
EU-152	1376.53	344.29	578.	-27.	-0.015	127.61	1.275s
HF-181	1382.70	345.83	619.	-28.	-0.015	128.43	1.276s
PB-214	1406.15	351.69	60.	830.	0.461	3.96	1.349
BA-133	1423.37	356.00	1067.	-25.	-0.014	183.82	1.285s
I-131	1457.31	364.48	88.	2.	0.001	921.05	1.293s
BA-133	1534.73	383.84	226.	11.	0.006	198.66	1.310s
Cf-249	1551.17	387.95	237.	0.	0.000	1000.00	1.314s
SN-113	1566.12	391.69	182.	19.	0.011	100.75	1.317s
AG-108M	1735.10	433.94	78.	20.	0.011	92.98	1.354
PM-146	1814.87	453.88	66.	17.	0.010	97.56	1.372s
SB-125	1852.82	463.37	117.	17.	0.009	94.15	1.380
Ir-192	1871.59	468.06	152.	12.	0.007	146.07	1.384s
BE-7	1909.73	477.60	168.	19.	0.010	100.32	1.392s
HF-181	1927.34	482.00	144.	18.	0.010	100.01	1.396
La-140	1947.43	487.02	183.	5.	0.003	414.17	1.400s
RU-103	1987.56	497.05	91.	-22.	-0.012	89.26	1.409
RH-106	2046.81	511.86	79.	131.	0.073	12.96	2.672s
Nd-147	2123.35	531.00	65.	-7.	-0.004	238.12	1.438s
Ba-140	2148.39	537.26	44.	15.	0.008	92.71	1.444s
CS-134	2252.30	563.24	33.	11.	0.006	118.97	1.466s
CS-134	2276.64	569.32	56.	9.	0.005	122.22	1.471s
PA-234	2277.24	569.47	65.	0.	0.000	1000.00	1.471s
BI-207	2278.16	569.70	67.	0.	0.000	1000.00	1.471s
TL-208	2331.82	583.12	43.	127.	0.070	15.01	1.416
SB-125	2401.36	600.50	821.	16.	0.009	260.76	1.497s
SB-124	2410.29	602.73	837.	16.	0.009	262.87	1.499s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
CS-134	2418.21	604.71	852.	12.	0.007	352.49	1.500
BI-214	2435.94	609.14	41.	639.	0.355	4.52	1.526
RU-103	2440.56	610.30	864.	0.	0.000	1000.00	1.505s
AG-108M	2456.49	614.28	864.	0.	0.000	1000.00	1.508s
PM-144	2471.62	618.06	864.	0.	0.000	1000.00	1.512s
RH-106	2487.04	621.92	900.	-17.	-0.010	244.11	1.515s
SB-125	2542.94	635.89	56.	-2.	-0.001	533.85	1.526s
I-131	2547.28	636.97	50.	14.	0.008	76.26	1.527s
AG-110M	2630.43	657.76	128.	-22.	-0.012	75.19	1.544s
CS-137	2646.03	661.66	139.	-13.	-0.007	129.56	1.548s
PM-144	2785.58	696.54	105.	5.	0.003	295.50	1.576
SB-124	2890.57	722.79	194.	-21.	-0.012	97.35	1.598s
AG-108M	2891.17	722.94	174.	-21.	-0.012	92.27	1.598s
ZR-95	2896.22	724.20	115.	0.	0.000	1000.00	1.599s
BI-212	2907.96	727.13	11.	75.	0.042	15.87	0.585s
PM-146	2942.31	735.72	75.	-19.	-0.011	37.80	1.608s
PM-146	2988.08	747.16	79.	-23.	-0.013	12.22	1.617s
ZR-95	3026.36	756.73	45.	11.	0.006	137.42	1.625s
AG-110M	3055.23	763.94	108.	-26.	-0.014	61.07	1.631s
NB-95	3062.61	765.79	95.	22.	0.012	66.20	1.632s
PA-234M	3065.10	766.41	37.	29.	0.016	34.97	1.633s
EU-152	3115.14	778.92	55.	-12.	-0.007	138.90	1.643s
BI-212	3141.15	785.42	59.	12.	0.007	91.62	1.648s
CS-134	3182.96	795.87	144.	-23.	-0.013	76.56	1.656s
TL-210	3197.88	799.60	167.	-23.	-0.013	81.90	1.659s
CS-134	3207.29	801.95	181.	7.	0.004	270.26	1.661s
CO-58	3242.59	810.78	80.	16.	0.009	82.92	1.668s
La-140	3262.58	815.77	96.	0.	0.000	1000.00	1.672s
Cs-136	3273.50	818.50	106.	-9.	-0.005	165.18	1.674s
MN-54	3338.91	834.85	65.	-10.	-0.006	110.68	1.687s
Co-56	3386.61	846.77	85.	-21.	-0.012	53.98	1.696s
TL-208	3439.17	859.91	1.	59.	0.033	13.26	0.337s
NB-94	3483.94	871.10	70.	-17.	-0.009	74.94	1.715s
EU-154	3492.47	873.23	74.	11.	0.006	117.84	1.717s
PA-234	3521.68	880.53	85.	-5.	-0.003	248.75	1.722s
PA-234	3532.53	883.24	91.	0.	0.000	1000.00	1.724s
AG-110M	3538.30	884.68	68.	6.	0.004	188.81	1.725s
Sc-46	3556.69	889.28	98.	-14.	-0.007	107.47	1.729s
Y-88	3591.74	898.04	30.	11.	0.006	113.55	1.736
AC-228	3643.88	911.07	57.	69.	0.038	26.66	1.746
AG-110M	3749.60	937.49	90.	-26.	-0.014	82.41	1.766s
PA-234	3783.72	946.02	50.	-2.	-0.001	780.49	1.772s
EU-152	3856.11	964.11	123.	11.	0.006	145.74	1.786s
AC-228	3875.56	968.97	89.	19.	0.010	75.50	1.790
EU-154	3985.03	996.33	96.	-19.	-0.010	76.89	1.810s
PA-234M	4003.71	1001.00	85.	17.	0.009	82.60	1.814s
EU-154	4018.82	1004.77	68.	12.	0.007	99.94	1.816s
Co-56	4151.13	1037.84	48.	-9.	-0.005	178.12	1.841s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Cs-136	4192.07	1048.07	53.	-2.	-0.001	447.44	1.848s
RH-106	4201.23	1050.36	64.	-6.	-0.003	187.60	1.850s
BI-207	4254.46	1063.66	53.	-2.	-0.001	714.43	1.860s
EU-152	4448.20	1112.07	250.	-20.	-0.011	115.39	1.895s
ZN-65	4462.09	1115.55	231.	-20.	-0.011	112.07	1.897s
BI-214	4479.92	1120.00	12.	157.	0.087	9.21	0.807s
Sc-46	4482.12	1120.55	209.	9.	0.005	229.60	1.901s
CO-60	4692.96	1173.24	70.	-22.	-0.012	67.02	1.938s
Ta-182	4756.25	1189.05	57.	-4.	-0.002	484.30	1.949
Ta-182	4885.75	1221.41	51.	-5.	-0.003	337.93	1.972
Co-56	4953.27	1238.28	63.	40.	0.022	48.37	1.984
NA-22	5098.35	1274.53	34.	-1.	-0.001	830.66	2.008s
EU-154	5098.39	1274.54	35.	0.	0.000	1000.00	2.008s
FE-59	5166.65	1291.60	45.	-5.	-0.003	299.22	2.020s
TL-210	5252.32	1313.00	34.	2.	0.001	687.39	2.034s
CO-60	5330.37	1332.50	45.	-16.	-0.009	99.79	2.047s
AG-110M	5537.69	1384.30	23.	9.	0.005	124.03	2.082s
EU-152	5632.56	1408.00	11.	24.	0.013	39.18	2.097s
K-40	5842.92	1460.55	15.	533.	0.296	4.64	1.768
SB-124	6765.35	1690.98	19.	-5.	-0.003	221.06	2.272s
BI-214	7058.80	1764.28	4.	129.	0.072	9.05	1.357s
Co-56	7087.11	1771.35	133.	0.	0.000	1000.00	2.318s
Y-88	7346.20	1836.06	0.	11.	0.006	30.53	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	4.3023E+00				5.31E+01	
			477.60	4.302E+00	&(	1.446E+01 1.00E+02 1.05E+01	G
NA-22	C	-5.1077E-02				9.50E+02	
			1274.53	-5.108E-02	?(	1.526E+00 8.31E+02 9.99E+01	G
K-40	N	2.8459E+02				4.66E+11	
			1460.83	2.846E+02	(P	1.113E+01 4.64E+00 1.07E+01	G
Sc-46	F	-5.1913E-01				8.38E+01	
			889.28	-5.191E-01	?(	1.883E+00 1.07E+02 1.00E+02	G
			1120.55	4.147E-01	+	3.229E+00 2.30E+02 1.00E+02	G

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Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CR-51	F -2.3545E-01					2.77E+01	
		320.08	-2.354E-01	%(P	3.059E+01	1.97E+03	9.94E+00 G
MN-54	C -3.7975E-01					3.12E+02	
		834.85	-3.798E-01	?(P	1.479E+00	1.11E+02	1.00E+02 G
FE-59	F -8.1036E-02					4.45E+01	
		1099.25	-8.104E-02	%(P	2.672E+00	1.36E+03	5.65E+01 G
		1291.60	-6.370E-01	+	4.071E+00	2.99E+02	4.32E+01 G
Co-56	C -7.9058E-01					7.73E+01	
		846.77	-7.906E-01	?(P	1.695E+00	5.40E+01	9.99E+01 G
		1238.28	3.058E+00	+ P	2.986E+00	4.84E+01	6.61E+01 G
		1037.84	-2.762E+00	+	1.074E+01	1.78E+02	1.41E+01 G
		1771.35	0.000E+00	+	2.434E+01	1.00E+03	1.55E+01 A
CO-57	C -4.5064E-01					2.72E+02	
		122.06	-4.506E-01	@(	1.382E+00	9.23E+01	8.56E+01 G
		136.47	-3.804E+00	+	1.867E+01	1.48E+02	1.07E+01 G
CO-58	C 5.7604E-01					7.09E+01	
		810.78	5.760E-01	?(	1.598E+00	8.29E+01	9.95E+01 G
CO-60	F -8.6426E-01					1.93E+03	
		1332.50	-8.643E-01	?(	1.804E+00	9.98E+01	1.00E+02 G
		1173.24	-1.036E+00	+ P	1.990E+00	6.70E+01	9.99E+01 G
ZN-65	F -1.7749E+00					2.44E+02	
		1115.55	-1.775E+00	?(	6.665E+00	1.12E+02	5.06E+01 G
NB-94	I -2.3532E-02					7.41E+06	
		702.63	-2.353E-02	%(P	1.697E+00	2.05E+03	9.79E+01 G
		871.10	-6.313E-01	&	1.576E+00	7.49E+01	9.99E+01 G
ZR-95	I 6.8617E-01					6.40E+01	
		756.73	6.862E-01	?(	2.119E+00	1.37E+02	5.45E+01 G
		724.20	0.000E+00	-	3.921E+00	1.00E+03	4.42E+01 G
NB-95	I 7.5618E-01					6.40E+01	
		765.79	7.562E-01	?(	1.655E+00	6.62E+01	9.98E+01 G
RU-103	I -6.1380E-01					3.93E+01	
		497.05	-6.138E-01	?(	1.289E+00	8.93E+01	9.09E+01 G
		610.30	0.000E+00	+	7.020E+01	1.00E+03	5.75E+00 GA

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
RH-106	I	-5.1557E+00					3.74E+02	
			621.92	-5.156E+00	?(	4.207E+01	2.44E+02	9.93E+00 G
			1050.36	-1.731E+01	+	1.121E+02	1.88E+02	1.56E+00 G
			511.86	1.665E+01	?	5.596E+00	1.30E+01	2.00E+01 GA
AG-108M	C	4.9740E-01					1.53E+05	
			433.94	4.974E-01	?(	1.092E+00	9.30E+01	9.05E+01 G
			722.94	-7.509E-01	+	2.315E+00	9.23E+01	9.08E+01 G
			614.28	0.000E+00	-	4.515E+00	1.00E+03	8.98E+01 G
AG-110M	F	7.7521E-01					2.50E+02	
			884.68	3.337E-01	&(	2.172E+00	1.89E+02	7.27E+01 G
			657.76	-7.150E-01	+	1.787E+00	7.52E+01	9.46E+01 G
			937.49	-3.037E+00	+	5.469E+00	8.24E+01	3.44E+01 G
			1384.30	2.096E+00	?(	5.592E+00	1.24E+02	2.43E+01 G
			763.94	-3.916E+00	&	7.871E+00	6.11E+01	2.23E+01 G
SN-113	F	6.3573E-01					1.15E+02	
			391.69	6.357E-01	&(	2.145E+00	1.01E+02	6.40E+01 G
SB-124	F	4.5554E-01					6.02E+01	
			602.73	4.555E-01	?(	4.007E+00	2.63E+02	9.83E+01 G
			1690.98	-6.721E-01	+	3.094E+00	2.21E+02	4.78E+01 G
			722.79	-6.309E+00	+	2.054E+01	9.73E+01	1.08E+01 G
SB-125	I	1.3917E+00					1.01E+03	
			427.88	-1.256E-01	%(	3.473E+00	1.14E+03	2.96E+01 G
			600.50	2.496E+00	(	2.178E+01	2.61E+02	1.79E+01 G
			635.89	-5.269E-01	+	9.901E+00	5.34E+02	1.13E+01 G
			463.37	3.797E+00	(	1.199E+01	9.41E+01	1.05E+01 G
I-131	I	5.1482E-01					8.02E+00	
			364.48	4.873E-02	&(	1.131E+00	9.21E+02	8.17E+01 G
			284.30	-8.188E-01	+	1.663E+01	8.17E+02	6.14E+00 G
			636.97	5.826E+00	?(	1.484E+01	7.63E+01	7.17E+00 G
Gd-153	F	1.2533E+00					2.42E+02	
			97.50	1.253E+00	&(	1.001E+01	2.41E+02	3.00E+01 G
			103.20	0.000E+00	-	1.371E+01	1.00E+03	2.18E+01 G
Ga-68	C	1.0569E+00					4.71E-02	
			1077.40	1.057E+00	%(	4.943E+01	2.09E+03	3.30E+00 G
Tc-99m	I	-8.8689E-02					2.51E-01	
			140.51	-8.869E-02	?(	2.373E+00	8.01E+02	8.93E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
BA-133	F	-7.9760E-01					3.85E+03	
			356.00	-7.976E-01	?(	4.888E+00	1.84E+02	6.20E+01 G
			302.85	0.000E+00	+	1.596E+01	1.00E+03	1.83E+01 G
			383.84	2.502E+00	?	1.681E+01	1.99E+02	8.94E+00 GA
			80.99	1.167E+00	? P	9.399E+00	2.43E+02	3.41E+01 GA
CS-134	I	-2.6488E-01					7.54E+02	
			795.87	-9.508E-01	?(	2.420E+00	7.66E+01	8.55E+01 G
			604.71	3.456E-01	+	4.079E+00	3.52E+02	9.76E+01 G
			569.32	1.606E+00	&	6.707E+00	1.22E+02	1.54E+01 G
			801.95	2.906E+00	?(	2.673E+01	2.70E+02	8.69E+00 G
			563.24	3.461E+00	?(P	9.679E+00	1.19E+02	8.35E+00 G
CS-137	I	-4.7523E-01					1.10E+04	
			661.66	-4.752E-01	?(	2.080E+00	1.30E+02	8.52E+01 G
CE-139	F	-5.3930E-01					1.38E+02	
			165.85	-5.393E-01	?(P	1.625E+00	8.67E+01	7.99E+01 G
Ba-140	I	2.1551E+00					1.28E+01	
			537.26	1.634E+00	*(P	3.628E+00	9.27E+01	2.44E+01 G
			162.66	4.198E+00	?(P	2.026E+01	1.44E+02	6.22E+00 G
			304.85	0.000E+00	-	6.849E+01	1.00E+03	4.29E+00 G
La-140	I	3.7392E-02					1.28E+01	
			1596.21	-6.422E-02	%(	1.444E+00	1.03E+03	9.54E+01 G
			487.02	2.504E-01	?(P	3.541E+00	4.14E+02	4.55E+01 G
			328.76	-2.498E+00	+	1.173E+01	1.41E+02	2.03E+01 G
			815.77	0.000E+00	-	7.475E+00	1.00E+03	2.33E+01 G
CE-141	I	8.3283E-01					3.25E+01	
			145.44	8.328E-01	(	3.988E+00	1.44E+02	4.82E+01 G
CE-144	I	-3.6276E+00					2.85E+02	
			133.54	-3.628E+00	?(	1.741E+01	1.44E+02	1.11E+01 G
PM-144	C	1.5999E-01					3.63E+02	
			696.54	1.600E-01	?(P	1.626E+00	2.95E+02	9.90E+01 G
			618.06	0.000E+00	-	4.112E+00	1.00E+03	9.91E+01 G
EU-152	F	1.5002E-01					4.94E+03	
			121.78	-1.349E+00	(	4.003E+00	8.94E+01	2.86E+01 G
			344.29	-1.946E+00	+	8.285E+00	1.28E+02	2.65E+01 G
			1112.07	-6.636E+00	+	2.566E+01	1.15E+02	1.36E+01 G
			778.92	-3.220E+00	+	1.000E+01	1.39E+02	1.29E+01 G
			964.11	3.083E+00	?(	1.525E+01	1.46E+02	1.46E+01 G
			244.69	-5.815E+00	+	3.167E+01	1.64E+02	7.58E+00 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
			1408.00	6.232E+00	?	4.845E+00	3.92E+01	2.10E+01 GA
EU-154	I	1.7953E+00					3.14E+03	
			123.10	8.723E-01	*(	2.604E+00	8.98E+01	4.08E+01 G
			1274.54	0.000E+00	-	4.392E+00	1.00E+03	3.52E+01 G
			723.36	-6.939E-02	%	8.569E+00	3.56E+03	2.02E+01 G
			873.23	3.296E+00	?(	1.319E+01	1.18E+02	1.23E+01 G
			1004.77	2.863E+00	?(	9.670E+00	9.99E+01	1.80E+01 G
			996.33	-7.483E+00	+	1.917E+01	7.69E+01	1.06E+01 G
EU-155	I	7.5012E-01					1.81E+03	
			105.31	0.000E+00	?(	1.406E+01	1.00E+03	2.12E+01 G
			86.54	1.268E+00	&(	1.001E+01	2.38E+02	3.07E+01 G
HF-181	F	5.2830E-01					4.24E+01	
			482.00	5.283E-01	(	1.772E+00	1.00E+02	8.05E+01 G
			133.02	-9.275E-01	+	4.396E+00	1.43E+02	4.33E+01 G
			345.83	-3.528E+00	+	1.511E+01	1.28E+02	1.51E+01 G
			136.30	-6.942E+00	+	3.366E+01	1.46E+02	5.85E+00 G
Ta-182	F	1.3208E-01					1.14E+02	
			1121.30	1.321E-01	%(	9.528E+00	2.11E+03	3.49E+01 G
			1221.41	-9.136E-01	+	6.576E+00	3.38E+02	2.70E+01 G
			1189.05	-1.093E+00	+	1.126E+01	4.84E+02	1.62E+01 G
Hg-203	F	-5.8258E-01					4.66E+01	
			279.20	-5.826E-01	&(	1.579E+00	8.16E+01	8.15E+01 G
TL-208	N	4.2875E+00					6.98E+02	
			583.02	4.192E+00	(P	1.102E+00	1.50E+01	8.45E+01 G
			277.28	5.571E+00	(P	1.907E+01	1.02E+02	6.31E+00 G
			860.56	1.781E+01	+ P	2.224E+00	1.33E+01	1.24E+01 G
PM-146	C	6.2440E-01					2.02E+03	
			453.88	6.244E-01	?(P	1.448E+00	9.76E+01	6.50E+01 G
			747.16	-2.298E+00	& P	4.376E+00	1.22E+01	3.40E+01 G
			735.72	-2.821E+00	+ P	6.368E+00	3.78E+01	2.25E+01 G
Y-88	F	7.5726E-01					1.07E+02	
			1836.06	7.573E-01	?(P	5.109E-01	3.05E+01	9.92E+01 G
			898.04	4.548E-01	&	1.167E+00	1.14E+02	9.37E+01 G
Cd-113m		-3.0075E+03					5.33E+03	
			263.70	-3.007E+03	?(	2.098E+04	2.07E+02	6.00E-03 K
Cd-109	F	1.0203E+01					4.53E+02	
			88.04	1.020E+01	?(	8.114E+01	2.40E+02	3.79E+00 G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

Cf-251   T  -1.6764E+00                                     3.28E+05
                         176.60-1.676E+00  (  6.035E+00 1.41E+02 1.70E+01 G
                         227.00 9.142E-01 &   1.684E+01 7.47E+02 6.30E+00 GA

Sn-126       4.8612E+00                                     3.65E+07
                          87.57 1.033E+00 -   8.233E+00 2.40E+02 3.75E+01 GA
                          64.28 4.861E+00  (  1.808E+01 1.12E+02 9.70E+00 G
                          86.94 4.298E+00     3.410E+01 2.39E+02 9.04E+00 GA

PB-210   N   3.4817E+01                                     8.14E+03
                          46.54 3.482E+01  (P 3.141E+01 3.74E+01 4.25E+00 G

PB-212   N   1.2433E+01                                     6.98E+02
                         238.63 1.243E+01  (P 1.753E+00 6.65E+00 4.33E+01 G
                         300.03-3.485E+00 -   8.883E+01 7.62E+02 3.28E+00 GA

PB-214   N   4.2531E+01                                     5.84E+05
                         351.93 4.288E+01  (P 2.002E+00 3.96E+00 3.76E+01 G
                         295.09 4.184E+01  (P 4.095E+00 5.40E+00 1.93E+01 G
                         242.00 4.751E+01 +   1.026E+01 9.00E+00 7.43E+00 GA

BI-207   C  -1.3848E-01                                     1.18E+04
                        1063.66-1.385E-01 ?(  2.181E+00 7.14E+02 7.45E+01 G
                         569.70 0.000E+00 &   1.148E+00 1.00E+03 9.77E+01 G

BI-212   N   3.2887E+01                                     6.98E+02
                         727.17 3.289E+01 @(  7.827E+00 1.59E+01 7.55E+00 G
                         785.42 3.406E+01 ? P 1.051E+02 9.16E+01 1.28E+00 GA

U-235    N   3.6379E+00                                     2.57E+11
                         143.79 3.638E+00 ?(  1.767E+01 1.46E+02 1.10E+01 G
                                                          Energy duplication
                         205.33-8.855E+00 + P 2.214E+01 9.68E+01 5.01E+00 G
                         163.38 0.000E+00 -   2.542E+01 1.00E+03 5.08E+00 G
                         185.72 3.201E+00 *   1.869E+00 2.42E+01 5.40E+01 GA

BI-214   N   4.0029E+01                                     5.84E+05
                         609.31 4.003E+01  (P 2.034E+00 4.52E+00 4.61E+01 G
                        1120.29 4.801E+01 + P 5.672E+00 9.21E+00 1.51E+01 G
                        1764.49 5.588E+01 + P 5.021E+00 9.05E+00 1.54E+01 G

BI-210M  T  -2.1098E-01                                     1.10E+09
                         265.83-2.110E-01 ?(P 2.540E+00 3.65E+02 5.00E+01 G
                         304.90 0.000E+00 +   1.049E+01 1.00E+03 2.80E+01 G

AC-228   N   1.2111E+01                                     2.10E+03
                         911.07 9.329E+00 ?(P 5.116E+00 2.67E+01 2.90E+01 G
                         968.97 4.375E+00 - P 1.099E+01 7.55E+01 1.75E+01 G
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Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
			338.32	1.883E+01	(P	7.433E+00	2.03E+01	1.20E+01 G
			93.35	1.404E+01	P	1.471E+01	3.28E+01	5.56E+00 XA
TH-227	N	-6.6182E+00					7.95E+03	
			256.24	-6.618E+00	(	1.545E+01	9.60E+01	7.00E+00 G
			235.97	3.107E+00	+	1.816E+01	1.75E+02	1.23E+01 G
			50.14	-7.637E+00	+ P	2.729E+01	8.06E+01	8.00E+00 G
TH-229	N	1.1640E+00					2.68E+06	
			193.51	-1.473E+00	?(	2.393E+01	6.61E+02	4.40E+00 G
			210.85	5.044E+00	?(	3.623E+01	2.93E+02	2.99E+00 G
TH-234	N	9.2317E+00					1.63E+12	
			92.59	6.769E+00	(P	5.448E+01	2.42E+02	5.58E+00 G
			63.29	1.284E+01	*(	4.440E+01	1.04E+02	3.81E+00 G
PA-234	N	-2.2188E+00					1.63E+12	
			131.29	-2.219E+00	(	1.056E+01	1.43E+02	1.80E+01 G
			946.02	-6.020E-01	+	1.073E+01	7.80E+02	1.34E+01 G
			569.47	0.000E+00	&	1.349E+01	1.00E+03	8.20E+00 G
			883.24	0.000E+00	+	1.876E+01	1.00E+03	9.60E+00 G
			880.53	-3.392E+00	+	2.910E+01	2.49E+02	6.00E+00 GA
PA-234M	N	1.4968E+02					1.63E+12	
			1001.00	8.353E+01	?(P	2.307E+02	8.26E+01	8.37E-01 G
			766.41	3.380E+02	?(	3.615E+02	3.50E+01	2.94E-01 G
AM-241	T	1.4854E+00					1.58E+05	
			59.54	1.485E+00	?(	5.391E+00	1.09E+02	3.59E+01 G
Np-237	F	2.9727E+00					2.14E+06	
			86.49	2.973E+00	&(	2.336E+01	2.37E+02	1.31E+01 G
Ir-192	F	2.0855E-01					7.40E+01	
			316.49	0.000E+00	?(	3.464E+00	1.00E+03	8.70E+01 G
			468.06	5.593E-01	?(	2.764E+00	1.46E+02	5.18E+01 G
			308.44	0.000E+00	-	9.329E+00	1.00E+03	3.18E+01 G
Cs-136	F	-3.2463E-01					1.30E+01	
			818.50	-3.246E-01	&(	1.828E+00	1.65E+02	1.00E+02 G
			1048.07	-1.275E-01	+	2.007E+00	4.47E+02	8.00E+01 G
			340.57	-1.117E+00	+	5.006E+00	1.34E+02	4.69E+01 G
Np-239	T	-1.6946E+00					2.36E+00	
			103.70	0.000E+00	+	1.244E+01	1.00E+03	2.40E+01 X
			106.13	-1.695E+00	?(	1.332E+01	2.37E+02	2.27E+01 G
			99.50	1.146E+00	@	2.002E+01	5.26E+02	1.50E+01 X

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

Nd-147       4.8343E-01                                      1.11E+01
                          531.00-1.404E+00 &(  8.080E+00 2.38E+02 1.30E+01 G
                           91.10 1.351E+00 ?(  1.076E+01 2.40E+02 2.83E+01 G

TL-210   N  -8.2617E-01                                      5.84E+05
                          799.60-8.262E-01 ?(  2.253E+00 8.19E+01 9.90E+01 G
                          296.00-5.754E-01 +   3.743E+00 1.95E+02 7.90E+01 G
                         1313.00 4.979E-01 +   7.439E+00 6.87E+02 2.10E+01 GA

Kr-85    I   4.9348E+00                                      3.92E+03
                          513.98 4.935E+00 %(  4.142E+02 2.45E+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	570.	-32.	-0.018	80.57	-7.637E+00	P
AM-241	59.54	717.	35.	0.020	109.12	1.485E+00	
TH-234	63.29	627.	35.	0.019	103.96	1.284E+01	
BA-133	80.99	3498.	35.	0.019	242.60	1.167E+00	P
EU-155	86.54	3470.	35.	0.020	237.89	1.268E+00	
Nd-147	91.10	3565.	35.	0.020	240.11	1.351E+00	
TH-234	92.59	3600.	35.	0.019	242.49	6.769E+00	P
Np-239	99.50	3660.	16.	0.009	525.93	1.146E+00	
Np-239	106.13	3789.	-37.	-0.020	236.82	-1.695E+00	
EU-152	121.78	523.	-37.	-0.020	89.36	-1.349E+00	
CO-57	122.06	559.	-37.	-0.020	92.33	-4.506E-01	
EU-154	123.10	447.	34.	0.019	89.83	8.723E-01	
PA-234	131.29	1423.	-37.	-0.021	143.18	-2.219E+00	
HF-181	133.02	1415.	-38.	-0.021	142.57	-9.275E-01	
CE-144	133.54	1452.	-38.	-0.021	144.37	-3.628E+00	
HF-181	136.30	1490.	-38.	-0.021	145.85	-6.942E+00	
CO-57	136.47	1528.	-38.	-0.021	147.66	-3.804E+00	
Tc-99m	140.51	1588.	-7.	-0.004	801.29	-8.869E-02	
U-235	143.79	1378.	36.	0.020	146.11	3.638E+00	
CE-141	145.44	1342.	36.	0.020	144.02	8.328E-01	
Ba-140	162.66	495.	22.	0.012	144.32	4.198E+00	P
CE-139	165.85	537.	-37.	-0.020	86.68	-5.393E-01	P
Cf-251	176.60	304.	-23.	-0.013	141.40	-1.676E+00	
U-235	185.72	275.	137.	0.076	24.20	3.201E+00	
U-235	205.33	292.	-33.	-0.018	96.76	-8.855E+00	P
Cf-251	227.00	232.	4.	0.002	747.22	9.142E-01	
TH-227	235.97	1015.	26.	0.014	175.27	3.107E+00	
EU-152	244.69	1119.	-29.	-0.016	163.52	-5.815E+00	
TH-227	256.24	204.	-30.	-0.016	96.03	-6.618E+00	
Cd-113m	263.70	268.	-11.	-0.006	206.55	-3.007E+03	
BI-210M	265.83	270.	-7.	-0.004	365.19	-2.110E-01	P
Hg-203	279.20	259.	-29.	-0.016	81.57	-5.826E-01	
I-131	284.30	156.	-3.	-0.002	817.18	-8.188E-01	
TL-210	296.00	1314.	-26.	-0.015	195.28	-5.754E-01	
La-140	328.76	729.	-27.	-0.015	140.78	-2.498E+00	
Cf-249	333.44	701.	-27.	-0.015	137.70	-3.312E+00	
Cs-136	340.57	674.	-28.	-0.015	134.34	-1.117E+00	
EU-152	344.29	578.	-27.	-0.015	127.61	-1.946E+00	
HF-181	345.83	619.	-28.	-0.015	128.43	-3.528E+00	
BA-133	356.00	1067.	-25.	-0.014	183.82	-7.976E-01	
I-131	364.48	88.	2.	0.001	921.05	4.873E-02	
BA-133	383.84	226.	11.	0.006	198.66	2.502E+00	
SN-113	391.69	182.	19.	0.011	100.75	6.357E-01	
AG-108M	433.94	78.	20.	0.011	92.98	4.974E-01	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
SB-125	463.37	117.	17.	0.009	94.15	3.797E+00	
Ir-192	468.06	152.	12.	0.007	146.07	5.593E-01	
BE-7	477.60	168.	19.	0.010	100.32	4.302E+00	
HF-181	482.00	144.	18.	0.010	100.01	5.283E-01	
La-140	487.02	183.	5.	0.003	414.17	2.504E-01	P
RU-103	497.05	91.	-22.	-0.012	89.26	-6.138E-01	
RH-106	511.86	79.	131.	0.073	12.96	1.665E+01	
Nd-147	531.00	65.	-7.	-0.004	238.12	-1.404E+00	
Ba-140	537.26	44.	15.	0.008	92.71	1.634E+00	P
CS-134	563.24	33.	11.	0.006	118.97	3.461E+00	P
CS-134	569.32	56.	9.	0.005	122.22	1.606E+00	
SB-125	600.50	821.	16.	0.009	260.76	2.496E+00	
SB-124	602.73	837.	16.	0.009	262.87	4.555E-01	
CS-134	604.71	852.	12.	0.007	352.49	3.456E-01	
RH-106	621.92	900.	-17.	-0.010	244.11	-5.156E+00	
SB-125	635.89	56.	-2.	-0.001	533.85	-5.269E-01	
I-131	636.97	50.	14.	0.008	76.26	5.826E+00	
AG-110M	657.76	128.	-22.	-0.012	75.19	-7.150E-01	
CS-137	661.66	139.	-13.	-0.007	129.56	-4.752E-01	
PM-144	696.54	105.	5.	0.003	295.50	1.600E-01	P
SB-124	722.79	194.	-21.	-0.012	97.35	-6.309E+00	
AG-108M	722.94	174.	-21.	-0.012	92.27	-7.509E-01	
ZR-95	756.73	45.	11.	0.006	137.42	6.862E-01	
AG-110M	763.94	108.	-26.	-0.014	61.07	-3.916E+00	
PA-234M	766.41	37.	29.	0.016	34.97	3.380E+02	
EU-152	778.92	55.	-12.	-0.007	138.90	-3.220E+00	
CS-134	795.87	144.	-23.	-0.013	76.56	-9.508E-01	
TL-210	799.60	167.	-23.	-0.013	81.90	-8.262E-01	
CS-134	801.95	181.	7.	0.004	270.26	2.906E+00	
CO-58	810.78	80.	16.	0.009	82.92	5.760E-01	
Cs-136	818.50	106.	-9.	-0.005	165.18	-3.246E-01	
MN-54	834.85	65.	-10.	-0.006	110.68	-3.798E-01	P
Co-56	846.77	85.	-21.	-0.012	53.98	-7.906E-01	P
NB-94	871.10	70.	-17.	-0.009	74.94	-6.313E-01	
EU-154	873.23	74.	11.	0.006	117.84	3.296E+00	
PA-234	880.53	85.	-5.	-0.003	248.75	-3.392E+00	
AG-110M	884.68	68.	6.	0.004	188.81	3.337E-01	
Sc-46	889.28	98.	-14.	-0.007	107.47	-5.191E-01	
AG-110M	937.49	90.	-26.	-0.014	82.41	-3.037E+00	
PA-234	946.02	50.	-2.	-0.001	780.49	-6.020E-01	
EU-152	964.11	123.	11.	0.006	145.74	3.083E+00	
EU-154	996.33	96.	-19.	-0.010	76.89	-7.483E+00	
PA-234M	1001.00	85.	17.	0.009	82.60	8.353E+01	P
EU-154	1004.77	68.	12.	0.007	99.94	2.863E+00	
Co-56	1037.84	48.	-9.	-0.005	178.12	-2.762E+00	
Cs-136	1048.07	53.	-2.	-0.001	447.44	-1.275E-01	
RH-106	1050.36	64.	-6.	-0.003	187.60	-1.731E+01	
BI-207	1063.66	53.	-2.	-0.001	714.43	-1.385E-01	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
EU-152	1112.07	250.	-20.	-0.011	115.39	-6.636E+00		
ZN-65	1115.55	231.	-20.	-0.011	112.07	-1.775E+00		
Sc-46	1120.55	209.	9.	0.005	229.60	4.147E-01		
CO-60	1173.24	70.	-22.	-0.012	67.02	-1.036E+00		P
Ta-182	1189.05	57.	-4.	-0.002	484.30	-1.093E+00		
Ta-182	1221.41	51.	-5.	-0.003	337.93	-9.136E-01		
Co-56	1238.28	63.	40.	0.022	48.37	3.058E+00		P
NA-22	1274.53	34.	-1.	-0.001	830.66	-5.108E-02		
FE-59	1291.60	45.	-5.	-0.003	299.22	-6.370E-01		
TL-210	1313.00	34.	2.	0.001	687.39	4.979E-01		
CO-60	1332.50	45.	-16.	-0.009	99.79	-8.643E-01		
AG-110M	1384.30	23.	9.	0.005	124.03	2.096E+00		
EU-152	1408.00	11.	24.	0.013	39.18	6.232E+00		
SB-124	1690.98	19.	-5.	-0.003	221.06	-6.721E-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 *****

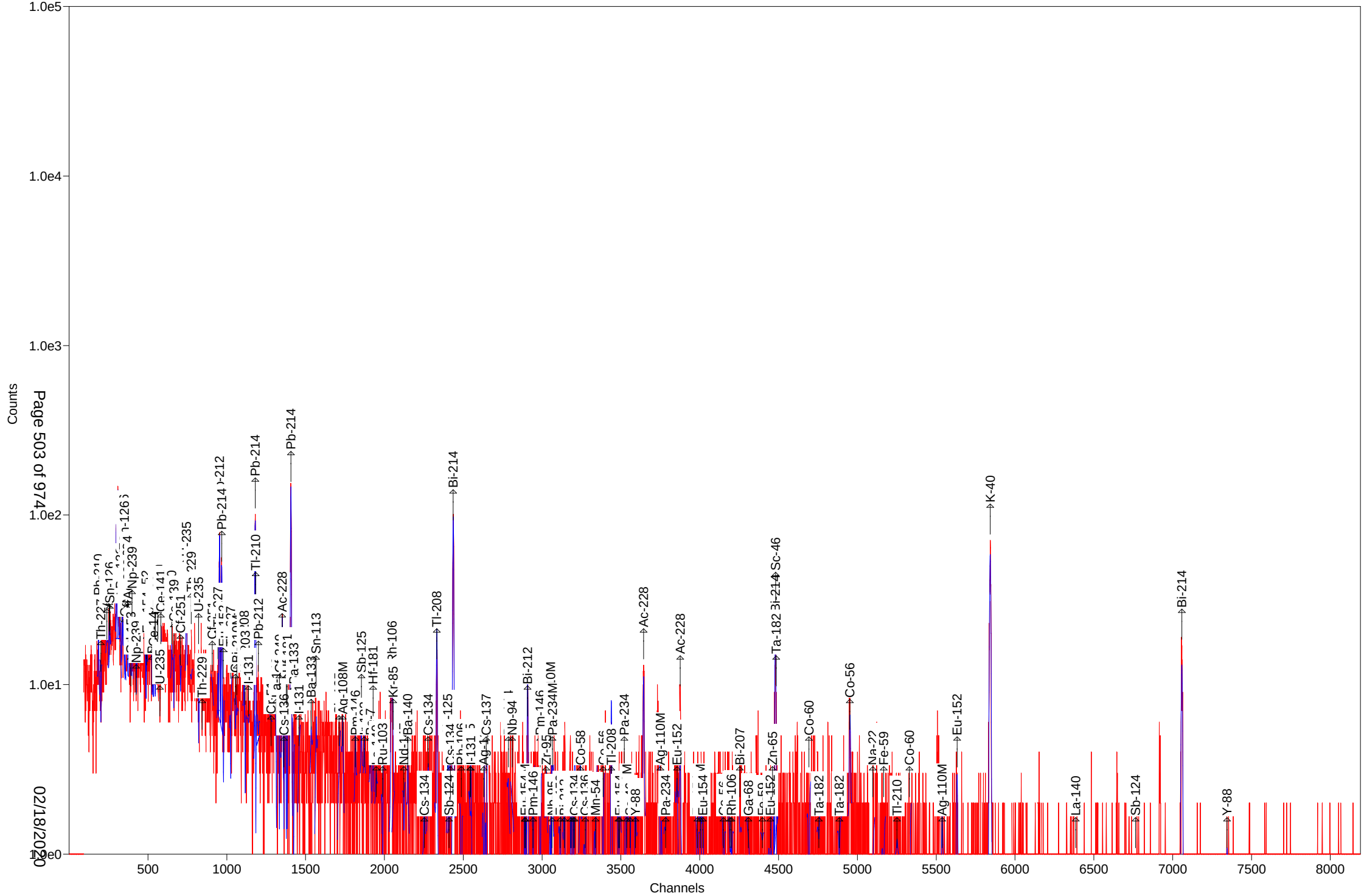
Nuclide		Time of Count Activity Bq/Sample	Time Corrected Activity Bq/Sample	Uncertainty Counting 1 Sigma	MDA Bq/Sample
BE-7	#A	4.3023E+00	4.3023E+00	1.003E+02%	1.45E+01
NA-22	#A	-5.1077E-02	-5.1077E-02	8.307E+02%	1.53E+00
K-40		2.8459E+02	2.8459E+02	4.635E+00%	1.11E+01
Sc-46	#A	-5.1913E-01	-5.1913E-01	1.075E+02%	1.88E+00
CR-51	#A	-2.3545E-01	-2.3545E-01	1.975E+03%	3.06E+01
MN-54	#A	-3.7975E-01	-3.7975E-01	1.107E+02%	1.48E+00
FE-59	#A	-8.1035E-02	-8.1036E-02	1.361E+03%	2.67E+00
Co-56	#A	-7.9058E-01	-7.9058E-01	5.398E+01%	1.70E+00
CO-57	#A	-4.5063E-01	-4.5064E-01	9.233E+01%	1.38E+00
CO-58	#A	5.7604E-01	5.7604E-01	8.292E+01%	1.60E+00
CO-60	#A	-8.6426E-01	-8.6426E-01	9.979E+01%	1.80E+00
ZN-65	#A	-1.7749E+00	-1.7749E+00	1.121E+02%	6.67E+00
NB-94	#A	-2.3532E-02	-2.3532E-02	2.053E+03%	1.70E+00
ZR-95	#A	6.8616E-01	6.8617E-01	1.374E+02%	2.12E+00
NB-95	#A	7.5618E-01	7.5618E-01	6.620E+01%	1.65E+00
RU-103	#A	-6.1379E-01	-6.1380E-01	8.926E+01%	1.29E+00
RH-106	#A	-5.1556E+00	-5.1557E+00	2.441E+02%	4.21E+01
AG-108M	#A	4.9740E-01	4.9740E-01	9.298E+01%	1.09E+00
AG-110M	#A	7.7521E-01	7.7521E-01	1.130E+02%	2.17E+00
SN-113	#A	6.3573E-01	6.3573E-01	1.008E+02%	2.15E+00
SB-124	#A	4.5554E-01	4.5554E-01	2.629E+02%	4.01E+00
SB-125	#A	1.3917E+00	1.3917E+00	9.415E+01%	3.47E+00
I-131	#A	5.1480E-01	5.1482E-01	7.626E+01%	1.13E+00
Gd-153	#A	1.2533E+00	1.2533E+00	2.407E+02%	1.00E+01
Ga-68	#A	1.0479E+00	1.0569E+00	2.087E+03%	4.94E+01
Tc-99m	#A	-8.8548E-02	-8.8689E-02	8.013E+02%	2.37E+00

BA-133	#A	-7.9760E-01	-7.9760E-01	1.838E+02%	4.89E+00
CS-134	#A	-2.6488E-01	-2.6488E-01	7.656E+01%	2.42E+00
CS-137	#A	-4.7523E-01	-4.7523E-01	1.296E+02%	2.08E+00
CE-139	#A	-5.3930E-01	-5.3930E-01	8.668E+01%	1.62E+00
Ba-140	#A	2.1551E+00	2.1551E+00	8.577E+01%	3.63E+00
La-140	#A	3.7391E-02	3.7392E-02	4.142E+02%	1.44E+00
CE-141	#A	8.3282E-01	8.3283E-01	1.440E+02%	3.99E+00
CE-144	#A	-3.6275E+00	-3.6276E+00	1.444E+02%	1.74E+01
PM-144	#A	1.5999E-01	1.5999E-01	2.955E+02%	1.63E+00
EU-152	#A	1.5002E-01	1.5002E-01	8.548E+01%	4.00E+00
EU-154	#A	1.7953E+00	1.7953E+00	5.958E+01%	2.60E+00
EU-155	#A	7.5012E-01	7.5012E-01	2.379E+02%	1.41E+01
HF-181	#A	5.2829E-01	5.2830E-01	1.000E+02%	1.77E+00
Ta-182	#A	1.3208E-01	1.3208E-01	2.109E+03%	9.53E+00
Hg-203	#A	-5.8257E-01	-5.8258E-01	8.157E+01%	1.58E+00
TL-208		4.2875E+00	4.2875E+00	1.501E+01%	1.10E+00
PM-146	#A	6.2440E-01	6.2440E-01	9.756E+01%	1.45E+00
Y-88	#	7.5726E-01	7.5726E-01	3.053E+01%	5.11E-01
Cd-113m	#A	-3.0075E+03	-3.0075E+03	2.066E+02%	2.10E+04
Cd-109	#A	1.0203E+01	1.0203E+01	2.396E+02%	8.11E+01
Cf-251	#A	-1.6764E+00	-1.6764E+00	1.414E+02%	6.04E+00
Cf-249	#A	0.0000E+00	0.0000E+00	1.000E+03%	2.35E+00
Sn-126	A	4.8612E+00	4.8612E+00	1.118E+02%	1.81E+01
PB-210		3.4817E+01	3.4817E+01	3.739E+01%	3.14E+01
PB-212		1.2433E+01	1.2433E+01	6.647E+00%	1.75E+00
PB-214		4.2531E+01	4.2531E+01	3.348E+00%	2.00E+00
BI-207	#A	-1.3848E-01	-1.3848E-01	7.144E+02%	2.18E+00
BI-212	#	3.2887E+01	3.2887E+01	1.587E+01%	7.83E+00
U-235	#A	3.6379E+00	3.6379E+00	1.461E+02%	1.77E+01
BI-214		4.0029E+01	4.0029E+01	4.515E+00%	2.03E+00
BI-210M	#A	-2.1098E-01	-2.1098E-01	3.652E+02%	2.54E+00
AC-228		1.2111E+01	1.2111E+01	1.677E+01%	5.12E+00
TH-227	#A	-6.6182E+00	-6.6182E+00	9.603E+01%	1.55E+01
TH-229	#A	1.1640E+00	1.1640E+00	2.929E+02%	2.39E+01
TH-234	#A	9.2317E+00	9.2317E+00	1.040E+02%	5.45E+01
PA-231	#A	0.0000E+00	0.0000E+00	7.071E+02%	1.02E+02
PA-233	#A	0.0000E+00	0.0000E+00	7.071E+02%	8.29E+00
PA-234	#A	-2.2188E+00	-2.2188E+00	1.432E+02%	1.06E+01
PA-234M	#A	1.4968E+02	1.4968E+02	3.497E+01%	2.31E+02
AM-241	#A	1.4854E+00	1.4854E+00	1.091E+02%	5.39E+00
Np-237	#A	2.9727E+00	2.9727E+00	2.367E+02%	2.34E+01
Ir-192	#A	2.0855E-01	2.0855E-01	1.461E+02%	3.46E+00
Cs-136	#A	-3.2462E-01	-3.2463E-01	1.652E+02%	1.83E+00
Np-239	#A	-1.6943E+00	-1.6946E+00	2.368E+02%	1.33E+01
Nd-147	#A	4.8341E-01	4.8343E-01	1.691E+02%	8.08E+00
TL-210	#A	-8.2617E-01	-8.2617E-01	8.190E+01%	2.25E+00
Kr-85	#A	4.9348E+00	4.9348E+00	2.451E+03%	4.14E+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)     4.637E+02  Bq/Sample
Total Decayed Activity (   25.1 to  1999.3 keV) 4.6368646E+02  Bq/Sample


The library has energies which are not separable.
```

453329_Gamma_160-36593-A-2-B. 9_Gamma_20193882.spc.



Test America St. Louis Spectrum ID: 12_Gamma_20193735

Sample Description: 453329_Gamma_160-36593-A-3-B
Detector: Detector #12
Batch ID: 453329
Work Order Number: Gamma
Lot Number: 160-36593-A-3-B

Decay to Time: 12/27/2019 08:17 Live Time: 1800 sec
Acquisition Time: 12/27/2019 08:17:27 Real Time: 1802 sec
Analysis Time: 12/27/2019 08:47 Dead Time: 0.11 %
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_2019-12-07_1443.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	5.189E+00	112.8	5.856E+00	5.862E+00	1.970E+01
NA-22	8.478E-01	56.2	4.768E-01	4.786E-01	1.540E+00
K-40	3.355E+02	4.9	1.631E+01	2.352E+01	1.010E+01
Sc-46	6.278E-02	1100.5	6.909E-01	6.909E-01	2.414E+00
CR-51	5.047E+00	219.2	1.106E+01	1.107E+01	3.695E+01
MN-54	-2.742E-01	288.2	7.904E-01	7.905E-01	1.856E+00
FE-59	1.408E+00	87.5	1.232E+00	1.234E+00	2.694E+00
Co-56	2.198E+00	33.2	7.293E-01	7.379E-01	1.573E+00
CO-57	1.514E-01	309.1	4.681E-01	4.681E-01	1.580E+00
CO-58	-8.602E-01	84.6	7.280E-01	7.293E-01	2.435E+00
CO-60	5.188E-01	86.7	4.497E-01	4.505E-01	1.003E+00
ZN-65	0.000E+00	1.#INF	3.074E-01	3.074E-01	8.713E+00
NB-94	5.289E-01	67.3	3.559E-01	3.569E-01	1.673E+00
ZR-95	-1.172E-01	1143.2	1.340E+00	1.340E+00	3.174E+00
NB-95	-8.816E-01	112.5	9.916E-01	9.926E-01	3.327E+00
RU-103	-3.868E-01	169.1	6.541E-01	6.544E-01	1.634E+00
RH-106	-5.828E+00	285.0	1.661E+01	1.661E+01	5.562E+01
AG-108M	-7.390E-01	93.6	6.917E-01	6.927E-01	1.696E+00
AG-110M	5.403E-01	143.2	7.738E-01	7.743E-01	3.055E+00
SN-113	7.384E-01	117.8	8.702E-01	8.710E-01	2.927E+00
SB-124	4.920E-01	312.2	1.536E+00	1.536E+00	5.151E+00
SB-125	4.492E+00	24.3	1.090E+00	1.113E+00	4.596E+00
I-131	5.528E-01	99.4	5.497E-01	5.504E-01	1.359E+00
Gd-153	-1.538E+00	139.9	2.152E+00	2.154E+00	7.167E+00
Ga-68	-5.105E+00	598.8	3.057E+01	3.057E+01	6.822E+01
Tc-99m	0.000E+00	1.#INF	1.582E-01	1.582E-01	2.937E+00
BA-133	-9.554E-01	205.8	1.966E+00	1.967E+00	6.562E+00
CS-134	7.740E-01	79.5	6.156E-01	6.169E-01	2.244E+00
CS-137	-8.970E-01	98.2	8.806E-01	8.818E-01	2.953E+00
CE-139	2.961E-01	203.6	6.028E-01	6.030E-01	2.025E+00
Ba-140	2.961E+00	78.7	2.330E+00	2.334E+00	5.101E+00
La-140	4.986E-01	152.9	7.627E-01	7.631E-01	1.659E+00
CE-141	1.179E-01	1336.7	1.576E+00	1.576E+00	5.275E+00

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CE-144	-1.220E+00	553.9	6.755E+00	6.756E+00	2.259E+01
PM-144	-7.895E-01	101.8	8.037E-01	8.047E-01	1.839E+00
EU-152	4.804E+00	28.3	1.359E+00	1.381E+00	4.691E+00
EU-154	1.039E+00	74.9	7.783E-01	7.801E-01	3.244E+00
EU-155	6.376E-01	467.9	2.983E+00	2.983E+00	9.996E+00
HF-181	0.000E+00	1.#INF	1.350E-01	1.350E-01	2.716E+00
Ta-182	1.678E+00	53.3	8.939E-01	8.979E-01	1.289E+01
Hg-203	2.692E-01	222.1	5.979E-01	5.980E-01	2.025E+00
TL-208	5.271E+00	14.9	7.830E-01	8.276E-01	1.409E+00
PM-146	6.548E-01	130.8	8.562E-01	8.568E-01	2.134E+00
Y-88	4.233E-01	111.3	4.710E-01	4.716E-01	1.407E+00
Cd-113m	-9.630E+03	92.6	8.913E+03	8.931E+03	2.970E+04
Cd-109	1.357E+01	141.4	1.919E+01	1.921E+01	6.387E+01
Cf-251	-1.583E+00	199.3	3.156E+00	3.157E+00	8.066E+00
Cf-249	1.216E+00	75.4	9.177E-01	9.197E-01	2.688E+00
Sn-126	-5.539E-02	13754.7	7.619E+00	7.619E+00	2.562E+01
PB-210	4.661E+01	31.2	1.454E+01	1.482E+01	4.565E+01
PB-212	1.389E+01	7.4	1.028E+00	1.258E+00	2.230E+00
PB-214	5.496E+01	4.0	2.182E+00	3.540E+00	3.191E+00
BI-207	1.015E+00	99.3	1.008E+00	1.009E+00	2.203E+00
BI-212	9.037E+00	114.0	1.030E+01	1.031E+01	3.470E+01
U-235	2.357E+00	103.9	2.448E+00	2.451E+00	2.339E+01
BI-214	4.912E+01	5.0	2.479E+00	3.521E+00	3.076E+00
BI-210M	9.784E-01	93.3	9.131E-01	9.145E-01	3.049E+00
AC-228	1.529E+01	18.6	2.838E+00	2.942E+00	5.331E+00
TH-227	2.500E+00	36.6	9.157E-01	9.249E-01	2.096E+01
TH-229	9.929E+00	103.1	1.024E+01	1.025E+01	2.979E+01
TH-234	-1.840E+00	230.9	4.249E+00	4.251E+00	4.346E+01
PA-231	0.000E+00	1.#INF	1.110E+01	1.110E+01	1.099E+02
PA-233	1.529E+00	188.6	2.884E+00	2.885E+00	9.628E+00
PA-234	1.072E+00	86.4	9.264E-01	9.281E-01	1.060E+01
PA-234M	7.649E+01	89.9	6.879E+01	6.890E+01	2.966E+02
AM-241	1.738E+00	129.2	2.245E+00	2.248E+00	7.477E+00
Np-237	2.942E+00	194.6	5.723E+00	5.726E+00	1.908E+01
Ir-192	5.474E-01	222.4	1.217E+00	1.218E+00	4.068E+00
Cs-136	6.908E-01	62.6	4.325E-01	4.342E-01	2.563E+00
Np-239	1.973E+00	140.7	2.777E+00	2.780E+00	9.252E+00
Nd-147	-5.579E+00	94.6	5.275E+00	5.285E+00	1.247E+01
TL-210	6.027E-01	105.7	6.369E-01	6.379E-01	2.155E+00
Kr-85	-1.146E+02	151.9	1.741E+02	1.742E+02	5.871E+02
Total	6.858E+02				

Analyst: Caleb Quinn

Sample description
453329_Gamma_160-36593-A-3-B

Spectrum Filename: C:\User\SPC\Det12\12_Gamma_20193735.An1

Acquisition information

Start time:	12/27/2019 8:17:27 AM
Live time:	1800
Real time:	1802
Dead time:	0.11 %
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	12/27/2019 8:17:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	12_2019-12-07_1443.PBC 12/7/2019 2:43:53 PM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 32 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 0.1597

***** 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
46.51	92.	29.64	1.17	1.803E-02	46.54	4.250	6.681E+01	PB210
50.16	9.	194.50	0.85	2.193E-02	50.14	8.000	PBC<MDA	TH227
59.54	32.	129.15	0.86	2.817E-02	59.54	35.900	PBC<MDA	AM241
63.29	7.	523.19	0.87	2.978E-02	63.29	3.810	PBC<MDA	TH234
74.94	286.	10.03	0.88	3.335E-02				
77.13	408.	7.68	0.88	3.386E-02				
87.33	173.	16.07	1.10	3.571E-02	86.49	13.100	2.061E+01	Np237
					86.54	30.700	8.794E+00	EU155
					86.94	9.040	2.982E+01	Sn126
					87.57	37.500	7.169E+00	Sn126
					88.04	3.790	7.080E+01	Cd109
91.08	33.	142.50	0.90	3.621E-02	91.10	28.300	PBC<MDA	Nd147
92.59	-20.	230.95	0.90	3.637E-02	92.59	5.584	PBC<MDA	TH234
					93.35	5.561	PBC<MDA	AC228
105.31	9.	467.86	0.91	3.726E-02	105.31	21.200	PBC<MDA	EU155
106.13	30.	140.74	0.91	3.729E-02	106.13	22.700	PBC<MDA	Np239
121.78	27.	99.94	0.93	3.725E-02	121.78	28.580	PBC<MDA	EU152
					122.06	85.600	4.702E-01	CO57
122.06	9.	309.09	0.93	3.724E-02	121.78	28.580	PBC<MDA	EU152
					122.06	85.600	1.514E-01	CO57
123.10	11.	235.38	0.93	3.721E-02	123.10	40.790	PBC<MDA	EU154
162.66	29.	103.10	0.97	3.435E-02	162.66	6.220	PBC<MDA	Ba140
163.38	3.	918.04	0.97	3.428E-02	163.38	5.080	PBC<MDA	U235
165.85	14.	203.59	0.97	3.405E-02	165.85	79.900	PBC<MDA	CE139
185.80	167.	17.14	1.25	3.214E-02	185.72	54.000	5.340E+00	U235
193.51	13.	216.68	1.00	3.140E-02	193.51	4.400	PBC<MDA	TH229
205.33	24.	103.86	1.01	3.030E-02	205.33	5.010	PBC<MDA	U235

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
210.85	27.	103.13	1.02	2.980E-02	210.85	2.990	PBC<MDA	TH229
227.00	6.	397.93	1.03	2.839E-02	227.00	6.300	PBC<MDA	Cf251
235.84	39.	36.63	1.04	2.764E-02	235.97	12.300	PBC<MDA	TH227
238.48	270.	8.17	1.05	2.744E-02	238.63	43.300	1.264E+01	PB212
241.93	188.	10.74	1.05	2.716E-02	242.00	7.430	5.168E+01	PB214
265.83	22.	93.33	1.07	2.539E-02	265.83	50.000	PBC<MDA	BI210M
279.20	10.	222.11	1.09	2.449E-02	279.20	81.460	PBC<MDA	Hg203
295.00	434.	6.67	0.98	2.351E-02	295.09	19.300	5.322E+01	PB214
					296.00	79.000	1.303E+01	TL210
299.02	8.	518.68	1.11	2.321E-02	300.03	3.280	PBC<MDA	PB212
312.01	22.	188.59	1.12	2.253E-02	312.01	36.000	PBC<MDA	PA233
316.49	19.	222.40	1.12	2.229E-02	316.49	87.040	PBC<MDA	Ir192
320.08	20.	219.20	1.13	2.210E-02	320.08	9.940	PBC<MDA	CR51
328.76	13.	152.95	1.13	2.165E-02	328.76	20.300	PBC<MDA	La140
333.49	20.	100.22	1.14	2.142E-02	333.44	15.510	PBC<MDA	Cf249
338.23	19.	128.66	1.14	2.118E-02	338.32	12.010	PBC<MDA	AC228
344.29	20.	106.84	1.15	2.090E-02	344.29	26.500	PBC<MDA	EU152
351.74	767.	4.39	1.20	2.056E-02	351.93	37.600	5.516E+01	PB214
364.48	16.	99.45	1.17	2.001E-02	364.48	81.700	PBC<MDA	I131
383.84	16.	110.39	1.19	1.923E-02	383.84	8.940	PBC<MDA	BA133
386.77	16.	112.80	1.19	1.907E-02	387.95	66.000	PBC<MDA	Cf249
391.69	16.	117.84	1.20	1.893E-02	391.69	64.000	PBC<MDA	SN113
400.76	2.	272.03	0.13	1.861E-02				
428.11	14.	124.81	1.23	1.770E-02	427.88	29.600	PBC<MDA	SB125
453.88	13.	130.77	1.26	1.692E-02	453.88	65.000	PBC<MDA	PM146
463.37	20.	91.80	1.27	1.666E-02	463.37	10.470	PBC<MDA	SB125
477.60	16.	112.85	1.28	1.628E-02	477.60	10.520	PBC<MDA	BE7
511.86	76.	22.98	2.56	1.546E-02	511.86	20.000	1.360E+01	RH106
537.26	12.	118.84	1.34	1.491E-02	537.26	24.390	PBC<MDA	Ba140
563.24	3.	426.32	1.36	1.439E-02	563.24	8.350	PBC<MDA	CS134
569.32	7.	161.09	1.37	1.428E-02	569.32	15.380	PBC<MDA	CS134
569.70	2.	795.82	1.37	1.427E-02	569.32	15.380	PBC<MDA	CS134
					569.47	8.200	7.118E-01	PA234
					569.70	97.740	5.973E-02	BI207
583.22	112.	14.85	1.71	1.403E-02	583.02	84.500	5.271E+00	TL208
600.50	12.	309.95	1.40	1.373E-02	600.50	17.860	PBC<MDA	SB125
602.73	12.	312.17	1.40	1.369E-02	602.73	98.260	PBC<MDA	SB124
604.71	12.	314.43	1.40	1.366E-02	604.71	97.620	PBC<MDA	CS134
609.23	553.	5.05	1.48	1.359E-02	609.31	46.090	4.907E+01	BI214
					610.30	5.750	3.938E+02	RU103
614.28	12.	317.69	1.41	1.350E-02	614.28	89.850	PBC<MDA	AG108M
618.06	12.	319.50	1.41	1.344E-02	618.06	99.100	PBC<MDA	PM144
635.89	36.	24.26	1.43	1.317E-02	635.89	11.310	1.356E+01	SB125
702.63	10.	160.48	1.49	1.224E-02	702.63	97.900	PBC<MDA	NB94
726.86	15.	113.95	1.52	1.194E-02	727.17	7.550	PBC<MDA	BI212
747.16	5.	281.58	1.53	1.171E-02	747.16	34.000	PBC<MDA	PM146
766.41	18.	89.94	1.55	1.150E-02	765.79	99.790	PBC<MDA	NB95
					766.41	0.294	2.942E+02	PA234M

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
785.49	15.	92.15	1.57	1.129E-02	785.42	1.280	PBC<MDA	BI212
795.87	15.	79.53	1.58	1.119E-02	795.87	85.530	PBC<MDA	CS134
799.60	12.	105.67	1.58	1.115E-02	799.60	98.960	PBC<MDA	TL210
818.50	10.	156.31	1.60	1.096E-02	818.50	100.000	PBC<MDA	Cs136
846.77	10.	133.85	1.63	1.070E-02	846.77	99.935	PBC<MDA	Co56
871.10	11.	67.28	1.65	1.048E-02	871.10	99.890	PBC<MDA	NB94
880.53	4.	271.89	1.66	1.040E-02	880.53	6.000	PBC<MDA	PA234
883.24	2.	668.34	1.66	1.038E-02	883.24	9.600	PBC<MDA	PA234
898.04	4.	305.16	1.67	1.025E-02	898.04	93.700	PBC<MDA	Y88
911.07	81.	18.56	1.68	1.015E-02	911.07	29.000	1.529E+01	AC228
946.02	15.	86.44	1.72	9.873E-03	946.02	13.400	PBC<MDA	PA234
964.11	50.	28.28	1.73	9.739E-03	964.11	14.605	1.953E+01	EU152
1004.77	13.	74.90	1.77	9.450E-03	1004.77	18.010	PBC<MDA	EU154
1037.84	5.	301.19	1.80	9.228E-03	1037.84	14.130	PBC<MDA	Co56
1048.07	13.	62.60	1.81	9.162E-03	1048.07	80.000	PBC<MDA	Cs136
1063.66	12.	99.34	1.82	9.063E-03	1063.66	74.500	PBC<MDA	BI207
1099.25	13.	87.52	1.85	8.846E-03	1099.25	56.500	PBC<MDA	FE59
1112.07	3.	618.37	1.86	8.770E-03	1112.07	13.644	PBC<MDA	EU152
1120.25	117.	11.65	1.87	8.722E-03	1120.29	15.100	4.925E+01	BI214
					1120.55	99.987	7.440E+00	Sc46
1221.96	20.	53.27	1.96	8.175E-03	1221.41	27.000	PBC<MDA	Ta182
1238.28	46.	33.18	1.97	8.090E-03	1238.28	66.070	4.781E+00	Co56
1274.53	12.	56.23	2.00	7.914E-03	1274.53	99.940	PBC<MDA	NA22
					1274.54	35.190	2.408E+00	EU154
1274.54	1.	826.57	2.00	7.914E-03	1274.53	99.940	PBC<MDA	NA22
					1274.54	35.190	1.855E-01	EU154
1332.50	7.	86.68	2.05	7.647E-03	1332.50	99.980	PBC<MDA	CO60
1384.30	7.	143.21	2.10	7.423E-03	1384.30	24.290	PBC<MDA	AG110M
1408.00	27.	36.48	2.12	7.324E-03	1408.00	21.005	9.751E+00	EU152
1460.60	458.	4.86	2.25	7.113E-03	1460.83	10.670	3.355E+02	K40
1596.21	3.	284.80	2.27	6.616E-03	1596.21	95.400	PBC<MDA	La140
1764.36	94.	13.52	2.40	6.075E-03	1764.49	15.400	5.562E+01	BI214
1771.35	3.	563.79	2.41	6.055E-03	1771.35	15.480	PBC<MDA	Co56
1836.06	6.	111.28	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 Channel	Centroid Energy	Background Counts	Net Area Counts	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide
299.34	74.93	267.	286.	8.565E+03	10.03	0.880	- D
308.07	77.11	285.	408.	1.204E+04	7.68	0.883	- D
742.50	185.80	171.	167.	5.192E+03	17.14	1.246	- s
1602.00	400.64	11.	2.	8.956E+01	272.03	0.125	- sc

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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	185.79	46.54	168.	64.	0.036	31.18	0.851D
TH-227	200.18	50.14	138.	9.	0.005	194.50	0.855D
AM-241	237.74	59.54	820.	32.	0.018	129.15	0.865
TH-234	252.74	63.29	758.	7.	0.004	523.19	0.868s
BA-133	323.50	80.99	490.	-37.	-0.021	106.74	0.887s
Np-237	345.49	86.49	1141.	25.	0.014	194.56	0.892A
EU-155	345.70	86.54	1166.	13.	0.007	214.42	0.892D
Sn-126	347.29	86.94	271.	85.	0.047	26.01	0.892D
Sn-126	349.81	87.57	1050.	33.	0.018	80.35	0.893D
Cd-109	351.68	88.04	1083.	33.	0.018	141.45	0.894A
Nd-147	363.92	91.10	1107.	33.	0.018	142.50	0.897s
TH-234	369.87	92.59	1123.	-20.	-0.011	230.95	0.898s
AC-228	372.91	93.35	1194.	-35.	-0.019	142.66	0.899s
Gd-153	389.50	97.50	900.	-31.	-0.017	139.87	0.903
Np-239	397.50	99.50	904.	-31.	-0.017	139.86	0.905s
Gd-153	412.29	103.20	939.	-21.	-0.012	202.81	0.909s
EU-155	420.73	105.31	895.	9.	0.005	467.86	0.911
Np-239	424.00	106.13	880.	30.	0.017	140.74	0.912
EU-152	486.56	121.78	350.	27.	0.015	99.94	0.928s
CO-57	487.69	122.06	356.	9.	0.005	309.09	0.928s
EU-154	491.84	123.10	340.	11.	0.006	235.38	0.929s
PA-234	524.60	131.29	705.	-32.	-0.018	120.20	0.938s
HF-181	531.51	133.02	1303.	-31.	-0.017	163.13	0.939s
CE-144	533.57	133.54	1220.	-9.	-0.005	553.85	0.940s
HF-181	544.61	136.30	1229.	0.	0.000	1000.00	0.943
CO-57	545.30	136.47	1229.	0.	0.000	1000.00	0.943
Tc-99m	561.44	140.51	1229.	0.	0.000	1000.00	0.947s
U-235	574.53	143.79	1229.	0.	0.000	1000.00	0.950
Ba-140	649.99	162.66	438.	29.	0.016	103.10	0.969s
U-235	652.87	163.38	467.	3.	0.002	918.04	0.970s
CE-139	662.76	165.85	428.	14.	0.008	203.59	0.973s
Cf-251	705.72	176.60	286.	-16.	-0.009	199.32	0.983s
U-235	742.18	185.72	393.	-3.	-0.002	936.30	0.992s
TH-229	773.32	193.51	235.	13.	0.007	216.68	1.000s
U-235	820.59	205.33	172.	24.	0.013	103.86	1.012s
TH-229	842.65	210.85	209.	27.	0.015	103.13	1.018s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Cf-251	907.22	227.00	180.	6.	0.004	397.93	1.034s
TH-227	943.09	235.97	80.	39.	0.021	36.63	1.043D
PB-212	953.73	238.63	93.	297.	0.165	7.40	1.045D
PB-214	967.18	242.00	86.	198.	0.110	9.72	1.049D
EU-152	977.96	244.69	942.	-24.	-0.013	182.29	1.051s
TH-227	1024.13	256.24	202.	-15.	-0.008	183.01	1.063s
Cd-113m	1053.96	263.70	289.	-27.	-0.015	92.56	1.070s
BI-210M	1062.48	265.83	207.	22.	0.012	93.33	1.072s
TL-208	1108.27	277.28	235.	-16.	-0.009	140.57	1.084s
Hg-203	1115.93	279.20	226.	10.	0.005	222.11	1.086s
I-131	1136.32	284.30	136.	-9.	-0.005	253.72	1.091s
PB-214	1179.11	295.00	97.	434.	0.241	6.67	0.976
TL-210	1183.11	296.00	814.	-22.	-0.012	184.52	1.102s
PB-212	1199.22	300.03	754.	8.	0.004	518.68	1.106s
PA-231	1199.38	300.07	762.	0.	0.000	1000.00	1.106
PA-233	1199.82	300.18	762.	0.	0.000	1000.00	1.107
PA-231	1209.70	302.65	762.	0.	0.000	1000.00	1.109s
BA-133	1210.50	302.85	762.	0.	0.000	1000.00	1.109s
Ba-140	1218.49	304.85	832.	-24.	-0.013	172.59	1.111s
BI-210M	1218.68	304.90	804.	-16.	-0.009	259.36	1.111s
Ir-192	1232.85	308.44	942.	-24.	-0.013	185.36	1.115
PA-233	1247.13	312.01	875.	22.	0.012	188.59	1.118
Ir-192	1265.04	316.49	894.	19.	0.011	222.40	1.123
CR-51	1279.41	320.08	947.	20.	0.011	219.20	1.126s
La-140	1314.10	328.76	181.	13.	0.007	152.95	1.135s
Cf-249	1332.81	333.44	195.	20.	0.011	100.22	1.139s
AC-228	1352.33	338.32	284.	19.	0.010	128.66	1.144
Cs-136	1361.32	340.57	303.	0.	0.000	1000.00	1.146s
EU-152	1376.18	344.29	227.	20.	0.011	106.84	1.150s
HF-181	1382.35	345.83	336.	-23.	-0.013	114.71	1.151s
PB-214	1405.99	351.74	80.	777.	0.432	4.31	1.203
BA-133	1423.02	356.00	990.	-22.	-0.012	205.77	1.162s
I-131	1456.95	364.48	64.	16.	0.009	99.45	1.170s
BA-133	1534.35	383.84	148.	16.	0.009	110.39	1.189s
Cf-249	1550.79	387.95	156.	16.	0.009	112.80	1.193
SN-113	1565.74	391.69	172.	16.	0.009	117.84	1.196s
SB-125	1710.45	427.88	76.	14.	0.008	124.81	1.232s
AG-108M	1734.69	433.94	96.	-21.	-0.012	93.60	1.238s
PM-146	1814.45	453.88	72.	13.	0.007	130.77	1.257s
SB-125	1852.39	463.37	80.	20.	0.011	91.80	1.266
Ir-192	1871.16	468.06	199.	-22.	-0.012	92.79	1.271
BE-7	1909.29	477.60	155.	16.	0.009	112.85	1.280s
HF-181	1926.90	482.00	171.	0.	0.000	1000.00	1.284s
La-140	1946.98	487.02	171.	0.	0.000	1000.00	1.289s
RU-103	1987.11	497.05	72.	-10.	-0.006	169.12	1.298
RH-106	2046.35	511.86	113.	76.	0.042	22.98	2.563s
Kr-85	2054.81	513.98	209.	-14.	-0.008	151.91	1.315s
Nd-147	2122.88	531.00	78.	-20.	-0.011	94.57	1.331s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Ba-140	2147.92	537.26	43.	12.	0.006	118.84	1.337s
CS-134	2251.82	563.24	48.	3.	0.002	426.32	1.362s
CS-134	2276.15	569.32	57.	7.	0.004	161.09	1.367s
PA-234	2276.75	569.47	74.	-6.	-0.004	196.58	1.368s
BI-207	2277.68	569.70	70.	2.	0.001	795.82	1.368s
TL-208	2331.75	583.22	34.	112.	0.063	14.85	1.714s
SB-125	2400.87	600.50	674.	12.	0.007	309.95	1.397
SB-124	2409.79	602.73	686.	12.	0.007	312.17	1.399s
CS-134	2417.71	604.71	698.	12.	0.007	314.43	1.401s
BI-214	2435.79	609.23	47.	553.	0.307	5.05	1.479
RU-103	2440.06	610.30	710.	12.	0.007	315.91	1.406s
AG-108M	2455.99	614.28	722.	12.	0.007	317.69	1.410s
PM-144	2471.12	618.06	734.	12.	0.007	319.50	1.414s
RH-106	2486.54	621.92	782.	-14.	-0.008	285.01	1.417s
SB-125	2542.43	635.89	21.	36.	0.020	24.26	1.430
I-131	2546.77	636.97	57.	0.	0.000	1000.00	1.432s
AG-110M	2629.92	657.76	99.	-21.	-0.012	69.20	1.451s
CS-137	2645.51	661.66	140.	-18.	-0.010	98.18	1.455s
PM-144	2785.05	696.54	65.	-17.	-0.010	101.80	1.487s
NB-94	2809.41	702.63	51.	10.	0.005	160.48	1.493s
SB-124	2890.04	722.79	98.	-9.	-0.005	159.09	1.512s
AG-108M	2890.65	722.94	89.	0.	0.000	1000.00	1.512s
EU-154	2892.34	723.36	89.	0.	0.000	1000.00	1.512s
ZR-95	2895.69	724.20	91.	-16.	-0.009	87.95	1.513s
BI-212	2907.58	727.17	132.	15.	0.008	113.95	1.516s
PM-146	2941.78	735.72	42.	-5.	-0.003	278.57	1.524s
PM-146	2987.55	747.16	37.	5.	0.003	281.58	1.535s
AG-110M	3054.69	763.94	216.	-33.	-0.018	65.74	1.550s
NB-95	3062.08	765.79	201.	-18.	-0.010	112.47	1.552s
PA-234M	3064.57	766.41	121.	18.	0.010	89.94	1.552s
EU-152	3114.61	778.92	42.	0.	0.000	1000.00	1.564s
BI-212	3140.62	785.42	37.	15.	0.008	92.15	1.570s
CS-134	3182.43	795.87	60.	15.	0.008	79.53	1.579s
TL-210	3197.35	799.60	74.	12.	0.007	105.67	1.583s
CS-134	3206.76	801.95	115.	-17.	-0.010	90.19	1.585s
CO-58	3242.06	810.78	95.	-17.	-0.009	84.63	1.593s
La-140	3262.05	815.77	112.	0.	0.000	1000.00	1.598s
Cs-136	3272.97	818.50	106.	10.	0.005	156.31	1.600
MN-54	3338.38	834.85	51.	-5.	-0.003	288.25	1.615
Co-56	3386.08	846.77	35.	10.	0.006	133.85	1.626
TL-208	3441.27	860.56	60.	-10.	-0.006	173.21	1.638s
NB-94	3483.41	871.10	24.	11.	0.006	67.28	1.648s
EU-154	3491.95	873.23	76.	-18.	-0.010	72.08	1.650s
PA-234	3521.16	880.53	65.	4.	0.002	271.89	1.657
PA-234	3532.00	883.24	67.	2.	0.001	668.34	1.659s
AG-110M	3537.78	884.68	69.	0.	0.000	1000.00	1.660s
Y-88	3591.22	898.04	30.	4.	0.002	305.16	1.672s
AC-228	3643.36	911.07	30.	81.	0.045	18.56	1.684

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
AG-110M	3749.09	937.49	85.	-24.	-0.014	85.19	1.708s
PA-234	3783.21	946.02	30.	15.	0.008	86.44	1.716
EU-152	3855.60	964.11	75.	50.	0.028	28.28	1.732s
PA-234M	4003.22	1001.00	72.	0.	0.000	1000.00	1.765s
EU-154	4018.33	1004.77	39.	13.	0.007	74.90	1.768s
Co-56	4150.66	1037.84	37.	5.	0.003	301.19	1.798s
Cs-136	4191.60	1048.07	25.	13.	0.007	62.60	1.807s
RH-106	4200.76	1050.36	60.	-17.	-0.009	70.44	1.809s
BI-207	4253.99	1063.66	27.	12.	0.007	99.34	1.820s
Ga-68	4308.98	1077.40	37.	-2.	-0.001	598.81	1.833s
FE-59	4396.44	1099.25	21.	13.	0.007	87.52	1.852s
EU-152	4447.76	1112.07	202.	3.	0.002	618.37	1.863s
ZN-65	4461.66	1115.55	205.	0.	0.000	1000.00	1.866s
BI-214	4480.63	1120.29	34.	117.	0.065	11.65	1.870D
Sc-46	4481.68	1120.55	205.	0.	0.000	1000.00	1.870
Ta-182	4484.69	1121.30	212.	-5.	-0.003	412.07	1.871s
CO-60	4692.57	1173.24	53.	-14.	-0.008	118.79	1.916s
Ta-182	4755.86	1189.05	59.	-14.	-0.008	130.23	1.930
Ta-182	4885.39	1221.41	17.	20.	0.011	53.27	1.957s
Co-56	4952.92	1238.28	34.	46.	0.026	33.18	1.972s
NA-22	5098.03	1274.53	17.	12.	0.007	56.23	2.003s
EU-154	5098.08	1274.54	29.	1.	0.001	826.57	2.003s
FE-59	5166.35	1291.60	40.	-3.	-0.001	557.27	2.017s
TL-210	5252.04	1313.00	23.	-2.	-0.001	674.39	2.036s
CO-60	5330.11	1332.50	6.	7.	0.004	86.68	2.052s
AG-110M	5537.48	1384.30	17.	7.	0.004	143.21	2.096s
EU-152	5632.39	1408.00	12.	27.	0.015	36.48	2.115s
K-40	5843.01	1460.60	6.	458.	0.255	4.86	2.253
La-140	6386.02	1596.21	12.	3.	0.002	284.80	2.269s
SB-124	6765.58	1690.98	19.	-11.	-0.006	102.92	2.345s
BI-214	7060.00	1764.49	33.	94.	0.052	13.52	2.403s
Co-56	7087.48	1771.35	126.	3.	0.002	563.79	2.408s
Y-88	7346.69	1836.06	7.	6.	0.004	111.28	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	5.1893E+00				5.31E+01	
			477.60	5.189E+00	?(	1.970E+01 1.13E+02 1.05E+01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
NA-22	C 8.4783E-01					9.50E+02	
		1274.53	8.478E-01	?(	1.540E+00	5.62E+01	9.99E+01 G
K-40	N 3.3554E+02					4.66E+11	
		1460.83	3.355E+02	(	1.010E+01	4.86E+00	1.07E+01 G
Sc-46	F 6.2779E-02					8.38E+01	
		889.28	6.278E-02	%(	2.414E+00	1.10E+03	1.00E+02 G
		1120.55	0.000E+00	-	4.424E+00	1.00E+03	1.00E+02 G
CR-51	F 5.0474E+00					2.77E+01	
		320.08	5.047E+00	&(	3.695E+01	2.19E+02	9.94E+00 G
MN-54	C -2.7420E-01					3.12E+02	
		834.85	-2.742E-01	?(	1.856E+00	2.88E+02	1.00E+02 G
FE-59	F 1.4080E+00					4.45E+01	
		1099.25	1.408E+00	&(	2.694E+00	8.75E+01	5.65E+01 G
		1291.60	-4.378E-01	-	5.263E+00	5.57E+02	4.32E+01 G
Co-56	C 2.1979E+00					7.73E+01	
		846.77	5.196E-01	?(	1.573E+00	1.34E+02	9.99E+01 G
		1238.28	4.781E+00	?(	3.106E+00	3.32E+01	6.61E+01 G
		1037.84	1.988E+00	?(	1.329E+01	3.01E+02	1.41E+01 G
		1771.35	1.679E+00	?	3.263E+01	5.64E+02	1.55E+01 A
CO-57	C 1.5143E-01					2.72E+02	
		122.06	1.514E-01	&(	1.580E+00	3.09E+02	8.56E+01 G
		136.47	0.000E+00	-	2.366E+01	1.00E+03	1.07E+01 G
CO-58	C -8.6022E-01					7.09E+01	
		810.78	-8.602E-01	?(	2.435E+00	8.46E+01	9.95E+01 G
CO-60	F 5.1882E-01					1.93E+03	
		1332.50	5.188E-01	?(	1.003E+00	8.67E+01	1.00E+02 G
		1173.24	-9.459E-01	+	2.425E+00	1.19E+02	9.99E+01 G
NB-94	I 5.2894E-01					7.41E+06	
		702.63	4.481E-01	?(	1.673E+00	1.60E+02	9.79E+01 G
		871.10	6.082E-01	?(	1.355E+00	6.73E+01	9.99E+01 G
ZR-95	I -1.1723E-01					6.40E+01	
		756.73	-1.172E-01	%(	3.174E+00	1.14E+03	5.45E+01 G
		724.20	-1.681E+00	&	4.955E+00	8.79E+01	4.42E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
NB-95	I	-8.8163E-01					6.40E+01	
			765.79	-8.816E-01	?(	3.327E+00	1.12E+02	9.98E+01 G
RU-103	I	-3.8681E-01					3.93E+01	
			497.05	-3.868E-01	(	1.634E+00	1.69E+02	9.09E+01 G
			610.30	8.529E+00	?	9.034E+01	3.16E+02	5.75E+00 GA
RH-106	I	-5.8277E+00					3.74E+02	
			621.92	-5.828E+00	?(	5.562E+01	2.85E+02	9.93E+00 G
			1050.36	-6.480E+01	&	1.515E+02	7.04E+01	1.56E+00 G
			511.86	1.360E+01	?	9.403E+00	2.30E+01	2.00E+01 GA
AG-108M	C	-7.3902E-01					1.53E+05	
			433.94	-7.390E-01	?(	1.696E+00	9.36E+01	9.05E+01 G
			722.94	0.000E+00	&	2.380E+00	1.00E+03	9.08E+01 G
			614.28	5.499E-01	+	5.857E+00	3.18E+02	8.98E+01 G
AG-110M	F	5.4030E-01					2.50E+02	
			884.68	0.000E+00	?(	3.055E+00	1.00E+03	7.27E+01 G
			657.76	-9.782E-01	+	2.243E+00	6.92E+01	9.46E+01 G
			937.49	-3.985E+00	+	7.430E+00	8.52E+01	3.44E+01 G
			1384.30	2.157E+00	?(	6.756E+00	1.43E+02	2.43E+01 G
			763.94	-7.094E+00	+	1.540E+01	6.57E+01	2.23E+01 G
SN-113	F	7.3843E-01					1.15E+02	
			391.69	7.384E-01	?(	2.927E+00	1.18E+02	6.40E+01 G
SB-124	F	4.9204E-01					6.02E+01	
			602.73	4.920E-01	?(	5.151E+00	3.12E+02	9.83E+01 G
			1690.98	-2.029E+00	+	4.247E+00	1.03E+02	4.78E+01 G
			722.79	-3.856E+00	+	2.093E+01	1.59E+02	1.08E+01 G
SB-125	I	4.4922E+00					1.01E+03	
			427.88	1.485E+00	?(	4.596E+00	1.25E+02	2.96E+01 G
			600.50	2.696E+00	(	2.802E+01	3.10E+02	1.79E+01 G
			635.89	1.356E+01	(	8.915E+00	2.43E+01	1.13E+01 G
			463.37	6.268E+00	(	1.414E+01	9.18E+01	1.05E+01 G
I-131	I	5.5276E-01					8.02E+00	
			364.48	5.528E-01	?(	1.359E+00	9.94E+01	8.17E+01 G
			284.30	-3.245E+00	+	2.134E+01	2.54E+02	6.14E+00 G
			636.97	0.000E+00	-	2.233E+01	1.00E+03	7.17E+00 G
Gd-153	F	-1.5383E+00					2.42E+02	
			97.50	-1.538E+00	?(	7.167E+00	1.40E+02	3.00E+01 G
			103.20	-1.473E+00	+	9.974E+00	2.03E+02	2.18E+01 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Ga-68	C -5.1048E+00					4.71E-02	
		1077.40	-5.105E+00	?(	6.822E+01	5.99E+02	3.30E+00 G
BA-133	F -9.5541E-01					3.85E+03	
		356.00	-9.554E-01	&(	6.562E+00	2.06E+02	6.20E+01 G
		302.85	0.000E+00	+	1.727E+01	1.00E+03	1.83E+01 G
		383.84	5.171E+00	?	1.920E+01	1.10E+02	8.94E+00 GA
		80.99	-1.758E+00	+	4.982E+00	1.07E+02	3.41E+01 GA
CS-134	I 7.7401E-01					7.54E+02	
		795.87	8.435E-01	?(	2.244E+00	7.95E+01	8.55E+01 G
		604.71	4.971E-01	?(	5.242E+00	3.14E+02	9.76E+01 G
		569.32	1.728E+00	?(	9.598E+00	1.61E+02	1.54E+01 G
		801.95	-1.001E+01	+	3.025E+01	9.02E+01	8.69E+00 G
		563.24	1.541E+00	?(	1.612E+01	4.26E+02	8.35E+00 G
CS-137	I -8.9701E-01					1.10E+04	
		661.66	-8.970E-01	?(	2.953E+00	9.82E+01	8.52E+01 G
CE-139	F 2.9608E-01					1.38E+02	
		165.85	2.961E-01	&(	2.025E+00	2.04E+02	7.99E+01 G
Ba-140	I 2.9614E+00					1.28E+01	
		537.26	1.783E+00	?(	5.101E+00	1.19E+02	2.44E+01 G
		162.66	7.584E+00	?(	2.605E+01	1.03E+02	6.22E+00 G
		304.85	-1.344E+01	&	7.744E+01	1.73E+02	4.29E+00 G
La-140	I 4.9865E-01					1.28E+01	
		1596.21	2.641E-01	?(	1.659E+00	2.85E+02	9.54E+01 G
		487.02	0.000E+00	-	4.844E+00	1.00E+03	4.55E+01 G
		328.76	1.601E+00	?(	8.274E+00	1.53E+02	2.03E+01 G
		815.77	0.000E+00	-	1.130E+01	1.00E+03	2.33E+01 G
CE-141	I 1.1787E-01					3.25E+01	
		145.44	1.179E-01	%(	5.275E+00	1.34E+03	4.82E+01 G
CE-144	I -1.2197E+00					2.85E+02	
		133.54	-1.220E+00	*(	2.259E+01	5.54E+02	1.11E+01 G
PM-144	C -7.8951E-01					3.63E+02	
		696.54	-7.895E-01	?(	1.839E+00	1.02E+02	9.90E+01 G
		618.06	5.021E-01	+	5.377E+00	3.20E+02	9.91E+01 G
EU-152	F 4.8039E+00					4.94E+03	
		121.78	1.408E+00	&(	4.691E+00	9.99E+01	2.86E+01 G
		344.29	2.044E+00	&(	7.312E+00	1.07E+02	2.65E+01 G
		1112.07	1.514E+00	?(	3.199E+01	6.18E+02	1.36E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
			778.92	0.000E+00	&	1.243E+01	1.00E+03	1.29E+01 G
			964.11	1.953E+01	?(	1.682E+01	2.83E+01	1.46E+01 G
			244.69	-6.516E+00	+	3.963E+01	1.82E+02	7.58E+00 G
			1408.00	9.751E+00	?	6.808E+00	3.65E+01	2.10E+01 GA
EU-154	I	1.0392E+00					3.14E+03	
			123.10	4.088E-01	&(	3.244E+00	2.35E+02	4.08E+01 G
			1274.54	1.855E-01	?(	5.553E+00	8.27E+02	3.52E+01 G
			723.36	0.000E+00	&	1.070E+01	1.00E+03	2.02E+01 G
			873.23	-7.852E+00	+	1.881E+01	7.21E+01	1.23E+01 G
			1004.77	4.135E+00	?(	1.034E+01	7.49E+01	1.80E+01 G
			996.33	-6.431E-01	%	2.316E+01	1.03E+03	1.06E+01 G
EU-155	I	6.3764E-01					1.81E+03	
			105.31	6.376E-01	&(	9.996E+00	4.68E+02	2.12E+01 G
			86.54	6.376E-01	}	8.226E+00	2.14E+02	3.07E+01 G
Ta-182	F	1.6782E+00					1.14E+02	
			1121.30	-9.181E-01	?(	1.289E+01	4.12E+02	3.49E+01 G
			1221.41	5.034E+00	?(	5.518E+00	5.33E+01	2.70E+01 G
			1189.05	-5.618E+00	+	1.579E+01	1.30E+02	1.62E+01 G
Hg-203	F	2.6918E-01					4.66E+01	
			279.20	2.692E-01	?(	2.025E+00	2.22E+02	8.15E+01 G
TL-208	N	5.2712E+00					6.98E+02	
			583.02	5.271E+00	@(	1.409E+00	1.49E+01	8.45E+01 G
			277.28	-5.603E+00	-	2.650E+01	1.41E+02	6.31E+00 G
			860.56	-4.230E+00	-	1.642E+01	1.73E+02	1.24E+01 G
PM-146	C	6.5475E-01					2.02E+03	
			453.88	6.566E-01	?(	2.134E+00	1.31E+02	6.50E+01 G
			747.16	6.512E-01	?(	4.351E+00	2.82E+02	3.40E+01 G
			735.72	-1.043E+00	+	6.862E+00	2.79E+02	2.25E+01 G
Y-88	F	4.2330E-01					1.07E+02	
			1836.06	6.046E-01	?(	1.407E+00	1.11E+02	9.92E+01 G
			898.04	2.313E-01	&(	1.633E+00	3.05E+02	9.37E+01 G
Cd-113m		-9.6298E+03					5.33E+03	
			263.70	-9.630E+03	&(	2.970E+04	9.26E+01	6.00E-03 K
Cd-109	F	1.3569E+01					4.53E+02	
							Derived Ave Activity	
			88.04	1.357E+01	}(	6.387E+01	1.41E+02	3.79E+00 G

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Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Cf-251	T	-1.5832E+00					3.28E+05	
			176.60	-1.583E+00	&(	8.066E+00	1.99E+02	1.70E+01 G
			227.00	1.968E+00	?	2.025E+01	3.98E+02	6.30E+00 GA
Cf-249	T	1.2163E+00					1.28E+05	
			387.95	7.086E-01	&(	2.688E+00	1.13E+02	6.60E+01 G
			333.44	3.377E+00	?(	1.133E+01	1.00E+02	1.55E+01 G
Sn-126		-5.5393E-02					3.65E+07	
			87.57	1.373E+00	}	6.369E+00	8.04E+01	3.75E+01 GA
			64.28	-5.539E-02	&(	2.562E+01	1.38E+04	9.70E+00 G
			86.94	1.465E+01	}	1.369E+01	2.60E+01	9.04E+00 GA
PB-210	N	4.6614E+01					8.14E+03	
			46.54	4.661E+01	(P	4.565E+01	3.12E+01	4.25E+00 G
PB-212	N	1.3893E+01					6.98E+02	
			238.63	1.389E+01	(	2.230E+00	7.40E+00	4.33E+01 G
			300.03	5.479E+00	&	9.540E+01	5.19E+02	3.28E+00 GA
PB-214	N	5.4965E+01					5.84E+05	
			351.93	5.586E+01	(	3.191E+00	4.31E+00	3.76E+01 G
			295.09	5.322E+01	(P	5.940E+00	6.67E+00	1.93E+01 G
			242.00	5.447E+01		1.265E+01	9.72E+00	7.43E+00 GA
BI-207	C	1.0148E+00					1.18E+04	
			1063.66	1.015E+00	?(	2.203E+00	9.93E+01	7.45E+01 G
			569.70	5.973E-02	-	1.666E+00	7.96E+02	9.77E+01 G
BI-212	N	9.0373E+00					6.98E+02	
			727.17	9.037E+00	?(	3.470E+01	1.14E+02	7.55E+00 G
			785.42	5.636E+01	?	1.198E+02	9.22E+01	1.28E+00 GA
U-235	N	2.3572E+00					2.57E+11	
			143.79	0.000E+00	(	2.339E+01	1.00E+03	1.10E+01 G
			205.33	8.826E+00	&(	2.338E+01	1.04E+02	5.01E+00 G
			163.38	1.063E+00	?(	3.298E+01	9.18E+02	5.08E+00 G
			185.72	-9.601E-02	-	3.043E+00	9.36E+02	5.40E+01 GA
BI-214	N	4.9115E+01					5.84E+05	
			609.31	4.907E+01	(P	3.076E+00	5.05E+00	4.61E+01 G
			1120.29	4.925E+01	(	1.264E+01	1.17E+01	1.51E+01 G
			1764.49	5.562E+01	+	1.759E+01	1.35E+01	1.54E+01 G
BI-210M	T	9.7841E-01					1.10E+09	
			265.83	9.784E-01	&(	3.049E+00	9.33E+01	5.00E+01 G
			304.90	-1.344E+00	+	1.167E+01	2.59E+02	2.80E+01 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
AC-228	N 1.5293E+01					2.10E+03	
		911.07	1.529E+01	(	5.331E+00	1.86E+01	2.90E+01 G
		968.97	4.919E-01	%	1.787E+01	1.05E+03	1.75E+01 G
		338.32	4.113E+00	-	1.775E+01	1.29E+02	1.20E+01 G
		93.35	-9.455E+00	&	4.487E+01	1.43E+02	5.56E+00 XA
TH-227	N 2.4999E+00					7.95E+03	
		256.24	-4.463E+00	?(	2.096E+01	1.83E+02	7.00E+00 G
		235.97	6.300E+00	(	7.272E+00	3.66E+01	1.23E+01 G
		50.14	2.751E+00	(	1.822E+01	1.95E+02	8.00E+00 G
TH-229	N 9.9286E+00					2.68E+06	
		193.51	5.361E+00	&(	2.979E+01	2.17E+02	4.40E+00 G
		210.85	1.665E+01	?(	4.370E+01	1.03E+02	2.99E+00 G
TH-234	N -1.8399E+00					1.63E+12	
		92.59	-5.591E+00	@(P	4.346E+01	2.31E+02	5.58E+00 G
		63.29	3.658E+00	(P	6.416E+01	5.23E+02	3.81E+00 G
PA-233	C 1.5291E+00					7.82E+08	
		312.01	1.529E+00	&(	9.628E+00	1.89E+02	3.60E+01 G
		300.18	0.000E+00	&	5.073E+01	1.00E+03	6.20E+00 G
PA-234	N 1.0718E+00					1.63E+12	
		131.29	-2.647E+00	?(	1.060E+01	1.20E+02	1.80E+01 G
		946.02	6.137E+00	(	1.186E+01	8.64E+01	1.34E+01 G
		569.47	-3.005E+00	+	2.035E+01	1.97E+02	8.20E+00 G
		883.24	9.740E-01	?(	2.282E+01	6.68E+02	9.60E+00 G
		880.53	3.787E+00	&	3.580E+01	2.72E+02	6.00E+00 GA
PA-234M	N 7.6489E+01					1.63E+12	
		1001.00	0.000E+00	?(	2.966E+02	1.00E+03	8.37E-01 G
		766.41	2.942E+02	?(	8.859E+02	8.99E+01	2.94E-01 G
AM-241	T 1.7385E+00					1.58E+05	
		59.54	1.738E+00	&(	7.477E+00	1.29E+02	3.59E+01 G
Np-237	F 2.9417E+00					2.14E+06	
						Derived Ave Activity	
		86.49	2.942E+00	}(	1.908E+01	1.95E+02	1.31E+01 G
Ir-192	F 5.4738E-01					7.40E+01	
		316.49	5.474E-01	(	4.068E+00	2.22E+02	8.70E+01 G
		468.06	-1.434E+00	+	4.443E+00	9.28E+01	5.18E+01 G
		308.44	-1.814E+00	+	1.122E+01	1.85E+02	3.18E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Cs-136	F	6.9084E-01					1.30E+01	
			818.50	4.814E-01	?(	2.563E+00	1.56E+02	1.00E+02 G
			1048.07	9.526E-01	?(	1.960E+00	6.26E+01	8.00E+01 G
			340.57	0.000E+00	-	4.712E+00	1.00E+03	4.69E+01 G
Np-239	T	1.9734E+00					2.36E+00	
			103.70	2.282E-01	&	8.819E+00	1.15E+03	2.40E+01 X
			106.13	1.973E+00	?(	9.252E+00	1.41E+02	2.27E+01 G
			99.50	-3.071E+00	&	1.431E+01	1.40E+02	1.50E+01 X
Nd-147		-5.5785E+00					1.11E+01	
			531.00	-5.579E+00	?(	1.247E+01	9.46E+01	1.30E+01 G
			91.10	1.804E+00	+	8.554E+00	1.43E+02	2.83E+01 G
TL-210	N	6.0274E-01					5.84E+05	
			799.60	6.027E-01	&(	2.155E+00	1.06E+02	9.90E+01 G
			296.00	-6.601E-01	+	4.068E+00	1.85E+02	7.90E+01 G
			1313.00	-5.700E-01	+	8.515E+00	6.74E+02	2.10E+01 GA
Kr-85	I	-1.1459E+02					3.92E+03	
			513.98	-1.146E+02	?(	5.871E+02	1.52E+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 **********

Nuclide	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	Activity	
AM-241	59.54	820.	32.	0.018	129.15	1.738E+00	
TH-234	63.29	758.	7.	0.004	523.19	3.658E+00	P
BA-133	80.99	490.	-37.	-0.021	106.74	-1.758E+00	
TH-234	92.59	1123.	-20.	-0.011	230.95	-5.591E+00	P
Gd-153	97.50	900.	-31.	-0.017	139.87	-1.538E+00	
Np-239	99.50	904.	-31.	-0.017	139.86	-3.071E+00	
Gd-153	103.20	939.	-21.	-0.012	202.81	-1.473E+00	
Np-239	106.13	880.	30.	0.017	140.74	1.973E+00	
CO-57	122.06	356.	9.	0.005	309.09	1.514E-01	
EU-154	123.10	340.	11.	0.006	235.38	4.088E-01	
HF-181	133.02	1303.	-31.	-0.017	163.13	-1.100E+00	
CE-144	133.54	1220.	-9.	-0.005	553.85	-1.220E+00	
Ba-140	162.66	438.	29.	0.016	103.10	7.584E+00	
U-235	163.38	467.	3.	0.002	918.04	1.063E+00	
CE-139	165.85	428.	14.	0.008	203.59	2.961E-01	
Cf-251	176.60	286.	-16.	-0.009	199.32	-1.583E+00	
U-235	185.72	393.	-3.	-0.002	936.30	-9.601E-02	
TH-229	193.51	235.	13.	0.007	216.68	5.361E+00	
U-235	205.33	172.	24.	0.013	103.86	8.826E+00	
TH-229	210.85	209.	27.	0.015	103.13	1.665E+01	
Cf-251	227.00	180.	6.	0.004	397.93	1.968E+00	
Cd-113m	263.70	289.	-27.	-0.015	92.56	-9.630E+03	
BI-210M	265.83	207.	22.	0.012	93.33	9.784E-01	
Hg-203	279.20	226.	10.	0.005	222.11	2.692E-01	
I-131	284.30	136.	-9.	-0.005	253.72	-3.245E+00	
TL-210	296.00	814.	-22.	-0.012	184.52	-6.601E-01	
Ba-140	304.85	832.	-24.	-0.013	172.59	-1.344E+01	
BI-210M	304.90	804.	-16.	-0.009	259.36	-1.344E+00	
PA-233	312.01	875.	22.	0.012	188.59	1.529E+00	
CR-51	320.08	947.	20.	0.011	219.20	5.047E+00	
La-140	328.76	181.	13.	0.007	152.95	1.601E+00	
HF-181	345.83	336.	-23.	-0.013	114.71	-4.069E+00	
BA-133	356.00	990.	-22.	-0.012	205.77	-9.554E-01	
I-131	364.48	64.	16.	0.009	99.45	5.528E-01	
BA-133	383.84	148.	16.	0.009	110.39	5.171E+00	
SN-113	391.69	172.	16.	0.009	117.84	7.384E-01	
AG-108M	433.94	96.	-21.	-0.012	93.60	-7.390E-01	
PM-146	453.88	72.	13.	0.007	130.77	6.566E-01	
BE-7	477.60	155.	16.	0.009	112.85	5.189E+00	
RU-103	497.05	72.	-10.	-0.006	169.12	-3.868E-01	
RH-106	511.86	113.	76.	0.042	22.98	1.360E+01	
Kr-85	513.98	209.	-14.	-0.008	151.91	-1.146E+02	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Ba-140	537.26	43.	12.	0.006	118.84	1.783E+00	
CS-134	563.24	48.	3.	0.002	426.32	1.541E+00	
CS-134	569.32	57.	7.	0.004	161.09	1.728E+00	
BI-207	569.70	70.	2.	0.001	795.82	5.973E-02	
SB-124	602.73	686.	12.	0.007	312.17	4.920E-01	
CS-134	604.71	698.	12.	0.007	314.43	4.971E-01	
RU-103	610.30	710.	12.	0.007	315.91	8.529E+00	
AG-108M	614.28	722.	12.	0.007	317.69	5.499E-01	
PM-144	618.06	734.	12.	0.007	319.50	5.021E-01	
RH-106	621.92	782.	-14.	-0.008	285.01	-5.828E+00	
AG-110M	657.76	99.	-21.	-0.012	69.20	-9.782E-01	
CS-137	661.66	140.	-18.	-0.010	98.18	-8.970E-01	
PM-144	696.54	65.	-17.	-0.010	101.80	-7.895E-01	
NB-94	702.63	51.	10.	0.005	160.48	4.481E-01	
SB-124	722.79	98.	-9.	-0.005	159.09	-3.856E+00	
ZR-95	724.20	91.	-16.	-0.009	87.95	-1.681E+00	
PM-146	735.72	42.	-5.	-0.003	278.57	-1.043E+00	
PM-146	747.16	37.	5.	0.003	281.58	6.512E-01	
AG-110M	763.94	216.	-33.	-0.018	65.74	-7.094E+00	
NB-95	765.79	201.	-18.	-0.010	112.47	-8.816E-01	
PA-234M	766.41	121.	18.	0.010	89.94	2.942E+02	
CS-134	795.87	60.	15.	0.008	79.53	8.435E-01	
TL-210	799.60	74.	12.	0.007	105.67	6.027E-01	
CS-134	801.95	115.	-17.	-0.010	90.19	-1.001E+01	
CO-58	810.78	95.	-17.	-0.009	84.63	-8.602E-01	
Cs-136	818.50	106.	10.	0.005	156.31	4.814E-01	
MN-54	834.85	51.	-5.	-0.003	288.25	-2.742E-01	
NB-94	871.10	24.	11.	0.006	67.28	6.082E-01	
EU-154	873.23	76.	-18.	-0.010	72.08	-7.852E+00	
Y-88	898.04	30.	4.	0.002	305.16	2.313E-01	
AG-110M	937.49	85.	-24.	-0.014	85.19	-3.985E+00	
EU-154	1004.77	39.	13.	0.007	74.90	4.135E+00	
Cs-136	1048.07	25.	13.	0.007	62.60	9.526E-01	
RH-106	1050.36	60.	-17.	-0.009	70.44	-6.480E+01	
BI-207	1063.66	27.	12.	0.007	99.34	1.015E+00	
Ga-68	1077.40	37.	-2.	-0.001	598.81	-5.105E+00	
FE-59	1099.25	21.	13.	0.007	87.52	1.408E+00	
CO-60	1173.24	53.	-14.	-0.008	118.79	-9.459E-01	
NA-22	1274.53	17.	12.	0.007	56.23	8.478E-01	
EU-154	1274.54	29.	1.	0.001	826.57	1.855E-01	
FE-59	1291.60	40.	-3.	-0.001	557.27	-4.378E-01	
TL-210	1313.00	23.	-2.	-0.001	674.39	-5.700E-01	
CO-60	1332.50	6.	7.	0.004	86.68	5.188E-01	
AG-110M	1384.30	17.	7.	0.004	143.21	2.157E+00	
La-140	1596.21	12.	3.	0.002	284.80	2.641E-01	
SB-124	1690.98	19.	-11.	-0.006	102.92	-2.029E+00	
Y-88	1836.06	7.	6.	0.004	111.28	6.046E-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 1 Sigma Counting	MDA Bq/Sample
BE-7	#A	5.1893E+00	5.1893E+00	1.128E+02%	1.97E+01
NA-22	#A	8.4783E-01	8.4783E-01	5.623E+01%	1.54E+00
K-40		3.3554E+02	3.3554E+02	4.860E+00%	1.01E+01
Sc-46	#A	6.2778E-02	6.2779E-02	1.100E+03%	2.41E+00
CR-51	#A	5.0474E+00	5.0474E+00	2.192E+02%	3.70E+01
MN-54	#A	-2.7420E-01	-2.7420E-01	2.882E+02%	1.86E+00
FE-59	#A	1.4080E+00	1.4080E+00	8.752E+01%	2.69E+00
Co-56	#C	2.1979E+00	2.1979E+00	3.318E+01%	1.57E+00
CO-57	#A	1.5143E-01	1.5143E-01	3.091E+02%	1.58E+00
CO-58	#A	-8.6022E-01	-8.6022E-01	8.463E+01%	2.44E+00
CO-60	#A	5.1882E-01	5.1882E-01	8.668E+01%	1.00E+00
ZN-65	#A	0.0000E+00	0.0000E+00	1.000E+03%	8.71E+00
NB-94	#A	5.2894E-01	5.2894E-01	6.728E+01%	1.67E+00
ZR-95	#A	-1.1723E-01	-1.1723E-01	1.143E+03%	3.17E+00
NB-95	#A	-8.8163E-01	-8.8163E-01	1.125E+02%	3.33E+00
RU-103	#A	-3.8680E-01	-3.8681E-01	1.691E+02%	1.63E+00
RH-106	#A	-5.8277E+00	-5.8277E+00	2.850E+02%	5.56E+01
AG-108M	#A	-7.3902E-01	-7.3902E-01	9.360E+01%	1.70E+00
AG-110M	#A	5.4030E-01	5.4030E-01	1.432E+02%	3.05E+00
SN-113	#A	7.3842E-01	7.3843E-01	1.178E+02%	2.93E+00
SB-124	#A	4.9203E-01	4.9204E-01	3.122E+02%	5.15E+00
SB-125	A	4.4922E+00	4.4922E+00	2.426E+01%	4.60E+00
I-131	#A	5.5274E-01	5.5276E-01	9.945E+01%	1.36E+00
Gd-153	#A	-1.5383E+00	-1.5383E+00	1.399E+02%	7.17E+00
Ga-68	#A	-5.0814E+00	-5.1048E+00	5.988E+02%	6.82E+01
Tc-99m	#A	0.0000E+00	0.0000E+00	1.000E+03%	2.94E+00
BA-133	#A	-9.5541E-01	-9.5541E-01	2.058E+02%	6.56E+00
CS-134	#A	7.7401E-01	7.7401E-01	7.953E+01%	2.24E+00
CS-137	#A	-8.9701E-01	-8.9701E-01	9.818E+01%	2.95E+00
CE-139	#A	2.9608E-01	2.9608E-01	2.036E+02%	2.03E+00
Ba-140	#A	2.9613E+00	2.9614E+00	7.866E+01%	5.10E+00
La-140	#A	4.9864E-01	4.9865E-01	1.529E+02%	1.66E+00
CE-141	#A	1.1787E-01	1.1787E-01	1.337E+03%	5.27E+00
CE-144	#A	-1.2197E+00	-1.2197E+00	5.539E+02%	2.26E+01
PM-144	#A	-7.8951E-01	-7.8951E-01	1.018E+02%	1.84E+00
EU-152	#C	4.8039E+00	4.8039E+00	2.828E+01%	4.69E+00
EU-154	#A	1.0392E+00	1.0392E+00	7.490E+01%	3.24E+00
EU-155	#A	6.3764E-01	6.3764E-01	4.679E+02%	1.00E+01
HF-181	#A	0.0000E+00	0.0000E+00	7.071E+02%	2.72E+00
Ta-182	#A	1.6782E+00	1.6782E+00	5.327E+01%	1.29E+01
Hg-203	#A	2.6918E-01	2.6918E-01	2.221E+02%	2.02E+00
TL-208	#	5.2712E+00	5.2712E+00	1.485E+01%	1.41E+00
PM-146	#A	6.5475E-01	6.5475E-01	1.308E+02%	2.13E+00

Y-88 #A	4.2329E-01	4.2330E-01	1.113E+02%		1.41E+00
Cd-113m#A	-9.6298E+03	-9.6298E+03	9.256E+01%		2.97E+04
Cd-109 #A	1.3569E+01	1.3569E+01	1.414E+02%		6.39E+01
Cf-251 #A	-1.5832E+00	-1.5832E+00	1.993E+02%		8.07E+00
Cf-249 #A	1.2163E+00	1.2163E+00	7.545E+01%		2.69E+00
Sn-126 A	-5.5393E-02	-5.5393E-02	1.375E+04%		2.56E+01
PB-210 #	4.6614E+01	4.6614E+01	3.118E+01%		4.57E+01
PB-212	1.3893E+01	1.3893E+01	7.401E+00%		2.23E+00
PB-214	5.4965E+01	5.4965E+01	3.970E+00%		3.19E+00
BI-207 #A	1.0148E+00	1.0148E+00	9.934E+01%		2.20E+00
BI-212 #A	9.0373E+00	9.0373E+00	1.140E+02%		3.47E+01
U-235 #A	2.3572E+00	2.3572E+00	1.039E+02%		2.34E+01
BI-214	4.9115E+01	4.9115E+01	5.047E+00%		3.08E+00
BI-210M#A	9.7841E-01	9.7841E-01	9.333E+01%		3.05E+00
AC-228 #	1.5293E+01	1.5293E+01	1.856E+01%		5.33E+00
TH-227 A	2.4999E+00	2.4999E+00	3.663E+01%		2.10E+01
TH-229 #A	9.9286E+00	9.9286E+00	1.031E+02%		2.98E+01
TH-234 #A	-1.8399E+00	-1.8399E+00	2.309E+02%		4.35E+01
PA-231 #A	0.0000E+00	0.0000E+00	7.071E+02%		1.10E+02
PA-233 #A	1.5291E+00	1.5291E+00	1.886E+02%		9.63E+00
PA-234 A	1.0718E+00	1.0718E+00	8.644E+01%		1.06E+01
PA-234M#A	7.6489E+01	7.6489E+01	8.994E+01%		2.97E+02
AM-241 #A	1.7385E+00	1.7385E+00	1.292E+02%		7.48E+00
Np-237 #A	2.9417E+00	2.9417E+00	1.946E+02%		1.91E+01
Ir-192 A	5.4737E-01	5.4738E-01	2.224E+02%		4.07E+00
Cs-136 #A	6.9082E-01	6.9084E-01	6.260E+01%		2.56E+00
Np-239 #A	1.9732E+00	1.9734E+00	1.407E+02%		9.25E+00
Nd-147 #A	-5.5784E+00	-5.5785E+00	9.457E+01%		1.25E+01
TL-210 #A	6.0274E-01	6.0274E-01	1.057E+02%		2.16E+00
Kr-85 #A	-1.1459E+02	-1.1459E+02	1.519E+02%		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 (25.1 to 1999.1 keV) 5.054E+02 Bq/Sample
Total Decayed Activity (25.1 to 1999.1 keV) 5.0539517E+02 Bq/Sample

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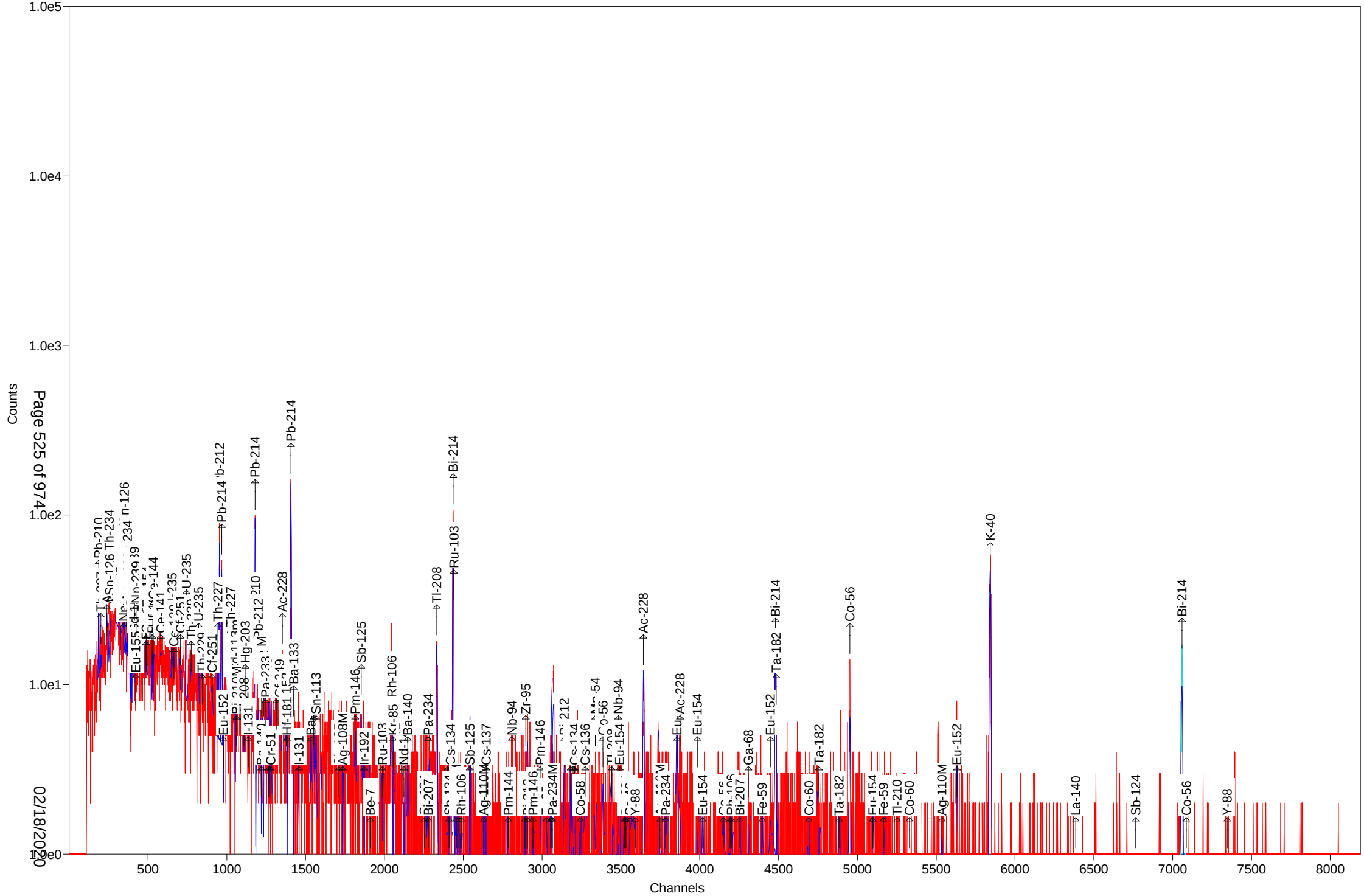
453329_Gamma_160-36593-A-3-B. 12_Gamma_20193735.spc.



Test America St. Louis Spectrum ID: 8_Gamma_20192228

Sample Description: 453329_Gamma_160-36593-A-4-B
Detector: Detector # 8
Batch ID: 453329
Work Order Number: Gamma
Lot Number: 160-36593-A-4-B

Decay to Time: 12/27/2019 08:19 Live Time: 1800 sec
Acquisition Time: 12/27/2019 08:19:29 Real Time: 1843 sec
Analysis Time: 12/27/2019 08:50 Dead Time: 2.33 %
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_2019-12-07_1517.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	-3.342E+00	153.0	5.112E+00	5.115E+00	1.739E+01
NA-22	7.192E-01	61.3	4.410E-01	4.425E-01	1.436E+00
K-40	2.674E+02	5.7	1.524E+01	2.048E+01	1.050E+01
Sc-46	4.906E-02	1455.7	7.142E-01	7.142E-01	2.506E+00
CR-51	3.538E+00	267.3	9.458E+00	9.460E+00	3.170E+01
MN-54	4.165E-01	142.5	5.933E-01	5.937E-01	1.413E+00
FE-59	4.996E-01	232.7	1.163E+00	1.163E+00	3.276E+00
Co-56	2.064E+00	23.0	4.755E-01	4.872E-01	1.294E+00
CO-57	-4.243E-01	82.4	3.494E-01	3.501E-01	1.162E+00
CO-58	-7.825E-01	86.2	6.749E-01	6.761E-01	2.265E+00
CO-60	4.455E-01	62.3	2.777E-01	2.786E-01	8.563E-01
ZN-65	-1.181E+00	197.5	2.332E+00	2.332E+00	7.946E+00
NB-94	7.058E-02	70.2	4.956E-02	4.970E-02	1.539E+00
ZR-95	8.024E-01	100.4	8.057E-01	8.067E-01	1.939E+00
NB-95	6.849E-01	83.5	5.718E-01	5.729E-01	1.919E+00
RU-103	-6.659E-02	725.3	4.829E-01	4.829E-01	1.204E+00
RH-106	-2.051E+00	261.7	5.368E+00	5.369E+00	1.325E+01
AG-108M	-3.475E-01	167.6	5.824E-01	5.826E-01	1.402E+00
AG-110M	4.624E-01	101.7	4.703E-01	4.709E-01	3.452E+00
SN-113	0.000E+00	1.#INF	1.621E-01	1.621E-01	3.006E+00
SB-124	-1.330E-01	1026.1	1.364E+00	1.364E+00	4.606E+00
SB-125	1.661E+00	102.5	1.703E+00	1.705E+00	3.653E+00
I-131	1.631E-01	344.3	5.617E-01	5.617E-01	1.211E+00
Gd-153	-1.572E+00	164.1	2.578E+00	2.580E+00	8.572E+00
Ga-68	7.376E+00	370.9	2.736E+01	2.736E+01	6.395E+01
Tc-99m	-2.401E-01	282.0	6.772E-01	6.773E-01	2.266E+00
BA-133	1.020E+00	173.6	1.771E+00	1.772E+00	6.247E+00
CS-134	1.578E+00	53.3	8.405E-01	8.444E-01	1.693E+00
CS-137	-1.035E+00	105.8	1.096E+00	1.097E+00	2.572E+00
CE-139	5.043E-01	91.8	4.628E-01	4.653E-01	1.542E+00
Ba-140	2.204E+00	103.8	2.287E+00	2.290E+00	4.502E+00
La-140	-1.579E+00	84.6	1.336E+00	1.338E+00	2.808E+00
CE-141	8.276E-01	145.0	1.200E+00	1.201E+00	4.001E+00

CE-144	0.000E+00	1.#INF	7.023E-01	7.023E-01	1.637E+01
PM-144	-5.005E-01	129.2	6.469E-01	6.474E-01	1.511E+00
EU-152	2.156E+00	87.3	1.883E+00	1.886E+00	3.366E+00
EU-154	1.489E+00	52.3	7.795E-01	7.834E-01	2.520E+00
EU-155	-2.232E+00	68.7	1.533E+00	1.538E+00	1.195E+01
HF-181	4.729E-01	248.2	1.174E+00	1.174E+00	2.384E+00
Ta-182	2.180E+00	49.1	1.071E+00	1.076E+00	1.117E+01
Hg-203	4.790E-01	88.2	4.227E-01	4.236E-01	1.416E+00
TL-208	3.769E+00	17.3	6.537E-01	6.823E-01	1.227E+00
PM-146	1.011E+00	76.2	7.699E-01	7.716E-01	1.651E+00
Y-88	-1.998E-01	375.4	7.499E-01	7.500E-01	1.546E+00
Cd-113m	-1.641E+03	323.2	5.305E+03	5.306E+03	1.828E+04
Cd-109	-1.279E+01	174.2	2.229E+01	2.230E+01	7.408E+01
Cf-251	7.871E-01	293.6	2.311E+00	2.312E+00	5.972E+00
Cf-249	6.077E-01	242.6	1.474E+00	1.475E+00	2.908E+00
Sn-126	-6.022E+00	113.6	6.839E+00	6.846E+00	2.276E+01
PB-210	-1.810E+01	71.8	1.300E+01	1.305E+01	6.858E+01
PB-212	1.230E+01	8.4	1.037E+00	1.307E+00	2.453E+00
PB-214	2.691E+01	6.4	1.713E+00	2.211E+00	3.430E+00
BI-207	-4.268E-01	231.6	9.886E-01	9.888E-01	2.809E+00
BI-212	9.086E+00	80.1	7.276E+00	7.291E+00	2.436E+01
U-235	-7.400E-01	435.4	3.222E+00	3.222E+00	1.834E+01
BI-214	3.262E+01	5.7	1.852E+00	2.510E+00	1.664E+00
BI-210M	-9.893E-01	83.5	8.258E-01	8.278E-01	2.752E+00
AC-228	1.397E+01	10.6	1.477E+00	1.640E+00	3.458E+00
TH-227	3.075E+00	178.3	5.483E+00	5.486E+00	1.592E+01
TH-229	8.702E+00	103.7	9.023E+00	9.050E+00	2.230E+01
TH-234	1.089E+01	41.8	4.555E+00	4.595E+00	2.008E+01
PA-231	1.322E+01	167.1	2.209E+01	2.210E+01	9.865E+01
PA-233	1.698E+00	172.7	2.933E+00	2.934E+00	8.552E+00
PA-234	3.837E-01	101.5	3.896E-01	3.901E-01	1.004E+01
PA-234M	2.471E+01	334.9	8.273E+01	8.274E+01	2.915E+02
AM-241	1.134E+00	171.9	1.950E+00	1.950E+00	6.515E+00
Np-237	3.108E+00	175.0	5.439E+00	5.442E+00	1.811E+01
Ir-192	7.091E-01	96.2	6.822E-01	6.835E-01	3.615E+00
Cs-136	3.835E-02	147.0	5.639E-02	5.643E-02	2.194E+00
Np-239	-2.097E+00	162.7	3.412E+00	3.414E+00	1.134E+01
Nd-147	9.828E-02	3609.7	3.548E+00	3.548E+00	8.889E+00
TL-210	4.766E-01	104.7	4.992E-01	5.000E-01	1.808E+00
Kr-85	-4.340E+00	3246.5	1.409E+02	1.409E+02	4.873E+02
Total	4.686E+02				

Analyst: Caleb Quinn

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Sample description
453329_Gamma_160-36593-A-4-B

Spectrum Filename: C:\User\SPC\Det8\8_Gamma_20192228.An1

Acquisition information
Start time: 12/27/2019 8:19:29 AM
Live time: 1800
Real time: 1843
Dead time: 2.33 %
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	12/27/2019 8:19:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	8_2019-12-07_1517.PBC 12/7/2019 3:17:53 PM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 24 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 0.0998

***** 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	15.	196.98	1.01	2.267E-02	50.14	8.000	PBC<MDA	TH227
59.68	26.	52.15	0.66	2.890E-02	59.54	35.900	PBC<MDA	AM241
63.11	49.	41.85	1.03	3.093E-02	63.29	3.810	PBC<MDA	TH234
74.83	195.	14.30	1.03	3.619E-02				
77.13	292.	9.93	1.04	3.700E-02				
80.99	33.	148.03	1.04	3.821E-02	80.99	34.060	PBC<MDA	BA133
86.49	29.	174.99	1.04	3.959E-02	86.49	13.100	PBC<MDA	Np237
					86.54	30.700	1.326E+00	EU155
					86.94	9.040	4.493E+00	Sn126
86.54	29.	176.95	1.04	3.961E-02	86.49	13.100	PBC<MDA	Np237
					86.54	30.700	1.326E+00	EU155
					86.94	9.040	4.493E+00	Sn126
86.94	29.	178.82	1.04	3.969E-02	86.49	13.100	PBC<MDA	Np237
					86.54	30.700	1.326E+00	EU155
					86.94	9.040	4.495E+00	Sn126
87.57	29.	180.67	1.04	3.982E-02	87.57	37.500	PBC<MDA	Sn126
					88.04	3.790	1.066E+01	Cd109
92.51	11.	224.72	1.05	4.072E-02	92.59	5.584	PBC<MDA	TH234
121.78	24.	91.46	1.07	4.148E-02	121.78	28.580	PBC<MDA	EU152
					122.06	85.600	3.685E-01	CO57
145.44	28.	145.01	1.09	3.874E-02	145.44	48.200	PBC<MDA	CE141
162.66	25.	103.77	1.10	3.593E-02	162.66	6.220	PBC<MDA	Ba140

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pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
165.33	26.	91.78	1.10	3.629E-02	165.85	79.900	PBC<MDA	CE139
176.60	8.	293.61	1.11	3.460E-02	176.60	17.000	PBC<MDA	Cf251
186.00	214.	13.51	1.11	3.326E-02	185.72	54.000	6.620E+00	U235
192.48	12.	178.96	1.13	3.226E-02	193.51	4.400	PBC<MDA	TH229
209.09	46.	36.89	0.48	3.040E-02				
210.89	23.	104.80	1.14	3.020E-02	210.85	2.990	PBC<MDA	TH229
235.97	21.	178.32	1.16	2.768E-02	235.97	12.300	PBC<MDA	TH227
238.73	263.	8.44	1.16	2.744E-02	238.63	43.300	1.229E+01	PB212
242.15	118.	15.02	1.16	2.713E-02	242.00	7.430	3.259E+01	PB214
244.69	17.	202.08	1.16	2.691E-02	244.69	7.580	PBC<MDA	EU152
256.24	3.	741.59	1.17	2.596E-02	256.24	7.000	PBC<MDA	TH227
277.28	14.	103.51	1.19	2.440E-02	277.28	6.310	PBC<MDA	TL208
279.20	17.	88.25	1.19	2.427E-02	279.20	81.460	PBC<MDA	Hg203
284.30	5.	344.29	1.19	2.393E-02	284.30	6.140	PBC<MDA	I131
295.10	271.	9.39	1.36	2.324E-02	295.09	19.300	3.358E+01	PB214
					296.00	79.000	8.223E+00	TL210
300.03	15.	230.64	1.20	2.294E-02	300.03	3.280	PBC<MDA	PB212
					300.07	2.460	1.429E+01	PA231
					300.18	6.200	5.670E+00	PA233
300.07	15.	233.61	1.20	2.293E-02	300.03	3.280	PBC<MDA	PB212
					300.07	2.460	1.429E+01	PA231
					300.18	6.200	5.670E+00	PA233
300.18	15.	236.51	1.20	2.293E-02	300.03	3.280	PBC<MDA	PB212
					300.07	2.460	1.429E+01	PA231
					300.18	6.200	5.671E+00	PA233
302.65	15.	239.08	1.21	2.278E-02	302.65	2.880	PBC<MDA	PA231
					302.85	18.330	1.934E+00	BA133
302.85	15.	241.90	1.21	2.277E-02	302.65	2.880	PBC<MDA	PA231
					302.85	18.330	1.935E+00	BA133
304.85	15.	244.43	1.21	2.265E-02	304.85	4.290	PBC<MDA	Ba140
					304.90	28.000	1.275E+00	BI210M
304.90	15.	247.23	1.21	2.265E-02	304.85	4.290	PBC<MDA	Ba140
					304.90	28.000	1.275E+00	BI210M
308.44	15.	249.43	1.21	2.244E-02	308.44	31.750	PBC<MDA	Ir192
312.01	15.	251.63	1.21	2.224E-02	312.01	36.000	PBC<MDA	PA233
316.49	15.	253.65	1.22	2.199E-02	316.49	87.040	PBC<MDA	Ir192
320.08	14.	267.30	1.22	2.179E-02	320.08	9.940	PBC<MDA	CR51
328.76	16.	249.07	1.23	2.133E-02	328.76	20.300	PBC<MDA	La140
333.35	17.	242.62	1.23	2.110E-02	333.44	15.510	PBC<MDA	Cf249
338.23	64.	17.41	1.23	2.085E-02	338.32	12.010	1.428E+01	AC228
340.57	17.	244.09	1.23	2.074E-02	340.57	46.900	PBC<MDA	Cs136
344.29	17.	246.01	1.24	2.057E-02	344.29	26.500	PBC<MDA	EU152
345.83	17.	248.22	1.24	2.049E-02	345.83	15.070	PBC<MDA	HF181
347.06	10.	68.66	1.24	2.043E-02	345.83	15.070	1.814E+00	HF181
351.93	368.	6.37	1.24	2.021E-02	351.93	37.600	2.691E+01	PB214
356.00	17.	249.14	1.25	2.002E-02	356.00	62.050	PBC<MDA	BA133
388.42	2.	941.63	1.27	1.869E-02	387.95	66.000	PBC<MDA	Cf249
425.94	4.	328.51	1.30	1.728E-02	427.88	29.600	PBC<MDA	SB125

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
453.88	8.	163.22	1.32	1.647E-02	453.88	65.000	PBC<MDA	PM146
463.29	14.	102.52	1.32	1.620E-02	463.37	10.470	PBC<MDA	SB125
468.06	14.	96.20	1.33	1.606E-02	468.06	51.750	PBC<MDA	Ir192
511.86	67.	20.73	2.61	1.494E-02	511.86	20.000	1.246E+01	RH106
563.24	11.	92.97	1.39	1.381E-02	563.24	8.350	PBC<MDA	CS134
583.22	75.	17.34	1.14	1.342E-02	583.02	84.500	3.674E+00	TL208
609.32	350.	5.68	1.63	1.294E-02	609.31	46.090	3.263E+01	BI214
					610.30	5.750	2.619E+02	RU103
635.52	6.	165.14	1.44	1.250E-02	635.89	11.310	PBC<MDA	SB125
657.76	10.	126.53	1.45	1.215E-02	657.76	94.640	PBC<MDA	AG110M
727.17	14.	80.08	1.50	1.118E-02	727.17	7.550	PBC<MDA	BI212
735.72	12.	92.58	1.51	1.107E-02	735.72	22.500	PBC<MDA	PM146
747.16	7.	130.32	1.51	1.093E-02	747.16	34.000	PBC<MDA	PM146
756.73	9.	100.41	1.52	1.081E-02	756.73	54.460	PBC<MDA	ZR95
763.94	1.	612.37	1.52	1.072E-02	763.94	22.280	PBC<MDA	AG110M
765.79	13.	83.49	1.53	1.070E-02	765.79	99.790	PBC<MDA	NB95
					766.41	0.294	2.326E+02	PA234M
766.41	2.	482.49	1.53	1.070E-02	765.79	99.790	PBC<MDA	NB95
					766.41	0.294	4.417E+01	PA234M
778.92	10.	110.78	1.53	1.055E-02	778.92	12.940	PBC<MDA	EU152
785.42	8.	138.45	1.54	1.048E-02	785.42	1.280	PBC<MDA	BI212
795.87	16.	53.27	1.54	1.036E-02	795.87	85.530	PBC<MDA	CS134
799.60	9.	104.75	1.55	1.032E-02	799.60	98.960	PBC<MDA	TL210
801.95	6.	167.94	1.55	1.030E-02	801.95	8.690	PBC<MDA	CS134
815.77	9.	99.46	1.56	1.015E-02	815.77	23.280	PBC<MDA	La140
834.85	7.	142.46	1.57	9.955E-03	834.85	99.980	PBC<MDA	MN54
846.77	6.	152.86	1.58	9.836E-03	846.77	99.935	PBC<MDA	Co56
859.93	31.	28.11	0.40	9.703E-03	860.56	12.420	1.444E+01	TL208
871.10	11.	70.22	1.59	9.604E-03	871.10	99.890	PBC<MDA	NB94
880.53	12.	93.70	1.60	9.517E-03	880.53	6.000	PBC<MDA	PA234
883.24	8.	143.35	1.60	9.493E-03	883.24	9.600	PBC<MDA	PA234
911.30	60.	16.33	2.60	9.247E-03	911.07	29.000	1.243E+01	AC228
969.22	45.	20.89	0.79	8.776E-03	968.97	17.460	1.632E+01	AC228
996.33	12.	84.31	1.67	8.571E-03	996.33	10.600	PBC<MDA	EU154
1001.00	2.	464.47	1.67	8.537E-03	1001.00	0.837	PBC<MDA	PA234M
1004.77	10.	102.96	1.67	8.509E-03	1004.77	18.010	PBC<MDA	EU154
1037.84	10.	89.23	1.69	8.278E-03	1037.84	14.130	PBC<MDA	Co56
1077.40	3.	370.93	1.72	8.017E-03	1077.40	3.300	PBC<MDA	Ga68
1099.25	2.	451.41	1.73	7.881E-03	1099.25	56.500	PBC<MDA	FE59
1120.32	69.	16.57	1.80	7.754E-03	1120.29	15.100	3.258E+01	BI214
					1120.55	99.987	PBC<MDA	Sc46
1221.41	17.	49.10	1.80	7.199E-03	1221.41	27.000	PBC<MDA	Ta182
1238.28	34.	23.04	1.81	7.114E-03	1238.28	66.070	4.059E+00	Co56
1274.53	9.	61.32	1.83	6.939E-03	1274.53	99.940	PBC<MDA	NA22
					1274.54	35.190	2.043E+00	EU154
1291.60	4.	232.74	1.84	6.860E-03	1291.60	43.200	PBC<MDA	FE59
1313.00	1.	563.47	1.85	6.763E-03	1313.00	21.000	PBC<MDA	TL210
1332.50	5.	62.33	1.86	6.678E-03	1332.50	99.980	PBC<MDA	CO60

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1384.30	6.	101.72	1.88	6.460E-03	1384.30	24.290	PBC<MDA	AG110M
1408.00	4.	232.74	1.90	6.366E-03	1408.00	21.005	PBC<MDA	EU152
1461.01	317.	5.70	2.03	6.165E-03	1460.83	10.670	2.674E+02	K40
1764.63	41.	16.48	2.22	5.226E-03	1764.49	15.400	2.819E+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
299.15	74.84	289.	195.	5.376E+03	14.30	1.034	- sD
308.33	77.14	274.	292.	7.887E+03	9.93	1.036	- sD
743.83	186.00	114.	214.	6.442E+03	13.51	1.114	- s
836.37	209.09	66.	51.	1.682E+03	26.49	1.137	- sD
1388.17	347.07	19.	10.	4.898E+02	69.22	1.239	- 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	484.	-28.	-0.015	71.84	1.012s
TH-227	200.36	50.14	429.	15.	0.008	196.98	1.015s
AM-241	237.95	59.54	648.	21.	0.012	171.93	1.022s
TH-234	252.96	63.29	182.	49.	0.027	41.85	1.025D
Sn-126	256.93	64.28	689.	-33.	-0.018	113.57	1.026s
BA-133	323.77	80.99	1189.	33.	0.018	148.03	1.039s
Np-237	345.77	86.49	1275.	29.	0.016	174.99	1.043
EU-155	345.98	86.54	1304.	29.	0.016	176.95	1.043
Sn-126	347.57	86.94	1333.	29.	0.016	178.82	1.044
Sn-126	350.09	87.57	1362.	29.	0.016	180.67	1.044
Cd-109	351.97	88.04	1824.	-35.	-0.019	174.24	1.044s
Nd-147	364.21	91.10	1789.	-35.	-0.019	172.21	1.047s
TH-234	370.17	92.59	291.	11.	0.006	224.72	1.048D
AC-228	373.21	93.35	1673.	-35.	-0.019	166.30	1.049s
Gd-153	389.81	97.50	1638.	-35.	-0.019	164.06	1.052s
Np-239	397.81	99.50	1603.	-35.	-0.020	162.07	1.053s
Gd-153	412.62	103.20	1568.	-35.	-0.020	159.87	1.056s
Np-239	414.62	103.70	1595.	-35.	-0.020	161.18	1.057s
EU-155	421.07	105.31	1631.	-36.	-0.020	68.69	1.058s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Np-239	424.34	106.13	1685.	-36.	-0.020	162.72	1.058
EU-152	486.94	121.78	220.	24.	0.013	91.46	1.071s
CO-57	488.06	122.06	236.	-27.	-0.015	82.36	1.071s
EU-154	492.22	123.10	251.	-28.	-0.015	83.31	1.072s
PA-234	525.00	131.29	771.	-28.	-0.015	143.86	1.078s
HF-181	531.92	133.02	751.	-17.	-0.010	223.16	1.079s
CE-144	533.98	133.54	768.	0.	0.000	1000.00	1.080s
HF-181	545.02	136.30	768.	0.	0.000	1000.00	1.082s
CO-57	545.72	136.47	808.	-29.	-0.016	140.34	1.082s
Tc-99m	561.86	140.51	861.	-15.	-0.008	282.01	1.085s
U-235	574.97	143.79	881.	-6.	-0.003	435.37	1.087s
CE-141	581.59	145.44	800.	28.	0.015	145.01	1.089s
Ba-140	650.47	162.66	324.	25.	0.014	103.77	1.102s
U-235	653.35	163.38	320.	-32.	-0.018	77.33	1.102s
CE-139	663.24	165.85	279.	26.	0.015	91.78	1.104s
Cf-251	706.23	176.60	169.	8.	0.005	293.61	1.112
U-235	742.71	185.72	430.	-45.	-0.025	57.19	1.119
TH-229	773.87	193.51	136.	12.	0.007	178.96	1.125s
U-235	821.17	205.33	358.	-28.	-0.015	104.83	1.134s
TH-229	843.24	210.85	289.	23.	0.013	104.80	1.138s
Cf-251	907.84	227.00	136.	-10.	-0.006	230.51	1.151
TH-227	943.73	235.97	659.	21.	0.011	178.32	1.157s
PB-212	954.37	238.63	114.	263.	0.146	8.44	1.159D
PB-214	967.84	242.00	97.	120.	0.066	14.82	1.162D
EU-152	978.62	244.69	598.	17.	0.010	202.08	1.164s
TH-227	1024.81	256.24	112.	3.	0.002	741.59	1.172s
Cd-113m	1054.65	263.70	104.	-4.	-0.002	323.18	1.178s
BI-210M	1063.18	265.83	164.	-22.	-0.012	83.47	1.179s
TL-208	1108.99	277.28	98.	14.	0.008	103.51	1.188
Hg-203	1116.66	279.20	105.	17.	0.009	88.25	1.189s
I-131	1137.05	284.30	76.	5.	0.003	344.29	1.193s
PB-214	1180.27	295.10	76.	271.	0.151	9.39	1.357s
TL-210	1183.86	296.00	538.	14.	0.008	228.19	1.202s
PB-212	1199.98	300.03	553.	15.	0.008	230.64	1.205
PA-231	1200.14	300.07	567.	15.	0.008	233.61	1.205s
PA-233	1200.58	300.18	582.	15.	0.008	236.51	1.205s
PA-231	1210.46	302.65	596.	15.	0.008	239.08	1.207s
BA-133	1211.27	302.85	611.	15.	0.008	241.90	1.207s
Ba-140	1219.26	304.85	625.	15.	0.008	244.43	1.208s
BI-210M	1219.45	304.90	640.	15.	0.008	247.23	1.208s
Ir-192	1233.62	308.44	654.	15.	0.008	249.43	1.211s
PA-233	1247.91	312.01	669.	15.	0.008	251.63	1.214
Ir-192	1265.82	316.49	684.	15.	0.008	253.65	1.217
CR-51	1280.20	320.08	673.	14.	0.008	267.30	1.219s
La-140	1314.91	328.76	786.	16.	0.009	249.07	1.226s
Cf-249	1333.63	333.44	798.	17.	0.009	242.62	1.229s
AC-228	1353.15	338.32	31.	64.	0.036	17.41	1.233D
Cs-136	1362.15	340.57	815.	17.	0.009	244.09	1.234s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
EU-152	1377.01	344.29	831.	17.	0.009	246.01	1.237s
HF-181	1383.19	345.83	848.	17.	0.009	248.22	1.238s
PB-214	1407.60	351.93	90.	368.	0.204	6.37	1.243D
BA-133	1423.87	356.00	865.	17.	0.009	249.14	1.245s
BA-133	1535.24	383.84	161.	-18.	-0.010	104.22	1.266s
Cf-249	1551.68	387.95	176.	2.	0.001	941.63	1.269s
SN-113	1566.64	391.69	174.	0.	0.000	1000.00	1.271s
SB-125	1711.39	427.88	44.	4.	0.002	328.51	1.297s
AG-108M	1735.64	433.94	61.	-10.	-0.005	167.59	1.301s
PM-146	1815.41	453.88	39.	8.	0.004	163.22	1.315s
SB-125	1853.36	463.37	96.	14.	0.008	102.52	1.322s
Ir-192	1872.14	468.06	82.	14.	0.008	96.20	1.325s
BE-7	1910.28	477.60	112.	-10.	-0.006	152.97	1.332s
HF-181	1927.89	482.00	122.	0.	0.000	1000.00	1.335s
La-140	1947.98	487.02	181.	-19.	-0.010	104.71	1.339s
RU-103	1988.12	497.05	35.	-2.	-0.001	725.26	1.346s
RH-106	2047.36	511.86	63.	67.	0.037	20.73	2.606
CS-134	2252.86	563.24	22.	11.	0.006	92.97	1.391s
CS-134	2277.20	569.32	42.	-9.	-0.005	107.15	1.395s
PA-234	2277.80	569.47	51.	0.	0.000	1000.00	1.395s
BI-207	2278.73	569.70	51.	0.	0.000	1000.00	1.396s
TL-208	2332.79	583.22	23.	75.	0.042	17.34	1.143
SB-125	2401.92	600.50	516.	-14.	-0.008	43.20	1.416s
CS-134	2418.76	604.71	492.	0.	0.000	1000.00	1.419s
BI-214	2437.21	609.32	11.	350.	0.195	5.68	1.627
AG-108M	2457.05	614.28	492.	0.	0.000	1000.00	1.426s
RH-106	2487.60	621.92	35.	-5.	-0.003	261.67	1.431s
SB-125	2543.49	635.89	38.	6.	0.003	165.14	1.440s
I-131	2547.83	636.97	62.	-17.	-0.009	71.54	1.441s
AG-110M	2630.98	657.76	68.	10.	0.005	126.53	1.455s
CS-137	2646.58	661.66	93.	-19.	-0.011	105.84	1.457s
PM-144	2786.11	696.54	37.	-10.	-0.006	129.23	1.480s
NB-94	2810.46	702.63	37.	-10.	-0.006	196.16	1.484s
SB-124	2891.09	722.79	69.	0.	0.000	1000.00	1.497s
AG-108M	2891.70	722.94	69.	0.	0.000	1000.00	1.498s
ZR-95	2896.74	724.20	68.	0.	0.000	1000.00	1.498s
BI-212	2908.63	727.17	54.	14.	0.008	80.08	1.500s
PM-146	2942.83	735.72	23.	12.	0.006	92.58	1.506s
PM-146	2988.59	747.16	19.	7.	0.004	130.32	1.513s
ZR-95	3026.87	756.73	15.	9.	0.005	100.41	1.519
AG-110M	3055.73	763.94	33.	1.	0.001	612.37	1.524s
NB-95	3063.11	765.79	54.	13.	0.007	83.49	1.525s
PA-234M	3065.60	766.41	72.	2.	0.001	482.49	1.526s
EU-152	3115.64	778.92	23.	10.	0.005	110.78	1.534
BI-212	3141.64	785.42	23.	8.	0.004	138.45	1.538s
CS-134	3183.44	795.87	27.	16.	0.009	53.27	1.544s
TL-210	3198.36	799.60	43.	9.	0.005	104.75	1.547s
CS-134	3207.77	801.95	53.	6.	0.003	167.94	1.548s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
CO-58	3243.06	810.78	69.	-14.	-0.008	86.24	1.554s
La-140	3263.04	815.77	39.	9.	0.005	99.46	1.557s
Cs-136	3273.97	818.50	64.	-7.	-0.004	163.99	1.559s
MN-54	3339.36	834.85	24.	7.	0.004	142.46	1.569s
Co-56	3387.05	846.77	19.	6.	0.003	152.86	1.577s
TL-208	3439.70	859.93	9.	31.	0.017	28.11	0.399s
NB-94	3484.36	871.10	25.	11.	0.006	70.22	1.592s
PA-234	3522.10	880.53	54.	12.	0.006	93.70	1.598s
PA-234	3532.94	883.24	66.	8.	0.005	143.35	1.599s
Y-88	3592.14	898.04	33.	-4.	-0.002	334.76	1.608s
AC-228	3645.17	911.30	9.	60.	0.033	16.33	2.598s
AG-110M	3749.96	937.49	45.	-7.	-0.004	214.05	1.633s
PA-234	3784.07	946.02	25.	-2.	-0.001	554.15	1.638
EU-152	3856.43	964.11	109.	-10.	-0.006	151.00	1.649s
AC-228	3876.88	969.22	10.	45.	0.025	20.89	0.788s
EU-154	3985.31	996.33	42.	12.	0.006	84.31	1.668s
PA-234M	4003.99	1001.00	56.	2.	0.001	464.47	1.671
EU-154	4019.10	1004.77	48.	10.	0.006	102.96	1.673s
Co-56	4151.36	1037.84	15.	10.	0.006	89.23	1.693s
Cs-136	4192.29	1048.07	32.	-5.	-0.003	176.70	1.698
BI-207	4254.65	1063.66	36.	-5.	-0.003	231.60	1.708s
Ga-68	4309.61	1077.40	25.	3.	0.002	370.93	1.716s
FE-59	4397.02	1099.25	26.	2.	0.001	451.41	1.728s
EU-152	4448.32	1112.07	148.	-16.	-0.009	110.76	1.736s
ZN-65	4462.20	1115.55	132.	-8.	-0.005	197.46	1.738s
BI-214	4481.30	1120.32	12.	69.	0.038	16.57	1.800
Sc-46	4482.22	1120.55	124.	0.	0.000	1000.00	1.740
CO-60	4692.97	1173.24	33.	-6.	-0.003	197.70	1.770s
Ta-182	4756.23	1189.05	45.	-12.	-0.007	126.24	1.779
Ta-182	4885.67	1221.41	11.	17.	0.010	49.10	1.797
Co-56	4953.16	1238.28	6.	34.	0.019	23.04	1.806s
NA-22	5098.16	1274.53	11.	9.	0.005	61.32	1.826s
FE-59	5166.43	1291.60	16.	4.	0.002	232.74	1.835s
TL-210	5252.05	1313.00	11.	1.	0.001	563.47	1.847s
CO-60	5330.06	1332.50	3.	5.	0.003	62.33	1.857s
AG-110M	5537.25	1384.30	5.	6.	0.003	101.72	1.884s
EU-152	5632.07	1408.00	16.	4.	0.002	232.74	1.896
K-40	5844.10	1461.01	4.	317.	0.176	5.70	2.033
La-140	6384.93	1596.21	28.	-15.	-0.009	84.62	1.990s
SB-124	6764.03	1690.98	11.	-9.	-0.005	90.70	2.034s
BI-214	7058.62	1764.63	2.	41.	0.023	16.48	2.219
Co-56	7085.51	1771.35	43.	0.	0.000	1000.00	2.070s
Y-88	7344.36	1836.06	6.	-2.	-0.001	375.40	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	-3.3417E+00				5.31E+01	
			477.60	-3.342E+00	?(	1.739E+01 1.53E+02 1.05E+01	G
NA-22	C	7.1919E-01				9.50E+02	
			1274.53	7.192E-01	?(	1.436E+00 6.13E+01 9.99E+01	G
K-40	N	2.6742E+02				4.66E+11	
			1460.83	2.674E+02	(P	1.050E+01 5.70E+00 1.07E+01	G
Sc-46	F	4.9061E-02				8.38E+01	
			889.28	4.906E-02	&(	2.506E+00 1.46E+03 1.00E+02	G
			1120.55	0.000E+00	-	3.913E+00 1.00E+03 1.00E+02	G
CR-51	F	3.5383E+00				2.77E+01	
			320.08	3.538E+00	&(P	3.170E+01 2.67E+02 9.94E+00	G
MN-54	C	4.1648E-01				3.12E+02	
			834.85	4.165E-01	?(P	1.413E+00 1.42E+02 1.00E+02	G
FE-59	F	4.9964E-01				4.45E+01	
			1099.25	3.083E-01	&(P	3.276E+00 4.51E+02 5.65E+01	G
			1291.60	7.498E-01	?(	4.002E+00 2.33E+02 4.32E+01	G
Co-56	C	2.0638E+00				7.73E+01	
			846.77	3.518E-01	?(P	1.294E+00 1.53E+02 9.99E+01	G
			1238.28	4.059E+00	(P	1.630E+00 2.30E+01 6.61E+01	G
			1037.84	4.841E+00	&(	9.860E+00 8.92E+01 1.41E+01	G
			1771.35	0.000E+00	-	2.293E+01 1.00E+03 1.55E+01	A
CO-57	C	-4.2429E-01				2.72E+02	
			122.06	-4.243E-01	?(	1.162E+00 8.24E+01 8.56E+01	G
			136.47	-3.758E+00	&	1.758E+01 1.40E+02 1.07E+01	G
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	4.4554E-01				1.93E+03	
			1332.50	4.455E-01	?(P	8.563E-01 6.23E+01 1.00E+02	G
			1173.24	-4.403E-01	- P	2.197E+00 1.98E+02 9.99E+01	G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
ZN-65	F	-1.1807E+00					2.44E+02	
			1115.55	-1.181E+00	?(	7.946E+00	1.97E+02	5.06E+01 G
NB-94	I	7.0582E-02					7.41E+06	
			702.63	-5.113E-01	?(P	1.539E+00	1.96E+02	9.79E+01 G
			871.10	6.409E-01	&(	1.497E+00	7.02E+01	9.99E+01 G
ZR-95	I	8.0241E-01					6.40E+01	
			756.73	8.024E-01	?(P	1.939E+00	1.00E+02	5.45E+01 G
			724.20	0.000E+00	-	4.616E+00	1.00E+03	4.42E+01 G
NB-95	I	6.8486E-01					6.40E+01	
			765.79	6.849E-01	?(	1.919E+00	8.35E+01	9.98E+01 G
RU-103	I	-6.6586E-02					3.93E+01	
			497.05	-6.659E-02	?(	1.204E+00	7.25E+02	9.09E+01 G
			610.30	-2.281E-05	%	7.928E+01	1.03E+08	5.75E+00 GA
RH-106	I	-2.0515E+00					3.74E+02	
			621.92	-2.051E+00	?(	1.325E+01	2.62E+02	9.93E+00 G
			1050.36	-3.622E+00	%	1.353E+02	1.04E+03	1.56E+00 G
			511.86	1.246E+01		7.383E+00	2.07E+01	2.00E+01 GA
AG-108M	C	-3.4749E-01					1.53E+05	
			433.94	-3.475E-01	?(	1.402E+00	1.68E+02	9.05E+01 G
			722.94	0.000E+00	+	2.255E+00	1.00E+03	9.08E+01 G
			614.28	0.000E+00	+	5.101E+00	1.00E+03	8.98E+01 G
AG-110M	F	4.6236E-01					2.50E+02	
			884.68	-2.513E-03	&(P	3.452E+00	3.52E+04	7.27E+01 G
			657.76	4.590E-01	(	1.981E+00	1.27E+02	9.46E+01 G
			937.49	-1.254E+00	+	6.086E+00	2.14E+02	3.44E+01 G
			1384.30	2.006E+00	?(	4.769E+00	1.02E+02	2.43E+01 G
			763.94	3.100E-01	?(	6.822E+00	6.12E+02	2.23E+01 G
SB-124	F	-1.3296E-01					6.02E+01	
			602.73	-1.330E-01	%(	4.606E+00	1.03E+03	9.83E+01 G
			1690.98	-2.000E+00	+	3.943E+00	9.07E+01	4.78E+01 G
			722.79	0.000E+00	+	1.895E+01	1.00E+03	1.08E+01 G
SB-125	I	1.6609E+00					1.01E+03	
			427.88	4.346E-01	&(	3.653E+00	3.29E+02	2.96E+01 G
			600.50	-3.386E+00	+ P	2.577E+01	4.32E+01	1.79E+01 G
			635.89	2.162E+00	?(	1.243E+01	1.65E+02	1.13E+01 G
			463.37	4.587E+00	?(	1.585E+01	1.03E+02	1.05E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
I-131	I	1.6314E-01					8.02E+00	
			364.48	3.332E-02	%(P	1.211E+00	1.41E+03	8.17E+01 G
			284.30	1.891E+00	&(	1.639E+01	3.44E+02	6.14E+00 G
			636.97	-1.032E+01	+	2.453E+01	7.15E+01	7.17E+00 G
Gd-153	F	-1.5716E+00					2.42E+02	
			97.50	-1.572E+00	&(	8.572E+00	1.64E+02	3.00E+01 G
			103.20	-2.150E+00	+	1.143E+01	1.60E+02	2.18E+01 G
Ga-68	C	7.3764E+00					4.71E-02	
			1077.40	7.376E+00	&(	6.395E+01	3.71E+02	3.30E+00 G
Tc-99m	I	-2.4012E-01					2.51E-01	
			140.51	-2.401E-01	?(	2.266E+00	2.82E+02	8.93E+01 G
BA-133	F	1.0201E+00					3.85E+03	
			356.00	7.499E-01	?(	6.247E+00	2.49E+02	6.20E+01 G
			302.85	1.935E+00	?(	1.569E+01	2.42E+02	1.83E+01 G
			383.84	-5.823E+00	+	2.036E+01	1.04E+02	8.94E+00 GA
			80.99	1.416E+00	& P	6.976E+00	1.48E+02	3.41E+01 GA
CS-134	I	1.5776E+00					7.54E+02	
			795.87	9.861E-01	?(P	1.693E+00	5.33E+01	8.55E+01 G
			604.71	0.000E+00	-	4.635E+00	1.00E+03	9.76E+01 G
			569.32	-2.375E+00	-	8.684E+00	1.07E+02	1.54E+01 G
			801.95	3.909E+00	?(P	2.269E+01	1.68E+02	8.69E+00 G
			563.24	5.210E+00	?(	1.176E+01	9.30E+01	8.35E+00 G
CS-137	I	-1.0354E+00					1.10E+04	
			661.66	-1.035E+00	(P	2.572E+00	1.06E+02	8.52E+01 G
CE-139	F	5.0429E-01					1.38E+02	
			165.85	5.043E-01	?(	1.542E+00	9.18E+01	7.99E+01 G
Ba-140	I	2.2042E+00					1.28E+01	
			537.26	1.058E-01	%(	4.502E+00	1.69E+03	2.44E+01 G
			162.66	6.215E+00	(	2.153E+01	1.04E+02	6.22E+00 G
			304.85	8.320E+00	?(	6.817E+01	2.44E+02	4.29E+00 G
La-140	I	-1.5786E+00					1.28E+01	
			1596.21	-1.579E+00	?(	2.808E+00	8.46E+01	9.54E+01 G
			487.02	-1.461E+00	+	5.130E+00	1.05E+02	4.55E+01 G
			328.76	2.052E+00	+ P	1.710E+01	2.49E+02	2.03E+01 G
			815.77	2.205E+00	+	7.461E+00	9.95E+01	2.33E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CE-141	I	8.2759E-01					3.25E+01	
			145.44	8.276E-01	&(	4.001E+00	1.45E+02	4.82E+01 G
PM-144	C	-5.0055E-01					3.63E+02	
			696.54	-5.005E-01	?(	1.511E+00	1.29E+02	9.90E+01 G
			618.06	-4.228E-02	% P	4.653E+00	2.07E+03	9.91E+01 G
EU-152	F	2.1562E+00					4.94E+03	
			121.78	1.103E+00	?(	3.366E+00	9.15E+01	2.86E+01 G
			344.29	1.698E+00	@(	1.397E+01	2.46E+02	2.65E+01 G
			1112.07	-8.330E+00	+	3.103E+01	1.11E+02	1.36E+01 G
			778.92	3.933E+00	&(	1.026E+01	1.11E+02	1.29E+01 G
			964.11	-4.316E+00	+	2.217E+01	1.51E+02	1.46E+01 G
			244.69	4.695E+00	&(P	3.177E+01	2.02E+02	7.58E+00 G
			1408.00	1.662E+00	?	8.870E+00	2.33E+02	2.10E+01 GA
EU-154	I	1.4895E+00					3.14E+03	
			123.10	-9.094E-01	&(	2.520E+00	8.33E+01	4.08E+01 G
			1274.54	8.083E-02	%	5.315E+00	1.77E+03	3.52E+01 G
			723.36	1.224E-01	&	1.003E+01	2.33E+03	2.02E+01 G
			873.23	1.256E-01	%	1.444E+01	3.19E+03	1.23E+01 G
			1004.77	3.625E+00	?(	1.269E+01	1.03E+02	1.80E+01 G
			996.33	7.092E+00	&(	2.012E+01	8.43E+01	1.06E+01 G
EU-155	I	-2.2319E+00					1.81E+03	
			105.31	-2.232E+00	*(P	1.195E+01	6.87E+01	2.12E+01 G
			86.54	1.326E+00	+	7.812E+00	1.77E+02	3.07E+01 G
HF-181	F	4.7290E-01					4.24E+01	
			482.00	0.000E+00	?(	2.384E+00	1.00E+03	8.05E+01 G
			133.02	-5.544E-01	+	4.139E+00	2.23E+02	4.33E+01 G
			345.83	2.999E+00	?(	2.490E+01	2.48E+02	1.51E+01 G
			136.30	0.000E+00	&	3.129E+01	1.00E+03	5.85E+00 G
Ta-182	F	2.1803E+00					1.14E+02	
			1121.30	3.424E-02	%(	1.117E+01	9.41E+03	3.49E+01 G
			1221.41	4.954E+00	(	5.125E+00	4.91E+01	2.70E+01 G
			1189.05	-5.586E+00	+	1.581E+01	1.26E+02	1.62E+01 G
Hg-203	F	4.7904E-01					4.66E+01	
			279.20	4.790E-01	&(	1.416E+00	8.82E+01	8.15E+01 G
TL-208	N	3.7694E+00					6.98E+02	
			583.02	3.674E+00	(P	1.227E+00	1.73E+01	8.45E+01 G
			277.28	5.051E+00	(	1.762E+01	1.04E+02	6.31E+00 G
			860.56	1.444E+01	+	7.573E+00	2.81E+01	1.24E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PM-146	C	1.0110E+00					2.02E+03	
			453.88	4.151E-01	&(	1.651E+00	1.63E+02	6.50E+01 G
			747.16	1.097E+00	?(	3.416E+00	1.30E+02	3.40E+01 G
			735.72	2.603E+00	?(	5.626E+00	9.26E+01	2.25E+01 G
Y-88	F	-1.9976E-01					1.07E+02	
			1836.06	-1.998E-01	?(P	1.546E+00	3.75E+02	9.92E+01 G
			898.04	-2.323E-01	+	1.859E+00	3.35E+02	9.37E+01 G
Cd-113m		-1.6414E+03					5.33E+03	
			263.70	-1.641E+03	?(	1.828E+04	3.23E+02	6.00E-03 K
Cd-109	F	-1.2790E+01					4.53E+02	
			88.04	-1.279E+01	?(	7.408E+01	1.74E+02	3.79E+00 G
Cf-251	T	7.8712E-01					3.28E+05	
			176.60	7.871E-01	&(	5.972E+00	2.94E+02	1.70E+01 G
			227.00	-3.091E+00	&	1.764E+01	2.31E+02	6.30E+00 GA
Cf-249	T	6.0766E-01					1.28E+05	
			387.95	9.006E-02	?(	2.908E+00	9.42E+02	6.60E+01 G
			333.44	2.810E+00	&(	2.281E+01	2.43E+02	1.55E+01 G
Sn-126		-6.0217E+00					3.65E+07	
			87.57	1.080E+00	&	6.498E+00	1.81E+02	3.75E+01 GA
			64.28	-6.022E+00	?(	2.276E+01	1.14E+02	9.70E+00 G
			86.94	4.495E+00	+	2.676E+01	1.79E+02	9.04E+00 GA
PB-210	N	-1.8099E+01					8.14E+03	
			46.54	-1.810E+01	(P	6.858E+01	7.18E+01	4.25E+00 G
PB-212	N	1.2297E+01					6.98E+02	
			238.63	1.230E+01	(P	2.453E+00	8.44E+00	4.33E+01 G
			300.03	1.071E+01		8.290E+01	2.31E+02	3.28E+00 GA
PB-214	N	2.6907E+01					5.84E+05	
			351.93	2.691E+01	(P	3.430E+00	6.37E+00	3.76E+01 G
			295.09	3.358E+01	+ P	5.366E+00	9.39E+00	1.93E+01 G
			242.00	3.295E+01	+	1.341E+01	1.48E+01	7.43E+00 GA
BI-207	C	-4.2684E-01					1.18E+04	
			1063.66	-4.268E-01	?(P	2.809E+00	2.32E+02	7.45E+01 G
			569.70	0.000E+00	+	1.495E+00	1.00E+03	9.77E+01 G
BI-212	N	9.0863E+00					6.98E+02	
			727.17	9.086E+00	(	2.436E+01	8.01E+01	7.55E+00 G
			785.42	3.176E+01		1.045E+02	1.38E+02	1.28E+00 GA

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
U-235	N	-7.4001E-01					2.57E+11	
			143.79	-7.400E-01	(P	1.834E+01	4.35E+02	1.10E+01 G
			205.33	-9.981E+00	+ P	3.269E+01	1.05E+02	5.01E+00 G
			163.38	-9.847E+00	+ P	2.631E+01	7.73E+01	5.08E+00 G
			185.72	-1.397E+00	+ P	3.070E+00	5.72E+01	5.40E+01 GA
BI-214	N	3.2620E+01					5.84E+05	
			609.31	3.263E+01	(P	1.664E+00	5.68E+00	4.61E+01 G
			1120.29	3.258E+01	(P	9.050E+00	1.66E+01	1.51E+01 G
			1764.49	2.819E+01	- P	6.606E+00	1.65E+01	1.54E+01 G
BI-210M	T	-9.8925E-01					1.10E+09	
			265.83	-9.893E-01	(	2.752E+00	8.35E+01	5.00E+01 G
			304.90	1.275E+00	+	1.056E+01	2.47E+02	2.80E+01 G
AC-228	N	1.3971E+01					2.10E+03	
			911.07	1.243E+01	(	3.458E+00	1.63E+01	2.90E+01 G
			968.97	1.632E+01	(	6.325E+00	2.09E+01	1.75E+01 G
			338.32	1.428E+01	(	6.321E+00	1.74E+01	1.20E+01 G
			93.35	-8.556E+00	-	4.730E+01	1.66E+02	5.56E+00 XA
TH-227	N	3.0747E+00					7.95E+03	
			256.24	8.575E-01	?(P	1.592E+01	7.42E+02	7.00E+00 G
			235.97	3.347E+00	&(	1.996E+01	1.78E+02	1.23E+01 G
			50.14	4.596E+00	?(	3.040E+01	1.97E+02	8.00E+00 G
TH-229	N	8.7017E+00					2.68E+06	
			193.51	4.827E+00	&(	2.230E+01	1.79E+02	4.40E+00 G
			210.85	1.440E+01	&(	5.043E+01	1.05E+02	2.99E+00 G
TH-234	N	1.0885E+01					1.63E+12	
			92.59	2.659E+00	(P	2.008E+01	2.25E+02	5.58E+00 G
			63.29	2.294E+01	(P	3.094E+01	4.18E+01	3.81E+00 G
PA-231	N	1.3218E+01					1.20E+07	
			302.65	1.231E+01	?(	9.865E+01	2.39E+02	2.88E+00 G
			300.07	1.429E+01	*(	1.120E+02	2.34E+02	2.46E+00 G
PA-233	C	1.6984E+00					7.82E+08	
			312.01	1.014E+00	(	8.552E+00	2.52E+02	3.60E+01 G
			300.18	5.671E+00	*(	4.498E+01	2.37E+02	6.20E+00 G
PA-234	N	3.8367E-01					1.63E+12	
			131.29	-2.093E+00	&(	1.004E+01	1.44E+02	1.80E+01 G
			946.02	-9.258E-01	+	1.204E+01	5.54E+02	1.34E+01 G
			569.47	0.000E+00	+	1.782E+01	1.00E+03	8.20E+00 G
			883.24	5.028E+00	?(	2.469E+01	1.43E+02	9.60E+00 G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          880.53 1.137E+01 ? P 3.597E+01 9.37E+01 6.00E+00 GA

PA-234M  N   2.4706E+01                                     1.63E+12
                         1001.00 1.787E+01 &(P 2.915E+02 4.64E+02 8.37E-01 G
                          766.41 4.417E+01 ?(  7.440E+02 4.82E+02 2.94E-01 G

AM-241   T   1.1340E+00                                     1.58E+05
                           59.54 1.134E+00 ?(P 6.515E+00 1.72E+02 3.59E+01 G

Np-237   F   3.1081E+00                                     2.14E+06
                           86.49 3.108E+00  (  1.811E+01 1.75E+02 1.31E+01 G

Ir-192   F   7.0913E-01                                     7.40E+01
                          316.49 4.254E-01 ?(  3.615E+00 2.54E+02 8.70E+01 G
                          468.06 9.237E-01 ?(  2.992E+00 9.62E+01 5.18E+01 G
                          308.44 1.137E+00 ?(  9.506E+00 2.49E+02 3.18E+01 G

Cs-136   F   3.8350E-02                                     1.30E+01
                          818.50-3.888E-01 ?(  2.194E+00 1.64E+02 1.00E+02 G
                         1048.07-3.948E-01 +   2.448E+00 1.77E+02 8.00E+01 G
                          340.57 9.490E-01 ?(  7.749E+00 2.44E+02 4.69E+01 G

Np-239   T  -2.0966E+00                                     2.36E+00
                          103.70-1.952E+00 &   1.046E+01 1.61E+02 2.40E+01 X
                          106.13-2.097E+00 ?(  1.134E+01 1.63E+02 2.27E+01 G
                           99.50-3.134E+00 +   1.689E+01 1.62E+02 1.50E+01 X

Nd-147       9.8283E-02                                     1.11E+01
                          531.00 9.828E-02 %(  8.889E+00 3.61E+03 1.30E+01 G
                           91.10-1.693E+00 +   9.691E+00 1.72E+02 2.83E+01 G

TL-210   N   4.7660E-01                                     5.84E+05
                          799.60 5.066E-01 ?(  1.808E+00 1.05E+02 9.90E+01 G
                          296.00 4.391E-01 ?(  3.362E+00 2.28E+02 7.90E+01 G
                         1313.00 5.215E-01 ?   7.013E+00 5.63E+02 2.10E+01 GA

Kr-85    I  -4.3398E+00                                     3.92E+03
                          513.98-4.340E+00 %(  4.873E+02 3.25E+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
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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	484.	-28.	-0.015	71.84	-1.810E+01	P
TH-227	50.14	429.	15.	0.008	196.98	4.596E+00	
Sn-126	64.28	689.	-33.	-0.018	113.57	-6.022E+00	
BA-133	80.99	1189.	33.	0.018	148.03	1.416E+00	P
Np-237	86.49	1275.	29.	0.016	174.99	3.108E+00	
EU-155	86.54	1304.	29.	0.016	176.95	1.326E+00	
Sn-126	86.94	1333.	29.	0.016	178.82	4.495E+00	
Sn-126	87.57	1362.	29.	0.016	180.67	1.080E+00	
Cd-109	88.04	1824.	-35.	-0.019	174.24	-1.279E+01	
Nd-147	91.10	1789.	-35.	-0.019	172.21	-1.693E+00	
Gd-153	97.50	1638.	-35.	-0.019	164.06	-1.572E+00	
Np-239	99.50	1603.	-35.	-0.020	162.07	-3.134E+00	
Gd-153	103.20	1568.	-35.	-0.020	159.87	-2.150E+00	
Np-239	103.70	1595.	-35.	-0.020	161.18	-1.952E+00	
EU-155	105.31	1631.	-36.	-0.020	68.69	-2.232E+00	P
Np-239	106.13	1685.	-36.	-0.020	162.72	-2.097E+00	
EU-152	121.78	220.	24.	0.013	91.46	1.103E+00	
CO-57	122.06	236.	-27.	-0.015	82.36	-4.243E-01	
EU-154	123.10	251.	-28.	-0.015	83.31	-9.094E-01	
PA-234	131.29	771.	-28.	-0.015	143.86	-2.093E+00	
HF-181	133.02	751.	-17.	-0.010	223.16	-5.544E-01	
CO-57	136.47	808.	-29.	-0.016	140.34	-3.758E+00	
Tc-99m	140.51	861.	-15.	-0.008	282.01	-2.401E-01	
U-235	143.79	881.	-6.	-0.003	435.37	-7.400E-01	P
CE-141	145.44	800.	28.	0.015	145.01	8.276E-01	
Ba-140	162.66	324.	25.	0.014	103.77	6.215E+00	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
U-235	163.38	320.	-32.	-0.018	77.33	-9.847E+00	P
Cf-251	176.60	169.	8.	0.005	293.61	7.871E-01	
U-235	185.72	430.	-45.	-0.025	57.19	-1.397E+00	P
U-235	205.33	358.	-28.	-0.015	104.83	-9.981E+00	P
Cf-251	227.00	136.	-10.	-0.006	230.51	-3.091E+00	
TH-227	235.97	659.	21.	0.011	178.32	3.347E+00	
EU-152	244.69	598.	17.	0.010	202.08	4.695E+00	P
TH-227	256.24	112.	3.	0.002	741.59	8.575E-01	P
Cd-113m	263.70	104.	-4.	-0.002	323.18	-1.641E+03	
BI-210M	265.83	164.	-22.	-0.012	83.47	-9.893E-01	
Hg-203	279.20	105.	17.	0.009	88.25	4.790E-01	
I-131	284.30	76.	5.	0.003	344.29	1.891E+00	
TL-210	296.00	538.	14.	0.008	228.19	4.391E-01	
PA-231	300.07	567.	15.	0.008	233.61	1.429E+01	
PA-233	300.18	582.	15.	0.008	236.51	5.671E+00	
PA-231	302.65	596.	15.	0.008	239.08	1.231E+01	
BA-133	302.85	611.	15.	0.008	241.90	1.935E+00	
Ba-140	304.85	625.	15.	0.008	244.43	8.320E+00	
BI-210M	304.90	640.	15.	0.008	247.23	1.275E+00	
Ir-192	308.44	654.	15.	0.008	249.43	1.137E+00	
PA-233	312.01	669.	15.	0.008	251.63	1.014E+00	
Ir-192	316.49	684.	15.	0.008	253.65	4.254E-01	
CR-51	320.08	673.	14.	0.008	267.30	3.538E+00	P
La-140	328.76	786.	16.	0.009	249.07	2.052E+00	P
Cs-136	340.57	815.	17.	0.009	244.09	9.490E-01	
EU-152	344.29	831.	17.	0.009	246.01	1.698E+00	
HF-181	345.83	848.	17.	0.009	248.22	2.999E+00	
BA-133	356.00	865.	17.	0.009	249.14	7.499E-01	
BA-133	383.84	161.	-18.	-0.010	104.22	-5.823E+00	
AG-108M	433.94	61.	-10.	-0.005	167.59	-3.475E-01	
PM-146	453.88	39.	8.	0.004	163.22	4.151E-01	
Ir-192	468.06	82.	14.	0.008	96.20	9.237E-01	
BE-7	477.60	112.	-10.	-0.006	152.97	-3.342E+00	
La-140	487.02	181.	-19.	-0.010	104.71	-1.461E+00	
RU-103	497.05	35.	-2.	-0.001	725.26	-6.659E-02	
RH-106	511.86	63.	67.	0.037	20.73	1.246E+01	
CS-134	563.24	22.	11.	0.006	92.97	5.210E+00	
CS-134	569.32	42.	-9.	-0.005	107.15	-2.375E+00	
RH-106	621.92	35.	-5.	-0.003	261.67	-2.051E+00	
I-131	636.97	62.	-17.	-0.009	71.54	-1.032E+01	
AG-110M	657.76	68.	10.	0.005	126.53	4.590E-01	
CS-137	661.66	93.	-19.	-0.011	105.84	-1.035E+00	P
PM-144	696.54	37.	-10.	-0.006	129.23	-5.005E-01	
NB-94	702.63	37.	-10.	-0.006	196.16	-5.113E-01	P
BI-212	727.17	54.	14.	0.008	80.08	9.086E+00	
PM-146	735.72	23.	12.	0.006	92.58	2.603E+00	
PM-146	747.16	19.	7.	0.004	130.32	1.097E+00	
ZR-95	756.73	15.	9.	0.005	100.41	8.024E-01	P

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
AG-110M	763.94	33.	1.	0.001	612.37	3.100E-01		
NB-95	765.79	54.	13.	0.007	83.49	6.849E-01		
PA-234M	766.41	72.	2.	0.001	482.49	4.417E+01		
EU-152	778.92	23.	10.	0.005	110.78	3.933E+00		
BI-212	785.42	23.	8.	0.004	138.45	3.176E+01		
CS-134	795.87	27.	16.	0.009	53.27	9.861E-01		P
TL-210	799.60	43.	9.	0.005	104.75	5.066E-01		
CS-134	801.95	53.	6.	0.003	167.94	3.909E+00		P
CO-58	810.78	69.	-14.	-0.008	86.24	-7.825E-01		
La-140	815.77	39.	9.	0.005	99.46	2.205E+00		
Cs-136	818.50	64.	-7.	-0.004	163.99	-3.888E-01		
MN-54	834.85	24.	7.	0.004	142.46	4.165E-01		P
NB-94	871.10	25.	11.	0.006	70.22	6.409E-01		
PA-234	880.53	54.	12.	0.006	93.70	1.137E+01		P
PA-234	883.24	66.	8.	0.005	143.35	5.028E+00		
Y-88	898.04	33.	-4.	-0.002	334.76	-2.323E-01		
AG-110M	937.49	45.	-7.	-0.004	214.05	-1.254E+00		
PA-234	946.02	25.	-2.	-0.001	554.15	-9.258E-01		
EU-152	964.11	109.	-10.	-0.006	151.00	-4.316E+00		
EU-154	996.33	42.	12.	0.006	84.31	7.092E+00		
PA-234M	1001.00	56.	2.	0.001	464.47	1.787E+01		P
EU-154	1004.77	48.	10.	0.006	102.96	3.625E+00		
Cs-136	1048.07	32.	-5.	-0.003	176.70	-3.948E-01		
BI-207	1063.66	36.	-5.	-0.003	231.60	-4.268E-01		P
Ga-68	1077.40	25.	3.	0.002	370.93	7.376E+00		
FE-59	1099.25	26.	2.	0.001	451.41	3.083E-01		P
EU-152	1112.07	148.	-16.	-0.009	110.76	-8.330E+00		
ZN-65	1115.55	132.	-8.	-0.005	197.46	-1.181E+00		
CO-60	1173.24	33.	-6.	-0.003	197.70	-4.403E-01		P
Ta-182	1189.05	45.	-12.	-0.007	126.24	-5.586E+00		
Ta-182	1221.41	11.	17.	0.010	49.10	4.954E+00		
NA-22	1274.53	11.	9.	0.005	61.32	7.192E-01		
FE-59	1291.60	16.	4.	0.002	232.74	7.498E-01		
TL-210	1313.00	11.	1.	0.001	563.47	5.215E-01		
CO-60	1332.50	3.	5.	0.003	62.33	4.455E-01		P
AG-110M	1384.30	5.	6.	0.003	101.72	2.006E+00		
EU-152	1408.00	16.	4.	0.002	232.74	1.662E+00		
La-140	1596.21	28.	-15.	-0.009	84.62	-1.579E+00		
SB-124	1690.98	11.	-9.	-0.005	90.70	-2.000E+00		
Y-88	1836.06	6.	-2.	-0.001	375.40	-1.998E-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 1 Sigma Counting	MDA Bq/Sample
BE-7	#A	-3.3416E+00	-3.3417E+00	1.530E+02%	1.74E+01
NA-22	#A	7.1919E-01	7.1919E-01	6.132E+01%	1.44E+00
K-40		2.6742E+02	2.6742E+02	5.700E+00%	1.05E+01
Sc-46	#A	4.9060E-02	4.9061E-02	1.456E+03%	2.51E+00
CR-51	#A	3.5383E+00	3.5383E+00	2.673E+02%	3.17E+01
MN-54	#A	4.1648E-01	4.1648E-01	1.425E+02%	1.41E+00
FE-59	#A	4.9964E-01	4.9964E-01	2.327E+02%	3.28E+00
Co-56	#C	2.0638E+00	2.0638E+00	2.304E+01%	1.29E+00
CO-57	#A	-4.2429E-01	-4.2429E-01	8.236E+01%	1.16E+00
CO-58	#A	-7.8254E-01	-7.8254E-01	8.624E+01%	2.27E+00
CO-60	#A	4.4554E-01	4.4554E-01	6.233E+01%	8.56E-01
ZN-65	#A	-1.1807E+00	-1.1807E+00	1.975E+02%	7.95E+00
NB-94	#A	7.0582E-02	7.0582E-02	7.022E+01%	1.54E+00
ZR-95	#A	8.0240E-01	8.0241E-01	1.004E+02%	1.94E+00
NB-95	#A	6.8486E-01	6.8486E-01	8.349E+01%	1.92E+00
RU-103	#A	-6.6586E-02	-6.6586E-02	7.253E+02%	1.20E+00
RH-106	#A	-2.0515E+00	-2.0515E+00	2.617E+02%	1.33E+01
AG-108M	#A	-3.4749E-01	-3.4749E-01	1.676E+02%	1.40E+00
AG-110M	#A	4.6236E-01	4.6236E-01	1.017E+02%	3.45E+00
SN-113	#A	0.0000E+00	0.0000E+00	1.000E+03%	3.01E+00
SB-124	#A	-1.3296E-01	-1.3296E-01	1.026E+03%	4.61E+00
SB-125	A	1.6609E+00	1.6609E+00	1.025E+02%	3.65E+00
I-131	#A	1.6314E-01	1.6314E-01	3.443E+02%	1.21E+00
Gd-153	#A	-1.5716E+00	-1.5716E+00	1.641E+02%	8.57E+00
Ga-68	#A	7.3401E+00	7.3764E+00	3.709E+02%	6.40E+01
Tc-99m	#A	-2.3990E-01	-2.4012E-01	2.820E+02%	2.27E+00
BA-133	#A	1.0201E+00	1.0201E+00	1.736E+02%	6.25E+00
CS-134	#A	1.5776E+00	1.5776E+00	5.327E+01%	1.69E+00
CS-137	#A	-1.0354E+00	-1.0354E+00	1.058E+02%	2.57E+00
CE-139	#A	5.0429E-01	5.0429E-01	9.178E+01%	1.54E+00
Ba-140	#A	2.2042E+00	2.2042E+00	1.038E+02%	4.50E+00
La-140	#A	-1.5785E+00	-1.5786E+00	8.462E+01%	2.81E+00
CE-141	#A	8.2758E-01	8.2759E-01	1.450E+02%	4.00E+00
CE-144	#A	0.0000E+00	0.0000E+00	1.000E+03%	1.64E+01
PM-144	#A	-5.0055E-01	-5.0055E-01	1.292E+02%	1.51E+00
EU-152	#A	2.1562E+00	2.1562E+00	8.732E+01%	3.37E+00
EU-154	#A	1.4895E+00	1.4895E+00	5.233E+01%	2.52E+00
EU-155	#A	-2.2319E+00	-2.2319E+00	6.869E+01%	1.20E+01
HF-181	#A	4.7290E-01	4.7290E-01	2.482E+02%	2.38E+00
Ta-182	#A	2.1803E+00	2.1803E+00	4.910E+01%	1.12E+01
Hg-203	#A	4.7904E-01	4.7904E-01	8.825E+01%	1.42E+00
TL-208		3.7694E+00	3.7694E+00	1.734E+01%	1.23E+00
PM-146	#A	1.0110E+00	1.0110E+00	7.615E+01%	1.65E+00

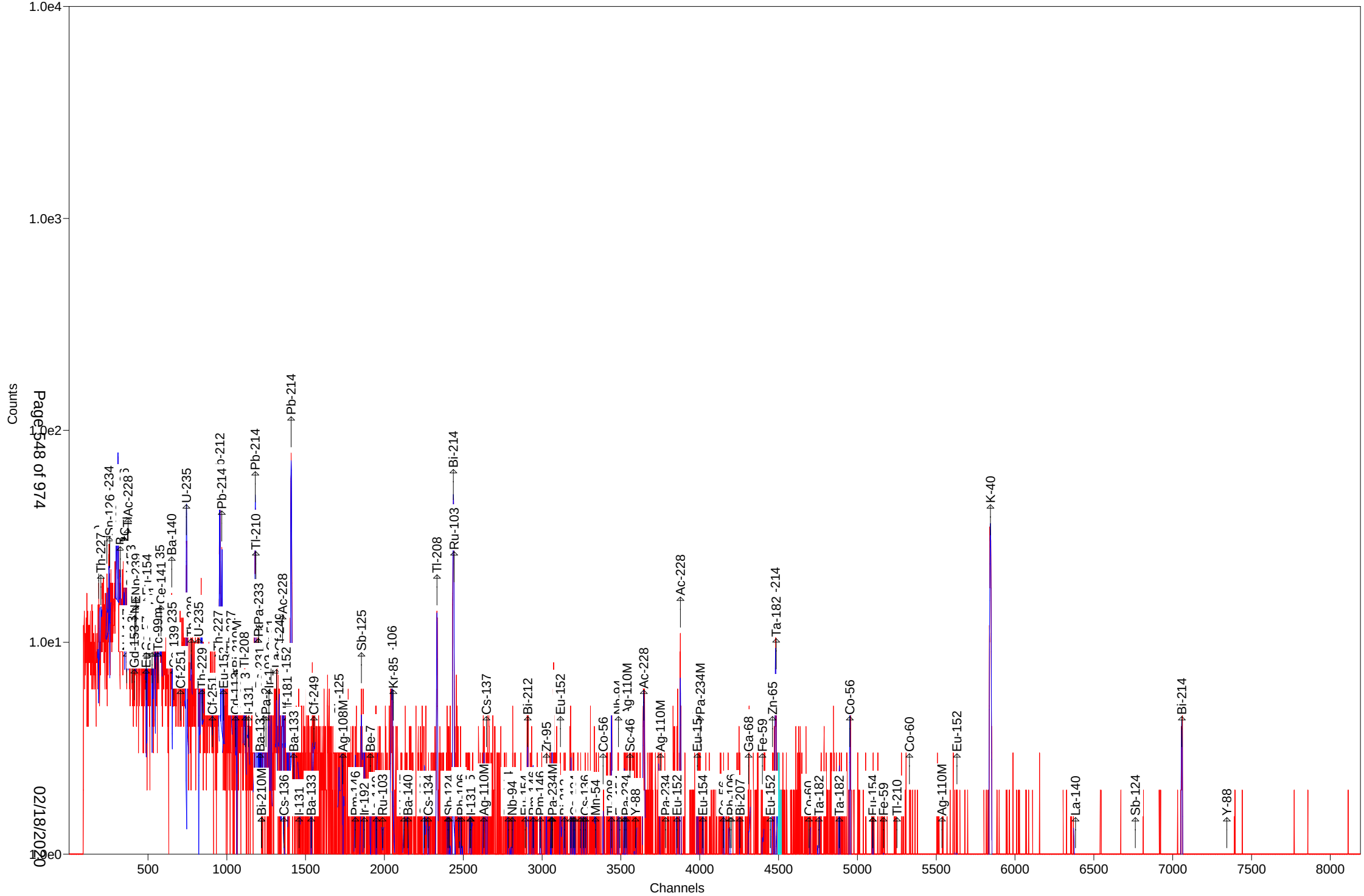
Y-88	#A	-1.9976E-01	-1.9976E-01	3.754E+02%	1.55E+00
Cd-113m	#A	-1.6414E+03	-1.6414E+03	3.232E+02%	1.83E+04
Cd-109	#A	-1.2790E+01	-1.2790E+01	1.742E+02%	7.41E+01
Cf-251	#A	7.8712E-01	7.8712E-01	2.936E+02%	5.97E+00
Cf-249	A	6.0766E-01	6.0766E-01	2.426E+02%	2.91E+00
Sn-126	#A	-6.0217E+00	-6.0217E+00	1.136E+02%	2.28E+01
PB-210	#A	-1.8099E+01	-1.8099E+01	7.184E+01%	6.86E+01
PB-212		1.2297E+01	1.2297E+01	8.437E+00%	2.45E+00
PB-214	#	2.6907E+01	2.6907E+01	6.368E+00%	3.43E+00
BI-207	#A	-4.2684E-01	-4.2684E-01	2.316E+02%	2.81E+00
BI-212	#A	9.0863E+00	9.0863E+00	8.008E+01%	2.44E+01
U-235	#A	-7.4001E-01	-7.4001E-01	4.354E+02%	1.83E+01
BI-214		3.2620E+01	3.2620E+01	5.676E+00%	1.66E+00
BI-210M	#A	-9.8925E-01	-9.8925E-01	8.347E+01%	2.75E+00
AC-228		1.3971E+01	1.3971E+01	1.057E+01%	3.46E+00
TH-227	#A	3.0747E+00	3.0747E+00	1.783E+02%	1.59E+01
TH-229	#A	8.7017E+00	8.7017E+00	1.037E+02%	2.23E+01
TH-234	A	1.0885E+01	1.0885E+01	4.185E+01%	2.01E+01
PA-231	#A	1.3218E+01	1.3218E+01	1.671E+02%	9.86E+01
PA-233	#A	1.6984E+00	1.6984E+00	1.727E+02%	8.55E+00
PA-234	#A	3.8367E-01	3.8367E-01	1.015E+02%	1.00E+01
PA-234M	#A	2.4706E+01	2.4706E+01	3.349E+02%	2.91E+02
AM-241	#A	1.1340E+00	1.1340E+00	1.719E+02%	6.52E+00
Np-237	#A	3.1081E+00	3.1081E+00	1.750E+02%	1.81E+01
Ir-192	#A	7.0913E-01	7.0913E-01	9.620E+01%	3.62E+00
Cs-136	#A	3.8349E-02	3.8350E-02	1.470E+02%	2.19E+00
Np-239	#A	-2.0964E+00	-2.0966E+00	1.627E+02%	1.13E+01
Nd-147	#A	9.8281E-02	9.8283E-02	3.610E+03%	8.89E+00
TL-210	#A	4.7660E-01	4.7660E-01	1.047E+02%	1.81E+00
Kr-85	#A	-4.3398E+00	-4.3398E+00	3.247E+03%	4.87E+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 (37.5 to 2000.0 keV) 3.570E+02 Bq/Sample
Total Decayed Activity (37.5 to 2000.0 keV) 3.5697974E+02 Bq/Sample

453329_Gamma_160-36593-A-4-B. 8_Gamma_20192228.spc.



Test America St. Louis Spectrum ID: 8_Gamma_20192229

Sample Description: 453329_Gamma_160-36593-A-5-B
Detector: Detector # 8
Batch ID: 453329
Work Order Number: Gamma
Lot Number: 160-36593-A-5-B

Decay to Time: 12/27/2019 08:58 Live Time: 1800 sec
Acquisition Time: 12/27/2019 08:58:34 Real Time: 1843 sec
Analysis Time: 12/27/2019 09:29 Dead Time: 2.33 %
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_2019-12-07_1517.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	-4.344E+00	126.2	5.481E+00	5.485E+00	1.852E+01
NA-22	-1.345E+00	56.9	7.661E-01	7.690E-01	2.498E+00
K-40	2.210E+02	6.3	1.390E+01	1.792E+01	1.050E+01
Sc-46	-4.141E-01	151.2	6.261E-01	6.265E-01	2.157E+00
CR-51	5.032E+00	192.8	9.702E+00	9.706E+00	3.244E+01
MN-54	-4.766E-01	116.5	5.552E-01	5.558E-01	1.745E+00
FE-59	-6.597E-02	1449.0	9.559E-01	9.559E-01	3.276E+00
Co-56	1.950E+00	39.7	7.735E-01	7.800E-01	1.294E+00
CO-57	-5.047E-02	86.5	4.368E-02	4.376E-02	1.289E+00
CO-58	-6.478E-01	103.3	6.694E-01	6.702E-01	2.265E+00
CO-60	-4.143E-01	267.8	1.110E+00	1.110E+00	2.124E+00
ZN-65	-3.527E-01	541.8	1.911E+00	1.911E+00	6.637E+00
NB-94	-1.089E-02	109.0	1.187E-02	1.188E-02	1.624E+00
ZR-95	4.108E-01	263.7	1.083E+00	1.083E+00	2.609E+00
NB-95	-7.795E-01	109.3	8.521E-01	8.530E-01	2.869E+00
RU-103	-3.862E-01	149.3	5.766E-01	5.769E-01	1.394E+00
RH-106	3.615E+00	366.8	1.326E+01	1.326E+01	4.468E+01
AG-108M	-7.273E-01	96.5	7.020E-01	7.030E-01	1.657E+00
AG-110M	1.055E+00	66.8	7.039E-01	7.060E-01	2.148E+00
SN-113	-8.273E-01	110.2	9.121E-01	9.130E-01	3.061E+00
SB-124	9.498E-01	44.7	4.248E-01	4.276E-01	3.949E+00
SB-125	2.434E+00	72.7	1.769E+00	1.773E+00	2.973E+00
I-131	1.162E+00	66.6	7.738E-01	7.761E-01	1.301E+00
Gd-153	-1.597E+00	167.9	2.681E+00	2.683E+00	8.912E+00
Ga-68	0.000E+00	1.#INF	3.480E+00	3.480E+00	5.108E+01
Tc-99m	-4.629E-01	147.3	6.817E-01	6.823E-01	2.272E+00
BA-133	-1.267E-01	1163.4	1.474E+00	1.474E+00	4.971E+00
CS-134	6.537E-01	96.1	6.283E-01	6.292E-01	2.480E+00
CS-137	-4.274E-01	357.0	1.526E+00	1.526E+00	2.665E+00
CE-139	-6.198E-01	93.0	5.766E-01	5.796E-01	1.918E+00
Ba-140	-6.876E-01	313.8	2.158E+00	2.158E+00	5.297E+00
La-140	-1.579E+00	84.6	1.336E+00	1.338E+00	2.808E+00
CE-141	-8.187E-01	144.3	1.181E+00	1.182E+00	3.939E+00

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CE-144	2.984E+00	148.9	4.444E+00	4.447E+00	1.484E+01
PM-144	2.790E-02	276.5	7.714E-02	7.715E-02	1.511E+00
EU-152	2.269E+00	51.3	1.165E+00	1.171E+00	3.749E+00
EU-154	-2.378E-01	322.5	7.668E-01	7.669E-01	2.599E+00
EU-155	-1.622E+00	90.7	1.471E+00	1.474E+00	1.023E+01
HF-181	6.169E-01	146.2	9.018E-01	9.023E-01	2.554E+00
Ta-182	5.903E-01	279.3	1.649E+00	1.649E+00	9.538E+00
Hg-203	3.278E-01	146.0	4.787E-01	4.791E-01	1.622E+00
TL-208	5.657E+00	11.4	6.456E-01	7.092E-01	8.721E-01
PM-146	4.999E-01	145.5	7.274E-01	7.279E-01	1.651E+00
Y-88	-1.998E-01	456.4	9.118E-01	9.118E-01	1.546E+00
Cd-113m	0.000E+00	1.#INF	4.437E+03	4.437E+03	2.302E+04
Cd-109	0.000E+00	1.#INF	2.185E+01	2.185E+01	7.264E+01
Cf-251	-9.445E-01	242.4	2.289E+00	2.291E+00	5.910E+00
Cf-249	1.078E+00	95.9	1.033E+00	1.035E+00	2.618E+00
Sn-126	1.448E+00	444.9	6.441E+00	6.442E+00	2.165E+01
PB-210	5.034E+01	26.8	1.350E+01	1.382E+01	3.226E+01
PB-212	1.189E+01	8.5	1.017E+00	1.275E+00	2.397E+00
PB-214	3.023E+01	6.3	1.913E+00	2.475E+00	2.872E+00
BI-207	7.136E-01	97.7	6.975E-01	6.984E-01	1.648E+00
BI-212	1.030E+01	82.8	8.535E+00	8.552E+00	2.857E+01
U-235	-4.451E+00	69.5	3.095E+00	3.103E+00	1.794E+01
BI-214	2.939E+01	6.4	1.896E+00	2.434E+00	2.322E+00
BI-210M	1.615E-01	474.2	7.659E-01	7.659E-01	2.628E+00
AC-228	1.708E+01	11.6	1.981E+00	2.164E+00	2.720E+00
TH-227	4.958E-01	108.3	5.371E-01	5.380E-01	1.645E+01
TH-229	1.594E+01	51.7	8.236E+00	8.335E+00	2.142E+01
TH-234	1.517E+01	40.3	6.111E+00	6.169E+00	1.890E+01
PA-231	-5.623E+00	587.9	3.306E+01	3.306E+01	1.110E+02
PA-233	0.000E+00	1.#INF	2.944E-01	2.944E-01	9.056E+00
PA-234	3.016E+00	91.3	2.754E+00	2.759E+00	8.641E+00
PA-234M	-5.133E+00	60.8	3.121E+00	3.132E+00	3.666E+02
AM-241	1.031E+00	171.0	1.763E+00	1.763E+00	5.898E+00
Np-237	-3.365E+00	179.0	6.023E+00	6.026E+00	2.004E+01
Ir-192	1.434E-01	255.4	3.664E-01	3.665E-01	3.788E+00
Cs-136	4.873E-01	87.0	4.238E-01	4.247E-01	1.352E+00
Np-239	1.787E+00	102.2	1.827E+00	1.830E+00	6.083E+00
Nd-147	-6.880E-01	486.2	3.345E+00	3.346E+00	8.367E+00
TL-210	0.000E+00	1.#INF	2.307E-01	2.307E-01	2.268E+00
Kr-85	5.063E+01	283.9	1.437E+02	1.437E+02	4.920E+02
Total	4.925E+02				

Analyst: Jasmine Stewart

Sample description
453329_Gamma_160-36593-A-5-B

Spectrum Filename: C:\User\SPC\Det8\8_Gamma_20192229.An1

Acquisition information
Start time: 12/27/2019 8:58:34 AM
Live time: 1800
Real time: 1843
Dead time: 2.33 %
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	12/27/2019 8:58:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	8_2019-12-07_1517.PBC 12/7/2019 3:17:53 PM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 29 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 0.0649

***** 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
46.89	77.	26.82	0.81	2.005E-02	46.54	4.250	5.034E+01	PB210
59.54	19.	170.98	1.02	2.881E-02	59.54	35.900	PBC<MDA	AM241
63.29	55.	40.30	1.03	3.093E-02	63.29	3.810	PBC<MDA	TH234
64.29	8.	444.94	1.03	3.146E-02	64.28	9.700	PBC<MDA	Sn126
77.25	244.	14.74	1.23	3.704E-02				
87.71	39.	59.33	1.04	3.982E-02	87.57	37.500	PBC<MDA	Sn126
					88.04	3.790	1.429E+01	Cd109
92.68	32.	73.95	1.05	4.072E-02	92.59	5.584	PBC<MDA	TH234
106.13	31.	102.24	1.06	4.187E-02	106.13	22.700	PBC<MDA	Np239
121.78	26.	91.21	1.07	4.148E-02	121.78	28.580	PBC<MDA	EU152
					122.06	85.600	4.120E-01	CO57
131.26	37.	91.33	1.08	4.061E-02	131.29	18.000	PBC<MDA	PA234
133.02	24.	146.17	1.08	4.041E-02	133.02	43.300	PBC<MDA	HF181
					133.54	11.090	2.983E+00	CE144
133.54	24.	148.94	1.08	4.035E-02	133.02	43.300	PBC<MDA	HF181
					133.54	11.090	2.984E+00	CE144
136.30	24.	151.42	1.08	4.001E-02	136.30	5.850	PBC<MDA	HF181
					136.47	10.680	3.132E+00	CO57
136.47	24.	154.11	1.08	3.999E-02	136.30	5.850	PBC<MDA	HF181
					136.47	10.680	3.133E+00	CO57
163.38	-2.	926.98	1.10	3.580E-02	163.38	5.080	PBC<MDA	U235
164.79	7.	158.37	1.10	3.556E-02	165.85	79.900	1.405E-01	CE139

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
186.38	153.	19.58	0.88	3.320E-02	185.72	54.000	4.032E+00	U235
193.04	42.	51.68	1.13	3.226E-02	193.51	4.400	PBC<MDA	TH229
205.33	19.	110.81	1.13	3.083E-02	205.33	5.010	PBC<MDA	U235
211.76	24.	100.99	1.14	3.020E-02	210.85	2.990	PBC<MDA	TH229
235.97	22.	169.81	1.16	2.768E-02	235.97	12.300	PBC<MDA	TH227
238.69	242.	12.14	1.38	2.744E-02	238.63	43.300	1.133E+01	PB212
242.11	117.	15.30	1.16	2.714E-02	242.00	7.430	3.226E+01	PB214
265.83	4.	474.21	1.18	2.523E-02	265.83	50.000	PBC<MDA	BI210M
277.28	6.	267.71	1.19	2.440E-02	277.28	6.310	PBC<MDA	TL208
279.20	12.	146.05	1.19	2.427E-02	279.20	81.460	PBC<MDA	Hg203
284.30	16.	112.27	1.19	2.393E-02	284.30	6.140	PBC<MDA	I131
295.16	320.	8.28	1.44	2.323E-02	295.09	19.300	3.958E+01	PB214
					296.00	79.000	9.694E+00	TL210
320.08	20.	192.81	1.22	2.179E-02	320.08	9.940	PBC<MDA	CR51
328.76	15.	159.58	1.23	2.133E-02	328.76	20.300	PBC<MDA	La140
333.44	15.	157.93	1.23	2.110E-02	333.44	15.510	PBC<MDA	Cf249
338.50	76.	22.05	1.39	2.085E-02	338.32	12.010	1.682E+01	AC228
340.57	15.	159.63	1.23	2.074E-02	340.57	46.900	PBC<MDA	Cs136
344.29	16.	163.28	1.24	2.057E-02	344.29	26.500	PBC<MDA	EU152
345.83	8.	324.04	1.24	2.049E-02	345.83	15.070	PBC<MDA	HF181
351.99	413.	6.33	1.40	2.021E-02	351.93	37.600	3.023E+01	PB214
364.48	16.	93.60	1.25	1.965E-02	364.48	81.700	PBC<MDA	I131
383.84	16.	103.04	1.27	1.885E-02	383.84	8.940	PBC<MDA	BA133
387.95	16.	108.73	1.27	1.869E-02	387.95	66.000	PBC<MDA	Cf249
427.88	12.	91.54	1.30	1.728E-02	427.88	29.600	PBC<MDA	SB125
453.88	9.	145.51	1.32	1.647E-02	453.88	65.000	PBC<MDA	PM146
463.37	15.	90.72	1.32	1.620E-02	463.37	10.470	PBC<MDA	SB125
468.06	6.	255.44	1.33	1.606E-02	468.06	51.750	PBC<MDA	Ir192
511.86	84.	16.67	2.61	1.494E-02	511.86	20.000	1.562E+01	RH106
513.98	6.	283.85	1.36	1.489E-02	513.98	0.430	PBC<MDA	Kr85
569.47	7.	167.18	1.40	1.369E-02	569.32	15.380	PBC<MDA	CS134
					569.47	8.200	3.383E+00	PA234
					569.70	97.740	2.839E-01	BI207
583.13	116.	11.41	1.86	1.342E-02	583.02	84.500	5.657E+00	TL208
600.50	7.	403.19	1.42	1.310E-02	600.50	17.860	PBC<MDA	SB125
602.73	7.	387.16	1.42	1.306E-02	602.73	98.260	PBC<MDA	SB124
604.71	7.	390.48	1.42	1.303E-02	604.71	97.620	PBC<MDA	CS134
609.32	310.	6.45	1.22	1.294E-02	609.31	46.090	2.889E+01	BI214
					610.30	5.750	2.319E+02	RU103
614.28	7.	395.98	1.43	1.286E-02	614.28	89.850	PBC<MDA	AG108M
618.06	6.	462.72	1.43	1.279E-02	618.06	99.100	PBC<MDA	PM144
621.92	8.	366.79	1.43	1.273E-02	621.92	9.930	PBC<MDA	RH106
635.89	11.	72.67	1.44	1.250E-02	635.89	11.310	PBC<MDA	SB125
636.97	6.	136.18	1.44	1.248E-02	636.97	7.170	PBC<MDA	I131
722.79	14.	79.90	1.50	1.123E-02	722.79	10.810	PBC<MDA	SB124
					722.94	90.840	7.501E-01	AG108M
					723.36	20.220	3.371E+00	EU154
722.94	14.	88.51	1.50	1.123E-02	722.79	10.810	6.303E+00	SB124

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
					722.94	90.840	7.501E-01	AG108M
					723.36	20.220	3.372E+00	EU154
727.17	16.	82.84	1.50	1.118E-02	727.17	7.550	PBC<MDA	BI212
735.72	3.	489.90	1.51	1.107E-02	735.72	22.500	PBC<MDA	PM146
756.73	4.	263.65	1.52	1.081E-02	756.73	54.460	PBC<MDA	ZR95
766.41	13.	98.16	1.53	1.070E-02	765.79	99.790	PBC<MDA	NB95
					766.41	0.294	2.295E+02	PA234M
778.92	15.	51.33	1.53	1.055E-02	778.92	12.940	PBC<MDA	EU152
785.42	4.	337.85	1.54	1.048E-02	785.42	1.280	PBC<MDA	BI212
795.87	7.	154.41	1.54	1.036E-02	795.87	85.530	PBC<MDA	CS134
801.95	10.	96.11	1.55	1.030E-02	801.95	8.690	PBC<MDA	CS134
815.77	9.	96.60	1.56	1.015E-02	815.77	23.280	PBC<MDA	La140
818.50	8.	94.01	1.56	1.012E-02	818.50	100.000	PBC<MDA	Cs136
846.77	8.	116.96	1.58	9.836E-03	846.77	99.935	PBC<MDA	Co56
860.80	3.	378.59	1.59	9.703E-03	860.56	12.420	PBC<MDA	TL208
871.10	6.	109.01	1.59	9.604E-03	871.10	99.890	PBC<MDA	NB94
884.68	8.	99.37	1.60	9.480E-03	884.68	72.680	PBC<MDA	AG110M
911.78	77.	13.43	2.02	9.247E-03	911.07	29.000	1.595E+01	AC228
968.09	53.	23.33	1.65	8.776E-03	968.97	17.460	1.912E+01	AC228
1037.84	7.	145.45	1.69	8.278E-03	1037.84	14.130	PBC<MDA	Co56
1048.07	4.	183.71	1.70	8.209E-03	1048.07	80.000	PBC<MDA	Cs136
1063.66	8.	97.75	1.71	8.106E-03	1063.66	74.500	PBC<MDA	BI207
1120.45	65.	13.73	2.10	7.754E-03	1120.29	15.100	3.061E+01	BI214
					1120.55	99.987	PBC<MDA	Sc46
					1121.30	34.900	1.325E+01	Ta182
1189.05	4.	279.32	1.78	7.367E-03	1189.05	16.200	PBC<MDA	Ta182
1238.28	33.	39.67	1.81	7.114E-03	1238.28	66.070	3.902E+00	Co56
1384.30	7.	89.15	1.88	6.460E-03	1384.30	24.290	PBC<MDA	AG110M
1460.99	262.	6.29	1.92	6.165E-03	1460.83	10.670	2.210E+02	K40
1690.98	5.	44.72	2.03	5.425E-03	1690.98	47.790	PBC<MDA	SB124
1764.65	43.	19.06	2.07	5.226E-03	1764.49	15.400	2.969E+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	
308.79	77.25	285.	244.	6.579E+03	14.74	1.229	-	
659.00	164.79	55.	7.	2.062E+02	158.37	0.000	-	c
745.36	186.38	153.	153.	4.598E+03	19.58	0.883	-	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	187.35	46.89	101.	77.	0.043	26.82	0.812s
TH-227	200.36	50.14	401.	-27.	-0.015	108.07	1.015
AM-241	237.95	59.54	528.	19.	0.011	170.98	1.022s
TH-234	252.96	63.29	219.	55.	0.031	40.30	1.025D
Sn-126	256.93	64.28	622.	8.	0.004	444.94	1.026s
BA-133	323.77	80.99	1148.	-45.	-0.025	49.18	1.039s
Np-237	345.77	86.49	1565.	-31.	-0.017	179.01	1.043s
EU-155	345.98	86.54	1824.	-35.	-0.020	171.66	1.043s
Sn-126	347.57	86.94	1789.	-35.	-0.020	169.94	1.044
Sn-126	350.09	87.57	1639.	39.	0.022	59.33	1.044D
Cd-109	351.97	88.04	1753.	0.	0.000	168.14	1.044A
Nd-147	364.21	91.10	1627.	-35.	-0.020	161.68	1.047s
TH-234	370.17	92.59	257.	32.	0.018	73.95	1.048D
AC-228	373.21	93.35	1718.	-36.	-0.020	165.84	1.049
Gd-153	389.81	97.50	1772.	-36.	-0.020	167.87	1.052s
Gd-153	412.62	103.20	1122.	-33.	-0.019	142.61	1.056s
Np-239	414.62	103.70	1155.	-33.	-0.019	144.64	1.057s
EU-155	421.07	105.31	1189.	-26.	-0.014	90.69	1.058s
Np-239	424.34	106.13	473.	31.	0.017	102.24	1.058s
EU-152	486.94	121.78	275.	26.	0.015	91.21	1.071s
CO-57	488.06	122.06	292.	-29.	-0.016	86.53	1.071s
EU-154	492.22	123.10	268.	-7.	-0.004	322.50	1.072s
PA-234	525.00	131.29	567.	37.	0.021	91.33	1.078s
HF-181	531.92	133.02	605.	24.	0.013	146.17	1.079s
CE-144	533.98	133.54	629.	24.	0.013	148.94	1.080s
HF-181	545.02	136.30	653.	24.	0.013	151.42	1.082s
CO-57	545.72	136.47	677.	24.	0.013	154.11	1.082s
Tc-99m	561.86	140.51	865.	-28.	-0.016	147.26	1.085
U-235	574.97	143.79	842.	-34.	-0.019	69.52	1.087
CE-141	581.59	145.44	775.	-28.	-0.015	144.29	1.089
Ba-140	650.47	162.66	421.	-30.	-0.017	97.87	1.102
U-235	653.35	163.38	263.	-2.	-0.001	926.98	1.102
CE-139	663.24	165.85	437.	-32.	-0.018	93.03	1.104
Cf-251	706.23	176.60	165.	-10.	-0.006	242.38	1.112s
U-235	742.71	185.72	427.	-51.	-0.029	46.60	1.119s
TH-229	773.87	193.51	125.	42.	0.024	51.68	1.125s
U-235	821.17	205.33	121.	19.	0.010	110.81	1.134s
TH-229	843.24	210.85	152.	24.	0.014	100.99	1.138s
Cf-251	907.84	227.00	192.	-28.	-0.015	99.72	1.151s
TH-227	943.73	235.97	689.	22.	0.012	169.81	1.157s
PB-212	954.37	238.63	109.	254.	0.141	8.55	1.159D
PB-214	967.84	242.00	102.	117.	0.065	15.30	1.162D
EU-152	978.62	244.69	736.	-13.	-0.007	168.84	1.164s
TH-227	1024.81	256.24	120.	-16.	-0.009	134.57	1.172s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Cd-113m	1054.65	263.70	168.	0.	0.000	1000.00	1.178
BI-210M	1063.18	265.83	149.	4.	0.002	474.21	1.179s
TL-208	1108.99	277.28	126.	6.	0.003	267.71	1.188
Hg-203	1116.66	279.20	139.	12.	0.006	146.05	1.189s
I-131	1137.05	284.30	80.	16.	0.009	112.27	1.193s
PB-214	1180.48	295.16	70.	320.	0.178	8.28	1.442s
TL-210	1183.86	296.00	841.	-20.	-0.011	201.54	1.202s
PB-212	1199.98	300.03	820.	-21.	-0.011	198.62	1.205
PA-231	1200.14	300.07	800.	-21.	-0.011	196.15	1.205s
PA-233	1200.58	300.18	779.	-21.	-0.011	193.62	1.205s
PA-231	1210.46	302.65	759.	-7.	-0.004	587.93	1.207s
BA-133	1211.27	302.85	752.	0.	0.000	1000.00	1.207s
Ba-140	1219.26	304.85	752.	0.	0.000	1000.00	1.208s
BI-210M	1219.45	304.90	752.	0.	0.000	1000.00	1.208s
Ir-192	1233.62	308.44	752.	0.	0.000	1000.00	1.211s
PA-233	1247.91	312.01	752.	0.	0.000	1000.00	1.214s
Ir-192	1265.82	316.49	752.	0.	0.000	1000.00	1.217s
CR-51	1280.20	320.08	706.	20.	0.011	192.81	1.219s
La-140	1314.91	328.76	274.	15.	0.008	159.58	1.226s
Cf-249	1333.63	333.44	288.	15.	0.009	157.93	1.229s
AC-228	1353.85	338.50	42.	76.	0.042	22.05	1.393s
Cs-136	1362.15	340.57	297.	15.	0.009	159.63	1.234s
EU-152	1377.01	344.29	313.	16.	0.009	163.28	1.237s
HF-181	1383.19	345.83	368.	8.	0.005	324.04	1.238s
PB-214	1407.85	351.99	62.	413.	0.230	6.33	1.402s
I-131	1457.81	364.48	56.	16.	0.009	93.60	1.252s
BA-133	1535.24	383.84	126.	16.	0.009	103.04	1.266s
Cf-249	1551.68	387.95	142.	16.	0.009	108.73	1.269s
SN-113	1566.64	391.69	181.	-18.	-0.010	110.25	1.271s
SB-125	1711.39	427.88	28.	12.	0.007	91.54	1.297s
AG-108M	1735.64	433.94	87.	-20.	-0.011	96.51	1.301s
PM-146	1815.41	453.88	39.	9.	0.005	145.51	1.315s
SB-125	1853.36	463.37	88.	15.	0.008	90.72	1.322s
Ir-192	1872.14	468.06	105.	6.	0.003	255.44	1.325s
BE-7	1910.28	477.60	128.	-13.	-0.007	126.16	1.332s
HF-181	1927.89	482.00	141.	0.	0.000	1000.00	1.335s
La-140	1947.98	487.02	141.	0.	0.000	1000.00	1.339s
RU-103	1988.12	497.05	48.	-10.	-0.005	149.29	1.346s
RH-106	2047.36	511.86	56.	84.	0.047	16.67	2.606s
Kr-85	2055.83	513.98	134.	6.	0.003	283.85	1.357s
Nd-147	2123.91	531.00	30.	-2.	-0.001	486.24	1.369s
Ba-140	2148.95	537.26	43.	-4.	-0.002	313.79	1.373s
CS-134	2252.86	563.24	52.	-16.	-0.009	95.33	1.391s
CS-134	2277.20	569.32	56.	-12.	-0.007	90.65	1.395s
PA-234	2277.80	569.47	62.	7.	0.004	167.18	1.395
BI-207	2278.73	569.70	62.	-6.	-0.003	206.11	1.396s
TL-208	2332.42	583.13	10.	116.	0.064	11.41	1.859s
SB-125	2401.92	600.50	354.	7.	0.004	403.19	1.416s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
SB-124	2410.85	602.73	361.	7.	0.004	387.16	1.418s
CS-134	2418.76	604.71	368.	7.	0.004	390.48	1.419s
BI-214	2437.22	609.32	23.	310.	0.172	6.45	1.215
RU-103	2441.12	610.30	375.	7.	0.004	393.11	1.423s
AG-108M	2457.05	614.28	382.	7.	0.004	395.98	1.426s
PM-144	2472.18	618.06	390.	6.	0.003	462.72	1.428s
RH-106	2487.60	621.92	451.	8.	0.005	366.79	1.431s
SB-125	2543.49	635.89	28.	11.	0.006	72.67	1.440
I-131	2547.83	636.97	32.	6.	0.003	136.18	1.441s
AG-110M	2630.98	657.76	82.	-17.	-0.009	80.37	1.455s
CS-137	2646.58	661.66	100.	-8.	-0.004	357.04	1.457s
PM-144	2786.11	696.54	37.	-4.	-0.002	302.94	1.480s
NB-94	2810.46	702.63	42.	-8.	-0.004	352.47	1.484s
SB-124	2891.09	722.79	54.	14.	0.008	79.90	1.497s
AG-108M	2891.70	722.94	67.	14.	0.008	88.51	1.498s
EU-154	2893.39	723.36	95.	-12.	-0.007	117.99	1.498s
ZR-95	2896.74	724.20	123.	-23.	-0.013	72.23	1.498s
BI-212	2908.63	727.17	76.	16.	0.009	82.84	1.500
PM-146	2942.83	735.72	37.	3.	0.001	489.90	1.506s
PM-146	2988.59	747.16	42.	-6.	-0.003	232.74	1.513s
ZR-95	3026.87	756.73	29.	4.	0.002	263.65	1.519s
AG-110M	3055.73	763.94	105.	-22.	-0.012	69.64	1.524s
NB-95	3063.11	765.79	127.	-15.	-0.008	109.31	1.525s
PA-234M	3065.60	766.41	75.	13.	0.007	98.16	1.526s
EU-152	3115.64	778.92	9.	15.	0.008	51.33	1.534s
BI-212	3141.64	785.42	47.	4.	0.002	337.85	1.538
CS-134	3183.44	795.87	63.	7.	0.004	154.41	1.544s
TL-210	3198.36	799.60	70.	0.	0.000	1000.00	1.547s
CS-134	3207.77	801.95	44.	10.	0.006	96.11	1.548s
CO-58	3243.06	810.78	69.	-12.	-0.007	103.33	1.554s
La-140	3263.04	815.77	36.	9.	0.005	96.60	1.557s
Cs-136	3273.97	818.50	22.	8.	0.004	94.01	1.559s
MN-54	3339.36	834.85	38.	-9.	-0.005	116.49	1.569s
Co-56	3387.05	846.77	19.	8.	0.005	116.96	1.577s
TL-208	3442.23	860.56	28.	3.	0.002	378.59	1.585s
NB-94	3484.36	871.10	21.	6.	0.004	109.01	1.592s
EU-154	3492.89	873.23	56.	-16.	-0.009	71.94	1.593s
PA-234	3522.10	880.53	54.	-8.	-0.004	20.30	1.598s
PA-234	3532.94	883.24	61.	0.	0.000	1000.00	1.599
AG-110M	3538.71	884.68	26.	8.	0.004	99.37	1.600s
Sc-46	3557.10	889.28	53.	-7.	-0.004	151.18	1.603s
Y-88	3592.14	898.04	23.	-2.	-0.001	444.01	1.608s
AC-228	3647.08	911.78	5.	77.	0.043	13.43	2.023s
AG-110M	3749.96	937.49	40.	-13.	-0.007	110.49	1.633s
PA-234	3784.07	946.02	35.	-5.	-0.003	263.94	1.638
EU-152	3856.43	964.11	122.	-24.	-0.014	67.28	1.649s
AC-228	3875.88	968.97	49.	53.	0.029	23.33	1.652s
EU-154	3985.31	996.33	74.	-15.	-0.009	83.05	1.668s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
PA-234M	4003.99	1001.00	91.	-11.	-0.006	71.79	1.671s
Co-56	4151.36	1037.84	20.	7.	0.004	145.45	1.693s
Cs-136	4192.29	1048.07	25.	4.	0.002	183.71	1.698s
RH-106	4201.45	1050.36	50.	-6.	-0.004	158.02	1.700s
BI-207	4254.65	1063.66	11.	8.	0.004	97.75	1.708s
Ga-68	4309.61	1077.40	15.	0.	0.000	1000.00	1.716s
ZN-65	4462.20	1115.55	90.	-2.	-0.001	541.85	1.738s
BI-214	4481.84	1120.45	3.	65.	0.036	13.73	2.104s
Sc-46	4482.22	1120.55	88.	0.	0.000	1000.00	1.740s
Ta-182	4485.22	1121.30	88.	0.	0.000	1000.00	1.741
Ta-182	4756.23	1189.05	25.	4.	0.002	279.32	1.779
Ta-182	4885.67	1221.41	37.	-9.	-0.005	152.36	1.797
Co-56	4953.16	1238.28	27.	33.	0.018	39.67	1.806
NA-22	5098.16	1274.53	37.	-17.	-0.009	56.94	1.826s
EU-154	5098.20	1274.54	54.	-3.	-0.001	414.90	1.826s
FE-59	5166.43	1291.60	27.	-4.	-0.002	324.36	1.835s
TL-210	5252.05	1313.00	16.	-2.	-0.001	460.07	1.847s
CO-60	5330.06	1332.50	24.	-5.	-0.003	267.78	1.857s
AG-110M	5537.25	1384.30	5.	7.	0.004	89.15	1.884s
EU-152	5632.07	1408.00	21.	-3.	-0.002	319.69	1.896s
K-40	5844.04	1460.99	4.	262.	0.145	6.29	1.925
La-140	6384.93	1596.21	28.	-15.	-0.009	84.62	1.990s
SB-124	6764.03	1690.98	0.	5.	0.003	44.72	2.034s
BI-214	7058.07	1764.49	12.	43.	0.024	19.06	2.067
Y-88	7344.36	1836.06	6.	-2.	-0.001	456.44	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	-4.3442E+00				5.31E+01	
			477.60	-4.344E+00	?(	1.852E+01 1.26E+02 1.05E+01	G
NA-22	C	-1.3455E+00				9.50E+02	
			1274.53	-1.345E+00	?(	2.498E+00 5.69E+01 9.99E+01	G
K-40	N	2.2097E+02				4.66E+11	
			1460.83	2.210E+02	(P	1.050E+01 6.29E+00 1.07E+01	G
Sc-46	F	-4.1414E-01				8.38E+01	
			889.28	-4.141E-01	?(	2.157E+00 1.51E+02 1.00E+02	G
			1120.55	0.000E+00	+	3.327E+00 1.00E+03 1.00E+02	G

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Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CR-51	F 5.0320E+00					2.77E+01	
		320.08	5.032E+00	?(P	3.244E+01	1.93E+02	9.94E+00 G
MN-54	C -4.7664E-01					3.12E+02	
		834.85	-4.766E-01	?(P	1.745E+00	1.16E+02	1.00E+02 G
FE-59	F -6.5973E-02					4.45E+01	
		1099.25	-6.597E-02	%(P	3.276E+00	1.45E+03	5.65E+01 G
		1291.60	-6.874E-01	+	5.019E+00	3.24E+02	4.32E+01 G
Co-56	C 1.9498E+00					7.73E+01	
		846.77	4.649E-01	(P	1.294E+00	1.17E+02	9.99E+01 G
		1238.28	3.902E+00	(P	3.182E+00	3.97E+01	6.61E+01 G
		1037.84	3.325E+00	?(	1.119E+01	1.45E+02	1.41E+01 G
		1771.35	-3.446E-01	%	2.579E+01	2.11E+03	1.55E+01 A
CO-57	C -5.0474E-02					2.72E+02	
		122.06	-4.477E-01	&(	1.289E+00	8.65E+01	8.56E+01 G
		136.47	3.133E+00	&(	1.612E+01	1.54E+02	1.07E+01 G
CO-58	C -6.4785E-01					7.09E+01	
		810.78	-6.478E-01	(	2.265E+00	1.03E+02	9.95E+01 G
CO-60	F -4.1434E-01					1.93E+03	
		1332.50	-4.143E-01	?(P	2.124E+00	2.68E+02	1.00E+02 G
		1173.24	8.208E-02	% P	2.039E+00	1.03E+03	9.99E+01 G
ZN-65	F -3.5271E-01					2.44E+02	
		1115.55	-3.527E-01	?(	6.637E+00	5.42E+02	5.06E+01 G
NB-94	I -1.0887E-02					7.41E+06	
		702.63	-3.962E-01	(P	1.624E+00	3.52E+02	9.79E+01 G
		871.10	3.668E-01	?(	1.384E+00	1.09E+02	9.99E+01 G
ZR-95	I 4.1081E-01					6.40E+01	
		756.73	4.108E-01	?(P	2.609E+00	2.64E+02	5.45E+01 G
		724.20	-2.548E+00	+	6.107E+00	7.22E+01	4.42E+01 G
NB-95	I -7.7948E-01					6.40E+01	
		765.79	-7.795E-01	?(	2.869E+00	1.09E+02	9.98E+01 G
RU-103	I -3.8620E-01					3.93E+01	
		497.05	-3.862E-01	?(	1.394E+00	1.49E+02	9.09E+01 G
		610.30	5.230E+00	?	6.945E+01	3.93E+02	5.75E+00 GA

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
RH-106	I	3.6150E+00					3.74E+02	
			621.92	3.615E+00	?(	4.468E+01	3.67E+02	9.93E+00 G
			1050.36	-2.825E+01	+	1.543E+02	1.58E+02	1.56E+00 G
			511.86	1.562E+01	?	6.990E+00	1.67E+01	2.00E+01 GA
AG-108M	C	-7.2734E-01					1.53E+05	
			433.94	-7.273E-01	?(	1.657E+00	9.65E+01	9.05E+01 G
			722.94	7.501E-01	+	2.231E+00	8.85E+01	9.08E+01 G
			614.28	3.371E-01	+	4.509E+00	3.96E+02	8.98E+01 G
AG-110M	F	1.0545E+00					2.50E+02	
			884.68	6.319E-01	?(P	2.148E+00	9.94E+01	7.27E+01 G
			657.76	-8.105E-01	&	2.176E+00	8.04E+01	9.46E+01 G
			937.49	-2.329E+00	+	5.765E+00	1.10E+02	3.44E+01 G
			1384.30	2.319E+00	?(	4.769E+00	8.92E+01	2.43E+01 G
			763.94	-5.080E+00	+	1.172E+01	6.96E+01	2.23E+01 G
SN-113	F	-8.2729E-01					1.15E+02	
			391.69	-8.273E-01	*(	3.061E+00	1.10E+02	6.40E+01 G
SB-124	F	9.4980E-01					6.02E+01	
			602.73	3.018E-01	?(	3.949E+00	3.87E+02	9.83E+01 G
			1690.98	1.071E+00	?(	1.579E+00	4.47E+01	4.78E+01 G
			722.79	6.302E+00	?(	1.686E+01	7.99E+01	1.08E+01 G
SB-125	I	2.4343E+00					1.01E+03	
			427.88	1.296E+00	?(	2.973E+00	9.15E+01	2.96E+01 G
			600.50	1.575E+00	?(P	2.147E+01	4.03E+02	1.79E+01 G
			635.89	4.401E+00	?(	1.067E+01	7.27E+01	1.13E+01 G
			463.37	4.994E+00	(	1.521E+01	9.07E+01	1.05E+01 G
I-131	I	1.1620E+00					8.02E+00	
			364.48	5.622E-01	?(P	1.301E+00	9.36E+01	8.17E+01 G
			284.30	6.050E+00	?(	1.678E+01	1.12E+02	6.14E+00 G
			636.97	3.812E+00	&(	1.802E+01	1.36E+02	7.17E+00 G
Gd-153	F	-1.5970E+00					2.42E+02	
			97.50	-1.597E+00	?(	8.912E+00	1.68E+02	3.00E+01 G
			103.20	-2.042E+00	+	9.689E+00	1.43E+02	2.18E+01 G
Tc-99m	I	-4.6295E-01					2.51E-01	
			140.51	-4.629E-01	?(	2.272E+00	1.47E+02	8.93E+01 G
BA-133	F	-1.2668E-01					3.85E+03	
			356.00	-1.267E-01	%(	4.971E+00	1.16E+03	6.20E+01 G
			302.85	0.000E+00	+	1.737E+01	1.00E+03	1.83E+01 G
			383.84	5.229E+00	?	1.811E+01	1.03E+02	8.94E+00 GA

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                           80.99-1.934E+00 + P 6.857E+00 4.92E+01 3.41E+01 GA

CS-134   I   6.5375E-01                                     7.54E+02
                          795.87 4.675E-01 ?(P 2.480E+00 1.54E+02 8.55E+01 G
                          604.71 3.049E-01 &(  4.023E+00 3.90E+02 9.76E+01 G
                          569.32-3.255E+00 &   9.945E+00 9.07E+01 1.54E+01 G
                          801.95 6.406E+00 ?(P 2.086E+01 9.61E+01 8.69E+00 G
                          563.24-7.708E+00 +   1.750E+01 9.53E+01 8.35E+00 G

CS-137   I  -4.2740E-01                                     1.10E+04
                          661.66-4.274E-01 ?(P 2.665E+00 3.57E+02 8.52E+01 G

CE-139   F  -6.1981E-01                                     1.38E+02
                          165.85-6.198E-01  (  1.918E+00 9.30E+01 7.99E+01 G

Ba-140   I  -6.8758E-01                                     1.28E+01
                          537.26-6.876E-01 ?(  5.297E+00 3.14E+02 2.44E+01 G
                          162.66-7.498E+00 +   2.443E+01 9.79E+01 6.22E+00 G
                          304.85 0.000E+00 &   7.462E+01 1.00E+03 4.29E+00 G

La-140   I  -1.5786E+00                                     1.28E+01
                         1596.21-1.579E+00 ?(  2.808E+00 8.46E+01 9.54E+01 G
                          487.02 0.000E+00 +   4.557E+00 1.00E+03 4.55E+01 G
                          328.76 1.906E+00 & P 1.023E+01 1.60E+02 2.03E+01 G
                          815.77 2.205E+00 +   7.241E+00 9.66E+01 2.33E+01 G

CE-141   I  -8.1868E-01                                     3.25E+01
                          145.44-8.187E-01 &(  3.939E+00 1.44E+02 4.82E+01 G

CE-144   I   2.9839E+00                                     2.85E+02
                          133.54 2.984E+00 ?(  1.484E+01 1.49E+02 1.11E+01 G

PM-144   C   2.7895E-02                                     3.63E+02
                          696.54-2.099E-01 ?(  1.511E+00 3.03E+02 9.90E+01 G
                          618.06 2.655E-01 ?(P 4.150E+00 4.63E+02 9.91E+01 G

EU-152   F   2.2694E+00                                     4.94E+03
                          121.78 1.233E+00 ?(  3.749E+00 9.12E+01 2.86E+01 G
                          344.29 1.581E+00 &(  8.677E+00 1.63E+02 2.65E+01 G
                         1112.07-4.349E-01 %   2.559E+01 1.69E+03 1.36E+01 G
                          778.92 5.968E+00 ?(  6.895E+00 5.13E+01 1.29E+01 G
                          964.11-1.049E+01 +   2.335E+01 6.73E+01 1.46E+01 G
                          244.69-3.513E+00 + P 3.517E+01 1.69E+02 7.58E+00 G
                         1408.00-1.385E+00 -   1.007E+01 3.20E+02 2.10E+01 GA

EU-154   I  -2.3778E-01                                     3.14E+03
                          123.10-2.378E-01  (  2.599E+00 3.22E+02 4.08E+01 G
                         1274.54-5.772E-01 +   8.416E+00 4.15E+02 3.52E+01 G
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Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
			723.36	-2.949E+00	+	1.178E+01	1.18E+02	2.02E+01 G
			873.23	-7.401E+00	+	1.770E+01	7.19E+01	1.23E+01 G
			1004.77	-4.229E-01	%	1.780E+01	1.21E+03	1.80E+01 G
			996.33	-9.382E+00	+	2.609E+01	8.30E+01	1.06E+01 G
EU-155	I	-1.6221E+00					1.81E+03	
			105.31	-1.622E+00	?(P	1.023E+01	9.07E+01	2.12E+01 G
			86.54	-1.615E+00	&	9.217E+00	1.72E+02	3.07E+01 G
HF-181	F	6.1692E-01					4.24E+01	
			482.00	0.000E+00	?(	2.554E+00	1.00E+03	8.05E+01 G
			133.02	7.628E-01	&(	3.724E+00	1.46E+02	4.33E+01 G
			345.83	1.514E+00	?(	1.656E+01	3.24E+02	1.51E+01 G
			136.30	5.716E+00	&(	2.890E+01	1.51E+02	5.85E+00 G
Ta-182	F	5.9028E-01					1.14E+02	
			1121.30	0.000E+00	(	9.538E+00	1.00E+03	3.49E+01 G
			1221.41	-2.668E+00	+	8.913E+00	1.52E+02	2.70E+01 G
			1189.05	1.862E+00	(	1.211E+01	2.79E+02	1.62E+01 G
Hg-203	F	3.2780E-01					4.66E+01	
			279.20	3.278E-01	?(	1.622E+00	1.46E+02	8.15E+01 G
TL-208	N	5.6574E+00					6.98E+02	
			583.02	5.657E+00	(P	8.721E-01	1.14E+01	8.45E+01 G
			277.28	2.165E+00	-	1.985E+01	2.68E+02	6.31E+00 G
			860.56	1.383E+00	-	1.262E+01	3.79E+02	1.24E+01 G
PM-146	C	4.9991E-01					2.02E+03	
			453.88	4.670E-01	&(	1.651E+00	1.46E+02	6.50E+01 G
			747.16	-8.973E-01	+	4.922E+00	2.33E+02	3.40E+01 G
			735.72	5.949E-01	?(	6.957E+00	4.90E+02	2.25E+01 G
Y-88	F	-1.9976E-01					1.07E+02	
			1836.06	-1.998E-01	?(P	1.546E+00	4.56E+02	9.92E+01 G
			898.04	-1.478E-01	+	1.598E+00	4.44E+02	9.37E+01 G
Cf-251	T	-9.4454E-01					3.28E+05	
			176.60	-9.445E-01	?(	5.910E+00	2.42E+02	1.70E+01 G
			227.00	-8.567E+00	+	2.080E+01	9.97E+01	6.30E+00 GA
Cf-249	T	1.0776E+00					1.28E+05	
			387.95	7.160E-01	?(	2.618E+00	1.09E+02	6.60E+01 G
			333.44	2.616E+00	?(	1.390E+01	1.58E+02	1.55E+01 G
Sn-126		1.4477E+00					3.65E+07	
			87.57	1.448E+00	}	7.118E+00	5.93E+01	3.75E+01 GA
			64.28	1.448E+00	?(	2.165E+01	4.45E+02	9.70E+00 G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          86.94-5.476E+00 +   3.093E+01 1.70E+02 9.04E+00 GA

PB-210   N   5.0343E+01                                     8.14E+03
                          46.54 5.034E+01 *(P 3.226E+01 2.68E+01 4.25E+00 G

PB-212   N   1.1893E+01                                     6.98E+02
                         238.63 1.189E+01  (P 2.397E+00 8.55E+00 4.33E+01 G
                         300.03-1.515E+01 -   1.006E+02 1.99E+02 3.28E+00 GA

PB-214   N   3.0225E+01                                     5.84E+05
                         351.93 3.023E+01 @(P 2.872E+00 6.33E+00 3.76E+01 G
                         295.09 3.958E+01 + P 5.180E+00 8.28E+00 1.93E+01 G
                         242.00 3.226E+01     1.370E+01 1.53E+01 7.43E+00 GA

BI-207   C   7.1355E-01                                     1.18E+04
                        1063.66 7.136E-01 ?(P 1.648E+00 9.77E+01 7.45E+01 G
                         569.70-2.285E-01 -   1.631E+00 2.06E+02 9.77E+01 G

BI-212   N   1.0303E+01                                     6.98E+02
                         727.17 1.030E+01  (  2.857E+01 8.28E+01 7.55E+00 G
                         785.42 1.795E+01     1.431E+02 3.38E+02 1.28E+00 GA

U-235    N  -4.4512E+00                                     2.57E+11
                         143.79-4.451E+00 ?(P 1.794E+01 6.95E+01 1.10E+01 G
                         205.33 6.788E+00 & P 1.940E+01 1.11E+02 5.01E+00 G
                         163.38-7.548E-01 & P 2.392E+01 9.27E+02 5.08E+00 G
                         185.72-1.586E+00 + P 3.059E+00 4.66E+01 5.40E+01 GA

BI-214   N   2.9389E+01                                     5.84E+05
                         609.31 2.889E+01  (P 2.322E+00 6.45E+00 4.61E+01 G
                        1120.29 3.061E+01  (P 5.420E+00 1.37E+01 1.51E+01 G
                        1764.49 2.969E+01 ?(P 1.302E+01 1.91E+01 1.54E+01 G

BI-210M  T   1.6151E-01                                     1.10E+09
                         265.83 1.615E-01 ?(  2.628E+00 4.74E+02 5.00E+01 G
                         304.90 0.000E+00 &   1.143E+01 1.00E+03 2.80E+01 G

AC-228   N   1.7078E+01                                     2.10E+03
                         911.07 1.595E+01 @(  2.720E+00 1.34E+01 2.90E+01 G
                         968.97 1.912E+01 &(  1.285E+01 2.33E+01 1.75E+01 G
                         338.32 1.682E+01 *(  7.313E+00 2.21E+01 1.20E+01 G
                          93.35-8.695E+00 -   4.793E+01 1.66E+02 5.56E+00 XA

TH-227   N   4.9584E-01                                     7.95E+03
                         256.24-4.951E+00 ?(P 1.645E+01 1.35E+02 7.00E+00 G
                         235.97 3.596E+00 ?(  2.040E+01 1.70E+02 1.23E+01 G
                          50.14-8.161E+00 +   2.942E+01 1.08E+02 8.00E+00 G
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Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-229	N	1.5937E+01					2.68E+06	
			193.51	1.657E+01	?(	2.142E+01	5.17E+01	4.40E+00 G
			210.85	1.501E+01	&(	3.701E+01	1.01E+02	2.99E+00 G
TH-234	N	1.5165E+01					1.63E+12	
			92.59	7.753E+00	(P	1.890E+01	7.39E+01	5.58E+00 G
			63.29	2.603E+01	(P	3.380E+01	4.03E+01	3.81E+00 G
PA-231	N	-5.6227E+00					1.20E+07	
			302.65	-5.623E+00	?(	1.110E+02	5.88E+02	2.88E+00 G
			300.07	-2.021E+01	+	1.324E+02	1.96E+02	2.46E+00 G
PA-234	N	3.0161E+00					1.63E+12	
			131.29	2.849E+00	?(	8.641E+00	9.13E+01	1.80E+01 G
			946.02	-2.314E+00	-	1.402E+01	2.64E+02	1.34E+01 G
			569.47	3.383E+00	(	1.948E+01	1.67E+02	8.20E+00 G
			883.24	0.000E+00	-	2.378E+01	1.00E+03	9.60E+00 G
			880.53	-7.846E+00	+ P	3.597E+01	2.03E+01	6.00E+00 GA
PA-234M	N	-5.1330E+00					1.63E+12	
			1001.00	-8.757E+01	?(P	3.666E+02	7.18E+01	8.37E-01 G
			766.41	2.295E+02	?(	7.601E+02	9.82E+01	2.94E-01 G
AM-241	T	1.0309E+00					1.58E+05	
			59.54	1.031E+00	&(P	5.898E+00	1.71E+02	3.59E+01 G
Np-237	F	-3.3646E+00					2.14E+06	
			86.49	-3.365E+00	&(	2.004E+01	1.79E+02	1.31E+01 G
Ir-192	F	1.4344E-01					7.40E+01	
			316.49	0.000E+00	?(	3.788E+00	1.00E+03	8.70E+01 G
			468.06	3.847E-01	?(	3.376E+00	2.55E+02	5.18E+01 G
			308.44	0.000E+00	-	1.018E+01	1.00E+03	3.18E+01 G
Cs-136	F	4.8734E-01					1.30E+01	
			818.50	4.207E-01	?(	1.352E+00	9.40E+01	1.00E+02 G
			1048.07	3.384E-01	?(	2.200E+00	1.84E+02	8.00E+01 G
			340.57	8.835E-01	?(	4.743E+00	1.60E+02	4.69E+01 G
Np-239	T	1.7868E+00					2.36E+00	
			103.70	-1.854E+00	+	8.925E+00	1.45E+02	2.40E+01 X
			106.13	1.787E+00	?(	6.083E+00	1.02E+02	2.27E+01 G
			99.50	-9.228E-02	&	1.792E+01	5.82E+03	1.50E+01 X
Nd-147		-6.8799E-01					1.11E+01	
			531.00	-6.880E-01	(	8.367E+00	4.86E+02	1.30E+01 G
			91.10	-1.720E+00	+	9.247E+00	1.62E+02	2.83E+01 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Kr-85	I 5.0631E+01					3.92E+03	
		513.98	5.063E+01	?(	4.920E+02	2.84E+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	401.	-27.	-0.015	108.07	-8.161E+00	
BA-133	80.99	1148.	-45.	-0.025	49.18	-1.934E+00	P
Np-237	86.49	1565.	-31.	-0.017	179.01	-3.365E+00	
EU-155	86.54	1824.	-35.	-0.020	171.66	-1.615E+00	
Nd-147	91.10	1627.	-35.	-0.020	161.68	-1.720E+00	
Gd-153	97.50	1772.	-36.	-0.020	167.87	-1.597E+00	
Gd-153	103.20	1122.	-33.	-0.019	142.61	-2.042E+00	
Np-239	103.70	1155.	-33.	-0.019	144.64	-1.854E+00	
EU-155	105.31	1189.	-26.	-0.014	90.69	-1.622E+00	P
Np-239	106.13	473.	31.	0.017	102.24	1.787E+00	
EU-152	121.78	275.	26.	0.015	91.21	1.233E+00	
CO-57	122.06	292.	-29.	-0.016	86.53	-4.477E-01	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
EU-154	123.10	268.	-7.	-0.004	322.50	-2.378E-01	
HF-181	133.02	605.	24.	0.013	146.17	7.628E-01	
CE-144	133.54	629.	24.	0.013	148.94	2.984E+00	
HF-181	136.30	653.	24.	0.013	151.42	5.716E+00	
CO-57	136.47	677.	24.	0.013	154.11	3.133E+00	
Tc-99m	140.51	865.	-28.	-0.016	147.26	-4.629E-01	
U-235	143.79	842.	-34.	-0.019	69.52	-4.451E+00	P
CE-141	145.44	775.	-28.	-0.015	144.29	-8.187E-01	
Ba-140	162.66	421.	-30.	-0.017	97.87	-7.498E+00	
U-235	163.38	263.	-2.	-0.001	926.98	-7.548E-01	P
CE-139	165.85	437.	-32.	-0.018	93.03	-6.198E-01	
Cf-251	176.60	165.	-10.	-0.006	242.38	-9.445E-01	
U-235	185.72	427.	-51.	-0.029	46.60	-1.586E+00	P
U-235	205.33	121.	19.	0.010	110.81	6.788E+00	P
Cf-251	227.00	192.	-28.	-0.015	99.72	-8.567E+00	
TH-227	235.97	689.	22.	0.012	169.81	3.596E+00	
EU-152	244.69	736.	-13.	-0.007	168.84	-3.513E+00	P
TH-227	256.24	120.	-16.	-0.009	134.57	-4.951E+00	P
BI-210M	265.83	149.	4.	0.002	474.21	1.615E-01	
Hg-203	279.20	139.	12.	0.006	146.05	3.278E-01	
I-131	284.30	80.	16.	0.009	112.27	6.050E+00	
TL-210	296.00	841.	-20.	-0.011	201.54	-6.209E-01	
PA-231	300.07	800.	-21.	-0.011	196.15	-2.021E+01	
PA-233	300.18	779.	-21.	-0.011	193.62	-8.020E+00	
PA-231	302.65	759.	-7.	-0.004	587.93	-5.623E+00	
CR-51	320.08	706.	20.	0.011	192.81	5.032E+00	P
La-140	328.76	274.	15.	0.008	159.58	1.906E+00	P
Cf-249	333.44	288.	15.	0.009	157.93	2.616E+00	
Cs-136	340.57	297.	15.	0.009	159.63	8.835E-01	
EU-152	344.29	313.	16.	0.009	163.28	1.581E+00	
HF-181	345.83	368.	8.	0.005	324.04	1.514E+00	
I-131	364.48	56.	16.	0.009	93.60	5.622E-01	P
BA-133	383.84	126.	16.	0.009	103.04	5.229E+00	
Cf-249	387.95	142.	16.	0.009	108.73	7.160E-01	
SN-113	391.69	181.	-18.	-0.010	110.25	-8.273E-01	
SB-125	427.88	28.	12.	0.007	91.54	1.296E+00	
AG-108M	433.94	87.	-20.	-0.011	96.51	-7.273E-01	
PM-146	453.88	39.	9.	0.005	145.51	4.670E-01	
SB-125	463.37	88.	15.	0.008	90.72	4.994E+00	
Ir-192	468.06	105.	6.	0.003	255.44	3.847E-01	
BE-7	477.60	128.	-13.	-0.007	126.16	-4.344E+00	
RU-103	497.05	48.	-10.	-0.005	149.29	-3.862E-01	
RH-106	511.86	56.	84.	0.047	16.67	1.562E+01	
Kr-85	513.98	134.	6.	0.003	283.85	5.063E+01	
Nd-147	531.00	30.	-2.	-0.001	486.24	-6.880E-01	
Ba-140	537.26	43.	-4.	-0.002	313.79	-6.876E-01	
CS-134	563.24	52.	-16.	-0.009	95.33	-7.708E+00	
CS-134	569.32	56.	-12.	-0.007	90.65	-3.255E+00	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-207	569.70	62.	-6.	-0.003	206.11	-2.285E-01	
SB-125	600.50	354.	7.	0.004	403.19	1.575E+00	P
SB-124	602.73	361.	7.	0.004	387.16	3.018E-01	
CS-134	604.71	368.	7.	0.004	390.48	3.049E-01	
RU-103	610.30	375.	7.	0.004	393.11	5.230E+00	
AG-108M	614.28	382.	7.	0.004	395.98	3.371E-01	
PM-144	618.06	390.	6.	0.003	462.72	2.655E-01	P
RH-106	621.92	451.	8.	0.005	366.79	3.615E+00	
SB-125	635.89	28.	11.	0.006	72.67	4.401E+00	
I-131	636.97	32.	6.	0.003	136.18	3.812E+00	
AG-110M	657.76	82.	-17.	-0.009	80.37	-8.105E-01	
CS-137	661.66	100.	-8.	-0.004	357.04	-4.274E-01	P
PM-144	696.54	37.	-4.	-0.002	302.94	-2.099E-01	
NB-94	702.63	42.	-8.	-0.004	352.47	-3.962E-01	P
SB-124	722.79	54.	14.	0.008	79.90	6.302E+00	
AG-108M	722.94	67.	14.	0.008	88.51	7.501E-01	
EU-154	723.36	95.	-12.	-0.007	117.99	-2.949E+00	
ZR-95	724.20	123.	-23.	-0.013	72.23	-2.548E+00	
PM-146	735.72	37.	3.	0.001	489.90	5.949E-01	
PM-146	747.16	42.	-6.	-0.003	232.74	-8.973E-01	
ZR-95	756.73	29.	4.	0.002	263.65	4.108E-01	P
AG-110M	763.94	105.	-22.	-0.012	69.64	-5.080E+00	
NB-95	765.79	127.	-15.	-0.008	109.31	-7.795E-01	
PA-234M	766.41	75.	13.	0.007	98.16	2.295E+02	
EU-152	778.92	9.	15.	0.008	51.33	5.968E+00	
CS-134	795.87	63.	7.	0.004	154.41	4.675E-01	P
CS-134	801.95	44.	10.	0.006	96.11	6.406E+00	P
CO-58	810.78	69.	-12.	-0.007	103.33	-6.478E-01	
La-140	815.77	36.	9.	0.005	96.60	2.205E+00	
Cs-136	818.50	22.	8.	0.004	94.01	4.207E-01	
MN-54	834.85	38.	-9.	-0.005	116.49	-4.766E-01	P
NB-94	871.10	21.	6.	0.004	109.01	3.668E-01	
EU-154	873.23	56.	-16.	-0.009	71.94	-7.401E+00	
AG-110M	884.68	26.	8.	0.004	99.37	6.319E-01	P
Sc-46	889.28	53.	-7.	-0.004	151.18	-4.141E-01	
Y-88	898.04	23.	-2.	-0.001	444.01	-1.478E-01	
AG-110M	937.49	40.	-13.	-0.007	110.49	-2.329E+00	
EU-152	964.11	122.	-24.	-0.014	67.28	-1.049E+01	
EU-154	996.33	74.	-15.	-0.009	83.05	-9.382E+00	
PA-234M	1001.00	91.	-11.	-0.006	71.79	-8.757E+01	P
Cs-136	1048.07	25.	4.	0.002	183.71	3.384E-01	
RH-106	1050.36	50.	-6.	-0.004	158.02	-2.825E+01	
BI-207	1063.66	11.	8.	0.004	97.75	7.136E-01	P
ZN-65	1115.55	90.	-2.	-0.001	541.85	-3.527E-01	
Ta-182	1189.05	25.	4.	0.002	279.32	1.862E+00	
Ta-182	1221.41	37.	-9.	-0.005	152.36	-2.668E+00	
NA-22	1274.53	37.	-17.	-0.009	56.94	-1.345E+00	
EU-154	1274.54	54.	-3.	-0.001	414.90	-5.772E-01	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
FE-59	1291.60	27.	-4.	-0.002	324.36	-6.874E-01		
TL-210	1313.00	16.	-2.	-0.001	460.07	-7.823E-01		
CO-60	1332.50	24.	-5.	-0.003	267.78	-4.143E-01		P
AG-110M	1384.30	5.	7.	0.004	89.15	2.319E+00		
EU-152	1408.00	21.	-3.	-0.002	319.69	-1.385E+00		
La-140	1596.21	28.	-15.	-0.009	84.62	-1.579E+00		
SB-124	1690.98	0.	5.	0.003	44.72	1.071E+00		
Y-88	1836.06	6.	-2.	-0.001	456.44	-1.998E-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 *****

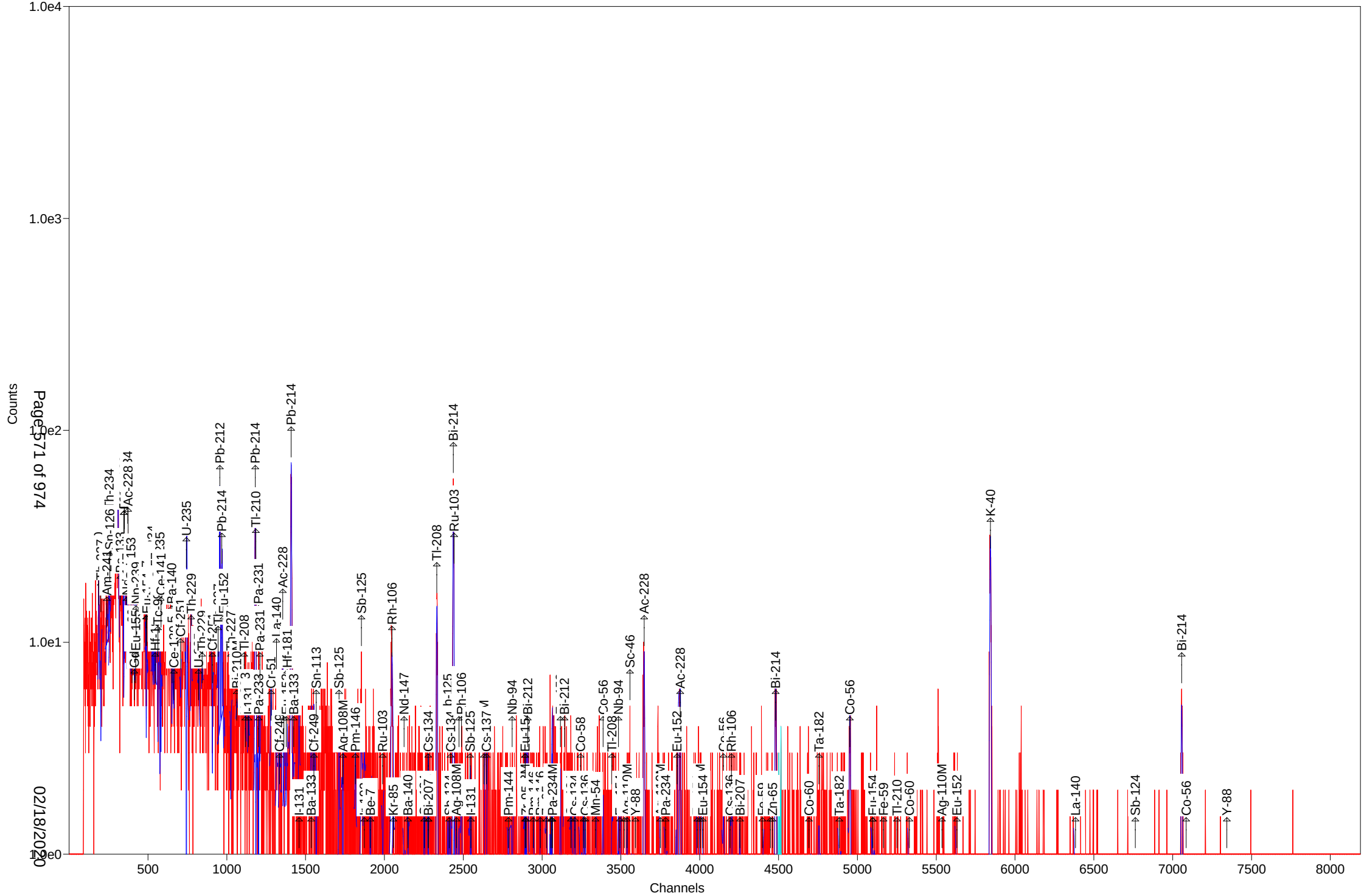
Nuclide		Time of Count Activity Bq/Sample	Time Corrected Activity Bq/Sample	Uncertainty Counting 1 Sigma	MDA Bq/Sample
BE-7	#A	-4.3441E+00	-4.3442E+00	1.262E+02%	1.85E+01
NA-22	#A	-1.3455E+00	-1.3455E+00	5.694E+01%	2.50E+00
K-40		2.2097E+02	2.2097E+02	6.289E+00%	1.05E+01
Sc-46	#A	-4.1414E-01	-4.1414E-01	1.512E+02%	2.16E+00
CR-51	#A	5.0319E+00	5.0320E+00	1.928E+02%	3.24E+01
MN-54	#A	-4.7664E-01	-4.7664E-01	1.165E+02%	1.75E+00
FE-59	#A	-6.5973E-02	-6.5973E-02	1.449E+03%	3.28E+00
Co-56	#C	1.9498E+00	1.9498E+00	3.967E+01%	1.29E+00
CO-57	#A	-5.0474E-02	-5.0474E-02	8.653E+01%	1.29E+00
CO-58	#A	-6.4785E-01	-6.4785E-01	1.033E+02%	2.27E+00
CO-60	#A	-4.1434E-01	-4.1434E-01	2.678E+02%	2.12E+00
ZN-65	#A	-3.5271E-01	-3.5271E-01	5.418E+02%	6.64E+00
NB-94	#A	-1.0887E-02	-1.0887E-02	1.090E+02%	1.62E+00
ZR-95	#A	4.1081E-01	4.1081E-01	2.637E+02%	2.61E+00
NB-95	#A	-7.7948E-01	-7.7948E-01	1.093E+02%	2.87E+00
RU-103	#A	-3.8620E-01	-3.8620E-01	1.493E+02%	1.39E+00
RH-106	#A	3.6150E+00	3.6150E+00	3.668E+02%	4.47E+01
AG-108M	#A	-7.2734E-01	-7.2734E-01	9.651E+01%	1.66E+00
AG-110M	#A	1.0545E+00	1.0545E+00	6.675E+01%	2.15E+00
SN-113	#A	-8.2729E-01	-8.2729E-01	1.102E+02%	3.06E+00
SB-124	#A	9.4979E-01	9.4980E-01	4.472E+01%	3.95E+00
SB-125	#A	2.4343E+00	2.4343E+00	7.267E+01%	2.97E+00
I-131	#A	1.1620E+00	1.1620E+00	6.659E+01%	1.30E+00
Gd-153	#A	-1.5970E+00	-1.5970E+00	1.679E+02%	8.91E+00
Ga-68	#A	0.0000E+00	0.0000E+00	1.000E+03%	5.11E+01
Tc-99m	#A	-4.6244E-01	-4.6295E-01	1.473E+02%	2.27E+00
BA-133	#A	-1.2668E-01	-1.2668E-01	1.163E+03%	4.97E+00
CS-134	#A	6.5375E-01	6.5375E-01	9.611E+01%	2.48E+00
CS-137	#A	-4.2740E-01	-4.2740E-01	3.570E+02%	2.67E+00
CE-139	#A	-6.1981E-01	-6.1981E-01	9.303E+01%	1.92E+00
Ba-140	#A	-6.8757E-01	-6.8758E-01	3.138E+02%	5.30E+00
La-140	#A	-1.5785E+00	-1.5786E+00	8.462E+01%	2.81E+00

CE-141 #A	-8.1868E-01	-8.1868E-01	1.443E+02%	3.94E+00
CE-144 #A	2.9839E+00	2.9839E+00	1.489E+02%	1.48E+01
PM-144 #A	2.7895E-02	2.7895E-02	2.765E+02%	1.51E+00
EU-152 #A	2.2694E+00	2.2694E+00	5.133E+01%	3.75E+00
EU-154 #A	-2.3778E-01	-2.3778E-01	3.225E+02%	2.60E+00
EU-155 #A	-1.6221E+00	-1.6221E+00	9.069E+01%	1.02E+01
HF-181 #A	6.1691E-01	6.1692E-01	1.462E+02%	2.55E+00
Ta-182 #A	5.9027E-01	5.9028E-01	2.793E+02%	9.54E+00
Hg-203 #A	3.2780E-01	3.2780E-01	1.460E+02%	1.62E+00
TL-208	5.6574E+00	5.6574E+00	1.141E+01%	8.72E-01
PM-146 #A	4.9991E-01	4.9991E-01	1.455E+02%	1.65E+00
Y-88 #A	-1.9976E-01	-1.9976E-01	4.564E+02%	1.55E+00
Cd-113m#A	0.0000E+00	0.0000E+00	1.000E+03%	2.30E+04
Cd-109 #A	0.0000E+00	0.0000E+00	1.000E+03%	7.26E+01
Cf-251 #A	-9.4454E-01	-9.4454E-01	2.424E+02%	5.91E+00
Cf-249 #A	1.0776E+00	1.0776E+00	9.587E+01%	2.62E+00
Sn-126 #A	1.4477E+00	1.4477E+00	4.449E+02%	2.17E+01
PB-210 #	5.0343E+01	5.0343E+01	2.682E+01%	3.23E+01
PB-212	1.1893E+01	1.1893E+01	8.550E+00%	2.40E+00
PB-214	3.0225E+01	3.0225E+01	6.329E+00%	2.87E+00
BI-207 #A	7.1355E-01	7.1355E-01	9.775E+01%	1.65E+00
BI-212 A	1.0303E+01	1.0303E+01	8.284E+01%	2.86E+01
U-235 #A	-4.4512E+00	-4.4512E+00	6.952E+01%	1.79E+01
BI-214	2.9389E+01	2.9389E+01	6.450E+00%	2.32E+00
BI-210M#A	1.6151E-01	1.6151E-01	4.742E+02%	2.63E+00
AC-228 #	1.7078E+01	1.7078E+01	1.160E+01%	2.72E+00
TH-227 #A	4.9584E-01	4.9584E-01	1.083E+02%	1.64E+01
TH-229 #A	1.5937E+01	1.5937E+01	5.168E+01%	2.14E+01
TH-234 #A	1.5165E+01	1.5165E+01	4.030E+01%	1.89E+01
PA-231 #A	-5.6227E+00	-5.6227E+00	5.879E+02%	1.11E+02
PA-233 #A	0.0000E+00	0.0000E+00	1.000E+03%	9.06E+00
PA-234 A	3.0161E+00	3.0161E+00	9.133E+01%	8.64E+00
PA-234M#A	-5.1330E+00	-5.1330E+00	6.081E+01%	3.67E+02
AM-241 #A	1.0309E+00	1.0309E+00	1.710E+02%	5.90E+00
Np-237 #A	-3.3646E+00	-3.3646E+00	1.790E+02%	2.00E+01
Ir-192 #A	1.4344E-01	1.4344E-01	2.554E+02%	3.79E+00
Cs-136 #A	4.8733E-01	4.8734E-01	8.697E+01%	1.35E+00
Np-239 #A	1.7866E+00	1.7868E+00	1.022E+02%	6.08E+00
Nd-147 #A	-6.8797E-01	-6.8799E-01	4.862E+02%	8.37E+00
TL-210 #A	0.0000E+00	0.0000E+00	1.000E+03%	2.27E+00
Kr-85 #A	5.0631E+01	5.0631E+01	2.839E+02%	4.92E+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)     3.815E+02  Bq/Sample
Total Decayed Activity (   37.5 to  2000.0 keV) 3.8148923E+02  Bq/Sample
```

453329_Gamma_160-36593-A-5-B. 8_Gamma_20192229.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-214
Bi-214
Pb-212
Ru-103
Tl-210
K-40
Tl-208
Ac-228
U-235
Sb-125
Rh-106
Nd-147
Sc-46
Co-56
Co-58
Nb-94
Ta-182
Eu-152
Eu-154
Co-60
La-140
Sb-124
Y-88
Ag-110M
Zn-65
Fe-59
Mn-54
Cs-134
Cs-137
Ba-133
Ba-140
Kr-85
Be-7
Pm-146
Pm-144
Sn-113
Cf-249
Cf-251
Th-229
Th-227
Th-234
Pa-231
Pa-233
Pa-234M
Ac-228
Hf-181
Ce-141
Ce-144
Eu-155
Eu-152
Eu-154
Eu-152
Eu-154
Eu-152
Eu-154

Sample Description: 453329_Gamma_160-36593-A-6-B
Detector: Detector # 5
Batch ID: 453329
Work Order Number: Gamma
Lot Number: 160-36593-A-6-B

Decay to Time: 12/27/2019 09:03 Live Time: 1800 sec
Acquisition Time: 12/27/2019 09:03:57 Real Time: 1806 sec
Analysis Time: 12/27/2019 09:34 Dead Time: 0.31 %
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_2019-12-07_1448.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	2.328E+00	198.7	4.627E+00	4.629E+00	1.600E+01
NA-22	-1.618E-01	445.0	7.201E-01	7.202E-01	2.600E+00
K-40	2.338E+02	6.7	1.564E+01	1.969E+01	1.076E+01
Sc-46	1.420E-02	4732.3	6.721E-01	6.721E-01	2.406E+00
CR-51	3.903E+00	107.5	4.196E+00	4.201E+00	1.417E+01
MN-54	8.178E-01	48.3	3.952E-01	3.974E-01	8.917E-01
FE-59	-3.033E-01	554.2	1.681E+00	1.681E+00	3.945E+00
Co-56	-5.558E-01	73.0	4.059E-01	4.069E-01	2.032E+00
CO-57	0.000E+00	1.#INF	1.883E-01	1.883E-01	1.405E+00
CO-58	4.681E-01	97.1	4.544E-01	4.550E-01	1.559E+00
CO-60	4.983E-01	95.2	4.745E-01	4.751E-01	2.193E+00
ZN-65	-2.227E+00	112.9	2.514E+00	2.516E+00	8.494E+00
NB-94	-1.023E+00	171.2	1.752E+00	1.753E+00	2.186E+00
ZR-95	3.834E-01	290.3	1.113E+00	1.113E+00	2.806E+00
NB-95	-5.107E-02	1838.0	9.386E-01	9.386E-01	3.259E+00
RU-103	-3.161E-01	154.9	4.898E-01	4.900E-01	1.570E+00
RH-106	-6.855E+00	194.4	1.332E+01	1.333E+01	5.599E+01
AG-108M	1.039E+00	48.0	4.988E-01	5.016E-01	1.192E+00
AG-110M	7.747E-01	117.1	9.070E-01	9.079E-01	3.008E+00
SN-113	2.277E-01	407.6	9.279E-01	9.280E-01	3.188E+00
SB-124	-8.688E-01	202.4	1.759E+00	1.759E+00	5.895E+00
SB-125	1.407E+00	47.0	6.611E-01	6.650E-01	4.773E+00
I-131	2.949E-01	190.6	5.620E-01	5.622E-01	1.553E+00
Gd-153	3.969E-01	316.3	1.256E+00	1.256E+00	3.407E+00
Ga-68	-3.594E+01	104.4	3.753E+01	3.758E+01	8.456E+01
Tc-99m	3.947E-01	122.7	4.843E-01	4.848E-01	1.621E+00
BA-133	-6.187E-01	277.8	1.719E+00	1.719E+00	5.777E+00
CS-134	8.280E-01	78.7	6.514E-01	6.528E-01	2.306E+00
CS-137	-1.020E+00	187.6	1.914E+00	1.915E+00	2.599E+00
CE-139	-4.992E-01	107.7	5.376E-01	5.397E-01	1.797E+00
Ba-140	-1.133E+00	73.3	8.310E-01	8.330E-01	6.749E+00
La-140	2.041E-01	81.2	1.657E-01	1.661E-01	2.278E+00
CE-141	-4.300E-01	218.4	9.392E-01	9.395E-01	3.162E+00

CE-144	-3.206E+00	138.0	4.424E+00	4.427E+00	1.479E+01
PM-144	1.884E-01	153.3	2.888E-01	2.890E-01	1.780E+00
EU-152	2.124E+00	137.3	2.917E+00	2.919E+00	4.193E+00
EU-154	7.327E-02	96.8	7.095E-02	7.105E-02	2.932E+00
EU-155	5.680E-01	197.4	1.121E+00	1.122E+00	5.543E+00
HF-181	7.066E-01	129.6	9.154E-01	9.161E-01	2.216E+00
Ta-182	3.476E+00	74.1	2.575E+00	2.581E+00	1.104E+01
Hg-203	-2.568E-01	214.7	5.514E-01	5.516E-01	1.882E+00
TL-208	4.615E+00	14.4	6.666E-01	7.083E-01	1.201E+00
PM-146	1.025E+00	37.1	3.801E-01	3.837E-01	2.211E+00
Y-88	-3.639E-02	2668.1	9.710E-01	9.710E-01	9.809E-01
Cd-113m	5.857E+03	85.6	5.011E+03	5.025E+03	1.683E+04
Cd-109	0.000E+00	1.#INF	3.787E+00	3.787E+00	5.696E+01
Cf-251	-2.525E+00	104.0	2.627E+00	2.637E+00	7.038E+00
Cf-249	1.114E+00	78.6	8.763E-01	8.782E-01	3.006E+00
Sn-126	-5.540E-01	951.6	5.272E+00	5.273E+00	1.790E+01
PB-210	4.266E+01	30.6	1.307E+01	1.331E+01	3.442E+01
PB-212	1.237E+01	8.0	9.921E-01	1.275E+00	1.948E+00
PB-214	3.533E+01	5.1	1.792E+00	2.566E+00	3.009E+00
BI-207	6.920E-02	1390.5	9.623E-01	9.623E-01	2.348E+00
BI-212	2.782E+00	392.6	1.092E+01	1.092E+01	3.782E+01
U-235	4.301E+00	88.7	3.813E+00	3.820E+00	1.337E+01
BI-214	3.561E+01	6.1	2.158E+00	2.843E+00	2.409E+00
BI-210M	2.442E-01	308.9	7.544E-01	7.545E-01	2.600E+00
AC-228	1.414E+01	12.0	1.703E+00	1.849E+00	4.393E+00
TH-227	-7.260E-01	880.3	6.391E+00	6.391E+00	1.685E+01
TH-229	7.682E-01	99.9	7.671E-01	7.695E-01	2.648E+01
TH-234	-1.067E+01	63.6	6.785E+00	6.811E+00	3.730E+01
PA-231	0.000E+00	1.#INF	3.509E+00	3.509E+00	1.100E+02
PA-233	1.151E+00	225.6	2.597E+00	2.598E+00	8.722E+00
PA-234	4.414E+00	32.7	1.444E+00	1.461E+00	3.816E+00
PA-234M	5.371E+01	102.3	5.494E+01	5.500E+01	3.568E+02
AM-241	-1.655E+00	67.4	1.115E+00	1.119E+00	4.595E+00
Np-237	3.048E+00	158.7	4.837E+00	4.840E+00	1.614E+01
Ir-192	1.916E-01	105.8	2.028E-01	2.031E-01	1.918E+00
Cs-136	1.528E-01	69.1	1.056E-01	1.060E-01	2.472E+00
Np-239	-9.537E-01	177.7	1.695E+00	1.696E+00	5.706E+00
Nd-147	1.792E+00	226.0	4.049E+00	4.050E+00	1.042E+01
TL-210	8.838E-02	656.7	5.804E-01	5.804E-01	2.075E+00
Kr-85	1.360E+02	108.4	1.475E+02	1.477E+02	4.983E+02
Total	6.467E+03				

Analyst: Jasmine Stewart

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Sample description
453329_Gamma_160-36593-A-6-B

Spectrum Filename: C:\User\SPC\Det5\5_Gamma_20193407.An1

Acquisition information

Start time:	12/27/2019 9:03:57 AM
Live time:	1800
Real time:	1806
Dead time:	0.31 %
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	12/27/2019 9:03:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	5_2019-12-07_1448.PBC 12/7/2019 2:48:46 PM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 18 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 0.0700

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

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. Bq/Sampl	Nuc
46.97	71.	24.60	0.71	1.815E-02	46.54	4.250	4.266E+01	PB210
63.29	4.	725.34	0.80	2.712E-02	63.29	3.810	PBC<MDA	TH234
74.71	145.	15.49	0.81	3.148E-02				
77.11	279.	8.28	0.81	3.220E-02				
87.00	123.	16.48	0.81	3.444E-02	86.49	13.100	1.519E+01	Np237
					86.54	30.700	6.478E+00	EU155
					86.94	9.040	2.195E+01	Sn126
					87.57	37.500	5.276E+00	Sn126
92.98	81.	28.89	1.23	3.536E-02	92.59	5.584	PBC<MDA	TH234
					93.35	5.561	2.288E+01	AC228
97.50	8.	316.35	0.84	3.577E-02	97.50	30.000	PBC<MDA	Gd153
128.92	28.	44.58	0.79	3.531E-02				
131.30	43.	32.70	0.87	3.509E-02	131.29	18.000	PBC<MDA	PA234
140.51	21.	122.72	0.88	3.411E-02	140.51	89.300	PBC<MDA	Tc99m
143.79	19.	140.70	0.88	3.371E-02	143.79	10.960	PBC<MDA	U235
162.66	20.	112.57	0.90	3.113E-02	162.66	6.220	PBC<MDA	Ba140
186.14	99.	16.02	0.91	2.848E-02	185.72	54.000	3.552E+00	U235
205.33	18.	107.89	0.94	2.626E-02	205.33	5.010	PBC<MDA	U235
210.85	16.	128.65	0.95	2.569E-02	210.85	2.990	PBC<MDA	TH229
227.00	9.	190.29	0.97	2.417E-02	227.00	6.300	PBC<MDA	Cf251
238.59	224.	8.01	0.98	2.320E-02	238.63	43.300	1.238E+01	PB212
242.08	105.	14.83	0.98	2.292E-02	242.00	7.430	3.409E+01	PB214

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
244.69	18.	189.84	0.98	2.272E-02	244.69	7.580	PBC<MDA	EU152
263.70	14.	85.56	1.00	2.135E-02	263.70	0.006	PBC<MDA	Cd113m
265.83	5.	308.86	1.00	2.121E-02	265.83	50.000	PBC<MDA	BI210M
277.28	12.	116.27	1.02	2.048E-02	277.28	6.310	PBC<MDA	TL208
284.30	8.	190.56	1.02	2.006E-02	284.30	6.140	PBC<MDA	I131
295.11	230.	8.19	1.13	1.945E-02	295.09	19.300	3.404E+01	PB214
					296.00	79.000	8.339E+00	TL210
299.36	14.	227.63	1.04	1.918E-02	300.03	3.280	PBC<MDA	PB212
308.44	14.	215.09	1.05	1.875E-02	308.44	31.750	PBC<MDA	Ir192
312.01	14.	225.58	1.05	1.857E-02	312.01	36.000	PBC<MDA	PA233
320.08	13.	107.50	1.06	1.818E-02	320.08	9.940	PBC<MDA	CR51
328.76	11.	141.82	1.07	1.778E-02	328.76	20.300	PBC<MDA	La140
333.44	13.	100.09	1.07	1.757E-02	333.44	15.510	PBC<MDA	Cf249
338.18	58.	23.70	1.04	1.736E-02	338.32	12.010	1.551E+01	AC228
345.83	15.	129.55	1.08	1.705E-02	345.83	15.070	PBC<MDA	HF181
351.93	409.	5.99	0.99	1.680E-02	351.93	37.600	3.599E+01	PB214
383.84	13.	115.68	1.12	1.563E-02	383.84	8.940	PBC<MDA	BA133
387.95	14.	121.30	1.12	1.549E-02	387.95	66.000	PBC<MDA	Cf249
391.69	4.	407.61	1.12	1.537E-02	391.69	64.000	PBC<MDA	SN113
433.94	24.	48.00	1.16	1.411E-02	433.94	90.480	PBC<MDA	AG108M
463.37	24.	46.98	1.19	1.336E-02	463.37	10.470	PBC<MDA	SB125
468.06	7.	194.75	1.20	1.325E-02	468.06	51.750	PBC<MDA	Ir192
477.60	6.	198.75	1.20	1.303E-02	477.60	10.520	PBC<MDA	BE7
482.00	5.	256.55	1.21	1.293E-02	482.00	80.500	PBC<MDA	HF181
487.02	7.	136.68	1.21	1.282E-02	487.02	45.500	PBC<MDA	La140
511.86	30.	46.04	2.48	1.230E-02	511.86	20.000	PBC<MDA	RH106
513.98	13.	108.44	1.24	1.226E-02	513.98	0.430	PBC<MDA	Kr85
531.00	5.	225.98	1.25	1.193E-02	531.00	13.000	PBC<MDA	Nd147
569.32	6.	115.47	1.29	1.125E-02	569.32	15.380	PBC<MDA	CS134
					569.47	8.200	3.613E+00	PA234
					569.70	97.740	3.032E-01	BI207
583.13	77.	14.44	0.79	1.103E-02	583.02	84.500	4.589E+00	TL208
609.24	313.	6.06	1.16	1.063E-02	609.31	46.090	3.550E+01	BI214
					610.30	5.750	2.850E+02	RU103
618.06	13.	217.45	1.33	1.051E-02	618.06	99.100	PBC<MDA	PM144
636.97	2.	459.61	1.34	1.025E-02	636.97	7.170	PBC<MDA	I131
657.76	3.	272.76	1.36	9.974E-03	657.76	94.640	PBC<MDA	AG110M
727.17	3.	392.56	1.42	9.170E-03	727.17	7.550	PBC<MDA	BI212
735.72	16.	37.07	1.43	9.081E-03	735.72	22.500	4.260E+00	PM146
756.73	3.	290.26	1.45	8.869E-03	756.73	54.460	PBC<MDA	ZR95
766.41	10.	102.28	1.45	8.776E-03	765.79	99.790	PBC<MDA	NB95
					766.41	0.294	2.175E+02	PA234M
795.87	8.	106.91	1.48	8.503E-03	795.87	85.530	PBC<MDA	CS134
799.60	1.	656.70	1.48	8.469E-03	799.60	98.960	PBC<MDA	TL210
810.78	7.	97.07	1.49	8.371E-03	810.78	99.460	PBC<MDA	CO58
815.77	7.	106.09	1.49	8.328E-03	815.77	23.280	PBC<MDA	La140
834.85	12.	48.32	1.51	8.168E-03	834.85	99.980	PBC<MDA	MN54
880.53	8.	103.54	1.54	7.812E-03	880.53	6.000	PBC<MDA	PA234

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
883.24	8.	105.33	1.55	7.791E-03	883.24	9.600	PBC<MDA	PA234
884.68	8.	117.08	1.55	7.781E-03	884.68	72.680	PBC<MDA	AG110M
911.07	45.	20.87	1.57	7.591E-03	911.07	29.000	1.137E+01	AC228
946.56	2.	398.21	1.60	7.355E-03	946.02	13.400	PBC<MDA	PA234
964.11	8.	137.33	1.61	7.239E-03	964.11	14.605	PBC<MDA	EU152
968.93	40.	17.55	0.81	7.209E-03	968.97	17.460	1.780E+01	AC228
996.33	5.	200.05	1.63	7.042E-03	996.33	10.600	PBC<MDA	EU154
1048.07	8.	69.10	1.67	6.749E-03	1048.07	80.000	PBC<MDA	Cs136
1050.36	1.	835.41	1.67	6.736E-03	1050.36	1.560	PBC<MDA	RH106
1120.04	58.	13.75	1.50	6.381E-03	1120.29	15.100	3.357E+01	BI214
					1120.55	99.987	PBC<MDA	Sc46
1121.69	11.	122.00	1.72	6.376E-03	1121.30	34.900	PBC<MDA	Ta182
1173.24	10.	95.23	1.76	6.138E-03	1173.24	99.900	PBC<MDA	CO60
1189.05	12.	86.87	1.77	6.069E-03	1189.05	16.200	PBC<MDA	Ta182
1221.41	7.	164.27	1.79	5.934E-03	1221.41	27.000	PBC<MDA	Ta182
1238.28	5.	281.74	1.80	5.866E-03	1238.28	66.070	PBC<MDA	Co56
1332.50	1.	716.85	1.87	5.514E-03	1332.50	99.980	PBC<MDA	CO60
1384.30	2.	460.07	1.90	5.340E-03	1384.30	24.290	PBC<MDA	AG110M
1408.00	9.	85.44	1.91	5.264E-03	1408.00	21.005	PBC<MDA	EU152
1460.50	229.	6.69	1.63	5.103E-03	1460.83	10.670	2.338E+02	K40
1764.64	46.	15.85	2.11	4.351E-03	1764.49	15.400	3.794E+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	74.73	180.	145.	4.611E+03	15.49	0.813	-	sD
308.08	77.12	128.	279.	8.680E+03	8.28	0.815	-	D
515.50	128.92	65.	30.	8.564E+02	41.92	0.868	-	D
744.53	186.14	58.	99.	3.459E+03	16.02	0.913	-	

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	187.41	46.97	91.	58.	0.032	30.65	0.714s
TH-227	200.11	50.14	147.	-14.	-0.008	125.04	0.787
AM-241	237.72	59.54	242.	-27.	-0.015	67.40	0.797s
TH-234	252.74	63.29	262.	4.	0.002	725.34	0.801s
Sn-126	256.71	64.28	321.	-3.	-0.001	951.65	0.802
BA-133	323.61	80.99	304.	-28.	-0.015	84.07	0.819s
Np-237	345.63	86.49	755.	25.	0.014	158.71	0.825A
EU-155	345.84	86.54	780.	20.	0.011	197.43	0.825s
Sn-126	347.43	86.94	767.	25.	0.014	80.92	0.825D
Sn-126	349.95	87.57	780.	20.	0.011	193.98	0.826s
Cd-109	351.83	88.04	800.	0.	0.000	1000.00	0.826s
Nd-147	364.08	91.10	800.	0.	0.000	1000.00	0.829s
TH-234	370.05	92.59	773.	-38.	-0.021	63.60	0.831s
AC-228	371.61	92.98	140.	81.	0.045	28.89	1.233s
Gd-153	389.70	97.50	183.	8.	0.004	316.35	0.836s
Np-239	397.71	99.50	255.	-8.	-0.004	284.50	0.838
Np-239	414.52	103.70	278.	-20.	-0.011	119.89	0.842s
Np-239	424.25	106.13	307.	-14.	-0.008	177.74	0.845s
CO-57	488.03	122.06	258.	0.	0.000	1000.00	0.861
EU-154	492.18	123.10	254.	-24.	-0.013	96.83	0.862
PA-234	524.99	131.29	76.	43.	0.024	32.70	0.871D
HF-181	531.91	133.02	569.	-24.	-0.013	142.63	0.872s
CE-144	533.97	133.54	463.	-22.	-0.012	138.01	0.873s
HF-181	545.02	136.30	465.	-23.	-0.013	135.46	0.876s
CO-57	545.72	136.47	500.	-24.	-0.013	133.36	0.876s
Tc-99m	561.88	140.51	321.	21.	0.012	122.72	0.880s
U-235	574.99	143.79	342.	19.	0.010	140.70	0.883s
CE-141	581.61	145.44	366.	-13.	-0.007	218.43	0.885
Ba-140	650.54	162.66	246.	20.	0.011	112.57	0.902
U-235	653.42	163.38	229.	-11.	-0.006	217.10	0.903
CE-139	663.32	165.85	282.	-22.	-0.012	107.69	0.905s
Cf-251	706.34	176.60	173.	-23.	-0.013	104.04	0.916s
U-235	742.85	185.72	249.	-21.	-0.012	109.10	0.925
TH-229	774.03	193.51	140.	-14.	-0.008	152.75	0.933s
U-235	821.35	205.33	111.	18.	0.010	107.89	0.945s
TH-229	843.44	210.85	123.	16.	0.009	128.65	0.950s
Cf-251	908.08	227.00	97.	9.	0.005	190.29	0.966s
TH-227	943.98	235.97	644.	-19.	-0.011	188.45	0.975s
PB-212	954.64	238.63	49.	224.	0.124	8.02	0.978D
PB-214	968.10	242.00	63.	103.	0.057	14.77	0.981D
EU-152	978.89	244.69	582.	18.	0.010	189.84	0.984s
TH-227	1025.11	256.24	88.	-2.	-0.001	880.34	0.995s
Cd-113m	1054.97	263.70	60.	14.	0.008	85.56	1.002s
BI-210M	1063.50	265.83	101.	5.	0.003	308.86	1.005s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
TL-208	1109.33	277.28	84.	12.	0.006	116.27	1.016
Hg-203	1117.00	279.20	132.	-8.	-0.004	214.72	1.017s
I-131	1137.41	284.30	70.	8.	0.005	190.56	1.022s
PB-214	1180.68	295.11	35.	230.	0.128	8.19	1.128
TL-210	1184.24	296.00	560.	-15.	-0.008	220.94	1.034s
PB-212	1200.37	300.03	502.	14.	0.008	227.63	1.038s
PA-231	1200.53	300.07	516.	0.	0.000	1000.00	1.038s
PA-233	1200.97	300.18	516.	0.	0.000	1000.00	1.038s
PA-231	1210.86	302.65	516.	0.	0.000	1000.00	1.040s
BA-133	1211.66	302.85	516.	0.	0.000	1000.00	1.040s
Ba-140	1219.66	304.85	516.	0.	0.000	1000.00	1.042s
BI-210M	1219.85	304.90	516.	0.	0.000	1000.00	1.042s
Ir-192	1234.03	308.44	452.	14.	0.008	215.09	1.046s
PA-233	1248.32	312.01	481.	14.	0.008	225.58	1.049s
Ir-192	1266.25	316.49	127.	-13.	-0.007	128.76	1.053s
CR-51	1280.63	320.08	87.	13.	0.007	107.50	1.057s
La-140	1315.35	328.76	62.	11.	0.006	141.82	1.065s
Cf-249	1334.08	333.44	48.	13.	0.007	100.09	1.070s
AC-228	1353.03	338.18	35.	58.	0.032	23.70	1.037s
Cs-136	1362.62	340.57	226.	-17.	-0.009	129.20	1.077s
EU-152	1377.49	344.29	209.	-9.	-0.005	231.56	1.080s
HF-181	1383.66	345.83	171.	15.	0.008	129.55	1.082s
PB-214	1408.09	351.93	46.	409.	0.227	5.99	0.991
BA-133	1424.36	356.00	504.	-12.	-0.006	277.78	1.091s
I-131	1458.32	364.48	55.	-2.	-0.001	697.32	1.099s
BA-133	1535.78	383.84	114.	13.	0.007	115.68	1.117s
Cf-249	1552.22	387.95	127.	14.	0.008	121.30	1.121s
SN-113	1567.19	391.69	133.	4.	0.002	407.61	1.125s
SB-125	1711.99	427.88	52.	-11.	-0.006	131.84	1.158s
AG-108M	1736.25	433.94	28.	24.	0.013	48.00	1.164s
PM-146	1816.05	453.88	48.	-1.	-0.001	769.05	1.182s
SB-125	1854.01	463.37	51.	24.	0.013	46.98	1.191s
Ir-192	1872.79	468.06	89.	7.	0.004	194.75	1.195
BE-7	1910.94	477.59	62.	6.	0.003	198.75	1.204s
HF-181	1928.56	482.00	69.	5.	0.003	256.55	1.208s
La-140	1948.65	487.02	25.	7.	0.004	136.68	1.212s
RU-103	1988.80	497.05	41.	-7.	-0.004	154.93	1.221
RH-106	2048.06	511.86	80.	30.	0.017	46.04	2.485s
Kr-85	2056.53	513.98	91.	13.	0.007	108.44	1.237
Nd-147	2124.62	531.00	32.	5.	0.003	225.98	1.252s
Ba-140	2149.67	537.26	48.	-15.	-0.008	94.04	1.258s
CS-134	2253.60	563.24	36.	0.	0.000	1000.00	1.280s
CS-134	2277.94	569.32	21.	6.	0.003	115.47	1.286s
PA-234	2278.54	569.47	35.	-5.	-0.003	168.18	1.286s
TL-208	2333.19	583.13	14.	77.	0.043	14.44	0.791s
SB-125	2402.69	600.50	566.	-17.	-0.009	60.29	1.313s
SB-124	2411.61	602.73	549.	-16.	-0.009	202.43	1.315s
CS-134	2419.53	604.71	532.	-17.	-0.009	199.15	1.317s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-214	2437.66	609.24	16.	313.	0.174	6.06	1.163
RU-103	2441.89	610.30	516.	-17.	-0.009	195.38	1.322s
AG-108M	2457.82	614.28	499.	-17.	-0.009	191.77	1.325s
PM-144	2472.94	618.06	413.	13.	0.007	217.45	1.328s
RH-106	2488.37	621.92	478.	-16.	-0.009	194.39	1.332s
SB-125	2544.26	635.89	30.	-12.	-0.007	69.28	1.344s
I-131	2548.61	636.97	48.	2.	0.001	459.61	1.345s
AG-110M	2631.76	657.76	40.	3.	0.002	272.76	1.362s
CS-137	2647.36	661.66	63.	-16.	-0.009	187.61	1.366s
PM-144	2786.90	696.54	35.	-6.	-0.003	216.21	1.395s
NB-94	2811.25	702.63	52.	-17.	-0.009	171.24	1.400s
SB-124	2891.88	722.79	63.	-4.	-0.002	309.76	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	81.	-15.	-0.008	192.16	1.418s
BI-212	2909.41	727.17	91.	3.	0.002	392.56	1.421s
PM-146	2943.61	735.72	4.	16.	0.009	37.07	1.428
PM-146	2989.37	747.16	26.	-8.	-0.005	165.49	1.437s
ZR-95	3027.65	756.73	22.	3.	0.002	290.26	1.445s
AG-110M	3056.50	763.94	123.	-24.	-0.013	67.86	1.451s
PA-234M	3066.38	766.41	48.	10.	0.006	102.28	1.453s
EU-152	3116.41	778.92	23.	-4.	-0.002	241.30	1.463s
BI-212	3142.41	785.42	42.	-3.	-0.002	407.75	1.468
CS-134	3184.20	795.87	35.	8.	0.005	106.91	1.477s
TL-210	3199.12	799.60	38.	1.	0.001	656.70	1.480s
CS-134	3208.53	801.95	54.	-8.	-0.005	127.53	1.482s
CO-58	3243.82	810.78	20.	7.	0.004	97.07	1.489s
La-140	3263.80	815.77	27.	7.	0.004	106.09	1.493s
Cs-136	3274.72	818.50	54.	-6.	-0.003	178.11	1.495s
MN-54	3340.10	834.85	5.	12.	0.007	48.32	1.508s
Co-56	3387.78	846.77	33.	-8.	-0.004	73.03	1.518s
TL-208	3442.95	860.56	28.	-5.	-0.003	59.64	1.529s
NB-94	3485.08	871.10	35.	-5.	-0.003	173.21	1.537
EU-154	3493.61	873.23	42.	-1.	-0.001	921.95	1.539s
PA-234	3522.80	880.53	27.	8.	0.004	103.54	1.544s
PA-234	3533.64	883.24	28.	8.	0.004	105.33	1.547s
AG-110M	3539.41	884.68	36.	8.	0.004	117.08	1.547s
Y-88	3592.83	898.04	39.	-5.	-0.003	69.91	1.558s
AC-228	3644.94	911.07	10.	45.	0.025	20.87	1.568s
AG-110M	3750.60	937.49	37.	-13.	-0.007	101.00	1.589s
PA-234	3784.70	946.02	19.	2.	0.001	398.21	1.595s
EU-152	3857.05	964.11	55.	8.	0.004	137.33	1.609s
AC-228	3876.30	968.93	3.	40.	0.022	17.55	0.812s
EU-154	3985.88	996.33	51.	5.	0.003	200.05	1.633s
EU-154	4019.65	1004.77	35.	-5.	-0.003	263.94	1.639s
Co-56	4151.87	1037.84	20.	-3.	-0.002	305.92	1.664s
Cs-136	4192.77	1048.07	12.	8.	0.005	69.10	1.671s
RH-106	4201.93	1050.36	21.	1.	0.000	835.41	1.673s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Ga-68	4310.04	1077.40	30.	-12.	-0.007	104.42	1.692s
FE-59	4397.41	1099.25	25.	-2.	-0.001	554.15	1.708s
EU-152	4448.68	1112.07	115.	-14.	-0.008	62.83	1.717s
ZN-65	4462.56	1115.55	101.	-13.	-0.007	112.87	1.720s
BI-214	4480.51	1120.04	3.	58.	0.032	13.75	1.501
Ta-182	4485.56	1121.30	79.	11.	0.006	122.00	1.724s
CO-60	4693.21	1173.24	15.	10.	0.005	95.23	1.760s
Ta-182	4756.42	1189.05	20.	12.	0.007	86.87	1.771
Ta-182	4885.79	1221.41	27.	7.	0.004	164.27	1.793
Co-56	4953.23	1238.28	43.	5.	0.003	281.74	1.804s
NA-22	5098.13	1274.53	27.	-2.	-0.001	444.97	1.828s
EU-154	5098.17	1274.54	28.	0.	0.000	1000.00	1.828s
FE-59	5166.35	1291.60	32.	-11.	-0.006	120.72	1.840s
TL-210	5251.91	1313.00	16.	-4.	-0.002	232.74	1.854s
CO-60	5329.85	1332.50	17.	1.	0.001	716.85	1.866s
AG-110M	5536.88	1384.30	16.	2.	0.001	460.07	1.899s
EU-152	5631.62	1408.00	11.	9.	0.005	85.44	1.914s
K-40	5841.43	1460.50	3.	229.	0.127	6.69	1.626
La-140	6383.73	1596.21	12.	-7.	-0.004	235.44	2.024s
SB-124	6762.39	1690.98	6.	-2.	-0.001	343.80	2.076s
BI-214	7056.06	1764.49	3.	46.	0.025	15.85	2.114s
Co-56	7083.46	1771.35	49.	0.	0.000	1000.00	2.117s

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	2.3282E+00				5.31E+01	
			477.60	2.328E+00	(P	1.600E+01 1.99E+02 1.05E+01	G
NA-22	C	-1.6184E-01				9.50E+02	
			1274.53	-1.618E-01	?(	2.600E+00 4.45E+02 9.99E+01	G
K-40	N	2.3382E+02				4.66E+11	
			1460.83	2.338E+02	(P	1.076E+01 6.69E+00 1.07E+01	G
Sc-46	F	1.4202E-02				8.38E+01	
			889.28	1.420E-02	%(	2.406E+00 4.73E+03 1.00E+02	G
			1120.55	-3.322E-07	%	4.043E+00 3.48E+08 1.00E+02	G
CR-51	F	3.9032E+00				2.77E+01	
			320.08	3.903E+00	(P	1.417E+01 1.08E+02 9.94E+00	G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

MN-54    C   8.1776E-01                                      3.12E+02
                          834.85 8.178E-01 &(P 8.917E-01 4.83E+01 1.00E+02 G

FE-59    F  -3.0331E-01                                      4.45E+01
                         1099.25-3.033E-01 ?(  3.945E+00 5.54E+02 5.65E+01 G
                         1291.60-2.499E+00 +   6.604E+00 1.21E+02 4.32E+01 G

Co-56    C  -5.5582E-01                                      7.73E+01
                          846.77-5.558E-01 ?(P 2.032E+00 7.30E+01 9.99E+01 G
                         1238.28 7.646E-01 +   4.752E+00 2.82E+02 6.61E+01 G
                         1037.84-1.789E+00 + P 1.364E+01 3.06E+02 1.41E+01 G
                         1771.35 0.000E+00 +   2.923E+01 1.00E+03 1.55E+01  A

CO-58    C   4.6812E-01                                      7.09E+01
                          810.78 4.681E-01 ?(P 1.559E+00 9.71E+01 9.95E+01 G

CO-60    F   4.9826E-01                                      1.93E+03
                         1332.50 1.299E-01 ?(P 2.193E+00 7.17E+02 1.00E+02 G
                         1173.24 8.669E-01 ?(P 1.904E+00 9.52E+01 9.99E+01 G

ZN-65    F  -2.2271E+00                                      2.44E+02
                         1115.55-2.227E+00 ?(  8.494E+00 1.13E+02 5.06E+01 G

NB-94    I  -1.0233E+00                                      7.41E+06
                          702.63-1.023E+00 ?(P 2.186E+00 1.71E+02 9.79E+01 G
                          871.10-3.528E-01 +   2.136E+00 1.73E+02 9.99E+01 G

ZR-95    I   3.8338E-01                                      6.40E+01
                          756.73 3.834E-01 ?(  2.806E+00 2.90E+02 5.45E+01 G
                          724.20-2.075E+00 + P 6.088E+00 1.92E+02 4.42E+01 G

NB-95    I  -5.1069E-02                                      6.40E+01
                          765.79-5.107E-02 %(  3.259E+00 1.84E+03 9.98E+01 G

RU-103   I  -3.1610E-01                                      3.93E+01
                          497.05-3.161E-01 ?(P 1.570E+00 1.55E+02 9.09E+01 G
                          610.30-1.508E+01 +   9.876E+01 1.95E+02 5.75E+00 GA

RH-106   I  -6.8545E+00                                      3.74E+02
                          621.92-8.585E+00 ?(  5.599E+01 1.94E+02 9.93E+00 G
                         1050.36 4.160E+00 ?(  1.278E+02 8.35E+02 1.56E+00 G
                          511.86 6.761E+00 ?   1.003E+01 4.60E+01 2.00E+01 GA

AG-108M  C   1.0391E+00                                      1.53E+05
                          433.94 1.039E+00 ?(P 1.192E+00 4.80E+01 9.05E+01 G
                          722.94 0.000E+00 -   2.699E+00 1.00E+03 9.08E+01 G
                          614.28-9.726E-01 -   6.254E+00 1.92E+02 8.98E+01 G
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Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
AG-110M	F 7.7472E-01					2.50E+02	
		884.68	7.474E-01	?(	3.008E+00	1.17E+02	7.27E+01 G
		657.76	1.962E-01	-	1.887E+00	2.73E+02	9.46E+01 G
		937.49	-2.909E+00	+	6.803E+00	1.01E+02	3.44E+01 G
		1384.30	8.566E-01	?(	9.144E+00	4.60E+02	2.43E+01 G
		763.94	-6.856E+00	+	1.539E+01	6.79E+01	2.23E+01 G
SN-113	F 2.2766E-01					1.15E+02	
		391.69	2.277E-01	?(	3.188E+00	4.08E+02	6.40E+01 G
SB-124	F -8.6881E-01					6.02E+01	
		602.73	-8.688E-01	?(	5.895E+00	2.02E+02	9.83E+01 G
		1690.98	-4.295E-01	+	3.557E+00	3.44E+02	4.78E+01 G
		722.79	-2.045E+00	+	2.208E+01	3.10E+02	1.08E+01 G
SB-125	I 1.4072E+00					1.01E+03	
		427.88	-1.446E+00	?(	4.773E+00	1.32E+02	2.96E+01 G
		600.50	-4.867E+00	+ P	3.281E+01	6.03E+01	1.79E+01 G
		635.89	-5.905E+00	+	1.359E+01	6.93E+01	1.13E+01 G
		463.37	9.473E+00	&(P	1.427E+01	4.70E+01	1.05E+01 G
I-131	I 2.9493E-01					8.02E+00	
		364.48	-8.334E-02	?(	1.553E+00	6.97E+02	8.17E+01 G
		284.30	3.759E+00	?(	1.877E+01	1.91E+02	6.14E+00 G
		636.97	1.639E+00	?(	2.660E+01	4.60E+02	7.17E+00 G
Gd-153	F 3.9688E-01					2.42E+02	
		97.50	3.969E-01	?(	3.407E+00	3.16E+02	3.00E+01 G
		103.20	-2.965E-03	&	5.575E+00	5.51E+04	2.18E+01 G
Ga-68	C -3.5938E+01					4.71E-02	
		1077.40	-3.594E+01	?(	8.456E+01	1.04E+02	3.30E+00 G
Tc-99m	I 3.9466E-01					2.51E-01	
		140.51	3.947E-01	?(	1.621E+00	1.23E+02	8.93E+01 G
BA-133	F -6.1871E-01					3.85E+03	
		356.00	-6.187E-01	?(	5.777E+00	2.78E+02	6.20E+01 G
		302.85	0.000E+00	+	1.729E+01	1.00E+03	1.83E+01 G
		383.84	5.342E+00	? P	2.086E+01	1.16E+02	8.94E+00 GA
		80.99	-1.354E+00	+ P	4.123E+00	8.41E+01	3.41E+01 GA
CS-134	I 8.2795E-01					7.54E+02	
		795.87	6.305E-01	*(P	2.306E+00	1.07E+02	8.55E+01 G
		604.71	-8.781E-01	+	5.862E+00	1.99E+02	9.76E+01 G
		569.32	1.926E+00	?(	7.725E+00	1.15E+02	1.54E+01 G
		801.95	-6.432E+00	+	2.808E+01	1.28E+02	8.69E+00 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
			563.24	0.000E+00	-	1.797E+01	1.00E+03	8.35E+00 G
CS-137	I	-1.0202E+00					1.10E+04	
			661.66	-1.020E+00	?(P	2.599E+00	1.88E+02	8.52E+01 G
CE-139	F	-4.9923E-01					1.38E+02	
			165.85	-4.992E-01	&(	1.797E+00	1.08E+02	7.99E+01 G
Ba-140	I	-1.1329E+00					1.28E+01	
			537.26	-2.893E+00	?(	6.749E+00	9.40E+01	2.44E+01 G
			162.66	5.768E+00	(	2.175E+01	1.13E+02	6.22E+00 G
			304.85	0.000E+00	+	7.427E+01	1.00E+03	4.29E+00 G
La-140	I	2.0410E-01					1.28E+01	
			1596.21	-8.016E-01	?(P	2.278E+00	2.35E+02	9.54E+01 G
			487.02	6.995E-01	?(P	2.462E+00	1.37E+02	4.55E+01 G
			328.76	1.642E+00	&(	6.080E+00	1.42E+02	2.03E+01 G
			815.77	2.103E+00	?(	7.671E+00	1.06E+02	2.33E+01 G
CE-141	I	-4.2999E-01					3.25E+01	
			145.44	-4.300E-01	&(	3.162E+00	2.18E+02	4.82E+01 G
CE-144	I	-3.2056E+00					2.85E+02	
			133.54	-3.206E+00	?(	1.479E+01	1.38E+02	1.11E+01 G
PM-144	C	1.8836E-01					3.63E+02	
			696.54	-3.345E-01	?(	1.780E+00	2.16E+02	9.90E+01 G
			618.06	7.107E-01	?(P	5.196E+00	2.17E+02	9.91E+01 G
EU-152	F	2.1238E+00					4.94E+03	
			121.78	9.944E-02	&(	4.193E+00	1.24E+03	2.86E+01 G
			344.29	-1.093E+00	+	8.584E+00	2.32E+02	2.65E+01 G
			1112.07	-8.742E+00	+ P	3.338E+01	6.28E+01	1.36E+01 G
			778.92	-2.149E+00	+	1.251E+01	2.41E+02	1.29E+01 G
			964.11	4.155E+00	?(	1.958E+01	1.37E+02	1.46E+01 G
			244.69	5.843E+00	&(	3.714E+01	1.90E+02	7.58E+00 G
			1408.00	4.723E+00	&	9.008E+00	8.54E+01	2.10E+01 GA
EU-154	I	7.3269E-02					3.14E+03	
			123.10	-9.070E-01	&(	2.932E+00	9.68E+01	4.08E+01 G
			1274.54	0.000E+00	+	7.588E+00	1.00E+03	3.52E+01 G
			723.36	0.000E+00	+	1.213E+01	1.00E+03	2.02E+01 G
			873.23	-5.756E-01	+	1.894E+01	9.22E+02	1.23E+01 G
			1004.77	-2.206E+00	+	1.336E+01	2.64E+02	1.80E+01 G
			996.33	3.845E+00	?(	2.674E+01	2.00E+02	1.06E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	I	5.6802E-01					1.81E+03	
			105.31	-1.448E-01	&(	5.543E+00	1.12E+03	2.12E+01 G
			86.54	1.060E+00	(	6.997E+00	1.97E+02	3.07E+01 G
HF-181	F	7.0658E-01					4.24E+01	
			482.00	2.491E-01	?(	2.216E+00	2.57E+02	8.05E+01 G
			133.02	-8.779E-01	+	4.183E+00	1.43E+02	4.33E+01 G
			345.83	3.151E+00	&(	1.376E+01	1.30E+02	1.51E+01 G
			136.30	-6.260E+00	&	2.835E+01	1.35E+02	5.85E+00 G
Ta-182	F	3.4755E+00					1.14E+02	
			1121.30	2.663E+00	?(	1.104E+01	1.22E+02	3.49E+01 G
			1221.41	2.543E+00	(	9.284E+00	1.64E+02	2.70E+01 G
			1189.05	6.780E+00	(	1.331E+01	8.69E+01	1.62E+01 G
Hg-203	F	-2.5678E-01					4.66E+01	
			279.20	-2.568E-01	?(	1.882E+00	2.15E+02	8.15E+01 G
TL-208	N	4.6154E+00					6.98E+02	
			583.02	4.589E+00	(	1.201E+00	1.44E+01	8.45E+01 G
			277.28	4.969E+00	(P	1.957E+01	1.16E+02	6.31E+00 G
			860.56	-2.900E+00	- P	1.541E+01	5.96E+01	1.24E+01 G
PM-146	C	1.0254E+00					2.02E+03	
			453.88	-9.417E-02	?(P	2.211E+00	7.69E+02	6.50E+01 G
			747.16	-1.502E+00	+ P	4.845E+00	1.65E+02	3.40E+01 G
			735.72	4.260E+00	?(	3.374E+00	3.71E+01	2.25E+01 G
Y-88	F	-3.6394E-02					1.07E+02	
			1836.06	-3.639E-02	%(P	9.809E-01	2.67E+03	9.92E+01 G
			898.04	-4.144E-01	& P	2.465E+00	6.99E+01	9.37E+01 G
Cd-113m		5.8567E+03					5.33E+03	
			263.70	5.857E+03	(	1.683E+04	8.56E+01	6.00E-03 K
Cf-251	T	-2.5250E+00					3.28E+05	
			176.60	-2.525E+00	(	7.038E+00	1.04E+02	1.70E+01 G
			227.00	3.405E+00		1.770E+01	1.90E+02	6.30E+00 GA
Cf-249	T	1.1145E+00					1.28E+05	
			387.95	7.338E-01	?(	3.006E+00	1.21E+02	6.60E+01 G
			333.44	2.734E+00	?(	7.111E+00	1.00E+02	1.55E+01 G
Sn-126		-5.5404E-01					3.65E+07	
			87.57	8.788E-01	?	5.697E+00	1.94E+02	3.75E+01 GA
			64.28	-5.540E-01	(	1.790E+01	9.52E+02	9.70E+00 G
			86.94	4.408E+00	}	2.353E+01	8.09E+01	9.04E+00 GA

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PB-210	N 4.2656E+01					8.14E+03	
		46.54	4.266E+01	*(P	3.442E+01	3.06E+01	4.25E+00 G
PB-212	N 1.2375E+01					6.98E+02	
		238.63	1.237E+01	(P	1.948E+00	8.02E+00	4.33E+01 G
		300.03	1.238E+01	& P	9.458E+01	2.28E+02	3.28E+00 GA
PB-214	N 3.5333E+01					5.84E+05	
		351.93	3.599E+01	(P	3.009E+00	5.99E+00	3.76E+01 G
		295.09	3.404E+01	(P	4.480E+00	8.19E+00	1.93E+01 G
		242.00	3.349E+01	P	1.298E+01	1.48E+01	7.43E+00 GA
BI-207	C 6.9201E-02					1.18E+04	
		1063.66	6.920E-02	%(P	2.348E+00	1.39E+03	7.45E+01 G
		569.70	-9.037E-09	%	1.427E+00	4.33E+09	9.77E+01 G
BI-212	N 2.7824E+00					6.98E+02	
		727.17	2.782E+00	?(P	3.782E+01	3.93E+02	7.55E+00 G
		785.42	-1.692E+01	+ P	1.668E+02	4.08E+02	1.28E+00 GA
U-235	N 4.3014E+00					2.57E+11	
		143.79	2.833E+00	?(	1.337E+01	1.41E+02	1.10E+01 G
		205.33	7.513E+00	?(P	2.188E+01	1.08E+02	5.01E+00 G
		163.38	-3.915E+00	& P	2.582E+01	2.17E+02	5.08E+00 G
		185.72	-7.522E-01	-	2.747E+00	1.09E+02	5.40E+01 GA
BI-214	N 3.5612E+01					5.84E+05	
		609.31	3.550E+01	(P	2.409E+00	6.06E+00	4.61E+01 G
		1120.29	3.357E+01	(P	6.045E+00	1.38E+01	1.51E+01 G
		1764.49	3.794E+01	?(P	9.193E+00	1.58E+01	1.54E+01 G
BI-210M	T 2.4424E-01					1.10E+09	
		265.83	2.442E-01	?(	2.600E+00	3.09E+02	5.00E+01 G
		304.90	0.000E+00	-	1.138E+01	1.00E+03	2.80E+01 G
AC-228	N 1.4140E+01					2.10E+03	
		911.07	1.137E+01	?(P	4.393E+00	2.09E+01	2.90E+01 G
		968.97	1.780E+01	(	4.555E+00	1.76E+01	1.75E+01 G
		338.32	1.551E+01	@(P	8.047E+00	2.37E+01	1.20E+01 G
		93.35	2.288E+01	*	1.634E+01	2.89E+01	5.56E+00 XA
TH-227	N -7.2598E-01					7.95E+03	
		256.24	-7.260E-01	(	1.685E+01	8.80E+02	7.00E+00 G
		235.97	-3.703E+00	+	2.335E+01	1.88E+02	1.23E+01 G
		50.14	-4.944E+00	+ P	2.046E+01	1.25E+02	8.00E+00 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-229	N	7.6820E-01					2.68E+06	
			193.51	-6.408E+00	?(	2.648E+01	1.53E+02	4.40E+00 G
			210.85	1.133E+01	?(	3.938E+01	1.29E+02	2.99E+00 G
TH-234	N	-1.0667E+01					1.63E+12	
			92.59	-1.067E+01	(P	3.730E+01	6.36E+01	5.58E+00 G
			63.29	2.009E+00	+ P	4.203E+01	7.25E+02	3.81E+00 G
PA-233	C	1.1514E+00					7.82E+08	
			312.01	1.151E+00	&(P	8.722E+00	2.26E+02	3.60E+01 G
			300.18	0.000E+00	-	5.073E+01	1.00E+03	6.20E+00 G
PA-234	N	4.4144E+00					1.63E+12	
			131.29	3.757E+00	(	3.816E+00	3.27E+01	1.80E+01 G
			946.02	1.315E+00	-	1.288E+01	3.98E+02	1.34E+01 G
			569.47	-3.111E+00	-	1.827E+01	1.68E+02	8.20E+00 G
			883.24	5.647E+00	?(	2.041E+01	1.05E+02	9.60E+00 G
			880.53	8.999E+00	?	3.197E+01	1.04E+02	6.00E+00 GA
PA-234M	N	5.3713E+01					1.63E+12	
			1001.00	-3.832E+00	&(P	3.568E+02	2.33E+03	8.37E-01 G
			766.41	2.175E+02	?(	7.560E+02	1.02E+02	2.94E-01 G
AM-241	T	-1.6549E+00					1.58E+05	
			59.54	-1.655E+00	?(P	4.595E+00	6.74E+01	3.59E+01 G
Np-237	F	3.0477E+00					2.14E+06	
							Derived Ave Activity	
			86.49	3.048E+00	}(	1.614E+01	1.59E+02	1.31E+01 G
Ir-192	F	1.9163E-01					7.40E+01	
			316.49	-4.406E-01	?(	1.918E+00	1.29E+02	8.70E+01 G
			468.06	5.658E-01	?(	3.782E+00	1.95E+02	5.18E+01 G
			308.44	1.315E+00	?(	9.500E+00	2.15E+02	3.18E+01 G
Cs-136	F	1.5285E-01					1.30E+01	
			818.50	-4.010E-01	?(	2.472E+00	1.78E+02	1.00E+02 G
			1048.07	8.452E-01	?(	1.940E+00	6.91E+01	8.00E+01 G
			340.57	-1.149E+00	+	4.989E+00	1.29E+02	4.69E+01 G
Np-239	T	-9.5374E-01					2.36E+00	
			103.70	-1.283E+00	+	5.152E+00	1.20E+02	2.40E+01 X
			106.13	-9.537E-01	?(	5.706E+00	1.78E+02	2.27E+01 G
			99.50	-8.250E-01	+	7.954E+00	2.84E+02	1.50E+01 X

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

Nd-147       1.7916E+00                                        1.11E+01
                          531.00 1.792E+00 &(  1.042E+01 2.26E+02 1.30E+01 G
                           91.10 0.000E+00 -   7.528E+00 1.00E+03 2.83E+01 G

TL-210   N   8.8381E-02                                        5.84E+05
                          799.60 8.838E-02 ?(  2.075E+00 6.57E+02 9.90E+01 G
                          296.00-5.530E-01 +   4.097E+00 2.21E+02 7.90E+01 G
                         1313.00-1.895E+00 +   1.012E+01 2.33E+02 2.10E+01 GA

Kr-85    I   1.3601E+02                                        3.92E+03
                          513.98 1.360E+02 ?(  4.983E+02 1.08E+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	147.	-14.	-0.008	125.04	-4.944E+00	P
AM-241	59.54	242.	-27.	-0.015	67.40	-1.655E+00	P
TH-234	63.29	262.	4.	0.002	725.34	2.009E+00	P
BA-133	80.99	304.	-28.	-0.015	84.07	-1.354E+00	P
EU-155	86.54	780.	20.	0.011	197.43	1.060E+00	
TH-234	92.59	773.	-38.	-0.021	63.60	-1.067E+01	P
Gd-153	97.50	183.	8.	0.004	316.35	3.969E-01	
Np-239	99.50	255.	-8.	-0.004	284.50	-8.250E-01	
Np-239	103.70	278.	-20.	-0.011	119.89	-1.283E+00	
Np-239	106.13	307.	-14.	-0.008	177.74	-9.537E-01	
EU-154	123.10	254.	-24.	-0.013	96.83	-9.070E-01	
HF-181	133.02	569.	-24.	-0.013	142.63	-8.779E-01	
CE-144	133.54	463.	-22.	-0.012	138.01	-3.206E+00	
HF-181	136.30	465.	-23.	-0.013	135.46	-6.260E+00	
CO-57	136.47	500.	-24.	-0.013	133.36	-3.611E+00	
Tc-99m	140.51	321.	21.	0.012	122.72	3.947E-01	
U-235	143.79	342.	19.	0.010	140.70	2.833E+00	
CE-141	145.44	366.	-13.	-0.007	218.43	-4.300E-01	
Ba-140	162.66	246.	20.	0.011	112.57	5.768E+00	
U-235	163.38	229.	-11.	-0.006	217.10	-3.915E+00	P
CE-139	165.85	282.	-22.	-0.012	107.69	-4.992E-01	
Cf-251	176.60	173.	-23.	-0.013	104.04	-2.525E+00	
U-235	185.72	249.	-21.	-0.012	109.10	-7.522E-01	
TH-229	193.51	140.	-14.	-0.008	152.75	-6.408E+00	
U-235	205.33	111.	18.	0.010	107.89	7.513E+00	P
TH-229	210.85	123.	16.	0.009	128.65	1.133E+01	
Cf-251	227.00	97.	9.	0.005	190.29	3.405E+00	
TH-227	235.97	644.	-19.	-0.011	188.45	-3.703E+00	
EU-152	244.69	582.	18.	0.010	189.84	5.843E+00	
TH-227	256.24	88.	-2.	-0.001	880.34	-7.260E-01	
Cd-113m	263.70	60.	14.	0.008	85.56	5.857E+03	
BI-210M	265.83	101.	5.	0.003	308.86	2.442E-01	
Hg-203	279.20	132.	-8.	-0.004	214.72	-2.568E-01	
I-131	284.30	70.	8.	0.005	190.56	3.759E+00	
TL-210	296.00	560.	-15.	-0.008	220.94	-5.530E-01	
Ir-192	308.44	452.	14.	0.008	215.09	1.315E+00	
PA-233	312.01	481.	14.	0.008	225.58	1.151E+00	P
Ir-192	316.49	127.	-13.	-0.007	128.76	-4.406E-01	
CR-51	320.08	87.	13.	0.007	107.50	3.903E+00	P
La-140	328.76	62.	11.	0.006	141.82	1.642E+00	
Cf-249	333.44	48.	13.	0.007	100.09	2.734E+00	
Cs-136	340.57	226.	-17.	-0.009	129.20	-1.149E+00	
EU-152	344.29	209.	-9.	-0.005	231.56	-1.093E+00	
HF-181	345.83	171.	15.	0.008	129.55	3.151E+00	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BA-133	356.00	504.	-12.	-0.006	277.78	-6.187E-01	
I-131	364.48	55.	-2.	-0.001	697.32	-8.334E-02	
BA-133	383.84	114.	13.	0.007	115.68	5.342E+00	P
Cf-249	387.95	127.	14.	0.008	121.30	7.338E-01	
SN-113	391.69	133.	4.	0.002	407.61	2.277E-01	
SB-125	427.88	52.	-11.	-0.006	131.84	-1.446E+00	
AG-108M	433.94	28.	24.	0.013	48.00	1.039E+00	P
PM-146	453.88	48.	-1.	-0.001	769.05	-9.417E-02	P
SB-125	463.37	51.	24.	0.013	46.98	9.473E+00	P
Ir-192	468.06	89.	7.	0.004	194.75	5.658E-01	
BE-7	477.59	62.	6.	0.003	198.75	2.328E+00	P
HF-181	482.00	69.	5.	0.003	256.55	2.491E-01	
La-140	487.02	25.	7.	0.004	136.68	6.995E-01	P
RU-103	497.05	41.	-7.	-0.004	154.93	-3.161E-01	P
RH-106	511.86	80.	30.	0.017	46.04	6.761E+00	
Kr-85	513.98	91.	13.	0.007	108.44	1.360E+02	
Nd-147	531.00	32.	5.	0.003	225.98	1.792E+00	
Ba-140	537.26	48.	-15.	-0.008	94.04	-2.893E+00	
CS-134	569.32	21.	6.	0.003	115.47	1.926E+00	
SB-125	600.50	566.	-17.	-0.009	60.29	-4.867E+00	P
SB-124	602.73	549.	-16.	-0.009	202.43	-8.688E-01	
CS-134	604.71	532.	-17.	-0.009	199.15	-8.781E-01	
RU-103	610.30	516.	-17.	-0.009	195.38	-1.508E+01	
AG-108M	614.28	499.	-17.	-0.009	191.77	-9.726E-01	
PM-144	618.06	413.	13.	0.007	217.45	7.107E-01	P
RH-106	621.92	478.	-16.	-0.009	194.39	-8.585E+00	
SB-125	635.89	30.	-12.	-0.007	69.28	-5.905E+00	
I-131	636.97	48.	2.	0.001	459.61	1.639E+00	
AG-110M	657.76	40.	3.	0.002	272.76	1.962E-01	
CS-137	661.66	63.	-16.	-0.009	187.61	-1.020E+00	P
PM-144	696.54	35.	-6.	-0.003	216.21	-3.345E-01	
NB-94	702.63	52.	-17.	-0.009	171.24	-1.023E+00	P
SB-124	722.79	63.	-4.	-0.002	309.76	-2.045E+00	
ZR-95	724.20	81.	-15.	-0.008	192.16	-2.075E+00	P
BI-212	727.17	91.	3.	0.002	392.56	2.782E+00	P
PM-146	735.72	4.	16.	0.009	37.07	4.260E+00	
PM-146	747.16	26.	-8.	-0.005	165.49	-1.502E+00	P
ZR-95	756.73	22.	3.	0.002	290.26	3.834E-01	
AG-110M	763.94	123.	-24.	-0.013	67.86	-6.856E+00	
PA-234M	766.41	48.	10.	0.006	102.28	2.175E+02	
EU-152	778.92	23.	-4.	-0.002	241.30	-2.149E+00	
BI-212	785.42	42.	-3.	-0.002	407.75	-1.692E+01	P
CS-134	795.87	35.	8.	0.005	106.91	6.305E-01	P
TL-210	799.60	38.	1.	0.001	656.70	8.838E-02	
CS-134	801.95	54.	-8.	-0.005	127.53	-6.432E+00	
CO-58	810.78	20.	7.	0.004	97.07	4.681E-01	P
La-140	815.77	27.	7.	0.004	106.09	2.103E+00	
Cs-136	818.50	54.	-6.	-0.003	178.11	-4.010E-01	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
MN-54	834.85	5.	12.	0.007	48.32	8.178E-01		P
Co-56	846.77	33.	-8.	-0.004	73.03	-5.558E-01		P
NB-94	871.10	35.	-5.	-0.003	173.21	-3.528E-01		
EU-154	873.23	42.	-1.	-0.001	921.95	-5.756E-01		
AG-110M	884.68	36.	8.	0.004	117.08	7.474E-01		
Y-88	898.04	39.	-5.	-0.003	69.91	-4.144E-01		P
AG-110M	937.49	37.	-13.	-0.007	101.00	-2.909E+00		
EU-152	964.11	55.	8.	0.004	137.33	4.155E+00		
EU-154	996.33	51.	5.	0.003	200.05	3.845E+00		
EU-154	1004.77	35.	-5.	-0.003	263.94	-2.206E+00		
Co-56	1037.84	20.	-3.	-0.002	305.92	-1.789E+00		P
Cs-136	1048.07	12.	8.	0.005	69.10	8.452E-01		
RH-106	1050.36	21.	1.	0.000	835.41	4.160E+00		
Ga-68	1077.40	30.	-12.	-0.007	104.42	-3.594E+01		
FE-59	1099.25	25.	-2.	-0.001	554.15	-3.033E-01		
EU-152	1112.07	115.	-14.	-0.008	62.83	-8.742E+00		P
ZN-65	1115.55	101.	-13.	-0.007	112.87	-2.227E+00		
Ta-182	1121.30	79.	11.	0.006	122.00	2.663E+00		
CO-60	1173.24	15.	10.	0.005	95.23	8.669E-01		P
Ta-182	1189.05	20.	12.	0.007	86.87	6.780E+00		
Ta-182	1221.41	27.	7.	0.004	164.27	2.543E+00		
Co-56	1238.28	43.	5.	0.003	281.74	7.646E-01		
NA-22	1274.53	27.	-2.	-0.001	444.97	-1.618E-01		
FE-59	1291.60	32.	-11.	-0.006	120.72	-2.499E+00		
TL-210	1313.00	16.	-4.	-0.002	232.74	-1.895E+00		
CO-60	1332.50	17.	1.	0.001	716.85	1.299E-01		P
AG-110M	1384.30	16.	2.	0.001	460.07	8.566E-01		
EU-152	1408.00	11.	9.	0.005	85.44	4.723E+00		
La-140	1596.21	12.	-7.	-0.004	235.44	-8.016E-01		P
SB-124	1690.98	6.	-2.	-0.001	343.80	-4.295E-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	2.3282E+00	2.3282E+00	1.987E+02%	1.60E+01
NA-22	#A	-1.6184E-01	-1.6184E-01	4.450E+02%	2.60E+00
K-40		2.3382E+02	2.3382E+02	6.690E+00%	1.08E+01
Sc-46	#A	1.4202E-02	1.4202E-02	4.732E+03%	2.41E+00
CR-51	#A	3.9032E+00	3.9032E+00	1.075E+02%	1.42E+01
MN-54	#A	8.1776E-01	8.1776E-01	4.832E+01%	8.92E-01
FE-59	#A	-3.0331E-01	-3.0331E-01	5.542E+02%	3.94E+00
Co-56	#A	-5.5582E-01	-5.5582E-01	7.303E+01%	2.03E+00
CO-57	#A	0.0000E+00	0.0000E+00	1.000E+03%	1.41E+00
CO-58	#A	4.6812E-01	4.6812E-01	9.707E+01%	1.56E+00

CO-60	#A	4.9826E-01	4.9826E-01	9.523E+01%	2.19E+00
ZN-65	#A	-2.2271E+00	-2.2271E+00	1.129E+02%	8.49E+00
NB-94	#A	-1.0233E+00	-1.0233E+00	1.712E+02%	2.19E+00
ZR-95	#A	3.8338E-01	3.8338E-01	2.903E+02%	2.81E+00
NB-95	#A	-5.1068E-02	-5.1069E-02	1.838E+03%	3.26E+00
RU-103	#A	-3.1610E-01	-3.1610E-01	1.549E+02%	1.57E+00
RH-106	#A	-6.8545E+00	-6.8545E+00	1.944E+02%	5.60E+01
AG-108M	#A	1.0391E+00	1.0391E+00	4.800E+01%	1.19E+00
AG-110M	#A	7.7472E-01	7.7472E-01	1.171E+02%	3.01E+00
SN-113	#A	2.2765E-01	2.2766E-01	4.076E+02%	3.19E+00
SB-124	#A	-8.6880E-01	-8.6881E-01	2.024E+02%	5.89E+00
SB-125	#A	1.4072E+00	1.4072E+00	4.698E+01%	4.77E+00
I-131	#A	2.9492E-01	2.9493E-01	1.906E+02%	1.55E+00
Gd-153	#A	3.9688E-01	3.9688E-01	3.163E+02%	3.41E+00
Ga-68	#A	-3.5591E+01	-3.5938E+01	1.044E+02%	8.46E+01
Tc-99m	#A	3.9395E-01	3.9466E-01	1.227E+02%	1.62E+00
BA-133	#A	-6.1871E-01	-6.1871E-01	2.778E+02%	5.78E+00
CS-134	#A	8.2795E-01	8.2795E-01	7.868E+01%	2.31E+00
CS-137	#A	-1.0202E+00	-1.0202E+00	1.876E+02%	2.60E+00
CE-139	#A	-4.9922E-01	-4.9923E-01	1.077E+02%	1.80E+00
Ba-140	#A	-1.1329E+00	-1.1329E+00	7.334E+01%	6.75E+00
La-140	#A	2.0409E-01	2.0410E-01	8.119E+01%	2.28E+00
CE-141	#A	-4.2998E-01	-4.2999E-01	2.184E+02%	3.16E+00
CE-144	#A	-3.2056E+00	-3.2056E+00	1.380E+02%	1.48E+01
PM-144	#A	1.8836E-01	1.8836E-01	1.533E+02%	1.78E+00
EU-152	#A	2.1238E+00	2.1238E+00	1.373E+02%	4.19E+00
EU-154	#A	7.3269E-02	7.3269E-02	9.683E+01%	2.93E+00
EU-155	#A	5.6802E-01	5.6802E-01	1.974E+02%	5.54E+00
HF-181	#A	7.0658E-01	7.0658E-01	1.296E+02%	2.22E+00
Ta-182	#A	3.4755E+00	3.4755E+00	7.410E+01%	1.10E+01
Hg-203	#A	-2.5677E-01	-2.5678E-01	2.147E+02%	1.88E+00
TL-208		4.6154E+00	4.6154E+00	1.444E+01%	1.20E+00
PM-146	#A	1.0254E+00	1.0254E+00	3.707E+01%	2.21E+00
Y-88	#A	-3.6394E-02	-3.6394E-02	2.668E+03%	9.81E-01
Cd-113m	#A	5.8567E+03	5.8567E+03	8.556E+01%	1.68E+04
Cd-109	#A	0.0000E+00	0.0000E+00	1.000E+03%	5.70E+01
Cf-251	#A	-2.5250E+00	-2.5250E+00	1.040E+02%	7.04E+00
Cf-249	#A	1.1145E+00	1.1145E+00	7.863E+01%	3.01E+00
Sn-126	#A	-5.5404E-01	-5.5404E-01	9.516E+02%	1.79E+01
PB-210	#	4.2656E+01	4.2656E+01	3.065E+01%	3.44E+01
PB-212		1.2375E+01	1.2375E+01	8.017E+00%	1.95E+00
PB-214		3.5333E+01	3.5333E+01	5.073E+00%	3.01E+00
BI-207	#A	6.9201E-02	6.9201E-02	1.391E+03%	2.35E+00
BI-212	#A	2.7824E+00	2.7824E+00	3.926E+02%	3.78E+01
U-235	#A	4.3014E+00	4.3014E+00	8.865E+01%	1.34E+01
BI-214		3.5612E+01	3.5612E+01	6.060E+00%	2.41E+00
BI-210M	#A	2.4424E-01	2.4424E-01	3.089E+02%	2.60E+00
AC-228		1.4140E+01	1.4140E+01	1.204E+01%	4.39E+00
TH-227	#A	-7.2598E-01	-7.2598E-01	8.803E+02%	1.69E+01

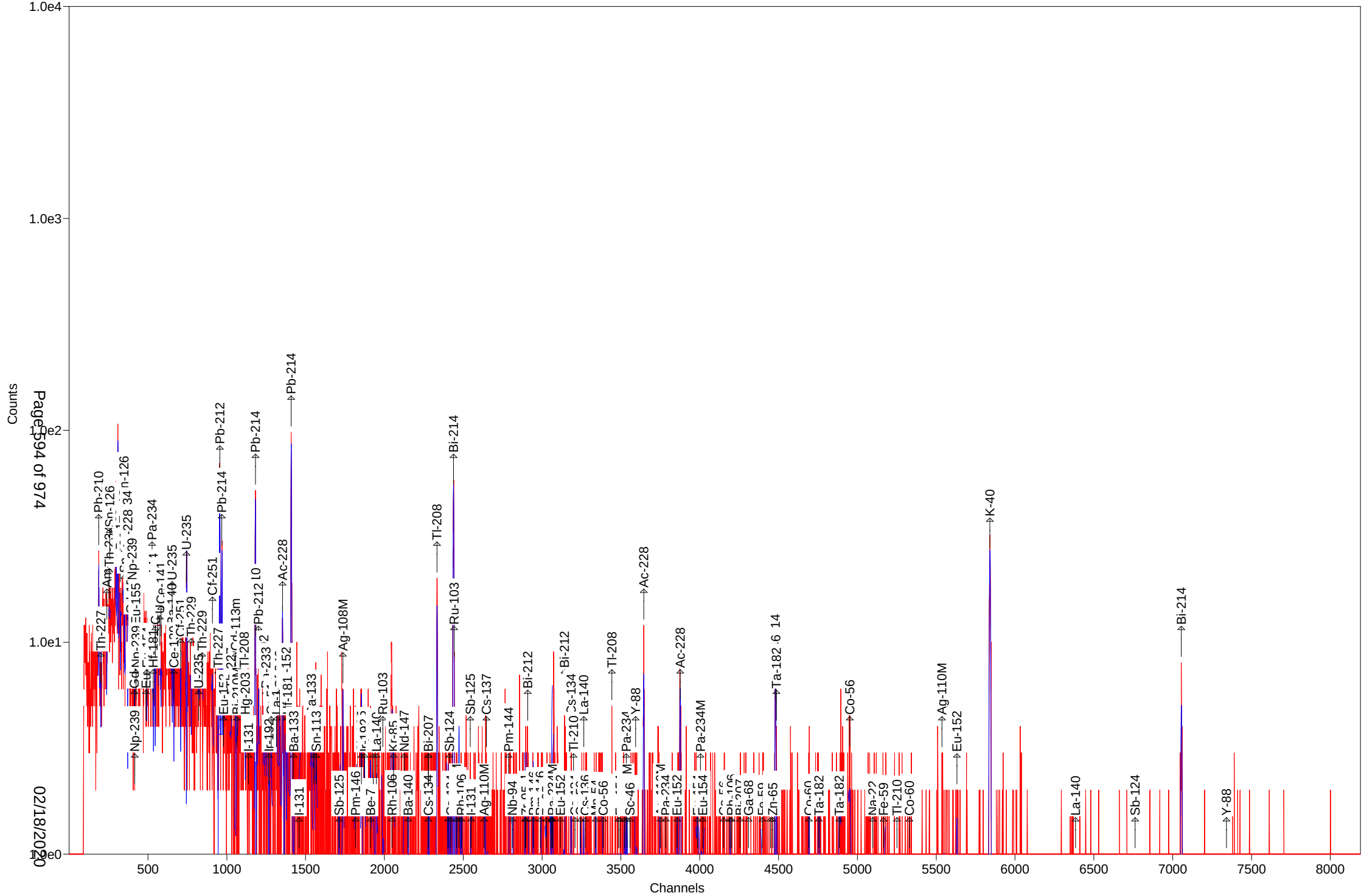
TH-229 #A	7.6820E-01	7.6820E-01	9.985E+01%		2.65E+01
TH-234 #A	-1.0667E+01	-1.0667E+01	6.360E+01%		3.73E+01
PA-231 #A	0.0000E+00	0.0000E+00	7.071E+02%		1.10E+02
PA-233 #A	1.1514E+00	1.1514E+00	2.256E+02%		8.72E+00
PA-234 #	4.4144E+00	4.4144E+00	3.270E+01%		3.82E+00
PA-234M#A	5.3713E+01	5.3713E+01	1.023E+02%		3.57E+02
AM-241 #A	-1.6549E+00	-1.6549E+00	6.740E+01%		4.59E+00
Np-237 #A	3.0477E+00	3.0477E+00	1.587E+02%		1.61E+01
Ir-192 #A	1.9163E-01	1.9163E-01	1.058E+02%		1.92E+00
Cs-136 #A	1.5284E-01	1.5285E-01	6.910E+01%		2.47E+00
Np-239 #A	-9.5355E-01	-9.5374E-01	1.777E+02%		5.71E+00
Nd-147 #A	1.7915E+00	1.7916E+00	2.260E+02%		1.04E+01
TL-210 #A	8.8381E-02	8.8381E-02	6.567E+02%		2.08E+00
Kr-85 #A	1.3601E+02	1.3601E+02	1.084E+02%		4.98E+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) 3.830E+02 Bq/Sample
Total Decayed Activity (37.6 to 2000.8 keV) 3.8296689E+02 Bq/Sample

453329_Gamma_160-36593-A-6-B. 5_Gamma_20193407.spc.



Test America St. Louis Spectrum ID: 9_Gamma_20193884

Sample Description: 453329_Gamma_160-36593-A-7-B
Detector: Detector # 9
Batch ID: 453329
Work Order Number: Gamma
Lot Number: 160-36593-A-7-B

Decay to Time: 12/27/2019 09:30 Live Time: 1800 sec
Acquisition Time: 12/27/2019 09:30:54 Real Time: 1802 sec
Analysis Time: 12/27/2019 10:01 Dead Time: 0.12 %
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_2019-12-07_1444.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	-5.091E+00	99.9	5.086E+00	5.092E+00	1.700E+01
NA-22	-1.070E+00	52.9	5.664E-01	5.689E-01	1.838E+00
K-40	2.383E+02	4.8	1.148E+01	1.675E+01	8.406E+00
Sc-46	6.117E-01	98.9	6.051E-01	6.059E-01	2.033E+00
CR-51	-2.355E-01	1696.5	3.995E+00	3.995E+00	2.679E+01
MN-54	-4.530E-01	106.5	4.823E-01	4.828E-01	1.479E+00
FE-59	-2.952E-01	302.5	8.931E-01	8.932E-01	2.515E+00
Co-56	9.216E-01	29.0	2.676E-01	2.717E-01	1.263E+00
CO-57	-2.395E-01	130.4	3.122E-01	3.124E-01	1.046E+00
CO-58	-1.440E-01	252.5	3.636E-01	3.637E-01	1.272E+00
CO-60	0.000E+00	1.#INF	5.291E-02	5.291E-02	1.160E+00
ZN-65	-1.666E+00	111.2	1.853E+00	1.855E+00	6.215E+00
NB-94	4.866E-01	92.3	4.491E-01	4.498E-01	1.508E+00
ZR-95	6.862E-01	113.5	7.791E-01	7.799E-01	1.761E+00
NB-95	7.295E-01	74.9	5.464E-01	5.477E-01	1.816E+00
RU-103	-6.282E-01	89.2	5.604E-01	5.613E-01	1.318E+00
RH-106	-5.385E+00	215.4	1.160E+01	1.160E+01	3.879E+01
AG-108M	2.652E-01	146.1	3.874E-01	3.877E-01	1.003E+00
AG-110M	4.074E-01	85.6	3.487E-01	3.493E-01	3.130E+00
SN-113	-5.781E-01	119.7	6.919E-01	6.925E-01	2.323E+00
SB-124	8.346E-01	77.0	6.426E-01	6.441E-01	3.402E+00
SB-125	1.198E+00	87.1	1.043E+00	1.044E+00	3.128E+00
I-131	4.876E-01	45.5	2.218E-01	2.232E-01	1.131E+00
Gd-153	-1.330E+00	168.0	2.235E+00	2.237E+00	7.426E+00
Ga-68	-2.644E+00	708.5	1.873E+01	1.873E+01	4.247E+01
Tc-99m	-4.690E-01	141.7	6.648E-01	6.653E-01	2.210E+00
BA-133	-6.907E-01	184.9	1.277E+00	1.278E+00	4.265E+00
CS-134	-7.517E-01	77.3	5.811E-01	5.824E-01	1.937E+00
CS-137	-1.431E-01	384.6	5.503E-01	5.504E-01	1.895E+00
CE-139	-1.468E-01	267.3	3.922E-01	3.925E-01	1.606E+00
Ba-140	1.396E+00	107.9	1.506E+00	1.508E+00	3.628E+00
La-140	2.859E-01	55.5	1.586E-01	1.594E-01	1.640E+00
CE-141	-8.643E-01	135.6	1.172E+00	1.173E+00	3.896E+00

CE-144	2.833E+00	146.7	4.158E+00	4.160E+00	1.385E+01
PM-144	-9.044E-02	163.1	1.475E-01	1.476E-01	1.576E+00
EU-152	7.232E-01	121.4	8.782E-01	8.790E-01	2.943E+00
EU-154	1.613E+00	70.4	1.136E+00	1.139E+00	1.990E+00
EU-155	0.000E+00	1.#INF	5.121E-01	5.121E-01	1.063E+01
HF-181	6.969E-02	77.3	5.389E-02	5.401E-02	2.336E+00
Ta-182	2.139E+00	105.3	2.253E+00	2.256E+00	7.573E+00
Hg-203	4.463E-01	82.6	3.685E-01	3.694E-01	1.228E+00
TL-208	4.398E+00	12.2	5.382E-01	5.846E-01	8.631E-01
PM-146	1.073E+00	51.1	5.483E-01	5.510E-01	1.306E+00
Y-88	1.565E-01	397.5	6.222E-01	6.223E-01	1.341E+00
Cd-113m	9.730E+02	545.7	5.310E+03	5.310E+03	1.813E+04
Cd-109	0.000E+00	1.#INF	1.800E+01	1.800E+01	5.982E+01
Cf-251	-1.341E+00	165.6	2.221E+00	2.224E+00	5.672E+00
Cf-249	2.732E-01	229.4	6.267E-01	6.268E-01	2.128E+00
Sn-126	5.492E+00	49.6	2.724E+00	2.739E+00	8.875E+00
PB-210	1.270E+01	115.7	1.470E+01	1.472E+01	4.909E+01
PB-212	1.116E+01	7.0	7.860E-01	1.067E+00	1.681E+00
PB-214	3.162E+01	3.9	1.242E+00	2.060E+00	2.115E+00
BI-207	-6.132E-01	138.0	8.460E-01	8.466E-01	1.851E+00
BI-212	3.437E+00	118.6	4.077E+00	4.081E+00	1.400E+01
U-235	-3.756E+00	139.4	5.237E+00	5.240E+00	1.741E+01
BI-214	2.998E+01	5.9	1.755E+00	2.346E+00	2.301E+00
BI-210M	6.565E-01	85.0	5.582E-01	5.595E-01	1.862E+00
AC-228	1.360E+01	9.3	1.269E+00	1.446E+00	2.659E+00
TH-227	5.189E+00	72.8	3.779E+00	3.792E+00	1.141E+01
TH-229	4.641E+00	165.9	7.701E+00	7.710E+00	2.152E+01
TH-234	-7.272E+00	66.7	4.850E+00	4.867E+00	4.017E+01
PA-231	0.000E+00	1.#INF	4.463E+00	4.463E+00	8.888E+01
PA-233	0.000E+00	1.#INF	4.382E-01	4.382E-01	7.261E+00
PA-234	1.507E+00	142.3	2.145E+00	2.146E+00	8.218E+00
PA-234M	5.127E+01	71.7	3.674E+01	3.683E+01	2.116E+02
AM-241	1.295E+00	121.1	1.569E+00	1.570E+00	5.226E+00
Np-237	0.000E+00	1.#INF	5.121E+00	5.121E+00	1.702E+01
Ir-192	0.000E+00	1.#INF	1.135E-01	1.135E-01	3.033E+00
Cs-136	3.636E-01	103.8	3.773E-01	3.779E-01	1.282E+00
Np-239	-1.832E+00	168.7	3.091E+00	3.093E+00	1.026E+01
Nd-147	-2.073E+00	151.5	3.140E+00	3.143E+00	7.560E+00
TL-210	-9.987E-02	530.8	5.301E-01	5.301E-01	1.833E+00
Kr-85	2.961E+00	3854.9	1.141E+02	1.141E+02	3.919E+02
Total	1.409E+03				

Analyst: Kellene Robbs

Sample description
453329_Gamma_160-36593-A-7-B

Spectrum Filename: C:\User\SPC\Det9\9_Gamma_20193884.An1

Acquisition information
Start time: 12/27/2019 9:30:54 AM
Live time: 1800
Real time: 1802
Dead time: 0.12 %
Detector ID: 9

Detector system
Ge9 S/N09363993

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	12/27/2019 9:30:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	9_2019-12-07_1444.PBC 12/7/2019 2:44:35 PM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 19 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 0.1761

***** 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	25.	115.74	1.00	2.577E-02	46.54	4.250	PBC<MDA	PB210
50.11	23.	108.90	1.00	2.900E-02	50.14	8.000	PBC<MDA	TH227
59.54	31.	121.14	1.01	3.659E-02	59.54	35.900	PBC<MDA	AM241
61.76	37.	60.71	0.55	3.817E-02				
64.52	38.	49.60	1.02	3.987E-02	64.28	9.700	PBC<MDA	Sn126
74.79	237.	10.43	1.03	4.573E-02				
77.19	440.	6.62	1.03	4.680E-02				
87.28	152.	16.22	0.94	5.030E-02	86.49	13.100	1.287E+01	Np237
					86.54	30.700	5.490E+00	EU155
					86.94	9.040	1.860E+01	Sn126
					87.57	37.500	4.470E+00	Sn126
					88.04	3.790	4.411E+01	Cd109
93.01	95.	27.98	1.70	5.171E-02	92.59	5.584	PBC<MDA	TH234
					93.35	5.561	1.840E+01	AC228
121.78	20.	121.44	1.07	5.305E-02	121.78	28.580	PBC<MDA	EU152
					122.06	85.600	2.415E-01	CO57
123.10	28.	82.79	1.07	5.296E-02	123.10	40.790	PBC<MDA	EU154
131.29	29.	142.31	1.08	5.216E-02	131.29	18.000	PBC<MDA	PA234
133.02	29.	144.47	1.08	5.195E-02	133.02	43.300	PBC<MDA	HF181
					133.54	11.090	2.832E+00	CE144
133.54	29.	146.75	1.08	5.189E-02	133.02	43.300	PBC<MDA	HF181
					133.54	11.090	2.833E+00	CE144

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
136.30	29.	148.70	1.08	5.152E-02	136.30	5.850	PBC<MDA	HF181
					136.47	10.680	2.971E+00	CO57
169.72	52.	40.16	0.39	4.667E-02				
186.23	153.	15.92	1.19	4.395E-02	185.72	54.000	3.575E+00	U235
193.51	18.	165.92	1.14	4.287E-02	193.51	4.400	PBC<MDA	TH229
204.08	19.	51.25	0.65	4.140E-02				
210.85	8.	358.09	1.15	4.052E-02	210.85	2.990	PBC<MDA	TH229
227.00	9.	293.76	1.17	3.858E-02	227.00	6.300	PBC<MDA	Cf251
238.49	325.	7.04	1.18	3.734E-02	238.63	43.300	1.117E+01	PB212
241.81	177.	10.43	1.18	3.699E-02	242.00	7.430	3.581E+01	PB214
256.24	22.	96.69	1.20	3.558E-02	256.24	7.000	PBC<MDA	TH227
263.70	4.	545.68	1.20	3.489E-02	263.70	0.006	PBC<MDA	Cd113m
265.83	21.	85.02	1.20	3.470E-02	265.83	50.000	PBC<MDA	BI210M
275.47	14.	146.39	1.21	3.372E-02	277.28	6.310	PBC<MDA	TL208
279.20	22.	82.57	1.22	3.356E-02	279.20	81.460	PBC<MDA	Hg203
284.30	41.	45.48	1.22	3.315E-02	284.30	6.140	PBC<MDA	I131
294.93	378.	7.01	1.20	3.233E-02	295.09	19.300	3.367E+01	PB214
					296.00	79.000	8.243E+00	TL210
328.76	34.	55.49	1.26	2.999E-02	328.76	20.300	PBC<MDA	La140
338.10	93.	15.07	1.52	2.940E-02	338.32	12.010	1.468E+01	AC228
351.74	609.	5.00	1.37	2.861E-02	351.93	37.600	3.144E+01	PB214
383.84	7.	306.73	1.31	2.691E-02	383.84	8.940	PBC<MDA	BA133
388.02	9.	229.42	1.31	2.671E-02	387.95	66.000	PBC<MDA	Cf249
427.88	5.	367.15	1.35	2.491E-02	427.88	29.600	PBC<MDA	SB125
453.88	29.	53.43	1.37	2.388E-02	453.88	65.000	PBC<MDA	PM146
463.37	16.	87.06	1.38	2.352E-02	463.37	10.470	PBC<MDA	SB125
487.02	18.	110.56	1.40	2.269E-02	487.02	45.500	PBC<MDA	La140
511.86	122.	13.10	2.67	2.188E-02	511.86	20.000	1.555E+01	RH106
537.26	13.	107.88	1.44	2.112E-02	537.26	24.390	PBC<MDA	Ba140
569.70	5.	218.14	1.47	2.023E-02	569.32	15.380	PBC<MDA	CS134
					569.47	8.200	1.618E+00	PA234
					569.70	97.740	1.358E-01	BI207
583.10	135.	12.24	1.73	1.989E-02	583.02	84.500	4.456E+00	TL208
602.73	14.	252.49	1.50	1.940E-02	602.73	98.260	PBC<MDA	SB124
604.71	14.	255.06	1.50	1.936E-02	604.71	97.620	PBC<MDA	CS134
609.22	479.	5.85	1.48	1.925E-02	609.31	46.090	2.998E+01	BI214
					610.30	5.750	2.406E+02	RU103
614.28	14.	259.32	1.51	1.913E-02	614.28	89.850	PBC<MDA	AG108M
618.06	13.	286.85	1.51	1.904E-02	618.06	99.100	PBC<MDA	PM144
640.94	8.	46.52	0.70	1.853E-02				
702.63	15.	92.29	1.58	1.730E-02	702.63	97.900	PBC<MDA	NB94
722.79	16.	77.00	1.60	1.693E-02	722.79	10.810	PBC<MDA	SB124
					722.94	90.840	5.676E-01	AG108M
					723.36	20.220	2.551E+00	EU154
722.94	9.	146.07	1.60	1.693E-02	722.79	10.810	2.718E+00	SB124
					722.94	90.840	3.234E-01	AG108M
					723.36	20.220	1.454E+00	EU154
727.17	8.	118.61	1.60	1.686E-02	727.17	7.550	PBC<MDA	BI212

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
747.16	11.	87.12	1.62	1.651E-02	747.16	34.000	PBC<MDA	PM146
756.73	11.	113.55	1.62	1.635E-02	756.73	54.460	PBC<MDA	ZR95
765.79	21.	74.89	1.63	1.621E-02	765.79	99.790	PBC<MDA	NB95
					766.41	0.294	2.478E+02	PA234M
766.41	17.	71.66	1.63	1.620E-02	765.79	99.790	PBC<MDA	NB95
					766.41	0.294	1.987E+02	PA234M
785.42	15.	88.56	1.65	1.590E-02	785.42	1.280	PBC<MDA	BI212
818.50	10.	103.76	1.67	1.540E-02	818.50	100.000	PBC<MDA	Cs136
860.24	4.	307.01	1.71	1.482E-02	860.56	12.420	PBC<MDA	TL208
873.23	12.	100.90	1.72	1.465E-02	873.23	12.270	PBC<MDA	EU154
889.28	16.	98.91	1.73	1.445E-02	889.28	99.984	PBC<MDA	Sc46
910.92	98.	13.63	1.66	1.418E-02	911.07	29.000	1.320E+01	AC228
946.02	4.	305.16	1.77	1.377E-02	946.02	13.400	PBC<MDA	PA234
969.45	57.	19.26	1.46	1.352E-02	968.97	17.460	1.351E+01	AC228
996.33	7.	165.99	1.81	1.323E-02	996.33	10.600	PBC<MDA	EU154
1037.84	3.	432.48	1.84	1.281E-02	1037.84	14.130	PBC<MDA	Co56
1120.27	124.	10.08	1.54	1.206E-02	1120.29	15.100	3.794E+01	BI214
					1120.55	99.987	5.731E+00	Sc46
					1121.30	34.900	1.643E+01	Ta182
1120.33	16.	105.31	1.90	1.205E-02	1120.29	15.100	PBC<MDA	BI214
					1120.55	99.987	7.464E-01	Sc46
					1121.30	34.900	2.139E+00	Ta182
1221.41	2.	636.40	1.97	1.126E-02	1221.41	27.000	PBC<MDA	Ta182
1238.28	40.	29.04	1.98	1.114E-02	1238.28	66.070	3.007E+00	Co56
1313.00	2.	488.62	2.03	1.063E-02	1313.00	21.000	PBC<MDA	TL210
1384.30	7.	85.58	2.08	1.018E-02	1384.30	24.290	PBC<MDA	AG110M
1408.00	16.	25.00	2.10	1.004E-02	1408.00	21.005	4.213E+00	EU152
1460.62	446.	4.82	2.17	9.749E-03	1460.83	10.670	2.383E+02	K40
1764.42	60.	18.90	2.31	8.350E-03	1764.49	15.400	2.607E+01	BI214
1771.35	9.	144.01	2.32	8.323E-03	1771.35	15.480	PBC<MDA	Co56
1836.06	2.	397.51	2.35	8.079E-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
247.59	61.76	189.	52.	1.351E+03	40.24	1.013	- sD
298.76	74.79	188.	237.	5.189E+03	10.43	1.025	- D
308.37	77.20	204.	440.	9.399E+03	6.62	1.027	- sD
678.40	169.72	108.	52.	1.104E+03	40.16	0.393	- s
744.39	186.23	120.	153.	3.481E+03	15.92	1.192	- s
815.80	204.08	35.	19.	4.590E+02	51.25	0.649	- s
2563.13	640.94	2.	8.	4.136E+02	46.52	0.700	- s

(Page 6 of 22)

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	407.	25.	0.014	115.74	0.998s
TH-227	200.20	50.14	303.	23.	0.013	108.90	1.001
AM-241	237.77	59.54	672.	31.	0.017	121.14	1.010s
TH-234	252.77	63.29	725.	-35.	-0.019	110.43	1.014s
Sn-126	256.74	64.28	161.	38.	0.021	49.60	1.015D
BA-133	323.56	80.99	1597.	-40.	-0.022	63.38	1.031
Np-237	345.55	86.49	1812.	0.	0.000	177.98	1.036A
EU-155	345.76	86.54	2024.	-37.	-0.021	171.56	1.036
Sn-126	349.87	87.57	1869.	121.	0.067	19.56	1.037D
Cd-109	351.75	88.04	1905.	0.	0.000	166.25	1.038A
Nd-147	363.99	91.10	1906.	-37.	-0.021	165.84	1.041s
TH-234	369.94	92.59	1944.	-38.	-0.021	66.69	1.042s
AC-228	371.64	93.01	176.	95.	0.053	27.98	1.705s
Gd-153	389.58	97.50	1981.	-38.	-0.021	168.03	1.047s
Np-239	397.58	99.50	2019.	-38.	-0.021	169.30	1.049
Gd-153	412.37	103.20	2056.	-35.	-0.019	185.76	1.052s
Np-239	414.37	103.70	2091.	0.	0.000	1000.00	1.053s
EU-155	420.82	105.31	2091.	0.	0.000	1000.00	1.054s
Np-239	424.09	106.13	2239.	-40.	-0.022	168.74	1.055
EU-152	486.67	121.78	277.	20.	0.011	121.44	1.070s
CO-57	487.80	122.06	316.	-20.	-0.011	130.35	1.070s
EU-154	491.95	123.10	257.	28.	0.016	82.79	1.071s
PA-234	524.72	131.29	854.	29.	0.016	142.31	1.079
HF-181	531.64	133.02	883.	29.	0.016	144.47	1.081s
CE-144	533.69	133.54	913.	29.	0.016	146.75	1.081s
HF-181	544.74	136.30	942.	29.	0.016	148.70	1.084
CO-57	545.43	136.47	1411.	-37.	-0.021	144.13	1.084
Tc-99m	561.57	140.51	1374.	-37.	-0.021	141.73	1.088s
U-235	574.67	143.79	1336.	-37.	-0.021	139.43	1.091s
CE-141	581.29	145.44	1280.	-38.	-0.021	135.61	1.092s
Ba-140	650.15	162.66	538.	-14.	-0.008	186.77	1.108s
U-235	653.03	163.38	524.	0.	0.000	1000.00	1.109s
CE-139	662.92	165.85	524.	-10.	-0.006	267.26	1.111s
Cf-251	705.90	176.60	268.	-19.	-0.010	165.60	1.122
U-235	742.37	185.72	449.	-33.	-0.018	92.19	1.130s
TH-229	773.52	193.51	228.	18.	0.010	165.92	1.137s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
U-235	820.80	205.33	211.	-4.	-0.002	628.31	1.148s
TH-229	842.87	210.85	212.	8.	0.004	358.09	1.153s
Cf-251	907.45	227.00	180.	9.	0.005	293.76	1.168s
TH-227	943.33	235.97	1043.	-29.	-0.016	156.00	1.176
PB-212	953.97	238.63	98.	325.	0.180	7.04	1.179D
PB-214	967.43	242.00	82.	177.	0.098	10.46	1.182D
EU-152	978.21	244.69	909.	-27.	-0.015	157.30	1.185
TH-227	1024.39	256.24	108.	22.	0.012	96.69	1.195
Cd-113m	1054.23	263.70	198.	4.	0.002	545.68	1.202s
BI-210M	1062.75	265.83	142.	21.	0.011	85.02	1.204s
TL-208	1108.55	277.28	198.	14.	0.008	146.39	1.215s
Hg-203	1116.22	279.20	154.	22.	0.012	82.57	1.216s
I-131	1136.61	284.30	80.	41.	0.023	45.48	1.221
PB-214	1179.77	295.09	57.	359.	0.199	6.06	1.231D
TL-210	1183.41	296.00	1070.	-24.	-0.013	195.22	1.231s
PB-212	1199.52	300.03	1016.	-24.	-0.013	189.66	1.235s
PA-231	1199.68	300.07	992.	-24.	-0.013	187.44	1.235s
PA-233	1200.12	300.18	968.	-18.	-0.010	244.51	1.235s
PA-231	1210.00	302.65	950.	0.	0.000	1000.00	1.237s
BA-133	1210.81	302.85	950.	0.	0.000	1000.00	1.238s
Ba-140	1218.80	304.85	950.	0.	0.000	1000.00	1.240s
BI-210M	1218.99	304.90	950.	0.	0.000	1000.00	1.240s
Ir-192	1233.16	308.44	950.	0.	0.000	1000.00	1.243s
PA-233	1247.44	312.01	950.	0.	0.000	1000.00	1.246
Ir-192	1265.35	316.49	950.	0.	0.000	1000.00	1.250s
La-140	1314.43	328.76	84.	34.	0.019	55.49	1.261s
Cf-249	1333.15	333.44	623.	-24.	-0.014	145.54	1.265
AC-228	1351.79	338.10	33.	93.	0.052	15.07	1.522
Cs-136	1361.66	340.57	598.	-25.	-0.014	141.98	1.272s
EU-152	1376.53	344.29	574.	-25.	-0.014	138.73	1.275s
HF-181	1382.70	345.83	492.	-11.	-0.006	281.25	1.276s
PB-214	1406.34	351.74	67.	609.	0.338	5.00	1.369
BA-133	1423.37	356.00	808.	-22.	-0.012	184.88	1.285s
I-131	1457.31	364.48	88.	-13.	-0.007	143.98	1.293s
BA-133	1534.73	383.84	196.	7.	0.004	306.73	1.310s
Cf-249	1551.17	387.95	193.	9.	0.005	229.42	1.314s
SN-113	1566.12	391.69	215.	-18.	-0.010	119.67	1.317s
SB-125	1710.86	427.88	69.	5.	0.003	367.15	1.349
PM-146	1814.87	453.88	53.	29.	0.016	53.43	1.372s
SB-125	1852.82	463.37	88.	16.	0.009	87.06	1.380s
Ir-192	1871.59	468.06	121.	-7.	-0.004	228.14	1.384s
BE-7	1909.73	477.60	235.	-22.	-0.012	99.90	1.392s
HF-181	1927.34	482.00	257.	-22.	-0.012	104.05	1.396s
La-140	1947.43	487.02	192.	18.	0.010	110.56	1.400s
RU-103	1987.56	497.05	95.	-23.	-0.013	89.20	1.409s
RH-106	2046.81	511.86	68.	122.	0.068	13.10	2.672s
Nd-147	2123.35	531.00	56.	-10.	-0.006	151.49	1.438s
Ba-140	2148.39	537.26	44.	13.	0.007	107.88	1.444

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
CS-134	2252.30	563.24	75.	-10.	-0.006	133.76	1.466
CS-134	2276.64	569.32	56.	0.	0.000	1000.00	1.471s
PA-234	2277.24	569.47	56.	0.	0.000	1000.00	1.471s
BI-207	2278.16	569.70	53.	5.	0.003	218.14	1.471s
TL-208	2331.76	583.10	25.	135.	0.075	12.24	1.725
SB-125	2401.36	600.50	795.	-21.	-0.012	192.75	1.497s
SB-124	2410.29	602.73	599.	14.	0.008	252.49	1.499s
CS-134	2418.21	604.71	613.	14.	0.008	255.06	1.500s
BI-214	2436.23	609.22	53.	479.	0.266	5.85	1.478
RU-103	2440.56	610.30	627.	14.	0.008	257.07	1.505s
AG-108M	2456.49	614.28	640.	14.	0.008	259.32	1.508s
PM-144	2471.62	618.06	654.	13.	0.007	286.85	1.512s
RH-106	2487.04	621.92	763.	-18.	-0.010	215.40	1.515s
SB-125	2542.94	635.89	74.	-2.	-0.001	526.64	1.526s
I-131	2547.28	636.97	72.	0.	0.000	1000.00	1.527s
AG-110M	2630.43	657.76	98.	-19.	-0.011	75.62	1.544s
CS-137	2646.03	661.66	115.	-4.	-0.002	384.65	1.548s
PM-144	2785.58	696.54	98.	-17.	-0.010	163.14	1.576s
NB-94	2809.93	702.63	86.	15.	0.008	92.29	1.581s
SB-124	2890.57	722.79	65.	16.	0.009	77.00	1.598s
AG-108M	2891.17	722.94	81.	9.	0.005	146.07	1.598s
EU-154	2892.86	723.36	90.	0.	0.000	1000.00	1.598s
ZR-95	2896.22	724.20	90.	0.	0.000	1000.00	1.599s
BI-212	2908.11	727.17	40.	8.	0.004	118.61	1.601s
PM-146	2942.31	735.72	42.	-3.	-0.002	401.21	1.608s
PM-146	2988.08	747.16	19.	11.	0.006	87.12	1.617s
ZR-95	3026.36	756.73	30.	11.	0.006	113.55	1.625
AG-110M	3055.23	763.94	115.	-27.	-0.015	58.98	1.631
NB-95	3062.61	765.79	116.	21.	0.012	74.89	1.632
PA-234M	3065.10	766.41	66.	17.	0.009	71.66	1.633s
EU-152	3115.14	778.92	50.	-13.	-0.007	122.76	1.643s
BI-212	3141.15	785.42	79.	15.	0.008	88.56	1.648s
CS-134	3182.96	795.87	90.	-18.	-0.010	77.31	1.656s
TL-210	3197.88	799.60	108.	-3.	-0.002	530.79	1.659s
CS-134	3207.29	801.95	120.	-9.	-0.005	175.33	1.661s
CO-58	3242.59	810.78	49.	-4.	-0.002	252.49	1.668s
La-140	3262.58	815.77	71.	-16.	-0.009	79.98	1.672s
Cs-136	3273.50	818.50	50.	10.	0.006	103.76	1.674s
MN-54	3338.91	834.85	65.	-12.	-0.007	106.46	1.687
Co-56	3386.61	846.77	45.	-12.	-0.007	107.01	1.696s
TL-208	3441.80	860.56	31.	4.	0.002	307.01	1.707s
NB-94	3483.94	871.10	57.	-18.	-0.010	64.19	1.715s
EU-154	3492.47	873.23	62.	12.	0.006	100.90	1.717s
PA-234	3521.68	880.53	117.	-20.	-0.011	80.31	1.722
PA-234	3532.53	883.24	128.	-20.	-0.011	82.49	1.724s
AG-110M	3538.30	884.68	148.	0.	0.000	1000.00	1.725s
Sc-46	3556.69	889.28	116.	16.	0.009	98.91	1.729s
Y-88	3591.74	898.04	40.	-6.	-0.003	235.31	1.736s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
AC-228	3643.28	910.92	13.	98.	0.054	13.63	1.659
AG-110M	3749.60	937.49	55.	-15.	-0.008	111.72	1.766s
PA-234	3783.72	946.02	30.	4.	0.002	305.16	1.772s
EU-152	3856.11	964.11	140.	-19.	-0.010	92.74	1.786s
AC-228	3877.47	969.45	13.	57.	0.032	19.26	1.464
EU-154	3985.03	996.33	64.	7.	0.004	165.99	1.810s
Co-56	4151.13	1037.84	32.	3.	0.002	432.48	1.841s
Cs-136	4192.07	1048.07	69.	-23.	-0.013	54.89	1.848s
RH-106	4201.23	1050.36	105.	-17.	-0.009	89.60	1.850s
BI-207	4254.46	1063.66	37.	-10.	-0.006	137.96	1.860s
Ga-68	4309.44	1077.40	27.	-2.	-0.001	708.52	1.870s
FE-59	4396.88	1099.25	38.	-4.	-0.002	302.52	1.886s
EU-152	4448.20	1112.07	218.	-19.	-0.010	114.39	1.895s
ZN-65	4462.09	1115.55	199.	-18.	-0.010	111.23	1.897s
BI-214	4480.98	1120.27	8.	124.	0.069	10.08	1.536s
Sc-46	4482.12	1120.55	211.	-22.	-0.012	96.16	1.901s
Ta-182	4485.12	1121.30	137.	16.	0.009	105.31	1.901
CO-60	4692.96	1173.24	43.	-5.	-0.003	251.50	1.938
Ta-182	4756.25	1189.05	57.	-14.	-0.008	131.98	1.949
Ta-182	4885.75	1221.41	40.	2.	0.001	636.40	1.972
Co-56	4953.27	1238.28	17.	40.	0.022	29.04	1.984s
NA-22	5098.35	1274.53	51.	-21.	-0.012	52.91	2.008s
EU-154	5098.39	1274.54	72.	-4.	-0.002	300.95	2.008s
FE-59	5166.65	1291.60	28.	-2.	-0.001	538.99	2.020s
TL-210	5252.32	1313.00	17.	2.	0.001	488.62	2.034s
CO-60	5330.37	1332.50	17.	0.	0.000	1000.00	2.047s
AG-110M	5537.69	1384.30	6.	7.	0.004	85.58	2.082s
EU-152	5632.56	1408.00	0.	16.	0.009	25.00	2.097s
K-40	5843.20	1460.62	8.	446.	0.248	4.82	2.168
La-140	6385.95	1596.21	24.	-10.	-0.006	122.47	2.215s
SB-124	6765.35	1690.98	13.	-3.	-0.001	337.04	2.272s
BI-214	7059.65	1764.49	35.	60.	0.034	18.90	2.314
Co-56	7087.11	1771.35	86.	9.	0.005	144.01	2.318s
Y-88	7346.20	1836.06	13.	2.	0.001	397.51	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	-5.0905E+00				5.31E+01	
			477.60	-5.091E+00	?(	1.700E+01 9.99E+01 1.05E+01	G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

NA-22    C  -1.0705E+00                                     9.50E+02
                         1274.53-1.070E+00 ?(  1.838E+00 5.29E+01 9.99E+01 G

K-40     N   2.3830E+02                                     4.66E+11
                         1460.83 2.383E+02  (P 8.406E+00 4.82E+00 1.07E+01 G

Sc-46    F   6.1175E-01                                     8.38E+01
                          889.28 6.117E-01 ?(  2.033E+00 9.89E+01 1.00E+02 G
                         1120.55-1.010E+00 +   3.246E+00 9.62E+01 1.00E+02 G

CR-51    F  -2.3545E-01                                     2.77E+01
                          320.08-2.355E-01 %(P 2.679E+01 1.70E+03 9.94E+00 G

MN-54    C  -4.5301E-01                                     3.12E+02
                          834.85-4.530E-01 ?(P 1.479E+00 1.06E+02 1.00E+02 G

FE-59    F  -2.9520E-01                                     4.45E+01
                         1099.25-2.952E-01 ?(P 2.515E+00 3.03E+02 5.65E+01 G
                         1291.60-2.787E-01 +   3.286E+00 5.39E+02 4.32E+01 G

Co-56    C   9.2157E-01                                     7.73E+01
                          846.77-4.572E-01 ?(P 1.263E+00 1.07E+02 9.99E+01 G
                         1238.28 3.007E+00  (P 1.662E+00 2.90E+01 6.61E+01 G
                         1037.84 9.207E-01 ?(  8.922E+00 4.32E+02 1.41E+01 G
                         1771.35 4.024E+00 ?   1.977E+01 1.44E+02 1.55E+01  A

CO-57    C  -2.3950E-01                                     2.72E+02
                          122.06-2.395E-01 &(  1.046E+00 1.30E+02 8.56E+01 G
                          136.47-3.747E+00 +   1.795E+01 1.44E+02 1.07E+01 G

CO-58    C  -1.4401E-01                                     7.09E+01
                          810.78-1.440E-01 ?(  1.272E+00 2.52E+02 9.95E+01 G

ZN-65    F  -1.6658E+00                                     2.44E+02
                         1115.55-1.666E+00 ?(  6.215E+00 1.11E+02 5.06E+01 G

NB-94    I   4.8661E-01                                     7.41E+06
                          702.63 4.866E-01 ?(P 1.508E+00 9.23E+01 9.79E+01 G
                          871.10-6.777E-01 &   1.435E+00 6.42E+01 9.99E+01 G

ZR-95    I   6.8617E-01                                     6.40E+01
                          756.73 6.862E-01 &(  1.761E+00 1.14E+02 5.45E+01 G
                          724.20 0.000E+00 -   3.492E+00 1.00E+03 4.42E+01 G

NB-95    I   7.2953E-01                                     6.40E+01
                          765.79 7.295E-01 &(  1.816E+00 7.49E+01 9.98E+01 G
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Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
RU-103	I	-6.2824E-01					3.93E+01	
			497.05	-6.282E-01	&(	1.318E+00	8.92E+01	9.09E+01 G
			610.30	6.959E+00	?	5.999E+01	2.57E+02	5.75E+00 GA
RH-106	I	-5.3849E+00					3.74E+02	
			621.92	-5.385E+00	&(	3.879E+01	2.15E+02	9.93E+00 G
			1050.36	-4.721E+01	&	1.417E+02	8.96E+01	1.56E+00 G
			511.86	1.555E+01	?	5.204E+00	1.31E+01	2.00E+01 GA
AG-108M	C	2.6525E-01					1.53E+05	
			433.94	2.490E-02	%(	1.003E+00	1.65E+03	9.05E+01 G
			722.94	3.234E-01	&(	1.613E+00	1.46E+02	9.08E+01 G
			614.28	4.485E-01	?(	3.899E+00	2.59E+02	8.98E+01 G
AG-110M	F	4.0744E-01					2.50E+02	
			884.68	0.000E+00	?(	3.130E+00	1.00E+03	7.27E+01 G
			657.76	-6.252E-01	+	1.573E+00	7.56E+01	9.46E+01 G
			937.49	-1.749E+00	+	4.345E+00	1.12E+02	3.44E+01 G
			1384.30	1.627E+00	?(	3.100E+00	8.56E+01	2.43E+01 G
			763.94	-4.176E+00	+	8.091E+00	5.90E+01	2.23E+01 G
SN-113	F	-5.7813E-01					1.15E+02	
			391.69	-5.781E-01	&(	2.323E+00	1.20E+02	6.40E+01 G
SB-124	F	8.3459E-01					6.02E+01	
			602.73	4.018E-01	?(	3.402E+00	2.52E+02	9.83E+01 G
			1690.98	-3.584E-01	+	2.593E+00	3.37E+02	4.78E+01 G
			722.79	4.769E+00	&(	1.225E+01	7.70E+01	1.08E+01 G
SB-125	I	1.1977E+00					1.01E+03	
			427.88	3.516E-01	?(	3.128E+00	3.67E+02	2.96E+01 G
			600.50	-3.328E+00	+	2.143E+01	1.93E+02	1.79E+01 G
			635.89	-6.147E-01	&	1.130E+01	5.27E+02	1.13E+01 G
			463.37	3.590E+00	&(	1.047E+01	8.71E+01	1.05E+01 G
I-131	I	4.8760E-01					8.02E+00	
			364.48	-3.168E-01	?(	1.131E+00	1.44E+02	8.17E+01 G
			284.30	1.119E+01	?(	1.212E+01	4.55E+01	6.14E+00 G
			636.97	0.000E+00	-	1.758E+01	1.00E+03	7.17E+00 G
Gd-153	F	-1.3301E+00					2.42E+02	
			97.50	-1.330E+00	?(	7.426E+00	1.68E+02	3.00E+01 G
			103.20	-1.666E+00	&	1.028E+01	1.86E+02	2.18E+01 G
Ga-68	C	-2.6439E+00					4.71E-02	
			1077.40	-2.644E+00	?(	4.247E+01	7.09E+02	3.30E+00 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Tc-99m	I	-4.6905E-01					2.51E-01	
			140.51	-4.690E-01	*(	2.210E+00	1.42E+02	8.93E+01 G
BA-133	F	-6.9074E-01					3.85E+03	
			356.00	-6.907E-01	&(	4.265E+00	1.85E+02	6.20E+01 G
			302.85	0.000E+00	+	1.397E+01	1.00E+03	1.83E+01 G
			383.84	1.501E+00	?	1.567E+01	3.07E+02	8.94E+00 GA
			80.99	-1.338E+00	+ P	6.381E+00	6.34E+01	3.41E+01 GA
CS-134	I	-7.5166E-01					7.54E+02	
			795.87	-7.517E-01	?(	1.937E+00	7.73E+01	8.55E+01 G
			604.71	4.058E-01	&	3.471E+00	2.55E+02	9.76E+01 G
			569.32	0.000E+00	+	6.707E+00	1.00E+03	1.54E+01 G
			801.95	-3.678E+00	+	2.197E+01	1.75E+02	8.69E+00 G
			563.24	-3.423E+00	+ P	1.409E+01	1.34E+02	8.35E+00 G
CS-137	I	-1.4307E-01					1.10E+04	
			661.66	-1.431E-01	?(	1.895E+00	3.85E+02	8.52E+01 G
CE-139	F	-1.4676E-01					1.38E+02	
			165.85	-1.468E-01	?(P	1.606E+00	2.67E+02	7.99E+01 G
Ba-140	I	1.3964E+00					1.28E+01	
			537.26	1.396E+00	?(P	3.628E+00	1.08E+02	2.44E+01 G
			162.66	-2.721E+00	+ P	2.111E+01	1.87E+02	6.22E+00 G
			304.85	0.000E+00	-	5.997E+01	1.00E+03	4.29E+00 G
La-140	I	2.8586E-01					1.28E+01	
			1596.21	-6.422E-01	?(	1.640E+00	1.22E+02	9.54E+01 G
			487.02	9.751E-01	(P	3.616E+00	1.11E+02	4.55E+01 G
			328.76	3.102E+00	&(	4.144E+00	5.55E+01	2.03E+01 G
			815.77	-2.421E+00	+	6.473E+00	8.00E+01	2.33E+01 G
CE-141	I	-8.6427E-01					3.25E+01	
			145.44	-8.643E-01	&(	3.896E+00	1.36E+02	4.82E+01 G
CE-144	I	2.8332E+00					2.85E+02	
			133.54	2.833E+00	(	1.385E+01	1.47E+02	1.11E+01 G
PM-144	C	-9.0441E-02					3.63E+02	
			696.54	-5.544E-01	?(P	1.576E+00	1.63E+02	9.90E+01 G
			618.06	3.730E-01	?(	3.589E+00	2.87E+02	9.91E+01 G
EU-152	F	7.2317E-01					4.94E+03	
			121.78	7.232E-01	&(	2.943E+00	1.21E+02	2.86E+01 G
			344.29	-1.781E+00	+	8.252E+00	1.39E+02	2.65E+01 G
			1112.07	-6.256E+00	+	2.400E+01	1.14E+02	1.36E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
			778.92	-3.489E+00	+	9.571E+00	1.23E+02	1.29E+01 G
			964.11	-5.223E+00	+	1.621E+01	9.27E+01	1.46E+01 G
			244.69	-5.455E+00	+	2.860E+01	1.57E+02	7.58E+00 G
			1408.00	4.213E+00	?	1.941E+00	2.50E+01	2.10E+01 GA
EU-154	I	1.6133E+00					3.14E+03	
			123.10	7.229E-01	?(	1.990E+00	8.28E+01	4.08E+01 G
			1274.54	-5.863E-01	-	6.127E+00	3.01E+02	3.52E+01 G
			723.36	0.000E+00	-	7.618E+00	1.00E+03	2.02E+01 G
			873.23	3.571E+00	?(	1.219E+01	1.01E+02	1.23E+01 G
			1004.77	1.565E-01	%	7.320E+00	2.09E+03	1.80E+01 G
			996.33	2.774E+00	?(	1.585E+01	1.66E+02	1.06E+01 G
HF-181	F	6.9692E-02					4.24E+01	
			482.00	-6.715E-01	?(	2.336E+00	1.04E+02	8.05E+01 G
			133.02	7.244E-01	(	3.487E+00	1.44E+02	4.33E+01 G
			345.83	-1.428E+00	+	1.351E+01	2.81E+02	1.51E+01 G
			136.30	5.422E+00	&(	2.686E+01	1.49E+02	5.85E+00 G
Ta-182	F	2.1395E+00					1.14E+02	
			1121.30	2.139E+00	&(	7.573E+00	1.05E+02	3.49E+01 G
			1221.41	4.264E-01	-	5.858E+00	6.36E+02	2.70E+01 G
			1189.05	-4.074E+00	+	1.126E+01	1.32E+02	1.62E+01 G
Hg-203	F	4.4633E-01					4.66E+01	
			279.20	4.463E-01	?(	1.228E+00	8.26E+01	8.15E+01 G
TL-208	N	4.3975E+00					6.98E+02	
			583.02	4.456E+00	(P	8.631E-01	1.22E+01	8.45E+01 G
			277.28	3.613E+00	&(P	1.783E+01	1.46E+02	6.31E+00 G
			860.56	1.209E+00	- P	8.648E+00	3.07E+02	1.24E+01 G
PM-146	C	1.0730E+00					2.02E+03	
			453.88	1.054E+00	&(P	1.306E+00	5.34E+01	6.50E+01 G
			747.16	1.109E+00	?(P	2.262E+00	8.71E+01	3.40E+01 G
			735.72	-5.057E-01	- P	4.886E+00	4.01E+02	2.25E+01 G
Y-88	F	1.5652E-01					1.07E+02	
			1836.06	1.565E-01	?(P	1.341E+00	3.98E+02	9.92E+01 G
			898.04	-2.481E-01	+	1.331E+00	2.35E+02	9.37E+01 G
Cd-113m		9.7302E+02					5.33E+03	
			263.70	9.730E+02	&(	1.813E+04	5.46E+02	6.00E-03 K
Cf-251	T	-1.3411E+00					3.28E+05	
			176.60	-1.341E+00	?(	5.672E+00	1.66E+02	1.70E+01 G
			227.00	2.057E+00	&	1.491E+01	2.94E+02	6.30E+00 GA

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Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Cf-249	T	2.7316E-01					1.28E+05	
			387.95	2.732E-01	?(	2.128E+00	2.29E+02	6.60E+01 G
			333.44	-2.953E+00	+	1.435E+01	1.46E+02	1.55E+01 G
Sn-126		5.4917E+00					3.65E+07	
			87.57	3.549E+00	}	6.003E+00	1.96E+01	3.75E+01 GA
			64.28	5.492E+00	(	8.875E+00	4.96E+01	9.70E+00 G
			86.94	0.000E+00	}	2.547E+01	2.55E+03	9.04E+00 GA
PB-210	N	1.2704E+01					8.14E+03	
			46.54	1.270E+01	(P	4.909E+01	1.16E+02	4.25E+00 G
PB-212	N	1.1164E+01					6.98E+02	
			238.63	1.116E+01	(P	1.681E+00	7.04E+00	4.33E+01 G
			300.03	-1.267E+01	-	8.017E+01	1.90E+02	3.28E+00 GA
PB-214	N	3.1624E+01					5.84E+05	
			351.93	3.144E+01	(P	2.115E+00	5.00E+00	3.76E+01 G
			295.09	3.198E+01	(P	3.374E+00	6.06E+00	1.93E+01 G
			242.00	3.572E+01	+	9.102E+00	1.05E+01	7.43E+00 GA
BI-207	C	-6.1325E-01					1.18E+04	
			1063.66	-6.132E-01	?(	1.851E+00	1.38E+02	7.45E+01 G
			569.70	1.358E-01	+	1.031E+00	2.18E+02	9.77E+01 G
BI-212	N	3.4371E+00					6.98E+02	
			727.17	3.437E+00	@(	1.400E+01	1.19E+02	7.55E+00 G
			785.42	4.047E+01	? P	1.203E+02	8.86E+01	1.28E+00 GA
U-235	N	-3.7560E+00					2.57E+11	
			143.79	-3.756E+00	?(	1.741E+01	1.39E+02	1.10E+01 G
			205.33	-1.144E+00	+ P	1.894E+01	6.28E+02	5.01E+00 G
			163.38	0.000E+00	+	2.558E+01	1.00E+03	5.08E+00 G
			185.72	-7.733E-01	+	2.370E+00	9.22E+01	5.40E+01 GA
BI-214	N	2.9978E+01					5.84E+05	
			609.31	2.998E+01	(P	2.301E+00	5.85E+00	4.61E+01 G
			1120.29	3.794E+01	+ P	4.750E+00	1.01E+01	1.51E+01 G
			1764.49	2.607E+01	- P	1.302E+01	1.89E+01	1.54E+01 G
BI-210M	T	6.5648E-01					1.10E+09	
			265.83	6.565E-01	(P	1.862E+00	8.50E+01	5.00E+01 G
			304.90	0.000E+00	-	9.189E+00	1.00E+03	2.80E+01 G
AC-228	N	1.3600E+01					2.10E+03	
			911.07	1.320E+01	(P	2.659E+00	1.36E+01	2.90E+01 G
			968.97	1.351E+01	(P	4.529E+00	1.93E+01	1.75E+01 G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          338.32 1.468E+01  (P 4.617E+00 1.51E+01 1.20E+01 G
                           93.35 1.840E+01   P 1.246E+01 2.80E+01 5.56E+00 XA

TH-227   N   5.1893E+00                                     7.95E+03
                          256.24 4.815E+00  (  1.141E+01 9.67E+01 7.00E+00 G
                          235.97-3.542E+00 -   1.841E+01 1.56E+02 1.23E+01 G
                           50.14 5.516E+00  (P 2.007E+01 1.09E+02 8.00E+00 G

TH-229   N   4.6411E+00                                     2.68E+06
                          193.51 5.302E+00 *(  2.152E+01 1.66E+02 4.40E+00 G
                          210.85 3.669E+00 &(  3.236E+01 3.58E+02 2.99E+00 G

TH-234   N  -7.2725E+00                                     1.63E+12
                           92.59-7.272E+00  (P 4.017E+01 6.67E+01 5.58E+00 G
                           63.29-1.297E+01 +   4.766E+01 1.10E+02 3.81E+00 G

PA-234   N   1.5073E+00                                     1.63E+12
                          131.29 1.733E+00 ?(  8.218E+00 1.42E+02 1.80E+01 G
                          946.02 1.204E+00 ?(  8.499E+00 3.05E+02 1.34E+01 G
                          569.47 0.000E+00 -   1.258E+01 1.00E+03 8.20E+00 G
                          883.24-8.022E+00 &   2.207E+01 8.25E+01 9.60E+00 G
                          880.53-1.263E+01 &   3.382E+01 8.03E+01 6.00E+00 GA

PA-234M  N   5.1272E+01                                     1.63E+12
                         1001.00-5.150E-01 %(P 2.116E+02 1.08E+04 8.37E-01 G
                          766.41 1.987E+02 &(  4.732E+02 7.17E+01 2.94E-01 G

AM-241   T   1.2950E+00                                     1.58E+05
                           59.54 1.295E+00 &(  5.226E+00 1.21E+02 3.59E+01 G

Cs-136   F   3.6364E-01                                     1.30E+01
                          818.50 3.636E-01 ?(  1.282E+00 1.04E+02 1.00E+02 G
                         1048.07-1.266E+00 +   2.268E+00 5.49E+01 8.00E+01 G
                          340.57-9.963E-01 +   4.724E+00 1.42E+02 4.69E+01 G

Np-239   T  -1.8317E+00                                     2.36E+00
                          103.70 0.000E+00 +   9.414E+00 1.00E+03 2.40E+01 X
                          106.13-1.832E+00 &(  1.026E+01 1.69E+02 2.27E+01 G
                           99.50-2.652E+00 +   1.492E+01 1.69E+02 1.50E+01 X

Nd-147      -2.0729E+00                                     1.11E+01
                          531.00-2.073E+00 ?(  7.560E+00 1.51E+02 1.30E+01 G
                           91.10-1.433E+00 +   7.898E+00 1.66E+02 2.83E+01 G

TL-210   N  -9.9865E-02                                     5.84E+05
                          799.60-9.987E-02 ?(  1.833E+00 5.31E+02 9.90E+01 G
                          296.00-5.197E-01 +   3.384E+00 1.95E+02 7.90E+01 G
                         1313.00 4.979E-01 ?   5.458E+00 4.89E+02 2.10E+01 GA
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Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Kr-85	I 2.9609E+00					3.92E+03	
		513.98	2.961E+00	%(	3.919E+02	3.85E+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	
PB-210	46.54	407.	25.	0.014	115.74	1.270E+01	P
TH-227	50.14	303.	23.	0.013	108.90	5.516E+00	P
AM-241	59.54	672.	31.	0.017	121.14	1.295E+00	
TH-234	63.29	725.	-35.	-0.019	110.43	-1.297E+01	
BA-133	80.99	1597.	-40.	-0.022	63.38	-1.338E+00	P
EU-155	86.54	2024.	-37.	-0.021	171.56	-1.346E+00	
Nd-147	91.10	1906.	-37.	-0.021	165.84	-1.433E+00	
TH-234	92.59	1944.	-38.	-0.021	66.69	-7.272E+00	P
Gd-153	97.50	1981.	-38.	-0.021	168.03	-1.330E+00	
Np-239	99.50	2019.	-38.	-0.021	169.30	-2.652E+00	
Gd-153	103.20	2056.	-35.	-0.019	185.76	-1.666E+00	
Np-239	106.13	2239.	-40.	-0.022	168.74	-1.832E+00	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
EU-152	121.78	277.	20.	0.011	121.44	7.232E-01		
CO-57	122.06	316.	-20.	-0.011	130.35	-2.395E-01		
EU-154	123.10	257.	28.	0.016	82.79	7.229E-01		
PA-234	131.29	854.	29.	0.016	142.31	1.733E+00		
HF-181	133.02	883.	29.	0.016	144.47	7.244E-01		
CE-144	133.54	913.	29.	0.016	146.75	2.833E+00		
HF-181	136.30	942.	29.	0.016	148.70	5.422E+00		
CO-57	136.47	1411.	-37.	-0.021	144.13	-3.747E+00		
Tc-99m	140.51	1374.	-37.	-0.021	141.73	-4.690E-01		
U-235	143.79	1336.	-37.	-0.021	139.43	-3.756E+00		
CE-141	145.44	1280.	-38.	-0.021	135.61	-8.643E-01		
Ba-140	162.66	538.	-14.	-0.008	186.77	-2.721E+00		P
CE-139	165.85	524.	-10.	-0.006	267.26	-1.468E-01		P
Cf-251	176.60	268.	-19.	-0.010	165.60	-1.341E+00		
U-235	185.72	449.	-33.	-0.018	92.19	-7.733E-01		
TH-229	193.51	228.	18.	0.010	165.92	5.302E+00		
U-235	205.33	211.	-4.	-0.002	628.31	-1.144E+00		P
TH-229	210.85	212.	8.	0.004	358.09	3.669E+00		
Cf-251	227.00	180.	9.	0.005	293.76	2.057E+00		
TH-227	235.97	1043.	-29.	-0.016	156.00	-3.542E+00		
EU-152	244.69	909.	-27.	-0.015	157.30	-5.455E+00		
TH-227	256.24	108.	22.	0.012	96.69	4.815E+00		
Cd-113m	263.70	198.	4.	0.002	545.68	9.730E+02		
BI-210M	265.83	142.	21.	0.011	85.02	6.565E-01		P
Hg-203	279.20	154.	22.	0.012	82.57	4.463E-01		
I-131	284.30	80.	41.	0.023	45.48	1.119E+01		
TL-210	296.00	1070.	-24.	-0.013	195.22	-5.197E-01		
PA-231	300.07	992.	-24.	-0.013	187.44	-1.690E+01		
PA-233	300.18	968.	-18.	-0.010	244.51	-5.072E+00		
La-140	328.76	84.	34.	0.019	55.49	3.102E+00		
Cs-136	340.57	598.	-25.	-0.014	141.98	-9.963E-01		
EU-152	344.29	574.	-25.	-0.014	138.73	-1.781E+00		
HF-181	345.83	492.	-11.	-0.006	281.25	-1.428E+00		
BA-133	356.00	808.	-22.	-0.012	184.88	-6.907E-01		
I-131	364.48	88.	-13.	-0.007	143.98	-3.168E-01		
BA-133	383.84	196.	7.	0.004	306.73	1.501E+00		
SN-113	391.69	215.	-18.	-0.010	119.67	-5.781E-01		
SB-125	427.88	69.	5.	0.003	367.15	3.516E-01		
PM-146	453.88	53.	29.	0.016	53.43	1.054E+00		P
SB-125	463.37	88.	16.	0.009	87.06	3.590E+00		
Ir-192	468.06	121.	-7.	-0.004	228.14	-3.178E-01		
BE-7	477.60	235.	-22.	-0.012	99.90	-5.091E+00		
HF-181	482.00	257.	-22.	-0.012	104.05	-6.715E-01		
La-140	487.02	192.	18.	0.010	110.56	9.751E-01		P
RU-103	497.05	95.	-23.	-0.013	89.20	-6.282E-01		
RH-106	511.86	68.	122.	0.068	13.10	1.555E+01		
Nd-147	531.00	56.	-10.	-0.006	151.49	-2.073E+00		
Ba-140	537.26	44.	13.	0.007	107.88	1.396E+00		P

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
CS-134	563.24	75.	-10.	-0.006	133.76	-3.423E+00	P
BI-207	569.70	53.	5.	0.003	218.14	1.358E-01	
SB-125	600.50	795.	-21.	-0.012	192.75	-3.328E+00	
SB-124	602.73	599.	14.	0.008	252.49	4.018E-01	
CS-134	604.71	613.	14.	0.008	255.06	4.058E-01	
RU-103	610.30	627.	14.	0.008	257.07	6.959E+00	
AG-108M	614.28	640.	14.	0.008	259.32	4.485E-01	
PM-144	618.06	654.	13.	0.007	286.85	3.730E-01	
RH-106	621.92	763.	-18.	-0.010	215.40	-5.385E+00	
SB-125	635.89	74.	-2.	-0.001	526.64	-6.147E-01	
AG-110M	657.76	98.	-19.	-0.011	75.62	-6.252E-01	
CS-137	661.66	115.	-4.	-0.002	384.65	-1.431E-01	
PM-144	696.54	98.	-17.	-0.010	163.14	-5.544E-01	P
NB-94	702.63	86.	15.	0.008	92.29	4.866E-01	P
SB-124	722.79	65.	16.	0.009	77.00	4.769E+00	
AG-108M	722.94	81.	9.	0.005	146.07	3.234E-01	
BI-212	727.17	40.	8.	0.004	118.61	3.437E+00	
PM-146	735.72	42.	-3.	-0.002	401.21	-5.057E-01	P
PM-146	747.16	19.	11.	0.006	87.12	1.109E+00	P
ZR-95	756.73	30.	11.	0.006	113.55	6.862E-01	
AG-110M	763.94	115.	-27.	-0.015	58.98	-4.176E+00	
NB-95	765.79	116.	21.	0.012	74.89	7.295E-01	
PA-234M	766.41	66.	17.	0.009	71.66	1.987E+02	
EU-152	778.92	50.	-13.	-0.007	122.76	-3.489E+00	
BI-212	785.42	79.	15.	0.008	88.56	4.047E+01	P
CS-134	795.87	90.	-18.	-0.010	77.31	-7.517E-01	
TL-210	799.60	108.	-3.	-0.002	530.79	-9.987E-02	
CS-134	801.95	120.	-9.	-0.005	175.33	-3.678E+00	
CO-58	810.78	49.	-4.	-0.002	252.49	-1.440E-01	
La-140	815.77	71.	-16.	-0.009	79.98	-2.421E+00	
Cs-136	818.50	50.	10.	0.006	103.76	3.636E-01	
MN-54	834.85	65.	-12.	-0.007	106.46	-4.530E-01	P
Co-56	846.77	45.	-12.	-0.007	107.01	-4.572E-01	P
NB-94	871.10	57.	-18.	-0.010	64.19	-6.777E-01	
EU-154	873.23	62.	12.	0.006	100.90	3.571E+00	
PA-234	880.53	117.	-20.	-0.011	80.31	-1.263E+01	
PA-234	883.24	128.	-20.	-0.011	82.49	-8.022E+00	
Sc-46	889.28	116.	16.	0.009	98.91	6.117E-01	
Y-88	898.04	40.	-6.	-0.003	235.31	-2.481E-01	
AG-110M	937.49	55.	-15.	-0.008	111.72	-1.749E+00	
PA-234	946.02	30.	4.	0.002	305.16	1.204E+00	
EU-152	964.11	140.	-19.	-0.010	92.74	-5.223E+00	
EU-154	996.33	64.	7.	0.004	165.99	2.774E+00	
Co-56	1037.84	32.	3.	0.002	432.48	9.207E-01	
Cs-136	1048.07	69.	-23.	-0.013	54.89	-1.266E+00	
RH-106	1050.36	105.	-17.	-0.009	89.60	-4.721E+01	
BI-207	1063.66	37.	-10.	-0.006	137.96	-6.132E-01	
Ga-68	1077.40	27.	-2.	-0.001	708.52	-2.644E+00	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
FE-59	1099.25	38.	-4.	-0.002	302.52	-2.952E-01	P
EU-152	1112.07	218.	-19.	-0.010	114.39	-6.256E+00	
ZN-65	1115.55	199.	-18.	-0.010	111.23	-1.666E+00	
Sc-46	1120.55	211.	-22.	-0.012	96.16	-1.010E+00	
Ta-182	1121.30	137.	16.	0.009	105.31	2.139E+00	
CO-60	1173.24	43.	-5.	-0.003	251.50	-2.391E-01	P
Ta-182	1189.05	57.	-14.	-0.008	131.98	-4.074E+00	
Ta-182	1221.41	40.	2.	0.001	636.40	4.264E-01	
Co-56	1238.28	17.	40.	0.022	29.04	3.007E+00	P
NA-22	1274.53	51.	-21.	-0.012	52.91	-1.070E+00	
EU-154	1274.54	72.	-4.	-0.002	300.95	-5.863E-01	
FE-59	1291.60	28.	-2.	-0.001	538.99	-2.787E-01	
TL-210	1313.00	17.	2.	0.001	488.62	4.979E-01	
AG-110M	1384.30	6.	7.	0.004	85.58	1.627E+00	
EU-152	1408.00	0.	16.	0.009	25.00	4.213E+00	
La-140	1596.21	24.	-10.	-0.006	122.47	-6.422E-01	
SB-124	1690.98	13.	-3.	-0.001	337.04	-3.584E-01	
Co-56	1771.35	86.	9.	0.005	144.01	4.024E+00	
Y-88	1836.06	13.	2.	0.001	397.51	1.565E-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	-5.0905E+00	-5.0905E+00	9.990E+01%	1.70E+01
NA-22	#A	-1.0705E+00	-1.0705E+00	5.291E+01%	1.84E+00
K-40		2.3830E+02	2.3830E+02	4.819E+00%	8.41E+00
Sc-46	#A	6.1175E-01	6.1175E-01	9.891E+01%	2.03E+00
CR-51	#A	-2.3545E-01	-2.3545E-01	1.697E+03%	2.68E+01
MN-54	#A	-4.5301E-01	-4.5301E-01	1.065E+02%	1.48E+00
FE-59	#A	-2.9520E-01	-2.9520E-01	3.025E+02%	2.51E+00
Co-56	#A	9.2157E-01	9.2157E-01	2.904E+01%	1.26E+00
CO-57	#A	-2.3950E-01	-2.3950E-01	1.304E+02%	1.05E+00
CO-58	#A	-1.4401E-01	-1.4401E-01	2.525E+02%	1.27E+00
CO-60	#A	0.0000E+00	0.0000E+00	1.000E+03%	1.16E+00
ZN-65	#A	-1.6657E+00	-1.6658E+00	1.112E+02%	6.22E+00
NB-94	#A	4.8661E-01	4.8661E-01	9.229E+01%	1.51E+00
ZR-95	#A	6.8616E-01	6.8617E-01	1.135E+02%	1.76E+00
NB-95	#A	7.2953E-01	7.2953E-01	7.489E+01%	1.82E+00
RU-103	#A	-6.2824E-01	-6.2824E-01	8.920E+01%	1.32E+00
RH-106	#A	-5.3849E+00	-5.3849E+00	2.154E+02%	3.88E+01
AG-108M	#A	2.6525E-01	2.6525E-01	1.461E+02%	1.00E+00
AG-110M	#A	4.0744E-01	4.0744E-01	8.558E+01%	3.13E+00
SN-113	#A	-5.7813E-01	-5.7813E-01	1.197E+02%	2.32E+00
SB-124	#A	8.3459E-01	8.3459E-01	7.700E+01%	3.40E+00

SB-125	#A	1.1977E+00	1.1977E+00	8.706E+01%	3.13E+00
I-131	#A	4.8758E-01	4.8760E-01	4.548E+01%	1.13E+00
Gd-153	#A	-1.3301E+00	-1.3301E+00	1.680E+02%	7.43E+00
Ga-68	#A	-2.6197E+00	-2.6439E+00	7.085E+02%	4.25E+01
Tc-99m	#A	-4.6824E-01	-4.6905E-01	1.417E+02%	2.21E+00
BA-133	#A	-6.9074E-01	-6.9074E-01	1.849E+02%	4.27E+00
CS-134	#A	-7.5166E-01	-7.5166E-01	7.731E+01%	1.94E+00
CS-137	#A	-1.4307E-01	-1.4307E-01	3.846E+02%	1.90E+00
CE-139	#A	-1.4675E-01	-1.4676E-01	2.673E+02%	1.61E+00
Ba-140	#A	1.3963E+00	1.3964E+00	1.079E+02%	3.63E+00
La-140	#A	2.8585E-01	2.8586E-01	5.549E+01%	1.64E+00
CE-141	#A	-8.6426E-01	-8.6427E-01	1.356E+02%	3.90E+00
CE-144	#A	2.8332E+00	2.8332E+00	1.467E+02%	1.39E+01
PM-144	#A	-9.0441E-02	-9.0441E-02	1.631E+02%	1.58E+00
EU-152	#A	7.2317E-01	7.2317E-01	1.214E+02%	2.94E+00
EU-154	#A	1.6133E+00	1.6133E+00	7.038E+01%	1.99E+00
EU-155	#A	0.0000E+00	0.0000E+00	1.000E+03%	1.06E+01
HF-181	#A	6.9691E-02	6.9692E-02	7.732E+01%	2.34E+00
Ta-182	#A	2.1395E+00	2.1395E+00	1.053E+02%	7.57E+00
Hg-203	#A	4.4633E-01	4.4633E-01	8.257E+01%	1.23E+00
TL-208		4.3975E+00	4.3975E+00	1.224E+01%	8.63E-01
PM-146	#A	1.0730E+00	1.0730E+00	5.110E+01%	1.31E+00
Y-88	#A	1.5652E-01	1.5652E-01	3.975E+02%	1.34E+00
Cd-113m	#A	9.7302E+02	9.7302E+02	5.457E+02%	1.81E+04
Cd-109	#A	0.0000E+00	0.0000E+00	1.000E+03%	5.98E+01
Cf-251	#A	-1.3411E+00	-1.3411E+00	1.656E+02%	5.67E+00
Cf-249	#A	2.7316E-01	2.7316E-01	2.294E+02%	2.13E+00
Sn-126	A	5.4917E+00	5.4917E+00	4.960E+01%	8.87E+00
PB-210	#A	1.2704E+01	1.2704E+01	1.157E+02%	4.91E+01
PB-212		1.1164E+01	1.1164E+01	7.041E+00%	1.68E+00
PB-214		3.1624E+01	3.1624E+01	3.928E+00%	2.12E+00
BI-207	#A	-6.1325E-01	-6.1325E-01	1.380E+02%	1.85E+00
BI-212	#A	3.4371E+00	3.4371E+00	1.186E+02%	1.40E+01
U-235	#A	-3.7560E+00	-3.7560E+00	1.394E+02%	1.74E+01
BI-214		2.9978E+01	2.9978E+01	5.854E+00%	2.30E+00
BI-210M	#A	6.5648E-01	6.5648E-01	8.502E+01%	1.86E+00
AC-228		1.3599E+01	1.3600E+01	9.333E+00%	2.66E+00
TH-227	#A	5.1893E+00	5.1893E+00	7.282E+01%	1.14E+01
TH-229	#A	4.6411E+00	4.6411E+00	1.659E+02%	2.15E+01
TH-234	#A	-7.2725E+00	-7.2725E+00	6.669E+01%	4.02E+01
PA-231	#A	0.0000E+00	0.0000E+00	1.000E+03%	8.89E+01
PA-233	#A	0.0000E+00	0.0000E+00	1.000E+03%	7.26E+00
PA-234	#A	1.5073E+00	1.5073E+00	1.423E+02%	8.22E+00
PA-234M	#A	5.1272E+01	5.1272E+01	7.166E+01%	2.12E+02
AM-241	#A	1.2950E+00	1.2950E+00	1.211E+02%	5.23E+00
Np-237	#A	0.0000E+00	0.0000E+00	1.000E+03%	1.70E+01
Ir-192	#A	0.0000E+00	0.0000E+00	7.071E+02%	3.03E+00
Cs-136	#A	3.6363E-01	3.6364E-01	1.038E+02%	1.28E+00
Np-239	#A	-1.8314E+00	-1.8317E+00	1.687E+02%	1.03E+01

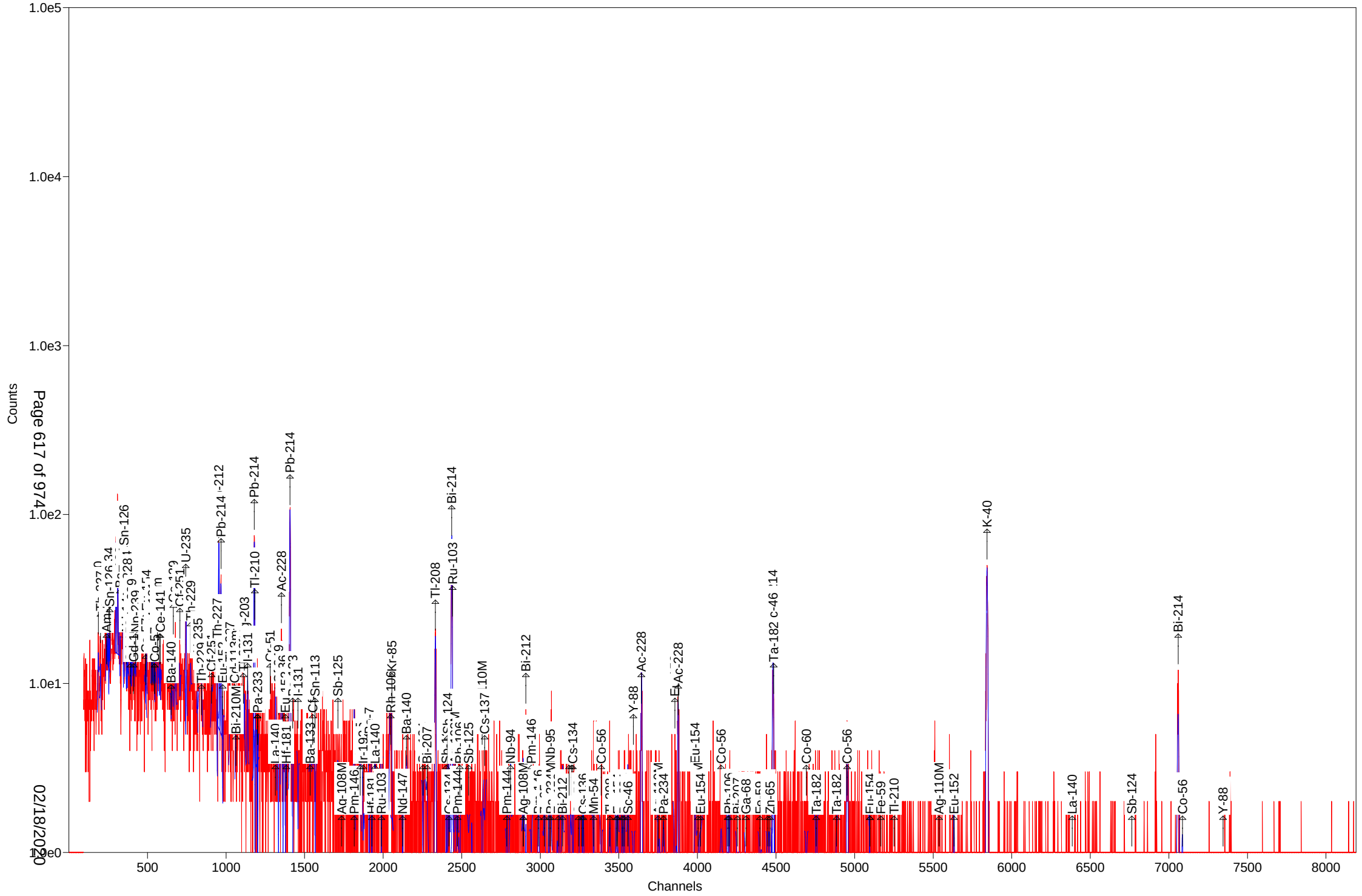
Nd-147	#A	-2.0728E+00	-2.0729E+00	1.515E+02%	7.56E+00
TL-210	#A	-9.9865E-02	-9.9865E-02	5.308E+02%	1.83E+00
Kr-85	#A	2.9609E+00	2.9609E+00	3.855E+03%	3.92E+02

- 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) 3.346E+02 Bq/Sample
Total Decayed Activity (25.1 to 1999.3 keV) 3.3455865E+02 Bq/Sample

453329_Gamma_160-36593-A-7-B. 9_Gamma_20193884.spc.



Test America St. Louis Spectrum ID: 12_Gamma_20193737

Sample Description: 453329_Gamma_160-36593-A-8-B
Detector: Detector #12
Batch ID: 453329
Work Order Number: Gamma
Lot Number: 160-36593-A-8-B

Decay to Time: 12/27/2019 09:31 Live Time: 1800 sec
Acquisition Time: 12/27/2019 09:31:25 Real Time: 1802 sec
Analysis Time: 12/27/2019 10:01 Dead Time: 0.09 %
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_2019-12-07_1443.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	3.817E+00	106.3	4.057E+00	4.061E+00	1.373E+01
NA-22	0.000E+00	1.#INF	2.433E-01	2.433E-01	1.540E+00
K-40	2.848E+02	5.1	1.444E+01	2.038E+01	5.395E+00
Sc-46	5.471E-01	141.8	7.758E-01	7.763E-01	2.639E+00
CR-51	4.536E+00	115.3	5.232E+00	5.237E+00	1.756E+01
MN-54	4.798E-01	103.5	4.967E-01	4.973E-01	1.174E+00
FE-59	2.297E+00	33.6	7.719E-01	7.804E-01	1.498E+00
Co-56	-1.707E-01	72.8	1.243E-01	1.246E-01	1.853E+00
CO-57	-2.208E-01	171.2	3.778E-01	3.780E-01	1.275E+00
CO-58	4.855E-01	85.1	4.129E-01	4.137E-01	1.396E+00
CO-60	-5.571E-01	150.0	8.359E-01	8.364E-01	1.809E+00
ZN-65	9.414E-01	197.0	1.855E+00	1.855E+00	6.346E+00
NB-94	5.380E-01	93.0	5.005E-01	5.013E-01	1.169E+00
ZR-95	7.884E-01	91.5	7.212E-01	7.224E-01	1.771E+00
NB-95	2.904E-01	200.9	5.835E-01	5.836E-01	2.014E+00
RU-103	4.276E-01	91.8	3.927E-01	3.933E-01	9.879E-01
RH-106	6.902E+00	26.3	1.819E+00	1.852E+00	4.433E+01
AG-108M	3.507E-01	127.8	4.482E-01	4.485E-01	1.129E+00
AG-110M	0.000E+00	1.#INF	1.475E-01	1.475E-01	3.755E+00
SN-113	7.641E-03	11816.7	9.029E-01	9.029E-01	3.099E+00
SB-124	5.315E-01	234.7	1.247E+00	1.247E+00	4.192E+00
SB-125	3.840E+00	25.7	9.856E-01	1.004E+00	4.241E+00
I-131	2.719E-01	186.5	5.072E-01	5.073E-01	1.277E+00
Gd-153	-1.349E+00	143.8	1.939E+00	1.941E+00	6.467E+00
Ga-68	-3.645E+00	708.5	2.583E+01	2.583E+01	5.855E+01
Tc-99m	-5.236E-01	166.2	8.699E-01	8.704E-01	2.897E+00
BA-133	-7.315E-01	192.7	1.410E+00	1.410E+00	4.727E+00
CS-134	1.047E+00	68.2	7.137E-01	7.157E-01	2.090E+00
CS-137	-9.987E-01	79.9	7.984E-01	8.000E-01	2.662E+00
CE-139	4.023E-01	107.9	4.342E-01	4.347E-01	1.455E+00
Ba-140	1.685E+00	119.6	2.015E+00	2.017E+00	4.336E+00
La-140	6.468E-01	95.8	6.195E-01	6.204E-01	1.243E+00
CE-141	-9.083E-01	169.0	1.535E+00	1.536E+00	5.114E+00

CE-144	-4.012E+00	161.1	6.465E+00	6.468E+00	2.153E+01
PM-144	4.711E-01	93.9	4.424E-01	4.431E-01	1.040E+00
EU-152	2.507E+00	90.4	2.265E+00	2.269E+00	3.948E+00
EU-154	1.630E+00	79.8	1.300E+00	1.303E+00	2.614E+00
EU-155	1.493E-01	153.1	2.286E-01	2.287E-01	9.676E+00
HF-181	5.040E-01	113.6	5.726E-01	5.732E-01	1.940E+00
Ta-182	5.490E-01	277.1	1.521E+00	1.522E+00	9.542E+00
Hg-203	-5.569E-02	927.4	5.165E-01	5.165E-01	1.772E+00
TL-208	7.192E+00	9.8	7.071E-01	7.961E-01	9.292E-01
PM-146	6.095E-01	110.0	6.706E-01	6.714E-01	1.189E+00
Y-88	8.592E-01	33.3	2.864E-01	2.906E-01	7.036E-01
Cd-113m	1.933E+03	299.2	5.785E+03	5.786E+03	1.984E+04
Cd-109	1.078E+01	247.0	2.663E+01	2.664E+01	8.860E+01
Cf-251	1.484E+00	151.4	2.247E+00	2.248E+00	5.782E+00
Cf-249	5.195E-01	102.5	5.325E-01	5.331E-01	3.006E+00
Sn-126	-5.474E+00	129.0	7.062E+00	7.068E+00	2.354E+01
PB-210	3.350E+01	54.8	1.836E+01	1.848E+01	4.528E+01
PB-212	1.940E+01	5.7	1.112E+00	1.504E+00	2.017E+00
PB-214	2.740E+01	5.8	1.602E+00	2.120E+00	2.030E+00
BI-207	-1.563E+00	86.0	1.344E+00	1.347E+00	2.879E+00
BI-212	9.744E+00	79.7	7.765E+00	7.781E+00	2.595E+01
U-235	-8.748E-01	98.8	8.644E-01	8.656E-01	2.335E+01
BI-214	2.635E+01	7.0	1.850E+00	2.286E+00	2.580E+00
BI-210M	-6.272E-01	115.7	7.256E-01	7.264E-01	2.446E+00
AC-228	1.492E+01	13.6	2.025E+00	2.161E+00	3.151E+00
TH-227	1.883E+00	205.1	3.861E+00	3.863E+00	1.594E+01
TH-229	-3.217E+00	302.5	9.729E+00	9.730E+00	2.516E+01
TH-234	1.649E+01	32.6	5.375E+00	5.452E+00	1.847E+01
PA-231	-1.737E+01	189.4	3.289E+01	3.290E+01	1.099E+02
PA-233	-1.096E+00	129.9	1.424E+00	1.425E+00	4.789E+00
PA-234	-2.043E+00	123.7	2.527E+00	2.530E+00	8.443E+00
PA-234M	2.727E+01	238.4	6.500E+01	6.501E+01	2.283E+02
AM-241	1.361E+00	126.8	1.725E+00	1.727E+00	5.763E+00
Np-237	4.859E+00	50.3	2.443E+00	2.458E+00	7.972E+00
Ir-192	0.000E+00	1.#INF	2.656E-01	2.656E-01	2.075E+00
Cs-136	-6.305E-01	96.4	6.076E-01	6.087E-01	2.051E+00
Np-239	1.715E+00	148.7	2.551E+00	2.553E+00	8.510E+00
Nd-147	2.630E+00	97.5	2.565E+00	2.569E+00	6.283E+00
TL-210	3.801E-01	154.7	5.881E-01	5.885E-01	2.020E+00
Kr-85	-1.327E+02	120.8	1.604E+02	1.605E+02	5.396E+02
Total	2.464E+03				

Analyst: Kellene Robbs

Sample description
453329_Gamma_160-36593-A-8-B

Spectrum Filename: C:\User\SPC\Det12\12_Gamma_20193737.An1

Acquisition information

Start time:	12/27/2019 9:31:25 AM
Live time:	1800
Real time:	1802
Dead time:	0.09 %
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	12/27/2019 9:31:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	12_2019-12-07_1443.PBC 12/7/2019 2:43:53 PM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 28 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 0.1641

***** 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
46.42	37.	58.75	0.59	1.799E-02	46.54	4.250	PBC<MDA	PB210
59.54	25.	126.81	0.86	2.817E-02	59.54	35.900	PBC<MDA	AM241
63.08	36.	53.72	0.87	2.978E-02	63.29	3.810	PBC<MDA	TH234
74.85	197.	12.35	0.88	3.333E-02				
77.18	370.	7.22	0.88	3.387E-02				
83.79	42.	38.80	0.89	3.517E-02				
87.21	90.	21.44	0.89	3.571E-02	86.49	13.100	1.077E+01	Np237
					86.54	30.700	4.596E+00	EU155
					86.94	9.040	1.558E+01	Sn126
					87.57	37.500	3.747E+00	Sn126
					88.04	3.790	3.700E+01	Cd109
89.88	70.	26.97	0.90	3.607E-02				
92.87	101.	19.48	0.90	3.641E-02	92.59	5.584	1.970E+01	TH234
					93.35	5.561	2.774E+01	AC228
106.13	26.	148.72	0.91	3.729E-02	106.13	22.700	PBC<MDA	Np239
121.78	12.	186.71	0.93	3.725E-02	121.78	28.580	PBC<MDA	EU152
					122.06	85.600	2.091E-01	CO57
153.57	25.	42.36	0.67	3.517E-02				
162.66	10.	206.49	0.97	3.435E-02	162.66	6.220	PBC<MDA	Ba140
163.38	20.	104.80	0.97	3.428E-02	163.38	5.080	PBC<MDA	U235
165.85	20.	107.93	0.97	3.405E-02	165.85	79.900	PBC<MDA	CE139
176.60	15.	151.36	0.98	3.303E-02	176.60	17.000	PBC<MDA	Cf251
185.72	77.	30.19	0.99	3.215E-02	185.72	54.000	2.461E+00	U235
209.59	34.	45.94	1.71	2.991E-02				
227.00	16.	137.62	1.03	2.839E-02	227.00	6.300	PBC<MDA	Cf251
235.97	20.	205.08	1.04	2.764E-02	235.97	12.300	PBC<MDA	TH227
238.57	397.	6.73	0.97	2.743E-02	238.63	43.300	1.858E+01	PB212

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
241.93	109.	14.76	1.05	2.716E-02	242.00	7.430	2.992E+01	PB214
244.69	18.	220.68	1.05	2.695E-02	244.69	7.580	PBC<MDA	EU152
263.70	5.	299.22	1.07	2.554E-02	263.70	0.006	PBC<MDA	Cd113m
276.79	34.	44.00	0.40	2.462E-02	277.28	6.310	PBC<MDA	TL208
295.14	213.	11.35	1.16	2.350E-02	295.09	19.300	2.615E+01	PB214
					296.00	79.000	6.403E+00	TL210
300.07	34.	36.91	0.98	2.321E-02	300.03	3.280	2.481E+01	PB212
					300.07	2.460	3.309E+01	PA231
					300.18	6.200	1.313E+01	PA233
320.08	18.	115.35	1.13	2.210E-02	320.08	9.940	PBC<MDA	CR51
328.76	13.	150.12	1.13	2.165E-02	328.76	20.300	PBC<MDA	La140
333.44	16.	102.49	1.14	2.142E-02	333.44	15.510	PBC<MDA	Cf249
338.19	116.	14.66	1.09	2.119E-02	338.32	12.010	2.533E+01	AC228
351.77	380.	6.06	1.18	2.056E-02	351.93	37.600	2.734E+01	PB214
365.09	8.	186.53	1.17	2.001E-02	364.48	81.700	PBC<MDA	I131
433.94	10.	127.80	1.24	1.751E-02	433.94	90.480	PBC<MDA	AG108M
453.98	6.	145.88	1.26	1.692E-02	453.88	65.000	PBC<MDA	PM146
463.37	53.	25.66	1.27	1.666E-02	463.37	10.470	1.688E+01	SB125
477.60	12.	106.28	1.28	1.628E-02	477.60	10.520	PBC<MDA	BE7
482.00	12.	113.62	1.28	1.617E-02	482.00	80.500	PBC<MDA	HF181
487.02	10.	126.47	1.29	1.604E-02	487.02	45.500	PBC<MDA	La140
497.05	11.	91.82	1.30	1.580E-02	497.05	90.900	PBC<MDA	RU103
511.86	91.	15.96	2.56	1.546E-02	511.86	20.000	1.635E+01	RH106
531.00	9.	97.54	1.33	1.504E-02	531.00	13.000	PBC<MDA	Nd147
537.26	10.	120.67	1.34	1.491E-02	537.26	24.390	PBC<MDA	Ba140
563.24	12.	94.44	1.36	1.439E-02	563.24	8.350	PBC<MDA	CS134
569.32	15.	68.17	1.37	1.428E-02	569.32	15.380	PBC<MDA	CS134
					569.47	8.200	7.134E+00	PA234
					569.70	97.740	5.987E-01	BI207
569.47	2.	561.74	1.37	1.428E-02	569.32	15.380	PBC<MDA	CS134
					569.47	8.200	9.332E-01	PA234
					569.70	97.740	7.831E-02	BI207
583.01	154.	9.83	1.10	1.403E-02	583.02	84.500	7.192E+00	TL208
600.50	13.	231.69	1.40	1.373E-02	600.50	17.860	PBC<MDA	SB125
602.73	13.	234.67	1.40	1.369E-02	602.73	98.260	PBC<MDA	SB124
604.71	11.	267.39	1.40	1.366E-02	604.71	97.620	PBC<MDA	CS134
609.25	297.	7.02	1.28	1.358E-02	609.31	46.090	2.635E+01	BI214
					610.30	5.750	2.115E+02	RU103
696.54	10.	93.91	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
724.20	7.	181.31	1.51	1.198E-02	724.20	44.150	PBC<MDA	ZR95
727.34	16.	79.69	1.52	1.194E-02	727.17	7.550	PBC<MDA	BI212
736.02	7.	164.75	1.52	1.184E-02	735.72	22.500	PBC<MDA	PM146
756.73	9.	91.48	1.54	1.160E-02	756.73	54.460	PBC<MDA	ZR95
765.79	6.	200.92	1.55	1.150E-02	765.79	99.790	PBC<MDA	NB95
					766.41	0.294	9.862E+01	PA234M
795.87	13.	79.88	1.58	1.119E-02	795.87	85.530	PBC<MDA	CS134
799.60	8.	154.74	1.58	1.115E-02	799.60	98.960	PBC<MDA	TL210

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
810.78	10.	85.05	1.59	1.104E-02	810.78	99.460	PBC<MDA	CO58
815.77	7.	125.49	1.60	1.099E-02	815.77	23.280	PBC<MDA	La140
834.85	9.	103.51	1.61	1.081E-02	834.85	99.980	PBC<MDA	MN54
889.28	10.	141.80	1.66	1.033E-02	889.28	99.984	PBC<MDA	Sc46
898.04	2.	496.66	1.67	1.025E-02	898.04	93.700	PBC<MDA	Y88
911.11	79.	13.57	1.78	1.015E-02	911.07	29.000	1.492E+01	AC228
964.11	9.	151.78	1.73	9.739E-03	964.11	14.605	PBC<MDA	EU152
968.81	79.	13.38	1.74	9.703E-03	968.97	17.460	2.601E+01	AC228
996.33	11.	79.78	1.76	9.508E-03	996.33	10.600	PBC<MDA	EU154
1001.00	4.	238.38	1.76	9.476E-03	1001.00	0.837	PBC<MDA	PA234M
1004.77	9.	102.65	1.77	9.450E-03	1004.77	18.010	PBC<MDA	EU154
1037.84	9.	90.44	1.80	9.228E-03	1037.84	14.130	PBC<MDA	Co56
1048.07	6.	68.11	1.81	9.162E-03	1048.07	80.000	PBC<MDA	Cs136
1050.36	23.	26.35	1.81	9.147E-03	1050.36	1.560	8.793E+01	RH106
1099.25	21.	33.60	1.85	8.846E-03	1099.25	56.500	2.297E+00	FE59
1112.07	9.	155.02	1.86	8.770E-03	1112.07	13.644	PBC<MDA	EU152
1115.55	8.	197.02	1.87	8.750E-03	1115.55	50.600	PBC<MDA	ZN65
1120.38	73.	13.62	1.34	8.722E-03	1120.29	15.100	3.093E+01	BI214
					1120.55	99.987	4.672E+00	Sc46
1221.41	5.	277.13	1.96	8.175E-03	1221.41	27.000	PBC<MDA	Ta182
1408.00	8.	110.40	2.12	7.324E-03	1408.00	21.005	PBC<MDA	EU152
1460.69	389.	5.07	1.77	7.113E-03	1460.83	10.670	2.848E+02	K40
1596.21	2.	304.14	2.27	6.616E-03	1596.21	95.400	PBC<MDA	La140
1763.90	38.	19.57	2.40	6.075E-03	1764.49	15.400	2.237E+01	BI214
1836.06	9.	33.33	2.46	5.866E-03	1836.06	99.200	8.592E-01	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 Channel	Centroid Energy	Background Counts	Net Area Counts	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide	
298.95	74.86	197.	197.	5.913E+03	12.35	0.880	-	D
308.29	77.19	174.	368.	1.085E+04	7.29	0.883	-	D
335.10	83.85	112.	44.	1.255E+03	37.07	0.889	-	sD
359.44	89.94	125.	71.	1.972E+03	25.18	0.896	-	D
613.64	153.57	41.	25.	7.155E+02	42.36	0.668	-	s
837.61	209.59	63.	34.	1.137E+03	45.94	1.712	-	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	185.47	46.46	165.	46.	0.026	54.81	0.600s
TH-227	200.18	50.14	415.	-22.	-0.012	131.35	0.855s
AM-241	237.74	59.54	481.	25.	0.014	126.81	0.865s
TH-234	252.74	63.29	169.	36.	0.020	53.72	0.868D
Sn-126	256.71	64.28	677.	-29.	-0.016	129.01	0.869s
BA-133	323.50	80.99	2205.	-27.	-0.015	243.33	0.887
Np-237	345.49	86.49	190.	41.	0.023	50.27	0.892D
EU-155	345.70	86.54	2052.	26.	0.015	244.32	0.892
Sn-126	347.29	86.94	2078.	26.	0.015	245.80	0.892
Sn-126	349.81	87.57	182.	54.	0.030	35.19	0.893D
Cd-109	351.68	88.04	2104.	26.	0.015	246.99	0.894A
TH-234	369.87	92.59	194.	57.	0.032	36.89	0.898D
AC-228	372.91	93.35	2105.	27.	0.015	245.59	0.899s
Gd-153	389.50	97.50	730.	-27.	-0.015	143.79	0.903
Np-239	397.50	99.50	757.	-27.	-0.015	146.07	0.905s
Gd-153	412.29	103.20	784.	-27.	-0.015	147.98	0.909s
Np-239	414.29	103.70	811.	-27.	-0.015	150.38	0.909s
EU-155	420.73	105.31	838.	-22.	-0.012	184.51	0.911s
Np-239	424.00	106.13	742.	26.	0.015	148.72	0.912s
EU-152	486.56	121.78	245.	12.	0.007	186.71	0.928s
CO-57	487.69	122.06	229.	-13.	-0.007	171.15	0.928s
PA-234	524.60	131.29	443.	-24.	-0.014	123.71	0.938s
HF-181	531.51	133.02	1055.	-29.	-0.016	157.43	0.939s
CE-144	533.57	133.54	1107.	-29.	-0.016	161.13	0.940s
HF-181	544.61	136.30	1136.	-29.	-0.016	162.74	0.943s
CO-57	545.30	136.47	1166.	-29.	-0.016	164.82	0.943s
Tc-99m	561.44	140.51	1195.	-30.	-0.016	166.15	0.947s
U-235	574.53	143.79	1225.	-30.	-0.017	167.55	0.950s
CE-141	581.15	145.44	1126.	-28.	-0.016	169.00	0.952s
Ba-140	649.99	162.66	193.	10.	0.005	206.49	0.969s
U-235	652.87	163.38	202.	20.	0.011	104.80	0.970
CE-139	662.76	165.85	216.	20.	0.011	107.93	0.973s
Cf-251	705.72	176.60	143.	15.	0.008	151.36	0.983s
U-235	742.18	185.72	139.	77.	0.043	30.19	0.992s
TH-229	773.32	193.51	165.	-8.	-0.004	302.46	1.000s
U-235	820.59	205.33	281.	-22.	-0.012	108.59	1.012s
TH-229	842.65	210.85	283.	-9.	-0.005	263.93	1.018s
Cf-251	907.22	227.00	128.	16.	0.009	137.62	1.034s
TH-227	943.09	235.97	818.	20.	0.011	205.08	1.043s
PB-212	953.73	238.63	75.	415.	0.230	5.73	1.045D
PB-214	967.18	242.00	74.	109.	0.060	14.76	1.049D
EU-152	977.96	244.69	771.	18.	0.010	220.68	1.051s
Cd-113m	1053.96	263.70	125.	5.	0.003	299.22	1.070s
BI-210M	1062.48	265.83	130.	-14.	-0.008	115.70	1.072s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
TL-208	1106.29	276.79	52.	34.	0.019	44.00	0.404s
Hg-203	1115.93	279.20	171.	-2.	-0.001	927.36	1.086s
I-131	1136.32	284.30	103.	-4.	-0.002	519.61	1.091
PB-214	1179.67	295.14	84.	213.	0.119	11.35	1.157
TL-210	1183.11	296.00	824.	-21.	-0.011	198.04	1.102s
PB-212	1199.39	300.07	39.	34.	0.019	36.91	0.982
PA-231	1199.38	300.07	804.	-21.	-0.012	194.88	1.106
PA-233	1199.82	300.18	783.	-21.	-0.012	192.34	1.107
PA-231	1209.70	302.65	762.	-21.	-0.012	189.39	1.109s
BA-133	1210.50	302.85	742.	-21.	-0.012	186.79	1.109s
Ba-140	1218.49	304.85	721.	-21.	-0.012	183.91	1.111s
BI-210M	1218.68	304.90	700.	-11.	-0.006	342.18	1.111s
PA-233	1247.13	312.01	208.	-16.	-0.009	129.90	1.118s
Ir-192	1265.04	316.49	224.	0.	0.000	1000.00	1.123s
CR-51	1279.41	320.08	205.	18.	0.010	115.35	1.126s
La-140	1314.10	328.76	179.	13.	0.007	150.12	1.135s
Cf-249	1332.81	333.44	132.	16.	0.009	102.49	1.139s
AC-228	1351.79	338.19	40.	116.	0.064	14.66	1.087
Cs-136	1361.32	340.57	364.	-21.	-0.012	132.09	1.146s
EU-152	1376.18	344.29	343.	-21.	-0.012	127.98	1.150s
HF-181	1382.35	345.83	300.	-18.	-0.010	141.64	1.151
PB-214	1406.11	351.77	30.	390.	0.217	5.85	1.177
BA-133	1423.02	356.00	506.	-17.	-0.009	192.72	1.162s
I-131	1456.95	364.48	56.	8.	0.004	186.53	1.170s
BA-133	1534.35	383.84	180.	-16.	-0.009	117.75	1.189s
Cf-249	1550.79	387.95	197.	0.	0.000	1000.00	1.193s
SB-125	1710.45	427.88	64.	-2.	-0.001	786.34	1.232s
AG-108M	1734.69	433.94	40.	10.	0.006	127.80	1.238s
PM-146	1814.45	453.88	20.	6.	0.003	145.88	1.257s
SB-125	1852.39	463.37	66.	53.	0.029	25.66	1.266s
BE-7	1909.29	477.60	72.	12.	0.007	106.28	1.280s
HF-181	1926.90	482.00	84.	12.	0.007	113.62	1.284
La-140	1946.98	487.02	75.	10.	0.006	126.47	1.289s
RU-103	1987.11	497.05	24.	11.	0.006	91.82	1.298s
RH-106	2046.35	511.86	60.	91.	0.051	15.96	2.563s
Kr-85	2054.81	513.98	175.	-16.	-0.009	120.81	1.315s
Nd-147	2122.88	531.00	17.	9.	0.005	97.54	1.331s
Ba-140	2147.92	537.26	30.	10.	0.005	120.67	1.337s
CS-134	2251.82	563.24	26.	12.	0.006	94.44	1.362s
CS-134	2276.15	569.32	45.	15.	0.008	68.17	1.367s
PA-234	2276.75	569.47	60.	2.	0.001	561.74	1.368
BI-207	2277.68	569.70	73.	-8.	-0.004	155.12	1.368
TL-208	2330.93	583.01	14.	154.	0.085	9.83	1.103
SB-125	2400.87	600.50	437.	13.	0.007	231.69	1.397s
SB-124	2409.79	602.73	450.	13.	0.007	234.67	1.399s
CS-134	2417.71	604.71	463.	11.	0.006	267.39	1.401s
BI-214	2435.88	609.25	32.	297.	0.165	7.02	1.280
RU-103	2440.06	610.30	474.	0.	0.000	1000.00	1.406s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
AG-108M	2455.99	614.28	474.	0.	0.000	1000.00	1.410s
PM-144	2471.12	618.06	474.	0.	0.000	1000.00	1.414s
RH-106	2486.54	621.92	492.	-14.	-0.008	226.53	1.417s
SB-125	2542.43	635.89	44.	-8.	-0.004	124.75	1.430s
I-131	2546.77	636.97	65.	-6.	-0.003	193.89	1.432s
AG-110M	2629.92	657.76	79.	-8.	-0.004	164.23	1.451s
CS-137	2645.51	661.66	113.	-20.	-0.011	79.94	1.455s
PM-144	2785.05	696.54	19.	10.	0.006	93.91	1.487s
NB-94	2809.41	702.63	23.	12.	0.006	93.03	1.493s
SB-124	2890.04	722.79	94.	-5.	-0.003	296.92	1.512s
AG-108M	2890.65	722.94	89.	0.	0.000	1000.00	1.512s
EU-154	2892.34	723.36	89.	0.	0.000	1000.00	1.512s
ZR-95	2895.69	724.20	81.	7.	0.004	181.31	1.513s
BI-212	2907.58	727.17	72.	16.	0.009	79.69	1.516s
PM-146	2941.78	735.72	28.	7.	0.004	164.75	1.524s
PM-146	2987.55	747.16	28.	-3.	-0.002	378.59	1.535
ZR-95	3025.83	756.73	14.	9.	0.005	91.48	1.543s
AG-110M	3054.69	763.94	48.	-11.	-0.006	91.70	1.550s
NB-95	3062.08	765.79	70.	6.	0.003	200.92	1.552s
PA-234M	3064.57	766.41	81.	-8.	-0.004	170.23	1.552s
EU-152	3114.61	778.92	51.	-17.	-0.010	90.91	1.564s
BI-212	3140.62	785.42	47.	-5.	-0.003	313.96	1.570s
CS-134	3182.43	795.87	51.	13.	0.007	79.88	1.579s
TL-210	3197.35	799.60	64.	8.	0.004	154.74	1.583
CS-134	3206.76	801.95	92.	-16.	-0.009	90.48	1.585s
CO-58	3242.06	810.78	28.	10.	0.005	85.05	1.593s
La-140	3262.05	815.77	34.	7.	0.004	125.49	1.598s
Cs-136	3272.97	818.50	66.	-12.	-0.007	96.37	1.600s
MN-54	3338.38	834.85	19.	9.	0.005	103.51	1.615s
Co-56	3386.08	846.77	50.	-14.	-0.008	114.21	1.626s
NB-94	3483.41	871.10	39.	0.	0.000	1000.00	1.648s
EU-154	3491.95	873.23	39.	0.	0.000	1000.00	1.650s
PA-234	3521.16	880.53	95.	-16.	-0.009	88.29	1.657s
PA-234	3532.00	883.24	100.	-7.	-0.004	214.71	1.659s
AG-110M	3537.78	884.68	107.	0.	0.000	1000.00	1.660s
Sc-46	3556.17	889.28	99.	10.	0.006	141.80	1.664s
Y-88	3591.22	898.04	20.	2.	0.001	496.66	1.672s
AC-228	3643.53	911.11	9.	79.	0.044	13.57	1.776
AG-110M	3749.09	937.49	55.	-20.	-0.011	85.77	1.708s
PA-234	3783.21	946.02	45.	-17.	-0.009	90.08	1.716s
EU-152	3855.60	964.11	79.	9.	0.005	151.78	1.732s
AC-228	3875.05	968.97	17.	79.	0.044	13.38	1.736s
EU-154	3984.54	996.33	30.	11.	0.006	79.78	1.761s
PA-234M	4003.22	1001.00	41.	4.	0.002	238.38	1.765s
EU-154	4018.33	1004.77	36.	9.	0.005	102.65	1.768s
Co-56	4150.66	1037.84	11.	9.	0.005	90.44	1.798s
Cs-136	4191.60	1048.07	6.	6.	0.004	68.11	1.807s
RH-106	4200.76	1050.36	6.	23.	0.013	26.35	1.809s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-207	4253.99	1063.66	48.	-19.	-0.011	86.02	1.820s
Ga-68	4308.98	1077.40	27.	-2.	-0.001	708.52	1.833s
FE-59	4396.44	1099.25	5.	21.	0.011	33.60	1.852s
EU-152	4447.76	1112.07	96.	9.	0.005	155.02	1.863s
ZN-65	4461.66	1115.55	105.	8.	0.004	197.02	1.866
BI-214	4480.98	1120.38	5.	73.	0.041	13.62	1.336s
Sc-46	4481.68	1120.55	113.	0.	0.000	1000.00	1.870s
Ta-182	4484.69	1121.30	113.	0.	0.000	1000.00	1.871s
Ta-182	4755.86	1189.05	43.	-16.	-0.009	98.08	1.930
Ta-182	4885.39	1221.41	34.	5.	0.003	277.13	1.957
NA-22	5098.03	1274.53	17.	0.	0.000	1000.00	2.003s
EU-154	5098.08	1274.54	17.	0.	0.000	1000.00	2.003s
FE-59	5166.35	1291.60	23.	-10.	-0.005	119.90	2.017s
TL-210	5252.04	1313.00	17.	-3.	-0.002	327.45	2.036
CO-60	5330.11	1332.50	23.	-8.	-0.004	150.05	2.052s
AG-110M	5537.48	1384.30	17.	-1.	-0.001	972.11	2.096s
EU-152	5632.39	1408.00	12.	8.	0.004	110.40	2.115s
K-40	5843.34	1460.69	0.	389.	0.216	5.07	1.775
La-140	6386.02	1596.21	6.	2.	0.001	304.14	2.269s
SB-124	6765.58	1690.98	0.	0.	0.000	1000.00	2.345s
BI-214	7060.00	1764.49	8.	38.	0.021	19.57	2.403s
Y-88	7346.69	1836.06	0.	9.	0.005	33.33	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	3.8170E+00				5.31E+01	
			477.60	3.817E+00	?(	1.373E+01 1.06E+02 1.05E+01	G
K-40	N	2.8478E+02				4.66E+11	
			1460.83	2.848E+02	(	5.395E+00 5.07E+00 1.07E+01	G
Sc-46	F	5.4707E-01				8.38E+01	
			889.28	5.471E-01	&(	2.639E+00 1.42E+02 1.00E+02	G
			1120.55	0.000E+00	-	3.329E+00 1.00E+03 1.00E+02	G
CR-51	F	4.5362E+00				2.77E+01	
			320.08	4.536E+00	&(	1.756E+01 1.15E+02 9.94E+00	G
MN-54	C	4.7985E-01				3.12E+02	
			834.85	4.798E-01	?(	1.174E+00 1.04E+02 1.00E+02	G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
FE-59	F	2.2973E+00					4.45E+01	
			1099.25	2.297E+00	?(	1.498E+00	3.36E+01	5.65E+01 G
			1291.60	-1.587E+00	-	4.087E+00	1.20E+02	4.32E+01 G
Co-56	C	-1.7070E-01					7.73E+01	
			846.77	-7.275E-01	?(	1.853E+00	1.14E+02	9.99E+01 G
			1238.28	-1.732E-01	%	3.928E+00	1.06E+03	6.61E+01 G
			1037.84	3.767E+00	&(	7.639E+00	9.04E+01	1.41E+01 G
			1771.35	2.964E-01	%	2.084E+01	1.97E+03	1.55E+01 A
CO-57	C	-2.2075E-01					2.72E+02	
			122.06	-2.208E-01	&(	1.275E+00	1.71E+02	8.56E+01 G
			136.47	-4.200E+00	+	2.305E+01	1.65E+02	1.07E+01 G
CO-58	C	4.8549E-01					7.09E+01	
			810.78	4.855E-01	?(	1.396E+00	8.51E+01	9.95E+01 G
CO-60	F	-5.5709E-01					1.93E+03	
			1332.50	-5.571E-01	?(	1.809E+00	1.50E+02	1.00E+02 G
			1173.24	2.200E-02	%	1.767E+00	3.53E+03	9.99E+01 G
ZN-65	F	9.4144E-01					2.44E+02	
			1115.55	9.414E-01	?(	6.346E+00	1.97E+02	5.06E+01 G
NB-94	I	5.3801E-01					7.41E+06	
			702.63	5.380E-01	&(	1.169E+00	9.30E+01	9.79E+01 G
			871.10	0.000E+00	-	1.688E+00	1.00E+03	9.99E+01 G
ZR-95	I	7.8843E-01					6.40E+01	
			756.73	8.172E-01	?(	1.771E+00	9.15E+01	5.45E+01 G
			724.20	7.529E-01	?(	4.686E+00	1.81E+02	4.42E+01 G
NB-95	I	2.9038E-01					6.40E+01	
			765.79	2.904E-01	?(	2.014E+00	2.01E+02	9.98E+01 G
RU-103	I	4.2764E-01					3.93E+01	
			497.05	4.276E-01	?(	9.879E-01	9.18E+01	9.09E+01 G
			610.30	0.000E+00	-	7.418E+01	1.00E+03	5.75E+00 GA
RH-106	I	6.9022E+00					3.74E+02	
			621.92	-5.828E+00	?(	4.433E+01	2.27E+02	9.93E+00 G
			1050.36	8.793E+01	?(	5.650E+01	2.63E+01	1.56E+00 G
			511.86	1.635E+01	?	6.974E+00	1.60E+01	2.00E+01 GA
AG-108M	C	3.5068E-01					1.53E+05	
			433.94	3.507E-01	&(	1.129E+00	1.28E+02	9.05E+01 G
			722.94	0.000E+00	-	2.380E+00	1.00E+03	9.08E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
			614.28	0.000E+00	-	4.770E+00	1.00E+03	8.98E+01 G
SN-113	F	7.6408E-03					1.15E+02	
			391.69	7.641E-03	%(	3.099E+00	1.18E+04	6.40E+01 G
SB-124	F	5.3146E-01					6.02E+01	
			602.73	5.315E-01	?(	4.192E+00	2.35E+02	9.83E+01 G
			1690.98	0.000E+00	-	1.359E+00	1.00E+03	4.78E+01 G
			722.79	-2.000E+00	+	2.049E+01	2.97E+02	1.08E+01 G
SB-125	I	3.8403E+00					1.01E+03	
			427.88	-2.121E-01	&(	4.241E+00	7.86E+02	2.96E+01 G
			600.50	2.912E+00	?(	2.268E+01	2.32E+02	1.79E+01 G
			635.89	-2.923E+00	+	1.252E+01	1.25E+02	1.13E+01 G
			463.37	1.688E+01	?(	1.292E+01	2.57E+01	1.05E+01 G
I-131	I	2.7190E-01					8.02E+00	
			364.48	2.719E-01	&(	1.277E+00	1.87E+02	8.17E+01 G
			284.30	-1.373E+00	+	1.870E+01	5.20E+02	6.14E+00 G
			636.97	-3.536E+00	+	2.368E+01	1.94E+02	7.17E+00 G
Gd-153	F	-1.3485E+00					2.42E+02	
			97.50	-1.349E+00	?(	6.467E+00	1.44E+02	3.00E+01 G
			103.20	-1.850E+00	+	9.129E+00	1.48E+02	2.18E+01 G
Ga-68	C	-3.6450E+00					4.71E-02	
			1077.40	-3.645E+00	?(	5.855E+01	7.09E+02	3.30E+00 G
Tc-99m	I	-5.2357E-01					2.51E-01	
			140.51	-5.236E-01	?(	2.897E+00	1.66E+02	8.93E+01 G
BA-133	F	-7.3150E-01					3.85E+03	
			356.00	-7.315E-01	&(	4.727E+00	1.93E+02	6.20E+01 G
			302.85	-2.730E+00	&	1.705E+01	1.87E+02	1.83E+01 G
			383.84	-5.332E+00	+	2.111E+01	1.18E+02	8.94E+00 GA
			80.99	-1.288E+00	+	1.043E+01	2.43E+02	3.41E+01 GA
CS-134	I	1.0469E+00					7.54E+02	
			795.87	7.810E-01	&(	2.090E+00	7.99E+01	8.55E+01 G
			604.71	4.768E-01	&(	4.289E+00	2.67E+02	9.76E+01 G
			569.32	3.803E+00	*(	8.593E+00	6.82E+01	1.54E+01 G
			801.95	-8.957E+00	+	2.719E+01	9.05E+01	8.69E+00 G
			563.24	5.360E+00	(	1.224E+01	9.44E+01	8.35E+00 G
CS-137	I	-9.9870E-01					1.10E+04	
			661.66	-9.987E-01	?(	2.662E+00	7.99E+01	8.52E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CE-139	F	4.0234E-01					1.38E+02	
			165.85	4.023E-01	&(	1.455E+00	1.08E+02	7.99E+01 G
Ba-140	I	1.6854E+00					1.28E+01	
			537.26	1.477E+00	(	4.336E+00	1.21E+02	2.44E+01 G
			162.66	2.502E+00	&(	1.752E+01	2.06E+02	6.22E+00 G
			304.85	-1.174E+01	+	7.219E+01	1.84E+02	4.29E+00 G
La-140	I	6.4679E-01					1.28E+01	
			1596.21	1.760E-01	?(	1.243E+00	3.04E+02	9.54E+01 G
			487.02	7.624E-01	?(	3.282E+00	1.26E+02	4.55E+01 G
			328.76	1.622E+00	?(	8.227E+00	1.50E+02	2.03E+01 G
			815.77	1.500E+00	?(	6.497E+00	1.25E+02	2.33E+01 G
CE-141	I	-9.0834E-01					3.25E+01	
			145.44	-9.083E-01	?(	5.114E+00	1.69E+02	4.82E+01 G
CE-144	I	-4.0122E+00					2.85E+02	
			133.54	-4.012E+00	&(	2.153E+01	1.61E+02	1.11E+01 G
PM-144	C	4.7110E-01					3.63E+02	
			696.54	4.711E-01	(	1.040E+00	9.39E+01	9.90E+01 G
			618.06	0.000E+00	-	4.344E+00	1.00E+03	9.91E+01 G
EU-152	F	2.5066E+00					4.94E+03	
			121.78	6.262E-01	(	3.948E+00	1.87E+02	2.86E+01 G
			344.29	-2.083E+00	+	8.926E+00	1.28E+02	2.65E+01 G
			1112.07	4.255E+00	?(	2.249E+01	1.55E+02	1.36E+01 G
			778.92	-6.549E+00	+	1.364E+01	9.09E+01	1.29E+01 G
			964.11	3.328E+00	?(	1.727E+01	1.52E+02	1.46E+01 G
			244.69	4.868E+00	?(	3.593E+01	2.21E+02	7.58E+00 G
			1408.00	2.889E+00	?	6.808E+00	1.10E+02	2.10E+01 GA
EU-154	I	1.6298E+00					3.14E+03	
			123.10	1.527E-08	%(	2.614E+00	5.00E+09	4.08E+01 G
			1274.54	0.000E+00	-	4.374E+00	1.00E+03	3.52E+01 G
			723.36	0.000E+00	&	1.070E+01	1.00E+03	2.02E+01 G
			873.23	0.000E+00	&	1.377E+01	1.00E+03	1.23E+01 G
			1004.77	2.839E+00	?(	9.948E+00	1.03E+02	1.80E+01 G
			996.33	5.847E+00	?(	1.568E+01	7.98E+01	1.06E+01 G
EU-155	I	1.4933E-01					1.81E+03	
			105.31	-1.571E+00	?(	9.676E+00	1.85E+02	2.12E+01 G
			86.54	1.337E+00	&(	1.087E+01	2.44E+02	3.07E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
HF-181	F	5.0398E-01					4.24E+01	
			482.00	5.040E-01	?(	1.940E+00	1.14E+02	8.05E+01 G
			133.02	-1.026E+00	+	5.381E+00	1.57E+02	4.33E+01 G
			345.83	-3.103E+00	+	1.475E+01	1.42E+02	1.51E+01 G
			136.30	-7.665E+00	+	4.155E+01	1.63E+02	5.85E+00 G
Ta-182	F	5.4895E-01					1.14E+02	
			1121.30	0.000E+00	?(	9.542E+00	1.00E+03	3.49E+01 G
			1221.41	1.259E+00	(	7.521E+00	2.77E+02	2.70E+01 G
			1189.05	-6.440E+00	+	1.363E+01	9.81E+01	1.62E+01 G
Hg-203	F	-5.5692E-02					4.66E+01	
			279.20	-5.569E-02	&(	1.772E+00	9.27E+02	8.15E+01 G
TL-208	N	7.1923E+00					6.98E+02	
			583.02	7.192E+00	(	9.292E-01	9.83E+00	8.45E+01 G
			277.28	1.198E+01	+	1.305E+01	4.40E+01	6.31E+00 G
			860.56	4.230E-01	%	1.437E+01	1.48E+03	1.24E+01 G
PM-146	C	6.0953E-01					2.02E+03	
			453.88	3.153E-01	?(	1.189E+00	1.46E+02	6.50E+01 G
			747.16	-4.186E-01	+	3.819E+00	3.79E+02	3.40E+01 G
			735.72	1.460E+00	?(	5.707E+00	1.65E+02	2.25E+01 G
Y-88	F	8.5922E-01					1.07E+02	
			1836.06	8.592E-01	?(	7.036E-01	3.33E+01	9.92E+01 G
			898.04	1.157E-01	-	1.362E+00	4.97E+02	9.37E+01 G
Cd-113m		1.9334E+03					5.33E+03	
			263.70	1.933E+03	&(	1.984E+04	2.99E+02	6.00E-03 K
Cd-109	F	1.0783E+01					4.53E+02	
							Derived Ave Activity	
			88.04	1.078E+01	}(	8.860E+01	2.47E+02	3.79E+00 G
Cf-251	T	1.4843E+00					3.28E+05	
			176.60	1.484E+00	*(	5.782E+00	1.51E+02	1.70E+01 G
			227.00	4.867E+00		1.724E+01	1.38E+02	6.30E+00 GA
Cf-249	T	5.1955E-01					1.28E+05	
			387.95	0.000E+00	?(	3.006E+00	1.00E+03	6.60E+01 G
			333.44	2.730E+00	?(	9.401E+00	1.02E+02	1.55E+01 G
Sn-126		-5.4736E+00					3.65E+07	
			87.57	2.235E+00	}	2.716E+00	3.52E+01	3.75E+01 GA
			64.28	-5.474E+00	?(	2.354E+01	1.29E+02	9.70E+00 G
			86.94	4.534E+00		3.708E+01	2.46E+02	9.04E+00 GA

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PB-210	N	3.3502E+01					8.14E+03	
			46.54	3.350E+01	(P	4.528E+01	5.48E+01	4.25E+00 G
PB-212	N	1.9402E+01					6.98E+02	
			238.63	1.940E+01	(	2.017E+00	5.73E+00	4.33E+01 G
			300.03	2.481E+01	+	2.322E+01	3.69E+01	3.28E+00 GA
PB-214	N	2.7398E+01					5.84E+05	
			351.93	2.804E+01	(	2.030E+00	5.85E+00	3.76E+01 G
			295.09	2.615E+01	(P	5.548E+00	1.13E+01	1.93E+01 G
			242.00	2.992E+01		1.180E+01	1.48E+01	7.43E+00 GA
BI-207	C	-1.5629E+00					1.18E+04	
			1063.66	-1.563E+00	?(	2.879E+00	8.60E+01	7.45E+01 G
			569.70	-3.186E-01	&	1.693E+00	1.55E+02	9.77E+01 G
BI-212	N	9.7438E+00					6.98E+02	
			727.17	9.744E+00	?(	2.595E+01	7.97E+01	7.55E+00 G
			785.42	-1.793E+01	&	1.327E+02	3.14E+02	1.28E+00 GA
U-235	N	-8.7481E-01					2.57E+11	
			143.79	-4.186E+00	*(	2.335E+01	1.68E+02	1.10E+01 G
			205.33	-8.142E+00	+	2.956E+01	1.09E+02	5.01E+00 G
			163.38	6.269E+00	?(	2.201E+01	1.05E+02	5.08E+00 G
			185.72	2.461E+00	P	1.846E+00	3.02E+01	5.40E+01 GA
BI-214	N	2.6353E+01					5.84E+05	
			609.31	2.635E+01	(P	2.580E+00	7.02E+00	4.61E+01 G
			1120.29	3.093E+01	+	5.390E+00	1.36E+01	1.51E+01 G
			1764.49	2.237E+01	-	9.597E+00	1.96E+01	1.54E+01 G
BI-210M	T	-6.2719E-01					1.10E+09	
			265.83	-6.272E-01	&(	2.446E+00	1.16E+02	5.00E+01 G
			304.90	-9.500E-01	+	1.090E+01	3.42E+02	2.80E+01 G
AC-228	N	1.4915E+01					2.10E+03	
			911.07	1.492E+01	(	3.151E+00	1.36E+01	2.90E+01 G
			968.97	2.601E+01	+	7.131E+00	1.34E+01	1.75E+01 G
			338.32	2.533E+01	+	7.028E+00	1.47E+01	1.20E+01 G
			93.35	7.264E+00	-	5.934E+01	2.46E+02	5.56E+00 XA
TH-227	N	1.8828E+00					7.95E+03	
			256.24	-5.072E-01	%(	1.594E+01	1.20E+03	7.00E+00 G
			235.97	3.243E+00	&(	2.223E+01	2.05E+02	1.23E+01 G
			50.14	-7.037E+00	+	3.091E+01	1.31E+02	8.00E+00 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-229	N	-3.2165E+00					2.68E+06	
			193.51	-3.217E+00	?(	2.516E+01	3.02E+02	4.40E+00 G
			210.85	-5.667E+00	+	5.058E+01	2.64E+02	2.99E+00 G
TH-234	N	1.6495E+01					1.63E+12	
			92.59	1.567E+01	(P	1.847E+01	3.69E+01	5.58E+00 G
			63.29	1.771E+01	(P	3.097E+01	5.37E+01	3.81E+00 G
PA-231	N	-1.7366E+01					1.20E+07	
			302.65	-1.737E+01	?(	1.099E+02	1.89E+02	2.88E+00 G
			300.07	-2.015E+01	+	1.312E+02	1.95E+02	2.46E+00 G
PA-233	C	-1.0959E+00					7.82E+08	
			312.01	-1.096E+00	&(	4.789E+00	1.30E+02	3.60E+01 G
			300.18	-7.999E+00	+	5.141E+01	1.92E+02	6.20E+00 G
PA-234	N	-2.0431E+00					1.63E+12	
			131.29	-2.043E+00	?(	8.443E+00	1.24E+02	1.80E+01 G
			946.02	-7.138E+00	+	1.426E+01	9.01E+01	1.34E+01 G
			569.47	9.332E-01	+	1.842E+01	5.62E+02	8.20E+00 G
			883.24	-3.740E+00	+	2.754E+01	2.15E+02	9.60E+00 G
			880.53	-1.451E+01	+	4.292E+01	8.83E+01	6.00E+00 GA
PA-234M	N	2.7267E+01					1.63E+12	
			1001.00	2.727E+01	(	2.283E+02	2.38E+02	8.37E-01 G
			766.41	-1.260E+02	+	7.353E+02	1.70E+02	2.94E-01 G
AM-241	T	1.3607E+00					1.58E+05	
			59.54	1.361E+00	?(	5.763E+00	1.27E+02	3.59E+01 G
Np-237	F	4.8589E+00					2.14E+06	
			86.49	4.859E+00	(	7.972E+00	5.03E+01	1.31E+01 G
Cs-136	F	-6.3048E-01					1.30E+01	
			818.50	-6.305E-01	?(	2.051E+00	9.64E+01	1.00E+02 G
			1048.07	4.861E-01	+	1.094E+00	6.81E+01	8.00E+01 G
			340.57	-1.164E+00	+	5.146E+00	1.32E+02	4.69E+01 G
Np-239	T	1.7153E+00					2.36E+00	
			103.70	-1.680E+00	&	8.426E+00	1.50E+02	2.40E+01 X
			106.13	1.715E+00	?(	8.510E+00	1.49E+02	2.27E+01 G
			99.50	-2.692E+00	+	1.312E+01	1.46E+02	1.50E+01 X
Nd-147		2.6297E+00					1.11E+01	
			531.00	2.630E+00	?(	6.283E+00	9.75E+01	1.30E+01 G
			91.10	2.936E-01	%	1.181E+01	1.21E+03	2.83E+01 G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TL-210   N   3.8008E-01                                      5.84E+05
                          799.60 3.801E-01 ?(  2.020E+00 1.55E+02 9.90E+01 G
                          296.00-6.188E-01 +   4.094E+00 1.98E+02 7.90E+01 G
                         1313.00-1.026E+00 +   7.498E+00 3.27E+02 2.10E+01 GA

Kr-85    I  -1.3275E+02                                      3.92E+03
                          513.98-1.327E+02 ?(  5.396E+02 1.21E+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	415.	-22.	-0.012	131.35	-7.037E+00
AM-241	59.54	481.	25.	0.014	126.81	1.361E+00
BA-133	80.99	2205.	-27.	-0.015	243.33	-1.288E+00
EU-155	86.54	2052.	26.	0.015	244.32	1.337E+00
Gd-153	97.50	730.	-27.	-0.015	143.79	-1.349E+00
Np-239	99.50	757.	-27.	-0.015	146.07	-2.692E+00
Gd-153	103.20	784.	-27.	-0.015	147.98	-1.850E+00

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Np-239	103.70	811.	-27.	-0.015	150.38	-1.680E+00	
EU-155	105.31	838.	-22.	-0.012	184.51	-1.571E+00	
Np-239	106.13	742.	26.	0.015	148.72	1.715E+00	
EU-152	121.78	245.	12.	0.007	186.71	6.262E-01	
CO-57	122.06	229.	-13.	-0.007	171.15	-2.208E-01	
HF-181	133.02	1055.	-29.	-0.016	157.43	-1.026E+00	
CE-144	133.54	1107.	-29.	-0.016	161.13	-4.012E+00	
HF-181	136.30	1136.	-29.	-0.016	162.74	-7.665E+00	
CO-57	136.47	1166.	-29.	-0.016	164.82	-4.200E+00	
Tc-99m	140.51	1195.	-30.	-0.016	166.15	-5.236E-01	
U-235	143.79	1225.	-30.	-0.017	167.55	-4.186E+00	
CE-141	145.44	1126.	-28.	-0.016	169.00	-9.083E-01	
Ba-140	162.66	193.	10.	0.005	206.49	2.502E+00	
U-235	163.38	202.	20.	0.011	104.80	6.269E+00	
CE-139	165.85	216.	20.	0.011	107.93	4.023E-01	
Cf-251	176.60	143.	15.	0.008	151.36	1.484E+00	
U-235	185.72	139.	77.	0.043	30.19	2.461E+00	P
TH-229	193.51	165.	-8.	-0.004	302.46	-3.217E+00	
U-235	205.33	281.	-22.	-0.012	108.59	-8.142E+00	
TH-229	210.85	283.	-9.	-0.005	263.93	-5.667E+00	
Cf-251	227.00	128.	16.	0.009	137.62	4.867E+00	
TH-227	235.97	818.	20.	0.011	205.08	3.243E+00	
EU-152	244.69	771.	18.	0.010	220.68	4.868E+00	
Cd-113m	263.70	125.	5.	0.003	299.22	1.933E+03	
BI-210M	265.83	130.	-14.	-0.008	115.70	-6.272E-01	
Hg-203	279.20	171.	-2.	-0.001	927.36	-5.569E-02	
TL-210	296.00	824.	-21.	-0.011	198.04	-6.188E-01	
PA-231	300.07	804.	-21.	-0.012	194.88	-2.015E+01	
PA-233	300.18	783.	-21.	-0.012	192.34	-7.999E+00	
PA-231	302.65	762.	-21.	-0.012	189.39	-1.737E+01	
BA-133	302.85	742.	-21.	-0.012	186.79	-2.730E+00	
Ba-140	304.85	721.	-21.	-0.012	183.91	-1.174E+01	
BI-210M	304.90	700.	-11.	-0.006	342.18	-9.500E-01	
PA-233	312.01	208.	-16.	-0.009	129.90	-1.096E+00	
CR-51	320.08	205.	18.	0.010	115.35	4.536E+00	
La-140	328.76	179.	13.	0.007	150.12	1.622E+00	
Cf-249	333.44	132.	16.	0.009	102.49	2.730E+00	
Cs-136	340.57	364.	-21.	-0.012	132.09	-1.164E+00	
EU-152	344.29	343.	-21.	-0.012	127.98	-2.083E+00	
HF-181	345.83	300.	-18.	-0.010	141.64	-3.103E+00	
BA-133	356.00	506.	-17.	-0.009	192.72	-7.315E-01	
BA-133	383.84	180.	-16.	-0.009	117.75	-5.332E+00	
SB-125	427.88	64.	-2.	-0.001	786.34	-2.121E-01	
AG-108M	433.94	40.	10.	0.006	127.80	3.507E-01	
SB-125	463.37	66.	53.	0.029	25.66	1.688E+01	
BE-7	477.60	72.	12.	0.007	106.28	3.817E+00	
HF-181	482.00	84.	12.	0.007	113.62	5.040E-01	
La-140	487.02	75.	10.	0.006	126.47	7.624E-01	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
RU-103	497.05	24.	11.	0.006	91.82	4.276E-01	
RH-106	511.86	60.	91.	0.051	15.96	1.635E+01	
Kr-85	513.98	175.	-16.	-0.009	120.81	-1.327E+02	
Nd-147	531.00	17.	9.	0.005	97.54	2.630E+00	
Ba-140	537.26	30.	10.	0.005	120.67	1.477E+00	
CS-134	563.24	26.	12.	0.006	94.44	5.360E+00	
CS-134	569.32	45.	15.	0.008	68.17	3.803E+00	
BI-207	569.70	73.	-8.	-0.004	155.12	-3.186E-01	
SB-125	600.50	437.	13.	0.007	231.69	2.912E+00	
SB-124	602.73	450.	13.	0.007	234.67	5.315E-01	
CS-134	604.71	463.	11.	0.006	267.39	4.768E-01	
RH-106	621.92	492.	-14.	-0.008	226.53	-5.828E+00	
SB-125	635.89	44.	-8.	-0.004	124.75	-2.923E+00	
AG-110M	657.76	79.	-8.	-0.004	164.23	-3.580E-01	
CS-137	661.66	113.	-20.	-0.011	79.94	-9.987E-01	
PM-144	696.54	19.	10.	0.006	93.91	4.711E-01	
NB-94	702.63	23.	12.	0.006	93.03	5.380E-01	
SB-124	722.79	94.	-5.	-0.003	296.92	-2.000E+00	
ZR-95	724.20	81.	7.	0.004	181.31	7.529E-01	
ZR-95	756.73	14.	9.	0.005	91.48	8.172E-01	
AG-110M	763.94	48.	-11.	-0.006	91.70	-2.452E+00	
NB-95	765.79	70.	6.	0.003	200.92	2.904E-01	
PA-234M	766.41	81.	-8.	-0.004	170.23	-1.260E+02	
EU-152	778.92	51.	-17.	-0.010	90.91	-6.549E+00	
CS-134	795.87	51.	13.	0.007	79.88	7.810E-01	
TL-210	799.60	64.	8.	0.004	154.74	3.801E-01	
CS-134	801.95	92.	-16.	-0.009	90.48	-8.957E+00	
CO-58	810.78	28.	10.	0.005	85.05	4.855E-01	
La-140	815.77	34.	7.	0.004	125.49	1.500E+00	
Cs-136	818.50	66.	-12.	-0.007	96.37	-6.305E-01	
MN-54	834.85	19.	9.	0.005	103.51	4.798E-01	
Co-56	846.77	50.	-14.	-0.008	114.21	-7.275E-01	
Sc-46	889.28	99.	10.	0.006	141.80	5.471E-01	
AG-110M	937.49	55.	-20.	-0.011	85.77	-3.205E+00	
EU-152	964.11	79.	9.	0.005	151.78	3.328E+00	
EU-154	996.33	30.	11.	0.006	79.78	5.847E+00	
PA-234M	1001.00	41.	4.	0.002	238.38	2.727E+01	
EU-154	1004.77	36.	9.	0.005	102.65	2.839E+00	
Co-56	1037.84	11.	9.	0.005	90.44	3.767E+00	
Cs-136	1048.07	6.	6.	0.004	68.11	4.861E-01	
RH-106	1050.36	6.	23.	0.013	26.35	8.793E+01	
BI-207	1063.66	48.	-19.	-0.011	86.02	-1.563E+00	
Ga-68	1077.40	27.	-2.	-0.001	708.52	-3.645E+00	
EU-152	1112.07	96.	9.	0.005	155.02	4.255E+00	
ZN-65	1115.55	105.	8.	0.004	197.02	9.414E-01	
Ta-182	1189.05	43.	-16.	-0.009	98.08	-6.440E+00	
Ta-182	1221.41	34.	5.	0.003	277.13	1.259E+00	
TL-210	1313.00	17.	-3.	-0.002	327.45	-1.026E+00	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
CO-60	1332.50	23.	-8.	-0.004	150.05	-5.571E-01	
AG-110M	1384.30	17.	-1.	-0.001	972.11	-3.081E-01	
EU-152	1408.00	12.	8.	0.004	110.40	2.889E+00	
La-140	1596.21	6.	2.	0.001	304.14	1.760E-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 *****

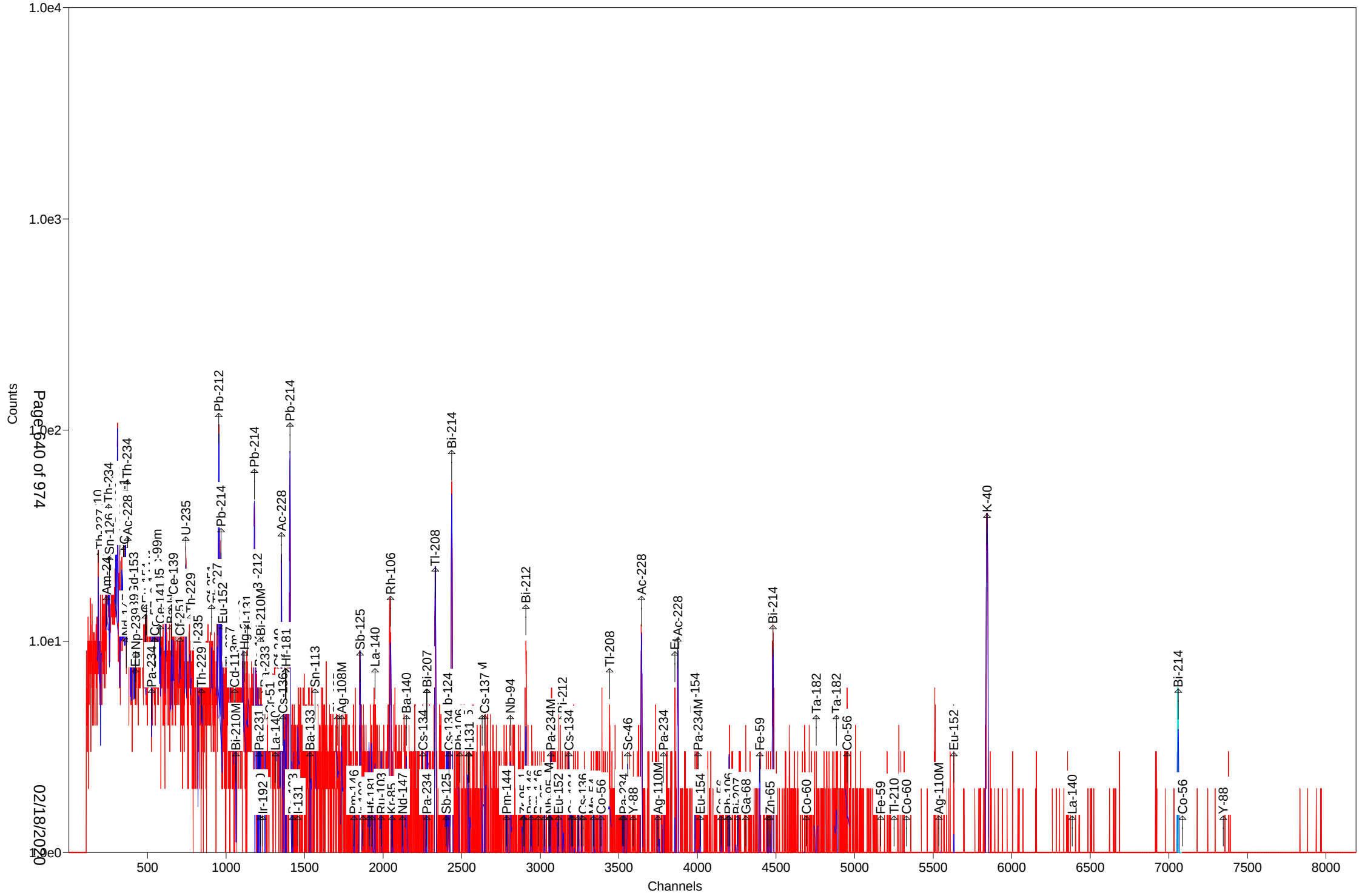
Nuclide		Time of Count Activity Bq/Sample	Time Corrected Activity Bq/Sample	Uncertainty Counting 1 Sigma	MDA Bq/Sample
BE-7	#A	3.8170E+00	3.8170E+00	1.063E+02%	1.37E+01
NA-22	#A	0.0000E+00	0.0000E+00	1.000E+03%	1.54E+00
K-40		2.8478E+02	2.8478E+02	5.070E+00%	5.40E+00
Sc-46	#A	5.4707E-01	5.4707E-01	1.418E+02%	2.64E+00
CR-51	#A	4.5361E+00	4.5362E+00	1.153E+02%	1.76E+01
MN-54	#A	4.7985E-01	4.7985E-01	1.035E+02%	1.17E+00
FE-59	#	2.2973E+00	2.2973E+00	3.360E+01%	1.50E+00
Co-56	#A	-1.7070E-01	-1.7070E-01	7.284E+01%	1.85E+00
CO-57	#A	-2.2075E-01	-2.2075E-01	1.712E+02%	1.28E+00
CO-58	#A	4.8549E-01	4.8549E-01	8.505E+01%	1.40E+00
CO-60	#A	-5.5709E-01	-5.5709E-01	1.500E+02%	1.81E+00
ZN-65	#A	9.4144E-01	9.4144E-01	1.970E+02%	6.35E+00
NB-94	#A	5.3801E-01	5.3801E-01	9.303E+01%	1.17E+00
ZR-95	#A	7.8842E-01	7.8843E-01	9.148E+01%	1.77E+00
NB-95	#A	2.9038E-01	2.9038E-01	2.009E+02%	2.01E+00
RU-103	#A	4.2764E-01	4.2764E-01	9.182E+01%	9.88E-01
RH-106	#A	6.9022E+00	6.9022E+00	2.635E+01%	4.43E+01
AG-108M	#A	3.5068E-01	3.5068E-01	1.278E+02%	1.13E+00
AG-110M	#A	0.0000E+00	0.0000E+00	1.000E+03%	3.75E+00
SN-113	#A	7.6408E-03	7.6408E-03	1.182E+04%	3.10E+00
SB-124	#A	5.3146E-01	5.3146E-01	2.347E+02%	4.19E+00
SB-125	#A	3.8403E+00	3.8403E+00	2.566E+01%	4.24E+00
I-131	#A	2.7189E-01	2.7190E-01	1.865E+02%	1.28E+00
Gd-153	#A	-1.3485E+00	-1.3485E+00	1.438E+02%	6.47E+00
Ga-68	#A	-3.6295E+00	-3.6450E+00	7.085E+02%	5.86E+01
Tc-99m	#A	-5.2315E-01	-5.2357E-01	1.662E+02%	2.90E+00
BA-133	#A	-7.3150E-01	-7.3150E-01	1.927E+02%	4.73E+00
CS-134	#A	1.0469E+00	1.0469E+00	6.817E+01%	2.09E+00
CS-137	#A	-9.9870E-01	-9.9870E-01	7.994E+01%	2.66E+00
CE-139	#A	4.0234E-01	4.0234E-01	1.079E+02%	1.45E+00
Ba-140	#A	1.6854E+00	1.6854E+00	1.196E+02%	4.34E+00
La-140	#A	6.4678E-01	6.4679E-01	9.578E+01%	1.24E+00
CE-141	#A	-9.0833E-01	-9.0834E-01	1.690E+02%	5.11E+00
CE-144	#A	-4.0122E+00	-4.0122E+00	1.611E+02%	2.15E+01
PM-144	#A	4.7110E-01	4.7110E-01	9.391E+01%	1.04E+00
EU-152	#A	2.5066E+00	2.5066E+00	9.036E+01%	3.95E+00

EU-154 #A	1.6298E+00	1.6298E+00	7.978E+01%	2.61E+00
EU-155 #A	1.4933E-01	1.4933E-01	1.531E+02%	9.68E+00
HF-181 #A	5.0398E-01	5.0398E-01	1.136E+02%	1.94E+00
Ta-182 #A	5.4895E-01	5.4895E-01	2.771E+02%	9.54E+00
Hg-203 #A	-5.5692E-02	-5.5692E-02	9.274E+02%	1.77E+00
TL-208	7.1923E+00	7.1923E+00	9.832E+00%	9.29E-01
PM-146 #A	6.0953E-01	6.0953E-01	1.100E+02%	1.19E+00
Y-88 #	8.5922E-01	8.5922E-01	3.333E+01%	7.04E-01
Cd-113m#A	1.9334E+03	1.9334E+03	2.992E+02%	1.98E+04
Cd-109 #A	1.0783E+01	1.0783E+01	2.470E+02%	8.86E+01
Cf-251 #A	1.4843E+00	1.4843E+00	1.514E+02%	5.78E+00
Cf-249 #A	5.1955E-01	5.1955E-01	1.025E+02%	3.01E+00
Sn-126 A	-5.4736E+00	-5.4736E+00	1.290E+02%	2.35E+01
PB-210 A	3.3502E+01	3.3502E+01	5.481E+01%	4.53E+01
PB-212	1.9402E+01	1.9402E+01	5.732E+00%	2.02E+00
PB-214	2.7398E+01	2.7398E+01	5.847E+00%	2.03E+00
BI-207 #A	-1.5629E+00	-1.5629E+00	8.602E+01%	2.88E+00
BI-212 #A	9.7438E+00	9.7438E+00	7.969E+01%	2.59E+01
U-235 #A	-8.7481E-01	-8.7481E-01	9.881E+01%	2.34E+01
BI-214	2.6353E+01	2.6353E+01	7.021E+00%	2.58E+00
BI-210M#A	-6.2719E-01	-6.2719E-01	1.157E+02%	2.45E+00
AC-228	1.4915E+01	1.4915E+01	1.357E+01%	3.15E+00
TH-227 #A	1.8828E+00	1.8828E+00	2.051E+02%	1.59E+01
TH-229 #A	-3.2165E+00	-3.2165E+00	3.025E+02%	2.52E+01
TH-234 A	1.6495E+01	1.6495E+01	3.258E+01%	1.85E+01
PA-231 #A	-1.7366E+01	-1.7366E+01	1.894E+02%	1.10E+02
PA-233 #A	-1.0959E+00	-1.0959E+00	1.299E+02%	4.79E+00
PA-234 A	-2.0431E+00	-2.0431E+00	1.237E+02%	8.44E+00
PA-234M#A	2.7267E+01	2.7267E+01	2.384E+02%	2.28E+02
AM-241 #A	1.3607E+00	1.3607E+00	1.268E+02%	5.76E+00
Np-237 A	4.8589E+00	4.8589E+00	5.027E+01%	7.97E+00
Ir-192 #A	0.0000E+00	0.0000E+00	1.000E+03%	2.07E+00
Cs-136 #A	-6.3047E-01	-6.3048E-01	9.637E+01%	2.05E+00
Np-239 #A	1.7151E+00	1.7153E+00	1.487E+02%	8.51E+00
Nd-147 #A	2.6297E+00	2.6297E+00	9.754E+01%	6.28E+00
TL-210 #A	3.8008E-01	3.8008E-01	1.547E+02%	2.02E+00
Kr-85 #A	-1.3275E+02	-1.3275E+02	1.208E+02%	5.40E+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)     4.349E+02  Bq/Sample
Total Decayed Activity (   25.1 to  1999.1 keV) 4.3489529E+02  Bq/Sample
```

453329_Gamma_160-36593-A-8-B. 12_Gamma_20193737.spc.



Test America St. Louis Spectrum ID: 5_Gamma_20193408

Sample Description: 453329_Gamma_160-36593-A-9-B
Detector: Detector # 5
Batch ID: 453329
Work Order Number: Gamma
Lot Number: 160-36593-A-9-B

Decay to Time: 12/27/2019 09:35 Live Time: 1800 sec
Acquisition Time: 12/27/2019 09:35:44 Real Time: 1806 sec
Analysis Time: 12/27/2019 10:06 Dead Time: 0.33 %
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_2019-12-07_1448.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	-6.116E+00	85.3	5.219E+00	5.228E+00	1.867E+01
NA-22	-3.884E-01	154.1	5.986E-01	5.989E-01	2.129E+00
K-40	2.379E+02	6.6	1.578E+01	1.993E+01	1.076E+01
Sc-46	-5.260E-01	159.4	8.385E-01	8.389E-01	2.882E+00
CR-51	-1.191E+00	755.6	8.998E+00	8.998E+00	1.691E+01
MN-54	-3.387E-01	207.2	7.018E-01	7.020E-01	2.005E+00
FE-59	1.134E-01	91.2	1.034E-01	1.035E-01	3.572E+00
Co-56	1.526E+00	49.6	7.574E-01	7.614E-01	1.188E+00
CO-57	3.412E-01	131.1	4.473E-01	4.477E-01	1.301E+00
CO-58	-4.259E-02	1610.1	6.857E-01	6.857E-01	2.349E+00
CO-60	1.238E+00	30.2	3.742E-01	3.794E-01	7.427E-01
ZN-65	-1.456E+00	168.0	2.446E+00	2.447E+00	8.353E+00
NB-94	7.408E-01	43.3	3.211E-01	3.234E-01	1.179E+00
ZR-95	3.029E+00	30.0	9.089E-01	9.223E-01	1.890E+00
NB-95	-5.037E-02	1614.4	8.132E-01	8.132E-01	2.845E+00
RU-103	4.794E-01	102.7	4.922E-01	4.928E-01	1.250E+00
RH-106	-6.557E+00	87.7	5.752E+00	5.762E+00	1.937E+01
AG-108M	5.060E-01	91.5	4.628E-01	4.636E-01	1.401E+00
AG-110M	8.834E-01	94.3	8.329E-01	8.341E-01	3.610E+00
SN-113	-7.326E-01	140.3	1.028E+00	1.029E+00	3.474E+00
SB-124	5.292E-02	83.3	4.409E-02	4.417E-02	5.182E+00
SB-125	-3.223E-01	62.1	2.003E-01	2.010E-01	4.773E+00
I-131	7.724E-01	102.7	7.929E-01	7.939E-01	1.553E+00
Gd-153	-1.173E+00	97.9	1.148E+00	1.150E+00	3.836E+00
Ga-68	-1.494E+01	201.7	3.013E+01	3.014E+01	7.038E+01
Tc-99m	-3.383E-01	156.3	5.290E-01	5.293E-01	1.774E+00
BA-133	-4.842E-01	343.7	1.664E+00	1.665E+00	5.604E+00
CS-134	-1.297E+00	60.3	7.822E-01	7.850E-01	3.504E+00
CS-137	-1.280E+00	90.4	1.158E+00	1.160E+00	3.145E+00
CE-139	1.923E-01	237.4	4.566E-01	4.570E-01	1.549E+00
Ba-140	1.044E+00	215.9	2.254E+00	2.255E+00	5.915E+00
La-140	-1.767E-01	255.6	4.518E-01	4.519E-01	2.278E+00
CE-141	2.867E-01	318.2	9.121E-01	9.122E-01	3.081E+00

CE-144	0.000E+00	1.#INF	1.675E+00	1.675E+00	1.451E+01
PM-144	4.387E-02	425.2	1.865E-01	1.865E-01	1.305E+00
EU-152	1.607E+00	132.8	2.134E+00	2.136E+00	3.791E+00
EU-154	1.598E+00	78.7	1.258E+00	1.261E+00	2.585E+00
EU-155	-1.522E+00	153.6	2.337E+00	2.339E+00	7.820E+00
HF-181	9.966E-01	86.7	8.643E-01	8.659E-01	2.233E+00
Ta-182	-3.956E+00	98.5	3.896E+00	3.901E+00	1.309E+01
Hg-203	4.106E-01	96.7	3.971E-01	3.978E-01	1.341E+00
TL-208	4.511E+00	14.2	6.410E-01	6.824E-01	1.018E+00
PM-146	5.345E-01	150.1	8.025E-01	8.030E-01	2.035E+00
Y-88	-3.026E-01	338.5	1.024E+00	1.024E+00	1.914E+00
Cd-113m	3.253E+03	191.6	6.232E+03	6.236E+03	2.133E+04
Cd-109	3.414E+00	444.4	1.517E+01	1.517E+01	5.099E+01
Cf-251	1.853E+00	104.8	1.942E+00	1.949E+00	5.243E+00
Cf-249	7.990E-01	121.7	9.721E-01	9.730E-01	3.019E+00
Sn-126	-1.316E+00	392.2	5.161E+00	5.161E+00	1.748E+01
PB-210	5.395E+00	301.1	1.624E+01	1.625E+01	4.700E+01
PB-212	1.311E+01	7.7	1.008E+00	1.317E+00	1.920E+00
PB-214	3.270E+01	6.3	2.070E+00	2.678E+00	3.113E+00
BI-207	-3.457E-02	112.5	3.890E-02	3.894E-02	2.657E+00
BI-212	9.280E+00	87.1	8.087E+00	8.101E+00	2.724E+01
U-235	1.575E+00	239.6	3.773E+00	3.774E+00	1.297E+01
BI-214	3.123E+01	6.6	2.066E+00	2.627E+00	2.579E+00
BI-210M	2.270E-01	338.9	7.694E-01	7.695E-01	2.652E+00
AC-228	1.423E+01	12.4	1.766E+00	1.910E+00	3.118E+00
TH-227	7.260E-01	880.3	6.391E+00	6.391E+00	1.685E+01
TH-229	-4.120E+00	227.9	9.388E+00	9.394E+00	2.556E+01
TH-234	9.648E+00	47.4	4.570E+00	4.602E+00	1.583E+01
PA-231	-1.795E+01	177.9	3.194E+01	3.196E+01	1.071E+02
PA-233	1.367E+00	177.9	2.432E+00	2.433E+00	8.160E+00
PA-234	-1.976E+00	128.2	2.533E+00	2.535E+00	8.470E+00
PA-234M	1.309E+02	70.7	9.252E+01	9.275E+01	2.676E+02
AM-241	-1.278E-01	1191.7	1.523E+00	1.523E+00	4.398E+00
Np-237	-3.149E+00	161.3	5.079E+00	5.082E+00	1.694E+01
Ir-192	3.528E-01	153.0	5.399E-01	5.403E-01	1.896E+00
Cs-136	6.391E-01	63.9	4.082E-01	4.098E-01	1.134E+00
Np-239	1.228E+00	176.4	2.166E+00	2.167E+00	7.258E+00
Nd-147	-3.225E+00	154.4	4.978E+00	4.981E+00	1.254E+01
TL-210	8.111E-01	93.4	7.578E-01	7.593E-01	2.557E+00
Kr-85	6.676E+01	235.1	1.569E+02	1.570E+02	5.383E+02
Total	3.838E+03				

Analyst: Kellene Robbs

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Sample description
453329_Gamma_160-36593-A-9-B

Spectrum Filename: C:\User\SPC\Det5\5_Gamma_20193408.An1

Acquisition information

Start time:	12/27/2019 9:35:44 AM
Live time:	1800
Real time:	1806
Dead time:	0.33 %
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	12/27/2019 9:35:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	5_2019-12-07_1448.PBC 12/7/2019 2:48:46 PM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 24 cutoff: 5.00E+01 %

Energy Calibration

Normalized diff: 0.1195

***** 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	7.	301.14	0.78	1.788E-02	46.54	4.250	PBC<MDA	PB210
63.47	16.	118.29	1.13	2.712E-02	63.29	3.810	PBC<MDA	TH234
74.68	160.	14.13	0.81	3.147E-02				
77.07	294.	7.71	0.81	3.218E-02				
87.15	94.	19.07	0.83	3.448E-02	86.49	13.100	1.159E+01	Np237
					86.54	30.700	4.942E+00	EU155
					86.94	9.040	1.675E+01	Sn126
					87.57	37.500	4.025E+00	Sn126
					88.04	3.790	3.973E+01	Cd109
89.92	68.	21.37	0.83	3.492E-02				
92.47	37.	47.37	0.83	3.527E-02	92.59	5.584	PBC<MDA	TH234
93.23	24.	150.50	0.83	3.536E-02	93.35	5.561	PBC<MDA	AC228
99.50	19.	112.71	0.84	3.592E-02	99.50	15.000	PBC<MDA	Np239
106.13	18.	176.36	0.84	3.620E-02	106.13	22.700	PBC<MDA	Np239
121.78	12.	170.01	0.86	3.584E-02	121.78	28.580	PBC<MDA	EU152
					122.06	85.600	2.204E-01	CO57
136.47	20.	131.09	0.88	3.457E-02	136.30	5.850	PBC<MDA	HF181
					136.47	10.680	3.076E+00	CO57
143.79	11.	239.63	0.88	3.371E-02	143.79	10.960	PBC<MDA	U235
145.44	8.	318.17	0.88	3.351E-02	145.44	48.200	PBC<MDA	CE141
162.66	10.	215.87	0.90	3.113E-02	162.66	6.220	PBC<MDA	Ba140
165.85	9.	237.40	0.91	3.133E-02	165.85	79.900	PBC<MDA	CE139

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
176.60	17.	104.80	0.92	2.975E-02	176.60	17.000	PBC<MDA	Cf251
185.72	96.	24.58	0.93	2.854E-02	185.72	54.000	3.473E+00	U235
205.33	4.	556.54	0.94	2.626E-02	205.33	5.010	PBC<MDA	U235
227.00	6.	299.38	0.97	2.417E-02	227.00	6.300	PBC<MDA	Cf251
238.67	230.	9.15	0.80	2.319E-02	238.63	43.300	1.271E+01	PB212
242.00	92.	15.41	0.98	2.293E-02	242.00	7.430	3.011E+01	PB214
244.69	16.	204.06	0.98	2.272E-02	244.69	7.580	PBC<MDA	EU152
256.24	2.	880.34	1.00	2.186E-02	256.24	7.000	PBC<MDA	TH227
263.70	8.	191.60	1.00	2.135E-02	263.70	0.006	PBC<MDA	Cd113m
266.27	4.	338.90	1.00	2.121E-02	265.83	50.000	PBC<MDA	BI210M
277.28	4.	301.85	1.02	2.048E-02	277.28	6.310	PBC<MDA	TL208
279.20	12.	96.71	1.02	2.036E-02	279.20	81.460	PBC<MDA	Hg203
284.30	15.	104.07	1.02	2.006E-02	284.30	6.140	PBC<MDA	I131
295.22	191.	9.86	1.08	1.944E-02	295.09	19.300	2.827E+01	PB214
					296.00	79.000	6.925E+00	TL210
312.01	16.	177.94	1.05	1.857E-02	312.01	36.000	PBC<MDA	PA233
316.49	2.	631.82	1.05	1.835E-02	316.49	87.040	PBC<MDA	Ir192
328.76	7.	260.60	1.07	1.778E-02	328.76	20.300	PBC<MDA	La140
333.44	7.	198.86	1.07	1.757E-02	333.44	15.510	PBC<MDA	Cf249
338.13	60.	19.14	0.43	1.736E-02	338.32	12.010	1.586E+01	AC228
345.83	14.	138.77	1.08	1.705E-02	345.83	15.070	PBC<MDA	HF181
351.91	372.	6.33	1.23	1.680E-02	351.93	37.600	3.270E+01	PB214
364.48	8.	177.00	1.10	1.632E-02	364.48	81.700	PBC<MDA	I131
380.84	24.	39.35	0.43	1.573E-02				
383.84	12.	134.77	1.12	1.563E-02	383.84	8.940	PBC<MDA	BA133
387.95	12.	140.22	1.12	1.549E-02	387.95	66.000	PBC<MDA	Cf249
433.94	12.	107.87	1.16	1.411E-02	433.94	90.480	PBC<MDA	AG108M
453.88	9.	150.14	1.18	1.360E-02	453.88	65.000	PBC<MDA	PM146
468.06	10.	153.03	1.20	1.325E-02	468.06	51.750	PBC<MDA	Ir192
482.00	12.	104.07	1.21	1.293E-02	482.00	80.500	PBC<MDA	HF181
497.05	10.	102.67	1.22	1.260E-02	497.05	90.900	PBC<MDA	RU103
511.86	53.	24.82	2.48	1.230E-02	511.86	20.000	1.197E+01	RH106
513.98	6.	235.08	1.24	1.226E-02	513.98	0.430	PBC<MDA	Kr85
537.26	3.	395.81	1.26	1.181E-02	537.26	24.390	PBC<MDA	Ba140
563.24	9.	94.11	1.28	1.135E-02	563.24	8.350	PBC<MDA	CS134
569.32	9.	74.97	1.29	1.125E-02	569.32	15.380	PBC<MDA	CS134
					569.47	8.200	5.385E+00	PA234
					569.70	97.740	4.519E-01	BI207
569.70	4.	153.16	1.29	1.125E-02	569.32	15.380	1.444E+00	CS134
					569.47	8.200	2.710E+00	PA234
					569.70	97.740	2.274E-01	BI207
583.37	76.	14.21	1.18	1.103E-02	583.02	84.500	4.500E+00	TL208
609.30	275.	6.62	1.34	1.063E-02	609.31	46.090	3.112E+01	BI214
					610.30	5.750	2.498E+02	RU103
618.06	3.	556.20	1.33	1.051E-02	618.06	99.100	PBC<MDA	PM144
635.89	8.	72.89	1.34	1.026E-02	635.89	11.310	PBC<MDA	SB125
702.63	16.	52.97	1.40	9.438E-03	702.63	97.900	PBC<MDA	NB94
722.79	12.	83.30	1.42	9.217E-03	722.79	10.810	PBC<MDA	SB124

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
					722.94	90.840	8.009E-01	AG108M
					723.36	20.220	3.600E+00	EU154
722.94	7.	147.75	1.42	9.215E-03	722.79	10.810	4.144E+00	SB124
					722.94	90.840	4.932E-01	AG108M
					723.36	20.220	2.217E+00	EU154
726.71	12.	87.14	1.42	9.170E-03	727.17	7.550	PBC<MDA	BI212
756.73	26.	30.01	1.45	8.869E-03	756.73	54.460	3.029E+00	ZR95
766.41	14.	91.30	1.45	8.776E-03	765.79	99.790	PBC<MDA	NB95
					766.41	0.294	2.979E+02	PA234M
799.60	12.	93.43	1.48	8.469E-03	799.60	98.960	PBC<MDA	TL210
818.50	7.	95.56	1.50	8.305E-03	818.50	100.000	PBC<MDA	Cs136
846.77	7.	100.15	1.52	8.072E-03	846.77	99.935	PBC<MDA	Co56
858.83	8.	117.75	1.53	7.963E-03	860.56	12.420	PBC<MDA	TL208
871.10	8.	68.63	1.54	7.882E-03	871.10	99.890	PBC<MDA	NB94
911.14	54.	15.81	0.84	7.591E-03	911.07	29.000	1.356E+01	AC228
937.49	9.	94.28	1.59	7.411E-03	937.49	34.360	PBC<MDA	AG110M
969.20	5.	242.06	1.61	7.209E-03	968.97	17.460	PBC<MDA	AC228
996.33	8.	89.29	1.63	7.042E-03	996.33	10.600	PBC<MDA	EU154
1001.00	8.	107.89	1.64	7.014E-03	1001.00	0.837	PBC<MDA	PA234M
1004.77	6.	160.19	1.64	6.992E-03	1004.77	18.010	PBC<MDA	EU154
1037.84	6.	96.51	1.66	6.805E-03	1037.84	14.130	PBC<MDA	Co56
1048.07	8.	84.78	1.67	6.749E-03	1048.07	80.000	PBC<MDA	Cs136
1119.92	55.	16.88	1.74	6.381E-03	1120.29	15.100	3.155E+01	BI214
					1120.55	99.987	PBC<MDA	Sc46
1238.28	19.	53.07	1.80	5.866E-03	1238.28	66.070	PBC<MDA	Co56
1274.54	6.	78.74	1.83	5.725E-03	1274.53	99.940	PBC<MDA	NA22
					1274.54	35.190	1.752E+00	EU154
1291.60	6.	91.17	1.84	5.661E-03	1291.60	43.200	PBC<MDA	FE59
1313.00	6.	90.55	1.85	5.583E-03	1313.00	21.000	PBC<MDA	TL210
1332.50	12.	30.22	1.87	5.514E-03	1332.50	99.980	1.238E+00	CO60
1384.30	5.	121.64	1.90	5.340E-03	1384.30	24.290	PBC<MDA	AG110M
1460.63	233.	6.63	1.61	5.103E-03	1460.83	10.670	2.379E+02	K40
1764.22	52.	14.79	2.11	4.351E-03	1764.49	15.400	4.292E+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
298.36	74.68	177.	160.	5.096E+03	14.13	0.812	- sD
307.92	77.06	110.	294.	9.141E+03	7.71	0.815	- D
348.08	87.22	147.	85.	2.452E+03	23.01	0.825	- sD
359.16	89.99	111.	49.	1.416E+03	33.32	0.828	- D
1523.78	380.84	17.	24.	1.525E+03	39.35	0.428	- 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	185.69	46.54	175.	7.	0.004	301.14	0.783s
TH-227	200.11	50.14	195.	-22.	-0.012	99.30	0.787s
TH-234	253.49	63.47	133.	16.	0.009	118.29	1.129s
Sn-126	256.71	64.28	305.	-6.	-0.004	392.20	0.802
Np-237	345.63	86.49	833.	-26.	-0.014	161.28	0.825s
EU-155	345.84	86.54	725.	-25.	-0.014	156.65	0.825s
Sn-126	347.43	86.94	701.	-25.	-0.014	153.98	0.825
Sn-126	349.95	87.57	676.	-25.	-0.014	151.17	0.826
Cd-109	351.83	88.04	638.	8.	0.004	444.38	0.826
Nd-147	364.08	91.10	646.	0.	0.000	1000.00	0.829s
TH-234	370.05	92.59	131.	37.	0.020	47.37	0.831D
AC-228	373.09	93.35	624.	24.	0.013	150.50	0.832s
Gd-153	389.70	97.50	235.	-23.	-0.013	97.86	0.836s
Np-239	397.71	99.50	228.	19.	0.011	112.71	0.838s
Gd-153	412.52	103.20	286.	-3.	-0.002	845.95	0.842s
Np-239	414.52	103.70	289.	0.	0.000	1000.00	0.842s
EU-155	420.98	105.31	510.	-21.	-0.012	153.62	0.844s
Np-239	424.25	106.13	504.	18.	0.010	176.36	0.845
EU-152	486.90	121.78	208.	12.	0.007	170.01	0.861s
CO-57	488.03	122.06	220.	0.	0.000	1000.00	0.861s
PA-234	524.99	131.29	403.	-22.	-0.012	128.19	0.871
HF-181	531.91	133.02	426.	-19.	-0.010	156.34	0.872
CE-144	533.97	133.54	445.	0.	0.000	1000.00	0.873s
HF-181	545.02	136.30	445.	0.	0.000	1000.00	0.876s
CO-57	545.72	136.47	349.	20.	0.011	131.09	0.876s
Tc-99m	561.88	140.51	387.	-18.	-0.010	156.35	0.880s
U-235	574.99	143.79	321.	11.	0.006	239.63	0.883s
CE-141	581.61	145.44	347.	8.	0.005	318.17	0.885s
Ba-140	650.54	162.66	228.	10.	0.006	215.87	0.902s
CE-139	663.32	165.85	207.	9.	0.005	237.40	0.905
Cf-251	706.34	176.60	93.	17.	0.009	104.80	0.916s
U-235	742.85	185.72	147.	96.	0.054	24.58	0.925s
TH-229	774.03	193.51	130.	-9.	-0.005	227.89	0.933s
U-235	821.35	205.33	124.	4.	0.002	556.54	0.945s
TH-229	843.44	210.85	137.	-10.	-0.005	217.60	0.950s
Cf-251	908.08	227.00	100.	6.	0.003	299.38	0.966s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
TH-227	943.98	235.97	628.	-19.	-0.010	192.14	0.975
PB-212	954.64	238.63	47.	237.	0.132	7.69	0.978D
PB-214	968.10	242.00	55.	92.	0.051	15.41	0.981D
EU-152	978.89	244.69	528.	16.	0.009	204.06	0.984s
TH-227	1025.11	256.24	88.	2.	0.001	880.34	0.995s
Cd-113m	1054.97	263.70	100.	8.	0.004	191.60	1.002s
BI-210M	1063.50	265.83	106.	4.	0.002	338.90	1.005s
TL-208	1109.33	277.28	73.	4.	0.002	301.85	1.016
Hg-203	1117.00	279.20	64.	12.	0.007	96.71	1.017s
I-131	1137.41	284.30	62.	15.	0.008	104.07	1.022
PB-214	1181.12	295.22	48.	191.	0.106	9.86	1.077
TL-210	1184.24	296.00	600.	-18.	-0.010	198.02	1.034s
PB-212	1200.37	300.03	542.	-18.	-0.010	81.75	1.038
PA-231	1200.53	300.07	524.	-18.	-0.010	184.55	1.038s
PA-233	1200.97	300.18	506.	-18.	-0.010	181.46	1.038s
PA-231	1210.86	302.65	488.	-18.	-0.010	177.91	1.040s
Ba-140	1219.66	304.85	468.	0.	0.000	1000.00	1.042s
BI-210M	1219.85	304.90	468.	0.	0.000	1000.00	1.042
Ir-192	1234.03	308.44	468.	0.	0.000	1000.00	1.046s
PA-233	1248.32	312.01	420.	16.	0.009	177.94	1.049s
Ir-192	1266.25	316.49	124.	2.	0.001	631.82	1.053s
CR-51	1280.63	320.08	126.	-4.	-0.002	755.62	1.057s
La-140	1315.35	328.76	84.	7.	0.004	260.60	1.065s
Cf-249	1334.08	333.44	59.	7.	0.004	198.86	1.070s
AC-228	1352.85	338.13	19.	60.	0.033	19.14	0.432s
Cs-136	1362.62	340.57	207.	-7.	-0.004	293.12	1.077s
EU-152	1377.49	344.29	200.	0.	0.000	1000.00	1.080s
HF-181	1383.66	345.83	170.	14.	0.008	138.77	1.082
PB-214	1408.00	351.91	49.	372.	0.207	6.33	1.226
BA-133	1424.36	356.00	474.	-9.	-0.005	343.73	1.091s
I-131	1458.32	364.48	55.	8.	0.004	177.00	1.099s
BA-133	1535.78	383.84	117.	12.	0.006	134.77	1.117s
Cf-249	1552.22	387.95	129.	12.	0.006	140.22	1.121
SN-113	1567.19	391.69	159.	-13.	-0.007	140.32	1.125s
SB-125	1711.99	427.88	52.	-15.	-0.008	100.69	1.158s
AG-108M	1736.25	433.94	40.	12.	0.007	107.87	1.164s
PM-146	1816.05	453.88	40.	9.	0.005	150.14	1.182s
SB-125	1854.01	463.37	108.	-17.	-0.009	76.80	1.191s
Ir-192	1872.79	468.06	109.	10.	0.005	153.03	1.195s
BE-7	1910.94	477.59	87.	-15.	-0.008	85.33	1.204s
HF-181	1928.56	482.00	71.	12.	0.007	104.07	1.208s
La-140	1948.65	487.02	37.	-2.	-0.001	781.25	1.212s
RU-103	1988.80	497.05	25.	10.	0.005	102.67	1.221s
RH-106	2048.06	511.86	60.	53.	0.029	24.82	2.485s
Kr-85	2056.53	513.98	108.	6.	0.004	235.08	1.237
Nd-147	2124.62	531.00	48.	-9.	-0.005	154.36	1.252s
Ba-140	2149.67	537.26	36.	3.	0.002	395.81	1.258s
CS-134	2253.60	563.24	16.	9.	0.005	94.11	1.280s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
CS-134	2277.94	569.32	18.	9.	0.005	74.97	1.286s
BI-207	2279.47	569.70	22.	4.	0.002	153.16	1.286s
TL-208	2334.15	583.37	10.	76.	0.042	14.21	1.176
SB-125	2402.69	600.50	434.	-13.	-0.007	76.77	1.313
SB-124	2411.61	602.73	421.	-13.	-0.007	226.09	1.315s
CS-134	2419.53	604.71	408.	-13.	-0.007	222.36	1.317
BI-214	2437.88	609.30	18.	275.	0.153	6.62	1.340
RU-103	2441.89	610.30	395.	-12.	-0.007	232.19	1.322s
PM-144	2472.94	618.06	149.	3.	0.002	556.20	1.328s
RH-106	2488.37	621.92	52.	-12.	-0.007	87.72	1.332s
SB-125	2544.26	635.89	13.	8.	0.004	72.89	1.344s
I-131	2548.61	636.97	49.	-13.	-0.007	79.99	1.345s
AG-110M	2631.76	657.76	62.	-14.	-0.008	82.43	1.362s
CS-137	2647.36	661.66	94.	-19.	-0.011	90.44	1.366s
PM-144	2786.90	696.54	17.	-1.	-0.001	643.23	1.395s
NB-94	2811.25	702.63	13.	16.	0.009	52.97	1.400s
SB-124	2891.88	722.79	44.	12.	0.007	83.30	1.417s
AG-108M	2892.48	722.94	57.	7.	0.004	147.75	1.417s
EU-154	2894.17	723.36	63.	0.	0.000	1000.00	1.418s
ZR-95	2897.53	724.20	120.	-21.	-0.012	39.94	1.418s
BI-212	2909.41	727.17	45.	12.	0.006	87.14	1.421s
PM-146	2943.61	735.72	26.	-3.	-0.002	351.72	1.428s
PM-146	2989.37	747.16	39.	-15.	-0.008	66.39	1.437s
ZR-95	3027.65	756.73	9.	26.	0.015	30.01	1.445s
AG-110M	3056.50	763.94	80.	-20.	-0.011	68.58	1.451s
PA-234M	3066.38	766.41	73.	14.	0.008	91.30	1.453s
EU-152	3116.41	778.92	37.	-14.	-0.008	93.87	1.463s
BI-212	3142.41	785.42	38.	-8.	-0.004	132.13	1.468
CS-134	3184.20	795.87	86.	-17.	-0.009	60.29	1.477s
TL-210	3199.12	799.60	59.	12.	0.007	93.43	1.480s
CS-134	3208.53	801.95	84.	-15.	-0.009	87.39	1.482s
Cs-136	3274.72	818.50	9.	7.	0.004	95.56	1.495s
MN-54	3340.10	834.85	33.	-5.	-0.003	207.21	1.508s
Co-56	3387.78	846.77	10.	7.	0.004	100.15	1.518s
TL-208	3442.95	860.56	19.	8.	0.005	117.75	1.529s
NB-94	3485.08	871.10	10.	8.	0.004	68.63	1.537s
EU-154	3493.61	873.23	38.	-8.	-0.005	110.01	1.539s
PA-234	3522.80	880.53	52.	-2.	-0.001	614.82	1.544s
PA-234	3533.64	883.24	53.	0.	0.000	1000.00	1.547s
AG-110M	3539.41	884.68	53.	0.	0.000	1000.00	1.547s
Sc-46	3557.79	889.28	65.	-7.	-0.004	159.42	1.551s
Y-88	3592.83	898.04	30.	-8.	-0.004	122.66	1.558s
AC-228	3645.22	911.14	4.	54.	0.030	15.81	0.843s
AG-110M	3750.60	937.49	14.	9.	0.005	94.28	1.589s
PA-234	3784.70	946.02	23.	-7.	-0.004	144.53	1.595
AC-228	3876.48	968.97	38.	5.	0.003	242.06	1.612s
EU-154	3985.88	996.33	22.	8.	0.004	89.29	1.633s
PA-234M	4004.55	1001.00	30.	8.	0.004	107.89	1.636s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
EU-154	4019.65	1004.77	37.	6.	0.003	160.19	1.639s
Co-56	4151.87	1037.84	5.	6.	0.003	96.51	1.664s
Cs-136	4192.77	1048.07	19.	8.	0.004	84.78	1.671s
RH-106	4201.93	1050.36	40.	-12.	-0.006	83.63	1.673s
BI-207	4255.11	1063.66	20.	-3.	-0.002	164.86	1.682s
Ga-68	4310.04	1077.40	20.	-5.	-0.003	201.66	1.692s
FE-59	4397.41	1099.25	20.	-6.	-0.003	168.87	1.708s
EU-152	4448.68	1112.07	111.	-14.	-0.008	41.11	1.717s
ZN-65	4462.56	1115.55	97.	-8.	-0.005	168.01	1.720s
BI-214	4480.04	1119.92	7.	55.	0.030	16.88	1.743
Ta-182	4485.56	1121.30	114.	-16.	-0.009	98.47	1.724s
Ta-182	4756.42	1189.05	15.	-1.	-0.001	857.32	1.771
Ta-182	4885.79	1221.41	27.	-10.	-0.005	125.61	1.793
Co-56	4953.23	1238.28	16.	19.	0.011	53.07	1.804s
NA-22	5098.13	1274.53	17.	-4.	-0.002	154.11	1.828s
EU-154	5098.17	1274.54	9.	6.	0.004	78.74	1.828s
FE-59	5166.35	1291.60	5.	6.	0.004	91.17	1.840s
TL-210	5251.91	1313.00	5.	6.	0.004	90.55	1.854s
CO-60	5329.85	1332.50	1.	12.	0.007	30.22	1.866s
AG-110M	5536.88	1384.30	5.	5.	0.003	121.64	1.899
EU-152	5631.62	1408.00	27.	-6.	-0.003	211.36	1.914s
K-40	5841.95	1460.63	3.	233.	0.130	6.63	1.613
La-140	6383.73	1596.21	12.	-4.	-0.002	439.87	2.024s
SB-124	6762.39	1690.98	0.	0.	0.000	1000.00	2.076s
BI-214	7056.06	1764.49	3.	52.	0.029	14.79	2.114
Co-56	7083.46	1771.35	55.	0.	0.000	1000.00	2.117s
Y-88	7341.96	1836.06	6.	-2.	-0.001	338.51	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	-6.1163E+00				5.31E+01	
			477.60	-6.116E+00	?(P	1.867E+01 8.53E+01 1.05E+01	G
NA-22	C	-3.8841E-01				9.50E+02	
			1274.53	-3.884E-01	&(	2.129E+00 1.54E+02 9.99E+01	G
K-40	N	2.3790E+02				4.66E+11	
			1460.83	2.379E+02	(P	1.076E+01 6.63E+00 1.07E+01	G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

Sc-46    F  -5.2598E-01                                     8.38E+01
                          889.28-5.260E-01 ?(  2.882E+00 1.59E+02 1.00E+02 G
                         1120.55-3.322E-07 %   4.065E+00 3.50E+08 1.00E+02 G

CR-51    F  -1.1908E+00                                     2.77E+01
                          320.08-1.191E+00 ?(P 1.691E+01 7.56E+02 9.94E+00 G

MN-54    C  -3.3867E-01                                     3.12E+02
                          834.85-3.387E-01 ?(P 2.005E+00 2.07E+02 1.00E+02 G

FE-59    F   1.1341E-01                                     4.45E+01
                         1099.25-9.099E-01 ?(  3.572E+00 1.69E+02 5.65E+01 G
                         1291.60 1.452E+00 ?(  3.060E+00 9.12E+01 4.32E+01 G

Co-56    C   1.5264E+00                                     7.73E+01
                          846.77 4.861E-01 ?(P 1.188E+00 1.00E+02 9.99E+01 G
                         1238.28 2.724E+00 ?(  3.061E+00 5.31E+01 6.61E+01 G
                         1037.84 3.285E+00 ?(P 7.644E+00 9.65E+01 1.41E+01 G
                         1771.35 0.000E+00 -   3.084E+01 1.00E+03 1.55E+01  A

CO-57    C   3.4124E-01                                     2.72E+02
                          122.06 0.000E+00 ?(  1.301E+00 1.00E+03 8.56E+01 G
                          136.47 3.076E+00  (  1.351E+01 1.31E+02 1.07E+01 G

CO-58    C  -4.2586E-02                                     7.09E+01
                          810.78-4.259E-02 %(P 2.349E+00 1.61E+03 9.95E+01 G

CO-60    F   1.2384E+00                                     1.93E+03
                         1332.50 1.238E+00 ?(P 7.427E-01 3.02E+01 1.00E+02 G
                         1173.24 5.146E-02 % P 2.154E+00 1.74E+03 9.99E+01 G

ZN-65    F  -1.4556E+00                                     2.44E+02
                         1115.55-1.456E+00 ?(  8.353E+00 1.68E+02 5.06E+01 G

NB-94    I   7.4079E-01                                     7.41E+06
                          702.63 9.527E-01 &(P 1.179E+00 5.30E+01 9.79E+01 G
                          871.10 5.331E-01 ?(  1.213E+00 6.86E+01 9.99E+01 G

ZR-95    I   3.0287E+00                                     6.40E+01
                          756.73 3.029E+00 ?(  1.890E+00 3.00E+01 5.45E+01 G
                          724.20-2.884E+00 - P 7.356E+00 3.99E+01 4.42E+01 G

NB-95    I  -5.0372E-02                                     6.40E+01
                          765.79-5.037E-02 %(  2.845E+00 1.61E+03 9.98E+01 G
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Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
RU-103	I	4.7943E-01					3.93E+01	
			497.05	4.794E-01	?(P	1.250E+00	1.03E+02	9.09E+01 G
			610.30	-1.110E+01	+	8.676E+01	2.32E+02	5.75E+00 GA
RH-106	I	-6.5568E+00					3.74E+02	
			621.92	-6.557E+00	?(	1.937E+01	8.77E+01	9.93E+00 G
			1050.36	-6.080E+01	+	1.711E+02	8.36E+01	1.56E+00 G
			511.86	1.197E+01	?	8.765E+00	2.48E+01	2.00E+01 GA
AG-108M	C	5.0601E-01					1.53E+05	
			433.94	5.189E-01	?(P	1.401E+00	1.08E+02	9.05E+01 G
			722.94	4.932E-01	&(	2.506E+00	1.48E+02	9.08E+01 G
			614.28	8.934E-07	%	5.498E+00	1.81E+08	8.98E+01 G
AG-110M	F	8.8339E-01					2.50E+02	
			884.68	0.000E+00	?(	3.610E+00	1.00E+03	7.27E+01 G
			657.76	-8.364E-01	+	2.310E+00	8.24E+01	9.46E+01 G
			937.49	1.963E+00	?(	4.395E+00	9.43E+01	3.44E+01 G
			1384.30	1.999E+00	?(	5.770E+00	1.22E+02	2.43E+01 G
			763.94	-5.537E+00	+	1.258E+01	6.86E+01	2.23E+01 G
SN-113	F	-7.3263E-01					1.15E+02	
			391.69	-7.326E-01	?(	3.474E+00	1.40E+02	6.40E+01 G
SB-124	F	5.2925E-02					6.02E+01	
			602.73	-6.816E-01	?(	5.182E+00	2.26E+02	9.83E+01 G
			1690.98	0.000E+00	+	1.899E+00	1.00E+03	4.78E+01 G
			722.79	6.729E+00	&(	1.884E+01	8.33E+01	1.08E+01 G
SB-125	I	-3.2230E-01					1.01E+03	
			427.88	-1.909E+00	?(	4.773E+00	1.01E+02	2.96E+01 G
			600.50	-3.842E+00	+ P	2.885E+01	7.68E+01	1.79E+01 G
			635.89	3.830E+00	&(	9.342E+00	7.29E+01	1.13E+01 G
			463.37	-6.631E+00	+ P	2.032E+01	7.68E+01	1.05E+01 G
I-131	I	7.7237E-01					8.02E+00	
			364.48	3.334E-01	?(	1.553E+00	1.77E+02	8.17E+01 G
			284.30	6.614E+00	?(	1.782E+01	1.04E+02	6.14E+00 G
			636.97	-1.000E+01	+	2.680E+01	8.00E+01	7.17E+00 G
Gd-153	F	-1.1734E+00					2.42E+02	
			97.50	-1.173E+00	&(	3.836E+00	9.79E+01	3.00E+01 G
			103.20	-1.999E-01	+	5.750E+00	8.46E+02	2.18E+01 G
Ga-68	C	-1.4942E+01					4.71E-02	
			1077.40	-1.494E+01	?(	7.038E+01	2.02E+02	3.30E+00 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Tc-99m	I	-3.3835E-01					2.51E-01	
			140.51	-3.383E-01	&(	1.774E+00	1.56E+02	8.93E+01 G
BA-133	F	-4.8420E-01					3.85E+03	
			356.00	-4.842E-01	?(	5.604E+00	3.44E+02	6.20E+01 G
			302.85	-4.160E-01	&	1.653E+01	1.18E+03	1.83E+01 G
			383.84	4.625E+00	? P	2.112E+01	1.35E+02	8.94E+00 GA
			80.99	-3.432E-02	% P	3.780E+00	3.25E+03	3.41E+01 GA
CS-134	I	-1.2974E+00					7.54E+02	
			795.87	-1.297E+00	?(P	3.504E+00	6.03E+01	8.55E+01 G
			604.71	-6.888E-01	+	5.151E+00	2.22E+02	9.76E+01 G
			569.32	2.870E+00	+	7.216E+00	7.50E+01	1.54E+01 G
			801.95	-1.170E+01	+	3.427E+01	8.74E+01	8.69E+00 G
			563.24	5.218E+00	+	1.251E+01	9.41E+01	8.35E+00 G
CS-137	I	-1.2801E+00					1.10E+04	
			661.66	-1.280E+00	?(P	3.145E+00	9.04E+01	8.52E+01 G
CE-139	F	1.9234E-01					1.38E+02	
			165.85	1.923E-01	(	1.549E+00	2.37E+02	7.99E+01 G
Ba-140	I	1.0441E+00					1.28E+01	
			537.26	5.786E-01	(	5.915E+00	3.96E+02	2.44E+01 G
			162.66	2.869E+00	*(	2.097E+01	2.16E+02	6.22E+00 G
			304.85	0.000E+00	-	7.082E+01	1.00E+03	4.29E+00 G
La-140	I	-1.7672E-01					1.28E+01	
			1596.21	-4.327E-01	?(P	2.278E+00	4.40E+02	9.54E+01 G
			487.02	-1.577E-01	+ P	2.945E+00	7.81E+02	4.55E+01 G
			328.76	1.026E+00	&(	7.004E+00	2.61E+02	2.03E+01 G
			815.77	-8.540E-09	%	1.009E+01	3.31E+10	2.33E+01 G
CE-141	I	2.8666E-01					3.25E+01	
			145.44	2.867E-01	?(	3.081E+00	3.18E+02	4.82E+01 G
PM-144	C	4.3867E-02					3.63E+02	
			696.54	-7.870E-02	?(	1.305E+00	6.43E+02	9.90E+01 G
			618.06	1.663E-01	?(P	3.176E+00	5.56E+02	9.91E+01 G
EU-152	F	1.6073E+00					4.94E+03	
			121.78	6.599E-01	?(	3.791E+00	1.70E+02	2.86E+01 G
			344.29	0.000E+00	-	8.406E+00	1.00E+03	2.65E+01 G
			1112.07	-8.742E+00	+ P	3.289E+01	4.11E+01	1.36E+01 G
			778.92	-7.135E+00	+	1.546E+01	9.39E+01	1.29E+01 G
			964.11	-4.379E-01	%	2.144E+01	1.39E+03	1.46E+01 G
			244.69	5.179E+00	?(	3.544E+01	2.04E+02	7.58E+00 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
			1408.00	-2.847E+00	+	1.345E+01	2.11E+02	2.10E+01 GA
EU-154	I	1.5977E+00					3.14E+03	
			123.10	-5.714E-02	&(	2.585E+00	1.32E+03	4.08E+01 G
			1274.54	1.752E+00	&(	4.673E+00	7.87E+01	3.52E+01 G
			723.36	0.000E+00	&	1.184E+01	1.00E+03	2.02E+01 G
			873.23	-4.829E+00	+	1.818E+01	1.10E+02	1.23E+01 G
			1004.77	2.469E+00	?(	1.377E+01	1.60E+02	1.80E+01 G
			996.33	5.973E+00	&(	1.816E+01	8.93E+01	1.06E+01 G
EU-155	I	-1.5216E+00					1.81E+03	
			105.31	-1.522E+00	&(	7.820E+00	1.54E+02	2.12E+01 G
			86.54	-1.291E+00	+	6.753E+00	1.57E+02	3.07E+01 G
HF-181	F	9.9661E-01					4.24E+01	
			482.00	6.341E-01	?(	2.233E+00	1.04E+02	8.05E+01 G
			133.02	-6.933E-01	+	3.632E+00	1.56E+02	4.33E+01 G
			345.83	2.933E+00	?(	1.374E+01	1.39E+02	1.51E+01 G
			136.30	0.000E+00	-	2.773E+01	1.00E+03	5.85E+00 G
Ta-182	F	-3.9565E+00					1.14E+02	
			1121.30	-3.956E+00	?(	1.309E+01	9.85E+01	3.49E+01 G
			1221.41	-3.352E+00	+	9.284E+00	1.26E+02	2.70E+01 G
			1189.05	-5.650E-01	+	1.173E+01	8.57E+02	1.62E+01 G
Hg-203	F	4.1063E-01					4.66E+01	
			279.20	4.106E-01	?(	1.341E+00	9.67E+01	8.15E+01 G
TL-208	N	4.5112E+00					6.98E+02	
			583.02	4.500E+00	(	1.018E+00	1.42E+01	8.45E+01 G
			277.28	1.745E+00	- P	1.828E+01	3.02E+02	6.31E+00 G
			860.56	4.590E+00	&(P	1.288E+01	1.18E+02	1.24E+01 G
PM-146	C	5.3451E-01					2.02E+03	
			453.88	5.345E-01	?(P	2.035E+00	1.50E+02	6.50E+01 G
			747.16	-2.776E+00	+ P	5.815E+00	6.64E+01	3.40E+01 G
			735.72	-8.157E-01	+	7.198E+00	3.52E+02	2.25E+01 G
Y-88	F	-3.0259E-01					1.07E+02	
			1836.06	-3.026E-01	?(P	1.914E+00	3.39E+02	9.92E+01 G
			898.04	-6.202E-01	+ P	2.180E+00	1.23E+02	9.37E+01 G
Cd-113m		3.2526E+03					5.33E+03	
			263.70	3.253E+03	&(	2.133E+04	1.92E+02	6.00E-03 K
Cd-109	F	3.4143E+00					4.53E+02	
			88.04	3.414E+00	?(	5.099E+01	4.44E+02	3.79E+00 G

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Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Cf-251	T	1.8528E+00					3.28E+05	
			176.60	1.853E+00	@(	5.243E+00	1.05E+02	1.70E+01 G
			227.00	2.189E+00	?	1.799E+01	2.99E+02	6.30E+00 GA
Cf-249	T	7.9902E-01					1.28E+05	
			387.95	6.355E-01	&(	3.019E+00	1.40E+02	6.60E+01 G
			333.44	1.495E+00	?(	7.828E+00	1.99E+02	1.55E+01 G
Sn-126		-1.3158E+00					3.65E+07	
			87.57	-1.053E+00	+	5.314E+00	1.51E+02	3.75E+01 GA
			64.28	-1.316E+00	(	1.748E+01	3.92E+02	9.70E+00 G
			86.94	-4.378E+00	+	2.250E+01	1.54E+02	9.04E+00 GA
PB-210	N	5.3945E+00					8.14E+03	
			46.54	5.395E+00	*(P	4.700E+01	3.01E+02	4.25E+00 G
PB-212	N	1.3112E+01					6.98E+02	
			238.63	1.311E+01	(P	1.920E+00	7.69E+00	4.33E+01 G
			300.03	-1.582E+01	- P	9.815E+01	8.17E+01	3.28E+00 GA
PB-214	N	3.2696E+01					5.84E+05	
			351.93	3.270E+01	(P	3.113E+00	6.33E+00	3.76E+01 G
			295.09	2.827E+01	- P	5.178E+00	9.86E+00	1.93E+01 G
			242.00	3.011E+01	P	1.212E+01	1.54E+01	7.43E+00 GA
BI-207	C	-3.4573E-02					1.18E+04	
			1063.66	-3.783E-01	?(P	2.657E+00	1.65E+02	7.45E+01 G
			569.70	2.274E-01	*(	1.229E+00	1.53E+02	9.77E+01 G
BI-212	N	9.2804E+00					6.98E+02	
			727.17	9.280E+00	?(P	2.724E+01	8.71E+01	7.55E+00 G
			785.42	-3.880E+01	+ P	1.581E+02	1.32E+02	1.28E+00 GA
U-235	N	1.5745E+00					2.57E+11	
			143.79	1.604E+00	(	1.297E+01	2.40E+02	1.10E+01 G
			205.33	1.511E+00	?(P	2.309E+01	5.57E+02	5.01E+00 G
			163.38	-4.128E-01	% P	2.636E+01	1.49E+03	5.08E+00 G
			185.72	3.473E+00		2.132E+00	2.46E+01	5.40E+01 GA
BI-214	N	3.1226E+01					5.84E+05	
			609.31	3.112E+01	(P	2.579E+00	6.62E+00	4.61E+01 G
			1120.29	3.155E+01	(P	8.814E+00	1.69E+01	1.51E+01 G
			1764.49	4.292E+01	+ P	9.193E+00	1.48E+01	1.54E+01 G
BI-210M	T	2.2702E-01					1.10E+09	
			265.83	2.270E-01	?(	2.652E+00	3.39E+02	5.00E+01 G
			304.90	0.000E+00	-	1.085E+01	1.00E+03	2.80E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
AC-228	N	1.4231E+01					2.10E+03	
			911.07	1.356E+01	(P	3.118E+00	1.58E+01	2.90E+01 G
			968.97	2.428E+00	-	1.390E+01	2.42E+02	1.75E+01 G
			338.32	1.586E+01	(P	6.201E+00	1.91E+01	1.20E+01 G
			93.35	6.692E+00	-	3.364E+01	1.51E+02	5.56E+00 XA
TH-227	N	7.2598E-01					7.95E+03	
			256.24	7.260E-01	*(	1.685E+01	8.80E+02	7.00E+00 G
			235.97	-3.585E+00	+	2.306E+01	1.92E+02	1.23E+01 G
			50.14	-7.732E+00	+ P	2.342E+01	9.93E+01	8.00E+00 G
TH-229	N	-4.1197E+00					2.68E+06	
			193.51	-4.120E+00	&(	2.556E+01	2.28E+02	4.40E+00 G
			210.85	-6.990E+00	+	4.135E+01	2.18E+02	2.99E+00 G
TH-234	N	9.6484E+00					1.63E+12	
			92.59	1.034E+01	(P	1.583E+01	4.74E+01	5.58E+00 G
			63.29	8.640E+00	(P	3.034E+01	1.18E+02	3.81E+00 G
PA-231	N	-1.7953E+01					1.20E+07	
			302.65	-1.795E+01	?(	1.071E+02	1.78E+02	2.88E+00 G
			300.07	-2.082E+01	+	1.288E+02	1.85E+02	2.46E+00 G
PA-233	C	1.3666E+00					7.82E+08	
			312.01	1.367E+00	?(P	8.160E+00	1.78E+02	3.60E+01 G
			300.18	-8.264E+00	+	5.025E+01	1.81E+02	6.20E+00 G
PA-234	N	-1.9756E+00					1.63E+12	
			131.29	-1.976E+00	&(	8.470E+00	1.28E+02	1.80E+01 G
			946.02	-4.134E+00	+	1.422E+01	1.45E+02	1.34E+01 G
			569.47	3.480E-02	%	1.620E+01	1.27E+04	8.20E+00 G
			883.24	0.000E+00	+	2.729E+01	1.00E+03	9.60E+00 G
			880.53	-1.976E+00	+	4.292E+01	6.15E+02	6.00E+00 GA
PA-234M	N	1.3092E+02					1.63E+12	
			1001.00	7.228E+01	?(P	2.676E+02	1.08E+02	8.37E-01 G
			766.41	2.979E+02	?(	9.147E+02	9.13E+01	2.94E-01 G
AM-241	T	-1.2777E-01					1.58E+05	
			59.54	-1.278E-01	%(P	4.398E+00	1.19E+03	3.59E+01 G
Np-237	F	-3.1490E+00					2.14E+06	
			86.49	-3.149E+00	?(	1.694E+01	1.61E+02	1.31E+01 G
Ir-192	F	3.5278E-01					7.40E+01	
			316.49	8.696E-02	?(	1.896E+00	6.32E+02	8.70E+01 G
			468.06	7.999E-01	?(	4.165E+00	1.53E+02	5.18E+01 G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          308.44 0.000E+00 -   9.662E+00 1.00E+03 3.18E+01 G

Cs-136   F   6.3907E-01                                     1.30E+01
                          818.50 4.918E-01 ?(  1.134E+00 9.56E+01 1.00E+02 G
                         1048.07 8.232E-01 ?(  2.369E+00 8.48E+01 8.00E+01 G
                          340.57-4.803E-01 -   4.786E+00 2.93E+02 4.69E+01 G

Np-239   T   1.2283E+00                                     2.36E+00
                          103.70 0.000E+00 &   5.246E+00 1.00E+03 2.40E+01 X
                          106.13 1.228E+00 ?(  7.258E+00 1.76E+02 2.27E+01 G
                           99.50 1.995E+00 ?   7.536E+00 1.13E+02 1.50E+01 X

Nd-147      -3.2248E+00                                     1.11E+01
                          531.00-3.225E+00 ?(  1.254E+01 1.54E+02 1.30E+01 G
                           91.10 0.000E+00 +   6.780E+00 1.00E+03 2.83E+01 G

TL-210   N   8.1113E-01                                     5.84E+05
                          799.60 8.111E-01 ?(  2.557E+00 9.34E+01 9.90E+01 G
                          296.00-6.385E-01 -   4.234E+00 1.98E+02 7.90E+01 G
                         1313.00 3.051E+00 ?   6.383E+00 9.05E+01 2.10E+01 GA

Kr-85    I   6.6764E+01                                     3.92E+03
                          513.98 6.676E+01 ?(  5.383E+02 2.35E+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	
PB-210	46.54	175.	7.	0.004	301.14	5.395E+00	P
TH-227	50.14	195.	-22.	-0.012	99.30	-7.732E+00	P
Sn-126	64.28	305.	-6.	-0.004	392.20	-1.316E+00	
Np-237	86.49	833.	-26.	-0.014	161.28	-3.149E+00	
EU-155	86.54	725.	-25.	-0.014	156.65	-1.291E+00	
Sn-126	86.94	701.	-25.	-0.014	153.98	-4.378E+00	
Sn-126	87.57	676.	-25.	-0.014	151.17	-1.053E+00	
Gd-153	97.50	235.	-23.	-0.013	97.86	-1.173E+00	
Np-239	99.50	228.	19.	0.011	112.71	1.995E+00	
Gd-153	103.20	286.	-3.	-0.002	845.95	-1.999E-01	
EU-155	105.31	510.	-21.	-0.012	153.62	-1.522E+00	
Np-239	106.13	504.	18.	0.010	176.36	1.228E+00	
EU-152	121.78	208.	12.	0.007	170.01	6.599E-01	
PA-234	131.29	403.	-22.	-0.012	128.19	-1.976E+00	
HF-181	133.02	426.	-19.	-0.010	156.34	-6.933E-01	
CO-57	136.47	349.	20.	0.011	131.09	3.076E+00	
Tc-99m	140.51	387.	-18.	-0.010	156.35	-3.383E-01	
U-235	143.79	321.	11.	0.006	239.63	1.604E+00	
CE-141	145.44	347.	8.	0.005	318.17	2.867E-01	
Ba-140	162.66	228.	10.	0.006	215.87	2.869E+00	
CE-139	165.85	207.	9.	0.005	237.40	1.923E-01	
Cf-251	176.60	93.	17.	0.009	104.80	1.853E+00	
U-235	185.72	147.	96.	0.054	24.58	3.473E+00	
TH-229	193.51	130.	-9.	-0.005	227.89	-4.120E+00	
U-235	205.33	124.	4.	0.002	556.54	1.511E+00	P
TH-229	210.85	137.	-10.	-0.005	217.60	-6.990E+00	
Cf-251	227.00	100.	6.	0.003	299.38	2.189E+00	
TH-227	235.97	628.	-19.	-0.010	192.14	-3.585E+00	
EU-152	244.69	528.	16.	0.009	204.06	5.179E+00	
TH-227	256.24	88.	2.	0.001	880.34	7.260E-01	
Cd-113m	263.70	100.	8.	0.004	191.60	3.253E+03	
Hg-203	279.20	64.	12.	0.007	96.71	4.106E-01	
I-131	284.30	62.	15.	0.008	104.07	6.614E+00	
TL-210	296.00	600.	-18.	-0.010	198.02	-6.385E-01	
PA-231	300.07	524.	-18.	-0.010	184.55	-2.082E+01	
PA-233	300.18	506.	-18.	-0.010	181.46	-8.264E+00	
PA-231	302.65	488.	-18.	-0.010	177.91	-1.795E+01	
PA-233	312.01	420.	16.	0.009	177.94	1.367E+00	P
Ir-192	316.49	124.	2.	0.001	631.82	8.696E-02	
CR-51	320.08	126.	-4.	-0.002	755.62	-1.191E+00	P
La-140	328.76	84.	7.	0.004	260.60	1.026E+00	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Cf-249	333.44	59.	7.	0.004	198.86	1.495E+00	
Cs-136	340.57	207.	-7.	-0.004	293.12	-4.803E-01	
HF-181	345.83	170.	14.	0.008	138.77	2.933E+00	
BA-133	356.00	474.	-9.	-0.005	343.73	-4.842E-01	
I-131	364.48	55.	8.	0.004	177.00	3.334E-01	
BA-133	383.84	117.	12.	0.006	134.77	4.625E+00	P
Cf-249	387.95	129.	12.	0.006	140.22	6.355E-01	
SN-113	391.69	159.	-13.	-0.007	140.32	-7.326E-01	
SB-125	427.88	52.	-15.	-0.008	100.69	-1.909E+00	
AG-108M	433.94	40.	12.	0.007	107.87	5.189E-01	P
PM-146	453.88	40.	9.	0.005	150.14	5.345E-01	P
SB-125	463.37	108.	-17.	-0.009	76.80	-6.631E+00	P
Ir-192	468.06	109.	10.	0.005	153.03	7.999E-01	
BE-7	477.59	87.	-15.	-0.008	85.33	-6.116E+00	P
HF-181	482.00	71.	12.	0.007	104.07	6.341E-01	
La-140	487.02	37.	-2.	-0.001	781.25	-1.577E-01	P
RU-103	497.05	25.	10.	0.005	102.67	4.794E-01	P
RH-106	511.86	60.	53.	0.029	24.82	1.197E+01	
Kr-85	513.98	108.	6.	0.004	235.08	6.676E+01	
Nd-147	531.00	48.	-9.	-0.005	154.36	-3.225E+00	
Ba-140	537.26	36.	3.	0.002	395.81	5.786E-01	
CS-134	563.24	16.	9.	0.005	94.11	5.218E+00	
CS-134	569.32	18.	9.	0.005	74.97	2.870E+00	
BI-207	569.70	22.	4.	0.002	153.16	2.274E-01	
SB-125	600.50	434.	-13.	-0.007	76.77	-3.842E+00	P
SB-124	602.73	421.	-13.	-0.007	226.09	-6.816E-01	
CS-134	604.71	408.	-13.	-0.007	222.36	-6.888E-01	
RU-103	610.30	395.	-12.	-0.007	232.19	-1.110E+01	
PM-144	618.06	149.	3.	0.002	556.20	1.663E-01	P
RH-106	621.92	52.	-12.	-0.007	87.72	-6.557E+00	
SB-125	635.89	13.	8.	0.004	72.89	3.830E+00	
I-131	636.97	49.	-13.	-0.007	79.99	-1.000E+01	
AG-110M	657.76	62.	-14.	-0.008	82.43	-8.364E-01	
CS-137	661.66	94.	-19.	-0.011	90.44	-1.280E+00	P
PM-144	696.54	17.	-1.	-0.001	643.23	-7.870E-02	
NB-94	702.63	13.	16.	0.009	52.97	9.527E-01	P
SB-124	722.79	44.	12.	0.007	83.30	6.729E+00	
AG-108M	722.94	57.	7.	0.004	147.75	4.932E-01	
PM-146	735.72	26.	-3.	-0.002	351.72	-8.157E-01	
PM-146	747.16	39.	-15.	-0.008	66.39	-2.776E+00	P
AG-110M	763.94	80.	-20.	-0.011	68.58	-5.537E+00	
PA-234M	766.41	73.	14.	0.008	91.30	2.979E+02	
EU-152	778.92	37.	-14.	-0.008	93.87	-7.135E+00	
CS-134	795.87	86.	-17.	-0.009	60.29	-1.297E+00	P
TL-210	799.60	59.	12.	0.007	93.43	8.111E-01	
CS-134	801.95	84.	-15.	-0.009	87.39	-1.170E+01	
Cs-136	818.50	9.	7.	0.004	95.56	4.918E-01	
MN-54	834.85	33.	-5.	-0.003	207.21	-3.387E-01	P

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
NB-94	871.10	10.	8.	0.004	68.63	5.331E-01		
EU-154	873.23	38.	-8.	-0.005	110.01	-4.829E+00		
PA-234	880.53	52.	-2.	-0.001	614.82	-1.976E+00		
Sc-46	889.28	65.	-7.	-0.004	159.42	-5.260E-01		
Y-88	898.04	30.	-8.	-0.004	122.66	-6.202E-01		P
AG-110M	937.49	14.	9.	0.005	94.28	1.963E+00		
PA-234	946.02	23.	-7.	-0.004	144.53	-4.134E+00		
EU-154	996.33	22.	8.	0.004	89.29	5.973E+00		
PA-234M	1001.00	30.	8.	0.004	107.89	7.228E+01		P
EU-154	1004.77	37.	6.	0.003	160.19	2.469E+00		
Cs-136	1048.07	19.	8.	0.004	84.78	8.232E-01		
RH-106	1050.36	40.	-12.	-0.006	83.63	-6.080E+01		
BI-207	1063.66	20.	-3.	-0.002	164.86	-3.783E-01		P
Ga-68	1077.40	20.	-5.	-0.003	201.66	-1.494E+01		
FE-59	1099.25	20.	-6.	-0.003	168.87	-9.099E-01		
EU-152	1112.07	111.	-14.	-0.008	41.11	-8.742E+00		P
ZN-65	1115.55	97.	-8.	-0.005	168.01	-1.456E+00		
Ta-182	1121.30	114.	-16.	-0.009	98.47	-3.956E+00		
Ta-182	1189.05	15.	-1.	-0.001	857.32	-5.650E-01		
Ta-182	1221.41	27.	-10.	-0.005	125.61	-3.352E+00		
NA-22	1274.53	17.	-4.	-0.002	154.11	-3.884E-01		
EU-154	1274.54	9.	6.	0.004	78.74	1.752E+00		
FE-59	1291.60	5.	6.	0.004	91.17	1.452E+00		
TL-210	1313.00	5.	6.	0.004	90.55	3.051E+00		
AG-110M	1384.30	5.	5.	0.003	121.64	1.999E+00		
EU-152	1408.00	27.	-6.	-0.003	211.36	-2.847E+00		
La-140	1596.21	12.	-4.	-0.002	439.87	-4.327E-01		P
Y-88	1836.06	6.	-2.	-0.001	338.51	-3.026E-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	-6.1163E+00	-6.1163E+00	8.533E+01%	1.87E+01
NA-22	#A	-3.8840E-01	-3.8841E-01	1.541E+02%	2.13E+00
K-40		2.3790E+02	2.3790E+02	6.631E+00%	1.08E+01
Sc-46	#A	-5.2597E-01	-5.2598E-01	1.594E+02%	2.88E+00
CR-51	#A	-1.1908E+00	-1.1908E+00	7.556E+02%	1.69E+01
MN-54	#A	-3.3867E-01	-3.3867E-01	2.072E+02%	2.00E+00
FE-59	#A	1.1340E-01	1.1341E-01	9.117E+01%	3.57E+00
Co-56	#C	1.5264E+00	1.5264E+00	4.962E+01%	1.19E+00
CO-57	#A	3.4124E-01	3.4124E-01	1.311E+02%	1.30E+00
CO-58	#A	-4.2586E-02	-4.2586E-02	1.610E+03%	2.35E+00
CO-60	#	1.2384E+00	1.2384E+00	3.022E+01%	7.43E-01
ZN-65	#A	-1.4556E+00	-1.4556E+00	1.680E+02%	8.35E+00

NB-94	#A	7.4079E-01	7.4079E-01	4.335E+01%	1.18E+00
ZR-95	#	3.0287E+00	3.0287E+00	3.001E+01%	1.89E+00
NB-95	#A	-5.0372E-02	-5.0372E-02	1.614E+03%	2.84E+00
RU-103	#A	4.7942E-01	4.7943E-01	1.027E+02%	1.25E+00
RH-106	#A	-6.5568E+00	-6.5568E+00	8.772E+01%	1.94E+01
AG-108M	#A	5.0601E-01	5.0601E-01	9.147E+01%	1.40E+00
AG-110M	#A	8.8338E-01	8.8339E-01	9.428E+01%	3.61E+00
SN-113	#A	-7.3263E-01	-7.3263E-01	1.403E+02%	3.47E+00
SB-124	#A	5.2924E-02	5.2925E-02	8.330E+01%	5.18E+00
SB-125	#A	-3.2230E-01	-3.2230E-01	6.215E+01%	4.77E+00
I-131	#A	7.7234E-01	7.7237E-01	1.027E+02%	1.55E+00
Gd-153	#A	-1.1734E+00	-1.1734E+00	9.786E+01%	3.84E+00
Ga-68	#A	-1.4830E+01	-1.4942E+01	2.017E+02%	7.04E+01
Tc-99m	#A	-3.3787E-01	-3.3835E-01	1.563E+02%	1.77E+00
BA-133	#A	-4.8420E-01	-4.8420E-01	3.437E+02%	5.60E+00
CS-134	#A	-1.2974E+00	-1.2974E+00	6.029E+01%	3.50E+00
CS-137	#A	-1.2801E+00	-1.2801E+00	9.044E+01%	3.14E+00
CE-139	#A	1.9234E-01	1.9234E-01	2.374E+02%	1.55E+00
Ba-140	#A	1.0440E+00	1.0441E+00	2.159E+02%	5.91E+00
La-140	#A	-1.7672E-01	-1.7672E-01	2.556E+02%	2.28E+00
CE-141	#A	2.8665E-01	2.8666E-01	3.182E+02%	3.08E+00
CE-144	#A	0.0000E+00	0.0000E+00	1.000E+03%	1.45E+01
PM-144	#A	4.3867E-02	4.3867E-02	4.252E+02%	1.31E+00
EU-152	#A	1.6073E+00	1.6073E+00	1.328E+02%	3.79E+00
EU-154	#A	1.5977E+00	1.5977E+00	7.874E+01%	2.59E+00
EU-155	#A	-1.5216E+00	-1.5216E+00	1.536E+02%	7.82E+00
HF-181	#A	9.9661E-01	9.9661E-01	8.673E+01%	2.23E+00
Ta-182	#A	-3.9565E+00	-3.9565E+00	9.847E+01%	1.31E+01
Hg-203	#A	4.1063E-01	4.1063E-01	9.671E+01%	1.34E+00
TL-208		4.5112E+00	4.5112E+00	1.421E+01%	1.02E+00
PM-146	#A	5.3451E-01	5.3451E-01	1.501E+02%	2.03E+00
Y-88	#A	-3.0259E-01	-3.0259E-01	3.385E+02%	1.91E+00
Cd-113m	#A	3.2526E+03	3.2526E+03	1.916E+02%	2.13E+04
Cd-109	#A	3.4143E+00	3.4143E+00	4.444E+02%	5.10E+01
Cf-251	#A	1.8528E+00	1.8528E+00	1.048E+02%	5.24E+00
Cf-249	#A	7.9902E-01	7.9902E-01	1.217E+02%	3.02E+00
Sn-126	#A	-1.3158E+00	-1.3158E+00	3.922E+02%	1.75E+01
PB-210	#A	5.3945E+00	5.3945E+00	3.011E+02%	4.70E+01
PB-212		1.3112E+01	1.3112E+01	7.687E+00%	1.92E+00
PB-214		3.2696E+01	3.2696E+01	6.332E+00%	3.11E+00
BI-207	#A	-3.4573E-02	-3.4573E-02	1.125E+02%	2.66E+00
BI-212	#A	9.2804E+00	9.2804E+00	8.714E+01%	2.72E+01
U-235	#A	1.5745E+00	1.5745E+00	2.396E+02%	1.30E+01
BI-214		3.1226E+01	3.1226E+01	6.617E+00%	2.58E+00
BI-210M	#A	2.2702E-01	2.2702E-01	3.389E+02%	2.65E+00
AC-228		1.4231E+01	1.4231E+01	1.241E+01%	3.12E+00
TH-227	#A	7.2598E-01	7.2598E-01	8.803E+02%	1.69E+01
TH-229	#A	-4.1197E+00	-4.1197E+00	2.279E+02%	2.56E+01
TH-234	A	9.6484E+00	9.6484E+00	4.737E+01%	1.58E+01

PA-231 #A	-1.7953E+01	-1.7953E+01	1.779E+02%	1.07E+02
PA-233 #A	1.3666E+00	1.3666E+00	1.779E+02%	8.16E+00
PA-234 #A	-1.9756E+00	-1.9756E+00	1.282E+02%	8.47E+00
PA-234M#A	1.3092E+02	1.3092E+02	7.067E+01%	2.68E+02
AM-241 #A	-1.2777E-01	-1.2777E-01	1.192E+03%	4.40E+00
Np-237 #A	-3.1490E+00	-3.1490E+00	1.613E+02%	1.69E+01
Ir-192 #A	3.5278E-01	3.5278E-01	1.530E+02%	1.90E+00
Cs-136 #A	6.3906E-01	6.3907E-01	6.387E+01%	1.13E+00
Np-239 #A	1.2281E+00	1.2283E+00	1.764E+02%	7.26E+00
Nd-147 #A	-3.2247E+00	-3.2248E+00	1.544E+02%	1.25E+01
TL-210 #A	8.1113E-01	8.1113E-01	9.343E+01%	2.56E+00
Kr-85 #A	6.6764E+01	6.6764E+01	2.351E+02%	5.38E+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) 3.433E+02 Bq/Sample
Total Decayed Activity (37.6 to 2000.8 keV) 3.4332803E+02 Bq/Sample

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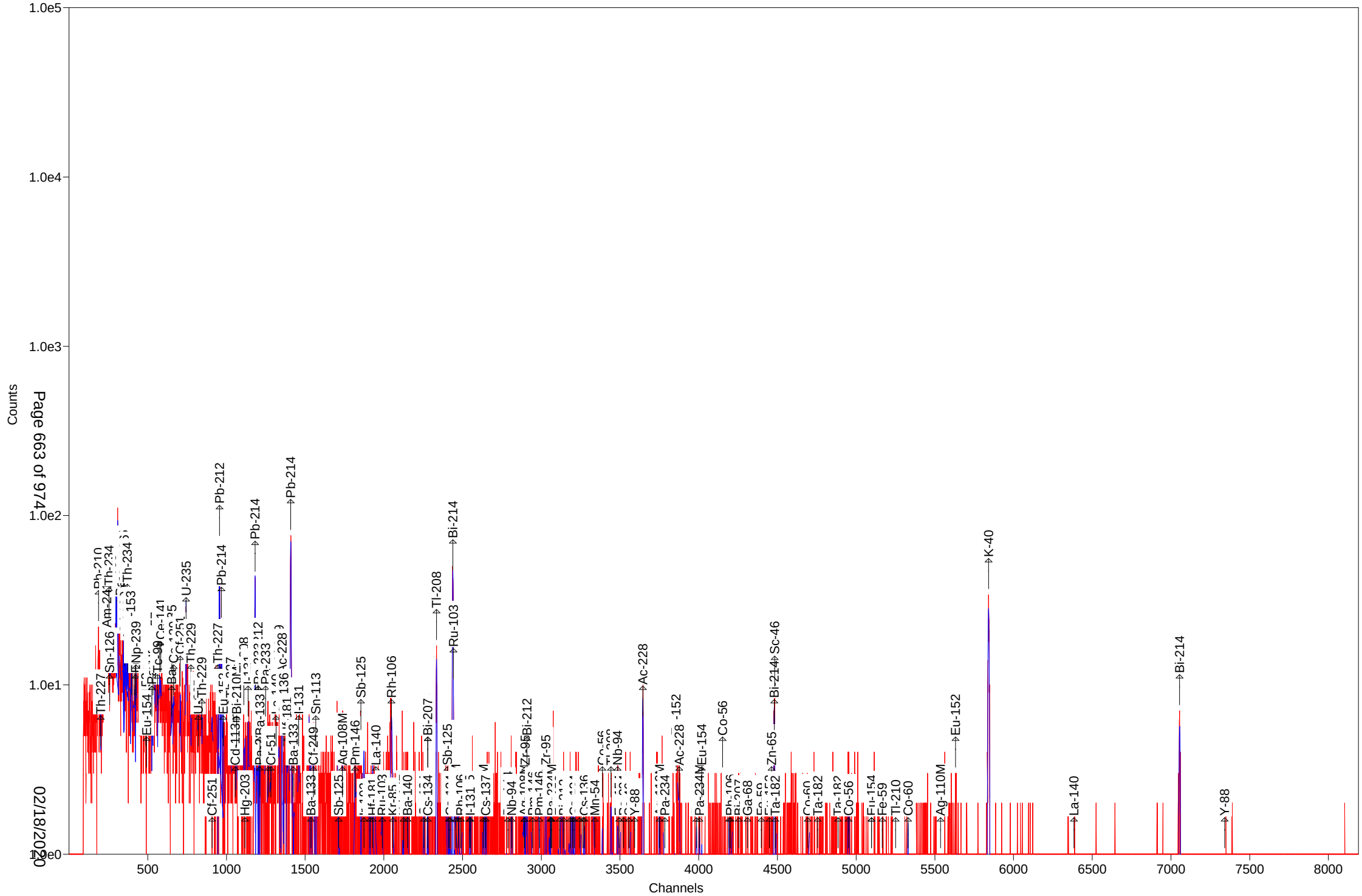
453329_Gamma_160-36593-A-9-B. 5_Gamma_20193408.spc.


Counts
Channels
1.0e5
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
Pb-214
Pb-214
Bi-214
Tl-208
Ru-103
K-40
Bi-214
Sc-46
Ac-228
Co-56
Eu-152
Bi-214
La-140
Y-88
Th-227
Sn-126
Th-229
U-235
Sb-125
Rh-106
Sn-113
Sb-125
Bi-207
Sb-125
Cs-137
Nb-94
Mn-54
Ac-228
Eu-154
Ta-182
Co-60
Ag-110M
Fe-59
Co-56
Ta-182
Pb-210
Th-234
Np-239
Eu-154
Cf-251
Hg-203
Ba-140
Cs-134
Pa-234
Ga-68
Zn-65
Co-60
Ta-182
Co-56
Eu-154
Tl-210
Ag-108M
Pm-146
La-140
Ba-133
Cf-249
Cr-51
Zr-95
Nb-94
Cs-136
Y-88
Th-227
Th-229
Pb-212
Pb-214
Pb-233
Ba-133
Ba-133
Pa-234
Pa-234
Ac-228
Ac-228
Pb-214
Pb-214
Pb-212
Pb-214
Pb-214
Pb-214

Test America St. Louis Spectrum ID: 8_Gamma_20192230

Sample Description: 453329_Gamma_160-36593-A-10-B
Detector: Detector # 8
Batch ID: 453329
Work Order Number: Gamma
Lot Number: 160-36593-A-10-B

Decay to Time: 12/27/2019 09:34 Live Time: 1800 sec
Acquisition Time: 12/27/2019 09:34:33 Real Time: 1843 sec
Analysis Time: 12/27/2019 10:05 Dead Time: 2.32 %
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_2019-12-07_1517.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	3.790E+00	106.3	4.029E+00	4.033E+00	1.365E+01
NA-22	-9.346E-01	69.1	6.458E-01	6.475E-01	2.145E+00
K-40	9.513E+01	9.8	9.319E+00	1.051E+01	1.050E+01
Sc-46	1.962E-02	2027.3	3.978E-01	3.978E-01	1.466E+00
CR-51	-6.121E+00	77.2	4.723E+00	4.735E+00	2.192E+01
MN-54	-4.022E-01	183.3	7.374E-01	7.377E-01	1.533E+00
FE-59	3.083E-01	353.0	1.088E+00	1.089E+00	2.629E+00
Co-56	1.300E-01	239.0	3.108E-01	3.109E-01	1.549E+00
CO-57	-1.566E-01	205.9	3.224E-01	3.225E-01	1.092E+00
CO-58	3.559E-01	124.5	4.431E-01	4.435E-01	1.534E+00
CO-60	-1.080E+00	94.3	1.018E+00	1.020E+00	2.124E+00
ZN-65	-1.906E+00	114.2	2.176E+00	2.178E+00	7.346E+00
NB-94	-1.002E-01	908.1	9.095E-01	9.096E-01	1.351E+00
ZR-95	-4.457E-02	112.4	5.008E-02	5.014E-02	2.794E+00
NB-95	0.000E+00	1.#INF	1.274E-01	1.274E-01	2.231E+00
RU-103	3.196E-01	134.8	4.309E-01	4.312E-01	1.058E+00
RH-106	4.934E+00	102.7	5.069E+00	5.075E+00	9.720E+00
AG-108M	1.205E-01	86.9	1.047E-01	1.048E-01	1.305E+00
AG-110M	-2.513E-03	21616.0	5.433E-01	5.433E-01	2.022E+00
SN-113	3.900E-02	1792.6	6.991E-01	6.991E-01	2.426E+00
SB-124	1.056E-01	220.0	2.322E-01	2.323E-01	3.971E+00
SB-125	1.093E+00	91.3	9.988E-01	1.000E+00	3.158E+00
I-131	1.444E-01	422.2	6.096E-01	6.096E-01	1.384E+00
Gd-153	-1.371E+00	175.4	2.405E+00	2.406E+00	8.003E+00
Ga-68	-3.883E+01	86.2	3.346E+01	3.353E+01	7.450E+01
Tc-99m	-4.547E-01	141.6	6.440E-01	6.445E-01	2.147E+00
BA-133	-7.244E-01	187.5	1.358E+00	1.359E+00	4.557E+00
CS-134	-4.544E-01	69.8	3.172E-01	3.181E-01	2.480E+00
CS-137	-1.224E+00	81.1	9.936E-01	9.957E-01	2.655E+00
CE-139	-1.054E-01	419.6	4.421E-01	4.422E-01	1.501E+00
Ba-140	1.645E+00	97.5	1.604E+00	1.606E+00	3.872E+00
La-140	5.632E-01	91.6	5.162E-01	5.170E-01	1.409E+00
CE-141	-3.273E-01	368.4	1.206E+00	1.206E+00	4.040E+00

CE-144	-3.456E+00	143.1	4.946E+00	4.949E+00	1.649E+01
PM-144	4.360E-01	129.1	5.628E-01	5.633E-01	1.326E+00
EU-152	1.421E+00	83.6	1.188E+00	1.191E+00	3.712E+00
EU-154	1.872E+00	48.9	9.152E-01	9.205E-01	2.291E+00
EU-155	-1.950E+00	75.2	1.465E+00	1.469E+00	1.070E+01
HF-181	5.557E-01	133.6	7.422E-01	7.428E-01	1.934E+00
Ta-182	1.648E+00	119.6	1.971E+00	1.973E+00	9.174E+00
Hg-203	4.440E-01	91.3	4.053E-01	4.061E-01	1.360E+00
TL-208	4.172E+00	15.6	6.517E-01	6.867E-01	1.041E+00
PM-146	6.206E-01	94.5	5.865E-01	5.874E-01	1.651E+00
Y-88	7.446E-02	250.6	1.866E-01	1.867E-01	8.180E-01
Cd-113m	-7.469E+03	87.4	6.530E+03	6.548E+03	2.181E+04
Cd-109	1.007E+01	180.0	1.812E+01	1.813E+01	6.037E+01
Cf-251	1.967E+00	95.2	1.872E+00	1.881E+00	4.795E+00
Cf-249	3.004E-01	148.8	4.469E-01	4.472E-01	2.405E+00
Sn-126	2.428E-01	2476.3	6.012E+00	6.012E+00	2.029E+01
PB-210	3.086E+00	472.2	1.457E+01	1.457E+01	4.953E+01
PB-212	8.764E+00	10.8	9.443E-01	1.101E+00	2.407E+00
PB-214	2.584E+01	5.9	1.533E+00	2.038E+00	1.888E+00
BI-207	-3.348E-01	218.2	7.306E-01	7.308E-01	2.420E+00
BI-212	4.857E+00	134.2	6.519E+00	6.524E+00	2.244E+01
U-235	-2.426E+00	127.1	3.083E+00	3.085E+00	1.754E+01
BI-214	2.335E+01	7.2	1.671E+00	2.065E+00	2.055E+00
BI-210M	2.559E-01	294.2	7.528E-01	7.530E-01	2.575E+00
AC-228	1.124E+01	13.5	1.513E+00	1.618E+00	3.511E+00
TH-227	3.149E+00	101.4	3.192E+00	3.198E+00	1.451E+01
TH-229	8.036E+00	101.2	8.137E+00	8.162E+00	2.142E+01
TH-234	5.574E+00	92.4	5.148E+00	5.157E+00	1.910E+01
PA-231	-1.776E+01	171.0	3.037E+01	3.039E+01	1.015E+02
PA-233	1.464E+00	155.7	2.280E+00	2.281E+00	7.627E+00
PA-234	1.797E+00	130.3	2.342E+00	2.344E+00	8.327E+00
PA-234M	5.216E+01	82.3	4.293E+01	4.301E+01	2.238E+02
AM-241	9.581E-01	169.1	1.620E+00	1.621E+00	5.429E+00
Np-237	2.933E+00	181.7	5.329E+00	5.331E+00	1.775E+01
Ir-192	1.376E-01	701.6	9.651E-01	9.651E-01	3.252E+00
Cs-136	4.354E-01	97.6	4.250E-01	4.257E-01	1.457E+00
Np-239	-1.149E+00	251.8	2.893E+00	2.894E+00	9.652E+00
Nd-147	6.320E-01	263.2	1.663E+00	1.664E+00	7.805E+00
TL-210	-5.780E-01	120.0	6.937E-01	6.945E-01	2.357E+00
Kr-85	-5.352E+01	265.7	1.422E+02	1.423E+02	4.868E+02
Total	2.872E+02				

Analyst: Kellene Robbs

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Sample description
453329_Gamma_160-36593-A-10-B

Spectrum Filename: C:\User\SPC\Det8\8_Gamma_20192230.An1

Acquisition information

Start time:	12/27/2019 9:34:33 AM
Live time:	1800
Real time:	1843
Dead time:	2.32 %
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	12/27/2019 9:34:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	8_2019-12-07_1517.PBC 12/7/2019 3:17:53 PM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 21 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 0.1968

***** 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	5.	472.16	1.01	2.005E-02	46.54	4.250	PBC<MDA	PB210
50.14	23.	101.38	1.01	2.267E-02	50.14	8.000	PBC<MDA	TH227
59.54	18.	169.11	1.02	2.881E-02	59.54	35.900	PBC<MDA	AM241
63.07	17.	115.14	1.03	3.093E-02	63.29	3.810	PBC<MDA	TH234
77.21	179.	19.91	1.05	3.702E-02				
86.48	27.	181.68	1.04	3.959E-02	86.49	13.100	PBC<MDA	Np237
					86.54	30.700	1.251E+00	EU155
					86.94	9.040	4.240E+00	Sn126
86.54	11.	472.86	1.04	3.961E-02	86.49	13.100	PBC<MDA	Np237
					86.54	30.700	4.844E-01	EU155
					86.94	9.040	1.642E+00	Sn126
87.58	7.	335.52	1.04	3.982E-02	87.57	37.500	PBC<MDA	Sn126
					88.04	3.790	2.396E+00	Cd109
88.05	27.	179.99	1.04	3.992E-02	87.57	37.500	PBC<MDA	Sn126
					88.04	3.790	1.007E+01	Cd109
91.10	19.	263.16	1.05	4.048E-02	91.10	28.300	PBC<MDA	Nd147
92.47	16.	144.44	1.05	4.072E-02	92.59	5.584	PBC<MDA	TH234
93.23	28.	180.06	1.05	4.083E-02	93.35	5.561	PBC<MDA	AC228
123.10	24.	87.52	1.07	4.138E-02	123.10	40.790	PBC<MDA	EU154
131.29	23.	141.89	1.08	4.061E-02	131.29	18.000	PBC<MDA	PA234
133.02	23.	144.73	1.08	4.041E-02	133.02	43.300	PBC<MDA	HF181
					133.54	11.090	2.872E+00	CE144

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
162.66	24.	97.47	1.10	3.593E-02	162.66	6.220	PBC<MDA	Ba140
163.38	-3.	898.46	1.10	3.580E-02	163.38	5.080	PBC<MDA	U235
176.60	21.	95.18	1.11	3.460E-02	176.60	17.000	PBC<MDA	Cf251
186.39	183.	13.88	1.11	3.320E-02	185.72	54.000	4.974E+00	U235
192.83	11.	186.69	1.13	3.226E-02	193.51	4.400	PBC<MDA	TH229
205.33	4.	497.01	1.13	3.083E-02	205.33	5.010	PBC<MDA	U235
212.32	22.	101.25	1.14	3.020E-02	210.85	2.990	PBC<MDA	TH229
235.97	20.	161.10	1.16	2.768E-02	235.97	12.300	PBC<MDA	TH227
238.67	186.	14.85	1.27	2.744E-02	238.63	43.300	8.713E+00	PB212
242.22	62.	24.82	1.16	2.714E-02	242.00	7.430	1.699E+01	PB214
244.69	21.	159.73	1.16	2.691E-02	244.69	7.580	PBC<MDA	EU152
265.83	6.	294.18	1.18	2.523E-02	265.83	50.000	PBC<MDA	BI210M
279.44	16.	91.27	1.19	2.427E-02	279.20	81.460	PBC<MDA	Hg203
295.42	182.	10.10	1.72	2.324E-02	295.09	19.300	2.255E+01	PB214
					296.00	79.000	5.523E+00	TL210
312.01	21.	155.75	1.21	2.224E-02	312.01	36.000	PBC<MDA	PA233
316.49	5.	701.56	1.22	2.199E-02	316.49	87.040	PBC<MDA	Ir192
333.44	15.	148.76	1.23	2.110E-02	333.44	15.510	PBC<MDA	Cf249
338.64	70.	17.45	2.50	2.085E-02	338.32	12.010	1.553E+01	AC228
340.57	14.	173.18	1.23	2.074E-02	340.57	46.900	PBC<MDA	Cs136
344.29	11.	172.75	1.24	2.057E-02	344.29	26.500	PBC<MDA	EU152
345.83	4.	574.10	1.24	2.049E-02	345.83	15.070	PBC<MDA	HF181
352.02	353.	5.93	1.57	2.020E-02	351.93	37.600	2.584E+01	PB214
364.48	3.	532.11	1.25	1.965E-02	364.48	81.700	PBC<MDA	I131
383.84	14.	104.30	1.27	1.885E-02	383.84	8.940	PBC<MDA	BA133
453.88	7.	185.99	1.32	1.647E-02	453.88	65.000	PBC<MDA	PM146
463.37	13.	91.34	1.32	1.620E-02	463.37	10.470	PBC<MDA	SB125
477.60	11.	106.28	1.33	1.580E-02	477.60	10.520	PBC<MDA	BE7
482.00	10.	133.55	1.34	1.569E-02	482.00	80.500	PBC<MDA	HF181
487.02	10.	121.20	1.34	1.555E-02	487.02	45.500	PBC<MDA	La140
497.05	8.	134.82	1.35	1.530E-02	497.05	90.900	PBC<MDA	RU103
511.86	81.	15.86	2.61	1.494E-02	511.86	20.000	1.506E+01	RH106
537.26	3.	290.26	1.37	1.436E-02	537.26	24.390	PBC<MDA	Ba140
569.32	8.	69.81	1.40	1.369E-02	569.32	15.380	PBC<MDA	CS134
					569.47	8.200	4.159E+00	PA234
					569.70	97.740	3.491E-01	BI207
583.17	85.	15.62	0.35	1.342E-02	583.02	84.500	4.172E+00	TL208
609.36	251.	7.16	1.33	1.294E-02	609.31	46.090	2.335E+01	BI214
					610.30	5.750	1.874E+02	RU103
621.92	4.	237.58	1.43	1.273E-02	621.92	9.930	PBC<MDA	RH106
635.89	6.	112.82	1.44	1.250E-02	635.89	11.310	PBC<MDA	SB125
636.97	1.	655.74	1.44	1.248E-02	636.97	7.170	PBC<MDA	I131
696.54	9.	129.10	1.48	1.158E-02	696.54	99.000	PBC<MDA	PM144
722.79	3.	219.99	1.50	1.123E-02	722.79	10.810	PBC<MDA	SB124
					722.94	90.840	1.736E-01	AG108M
					723.36	20.220	7.803E-01	EU154
722.94	9.	86.88	1.50	1.123E-02	722.79	10.810	4.126E+00	SB124
					722.94	90.840	4.911E-01	AG108M

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
					723.36	20.220	2.207E+00	EU154
723.36	9.	98.82	1.50	1.123E-02	722.79	10.810	PBC<MDA	SB124
					722.94	90.840	4.911E-01	AG108M
					723.36	20.220	2.208E+00	EU154
724.20	9.	112.38	1.50	1.121E-02	724.20	44.150	PBC<MDA	ZR95
727.17	7.	134.22	1.50	1.118E-02	727.17	7.550	PBC<MDA	BI212
747.16	7.	94.50	1.51	1.093E-02	747.16	34.000	PBC<MDA	PM146
766.41	13.	82.29	1.53	1.070E-02	765.79	99.790	PBC<MDA	NB95
					766.41	0.294	2.295E+02	PA234M
785.42	4.	285.04	1.54	1.048E-02	785.42	1.280	PBC<MDA	BI212
810.78	6.	124.51	1.55	1.020E-02	810.78	99.460	PBC<MDA	CO58
818.50	8.	101.06	1.56	1.012E-02	818.50	100.000	PBC<MDA	Cs136
880.53	1.	718.92	1.60	9.517E-03	880.53	6.000	PBC<MDA	PA234
898.04	3.	250.62	1.61	9.360E-03	898.04	93.700	PBC<MDA	Y88
911.46	46.	20.50	1.62	9.247E-03	911.07	29.000	9.461E+00	AC228
946.02	4.	218.66	1.64	8.957E-03	946.02	13.400	PBC<MDA	PA234
964.11	8.	121.99	1.65	8.814E-03	964.11	14.605	PBC<MDA	EU152
969.07	8.	93.51	1.65	8.776E-03	968.97	17.460	PBC<MDA	AC228
996.33	8.	86.40	1.67	8.571E-03	996.33	10.600	PBC<MDA	EU154
1001.00	-1.	601.37	1.67	8.537E-03	1001.00	0.837	PBC<MDA	PA234M
1004.77	6.	115.53	1.67	8.509E-03	1004.77	18.010	PBC<MDA	EU154
1048.07	3.	213.44	1.70	8.209E-03	1048.07	80.000	PBC<MDA	Cs136
1050.36	6.	102.74	1.70	8.193E-03	1050.36	1.560	PBC<MDA	RH106
1099.25	2.	353.03	1.73	7.881E-03	1099.25	56.500	PBC<MDA	FE59
1120.23	69.	12.13	1.53	7.754E-03	1120.29	15.100	3.258E+01	BI214
					1120.55	99.987	4.922E+00	Sc46
1121.19	11.	119.57	1.74	7.748E-03	1120.55	99.987	PBC<MDA	Sc46
					1121.30	34.900	2.260E+00	Ta182
1221.41	3.	308.52	1.80	7.199E-03	1221.41	27.000	PBC<MDA	Ta182
1238.28	5.	238.99	1.81	7.114E-03	1238.28	66.070	PBC<MDA	Co56
1408.00	6.	101.72	1.90	6.366E-03	1408.00	21.005	PBC<MDA	EU152
1460.98	113.	9.80	1.64	6.165E-03	1460.83	10.670	9.513E+01	K40
1596.21	4.	137.50	1.99	5.706E-03	1596.21	95.400	PBC<MDA	La140
1764.61	40.	16.71	2.07	5.226E-03	1764.49	15.400	2.750E+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	
308.65	77.21	283.	179.	4.826E+03	19.91	1.051	-	
745.39	186.39	96.	183.	5.517E+03	13.88	1.113	-	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: 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	247.	5.	0.003	472.16	1.012s
TH-227	200.36	50.14	264.	23.	0.013	101.38	1.015s
AM-241	237.95	59.54	446.	18.	0.010	169.11	1.022s
TH-234	252.96	63.29	179.	17.	0.009	115.14	1.025D
BA-133	323.77	80.99	949.	-42.	-0.023	46.49	1.039s
Np-237	345.77	86.49	1224.	27.	0.015	181.68	1.043A
EU-155	345.98	86.54	1251.	11.	0.006	472.86	1.043
Sn-126	350.09	87.57	1216.	7.	0.004	335.52	1.044D
Cd-109	351.97	88.04	1204.	27.	0.015	179.99	1.044A
Nd-147	364.21	91.10	1243.	19.	0.011	263.16	1.047
TH-234	370.17	92.59	262.	16.	0.009	144.44	1.048D
AC-228	373.21	93.35	1214.	28.	0.015	180.06	1.049s
Gd-153	389.81	97.50	1425.	-31.	-0.017	175.41	1.052s
Np-239	397.81	99.50	1394.	-31.	-0.017	173.28	1.053s
Gd-153	412.62	103.20	1364.	-31.	-0.017	170.92	1.056s
Np-239	414.62	103.70	1333.	-31.	-0.017	168.94	1.057s
EU-155	421.07	105.31	1302.	-31.	-0.017	75.16	1.058s
Np-239	424.34	106.13	1215.	-20.	-0.011	251.81	1.058s
EU-152	486.94	121.78	270.	-12.	-0.006	204.02	1.071s
CO-57	488.06	122.06	207.	-10.	-0.006	205.91	1.071s
EU-154	492.22	123.10	206.	24.	0.013	87.52	1.072s
PA-234	525.00	131.29	526.	23.	0.013	141.89	1.078
HF-181	531.92	133.02	549.	23.	0.013	144.73	1.079s
CE-144	533.98	133.54	780.	-28.	-0.015	143.11	1.080s
HF-181	545.02	136.30	752.	-28.	-0.015	140.30	1.082s
CO-57	545.72	136.47	743.	-28.	-0.015	139.46	1.082s
Tc-99m	561.86	140.51	771.	-28.	-0.016	141.61	1.085s
U-235	574.97	143.79	804.	-19.	-0.010	127.10	1.087s
CE-141	581.59	145.44	816.	-11.	-0.006	368.41	1.089s
Ba-140	650.47	162.66	267.	24.	0.013	97.47	1.102s
U-235	653.35	163.38	294.	-3.	-0.001	898.46	1.102s
CE-139	663.24	165.85	264.	-6.	-0.003	419.56	1.104
Cf-251	706.23	176.60	106.	21.	0.012	95.18	1.112s
U-235	742.71	185.72	308.	-11.	-0.006	223.39	1.119s
TH-229	773.87	193.51	125.	11.	0.006	186.69	1.125
U-235	821.17	205.33	102.	4.	0.002	497.01	1.134s
TH-229	843.24	210.85	120.	22.	0.012	101.25	1.138s
Cf-251	907.84	227.00	140.	-19.	-0.011	124.07	1.151s
TH-227	943.73	235.97	515.	20.	0.011	161.10	1.157
PB-212	954.37	238.63	110.	187.	0.104	10.78	1.159D
PB-214	967.84	242.00	86.	62.	0.034	24.82	1.162D

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
EU-152	978.62	244.69	553.	21.	0.012	159.73	1.164
TH-227	1024.81	256.24	92.	-5.	-0.003	646.26	1.172s
Cd-113m	1054.65	263.70	150.	-20.	-0.011	87.43	1.178
BI-210M	1063.18	265.83	143.	6.	0.003	294.18	1.179s
TL-208	1108.99	277.28	112.	-5.	-0.003	277.46	1.188s
Hg-203	1116.66	279.20	96.	16.	0.009	91.27	1.189
PB-214	1181.55	295.42	40.	182.	0.101	10.10	1.721s
TL-210	1183.86	296.00	716.	-21.	-0.012	182.50	1.202s
PB-212	1199.98	300.03	695.	-21.	-0.012	179.42	1.205
PA-231	1200.14	300.07	675.	-21.	-0.012	176.74	1.205s
PA-233	1200.58	300.18	654.	-21.	-0.012	173.99	1.205s
PA-231	1210.46	302.65	633.	-21.	-0.012	171.00	1.207
BA-133	1211.27	302.85	612.	-21.	-0.012	168.16	1.207
Ba-140	1219.26	304.85	591.	-21.	-0.012	165.10	1.208s
BI-210M	1219.45	304.90	570.	-15.	-0.008	231.68	1.208s
PA-233	1247.91	312.01	529.	21.	0.012	155.75	1.214
Ir-192	1265.82	316.49	550.	5.	0.003	701.56	1.217s
CR-51	1280.20	320.08	315.	-24.	-0.013	77.16	1.219s
La-140	1314.91	328.76	311.	-17.	-0.009	108.47	1.226s
Cf-249	1333.63	333.44	255.	15.	0.009	148.76	1.229s
AC-228	1354.41	338.64	19.	70.	0.039	17.45	2.500s
Cs-136	1362.15	340.57	270.	14.	0.008	173.18	1.234s
EU-152	1377.01	344.29	188.	11.	0.006	172.75	1.237
HF-181	1383.19	345.83	278.	4.	0.002	574.10	1.238s
PB-214	1407.95	352.02	25.	353.	0.196	5.93	1.570s
BA-133	1423.87	356.00	453.	-16.	-0.009	187.50	1.245
I-131	1457.81	364.48	64.	3.	0.002	532.11	1.252
BA-133	1535.24	383.84	98.	14.	0.008	104.30	1.266
Cf-249	1551.68	387.95	118.	-5.	-0.003	287.51	1.269s
SB-125	1711.39	427.88	32.	-4.	-0.002	281.37	1.297s
AG-108M	1735.64	433.94	52.	-7.	-0.004	213.65	1.301s
PM-146	1815.41	453.88	39.	7.	0.004	185.99	1.315s
SB-125	1853.36	463.37	64.	13.	0.007	91.34	1.322s
Ir-192	1872.14	468.06	95.	-15.	-0.008	93.98	1.325s
BE-7	1910.28	477.60	67.	11.	0.006	106.28	1.332s
HF-181	1927.89	482.00	78.	10.	0.005	133.55	1.335s
La-140	1947.98	487.02	74.	10.	0.006	121.20	1.339s
RU-103	1988.12	497.05	26.	8.	0.004	134.82	1.346s
RH-106	2047.36	511.86	42.	81.	0.045	15.86	2.606s
Kr-85	2055.83	513.98	131.	-6.	-0.003	265.72	1.357s
Nd-147	2123.91	531.00	26.	0.	0.000	1000.00	1.369s
Ba-140	2148.95	537.26	22.	3.	0.002	290.26	1.373s
CS-134	2252.86	563.24	43.	-7.	-0.004	186.92	1.391s
CS-134	2277.20	569.32	13.	8.	0.005	69.81	1.395s
PA-234	2277.80	569.47	35.	-8.	-0.005	105.92	1.395s
BI-207	2278.73	569.70	33.	-5.	-0.003	179.28	1.396s
TL-208	2332.61	583.17	16.	85.	0.047	15.62	0.354s
SB-125	2401.92	600.50	371.	-3.	-0.002	400.47	1.416s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
CS-134	2418.76	604.71	364.	0.	0.000	1000.00	1.419s
BI-214	2437.38	609.36	17.	251.	0.139	7.16	1.330s
RU-103	2441.12	610.30	364.	0.	0.000	1000.00	1.423s
AG-108M	2457.05	614.28	364.	0.	0.000	1000.00	1.426s
RH-106	2487.60	621.92	17.	4.	0.002	237.58	1.431s
SB-125	2543.49	635.89	16.	6.	0.003	112.82	1.440s
I-131	2547.83	636.97	21.	1.	0.001	655.74	1.441s
AG-110M	2630.98	657.76	63.	-16.	-0.009	74.68	1.455s
CS-137	2646.58	661.66	100.	-23.	-0.013	81.15	1.457s
PM-144	2786.11	696.54	28.	9.	0.005	129.10	1.480s
NB-94	2810.46	702.63	28.	-2.	-0.001	908.11	1.484s
SB-124	2891.09	722.79	23.	3.	0.002	219.99	1.497s
AG-108M	2891.70	722.94	26.	9.	0.005	86.88	1.498s
EU-154	2893.39	723.36	35.	9.	0.005	98.82	1.498s
ZR-95	2896.74	724.20	44.	9.	0.005	112.38	1.498s
BI-212	2908.63	727.17	45.	7.	0.004	134.22	1.500s
PM-146	2942.83	735.72	23.	-1.	-0.001	773.39	1.506s
PM-146	2988.59	747.16	9.	7.	0.004	94.50	1.513s
ZR-95	3026.87	756.73	33.	-9.	-0.005	198.37	1.519s
AG-110M	3055.73	763.94	62.	-13.	-0.007	92.07	1.524s
NB-95	3063.11	765.79	74.	0.	0.000	1000.00	1.525s
PA-234M	3065.60	766.41	51.	13.	0.007	82.29	1.526s
EU-152	3115.64	778.92	23.	-2.	-0.001	444.01	1.534s
BI-212	3141.64	785.42	28.	4.	0.002	285.04	1.538s
CS-134	3183.44	795.87	63.	-15.	-0.008	124.16	1.544
TL-210	3198.36	799.60	76.	-11.	-0.006	120.03	1.547s
CO-58	3243.06	810.78	30.	6.	0.004	124.51	1.554s
La-140	3263.04	815.77	36.	0.	0.000	1000.00	1.557s
Cs-136	3273.97	818.50	26.	8.	0.004	101.06	1.559s
MN-54	3339.36	834.85	28.	-7.	-0.004	183.33	1.569s
Co-56	3387.05	846.77	28.	-3.	-0.002	425.52	1.577
TL-208	3442.23	860.56	37.	-5.	-0.003	246.86	1.585s
NB-94	3484.36	871.10	25.	-4.	-0.002	198.55	1.592s
EU-154	3492.89	873.23	34.	-5.	-0.003	166.68	1.593s
PA-234	3522.10	880.53	22.	1.	0.001	718.92	1.598s
PA-234	3532.94	883.24	23.	0.	0.000	1000.00	1.599s
Y-88	3592.14	898.04	9.	3.	0.001	250.62	1.608s
AC-228	3644.26	911.07	9.	46.	0.025	20.50	1.616
AG-110M	3749.96	937.49	45.	-17.	-0.009	89.94	1.633s
PA-234	3784.07	946.02	15.	4.	0.002	218.66	1.638s
EU-152	3856.43	964.11	45.	8.	0.005	121.99	1.649s
AC-228	3875.88	968.97	25.	8.	0.005	93.51	1.652s
EU-154	3985.31	996.33	21.	8.	0.005	86.40	1.668s
PA-234M	4003.99	1001.00	31.	-1.	-0.001	601.37	1.671s
EU-154	4019.10	1004.77	20.	6.	0.003	115.53	1.673s
Co-56	4151.36	1037.84	15.	-1.	-0.001	857.32	1.693s
Cs-136	4192.29	1048.07	19.	3.	0.002	213.44	1.698s
RH-106	4201.45	1050.36	16.	6.	0.003	102.74	1.700s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-207	4254.65	1063.66	26.	-4.	-0.002	218.19	1.708s
Ga-68	4309.61	1077.40	35.	-16.	-0.009	86.18	1.716s
FE-59	4397.02	1099.25	16.	2.	0.001	353.03	1.728s
EU-152	4448.32	1112.07	126.	-13.	-0.007	120.61	1.736s
ZN-65	4462.20	1115.55	112.	-14.	-0.008	114.18	1.738s
BI-214	4480.94	1120.23	0.	69.	0.038	12.13	1.531s
Sc-46	4482.22	1120.55	99.	-6.	-0.003	251.43	1.740s
Ta-182	4485.22	1121.30	81.	11.	0.006	119.57	1.741
Ta-182	4756.23	1189.05	15.	0.	0.000	1000.00	1.779
Ta-182	4885.67	1221.41	16.	3.	0.002	308.52	1.797
Co-56	4953.16	1238.28	27.	5.	0.003	238.99	1.806s
NA-22	5098.16	1274.53	27.	-12.	-0.006	69.11	1.826s
EU-154	5098.20	1274.54	38.	0.	0.000	1000.00	1.826s
TL-210	5252.05	1313.00	21.	-11.	-0.006	97.28	1.847s
CO-60	5330.06	1332.50	24.	-13.	-0.007	94.29	1.857s
AG-110M	5537.25	1384.30	21.	-10.	-0.006	106.26	1.884s
EU-152	5632.07	1408.00	5.	6.	0.003	101.72	1.896s
K-40	5843.98	1460.98	4.	113.	0.063	9.80	1.637
La-140	6384.93	1596.21	6.	4.	0.002	137.50	1.990s
SB-124	6764.03	1690.98	0.	0.	0.000	1000.00	2.034s
BI-214	7058.07	1764.49	2.	40.	0.022	16.71	2.067s
Co-56	7085.51	1771.35	42.	0.	0.000	1000.00	2.070s

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	3.7904E+00				5.31E+01	
			477.60	3.790E+00	?(	1.365E+01 1.06E+02 1.05E+01	G
NA-22	C	-9.3456E-01				9.50E+02	
			1274.53	-9.346E-01	?(	2.145E+00 6.91E+01 9.99E+01	G
K-40	N	9.5130E+01				4.66E+11	
			1460.83	9.513E+01	(P	1.050E+01 9.80E+00 1.07E+01	G
Sc-46	F	1.9624E-02				8.38E+01	
			889.28	1.962E-02	%(	1.466E+00 2.03E+03 1.00E+02	G
			1120.55	-4.061E-01	+	3.512E+00 2.51E+02 1.00E+02	G
CR-51	F	-6.1215E+00				2.77E+01	
			320.08	-6.121E+00	?(P	2.192E+01 7.72E+01 9.94E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
MN-54	C -4.0221E-01					3.12E+02	
		834.85	-4.022E-01	?(P	1.533E+00	1.83E+02	1.00E+02 G
FE-59	F 3.0833E-01					4.45E+01	
		1099.25	3.083E-01	?(P	2.629E+00	3.53E+02	5.65E+01 G
		1291.60	-1.250E-01	%	3.361E+00	1.12E+03	4.32E+01 G
Co-56	C 1.3005E-01					7.73E+01	
		846.77	-1.757E-01	(P	1.549E+00	4.26E+02	9.99E+01 G
		1238.28	5.924E-01	?(P	3.182E+00	2.39E+02	6.61E+01 G
		1037.84	-4.750E-01	+	9.860E+00	8.57E+02	1.41E+01 G
		1771.35	0.000E+00	-	2.268E+01	1.00E+03	1.55E+01 A
CO-57	C -1.5655E-01					2.72E+02	
		122.06	-1.566E-01	(	1.092E+00	2.06E+02	8.56E+01 G
		136.47	-3.629E+00	&	1.687E+01	1.39E+02	1.07E+01 G
CO-58	C 3.5586E-01					7.09E+01	
		810.78	3.559E-01	?(	1.534E+00	1.25E+02	9.95E+01 G
CO-60	F -1.0800E+00					1.93E+03	
		1332.50	-1.080E+00	?(P	2.124E+00	9.43E+01	1.00E+02 G
		1173.24	7.462E-03	% P	1.451E+00	7.39E+03	9.99E+01 G
ZN-65	F -1.9057E+00					2.44E+02	
		1115.55	-1.906E+00	?(	7.346E+00	1.14E+02	5.06E+01 G
NB-94	I -1.0016E-01					7.41E+06	
		702.63	-1.002E-01	?(P	1.351E+00	9.08E+02	9.79E+01 G
		871.10	-2.123E-01	&	1.497E+00	1.99E+02	9.99E+01 G
ZR-95	I -4.4568E-02					6.40E+01	
		756.73	-8.788E-01	?(P	2.794E+00	1.98E+02	5.45E+01 G
		724.20	9.845E-01	&(	3.781E+00	1.12E+02	4.42E+01 G
RU-103	I 3.1961E-01					3.93E+01	
		497.05	3.196E-01	?(	1.058E+00	1.35E+02	9.09E+01 G
		610.30	0.000E+00	-	6.848E+01	1.00E+03	5.75E+00 GA
RH-106	I 4.9337E+00					3.74E+02	
		621.92	1.612E+00	&(	9.720E+00	2.38E+02	9.93E+00 G
		1050.36	2.608E+01	?(	9.280E+01	1.03E+02	1.56E+00 G
		511.86	1.506E+01	?	6.121E+00	1.59E+01	2.00E+01 GA
AG-108M	C 1.2046E-01					1.53E+05	
		433.94	-2.516E-01	(	1.305E+00	2.14E+02	9.05E+01 G
		722.94	4.911E-01	(	1.446E+00	8.69E+01	9.08E+01 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		614.28	0.000E+00	-	4.406E+00	1.00E+03	8.98E+01 G
AG-110M F	-2.5132E-03					2.50E+02	
		884.68	-2.513E-03	%(P	2.022E+00	2.16E+04	7.27E+01 G
		657.76	-7.728E-01	&	1.923E+00	7.47E+01	9.46E+01 G
		937.49	-3.050E+00	+	6.086E+00	8.99E+01	3.44E+01 G
		1384.30	-3.658E+00	+	8.579E+00	1.06E+02	2.43E+01 G
		763.94	-2.945E+00	+	9.138E+00	9.21E+01	2.23E+01 G
SN-113 F	3.8996E-02					1.15E+02	
		391.69	3.900E-02	%(	2.426E+00	1.79E+03	6.40E+01 G
SB-124 F	1.0556E-01					6.02E+01	
		602.73	-4.329E-02	%(	3.971E+00	2.70E+03	9.83E+01 G
		1690.98	0.000E+00	+	1.579E+00	1.00E+03	4.78E+01 G
		722.79	1.459E+00	?(	1.146E+01	2.20E+02	1.08E+01 G
SB-125 I	1.0934E+00					1.01E+03	
		427.88	-4.346E-01	&(	3.158E+00	2.81E+02	2.96E+01 G
		600.50	-7.911E-01	+ P	2.197E+01	4.00E+02	1.79E+01 G
		635.89	2.162E+00	?(	8.507E+00	1.13E+02	1.13E+01 G
		463.37	4.259E+00	&(	1.310E+01	9.13E+01	1.05E+01 G
I-131 I	1.4436E-01					8.02E+00	
		364.48	1.025E-01	?(P	1.384E+00	5.32E+02	8.17E+01 G
		284.30	3.781E-01	%	1.717E+01	1.80E+03	6.14E+00 G
		636.97	6.210E-01	?(	1.494E+01	6.56E+02	7.17E+00 G
Gd-153 F	-1.3709E+00					2.42E+02	
		97.50	-1.371E+00	(	8.003E+00	1.75E+02	3.00E+01 G
		103.20	-1.875E+00	+	1.067E+01	1.71E+02	2.18E+01 G
Ga-68 C	-3.8829E+01					4.71E-02	
		1077.40	-3.883E+01	?(	7.450E+01	8.62E+01	3.30E+00 G
Tc-99m I	-4.5474E-01					2.51E-01	
		140.51	-4.547E-01	?(	2.147E+00	1.42E+02	8.93E+01 G
BA-133 F	-7.2444E-01					3.85E+03	
		356.00	-7.244E-01	(	4.557E+00	1.87E+02	6.20E+01 G
		302.85	-2.792E+00	+	1.570E+01	1.68E+02	1.83E+01 G
		383.84	4.586E+00	?	1.612E+01	1.04E+02	8.94E+00 GA
		80.99	-1.786E+00	+ P	6.245E+00	4.65E+01	3.41E+01 GA
CS-134 I	-4.5442E-01					7.54E+02	
		795.87	-9.348E-01	&(P	2.480E+00	1.24E+02	8.55E+01 G
		604.71	0.000E+00	+	4.003E+00	1.00E+03	9.76E+01 G
		569.32	2.217E+00	?(	5.149E+00	6.98E+01	1.54E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
			801.95	-2.787E-01	% P	2.869E+01	2.94E+03	8.69E+00 G
			563.24	-3.533E+00	+	1.608E+01	1.87E+02	8.35E+00 G
CS-137	I	-1.2245E+00					1.10E+04	
			661.66	-1.224E+00	?(P	2.655E+00	8.11E+01	8.52E+01 G
CE-139	F	-1.0538E-01					1.38E+02	
			165.85	-1.054E-01	?(	1.501E+00	4.20E+02	7.99E+01 G
Ba-140	I	1.6452E+00					1.28E+01	
			537.26	5.289E-01	?(	3.872E+00	2.90E+02	2.44E+01 G
			162.66	6.023E+00	*(	1.959E+01	9.75E+01	6.22E+00 G
			304.85	-1.201E+01	+	6.631E+01	1.65E+02	4.29E+00 G
La-140	I	5.6324E-01					1.28E+01	
			1596.21	4.423E-01	?(	1.409E+00	1.37E+02	9.54E+01 G
			487.02	8.169E-01	*(	3.367E+00	1.21E+02	4.55E+01 G
			328.76	-2.182E+00	+ P	1.088E+01	1.08E+02	2.03E+01 G
			815.77	0.000E+00	-	7.211E+00	1.00E+03	2.33E+01 G
CE-141	I	-3.2726E-01					3.25E+01	
			145.44	-3.273E-01	&(	4.040E+00	3.68E+02	4.82E+01 G
CE-144	I	-3.4560E+00					2.85E+02	
			133.54	-3.456E+00	?(	1.649E+01	1.43E+02	1.11E+01 G
PM-144	C	4.3596E-01					3.63E+02	
			696.54	4.360E-01	?(	1.326E+00	1.29E+02	9.90E+01 G
			618.06	-4.228E-02	% P	4.020E+00	1.87E+03	9.91E+01 G
EU-152	F	1.4211E+00					4.94E+03	
			121.78	-5.390E-01	(	3.712E+00	2.04E+02	2.86E+01 G
			344.29	1.160E+00	?(	6.781E+00	1.73E+02	2.65E+01 G
			1112.07	-7.041E+00	+	2.867E+01	1.21E+02	1.36E+01 G
			778.92	-9.494E-01	+	1.026E+01	4.44E+02	1.29E+01 G
			964.11	3.498E+00	?(	1.464E+01	1.22E+02	1.46E+01 G
			244.69	5.722E+00	?(P	3.057E+01	1.60E+02	7.58E+00 G
			1408.00	2.354E+00	?	5.597E+00	1.02E+02	2.10E+01 GA
EU-154	I	1.8723E+00					3.14E+03	
			123.10	7.852E-01	?(	2.291E+00	8.75E+01	4.08E+01 G
			1274.54	0.000E+00	-	7.180E+00	1.00E+03	3.52E+01 G
			723.36	2.208E+00	(	7.431E+00	9.88E+01	2.02E+01 G
			873.23	-2.441E+00	+	1.421E+01	1.67E+02	1.23E+01 G
			1004.77	2.108E+00	&(	8.474E+00	1.16E+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	-1.9497E+00					1.81E+03	
			105.31	-1.950E+00	(P	1.070E+01	7.52E+01	2.12E+01 G
			86.54	4.844E-01	&	7.656E+00	4.73E+02	3.07E+01 G
HF-181	F	5.5574E-01					4.24E+01	
			482.00	4.249E-01	&(	1.934E+00	1.34E+02	8.05E+01 G
			133.02	7.344E-01	?(	3.552E+00	1.45E+02	4.33E+01 G
			345.83	7.414E-01	&(	1.446E+01	5.74E+02	1.51E+01 G
			136.30	-6.620E+00	&	3.097E+01	1.40E+02	5.85E+00 G
Ta-182	F	1.6482E+00					1.14E+02	
			1121.30	2.260E+00	(	9.174E+00	1.20E+02	3.49E+01 G
			1221.41	8.575E-01	(	6.102E+00	3.09E+02	2.70E+01 G
			1189.05	0.000E+00	-	9.662E+00	1.00E+03	1.62E+01 G
Hg-203	F	4.4405E-01					4.66E+01	
			279.20	4.440E-01	?(	1.360E+00	9.13E+01	8.15E+01 G
TL-208	N	4.1717E+00					6.98E+02	
			583.02	4.172E+00	(P	1.041E+00	1.56E+01	8.45E+01 G
			277.28	-1.974E+00	-	1.881E+01	2.77E+02	6.31E+00 G
			860.56	-2.459E+00	-	1.437E+01	2.47E+02	1.24E+01 G
PM-146	C	6.2065E-01					2.02E+03	
			453.88	3.632E-01	&(	1.651E+00	1.86E+02	6.50E+01 G
			747.16	1.113E+00	?(	2.534E+00	9.45E+01	3.40E+01 G
			735.72	-2.975E-01	+	5.626E+00	7.73E+02	2.25E+01 G
Y-88	F	7.4458E-02					1.07E+02	
			1836.06	-1.476E-02	%(P	8.180E-01	5.02E+03	9.92E+01 G
			898.04	1.689E-01	?(	1.073E+00	2.51E+02	9.37E+01 G
Cd-113m		-7.4688E+03					5.33E+03	
			263.70	-7.469E+03	&(	2.181E+04	8.74E+01	6.00E-03 K
Cd-109	F	1.0067E+01					4.53E+02	
								Derived Ave Activity
			88.04	1.007E+01	}(	6.037E+01	1.80E+02	3.79E+00 G
Cf-251	T	1.9673E+00					3.28E+05	
			176.60	1.967E+00	(	4.795E+00	9.52E+01	1.70E+01 G
			227.00	-5.873E+00	&	1.788E+01	1.24E+02	6.30E+00 GA
Cf-249	T	3.0044E-01					1.28E+05	
			387.95	-2.438E-01	?(	2.405E+00	2.88E+02	6.60E+01 G
			333.44	2.616E+00	?(	1.309E+01	1.49E+02	1.55E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Sn-126		2.4278E-01					3.65E+07	
			87.57	2.428E-01	}	6.145E+00	3.36E+02	3.75E+01 GA
			64.28	2.428E-01	%(	2.029E+01	2.48E+03	9.70E+00 G
			86.94	2.428E-01	}	2.538E+01	1.37E+03	9.04E+00 GA
PB-210	N	3.0858E+00					8.14E+03	
			46.54	3.086E+00	*(P	4.953E+01	4.72E+02	4.25E+00 G
PB-212	N	8.7635E+00					6.98E+02	
			238.63	8.764E+00	(P	2.407E+00	1.08E+01	4.33E+01 G
			300.03	-1.546E+01	-	9.275E+01	1.79E+02	3.28E+00 GA
PB-214	N	2.5838E+01					5.84E+05	
			351.93	2.584E+01	@(P	1.888E+00	5.93E+00	3.76E+01 G
			295.09	2.255E+01	- P	3.983E+00	1.01E+01	1.93E+01 G
			242.00	1.699E+01	-	1.267E+01	2.48E+01	7.43E+00 GA
BI-207	C	-3.3485E-01					1.18E+04	
			1063.66	-3.348E-01	?(P	2.420E+00	2.18E+02	7.45E+01 G
			569.70	-1.939E-01	+	1.219E+00	1.79E+02	9.77E+01 G
BI-212	N	4.8568E+00					6.98E+02	
			727.17	4.857E+00	?(	2.244E+01	1.34E+02	7.55E+00 G
			785.42	1.657E+01	?	1.134E+02	2.85E+02	1.28E+00 GA
U-235	N	-2.4257E+00					2.57E+11	
			143.79	-2.426E+00	&(P	1.754E+01	1.27E+02	1.10E+01 G
			205.33	1.369E+00	+ P	1.794E+01	4.97E+02	5.01E+00 G
			163.38	-8.227E-01	& P	2.522E+01	8.98E+02	5.08E+00 G
			185.72	-3.406E-01	+ P	2.611E+00	2.23E+02	5.40E+01 GA
BI-214	N	2.3350E+01					5.84E+05	
			609.31	2.335E+01	@(P	2.055E+00	7.16E+00	4.61E+01 G
			1120.29	3.258E+01	+ P	3.497E+00	1.21E+01	1.51E+01 G
			1764.49	2.750E+01	+ P	6.606E+00	1.67E+01	1.54E+01 G
BI-210M	T	2.5590E-01					1.10E+09	
			265.83	2.559E-01	?(	2.575E+00	2.94E+02	5.00E+01 G
			304.90	-1.285E+00	+	9.982E+00	2.32E+02	2.80E+01 G
AC-228	N	1.1238E+01					2.10E+03	
			911.07	9.461E+00	?(	3.511E+00	2.05E+01	2.90E+01 G
			968.97	2.944E+00	-	9.392E+00	9.35E+01	1.75E+01 G
			338.32	1.553E+01	*(	5.107E+00	1.74E+01	1.20E+01 G
			93.35	6.735E+00	-	4.040E+01	1.80E+02	5.56E+00 XA

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-227	N	3.1488E+00					7.95E+03	
			256.24	-1.588E+00	?(P	1.451E+01	6.46E+02	7.00E+00 G
			235.97	3.282E+00	&(	1.770E+01	1.61E+02	1.23E+01 G
			50.14	7.088E+00	?(	2.401E+01	1.01E+02	8.00E+00 G
TH-229	N	8.0363E+00					2.68E+06	
			193.51	4.435E+00	&(	2.142E+01	1.87E+02	4.40E+00 G
			210.85	1.334E+01	&(	3.307E+01	1.01E+02	2.99E+00 G
TH-234	N	5.5736E+00					1.63E+12	
			92.59	3.954E+00	(P	1.910E+01	1.44E+02	5.58E+00 G
			63.29	7.947E+00	(P	3.069E+01	1.15E+02	3.81E+00 G
PA-231	N	-1.7761E+01					1.20E+07	
			302.65	-1.776E+01	?(	1.015E+02	1.71E+02	2.88E+00 G
			300.07	-2.062E+01	+	1.218E+02	1.77E+02	2.46E+00 G
PA-233	C	1.4639E+00					7.82E+08	
			312.01	1.464E+00	&(	7.627E+00	1.56E+02	3.60E+01 G
			300.18	-8.186E+00	+	4.762E+01	1.74E+02	6.20E+00 G
PA-234	N	1.7967E+00					1.63E+12	
			131.29	1.756E+00	?(	8.327E+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	-4.159E+00	+	1.507E+01	1.06E+02	8.20E+00 G
			883.24	0.000E+00	-	1.528E+01	1.00E+03	9.60E+00 G
			880.53	9.095E-01	? P	2.393E+01	7.19E+02	6.00E+00 GA
PA-234M	N	5.2163E+01					1.63E+12	
			1001.00	-1.014E+01	?(P	2.238E+02	6.01E+02	8.37E-01 G
			766.41	2.295E+02	?(	6.339E+02	8.23E+01	2.94E-01 G
AM-241	T	9.5811E-01					1.58E+05	
			59.54	9.581E-01	?(P	5.429E+00	1.69E+02	3.59E+01 G
Np-237	F	2.9332E+00					2.14E+06	
							Derived Ave Activity	
			86.49	2.933E+00	}(	1.775E+01	1.82E+02	1.31E+01 G
Ir-192	F	1.3756E-01					7.40E+01	
			316.49	1.376E-01	?(	3.252E+00	7.02E+02	8.70E+01 G
			468.06	-1.021E+00	+	3.224E+00	9.40E+01	5.18E+01 G
			308.44	1.487E-07	%	8.771E+00	1.75E+09	3.18E+01 G
Cs-136	F	4.3537E-01					1.30E+01	
			818.50	4.207E-01	?(	1.457E+00	1.01E+02	1.00E+02 G
			1048.07	2.538E-01	?(	1.948E+00	2.13E+02	8.00E+01 G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          340.57 7.764E-01 ?(  4.531E+00 1.73E+02 4.69E+01 G

Np-239   T  -1.1488E+00                                     2.36E+00
                          103.70-1.703E+00 +   9.576E+00 1.69E+02 2.40E+01 X
                          106.13-1.149E+00 &(  9.652E+00 2.52E+02 2.27E+01 G
                           99.50-2.734E+00 +   1.577E+01 1.73E+02 1.50E+01 X

Nd-147       6.3202E-01                                     1.11E+01
                          531.00 0.000E+00 &(  7.805E+00 1.00E+03 1.30E+01 G
                           91.10 9.223E-01 &(  8.099E+00 2.63E+02 2.83E+01 G

TL-210   N  -5.7798E-01                                     5.84E+05
                          799.60-5.780E-01 ?(  2.357E+00 1.20E+02 9.90E+01 G
                          296.00-6.337E-01 +   3.866E+00 1.83E+02 7.90E+01 G
                         1313.00-4.433E+00 +   9.479E+00 9.73E+01 2.10E+01 GA

Kr-85    I  -5.3524E+01                                     3.92E+03
                          513.98-5.352E+01 ?(  4.868E+02 2.66E+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:                      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	247.	5.	0.003	472.16	3.086E+00	P
TH-227	50.14	264.	23.	0.013	101.38	7.088E+00	
AM-241	59.54	446.	18.	0.010	169.11	9.581E-01	P
BA-133	80.99	949.	-42.	-0.023	46.49	-1.786E+00	P
EU-155	86.54	1251.	11.	0.006	472.86	4.844E-01	
Nd-147	91.10	1243.	19.	0.011	263.16	9.223E-01	
Gd-153	97.50	1425.	-31.	-0.017	175.41	-1.371E+00	
Np-239	99.50	1394.	-31.	-0.017	173.28	-2.734E+00	
Gd-153	103.20	1364.	-31.	-0.017	170.92	-1.875E+00	
Np-239	103.70	1333.	-31.	-0.017	168.94	-1.703E+00	
EU-155	105.31	1302.	-31.	-0.017	75.16	-1.950E+00	P
Np-239	106.13	1215.	-20.	-0.011	251.81	-1.149E+00	
EU-152	121.78	270.	-12.	-0.006	204.02	-5.390E-01	
CO-57	122.06	207.	-10.	-0.006	205.91	-1.566E-01	
EU-154	123.10	206.	24.	0.013	87.52	7.852E-01	
PA-234	131.29	526.	23.	0.013	141.89	1.756E+00	
HF-181	133.02	549.	23.	0.013	144.73	7.344E-01	
CE-144	133.54	780.	-28.	-0.015	143.11	-3.456E+00	
HF-181	136.30	752.	-28.	-0.015	140.30	-6.620E+00	
CO-57	136.47	743.	-28.	-0.015	139.46	-3.629E+00	
Tc-99m	140.51	771.	-28.	-0.016	141.61	-4.547E-01	
U-235	143.79	804.	-19.	-0.010	127.10	-2.426E+00	P
CE-141	145.44	816.	-11.	-0.006	368.41	-3.273E-01	
Ba-140	162.66	267.	24.	0.013	97.47	6.023E+00	
U-235	163.38	294.	-3.	-0.001	898.46	-8.227E-01	P
CE-139	165.85	264.	-6.	-0.003	419.56	-1.054E-01	
Cf-251	176.60	106.	21.	0.012	95.18	1.967E+00	
U-235	185.72	308.	-11.	-0.006	223.39	-3.406E-01	P
U-235	205.33	102.	4.	0.002	497.01	1.369E+00	P
Cf-251	227.00	140.	-19.	-0.011	124.07	-5.873E+00	
TH-227	235.97	515.	20.	0.011	161.10	3.282E+00	
EU-152	244.69	553.	21.	0.012	159.73	5.722E+00	P
TH-227	256.24	92.	-5.	-0.003	646.26	-1.588E+00	P
Cd-113m	263.70	150.	-20.	-0.011	87.43	-7.469E+03	
BI-210M	265.83	143.	6.	0.003	294.18	2.559E-01	
TL-210	296.00	716.	-21.	-0.012	182.50	-6.337E-01	
PA-231	300.07	675.	-21.	-0.012	176.74	-2.062E+01	
PA-233	300.18	654.	-21.	-0.012	173.99	-8.186E+00	
PA-231	302.65	633.	-21.	-0.012	171.00	-1.776E+01	
BA-133	302.85	612.	-21.	-0.012	168.16	-2.792E+00	
Ba-140	304.85	591.	-21.	-0.012	165.10	-1.201E+01	
BI-210M	304.90	570.	-15.	-0.008	231.68	-1.285E+00	
PA-233	312.01	529.	21.	0.012	155.75	1.464E+00	
Ir-192	316.49	550.	5.	0.003	701.56	1.376E-01	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
CR-51	320.08	315.	-24.	-0.013	77.16	-6.121E+00	P
La-140	328.76	311.	-17.	-0.009	108.47	-2.182E+00	P
Cf-249	333.44	255.	15.	0.009	148.76	2.616E+00	
Cs-136	340.57	270.	14.	0.008	173.18	7.764E-01	
EU-152	344.29	188.	11.	0.006	172.75	1.160E+00	
HF-181	345.83	278.	4.	0.002	574.10	7.414E-01	
BA-133	356.00	453.	-16.	-0.009	187.50	-7.244E-01	
I-131	364.48	64.	3.	0.002	532.11	1.025E-01	P
BA-133	383.84	98.	14.	0.008	104.30	4.586E+00	
Cf-249	387.95	118.	-5.	-0.003	287.51	-2.438E-01	
SB-125	427.88	32.	-4.	-0.002	281.37	-4.346E-01	
AG-108M	433.94	52.	-7.	-0.004	213.65	-2.516E-01	
PM-146	453.88	39.	7.	0.004	185.99	3.632E-01	
SB-125	463.37	64.	13.	0.007	91.34	4.259E+00	
Ir-192	468.06	95.	-15.	-0.008	93.98	-1.021E+00	
BE-7	477.60	67.	11.	0.006	106.28	3.790E+00	
HF-181	482.00	78.	10.	0.005	133.55	4.249E-01	
La-140	487.02	74.	10.	0.006	121.20	8.169E-01	
RU-103	497.05	26.	8.	0.004	134.82	3.196E-01	
RH-106	511.86	42.	81.	0.045	15.86	1.506E+01	
Kr-85	513.98	131.	-6.	-0.003	265.72	-5.352E+01	
Ba-140	537.26	22.	3.	0.002	290.26	5.289E-01	
CS-134	563.24	43.	-7.	-0.004	186.92	-3.533E+00	
CS-134	569.32	13.	8.	0.005	69.81	2.217E+00	
PA-234	569.47	35.	-8.	-0.005	105.92	-4.159E+00	
BI-207	569.70	33.	-5.	-0.003	179.28	-1.939E-01	
SB-125	600.50	371.	-3.	-0.002	400.47	-7.911E-01	P
RH-106	621.92	17.	4.	0.002	237.58	1.612E+00	
SB-125	635.89	16.	6.	0.003	112.82	2.162E+00	
I-131	636.97	21.	1.	0.001	655.74	6.210E-01	
AG-110M	657.76	63.	-16.	-0.009	74.68	-7.728E-01	
CS-137	661.66	100.	-23.	-0.013	81.15	-1.224E+00	P
PM-144	696.54	28.	9.	0.005	129.10	4.360E-01	
NB-94	702.63	28.	-2.	-0.001	908.11	-1.002E-01	P
SB-124	722.79	23.	3.	0.002	219.99	1.459E+00	
AG-108M	722.94	26.	9.	0.005	86.88	4.911E-01	
EU-154	723.36	35.	9.	0.005	98.82	2.208E+00	
ZR-95	724.20	44.	9.	0.005	112.38	9.845E-01	
BI-212	727.17	45.	7.	0.004	134.22	4.857E+00	
PM-146	735.72	23.	-1.	-0.001	773.39	-2.975E-01	
PM-146	747.16	9.	7.	0.004	94.50	1.113E+00	
ZR-95	756.73	33.	-9.	-0.005	198.37	-8.788E-01	P
AG-110M	763.94	62.	-13.	-0.007	92.07	-2.945E+00	
PA-234M	766.41	51.	13.	0.007	82.29	2.295E+02	
EU-152	778.92	23.	-2.	-0.001	444.01	-9.494E-01	
BI-212	785.42	28.	4.	0.002	285.04	1.657E+01	
CS-134	795.87	63.	-15.	-0.008	124.16	-9.348E-01	P
TL-210	799.60	76.	-11.	-0.006	120.03	-5.780E-01	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
CO-58	810.78	30.	6.	0.004	124.51	3.559E-01		
Cs-136	818.50	26.	8.	0.004	101.06	4.207E-01		
MN-54	834.85	28.	-7.	-0.004	183.33	-4.022E-01		P
Co-56	846.77	28.	-3.	-0.002	425.52	-1.757E-01		P
NB-94	871.10	25.	-4.	-0.002	198.55	-2.123E-01		
EU-154	873.23	34.	-5.	-0.003	166.68	-2.441E+00		
PA-234	880.53	22.	1.	0.001	718.92	9.095E-01		P
Y-88	898.04	9.	3.	0.001	250.62	1.689E-01		
AG-110M	937.49	45.	-17.	-0.009	89.94	-3.050E+00		
PA-234	946.02	15.	4.	0.002	218.66	1.852E+00		
EU-152	964.11	45.	8.	0.005	121.99	3.498E+00		
EU-154	996.33	21.	8.	0.005	86.40	5.015E+00		
PA-234M	1001.00	31.	-1.	-0.001	601.37	-1.014E+01		P
EU-154	1004.77	20.	6.	0.003	115.53	2.108E+00		
Co-56	1037.84	15.	-1.	-0.001	857.32	-4.750E-01		
Cs-136	1048.07	19.	3.	0.002	213.44	2.538E-01		
RH-106	1050.36	16.	6.	0.003	102.74	2.608E+01		
BI-207	1063.66	26.	-4.	-0.002	218.19	-3.348E-01		P
Ga-68	1077.40	35.	-16.	-0.009	86.18	-3.883E+01		
FE-59	1099.25	16.	2.	0.001	353.03	3.083E-01		P
EU-152	1112.07	126.	-13.	-0.007	120.61	-7.041E+00		
ZN-65	1115.55	112.	-14.	-0.008	114.18	-1.906E+00		
Sc-46	1120.55	99.	-6.	-0.003	251.43	-4.061E-01		
Ta-182	1121.30	81.	11.	0.006	119.57	2.260E+00		
Ta-182	1221.41	16.	3.	0.002	308.52	8.575E-01		
Co-56	1238.28	27.	5.	0.003	238.99	5.924E-01		P
NA-22	1274.53	27.	-12.	-0.006	69.11	-9.346E-01		
TL-210	1313.00	21.	-11.	-0.006	97.28	-4.433E+00		
CO-60	1332.50	24.	-13.	-0.007	94.29	-1.080E+00		P
AG-110M	1384.30	21.	-10.	-0.006	106.26	-3.658E+00		
EU-152	1408.00	5.	6.	0.003	101.72	2.354E+00		
La-140	1596.21	6.	4.	0.002	137.50	4.423E-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	3.7904E+00	3.7904E+00	1.063E+02%	1.37E+01
NA-22	#A	-9.3456E-01	-9.3456E-01	6.911E+01%	2.14E+00
K-40		9.5130E+01	9.5130E+01	9.796E+00%	1.05E+01
Sc-46	#A	1.9624E-02	1.9624E-02	2.027E+03%	1.47E+00
CR-51	#A	-6.1214E+00	-6.1215E+00	7.716E+01%	2.19E+01
MN-54	#A	-4.0221E-01	-4.0221E-01	1.833E+02%	1.53E+00
FE-59	#A	3.0833E-01	3.0833E-01	3.530E+02%	2.63E+00
Co-56	#A	1.3005E-01	1.3005E-01	2.390E+02%	1.55E+00

CO-57	#A	-1.5655E-01	-1.5655E-01	2.059E+02%	1.09E+00
CO-58	#A	3.5586E-01	3.5586E-01	1.245E+02%	1.53E+00
CO-60	#A	-1.0800E+00	-1.0800E+00	9.429E+01%	2.12E+00
ZN-65	#A	-1.9057E+00	-1.9057E+00	1.142E+02%	7.35E+00
NB-94	#A	-1.0016E-01	-1.0016E-01	9.081E+02%	1.35E+00
ZR-95	#A	-4.4568E-02	-4.4568E-02	1.124E+02%	2.79E+00
NB-95	#A	0.0000E+00	0.0000E+00	1.000E+03%	2.23E+00
RU-103	#A	3.1961E-01	3.1961E-01	1.348E+02%	1.06E+00
RH-106	#A	4.9337E+00	4.9337E+00	1.027E+02%	9.72E+00
AG-108M	#A	1.2046E-01	1.2046E-01	8.688E+01%	1.31E+00
AG-110M	#A	-2.5132E-03	-2.5132E-03	2.162E+04%	2.02E+00
SN-113	#A	3.8996E-02	3.8996E-02	1.793E+03%	2.43E+00
SB-124	#A	1.0556E-01	1.0556E-01	2.200E+02%	3.97E+00
SB-125	#A	1.0934E+00	1.0934E+00	9.134E+01%	3.16E+00
I-131	#A	1.4436E-01	1.4436E-01	4.222E+02%	1.38E+00
Gd-153	#A	-1.3709E+00	-1.3709E+00	1.754E+02%	8.00E+00
Ga-68	#A	-3.8611E+01	-3.8829E+01	8.618E+01%	7.45E+01
Tc-99m	#A	-4.5426E-01	-4.5474E-01	1.416E+02%	2.15E+00
BA-133	#A	-7.2444E-01	-7.2444E-01	1.875E+02%	4.56E+00
CS-134	#A	-4.5442E-01	-4.5442E-01	6.981E+01%	2.48E+00
CS-137	#A	-1.2245E+00	-1.2245E+00	8.115E+01%	2.66E+00
CE-139	#A	-1.0538E-01	-1.0538E-01	4.196E+02%	1.50E+00
Ba-140	#A	1.6452E+00	1.6452E+00	9.747E+01%	3.87E+00
La-140	#A	5.6322E-01	5.6324E-01	9.164E+01%	1.41E+00
CE-141	#A	-3.2726E-01	-3.2726E-01	3.684E+02%	4.04E+00
CE-144	#A	-3.4560E+00	-3.4560E+00	1.431E+02%	1.65E+01
PM-144	#A	4.3596E-01	4.3596E-01	1.291E+02%	1.33E+00
EU-152	#A	1.4211E+00	1.4211E+00	8.362E+01%	3.71E+00
EU-154	#A	1.8723E+00	1.8723E+00	4.888E+01%	2.29E+00
EU-155	#A	-1.9497E+00	-1.9497E+00	7.516E+01%	1.07E+01
HF-181	#A	5.5573E-01	5.5574E-01	1.336E+02%	1.93E+00
Ta-182	#A	1.6482E+00	1.6482E+00	1.196E+02%	9.17E+00
Hg-203	#A	4.4404E-01	4.4405E-01	9.127E+01%	1.36E+00
TL-208		4.1717E+00	4.1717E+00	1.562E+01%	1.04E+00
PM-146	#A	6.2065E-01	6.2065E-01	9.450E+01%	1.65E+00
Y-88	#A	7.4458E-02	7.4458E-02	2.506E+02%	8.18E-01
Cd-113m	#A	-7.4688E+03	-7.4688E+03	8.743E+01%	2.18E+04
Cd-109	#A	1.0067E+01	1.0067E+01	1.800E+02%	6.04E+01
Cf-251	#A	1.9673E+00	1.9673E+00	9.518E+01%	4.79E+00
Cf-249	#A	3.0044E-01	3.0044E-01	1.488E+02%	2.41E+00
Sn-126	#A	2.4278E-01	2.4278E-01	2.476E+03%	2.03E+01
PB-210	#A	3.0858E+00	3.0858E+00	4.722E+02%	4.95E+01
PB-212	#	8.7635E+00	8.7635E+00	1.078E+01%	2.41E+00
PB-214	#	2.5838E+01	2.5838E+01	5.934E+00%	1.89E+00
BI-207	#A	-3.3485E-01	-3.3485E-01	2.182E+02%	2.42E+00
BI-212	#A	4.8568E+00	4.8568E+00	1.342E+02%	2.24E+01
U-235	#A	-2.4257E+00	-2.4257E+00	1.271E+02%	1.75E+01
BI-214	#	2.3350E+01	2.3350E+01	7.158E+00%	2.05E+00
BI-210M	#A	2.5590E-01	2.5590E-01	2.942E+02%	2.58E+00

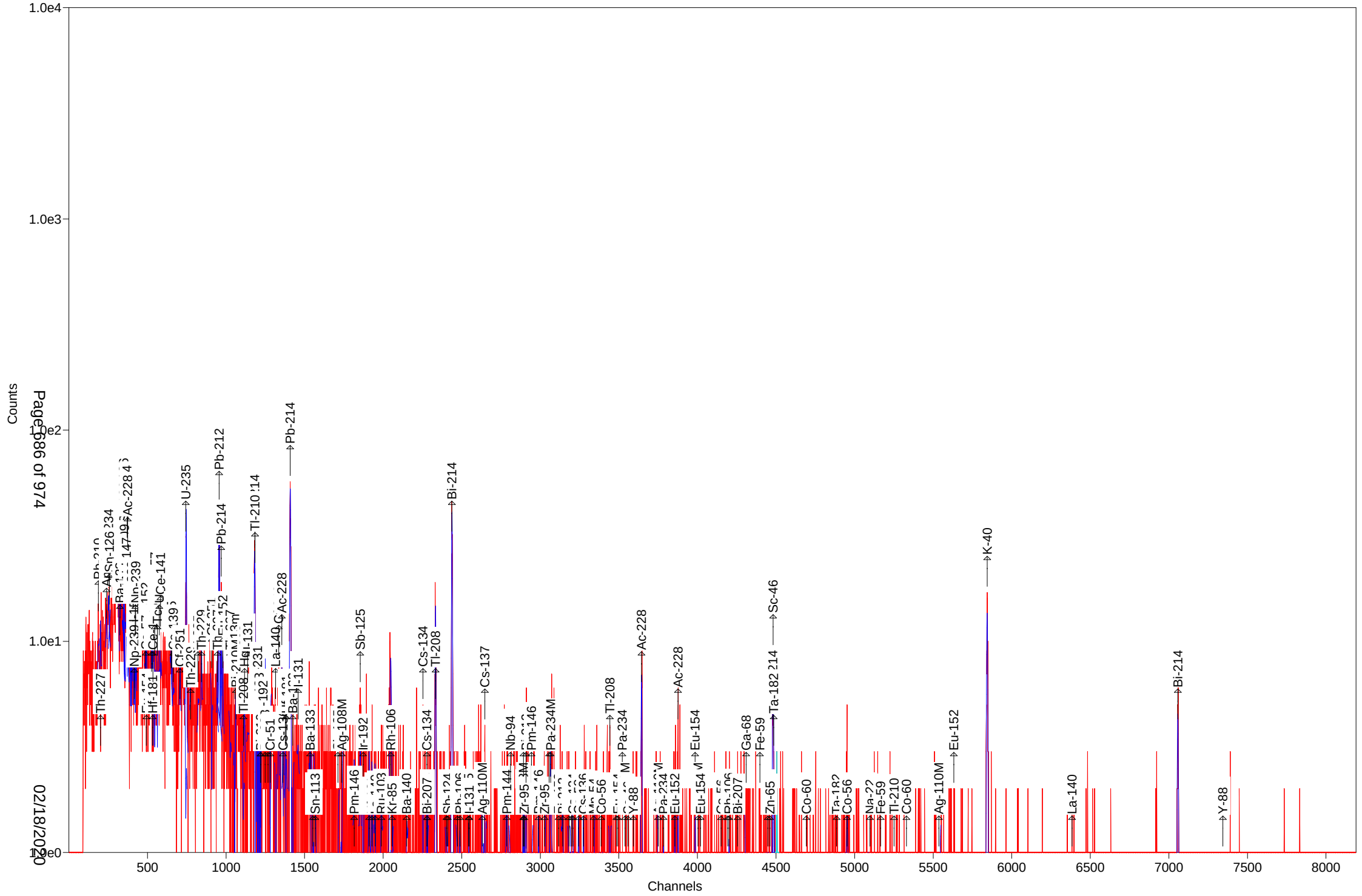
AC-228	#	1.1238E+01	1.1238E+01	1.346E+01%	3.51E+00
TH-227	#A	3.1488E+00	3.1488E+00	1.014E+02%	1.45E+01
TH-229	#A	8.0363E+00	8.0363E+00	1.012E+02%	2.14E+01
TH-234	#A	5.5736E+00	5.5736E+00	9.236E+01%	1.91E+01
PA-231	#A	-1.7761E+01	-1.7761E+01	1.710E+02%	1.02E+02
PA-233	#A	1.4639E+00	1.4639E+00	1.557E+02%	7.63E+00
PA-234	#A	1.7967E+00	1.7967E+00	1.303E+02%	8.33E+00
PA-234M	#A	5.2163E+01	5.2163E+01	8.229E+01%	2.24E+02
AM-241	#A	9.5811E-01	9.5811E-01	1.691E+02%	5.43E+00
Np-237	#A	2.9332E+00	2.9332E+00	1.817E+02%	1.78E+01
Ir-192	#A	1.3756E-01	1.3756E-01	7.016E+02%	3.25E+00
Cs-136	#A	4.3536E-01	4.3537E-01	9.762E+01%	1.46E+00
Np-239	#A	-1.1487E+00	-1.1488E+00	2.518E+02%	9.65E+00
Nd-147	#A	6.3200E-01	6.3202E-01	2.632E+02%	7.81E+00
TL-210	#A	-5.7798E-01	-5.7798E-01	1.200E+02%	2.36E+00
Kr-85	#A	-5.3524E+01	-5.3524E+01	2.657E+02%	4.87E+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 (37.5 to 2000.0 keV) 1.685E+02 Bq/Sample
Total Decayed Activity (37.5 to 2000.0 keV) 1.6849170E+02 Bq/Sample

453329_Gamma_160-36593-A-10-B. 8_Gamma_20192230.spc.



Test America St. Louis Spectrum ID: 9_Gamma_20193885

Sample Description: 453329_Gamma_160-36593-A-11-B
Detector: Detector # 9
Batch ID: 453329
Work Order Number: Gamma
Lot Number: 160-36593-A-11-B

Decay to Time: 12/27/2019 10:11 Live Time: 1800 sec
Acquisition Time: 12/27/2019 10:11:54 Real Time: 1802 sec
Analysis Time: 12/30/2019 08:32 Dead Time: 0.11 %
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_2019-12-07_1444.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	-5.091E+00	99.9	5.086E+00	5.092E+00	1.700E+01
NA-22	-1.873E-01	198.5	3.718E-01	3.720E-01	1.321E+00
K-40	1.919E+02	5.7	1.088E+01	1.466E+01	1.064E+01
Sc-46	-3.397E-01	152.9	5.195E-01	5.198E-01	1.774E+00
CR-51	-2.355E-01	1405.0	3.308E+00	3.308E+00	2.253E+01
MN-54	-1.966E-01	184.1	3.620E-01	3.621E-01	1.114E+00
FE-59	6.150E-01	124.7	7.666E-01	7.672E-01	1.731E+00
Co-56	2.753E-01	92.4	2.543E-01	2.547E-01	7.766E-01
CO-57	0.000E+00	1.#INF	1.458E-01	1.458E-01	1.054E+00
CO-58	3.000E-02	1195.0	3.585E-01	3.585E-01	1.274E+00
CO-60	3.351E-01	96.7	3.240E-01	3.245E-01	7.304E-01
ZN-65	1.466E+00	80.8	1.184E+00	1.187E+00	3.959E+00
NB-94	5.043E-01	26.6	1.339E-01	1.364E-01	1.332E+00
ZR-95	7.049E-01	92.0	6.482E-01	6.492E-01	1.469E+00
NB-95	4.776E-01	68.2	3.257E-01	3.267E-01	1.080E+00
RU-103	7.290E-01	37.3	2.719E-01	2.744E-01	6.045E-01
RH-106	-4.906E+00	186.0	9.125E+00	9.128E+00	3.060E+01
AG-108M	-4.980E-02	739.4	3.682E-01	3.682E-01	9.042E-01
AG-110M	1.526E-01	187.1	2.856E-01	2.857E-01	2.269E+00
SN-113	5.454E-02	1251.4	6.825E-01	6.825E-01	2.333E+00
SB-124	7.047E-02	44.7	3.151E-02	3.173E-02	3.186E+00
SB-125	-1.457E+00	98.5	1.434E+00	1.436E+00	3.390E+00
I-131	3.023E-01	154.2	4.660E-01	4.663E-01	8.848E-01
Gd-153	0.000E+00	1.#INF	4.715E-01	4.715E-01	6.231E+00
Ga-68	3.278E+01	33.6	1.102E+01	1.117E+01	2.137E+01
Tc-99m	0.000E+00	1.#INF	9.427E-02	9.428E-02	1.765E+00
BA-133	-6.461E-01	163.8	1.058E+00	1.059E+00	3.541E+00
CS-134	-3.458E-01	77.5	2.680E-01	2.686E-01	1.843E+00
CS-137	1.201E-02	3416.1	4.102E-01	4.102E-01	1.448E+00
CE-139	-2.667E-01	127.2	3.392E-01	3.402E-01	1.166E+00
Ba-140	6.605E-01	99.9	6.596E-01	6.605E-01	3.460E+00
La-140	1.186E-01	223.4	2.651E-01	2.652E-01	1.211E+00
CE-141	6.235E-01	142.5	8.883E-01	8.888E-01	2.963E+00

CE-144	-2.763E+00	141.2	3.902E+00	3.904E+00	1.301E+01
PM-144	4.443E-01	88.6	3.939E-01	3.945E-01	1.191E+00
EU-152	1.380E+00	79.8	1.102E+00	1.104E+00	3.024E+00
EU-154	1.230E+00	51.9	6.380E-01	6.412E-01	1.956E+00
EU-155	1.543E+00	163.6	2.524E+00	2.525E+00	8.399E+00
HF-181	-6.715E-01	104.0	6.986E-01	6.995E-01	2.336E+00
Ta-182	-6.604E-02	3016.6	1.992E+00	1.992E+00	6.915E+00
Hg-203	3.841E-01	86.5	3.324E-01	3.331E-01	1.111E+00
TL-208	4.683E+00	9.4	4.422E-01	5.045E-01	5.528E-01
PM-146	7.487E-01	73.0	5.463E-01	5.476E-01	1.255E+00
Y-88	4.100E-02	1067.4	4.376E-01	4.376E-01	1.006E+00
Cd-113m	-5.971E+03	84.4	5.041E+03	5.056E+03	1.680E+04
Cd-109	0.000E+00	1.#INF	1.552E+01	1.552E+01	5.163E+01
Cf-251	-8.861E-01	188.2	1.667E+00	1.669E+00	4.300E+00
Cf-249	-1.984E-01	333.3	6.614E-01	6.615E-01	2.249E+00
Sn-126	4.179E+00	112.1	4.687E+00	4.692E+00	1.562E+01
PB-210	3.228E+01	28.5	9.205E+00	9.398E+00	2.204E+01
PB-212	1.149E+01	6.3	7.255E-01	1.038E+00	1.280E+00
PB-214	2.014E+01	5.0	1.006E+00	1.451E+00	1.749E+00
BI-207	1.029E+00	49.1	5.051E-01	5.078E-01	1.064E+00
BI-212	4.210E+00	88.8	3.738E+00	3.744E+00	1.266E+01
U-235	2.412E+00	145.2	3.503E+00	3.505E+00	1.319E+01
BI-214	1.919E+01	6.2	1.195E+00	1.556E+00	1.360E+00
BI-210M	1.625E-01	373.3	6.068E-01	6.068E-01	2.071E+00
AC-228	1.258E+01	9.3	1.165E+00	1.330E+00	2.024E+00
TH-227	1.663E+00	191.9	3.191E+00	3.193E+00	1.199E+01
TH-229	2.465E-01	276.7	6.821E-01	6.824E-01	1.901E+01
TH-234	1.954E+01	18.6	3.628E+00	3.788E+00	1.061E+01
PA-231	0.000E+00	1.#INF	5.295E+00	5.295E+00	7.474E+01
PA-233	0.000E+00	1.#INF	2.807E-01	2.807E-01	6.106E+00
PA-234	4.455E-01	83.0	3.699E-01	3.706E-01	7.671E+00
PA-234M	2.114E+01	151.0	3.193E+01	3.195E+01	2.143E+02
AM-241	1.011E+00	134.2	1.356E+00	1.357E+00	4.531E+00
Np-237	-2.624E+00	178.0	4.670E+00	4.673E+00	1.554E+01
Ir-192	0.000E+00	1.#INF	2.052E-01	2.052E-01	2.551E+00
Cs-136	-6.298E-01	70.0	4.410E-01	4.424E-01	1.463E+00
Np-239	1.441E+00	161.5	2.327E+00	2.328E+00	7.745E+00
Nd-147	-8.024E-01	322.6	2.588E+00	2.589E+00	6.382E+00
TL-210	-6.172E-02	816.8	5.041E-01	5.041E-01	1.751E+00
Kr-85	0.000E+00	1.#INF	2.051E+01	2.051E+01	3.769E+02
Total	3.955E+02				

Analyst: kody Saulters

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Sample description
453329_Gamma_160-36593-A-11-B

Spectrum Filename: C:\User\SPC\Det9\9_Gamma_20193885.An1

Acquisition information
Start time: 12/27/2019 10:11:54 AM
Live time: 1800
Real time: 1802
Dead time: 0.11 %
Detector ID: 9

Detector system
Ge9 S/N09363993

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

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	12/27/2019 10:11:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	9_2019-12-07_1444.PBC 12/7/2019 2:44:35 PM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 22 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 0.1677

***** 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
46.26	64.	28.51	1.89	2.577E-02	46.54	4.250	3.228E+01	PB210
59.54	24.	134.17	1.01	3.659E-02	59.54	35.900	PBC<MDA	AM241
63.36	29.	108.51	1.01	3.921E-02	63.29	3.810	PBC<MDA	TH234
64.35	29.	112.15	1.02	3.987E-02	64.28	9.700	PBC<MDA	Sn126
74.87	218.	11.64	1.03	4.574E-02				
77.17	320.	8.03	1.03	4.677E-02				
87.70	90.	23.04	1.04	5.038E-02	87.57	37.500	PBC<MDA	Sn126
					88.04	3.790	2.601E+01	Cd109
93.01	150.	14.64	0.86	5.164E-02	92.59	5.584	2.890E+01	TH234
					93.35	5.561	PBC<MDA	AC228
105.31	31.	163.58	1.05	5.318E-02	105.31	21.200	PBC<MDA	EU155
106.13	31.	161.51	1.05	5.323E-02	106.13	22.700	PBC<MDA	Np239
123.10	22.	104.19	1.07	5.296E-02	123.10	40.790	PBC<MDA	EU154
143.79	27.	145.22	1.09	5.039E-02	143.79	10.960	PBC<MDA	U235
145.44	27.	142.47	1.09	5.012E-02	145.44	48.200	PBC<MDA	CE141
162.66	23.	99.87	1.11	4.690E-02	162.66	6.220	PBC<MDA	Ba140
163.38	7.	318.72	1.11	4.676E-02	163.38	5.080	PBC<MDA	U235
185.72	87.	30.64	1.13	4.403E-02	185.72	54.000	2.041E+00	U235
210.85	7.	342.36	1.15	4.052E-02	210.85	2.990	PBC<MDA	TH229
235.97	20.	191.86	1.18	3.760E-02	235.97	12.300	PBC<MDA	TH227
238.43	334.	6.31	1.18	3.734E-02	238.63	43.300	1.149E+01	PB212
241.52	126.	13.08	1.18	3.702E-02	242.00	7.430	2.542E+01	PB214

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
244.69	19.	194.58	1.18	3.670E-02	244.69	7.580	PBC<MDA	EU152
265.83	5.	373.29	1.20	3.470E-02	265.83	50.000	PBC<MDA	BI210M
277.13	21.	67.25	0.92	3.372E-02	277.28	6.310	PBC<MDA	TL208
279.20	19.	86.53	1.22	3.356E-02	279.20	81.460	PBC<MDA	Hg203
295.03	229.	7.95	1.23	3.232E-02	295.09	19.300	2.042E+01	PB214
					296.00	79.000	4.999E+00	TL210
298.32	6.	170.39	1.23	3.208E-02				
299.97	33.	31.98	1.24	3.195E-02	300.03	3.280	1.733E+01	PB212
					300.07	2.460	2.311E+01	PA231
					300.18	6.200	9.172E+00	PA233
338.37	90.	19.47	1.16	2.940E-02	338.32	12.010	1.421E+01	AC228
344.29	9.	286.81	1.28	2.905E-02	344.29	26.500	PBC<MDA	EU152
351.78	380.	6.48	1.21	2.861E-02	351.93	37.600	1.965E+01	PB214
364.48	5.	285.89	1.29	2.791E-02	364.48	81.700	PBC<MDA	I131
453.88	13.	114.16	1.37	2.388E-02	453.88	65.000	PBC<MDA	PM146
487.02	9.	223.44	1.40	2.269E-02	487.02	45.500	PBC<MDA	La140
497.05	27.	37.29	1.41	2.236E-02	497.05	90.900	7.290E-01	RU103
511.86	66.	25.17	2.67	2.188E-02	511.86	20.000	8.378E+00	RH106
583.04	140.	9.44	1.63	1.989E-02	583.02	84.500	4.627E+00	TL208
609.07	304.	6.23	1.71	1.925E-02	609.31	46.090	1.906E+01	BI214
					610.30	5.750	1.530E+02	RU103
618.06	17.	171.58	1.51	1.904E-02	618.06	99.100	PBC<MDA	PM144
635.89	3.	272.76	1.53	1.864E-02	635.89	11.310	PBC<MDA	SB125
636.97	6.	154.18	1.53	1.862E-02	636.97	7.170	PBC<MDA	I131
657.76	6.	187.08	1.54	1.818E-02	657.76	94.640	PBC<MDA	AG110M
696.54	12.	88.64	1.58	1.741E-02	696.54	99.000	PBC<MDA	PM144
722.79	9.	127.97	1.60	1.693E-02	722.79	10.810	PBC<MDA	SB124
					722.94	90.840	3.371E-01	AG108M
					723.36	20.220	1.515E+00	EU154
727.17	10.	88.79	1.60	1.686E-02	727.17	7.550	PBC<MDA	BI212
735.72	11.	90.92	1.61	1.671E-02	735.72	22.500	PBC<MDA	PM146
756.73	11.	91.95	1.62	1.635E-02	756.73	54.460	PBC<MDA	ZR95
765.79	14.	68.20	1.63	1.621E-02	765.79	99.790	PBC<MDA	NB95
					766.41	0.294	1.622E+02	PA234M
766.41	7.	151.03	1.63	1.620E-02	765.79	99.790	PBC<MDA	NB95
					766.41	0.294	8.281E+01	PA234M
785.42	11.	88.37	1.65	1.590E-02	785.42	1.280	PBC<MDA	BI212
801.95	8.	172.30	1.66	1.565E-02	801.95	8.690	PBC<MDA	CS134
846.77	10.	92.38	1.70	1.501E-02	846.77	99.935	PBC<MDA	Co56
871.10	27.	26.55	1.71	1.468E-02	871.10	99.890	1.035E+00	NB94
873.23	1.	900.00	1.72	1.465E-02	873.23	12.270	PBC<MDA	EU154
910.76	80.	13.35	1.44	1.418E-02	911.07	29.000	1.082E+01	AC228
946.02	11.	85.43	1.77	1.377E-02	946.02	13.400	PBC<MDA	PA234
964.11	3.	416.50	1.79	1.357E-02	964.11	14.605	PBC<MDA	EU152
969.14	61.	14.64	1.31	1.352E-02	968.97	17.460	1.438E+01	AC228
1004.77	10.	96.26	1.82	1.314E-02	1004.77	18.010	PBC<MDA	EU154
1048.07	5.	151.00	1.85	1.271E-02	1048.07	80.000	PBC<MDA	Cs136
1063.66	17.	49.10	1.86	1.257E-02	1063.66	74.500	PBC<MDA	BI207

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1077.40	21.	33.60	1.87	1.244E-02	1077.40	3.300	3.278E+01	Ga68
1099.25	8.	124.65	1.89	1.224E-02	1099.25	56.500	PBC<MDA	FE59
1112.07	16.	79.85	1.89	1.213E-02	1112.07	13.644	PBC<MDA	EU152
1115.55	16.	80.77	1.90	1.210E-02	1115.55	50.600	PBC<MDA	ZN65
1120.02	9.	167.98	1.90	1.206E-02	1120.29	15.100	PBC<MDA	BI214
					1120.55	99.987	PBC<MDA	Sc46
1173.24	2.	592.37	1.94	1.163E-02	1173.24	99.900	PBC<MDA	CO60
1238.28	2.	917.91	1.98	1.114E-02	1238.28	66.070	PBC<MDA	Co56
1274.54	10.	63.92	2.01	1.088E-02	1274.53	99.940	PBC<MDA	NA22
					1274.54	35.190	1.433E+00	EU154
1332.50	6.	96.69	2.05	1.050E-02	1332.50	99.980	PBC<MDA	CO60
1384.30	2.	488.62	2.08	1.018E-02	1384.30	24.290	PBC<MDA	AG110M
1408.00	17.	40.18	2.10	1.004E-02	1408.00	21.005	4.564E+00	EU152
1460.53	359.	5.67	2.02	9.749E-03	1460.83	10.670	1.919E+02	K40
1690.98	5.	44.72	2.27	8.649E-03	1690.98	47.790	PBC<MDA	SB124
1764.28	45.	16.06	2.31	8.350E-03	1764.49	15.400	1.959E+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
299.07	74.83	212.	218.	4.756E+03	11.64	1.025	- D
308.29	77.13	170.	320.	6.837E+03	8.03	1.027	- D
1192.68	298.29	58.	6.	4.468E+02	170.39	1.234	- lc

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	184.68	46.26	76.	64.	0.035	28.51	1.888s
TH-227	200.20	50.14	332.	-21.	-0.012	86.34	1.001s
AM-241	237.77	59.54	502.	24.	0.013	134.17	1.010s
TH-234	252.77	63.29	483.	29.	0.016	108.51	1.014s
Sn-126	256.74	64.28	518.	29.	0.016	112.15	1.015s
BA-133	323.56	80.99	1431.	-39.	-0.021	47.19	1.031
Np-237	345.55	86.49	1506.	-31.	-0.017	178.01	1.036s
EU-155	345.76	86.54	1476.	-32.	-0.018	172.84	1.036s
Sn-126	347.35	86.94	1445.	-32.	-0.018	170.96	1.037

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Sn-126	349.87	87.57	1327.	90.	0.050	23.04	1.037D
Cd-109	351.75	88.04	1413.	0.	0.000	168.91	1.038A
Nd-147	363.99	91.10	1323.	-32.	-0.018	163.03	1.041s
TH-234	369.94	92.59	126.	101.	0.056	18.57	1.042D
AC-228	372.98	93.35	1398.	8.	0.004	664.99	1.043s
Gd-153	389.58	97.50	1388.	0.	0.000	1000.00	1.047s
Np-239	397.58	99.50	1388.	0.	0.000	1000.00	1.049s
Gd-153	412.37	103.20	1388.	0.	0.000	1000.00	1.052s
Np-239	414.37	103.70	1388.	0.	0.000	1000.00	1.053s
EU-155	420.82	105.31	1296.	31.	0.017	163.58	1.054
Np-239	424.09	106.13	1264.	31.	0.017	161.51	1.055s
EU-152	486.67	121.78	293.	-27.	-0.015	90.66	1.070
CO-57	487.80	122.06	321.	0.	0.000	1000.00	1.070
EU-154	491.95	123.10	248.	22.	0.012	104.19	1.071
PA-234	524.72	131.29	742.	-27.	-0.015	142.40	1.079s
CE-144	533.69	133.54	802.	-29.	-0.016	141.23	1.081s
HF-181	544.74	136.30	831.	-29.	-0.016	143.34	1.084s
CO-57	545.43	136.47	860.	-10.	-0.006	414.45	1.084s
Tc-99m	561.57	140.51	870.	0.	0.000	1000.00	1.088s
U-235	574.67	143.79	759.	27.	0.015	145.22	1.091s
CE-141	581.29	145.44	732.	27.	0.015	142.47	1.092
Ba-140	650.15	162.66	254.	23.	0.013	99.87	1.108s
U-235	653.03	163.38	278.	7.	0.004	318.72	1.109s
CE-139	662.92	165.85	271.	-18.	-0.010	127.22	1.111s
Cf-251	705.90	176.60	150.	-12.	-0.007	188.15	1.122s
U-235	742.37	185.72	180.	87.	0.049	30.64	1.130s
TH-229	773.52	193.51	176.	-6.	-0.003	434.83	1.137s
U-235	820.80	205.33	200.	-28.	-0.016	81.22	1.148
TH-229	842.87	210.85	148.	7.	0.004	342.36	1.153s
Cf-251	907.45	227.00	144.	-7.	-0.004	337.76	1.168s
TH-227	943.33	235.97	698.	20.	0.011	191.86	1.176s
PB-212	953.97	238.63	55.	334.	0.186	6.32	1.179D
PB-214	967.43	242.00	72.	122.	0.068	13.41	1.182D
EU-152	978.21	244.69	696.	19.	0.011	194.58	1.185s
Cd-113m	1054.23	263.70	169.	-22.	-0.012	84.43	1.202s
BI-210M	1062.75	265.83	177.	5.	0.003	373.29	1.204s
TL-208	1107.94	277.13	50.	21.	0.012	67.25	0.917s
Hg-203	1116.22	279.20	124.	19.	0.011	86.53	1.216s
PB-214	1179.77	295.09	43.	237.	0.132	7.60	1.231D
TL-210	1183.41	296.00	697.	-19.	-0.011	196.35	1.231s
PB-212	1199.52	300.03	38.	33.	0.018	31.98	1.235D
PA-231	1199.68	300.07	678.	-11.	-0.006	348.80	1.235s
PA-233	1200.12	300.18	667.	0.	0.000	1000.00	1.235s
PA-231	1210.00	302.65	667.	0.	0.000	1000.00	1.237s
BA-133	1210.81	302.85	667.	0.	0.000	1000.00	1.238s
Ba-140	1218.80	304.85	667.	0.	0.000	1000.00	1.240s
BI-210M	1218.99	304.90	667.	0.	0.000	1000.00	1.240s
Ir-192	1233.16	308.44	667.	0.	0.000	1000.00	1.243s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
PA-233	1247.44	312.01	667.	0.	0.000	1000.00	1.246s
Ir-192	1265.35	316.49	667.	0.	0.000	1000.00	1.250s
La-140	1314.43	328.76	407.	-21.	-0.011	140.46	1.261s
Cf-249	1333.15	333.44	386.	-21.	-0.011	136.49	1.265s
AC-228	1352.86	338.37	44.	90.	0.050	19.47	1.156s
Cs-136	1361.66	340.57	365.	-21.	-0.012	132.22	1.272s
EU-152	1376.53	344.29	323.	9.	0.005	286.81	1.275s
HF-181	1382.70	345.83	398.	-21.	-0.012	134.43	1.276s
PB-214	1406.48	351.78	45.	380.	0.211	6.48	1.212
BA-133	1423.37	356.00	552.	-20.	-0.011	163.79	1.285s
I-131	1457.31	364.48	52.	5.	0.003	285.89	1.293s
BA-133	1534.73	383.84	197.	-20.	-0.011	99.85	1.310s
Cf-249	1551.17	387.95	217.	-6.	-0.003	333.32	1.314s
SB-125	1710.86	427.88	82.	-19.	-0.011	98.46	1.349s
AG-108M	1735.10	433.94	52.	-2.	-0.001	739.37	1.354s
PM-146	1814.87	453.88	48.	13.	0.007	114.16	1.372s
Ir-192	1871.59	468.06	49.	-5.	-0.003	308.63	1.384s
BE-7	1909.73	477.60	234.	-22.	-0.012	99.90	1.392s
HF-181	1927.34	482.00	257.	-22.	-0.012	104.05	1.396s
La-140	1947.43	487.02	213.	9.	0.005	223.44	1.400s
RU-103	1987.56	497.05	17.	27.	0.015	37.29	1.409s
RH-106	2046.81	511.86	105.	66.	0.037	25.17	2.672s
Kr-85	2055.27	513.98	171.	0.	0.000	1000.00	1.424s
Nd-147	2123.35	531.00	39.	-4.	-0.002	322.59	1.438s
Ba-140	2148.39	537.26	40.	-3.	-0.002	768.32	1.444
CS-134	2252.30	563.24	47.	-2.	-0.001	839.11	1.466s
CS-134	2276.64	569.32	47.	-8.	-0.004	131.09	1.471s
PA-234	2277.24	569.47	54.	0.	0.000	1000.00	1.471s
TL-208	2331.50	583.04	9.	140.	0.078	9.44	1.625s
SB-125	2401.36	600.50	542.	-18.	-0.010	184.07	1.497s
SB-124	2410.29	602.73	524.	-18.	-0.010	180.81	1.499s
CS-134	2418.21	604.71	506.	-18.	-0.010	177.52	1.500s
BI-214	2435.64	609.07	17.	304.	0.169	6.23	1.711
RU-103	2440.56	610.30	488.	-18.	-0.010	173.83	1.505s
AG-108M	2456.49	614.28	469.	-16.	-0.009	188.63	1.508s
PM-144	2471.62	618.06	398.	17.	0.009	171.58	1.512s
RH-106	2487.04	621.92	470.	-17.	-0.009	186.01	1.515s
SB-125	2542.94	635.89	40.	3.	0.002	272.76	1.526s
I-131	2547.28	636.97	35.	6.	0.003	154.18	1.527
AG-110M	2630.43	657.76	60.	6.	0.003	187.08	1.544s
PM-144	2785.58	696.54	54.	12.	0.007	88.64	1.576s
NB-94	2809.93	702.63	66.	-1.	-0.001	967.43	1.581s
SB-124	2890.57	722.79	67.	9.	0.005	127.97	1.598s
AG-108M	2891.17	722.94	76.	0.	0.000	1000.00	1.598s
EU-154	2892.86	723.36	76.	0.	0.000	1000.00	1.598s
ZR-95	2896.22	724.20	76.	0.	0.000	1000.00	1.599s
BI-212	2908.11	727.17	32.	10.	0.005	88.79	1.601s
PM-146	2942.31	735.72	19.	11.	0.006	90.92	1.608s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
ZR-95	3026.36	756.73	20.	11.	0.006	91.95	1.625s
AG-110M	3055.23	763.94	55.	0.	0.000	1000.00	1.631s
NB-95	3062.61	765.79	38.	14.	0.008	68.20	1.632s
PA-234M	3065.10	766.41	54.	7.	0.004	151.03	1.633s
EU-152	3115.14	778.92	30.	-5.	-0.003	244.95	1.643s
BI-212	3141.15	785.42	43.	11.	0.006	88.37	1.648s
CS-134	3182.96	795.87	81.	-17.	-0.010	77.50	1.656s
TL-210	3197.88	799.60	98.	-2.	-0.001	816.82	1.659s
CS-134	3207.29	801.95	91.	8.	0.004	172.30	1.661s
La-140	3262.58	815.77	41.	-7.	-0.004	137.67	1.672s
Cs-136	3273.50	818.50	66.	-17.	-0.010	70.01	1.674s
MN-54	3338.91	834.85	35.	-5.	-0.003	184.11	1.687s
Co-56	3386.61	846.77	15.	10.	0.005	92.38	1.696s
NB-94	3483.94	871.10	13.	27.	0.015	26.55	1.715
EU-154	3492.47	873.23	40.	1.	0.001	900.00	1.717s
PA-234	3521.68	880.53	64.	-11.	-0.006	107.18	1.722s
PA-234	3532.53	883.24	75.	0.	0.000	1000.00	1.724s
AG-110M	3538.30	884.68	75.	0.	0.000	1000.00	1.725s
Sc-46	3556.69	889.28	87.	-9.	-0.005	152.93	1.729s
Y-88	3591.74	898.04	45.	-18.	-0.010	85.26	1.736s
AC-228	3642.64	910.76	7.	80.	0.044	13.35	1.437
AG-110M	3749.60	937.49	35.	-5.	-0.003	263.94	1.766s
PA-234	3783.72	946.02	15.	11.	0.006	85.43	1.772s
EU-152	3856.11	964.11	104.	3.	0.002	416.50	1.786s
AC-228	3876.24	969.14	4.	61.	0.034	14.64	1.309s
EU-154	3985.03	996.33	64.	-9.	-0.005	130.05	1.810s
EU-154	4018.82	1004.77	16.	10.	0.006	96.26	1.816s
Cs-136	4192.07	1048.07	26.	5.	0.003	151.00	1.848s
RH-106	4201.23	1050.36	32.	-1.	-0.001	609.30	1.850s
BI-207	4254.46	1063.66	11.	17.	0.010	49.10	1.860s
Ga-68	4309.44	1077.40	5.	21.	0.011	33.60	1.870s
FE-59	4396.88	1099.25	16.	8.	0.004	124.65	1.886s
EU-152	4448.20	1112.07	75.	16.	0.009	79.85	1.895s
ZN-65	4462.09	1115.55	77.	16.	0.009	80.77	1.897s
BI-214	4481.06	1120.29	103.	9.	0.005	167.98	1.901s
Sc-46	4482.12	1120.55	121.	-11.	-0.006	144.60	1.901s
CO-60	4692.96	1173.24	27.	2.	0.001	592.37	1.938s
Ta-182	4756.25	1189.05	40.	-11.	-0.006	141.82	1.949
Ta-182	4885.75	1221.41	40.	-3.	-0.001	557.27	1.972
Co-56	4953.27	1238.28	51.	2.	0.001	917.91	1.984s
NA-22	5098.35	1274.53	25.	-4.	-0.002	198.55	2.008s
EU-154	5098.39	1274.54	15.	10.	0.005	63.92	2.008s
FE-59	5166.65	1291.60	28.	-8.	-0.005	153.75	2.020s
TL-210	5252.32	1313.00	23.	-4.	-0.002	308.96	2.034s
CO-60	5330.37	1332.50	6.	6.	0.004	96.69	2.047s
AG-110M	5537.69	1384.30	17.	2.	0.001	488.62	2.082s
EU-152	5632.56	1408.00	6.	17.	0.010	40.18	2.097s
K-40	5842.81	1460.53	14.	359.	0.200	5.67	2.019

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
La-140	6385.95	1596.21	12.	-1.	-0.001	842.61	2.215s
SB-124	6765.35	1690.98	0.	5.	0.003	44.72	2.272s
BI-214	7059.65	1764.49	4.	45.	0.025	16.06	2.314s
Co-56	7087.11	1771.35	49.	0.	0.000	1000.00	2.318s

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	-5.0905E+00				5.31E+01	
			477.60	-5.091E+00	?(	1.700E+01 9.99E+01 1.05E+01	G
NA-22	C	-1.8728E-01				9.50E+02	
			1274.53	-1.873E-01	&(	1.321E+00 1.99E+02 9.99E+01	G
K-40	N	1.9193E+02				4.66E+11	
			1460.83	1.919E+02	(P	1.064E+01 5.67E+00 1.07E+01	G
Sc-46	F	-3.3968E-01				8.38E+01	
			889.28	-3.397E-01	?(	1.774E+00 1.53E+02 1.00E+02	G
			1120.55	-5.068E-01	+	2.487E+00 1.45E+02 1.00E+02	G
CR-51	F	-2.3545E-01				2.77E+01	
			320.08	-2.355E-01	%(P	2.253E+01 1.40E+03 9.94E+00	G
MN-54	C	-1.9661E-01				3.12E+02	
			834.85	-1.966E-01	?(P	1.114E+00 1.84E+02 1.00E+02	G
FE-59	F	6.1500E-01				4.45E+01	
			1099.25	6.150E-01	?(P	1.731E+00 1.25E+02 5.65E+01	G
			1291.60	-9.953E-01	+	3.286E+00 1.54E+02 4.32E+01	G
Co-56	C	2.7529E-01				7.73E+01	
			846.77	3.659E-01	?(P	7.766E-01 9.24E+01 9.99E+01	G
			1238.28	1.383E-01	?(P	2.721E+00 9.18E+02 6.61E+01	G
			1037.84	1.023E-01	%	8.217E+00 3.53E+03 1.41E+01	G
			1771.35	0.000E+00	-	1.523E+01 1.00E+03 1.55E+01	A
CO-58	C	3.0002E-02				7.09E+01	
			810.78	3.000E-02	%(	1.274E+00 1.19E+03 9.95E+01	G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
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	9.572E-02	- P	1.288E+00	5.92E+02	9.99E+01 G
ZN-65	F	1.4665E+00					2.44E+02	
			1115.55	1.466E+00	?(	3.959E+00	8.08E+01	5.06E+01 G
NB-94	I	5.0434E-01					7.41E+06	
			702.63	-3.751E-02	?(P	1.332E+00	9.67E+02	9.79E+01 G
			871.10	1.035E+00	&(	7.309E-01	2.66E+01	9.99E+01 G
ZR-95	I	7.0487E-01					6.40E+01	
			756.73	7.049E-01	*(	1.469E+00	9.20E+01	5.45E+01 G
			724.20	0.000E+00	&	3.225E+00	1.00E+03	4.42E+01 G
NB-95	I	4.7759E-01					6.40E+01	
			765.79	4.776E-01	?(	1.080E+00	6.82E+01	9.98E+01 G
RU-103	I	7.2901E-01					3.93E+01	
			497.05	7.290E-01	*(	6.045E-01	3.73E+01	9.09E+01 G
			610.30	-9.112E+00	-	5.307E+01	1.74E+02	5.75E+00 GA
RH-106	I	-4.9056E+00					3.74E+02	
			621.92	-4.906E+00	?(	3.060E+01	1.86E+02	9.93E+00 G
			1050.36	-3.742E+00	+	8.196E+01	6.09E+02	1.56E+00 G
			511.86	8.378E+00	?	6.405E+00	2.52E+01	2.00E+01 GA
AG-108M	C	-4.9799E-02					1.53E+05	
			433.94	-4.980E-02	?(	9.042E-01	7.39E+02	9.05E+01 G
			722.94	0.000E+00	+	1.565E+00	1.00E+03	9.08E+01 G
			614.28	-5.295E-01	&	3.351E+00	1.89E+02	8.98E+01 G
AG-110M	F	1.5264E-01					2.50E+02	
			884.68	0.000E+00	?(	2.269E+00	1.00E+03	7.27E+01 G
			657.76	1.937E-01	*(	1.253E+00	1.87E+02	9.46E+01 G
			937.49	-5.829E-01	+	3.530E+00	2.64E+02	3.44E+01 G
			1384.30	4.492E-01	?(	4.924E+00	4.89E+02	2.43E+01 G
			763.94	0.000E+00	-	5.724E+00	1.00E+03	2.23E+01 G
SN-113	F	5.4541E-02					1.15E+02	
			391.69	5.454E-02	&(	2.333E+00	1.25E+03	6.40E+01 G
SB-124	F	7.0467E-02					6.02E+01	
			602.73	-5.260E-01	(	3.186E+00	1.81E+02	9.83E+01 G
			1690.98	6.721E-01	?(	9.906E-01	4.47E+01	4.78E+01 G
			722.79	2.833E+00	?(	1.237E+01	1.28E+02	1.08E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	I	-1.4568E+00					1.01E+03	
			427.88	-1.457E+00	?(	3.390E+00	9.85E+01	2.96E+01 G
			600.50	-2.882E+00	+	1.777E+01	1.84E+02	1.79E+01 G
			635.89	8.782E-01	+	8.446E+00	2.73E+02	1.13E+01 G
			463.37	2.256E-01	&	1.091E+01	1.39E+03	1.05E+01 G
I-131	I	3.0225E-01					8.02E+00	
			364.48	1.218E-01	?(	8.848E-01	2.86E+02	8.17E+01 G
			284.30	2.729E-01	%	1.294E+01	1.88E+03	6.14E+00 G
			636.97	2.358E+00	?(	1.265E+01	1.54E+02	7.17E+00 G
Ga-68	C	3.2784E+01					4.71E-02	
			1077.40	3.278E+01	?(	2.137E+01	3.36E+01	3.30E+00 G
BA-133	F	-6.4613E-01					3.85E+03	
			356.00	-6.461E-01	?(	3.541E+00	1.64E+02	6.20E+01 G
			302.85	0.000E+00	&	1.175E+01	1.00E+03	1.83E+01 G
			383.84	-4.704E+00	+	1.572E+01	9.98E+01	8.94E+00 GA
			80.99	-1.304E+00	+ P	6.044E+00	4.72E+01	3.41E+01 GA
CS-134	I	-3.4582E-01					7.54E+02	
			795.87	-7.131E-01	?(	1.843E+00	7.75E+01	8.55E+01 G
			604.71	-5.313E-01	+	3.160E+00	1.78E+02	9.76E+01 G
			569.32	-1.368E+00	+	6.165E+00	1.31E+02	1.54E+01 G
			801.95	3.269E+00	?(	1.927E+01	1.72E+02	8.69E+00 G
			563.24	-8.136E-01	& P	1.136E+01	8.39E+02	8.35E+00 G
CS-137	I	1.2008E-02					1.10E+04	
			661.66	1.201E-02	%(	1.448E+00	3.42E+03	8.52E+01 G
CE-139	F	-2.6665E-01					1.38E+02	
			165.85	-2.667E-01	&(P	1.166E+00	1.27E+02	7.99E+01 G
Ba-140	I	6.6047E-01					1.28E+01	
			537.26	-2.932E-01	?(P	3.460E+00	7.68E+02	2.44E+01 G
			162.66	4.400E+00	&(P	1.467E+01	9.99E+01	6.22E+00 G
			304.85	0.000E+00	&	5.043E+01	1.00E+03	4.29E+00 G
La-140	I	1.1864E-01					1.28E+01	
			1596.21	-6.422E-02	?(	1.211E+00	8.43E+02	9.54E+01 G
			487.02	5.021E-01	?(P	3.802E+00	2.23E+02	4.55E+01 G
			328.76	-1.876E+00	&	8.822E+00	1.40E+02	2.03E+01 G
			815.77	-1.056E+00	+	5.021E+00	1.38E+02	2.33E+01 G
CE-141	I	6.2348E-01					3.25E+01	
			145.44	6.235E-01	?(	2.963E+00	1.42E+02	4.82E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CE-144	I	-2.7627E+00					2.85E+02	
			133.54	-2.763E+00	&(	1.301E+01	1.41E+02	1.11E+01 G
PM-144	C	4.4432E-01					3.63E+02	
			696.54	3.993E-01	?(P	1.191E+00	8.86E+01	9.90E+01 G
			618.06	4.893E-01	?(	2.818E+00	1.72E+02	9.91E+01 G
EU-152	F	1.3797E+00					4.94E+03	
			121.78	-1.002E+00	&(	3.024E+00	9.07E+01	2.86E+01 G
			344.29	6.441E-01	+	6.241E+00	2.87E+02	2.65E+01 G
			1112.07	5.418E+00	?(	1.445E+01	7.98E+01	1.36E+01 G
			778.92	-1.342E+00	+	7.577E+00	2.45E+02	1.29E+01 G
			964.11	9.810E-01	&(	1.411E+01	4.16E+02	1.46E+01 G
			244.69	3.857E+00	?(	2.510E+01	1.95E+02	7.58E+00 G
			1408.00	4.564E+00	?	3.635E+00	4.02E+01	2.10E+01 GA
EU-154	I	1.2301E+00					3.14E+03	
			123.10	5.615E-01	?(	1.956E+00	1.04E+02	4.08E+01 G
			1274.54	1.433E+00	&(	3.011E+00	6.39E+01	3.52E+01 G
			723.36	0.000E+00	-	7.036E+00	1.00E+03	2.02E+01 G
			873.23	3.090E-01	-	9.943E+00	9.00E+02	1.23E+01 G
			1004.77	2.348E+00	?(	5.012E+00	9.63E+01	1.80E+01 G
			996.33	-3.566E+00	+	1.585E+01	1.30E+02	1.06E+01 G
EU-155	I	1.5427E+00					1.81E+03	
			105.31	1.543E+00	(	8.399E+00	1.64E+02	2.12E+01 G
			86.54	-1.142E+00	&	6.566E+00	1.73E+02	3.07E+01 G
HF-181	F	-6.7146E-01					4.24E+01	
			482.00	-6.715E-01	?(	2.336E+00	1.04E+02	8.05E+01 G
			133.02	-4.198E-02	%	3.259E+00	2.31E+03	4.33E+01 G
			345.83	-2.709E+00	&	1.219E+01	1.34E+02	1.51E+01 G
			136.30	-5.287E+00	&	2.526E+01	1.43E+02	5.85E+00 G
Ta-182	F	-6.6038E-02					1.14E+02	
			1121.30	-6.604E-02	%(	6.915E+00	3.02E+03	3.49E+01 G
			1221.41	-4.873E-01	+	5.858E+00	5.57E+02	2.70E+01 G
			1189.05	-3.180E+00	+	9.557E+00	1.42E+02	1.62E+01 G
Hg-203	F	3.8414E-01					4.66E+01	
			279.20	3.841E-01	?(	1.111E+00	8.65E+01	8.15E+01 G
TL-208	N	4.6835E+00					6.98E+02	
			583.02	4.627E+00	(P	5.528E-01	9.44E+00	8.45E+01 G
			277.28	5.441E+00	(P	9.325E+00	6.72E+01	6.31E+00 G
			860.56	3.033E-01	% P	8.648E+00	1.21E+03	1.24E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PM-146	C	7.4867E-01					2.02E+03	
			453.88	4.573E-01	&(P	1.255E+00	1.14E+02	6.50E+01 G
			747.16	2.936E-02	% P	2.262E+00	3.10E+03	3.40E+01 G
			735.72	1.590E+00	?(P	3.409E+00	9.09E+01	2.25E+01 G
Y-88	F	4.0995E-02					1.07E+02	
			1836.06	4.100E-02	%(P	1.006E+00	1.07E+03	9.92E+01 G
			898.04	-7.442E-01	&	1.405E+00	8.53E+01	9.37E+01 G
Cd-113m		-5.9706E+03					5.33E+03	
			263.70	-5.971E+03	?(	1.680E+04	8.44E+01	6.00E-03 K
Cf-251	T	-8.8608E-01					3.28E+05	
			176.60	-8.861E-01	(	4.300E+00	1.88E+02	1.70E+01 G
			227.00	-1.600E+00	+	1.340E+01	3.38E+02	6.30E+00 GA
Cf-249	T	-1.9843E-01					1.28E+05	
			387.95	-1.984E-01	?(	2.249E+00	3.33E+02	6.60E+01 G
			333.44	-2.488E+00	+	1.137E+01	1.36E+02	1.55E+01 G
Sn-126		4.1793E+00					3.65E+07	
			87.57	2.635E+00	}	5.071E+00	2.30E+01	3.75E+01 GA
			64.28	4.179E+00	&(	1.562E+01	1.12E+02	9.70E+00 G
			86.94	-3.869E+00	+	2.201E+01	1.71E+02	9.04E+00 GA
PB-210	N	3.2280E+01					8.14E+03	
			46.54	3.228E+01	(P	2.204E+01	2.85E+01	4.25E+00 G
PB-212	N	1.1487E+01					6.98E+02	
			238.63	1.149E+01	(P	1.280E+00	6.32E+00	4.33E+01 G
			300.03	1.733E+01	+	1.673E+01	3.20E+01	3.28E+00 GA
PB-214	N	2.0139E+01					5.84E+05	
			351.93	1.965E+01	(P	1.749E+00	6.48E+00	3.76E+01 G
			295.09	2.110E+01	(P	2.967E+00	7.60E+00	1.93E+01 G
			242.00	2.461E+01	+	8.562E+00	1.34E+01	7.43E+00 GA
BI-207	C	1.0287E+00					1.18E+04	
			1063.66	1.029E+00	&(	1.064E+00	4.91E+01	7.45E+01 G
			569.70	-1.873E-02	%	1.056E+00	1.59E+03	9.77E+01 G
BI-212	N	4.2096E+00					6.98E+02	
			727.17	4.210E+00	?(	1.266E+01	8.88E+01	7.55E+00 G
			785.42	3.037E+01	? P	9.051E+01	8.84E+01	1.28E+00 GA

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
U-235	N	2.4122E+00					2.57E+11	
			143.79	2.723E+00	?(	1.319E+01	1.45E+02	1.10E+01 G
			205.33	-7.659E+00	+ P	1.846E+01	8.12E+01	5.01E+00 G
			163.38	1.741E+00	?(	1.879E+01	3.19E+02	5.08E+00 G
			185.72	2.041E+00		1.523E+00	3.06E+01	5.40E+01 GA
BI-214	N	1.9193E+01					5.84E+05	
			609.31	1.906E+01	(P	1.360E+00	6.23E+00	4.61E+01 G
			1120.29	2.667E+00	- P	1.527E+01	1.68E+02	1.51E+01 G
			1764.49	1.959E+01	?(P	5.021E+00	1.61E+01	1.54E+01 G
BI-210M	T	1.6254E-01					1.10E+09	
			265.83	1.625E-01	?(P	2.071E+00	3.73E+02	5.00E+01 G
			304.90	0.000E+00	&	7.727E+00	1.00E+03	2.80E+01 G
AC-228	N	1.2577E+01					2.10E+03	
			911.07	1.082E+01	(P	2.024E+00	1.34E+01	2.90E+01 G
			968.97	1.438E+01	(P	2.810E+00	1.46E+01	1.75E+01 G
			338.32	1.421E+01	@(P	5.271E+00	1.95E+01	1.20E+01 G
			93.35	1.538E+00	& P	3.418E+01	6.65E+02	5.56E+00 XA
TH-227	N	1.6632E+00					7.95E+03	
			256.24	4.462E-01	&(	1.199E+01	1.07E+03	7.00E+00 G
			235.97	2.356E+00	(	1.512E+01	1.92E+02	1.23E+01 G
			50.14	-5.045E+00	& P	2.099E+01	8.63E+01	8.00E+00 G
TH-229	N	2.4649E-01					2.68E+06	
			193.51	-1.767E+00	?(	1.901E+01	4.35E+02	4.40E+00 G
			210.85	3.210E+00	?(	2.724E+01	3.42E+02	2.99E+00 G
TH-234	N	1.9540E+01					1.63E+12	
			92.59	1.954E+01	(P	1.061E+01	1.86E+01	5.58E+00 G
			63.29	1.081E+01	&	3.908E+01	1.09E+02	3.81E+00 G
PA-234	N	4.4546E-01					1.63E+12	
			131.29	-1.615E+00	?(	7.671E+00	1.42E+02	1.80E+01 G
			946.02	3.214E+00	?(	6.249E+00	8.54E+01	1.34E+01 G
			569.47	0.000E+00	-	1.241E+01	1.00E+03	8.20E+00 G
			883.24	0.000E+00	-	1.716E+01	1.00E+03	9.60E+00 G
			880.53	-6.995E+00	+	2.543E+01	1.07E+02	6.00E+00 GA
PA-234M	N	2.1145E+01					1.63E+12	
			1001.00	-5.150E-01	%(P	2.143E+02	8.77E+03	8.37E-01 G
			766.41	8.281E+01	?(	4.308E+02	1.51E+02	2.94E-01 G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

AM-241   T   1.0108E+00                                      1.58E+05
                           59.54 1.011E+00 &(  4.531E+00 1.34E+02 3.59E+01 G

Np-237   F  -2.6237E+00                                      2.14E+06
                           86.49-2.624E+00 &(  1.554E+01 1.78E+02 1.31E+01 G

Cs-136   F  -6.2984E-01                                      1.30E+01
                          818.50-6.298E-01 ?(  1.463E+00 7.00E+01 1.00E+02 G
                         1048.07 2.731E-01 +   1.446E+00 1.51E+02 8.00E+01 G
                          340.57-8.393E-01 +   3.716E+00 1.32E+02 4.69E+01 G

Np-239   T   1.4407E+00                                      2.36E+00
                          103.70 0.000E+00 &   7.692E+00 1.00E+03 2.40E+01 X
                          106.13 1.441E+00 &(  7.745E+00 1.62E+02 2.27E+01 G
                           99.50 0.000E+00 -   1.240E+01 1.00E+03 1.50E+01 X

Nd-147      -8.0242E-01                                      1.11E+01
                          531.00-8.024E-01 ?(  6.382E+00 3.23E+02 1.30E+01 G
                           91.10-1.216E+00 +   6.597E+00 1.63E+02 2.83E+01 G

TL-210   N  -6.1719E-02                                      5.84E+05
                          799.60-6.172E-02 ?(  1.751E+00 8.17E+02 9.90E+01 G
                          296.00-4.174E-01 +   2.741E+00 1.96E+02 7.90E+01 G
                         1313.00-9.128E-01 +   6.198E+00 3.09E+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
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N - Naturally Occurring Isotope
P - Photon Reaction
C - Charged Particle Reaction
M - No MDA Calculation
R - Coincidence Corrected
H - Halflife limit exceeded
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	332.	-21.	-0.012	86.34	-5.045E+00	P
AM-241	59.54	502.	24.	0.013	134.17	1.011E+00	
BA-133	80.99	1431.	-39.	-0.021	47.19	-1.304E+00	P
Np-237	86.49	1506.	-31.	-0.017	178.01	-2.624E+00	
EU-155	86.54	1476.	-32.	-0.018	172.84	-1.142E+00	
Nd-147	91.10	1323.	-32.	-0.018	163.03	-1.216E+00	
EU-155	105.31	1296.	31.	0.017	163.58	1.543E+00	
Np-239	106.13	1264.	31.	0.017	161.51	1.441E+00	
EU-152	121.78	293.	-27.	-0.015	90.66	-1.002E+00	
EU-154	123.10	248.	22.	0.012	104.19	5.615E-01	
PA-234	131.29	742.	-27.	-0.015	142.40	-1.615E+00	
CE-144	133.54	802.	-29.	-0.016	141.23	-2.763E+00	
HF-181	136.30	831.	-29.	-0.016	143.34	-5.287E+00	
CO-57	136.47	860.	-10.	-0.006	414.45	-1.014E+00	
U-235	143.79	759.	27.	0.015	145.22	2.723E+00	
CE-141	145.44	732.	27.	0.015	142.47	6.235E-01	
Ba-140	162.66	254.	23.	0.013	99.87	4.400E+00	P
U-235	163.38	278.	7.	0.004	318.72	1.741E+00	
CE-139	165.85	271.	-18.	-0.010	127.22	-2.667E-01	P
Cf-251	176.60	150.	-12.	-0.007	188.15	-8.861E-01	
U-235	185.72	180.	87.	0.049	30.64	2.041E+00	
TH-229	193.51	176.	-6.	-0.003	434.83	-1.767E+00	
U-235	205.33	200.	-28.	-0.016	81.22	-7.659E+00	P
TH-229	210.85	148.	7.	0.004	342.36	3.210E+00	
Cf-251	227.00	144.	-7.	-0.004	337.76	-1.600E+00	
TH-227	235.97	698.	20.	0.011	191.86	2.356E+00	
EU-152	244.69	696.	19.	0.011	194.58	3.857E+00	
Cd-113m	263.70	169.	-22.	-0.012	84.43	-5.971E+03	
BI-210M	265.83	177.	5.	0.003	373.29	1.625E-01	P
Hg-203	279.20	124.	19.	0.011	86.53	3.841E-01	
TL-210	296.00	697.	-19.	-0.011	196.35	-4.174E-01	
PA-231	300.07	678.	-11.	-0.006	348.80	-7.490E+00	
La-140	328.76	407.	-21.	-0.011	140.46	-1.876E+00	
Cf-249	333.44	386.	-21.	-0.011	136.49	-2.488E+00	
Cs-136	340.57	365.	-21.	-0.012	132.22	-8.393E-01	
EU-152	344.29	323.	9.	0.005	286.81	6.441E-01	
HF-181	345.83	398.	-21.	-0.012	134.43	-2.709E+00	
BA-133	356.00	552.	-20.	-0.011	163.79	-6.461E-01	
I-131	364.48	52.	5.	0.003	285.89	1.218E-01	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BA-133	383.84	197.	-20.	-0.011	99.85	-4.704E+00	
Cf-249	387.95	217.	-6.	-0.003	333.32	-1.984E-01	
SB-125	427.88	82.	-19.	-0.011	98.46	-1.457E+00	
AG-108M	433.94	52.	-2.	-0.001	739.37	-4.980E-02	
PM-146	453.88	48.	13.	0.007	114.16	4.573E-01	P
Ir-192	468.06	49.	-5.	-0.003	308.63	-2.145E-01	
BE-7	477.60	234.	-22.	-0.012	99.90	-5.091E+00	
HF-181	482.00	257.	-22.	-0.012	104.05	-6.715E-01	
La-140	487.02	213.	9.	0.005	223.44	5.021E-01	P
RH-106	511.86	105.	66.	0.037	25.17	8.378E+00	
Nd-147	531.00	39.	-4.	-0.002	322.59	-8.024E-01	
Ba-140	537.26	40.	-3.	-0.002	768.32	-2.932E-01	P
CS-134	563.24	47.	-2.	-0.001	839.11	-8.136E-01	P
CS-134	569.32	47.	-8.	-0.004	131.09	-1.368E+00	
SB-125	600.50	542.	-18.	-0.010	184.07	-2.882E+00	
SB-124	602.73	524.	-18.	-0.010	180.81	-5.260E-01	
CS-134	604.71	506.	-18.	-0.010	177.52	-5.313E-01	
AG-108M	614.28	469.	-16.	-0.009	188.63	-5.295E-01	
PM-144	618.06	398.	17.	0.009	171.58	4.893E-01	
RH-106	621.92	470.	-17.	-0.009	186.01	-4.906E+00	
SB-125	635.89	40.	3.	0.002	272.76	8.782E-01	
I-131	636.97	35.	6.	0.003	154.18	2.358E+00	
AG-110M	657.76	60.	6.	0.003	187.08	1.937E-01	
PM-144	696.54	54.	12.	0.007	88.64	3.993E-01	P
NB-94	702.63	66.	-1.	-0.001	967.43	-3.751E-02	P
SB-124	722.79	67.	9.	0.005	127.97	2.833E+00	
BI-212	727.17	32.	10.	0.005	88.79	4.210E+00	
PM-146	735.72	19.	11.	0.006	90.92	1.590E+00	P
ZR-95	756.73	20.	11.	0.006	91.95	7.049E-01	
PA-234M	766.41	54.	7.	0.004	151.03	8.281E+01	
EU-152	778.92	30.	-5.	-0.003	244.95	-1.342E+00	
BI-212	785.42	43.	11.	0.006	88.37	3.037E+01	P
CS-134	795.87	81.	-17.	-0.010	77.50	-7.131E-01	
TL-210	799.60	98.	-2.	-0.001	816.82	-6.172E-02	
CS-134	801.95	91.	8.	0.004	172.30	3.269E+00	
La-140	815.77	41.	-7.	-0.004	137.67	-1.056E+00	
Cs-136	818.50	66.	-17.	-0.010	70.01	-6.298E-01	
MN-54	834.85	35.	-5.	-0.003	184.11	-1.966E-01	P
Co-56	846.77	15.	10.	0.005	92.38	3.659E-01	P
NB-94	871.10	13.	27.	0.015	26.55	1.035E+00	
EU-154	873.23	40.	1.	0.001	900.00	3.090E-01	
PA-234	880.53	64.	-11.	-0.006	107.18	-6.995E+00	
Sc-46	889.28	87.	-9.	-0.005	152.93	-3.397E-01	
Y-88	898.04	45.	-18.	-0.010	85.26	-7.442E-01	
AG-110M	937.49	35.	-5.	-0.003	263.94	-5.829E-01	
PA-234	946.02	15.	11.	0.006	85.43	3.214E+00	
EU-152	964.11	104.	3.	0.002	416.50	9.810E-01	
EU-154	996.33	64.	-9.	-0.005	130.05	-3.566E+00	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
EU-154	1004.77	16.	10.	0.006	96.26	2.348E+00		
Cs-136	1048.07	26.	5.	0.003	151.00	2.731E-01		
RH-106	1050.36	32.	-1.	-0.001	609.30	-3.742E+00		
BI-207	1063.66	11.	17.	0.010	49.10	1.029E+00		
FE-59	1099.25	16.	8.	0.004	124.65	6.150E-01		P
EU-152	1112.07	75.	16.	0.009	79.85	5.418E+00		
ZN-65	1115.55	77.	16.	0.009	80.77	1.466E+00		
Sc-46	1120.55	121.	-11.	-0.006	144.60	-5.068E-01		
CO-60	1173.24	27.	2.	0.001	592.37	9.572E-02		P
Ta-182	1189.05	40.	-11.	-0.006	141.82	-3.180E+00		
Ta-182	1221.41	40.	-3.	-0.001	557.27	-4.873E-01		
Co-56	1238.28	51.	2.	0.001	917.91	1.383E-01		P
NA-22	1274.53	25.	-4.	-0.002	198.55	-1.873E-01		
EU-154	1274.54	15.	10.	0.005	63.92	1.433E+00		
FE-59	1291.60	28.	-8.	-0.005	153.75	-9.953E-01		
TL-210	1313.00	23.	-4.	-0.002	308.96	-9.128E-01		
CO-60	1332.50	6.	6.	0.004	96.69	3.351E-01		
AG-110M	1384.30	17.	2.	0.001	488.62	4.492E-01		
EU-152	1408.00	6.	17.	0.010	40.18	4.564E+00		
La-140	1596.21	12.	-1.	-0.001	842.61	-6.422E-02		
SB-124	1690.98	0.	5.	0.003	44.72	6.721E-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	-5.0905E+00	-5.0905E+00	9.990E+01%	1.70E+01
NA-22	#A	-1.8728E-01	-1.8728E-01	1.985E+02%	1.32E+00
K-40		1.9193E+02	1.9193E+02	5.671E+00%	1.06E+01
Sc-46	#A	-3.3968E-01	-3.3968E-01	1.529E+02%	1.77E+00
CR-51	#A	-2.3545E-01	-2.3545E-01	1.405E+03%	2.25E+01
MN-54	#A	-1.9661E-01	-1.9661E-01	1.841E+02%	1.11E+00
FE-59	#A	6.1500E-01	6.1500E-01	1.247E+02%	1.73E+00
Co-56	#A	2.7529E-01	2.7529E-01	9.238E+01%	7.77E-01
CO-57	#A	0.0000E+00	0.0000E+00	1.000E+03%	1.05E+00
CO-58	#A	3.0002E-02	3.0002E-02	1.195E+03%	1.27E+00
CO-60	#A	3.3512E-01	3.3512E-01	9.669E+01%	7.30E-01
ZN-65	#A	1.4665E+00	1.4665E+00	8.077E+01%	3.96E+00
NB-94	#A	5.0434E-01	5.0434E-01	2.655E+01%	1.33E+00
ZR-95	#A	7.0487E-01	7.0487E-01	9.195E+01%	1.47E+00
NB-95	#A	4.7759E-01	4.7759E-01	6.820E+01%	1.08E+00
RU-103	#	7.2900E-01	7.2901E-01	3.729E+01%	6.04E-01
RH-106	#A	-4.9056E+00	-4.9056E+00	1.860E+02%	3.06E+01
AG-108M	#A	-4.9799E-02	-4.9799E-02	7.394E+02%	9.04E-01
AG-110M	#A	1.5264E-01	1.5264E-01	1.871E+02%	2.27E+00

SN-113 #A	5.4541E-02	5.4541E-02	1.251E+03%	2.33E+00
SB-124 #A	7.0466E-02	7.0467E-02	4.472E+01%	3.19E+00
SB-125 #A	-1.4568E+00	-1.4568E+00	9.846E+01%	3.39E+00
I-131 #A	3.0223E-01	3.0225E-01	1.542E+02%	8.85E-01
Gd-153 #A	0.0000E+00	0.0000E+00	7.071E+02%	6.23E+00
Ga-68 #	3.2484E+01	3.2784E+01	3.360E+01%	2.14E+01
Tc-99m #A	0.0000E+00	0.0000E+00	1.000E+03%	1.77E+00
BA-133 #A	-6.4613E-01	-6.4613E-01	1.638E+02%	3.54E+00
CS-134 #A	-3.4581E-01	-3.4582E-01	7.750E+01%	1.84E+00
CS-137 #A	1.2008E-02	1.2008E-02	3.416E+03%	1.45E+00
CE-139 #A	-2.6665E-01	-2.6665E-01	1.272E+02%	1.17E+00
Ba-140 #A	6.6044E-01	6.6047E-01	9.987E+01%	3.46E+00
La-140 #A	1.1864E-01	1.1864E-01	2.234E+02%	1.21E+00
CE-141 #A	6.2347E-01	6.2348E-01	1.425E+02%	2.96E+00
CE-144 #A	-2.7627E+00	-2.7627E+00	1.412E+02%	1.30E+01
PM-144 #A	4.4432E-01	4.4432E-01	8.864E+01%	1.19E+00
EU-152 #A	1.3797E+00	1.3797E+00	7.985E+01%	3.02E+00
EU-154 #A	1.2301E+00	1.2301E+00	5.186E+01%	1.96E+00
EU-155 #A	1.5427E+00	1.5427E+00	1.636E+02%	8.40E+00
HF-181 #A	-6.7145E-01	-6.7146E-01	1.040E+02%	2.34E+00
Ta-182 #A	-6.6037E-02	-6.6038E-02	3.017E+03%	6.91E+00
Hg-203 #A	3.8414E-01	3.8414E-01	8.653E+01%	1.11E+00
TL-208	4.6835E+00	4.6835E+00	9.442E+00%	5.53E-01
PM-146 #A	7.4867E-01	7.4867E-01	7.297E+01%	1.26E+00
Y-88 #A	4.0995E-02	4.0995E-02	1.067E+03%	1.01E+00
Cd-113m#A	-5.9706E+03	-5.9706E+03	8.443E+01%	1.68E+04
Cd-109 #A	0.0000E+00	0.0000E+00	1.000E+03%	5.16E+01
Cf-251 #A	-8.8608E-01	-8.8608E-01	1.882E+02%	4.30E+00
Cf-249 #A	-1.9843E-01	-1.9843E-01	3.333E+02%	2.25E+00
Sn-126 #A	4.1793E+00	4.1793E+00	1.121E+02%	1.56E+01
PB-210 #	3.2280E+01	3.2280E+01	2.851E+01%	2.20E+01
PB-212	1.1487E+01	1.1487E+01	6.315E+00%	1.28E+00
PB-214	2.0139E+01	2.0139E+01	4.994E+00%	1.75E+00
BI-207 #A	1.0287E+00	1.0287E+00	4.910E+01%	1.06E+00
BI-212 #A	4.2096E+00	4.2096E+00	8.879E+01%	1.27E+01
U-235 #A	2.4122E+00	2.4122E+00	1.452E+02%	1.32E+01
BI-214	1.9193E+01	1.9193E+01	6.226E+00%	1.36E+00
BI-210M#A	1.6254E-01	1.6254E-01	3.733E+02%	2.07E+00
AC-228	1.2577E+01	1.2577E+01	9.260E+00%	2.02E+00
TH-227 #A	1.6632E+00	1.6632E+00	1.919E+02%	1.20E+01
TH-229 #A	2.4649E-01	2.4649E-01	2.767E+02%	1.90E+01
TH-234	1.9540E+01	1.9540E+01	1.857E+01%	1.06E+01
PA-231 #A	0.0000E+00	0.0000E+00	1.000E+03%	7.47E+01
PA-233 #A	0.0000E+00	0.0000E+00	7.071E+02%	6.11E+00
PA-234 #A	4.4546E-01	4.4546E-01	8.303E+01%	7.67E+00
PA-234M#A	2.1145E+01	2.1145E+01	1.510E+02%	2.14E+02
AM-241 #A	1.0108E+00	1.0108E+00	1.342E+02%	4.53E+00
Np-237 #A	-2.6237E+00	-2.6237E+00	1.780E+02%	1.55E+01
Ir-192 #A	0.0000E+00	0.0000E+00	7.071E+02%	2.55E+00

Cs-136	#A	-6.2982E-01	-6.2984E-01	7.001E+01%	1.46E+00
Np-239	#A	1.4405E+00	1.4407E+00	1.615E+02%	7.74E+00
Nd-147	#A	-8.0238E-01	-8.0242E-01	3.226E+02%	6.38E+00
TL-210	#A	-6.1719E-02	-6.1719E-02	8.168E+02%	1.75E+00
Kr-85	#A	0.0000E+00	0.0000E+00	1.000E+03%	3.77E+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) 3.118E+02 Bq/Sample
Total Decayed Activity (25.1 to 1999.3 keV) 3.1182480E+02 Bq/Sample

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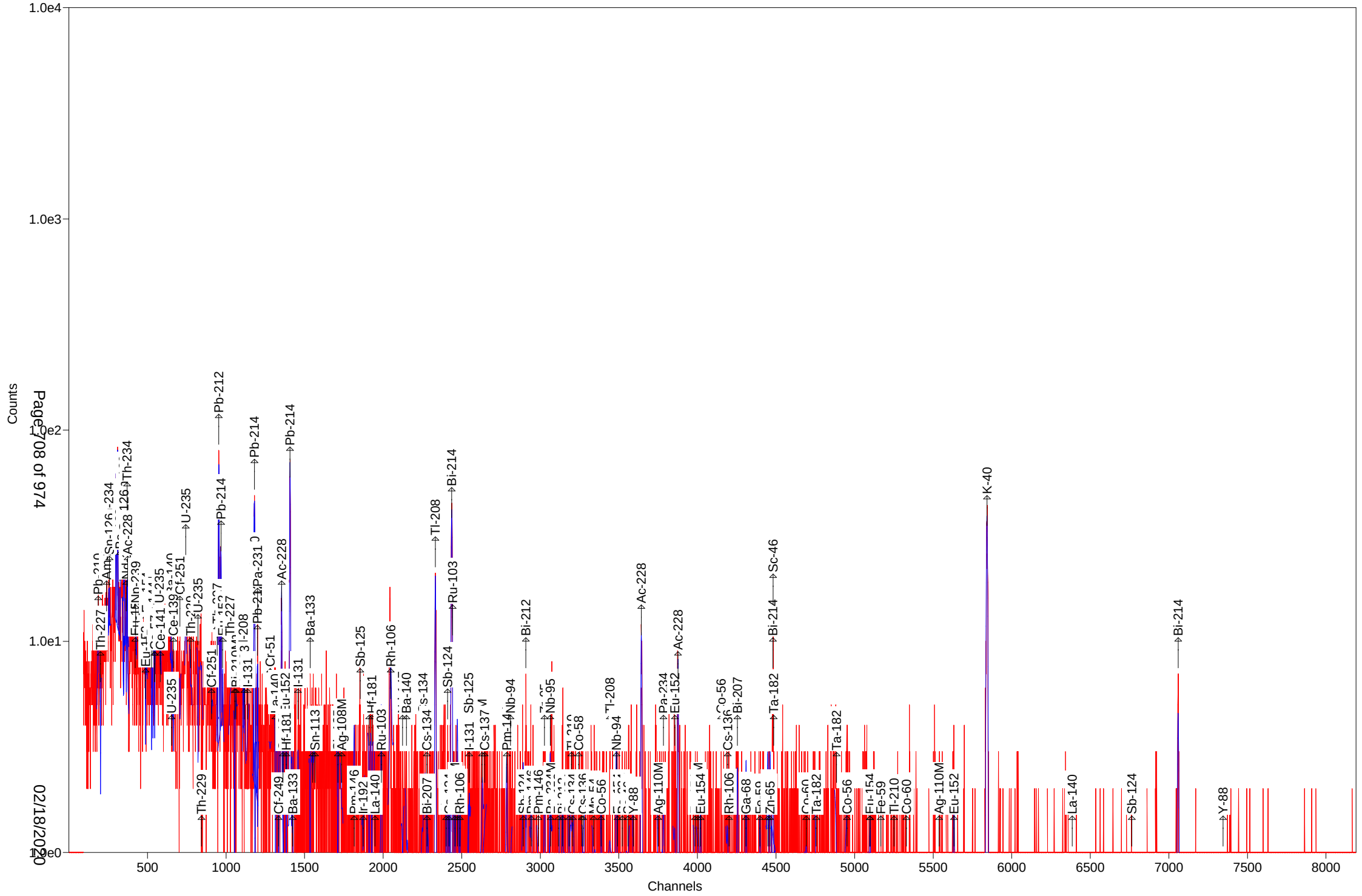
453329_Gamma_160-36593-A-11-B. 9_Gamma_20193885.spc.



Test America St. Louis Spectrum ID: 12_Gamma_20193738

Sample Description: 453329_Gamma_160-36593-A-12-B
Detector: Detector #12
Batch ID: 453329
Work Order Number: Gamma
Lot Number: 160-36593-A-12-B

Decay to Time: 12/27/2019 10:12 Live Time: 1800 sec
Acquisition Time: 12/27/2019 10:12:31 Real Time: 1802 sec
Analysis Time: 12/30/2019 08:34 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_2019-12-07_1443.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	-4.998E+00	105.3	5.264E+00	5.270E+00	1.771E+01
NA-22	-8.429E-01	74.5	6.283E-01	6.297E-01	2.099E+00
K-40	2.050E+02	6.0	1.225E+01	1.604E+01	5.395E+00
Sc-46	-6.188E-01	103.8	6.424E-01	6.431E-01	2.175E+00
CR-51	4.536E+00	185.6	8.420E+00	8.423E+00	2.821E+01
MN-54	1.885E-01	284.3	5.359E-01	5.360E-01	1.297E+00
FE-59	1.073E+00	62.2	6.678E-01	6.700E-01	1.993E+00
Co-56	2.009E+00	18.2	3.655E-01	3.795E-01	1.467E+00
CO-57	2.971E-01	190.7	5.666E-01	5.668E-01	1.376E+00
CO-58	5.606E-01	84.2	4.722E-01	4.731E-01	1.591E+00
CO-60	-6.751E-02	119.0	8.031E-02	8.038E-02	1.593E+00
ZN-65	-5.906E-01	316.7	1.870E+00	1.870E+00	6.437E+00
NB-94	-3.863E-01	185.6	7.171E-01	7.174E-01	1.673E+00
ZR-95	-2.931E-02	3079.0	9.024E-01	9.024E-01	2.217E+00
NB-95	-5.082E-01	114.1	5.798E-01	5.803E-01	1.970E+00
RU-103	3.868E-01	115.2	4.455E-01	4.460E-01	1.124E+00
RH-106	5.451E+00	195.2	1.064E+01	1.065E+01	3.585E+01
AG-108M	3.991E-01	95.7	3.821E-01	3.826E-01	9.597E-01
AG-110M	0.000E+00	1.#INF	2.332E-01	2.332E-01	2.702E+00
SN-113	1.906E-01	480.6	9.160E-01	9.160E-01	3.127E+00
SB-124	2.548E-01	170.0	4.331E-01	4.333E-01	3.897E+00
SB-125	1.717E+00	37.3	6.402E-01	6.460E-01	3.851E+00
I-131	8.244E-01	48.6	4.005E-01	4.027E-01	1.319E+00
Gd-153	-1.127E+00	148.5	1.674E+00	1.676E+00	5.597E+00
Ga-68	4.305E+01	34.9	1.504E+01	1.524E+01	2.949E+01
Tc-99m	0.000E+00	1.#INF	2.600E-01	2.600E-01	2.138E+00
BA-133	2.857E-01	442.6	1.264E+00	1.264E+00	4.269E+00
CS-134	1.164E+00	61.9	7.203E-01	7.228E-01	1.921E+00
CS-137	5.157E-01	90.8	4.685E-01	4.692E-01	1.586E+00
CE-139	-1.021E-02	4654.0	4.752E-01	4.752E-01	1.620E+00
Ba-140	-8.149E-01	215.2	1.754E+00	1.754E+00	4.336E+00
La-140	3.879E-01	99.0	3.839E-01	3.845E-01	1.659E+00
CE-141	6.807E-01	152.1	1.035E+00	1.036E+00	3.464E+00

CE-144	-3.306E+00	161.5	5.339E+00	5.342E+00	1.782E+01
PM-144	-1.974E-01	302.9	5.979E-01	5.980E-01	1.420E+00
EU-152	3.848E+00	28.1	1.080E+00	1.098E+00	3.948E+00
EU-154	1.015E+00	126.0	1.279E+00	1.280E+00	2.623E+00
EU-155	2.321E+00	50.1	1.162E+00	1.169E+00	3.122E+00
HF-181	4.113E-01	124.0	5.101E-01	5.105E-01	2.464E+00
Ta-182	-3.358E-02	25.8	8.671E-03	8.831E-03	1.014E+01
Hg-203	3.931E-01	89.3	3.513E-01	3.518E-01	1.180E+00
TL-208	5.388E+00	11.2	6.010E-01	6.604E-01	7.820E-01
PM-146	7.713E-01	66.2	5.109E-01	5.124E-01	1.468E+00
Y-88	5.728E-01	40.8	2.338E-01	2.361E-01	7.036E-01
Cd-113m	1.088E+03	517.5	5.628E+03	5.628E+03	1.941E+04
Cd-109	6.618E+00	232.1	1.536E+01	1.537E+01	5.143E+01
Cf-251	-4.288E-01	511.9	2.195E+00	2.195E+00	5.711E+00
Cf-249	-8.582E-01	111.4	9.556E-01	9.566E-01	3.202E+00
Sn-126	3.027E+00	193.4	5.856E+00	5.858E+00	1.572E+01
PB-210	4.195E+01	38.5	1.616E+01	1.637E+01	4.104E+01
PB-212	1.306E+01	7.0	9.158E-01	1.141E+00	1.699E+00
PB-214	2.250E+01	7.0	1.585E+00	1.953E+00	2.314E+00
BI-207	-1.152E+00	95.7	1.102E+00	1.103E+00	2.392E+00
BI-212	6.496E+00	86.9	5.643E+00	5.653E+00	1.906E+01
U-235	2.978E+00	155.4	4.629E+00	4.631E+00	1.548E+01
BI-214	2.039E+01	7.6	1.542E+00	1.859E+00	2.695E+00
BI-210M	6.316E-01	90.5	5.712E-01	5.722E-01	1.919E+00
AC-228	1.057E+01	22.1	2.333E+00	2.394E+00	4.446E+00
TH-227	1.404E+00	103.2	1.448E+00	1.450E+00	1.570E+01
TH-229	3.440E+00	160.7	5.528E+00	5.531E+00	2.138E+01
TH-234	1.800E+01	33.5	6.033E+00	6.115E+00	1.631E+01
PA-231	-1.547E+01	202.2	3.127E+01	3.128E+01	1.046E+02
PA-233	-3.757E-01	631.1	2.371E+00	2.371E+00	7.981E+00
PA-234	1.915E+00	52.0	9.956E-01	1.000E+00	2.933E+00
PA-234M	3.212E+00	67.4	2.166E+00	2.172E+00	3.241E+02
AM-241	1.371E+00	130.3	1.786E+00	1.787E+00	5.963E+00
Np-237	0.000E+00	1.#INF	4.487E+00	4.487E+00	1.511E+01
Ir-192	0.000E+00	1.#INF	1.146E-01	1.146E-01	3.322E+00
Cs-136	4.921E-01	90.7	4.463E-01	4.472E-01	1.730E+00
Np-239	9.335E-01	222.4	2.077E+00	2.077E+00	6.972E+00
Nd-147	3.221E+00	96.5	3.109E+00	3.114E+00	7.523E+00
TL-210	-7.331E-01	81.1	5.946E-01	5.960E-01	1.991E+00
Kr-85	1.327E+02	99.7	1.324E+02	1.326E+02	4.449E+02
Total	1.666E+03				

Analyst: kody Saulters

Sample description
453329_Gamma_160-36593-A-12-B

Spectrum Filename: C:\User\SPC\Det12\12_Gamma_20193738.An1

Acquisition information

Start time:	12/27/2019 10:12:31 AM
Live time:	1800
Real time:	1802
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

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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	12/27/2019 10:12:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	12_2019-12-07_1443.PBC 12/7/2019 2:43:53 PM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 28 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 0.1719

***** 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	58.	38.53	0.97	1.811E-02	46.54	4.250	4.195E+01	PB210
50.14	19.	137.91	0.85	2.193E-02	50.14	8.000	PBC<MDA	TH227
59.54	25.	130.27	0.86	2.817E-02	59.54	35.900	PBC<MDA	AM241
64.46	16.	193.42	0.87	3.015E-02	64.28	9.700	PBC<MDA	Sn126
68.57	52.	38.46	0.73	3.160E-02				
74.79	126.	17.11	0.88	3.330E-02				
77.17	249.	9.50	0.88	3.386E-02				
87.14	65.	30.94	0.77	3.569E-02	86.49	13.100	7.725E+00	Np237
					86.54	30.700	3.296E+00	EU155
					86.94	9.040	1.117E+01	Sn126
					87.57	37.500	2.687E+00	Sn126
88.04	16.	232.11	0.89	3.582E-02	88.04	3.790	PBC<MDA	Cd109
92.48	66.	33.51	0.70	3.636E-02	92.59	5.584	1.800E+01	TH234
					93.35	5.561	1.804E+01	AC228
105.09	33.	50.07	1.03	3.726E-02	105.31	21.200	PBC<MDA	EU155
106.13	14.	222.44	0.91	3.729E-02	106.13	22.700	PBC<MDA	Np239
123.10	11.	189.72	0.93	3.721E-02	123.10	40.790	PBC<MDA	EU154
131.72	23.	51.99	0.31	3.683E-02	131.29	18.000	PBC<MDA	PA234
136.47	19.	190.72	0.94	3.651E-02	136.30	5.850	PBC<MDA	HF181
					136.47	10.680	2.738E+00	CO57
143.79	21.	155.42	0.95	3.599E-02	143.79	10.960	PBC<MDA	U235
145.44	21.	152.11	0.95	3.586E-02	145.44	48.200	PBC<MDA	CE141
186.00	98.	17.10	0.78	3.212E-02	185.72	54.000	2.572E+00	U235
210.85	13.	160.71	1.02	2.980E-02	210.85	2.990	PBC<MDA	TH229
227.00	13.	152.08	1.03	2.839E-02	227.00	6.300	PBC<MDA	Cf251
238.57	257.	8.37	1.00	2.743E-02	238.63	43.300	1.204E+01	PB212
241.93	63.	24.72	1.05	2.716E-02	242.00	7.430	1.723E+01	PB214

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
263.70	3.	517.47	1.07	2.554E-02	263.70	0.006	PBC<MDA	Cd113m
265.83	14.	90.45	1.07	2.539E-02	265.83	50.000	PBC<MDA	BI210M
279.20	14.	89.35	1.09	2.449E-02	279.20	81.460	PBC<MDA	Hg203
284.30	27.	48.58	1.09	2.416E-02	284.30	6.140	PBC<MDA	I131
295.07	217.	10.03	1.15	2.350E-02	295.09	19.300	2.654E+01	PB214
					296.00	79.000	6.498E+00	TL210
300.12	34.	33.48	2.30	2.321E-02	300.03	3.280	2.506E+01	PB212
					300.07	2.460	3.341E+01	PA231
					300.18	6.200	1.326E+01	PA233
320.08	18.	185.63	1.13	2.210E-02	320.08	9.940	PBC<MDA	CR51
328.76	17.	98.99	1.13	2.165E-02	328.76	20.300	PBC<MDA	La140
338.30	16.	104.60	1.14	2.118E-02	338.32	12.010	PBC<MDA	AC228
340.57	16.	109.11	1.15	2.108E-02	340.57	46.900	PBC<MDA	Cs136
344.29	9.	202.87	1.15	2.090E-02	344.29	26.500	PBC<MDA	EU152
345.83	15.	124.02	1.15	2.083E-02	345.83	15.070	PBC<MDA	HF181
351.71	303.	7.36	1.31	2.056E-02	351.93	37.600	2.180E+01	PB214
356.00	6.	442.56	1.16	2.037E-02	356.00	62.050	PBC<MDA	BA133
364.48	4.	382.43	1.17	2.001E-02	364.48	81.700	PBC<MDA	I131
391.69	4.	480.57	1.20	1.893E-02	391.69	64.000	PBC<MDA	SN113
433.94	11.	95.73	1.24	1.751E-02	433.94	90.480	PBC<MDA	AG108M
453.88	12.	94.05	1.26	1.692E-02	453.88	65.000	PBC<MDA	PM146
463.37	8.	147.90	1.27	1.666E-02	463.37	10.470	PBC<MDA	SB125
487.02	6.	204.34	1.29	1.604E-02	487.02	45.500	PBC<MDA	La140
497.05	10.	115.18	1.30	1.580E-02	497.05	90.900	PBC<MDA	RU103
511.86	33.	43.29	2.56	1.546E-02	511.86	20.000	PBC<MDA	RH106
513.98	16.	99.73	1.31	1.541E-02	513.98	0.430	PBC<MDA	Kr85
531.00	11.	96.52	1.33	1.504E-02	531.00	13.000	PBC<MDA	Nd147
563.16	13.	94.10	1.36	1.439E-02	563.24	8.350	PBC<MDA	CS134
569.70	8.	145.82	1.37	1.427E-02	569.32	15.380	2.108E+00	CS134
					569.47	8.200	3.954E+00	PA234
					569.70	97.740	3.319E-01	BI207
583.04	115.	11.15	1.11	1.403E-02	583.02	84.500	5.388E+00	TL208
609.16	257.	6.68	1.25	1.359E-02	609.31	46.090	2.280E+01	BI214
					610.30	5.750	1.830E+02	RU103
621.92	13.	195.25	1.42	1.338E-02	621.92	9.930	PBC<MDA	RH106
635.89	15.	37.27	1.43	1.317E-02	635.89	11.310	PBC<MDA	SB125
661.66	10.	90.84	1.45	1.279E-02	661.66	85.210	PBC<MDA	CS137
722.79	6.	169.97	1.51	1.199E-02	722.79	10.810	PBC<MDA	SB124
					722.94	90.840	3.060E-01	AG108M
					723.36	20.220	1.375E+00	EU154
726.97	11.	86.87	1.52	1.194E-02	727.17	7.550	PBC<MDA	BI212
747.16	8.	93.28	1.53	1.171E-02	747.16	34.000	PBC<MDA	PM146
766.41	15.	71.73	1.55	1.150E-02	765.79	99.790	PBC<MDA	NB95
					766.41	0.294	2.509E+02	PA234M
778.92	8.	91.66	1.56	1.136E-02	778.92	12.940	PBC<MDA	EU152
784.85	9.	90.03	1.57	1.129E-02	785.42	1.280	PBC<MDA	BI212
796.08	12.	80.32	1.58	1.119E-02	795.87	85.530	PBC<MDA	CS134
810.78	11.	84.23	1.59	1.104E-02	810.78	99.460	PBC<MDA	CO58

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
815.77	5.	206.31	1.60	1.099E-02	815.77	23.280	PBC<MDA	La140
818.50	10.	105.53	1.60	1.096E-02	818.50	100.000	PBC<MDA	Cs136
834.85	4.	284.30	1.61	1.081E-02	834.85	99.980	PBC<MDA	MN54
860.13	39.	16.01	2.42	1.057E-02	860.56	12.420	1.650E+01	TL208
873.23	7.	165.99	1.65	1.046E-02	873.23	12.270	PBC<MDA	EU154
883.24	3.	317.82	1.66	1.038E-02	883.24	9.600	PBC<MDA	PA234
911.07	56.	22.06	1.68	1.015E-02	911.07	29.000	1.057E+01	AC228
964.11	37.	28.07	1.73	9.739E-03	964.11	14.605	1.452E+01	EU152
969.01	7.	169.08	1.74	9.703E-03	968.97	17.460	PBC<MDA	AC228
1048.07	3.	225.83	1.81	9.162E-03	1048.07	80.000	PBC<MDA	Cs136
1077.40	20.	34.94	1.83	8.978E-03	1077.40	3.300	4.305E+01	Ga68
1099.25	9.	87.98	1.85	8.846E-03	1099.25	56.500	PBC<MDA	FE59
1120.16	77.	11.40	0.71	8.722E-03	1120.29	15.100	3.248E+01	BI214
1173.24	6.	189.97	1.92	8.426E-03	1173.24	99.900	PBC<MDA	CO60
1189.05	15.	25.82	1.93	8.342E-03	1189.05	16.200	6.166E+00	Ta182
1238.28	49.	18.19	1.97	8.090E-03	1238.28	66.070	5.128E+00	Co56
1291.60	7.	88.04	2.02	7.834E-03	1291.60	43.200	PBC<MDA	FE59
1460.73	280.	5.98	1.71	7.113E-03	1460.83	10.670	2.050E+02	K40
1764.12	8.	110.35	2.40	6.075E-03	1764.49	15.400	PBC<MDA	BI214
1836.06	6.	40.82	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 Channel	Centroid Energy	Background Counts	Net Area Counts	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide
273.85	68.57	116.	52.	1.645E+03	38.46	0.726	- s
298.72	74.75	170.	126.	3.792E+03	17.11	0.880	- D
308.25	77.13	153.	249.	7.339E+03	9.50	0.883	- D
743.32	186.00	58.	98.	3.067E+03	17.10	0.781	-

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	186.16	46.63	134.	58.	0.032	38.53	0.975s
TH-227	200.18	50.14	343.	19.	0.011	137.91	0.855s
AM-241	237.74	59.54	516.	25.	0.014	130.27	0.865s
Sn-126	256.71	64.28	295.	16.	0.009	193.42	0.869s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BA-133	323.50	80.99	263.	-16.	-0.009	178.52	0.887s
Np-237	345.49	86.49	709.	0.	0.000	1000.00	0.892A
EU-155	345.70	86.54	721.	8.	0.005	238.97	0.892D
Sn-126	347.29	86.94	666.	18.	0.010	109.86	0.892D
Sn-126	349.81	87.57	671.	43.	0.024	43.73	0.893D
Cd-109	351.68	88.04	696.	16.	0.009	232.11	0.894A
Nd-147	363.92	91.10	721.	0.	0.000	1000.00	0.897s
TH-234	369.41	92.48	149.	66.	0.037	33.51	0.697
AC-228	372.91	93.35	726.	-11.	-0.006	347.72	0.899
Gd-153	389.50	97.50	543.	-22.	-0.012	148.53	0.903s
Np-239	397.50	99.50	521.	-22.	-0.012	151.03	0.905s
Gd-153	412.29	103.20	521.	0.	0.000	1000.00	0.909s
Np-239	414.29	103.70	443.	-23.	-0.013	129.85	0.909s
EU-155	419.86	105.09	80.	33.	0.018	50.07	1.030s
Np-239	424.00	106.13	493.	14.	0.008	222.44	0.912s
EU-152	486.56	121.78	245.	-23.	-0.013	100.31	0.928s
EU-154	491.84	123.10	219.	11.	0.006	189.72	0.929
PA-234	526.30	131.72	48.	23.	0.013	51.99	0.312s
HF-181	531.51	133.02	775.	-24.	-0.013	163.87	0.939s
CE-144	533.57	133.54	753.	-24.	-0.013	161.50	0.940s
HF-181	544.61	136.30	777.	-24.	-0.013	163.55	0.943s
CO-57	545.30	136.47	662.	19.	0.011	190.72	0.943s
Tc-99m	561.44	140.51	643.	0.	0.000	1000.00	0.947
U-235	574.53	143.79	529.	21.	0.012	155.42	0.950s
CE-141	581.15	145.44	508.	21.	0.012	152.11	0.952s
Ba-140	649.99	162.66	323.	-24.	-0.013	107.63	0.969
Cf-251	705.72	176.60	139.	-4.	-0.002	511.87	0.983s
U-235	742.18	185.72	241.	-32.	-0.018	71.14	0.992
U-235	820.59	205.33	158.	-23.	-0.013	103.95	1.012s
TH-229	842.65	210.85	121.	13.	0.007	160.71	1.018s
Cf-251	907.22	227.00	114.	13.	0.007	152.08	1.034s
TH-227	943.09	235.97	725.	-23.	-0.013	169.62	1.043s
PB-212	953.73	238.63	52.	279.	0.155	7.01	1.045D
PB-214	967.18	242.00	88.	63.	0.035	24.72	1.049D
EU-152	977.96	244.69	680.	-23.	-0.013	165.10	1.051s
TH-227	1024.13	256.24	110.	-13.	-0.007	153.46	1.063s
Cd-113m	1053.96	263.70	119.	3.	0.002	517.47	1.070s
BI-210M	1062.48	265.83	78.	14.	0.008	90.45	1.072s
TL-208	1108.27	277.28	80.	-2.	-0.001	511.47	1.084s
Hg-203	1115.93	279.20	72.	14.	0.008	89.35	1.086s
I-131	1136.32	284.30	40.	27.	0.015	48.58	1.091s
PB-214	1179.39	295.07	56.	217.	0.120	10.03	1.152
TL-210	1183.11	296.00	744.	-18.	-0.010	211.29	1.102s
PB-212	1199.57	300.12	27.	34.	0.019	33.48	2.301s
PA-231	1199.38	300.07	726.	-18.	-0.010	207.95	1.106s
PA-233	1199.82	300.18	708.	-18.	-0.010	205.28	1.107s
PA-231	1209.70	302.65	689.	-18.	-0.010	202.18	1.109s
BA-133	1210.50	302.85	671.	-18.	-0.010	199.44	1.109s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Ba-140	1218.49	304.85	652.	-19.	-0.010	196.40	1.111s
BI-210M	1218.68	304.90	634.	-19.	-0.010	193.59	1.111s
Ir-192	1232.85	308.44	615.	-19.	-0.010	190.19	1.115s
PA-233	1247.13	312.01	596.	-5.	-0.003	631.13	1.118s
Ir-192	1265.04	316.49	591.	0.	0.000	1000.00	1.123s
CR-51	1279.41	320.08	545.	18.	0.010	185.63	1.126
La-140	1314.10	328.76	136.	17.	0.010	98.99	1.135s
Cf-249	1332.81	333.44	192.	-20.	-0.011	101.54	1.139s
AC-228	1352.33	338.32	139.	16.	0.009	104.60	1.144
Cs-136	1361.32	340.57	152.	16.	0.009	109.11	1.146
EU-152	1376.18	344.29	169.	9.	0.005	202.87	1.150s
HF-181	1382.35	345.83	177.	15.	0.009	124.02	1.151
PB-214	1405.86	351.71	40.	313.	0.174	7.05	1.313
BA-133	1423.02	356.00	410.	6.	0.004	442.56	1.162s
I-131	1456.95	364.48	60.	4.	0.002	382.43	1.170s
BA-133	1534.35	383.84	205.	-19.	-0.011	107.02	1.189s
Cf-249	1550.79	387.95	225.	-19.	-0.011	111.35	1.193s
SN-113	1565.74	391.69	197.	4.	0.002	480.57	1.196s
AG-108M	1734.69	433.94	28.	11.	0.006	95.73	1.238s
PM-146	1814.45	453.88	32.	12.	0.007	94.05	1.257s
SB-125	1852.39	463.37	66.	8.	0.004	147.90	1.266
BE-7	1909.29	477.60	124.	-15.	-0.009	105.33	1.280s
La-140	1946.98	487.02	33.	6.	0.003	204.34	1.289s
RU-103	1987.11	497.05	32.	10.	0.006	115.18	1.298s
RH-106	2046.35	511.86	84.	33.	0.018	43.29	2.563s
Kr-85	2054.81	513.98	117.	16.	0.009	99.73	1.315s
Nd-147	2122.88	531.00	26.	11.	0.006	96.52	1.331s
Ba-140	2147.92	537.26	30.	-5.	-0.003	215.19	1.337s
CS-134	2251.82	563.24	30.	13.	0.007	94.10	1.362s
CS-134	2276.15	569.32	60.	-16.	-0.009	73.72	1.367
PA-234	2276.75	569.47	70.	-7.	-0.004	167.50	1.368s
BI-207	2277.68	569.70	70.	8.	0.005	145.82	1.368s
TL-208	2331.05	583.04	9.	115.	0.064	11.15	1.109
SB-125	2400.87	600.50	392.	-5.	-0.003	512.77	1.397
SB-124	2409.79	602.73	387.	0.	0.000	1000.00	1.399s
BI-214	2436.11	609.31	35.	230.	0.128	7.56	1.405D
RU-103	2440.06	610.30	392.	-5.	-0.003	512.77	1.406s
AG-108M	2455.99	614.28	366.	-15.	-0.008	185.71	1.410
PM-144	2471.12	618.06	351.	-3.	-0.002	897.19	1.414s
RH-106	2486.54	621.92	318.	13.	0.007	195.25	1.417s
SB-125	2542.43	635.89	9.	15.	0.009	37.27	1.430s
I-131	2546.77	636.97	41.	-8.	-0.005	116.49	1.432s
AG-110M	2629.92	657.76	50.	-9.	-0.005	114.16	1.451s
CS-137	2645.51	661.66	37.	10.	0.006	90.84	1.455s
PM-144	2785.05	696.54	37.	-4.	-0.002	302.94	1.487s
NB-94	2809.41	702.63	51.	-8.	-0.005	185.64	1.493s
SB-124	2890.04	722.79	49.	6.	0.003	169.97	1.512s
AG-108M	2890.65	722.94	55.	0.	0.000	1000.00	1.512s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
EU-154	2892.34	723.36	55.	0.	0.000	1000.00	1.512s
ZR-95	2895.69	724.20	55.	0.	0.000	1000.00	1.513
BI-212	2907.58	727.17	37.	11.	0.006	86.87	1.516s
PM-146	2941.78	735.72	56.	-18.	-0.010	89.58	1.524s
PM-146	2987.55	747.16	9.	8.	0.004	93.28	1.535s
NB-95	3062.08	765.79	66.	-10.	-0.006	114.09	1.552s
PA-234M	3064.57	766.41	52.	15.	0.008	71.73	1.552s
EU-152	3114.61	778.92	9.	8.	0.004	91.66	1.564s
BI-212	3140.62	785.42	14.	9.	0.005	90.03	1.570s
CS-134	3182.43	795.87	42.	12.	0.007	80.32	1.579s
TL-210	3197.35	799.60	62.	-15.	-0.008	81.10	1.583s
CO-58	3242.06	810.78	38.	11.	0.006	84.23	1.593s
La-140	3262.05	815.77	49.	5.	0.003	206.31	1.598s
Cs-136	3272.97	818.50	46.	10.	0.005	105.53	1.600s
MN-54	3338.38	834.85	23.	4.	0.002	284.30	1.615
TL-208	3439.54	860.13	0.	39.	0.022	16.01	2.416s
NB-94	3483.41	871.10	54.	-12.	-0.007	91.29	1.648s
EU-154	3491.95	873.23	64.	7.	0.004	165.99	1.650s
PA-234	3521.16	880.53	56.	-4.	-0.002	276.39	1.657s
PA-234	3532.00	883.24	56.	3.	0.002	317.82	1.659
AG-110M	3537.78	884.68	53.	0.	0.000	1000.00	1.660s
Sc-46	3556.17	889.28	66.	-12.	-0.006	103.80	1.664s
Y-88	3591.22	898.04	35.	-15.	-0.008	90.47	1.672s
AC-228	3643.36	911.07	20.	56.	0.031	22.06	1.684
AG-110M	3749.09	937.49	30.	-2.	-0.001	606.22	1.708s
PA-234	3783.21	946.02	30.	-13.	-0.007	96.69	1.716s
EU-152	3855.60	964.11	36.	37.	0.021	28.07	1.732s
AC-228	3875.05	968.97	70.	7.	0.004	169.08	1.736s
EU-154	3984.54	996.33	71.	-16.	-0.009	77.71	1.761s
PA-234M	4003.22	1001.00	87.	-12.	-0.007	114.21	1.765s
EU-154	4018.33	1004.77	133.	-19.	-0.011	86.93	1.768s
Co-56	4150.66	1037.84	27.	-3.	-0.001	444.41	1.798
Cs-136	4191.60	1048.07	27.	3.	0.002	225.83	1.807s
RH-106	4200.76	1050.36	44.	-8.	-0.005	118.19	1.809s
BI-207	4253.99	1063.66	32.	-14.	-0.008	95.65	1.820s
Ga-68	4308.98	1077.40	5.	20.	0.011	34.94	1.833s
FE-59	4396.44	1099.25	11.	9.	0.005	87.98	1.852s
EU-152	4447.76	1112.07	122.	-13.	-0.007	123.53	1.863s
ZN-65	4461.66	1115.55	109.	-5.	-0.003	316.66	1.866s
BI-214	4480.12	1120.16	0.	77.	0.043	11.40	0.714s
Ta-182	4484.69	1121.30	128.	-16.	-0.009	103.57	1.871s
CO-60	4692.57	1173.24	21.	6.	0.003	189.97	1.916s
Ta-182	4755.86	1189.05	0.	15.	0.008	25.82	1.930
Ta-182	4885.39	1221.41	34.	-4.	-0.002	345.51	1.957
Co-56	4952.92	1238.28	6.	49.	0.027	18.19	1.972s
NA-22	5098.03	1274.53	34.	-12.	-0.007	74.54	2.003s
EU-154	5098.08	1274.54	46.	0.	0.000	1000.00	2.003s
FE-59	5166.35	1291.60	6.	7.	0.004	88.04	2.017s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
TL-210	5252.04	1313.00	34.	-17.	-0.010	82.40	2.036s
CO-60	5330.11	1332.50	17.	-7.	-0.004	143.21	2.052s
AG-110M	5537.48	1384.30	17.	-8.	-0.004	125.93	2.096s
EU-152	5632.39	1408.00	24.	-6.	-0.003	201.38	2.115s
K-40	5843.49	1460.73	0.	280.	0.156	5.98	1.705
La-140	6386.02	1596.21	12.	-2.	-0.001	424.26	2.269
BI-214	7060.00	1764.49	30.	8.	0.004	110.35	2.403s
Co-56	7087.48	1771.35	51.	-11.	-0.006	97.91	2.408s
Y-88	7346.69	1836.06	0.	6.	0.003	40.82	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	-4.9976E+00				5.31E+01	
			477.60	-4.998E+00	&(	1.771E+01 1.05E+02 1.05E+01	G
NA-22	C	-8.4291E-01				9.50E+02	
			1274.53	-8.429E-01	?(	2.099E+00 7.45E+01 9.99E+01	G
K-40	N	2.0498E+02				4.66E+11	
			1460.83	2.050E+02	(	5.395E+00 5.98E+00 1.07E+01	G
Sc-46	F	-6.1882E-01				8.38E+01	
			889.28	-6.188E-01	&(	2.175E+00 1.04E+02 1.00E+02	G
			1120.55	2.431E-07	%	3.201E+00 3.78E+08 1.00E+02	G
CR-51	F	4.5362E+00				2.77E+01	
			320.08	4.536E+00	?(	2.821E+01 1.86E+02 9.94E+00	G
MN-54	C	1.8851E-01				3.12E+02	
			834.85	1.885E-01	?(	1.297E+00 2.84E+02 1.00E+02	G
FE-59	F	1.0731E+00				4.45E+01	
			1099.25	1.012E+00	?(	1.993E+00 8.80E+01 5.65E+01	G
			1291.60	1.152E+00	?(	2.266E+00 8.80E+01 4.32E+01	G
Co-56	C	2.0095E+00				7.73E+01	
			846.77	-5.196E-02	%(	1.467E+00 1.21E+03 9.99E+01	G
			1238.28	5.128E+00	(	1.435E+00 1.82E+01 6.61E+01	G
			1037.84	-1.136E+00	+	1.141E+01 4.44E+02 1.41E+01	G
			1771.35	-6.421E+00	+	2.130E+01 9.79E+01 1.55E+01	A

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CO-57	C 2.9709E-01				2.72E+02		
		122.06	-7.475E-03	%(	1.376E+00	5.40E+03	8.56E+01 G
		136.47	2.738E+00	@(	1.747E+01	1.91E+02	1.07E+01 G
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 -6.7514E-02				1.93E+03		
		1332.50	-5.087E-01	?(	1.593E+00	1.43E+02	1.00E+02 G
		1173.24	3.740E-01	?(	1.599E+00	1.90E+02	9.99E+01 G
ZN-65	F -5.9060E-01				2.44E+02		
		1115.55	-5.906E-01	?(	6.437E+00	3.17E+02	5.06E+01 G
NB-94	I -3.8627E-01				7.41E+06		
		702.63	-3.863E-01	(	1.673E+00	1.86E+02	9.79E+01 G
		871.10	-6.367E-01	&	1.961E+00	9.13E+01	9.99E+01 G
ZR-95	I -2.9307E-02				6.40E+01		
		756.73	-2.931E-02	%(	2.217E+00	3.08E+03	5.45E+01 G
		724.20	0.000E+00	+	3.916E+00	1.00E+03	4.42E+01 G
NB-95	I -5.0817E-01				6.40E+01		
		765.79	-5.082E-01	?(	1.970E+00	1.14E+02	9.98E+01 G
RU-103	I 3.8681E-01				3.93E+01		
		497.05	3.868E-01	?(	1.124E+00	1.15E+02	9.09E+01 G
		610.30	-3.905E+00	+	6.767E+01	5.13E+02	5.75E+00 GA
RH-106	I 5.4513E+00				3.74E+02		
		621.92	5.451E+00	&(	3.585E+01	1.95E+02	9.93E+00 G
		1050.36	-3.244E+01	+	1.313E+02	1.18E+02	1.56E+00 G
		511.86	5.882E+00	?	8.163E+00	4.33E+01	2.00E+01 GA
AG-108M	C 3.9912E-01				1.53E+05		
		433.94	3.991E-01	(	9.597E-01	9.57E+01	9.05E+01 G
		722.94	0.000E+00	-	1.901E+00	1.00E+03	9.08E+01 G
		614.28	-6.735E-01	&	4.205E+00	1.86E+02	8.98E+01 G
SN-113	F 1.9060E-01				1.15E+02		
		391.69	1.906E-01	?(	3.127E+00	4.81E+02	6.40E+01 G
SB-124	F 2.5480E-01				6.02E+01		
		602.73	0.000E+00	&(	3.897E+00	1.00E+03	9.83E+01 G
		1690.98	-1.230E-01	%	3.559E+00	1.33E+03	4.78E+01 G
		722.79	2.571E+00	?(	1.514E+01	1.70E+02	1.08E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	I	1.7175E+00					1.01E+03	
			427.88	-1.061E-01	%(	3.851E+00	1.42E+03	2.96E+01 G
			600.50	-1.242E+00	+	2.153E+01	5.13E+02	1.79E+01 G
			635.89	5.721E+00	?(	6.130E+00	3.73E+01	1.13E+01 G
			463.37	2.548E+00	?(	1.292E+01	1.48E+02	1.05E+01 G
I-131	I	8.2443E-01					8.02E+00	
			364.48	1.360E-01	&(	1.319E+00	3.82E+02	8.17E+01 G
			284.30	9.985E+00	*(	1.210E+01	4.86E+01	6.14E+00 G
			636.97	-4.813E+00	+	1.922E+01	1.16E+02	7.17E+00 G
Gd-153	F	-1.1271E+00					2.42E+02	
			97.50	-1.127E+00	?(	5.597E+00	1.49E+02	3.00E+01 G
			103.20	0.000E+00	&	7.477E+00	1.00E+03	2.18E+01 G
Ga-68	C	4.3055E+01					4.71E-02	
			1077.40	4.305E+01	?(	2.949E+01	3.49E+01	3.30E+00 G
BA-133	F	2.8567E-01					3.85E+03	
			356.00	2.857E-01	?(	4.269E+00	4.43E+02	6.20E+01 G
			302.85	-2.432E+00	&	1.623E+01	1.99E+02	1.83E+01 G
			383.84	-6.262E+00	+	2.245E+01	1.07E+02	8.94E+00 GA
			80.99	-7.687E-01	&	3.686E+00	1.79E+02	3.41E+01 GA
CS-134	I	1.1644E+00					7.54E+02	
			795.87	7.129E-01	?(	1.921E+00	8.03E+01	8.55E+01 G
			604.71	5.722E-02	%	3.926E+00	2.02E+03	9.76E+01 G
			569.32	-3.988E+00	+	9.791E+00	7.37E+01	1.54E+01 G
			801.95	-3.171E-01	%	2.300E+01	2.06E+03	8.69E+00 G
			563.24	5.789E+00	?(	1.312E+01	9.41E+01	8.35E+00 G
CS-137	I	5.1573E-01					1.10E+04	
			661.66	5.157E-01	?(	1.586E+00	9.08E+01	8.52E+01 G
CE-139	F	-1.0210E-02					1.38E+02	
			165.85	-1.021E-02	&(	1.620E+00	4.65E+03	7.99E+01 G
Ba-140	I	-8.1490E-01					1.28E+01	
			537.26	-8.149E-01	?(	4.336E+00	2.15E+02	2.44E+01 G
			162.66	-6.254E+00	+	2.248E+01	1.08E+02	6.22E+00 G
			304.85	-1.046E+01	+	6.874E+01	1.96E+02	4.29E+00 G
La-140	I	3.8786E-01					1.28E+01	
			1596.21	-1.760E-01	?(	1.659E+00	4.24E+02	9.54E+01 G
			487.02	4.255E-01	?(	2.231E+00	2.04E+02	4.55E+01 G
			328.76	2.173E+00	(	7.216E+00	9.90E+01	2.03E+01 G
			815.77	1.069E+00	?(	7.678E+00	2.06E+02	2.33E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CE-141	I	6.8074E-01					3.25E+01	
			145.44	6.807E-01	?(	3.464E+00	1.52E+02	4.82E+01 G
CE-144	I	-3.3061E+00					2.85E+02	
			133.54	-3.306E+00	(	1.782E+01	1.61E+02	1.11E+01 G
PM-144	C	-1.9738E-01					3.63E+02	
			696.54	-1.974E-01	(	1.420E+00	3.03E+02	9.90E+01 G
			618.06	-1.234E-01	+	3.754E+00	8.97E+02	9.91E+01 G
EU-152	F	3.8478E+00					4.94E+03	
			121.78	-1.178E+00	?(	3.948E+00	1.00E+02	2.86E+01 G
			344.29	9.208E-01	&	6.345E+00	2.03E+02	2.65E+01 G
			1112.07	-6.017E+00	+	2.512E+01	1.24E+02	1.36E+01 G
			778.92	2.906E+00	?(	6.403E+00	9.17E+01	1.29E+01 G
			964.11	1.452E+01	?(	1.195E+01	2.81E+01	1.46E+01 G
			244.69	-6.125E+00	+	3.379E+01	1.65E+02	7.58E+00 G
			1408.00	-2.167E+00	-	9.223E+00	2.01E+02	2.10E+01 GA
EU-154	I	1.0147E+00					3.14E+03	
			123.10	4.088E-01	?(	2.623E+00	1.90E+02	4.08E+01 G
			1274.54	0.000E+00	-	6.846E+00	1.00E+03	3.52E+01 G
			723.36	0.000E+00	-	8.542E+00	1.00E+03	2.02E+01 G
			873.23	3.029E+00	?(	1.731E+01	1.66E+02	1.23E+01 G
			1004.77	-6.348E+00	+	1.844E+01	8.69E+01	1.80E+01 G
			996.33	-8.932E+00	+	2.316E+01	7.77E+01	1.06E+01 G
EU-155	I	2.3210E+00					1.81E+03	
			105.31	2.321E+00	*(	3.122E+00	5.01E+01	2.12E+01 G
			86.54	4.199E-01	}	6.498E+00	2.39E+02	3.07E+01 G
HF-181	F	4.1129E-01					4.24E+01	
			482.00	-2.523E-02	%(	2.464E+00	2.83E+03	8.05E+01 G
			133.02	-8.456E-01	+	4.625E+00	1.64E+02	4.33E+01 G
			345.83	2.743E+00	&(	1.145E+01	1.24E+02	1.51E+01 G
			136.30	-6.316E+00	+	3.448E+01	1.64E+02	5.85E+00 G
Ta-182	F	-3.3583E-02					1.14E+02	
			1121.30	-2.911E+00	?(	1.014E+01	1.04E+02	3.49E+01 G
			1221.41	-1.007E+00	+	7.521E+00	3.46E+02	2.70E+01 G
			1189.05	6.166E+00	(	3.030E+00	2.58E+01	1.62E+01 G
Hg-203	F	3.9315E-01					4.66E+01	
			279.20	3.931E-01	?(	1.180E+00	8.93E+01	8.15E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	N	5.3884E+00					6.98E+02	
			583.02	5.388E+00	(	7.820E-01	1.12E+01	8.45E+01 G
			277.28	-8.941E-01	&	1.592E+01	5.11E+02	6.31E+00 G
			860.56	1.650E+01	+	3.118E+00	1.60E+01	1.24E+01 G
PM-146	C	7.7135E-01					2.02E+03	
			453.88	6.241E-01	?(	1.468E+00	9.40E+01	6.50E+01 G
			747.16	1.053E+00	?(	2.365E+00	9.33E+01	3.40E+01 G
			735.72	-3.827E+00	+	7.837E+00	8.96E+01	2.25E+01 G
Y-88	F	5.7281E-01					1.07E+02	
			1836.06	5.728E-01	?(	7.036E-01	4.08E+01	9.92E+01 G
			898.04	-8.674E-01	-	1.751E+00	9.05E+01	9.37E+01 G
Cd-113m		1.0875E+03					5.33E+03	
			263.70	1.088E+03	&(	1.941E+04	5.17E+02	6.00E-03 K
Cd-109	F	6.6178E+00					4.53E+02	
							Derived Ave Activity	
			88.04	6.618E+00	}(	5.143E+01	2.32E+02	3.79E+00 G
Cf-251	T	-4.2879E-01					3.28E+05	
			176.60	-4.288E-01	&(	5.711E+00	5.12E+02	1.70E+01 G
			227.00	4.142E+00	?	1.628E+01	1.52E+02	6.30E+00 GA
Cf-249	T	-8.5819E-01					1.28E+05	
			387.95	-8.582E-01	?(	3.202E+00	1.11E+02	6.60E+01 G
			333.44	-3.311E+00	+	1.126E+01	1.02E+02	1.55E+01 G
Sn-126		3.0274E+00					3.65E+07	
			87.57	1.771E+00	}	5.115E+00	4.37E+01	3.75E+01 GA
			64.28	3.027E+00	&(	1.572E+01	1.93E+02	9.70E+00 G
			86.94	3.027E+00	}	2.119E+01	1.10E+02	9.04E+00 GA
PB-210	N	4.1951E+01					8.14E+03	
			46.54	4.195E+01	@(P	4.104E+01	3.85E+01	4.25E+00 G
PB-212	N	1.3063E+01					6.98E+02	
			238.63	1.306E+01	(	1.699E+00	7.01E+00	4.33E+01 G
			300.03	2.506E+01	+	1.954E+01	3.35E+01	3.28E+00 GA
PB-214	N	2.2502E+01					5.84E+05	
			351.93	2.250E+01	(	2.314E+00	7.05E+00	3.76E+01 G
			295.09	2.654E+01	+ P	4.617E+00	1.00E+01	1.93E+01 G
			242.00	1.723E+01	-	1.281E+01	2.47E+01	7.43E+00 GA

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
BI-207	C	-1.1519E+00					1.18E+04	
			1063.66	-1.152E+00	?(	2.392E+00	9.57E+01	7.45E+01 G
			569.70	3.319E-01	+	1.657E+00	1.46E+02	9.77E+01 G
BI-212	N	6.4959E+00					6.98E+02	
			727.17	6.496E+00	?(	1.906E+01	8.69E+01	7.55E+00 G
			785.42	3.633E+01	?	7.742E+01	9.00E+01	1.28E+00 GA
U-235	N	2.9782E+00					2.57E+11	
			143.79	2.978E+00	(	1.548E+01	1.55E+02	1.10E+01 G
			205.33	-8.442E+00	+	2.241E+01	1.04E+02	5.01E+00 G
			163.38	3.353E-01	%	2.570E+01	2.25E+03	5.08E+00 G
			185.72	-1.033E+00	- P	2.403E+00	7.11E+01	5.40E+01 GA
BI-214	N	2.0388E+01					5.84E+05	
			609.31	2.039E+01	(P	2.695E+00	7.56E+00	4.61E+01 G
			1120.29	3.248E+01	+	3.109E+00	1.14E+01	1.51E+01 G
			1764.49	4.454E+00	-	1.689E+01	1.10E+02	1.54E+01 G
BI-210M	T	6.3156E-01					1.10E+09	
			265.83	6.316E-01	?(	1.919E+00	9.05E+01	5.00E+01 G
			304.90	-1.603E+00	&	1.039E+01	1.94E+02	2.80E+01 G
AC-228	N	1.0573E+01					2.10E+03	
			911.07	1.057E+01	(	4.446E+00	2.21E+01	2.90E+01 G
			968.97	2.350E+00	-	1.366E+01	1.69E+02	1.75E+01 G
			338.32	3.580E+00	-	1.258E+01	1.05E+02	1.20E+01 G
			93.35	-3.015E+00	-	3.515E+01	3.48E+02	5.56E+00 XA
TH-227	N	1.4039E+00					7.95E+03	
			256.24	-3.956E+00	?(	1.570E+01	1.53E+02	7.00E+00 G
			235.97	-3.697E+00	+	2.095E+01	1.70E+02	1.23E+01 G
			50.14	6.094E+00	&(	2.817E+01	1.38E+02	8.00E+00 G
TH-229	N	3.4396E+00					2.68E+06	
			193.51	2.680E-01	%(	2.138E+01	3.04E+03	4.40E+00 G
			210.85	8.107E+00	?(	3.366E+01	1.61E+02	2.99E+00 G
TH-234	N	1.8004E+01					1.63E+12	
			92.59	1.800E+01	(P	1.631E+01	3.35E+01	5.58E+00 G
			63.29	4.346E-01	% P	5.300E+01	3.62E+03	3.81E+00 G
PA-231	N	-1.5465E+01					1.20E+07	
			302.65	-1.547E+01	?(	1.046E+02	2.02E+02	2.88E+00 G
			300.07	-1.795E+01	+	1.248E+02	2.08E+02	2.46E+00 G

Nuclide		Ave activity	Energy		Activity	Code	Peak	MDA	Comments
PA-233	C	-3.7570E-01						7.82E+08	
			312.01	-3.757E-01	?(	7.981E+00	6.31E+02	3.60E+01	G
			300.18	-7.124E+00	+	4.892E+01	2.05E+02	6.20E+00	G
PA-234	N	1.9149E+00						1.63E+12	
			131.29	1.927E+00	(	2.933E+00	5.20E+01	1.80E+01	G
			946.02	-5.459E+00	-	1.186E+01	9.67E+01	1.34E+01	G
			569.47	-3.432E+00	-	1.976E+01	1.67E+02	8.20E+00	G
			883.24	1.891E+00	?(	2.103E+01	3.18E+02	9.60E+00	G
			880.53	-3.465E+00	-	3.343E+01	2.76E+02	6.00E+00	GA
PA-234M	N	3.2121E+00						1.63E+12	
			1001.00	-8.380E+01	&(	3.241E+02	1.14E+02	8.37E-01	G
			766.41	2.509E+02	?(	5.986E+02	7.17E+01	2.94E-01	G
AM-241	T	1.3707E+00						1.58E+05	
			59.54	1.371E+00	(	5.963E+00	1.30E+02	3.59E+01	G
Cs-136	F	4.9208E-01						1.30E+01	
			818.50	4.814E-01	?(	1.730E+00	1.06E+02	1.00E+02	G
			1048.07	2.527E-01	?(	2.029E+00	2.26E+02	8.00E+01	G
			340.57	9.232E-01	&(	3.386E+00	1.09E+02	4.69E+01	G
Np-239	T	9.3352E-01						2.36E+00	
			103.70	-1.445E+00	+	6.273E+00	1.30E+02	2.40E+01	X
			106.13	9.335E-01	&(	6.972E+00	2.22E+02	2.27E+01	G
			99.50	-2.163E+00	+	1.092E+01	1.51E+02	1.50E+01	X
Nd-147		3.2208E+00						1.11E+01	
			531.00	3.221E+00	?(	7.523E+00	9.65E+01	1.30E+01	G
			91.10	0.000E+00	-	6.931E+00	1.00E+03	2.83E+01	G
TL-210	N	-7.3313E-01						5.84E+05	
			799.60	-7.331E-01	?(	1.991E+00	8.11E+01	9.90E+01	G
			296.00	-5.511E-01	+	3.895E+00	2.11E+02	7.90E+01	G
			1313.00	-5.934E+00	+	1.022E+01	8.24E+01	2.10E+01	GA
Kr-85	I	1.3275E+02						3.92E+03	
			513.98	1.327E+02	&(	4.449E+02	9.97E+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:
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	
TH-227	50.14	343.	19.	0.011	137.91	6.094E+00	
AM-241	59.54	516.	25.	0.014	130.27	1.371E+00	
BA-133	80.99	263.	-16.	-0.009	178.52	-7.687E-01	
Gd-153	97.50	543.	-22.	-0.012	148.53	-1.127E+00	
Np-239	99.50	521.	-22.	-0.012	151.03	-2.163E+00	
Np-239	103.70	443.	-23.	-0.013	129.85	-1.445E+00	
Np-239	106.13	493.	14.	0.008	222.44	9.335E-01	
EU-152	121.78	245.	-23.	-0.013	100.31	-1.178E+00	
EU-154	123.10	219.	11.	0.006	189.72	4.088E-01	
HF-181	133.02	775.	-24.	-0.013	163.87	-8.456E-01	
CE-144	133.54	753.	-24.	-0.013	161.50	-3.306E+00	
HF-181	136.30	777.	-24.	-0.013	163.55	-6.316E+00	
CO-57	136.47	662.	19.	0.011	190.72	2.738E+00	
U-235	143.79	529.	21.	0.012	155.42	2.978E+00	
CE-141	145.44	508.	21.	0.012	152.11	6.807E-01	
Ba-140	162.66	323.	-24.	-0.013	107.63	-6.254E+00	
Cf-251	176.60	139.	-4.	-0.002	511.87	-4.288E-01	
U-235	185.72	241.	-32.	-0.018	71.14	-1.033E+00	P
U-235	205.33	158.	-23.	-0.013	103.95	-8.442E+00	
TH-229	210.85	121.	13.	0.007	160.71	8.107E+00	
Cf-251	227.00	114.	13.	0.007	152.08	4.142E+00	
TH-227	235.97	725.	-23.	-0.013	169.62	-3.697E+00	
EU-152	244.69	680.	-23.	-0.013	165.10	-6.125E+00	
TH-227	256.24	110.	-13.	-0.007	153.46	-3.956E+00	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Cd-113m	263.70	119.	3.	0.002	517.47	1.088E+03	
BI-210M	265.83	78.	14.	0.008	90.45	6.316E-01	
Hg-203	279.20	72.	14.	0.008	89.35	3.931E-01	
I-131	284.30	40.	27.	0.015	48.58	9.985E+00	
TL-210	296.00	744.	-18.	-0.010	211.29	-5.511E-01	
PA-231	300.07	726.	-18.	-0.010	207.95	-1.795E+01	
PA-233	300.18	708.	-18.	-0.010	205.28	-7.124E+00	
PA-231	302.65	689.	-18.	-0.010	202.18	-1.547E+01	
BA-133	302.85	671.	-18.	-0.010	199.44	-2.432E+00	
Ba-140	304.85	652.	-19.	-0.010	196.40	-1.046E+01	
BI-210M	304.90	634.	-19.	-0.010	193.59	-1.603E+00	
Ir-192	308.44	615.	-19.	-0.010	190.19	-1.430E+00	
PA-233	312.01	596.	-5.	-0.003	631.13	-3.757E-01	
CR-51	320.08	545.	18.	0.010	185.63	4.536E+00	
La-140	328.76	136.	17.	0.010	98.99	2.173E+00	
Cf-249	333.44	192.	-20.	-0.011	101.54	-3.311E+00	
Cs-136	340.57	152.	16.	0.009	109.11	9.232E-01	
EU-152	344.29	169.	9.	0.005	202.87	9.208E-01	
HF-181	345.83	177.	15.	0.009	124.02	2.743E+00	
BA-133	356.00	410.	6.	0.004	442.56	2.857E-01	
I-131	364.48	60.	4.	0.002	382.43	1.360E-01	
BA-133	383.84	205.	-19.	-0.011	107.02	-6.262E+00	
Cf-249	387.95	225.	-19.	-0.011	111.35	-8.582E-01	
SN-113	391.69	197.	4.	0.002	480.57	1.906E-01	
AG-108M	433.94	28.	11.	0.006	95.73	3.991E-01	
PM-146	453.88	32.	12.	0.007	94.05	6.241E-01	
SB-125	463.37	66.	8.	0.004	147.90	2.548E+00	
BE-7	477.60	124.	-15.	-0.009	105.33	-4.998E+00	
La-140	487.02	33.	6.	0.003	204.34	4.255E-01	
RU-103	497.05	32.	10.	0.006	115.18	3.868E-01	
RH-106	511.86	84.	33.	0.018	43.29	5.882E+00	
Kr-85	513.98	117.	16.	0.009	99.73	1.327E+02	
Nd-147	531.00	26.	11.	0.006	96.52	3.221E+00	
Ba-140	537.26	30.	-5.	-0.003	215.19	-8.149E-01	
BI-207	569.70	70.	8.	0.005	145.82	3.319E-01	
SB-125	600.50	392.	-5.	-0.003	512.77	-1.242E+00	
RU-103	610.30	392.	-5.	-0.003	512.77	-3.905E+00	
AG-108M	614.28	366.	-15.	-0.008	185.71	-6.735E-01	
PM-144	618.06	351.	-3.	-0.002	897.19	-1.234E-01	
RH-106	621.92	318.	13.	0.007	195.25	5.451E+00	
SB-125	635.89	9.	15.	0.009	37.27	5.721E+00	
I-131	636.97	41.	-8.	-0.005	116.49	-4.813E+00	
AG-110M	657.76	50.	-9.	-0.005	114.16	-4.189E-01	
CS-137	661.66	37.	10.	0.006	90.84	5.157E-01	
PM-144	696.54	37.	-4.	-0.002	302.94	-1.974E-01	
NB-94	702.63	51.	-8.	-0.005	185.64	-3.863E-01	
SB-124	722.79	49.	6.	0.003	169.97	2.571E+00	
PM-146	735.72	56.	-18.	-0.010	89.58	-3.827E+00	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
PM-146	747.16	9.	8.	0.004	93.28	1.053E+00	
NB-95	765.79	66.	-10.	-0.006	114.09	-5.082E-01	
PA-234M	766.41	52.	15.	0.008	71.73	2.509E+02	
EU-152	778.92	9.	8.	0.004	91.66	2.906E+00	
TL-210	799.60	62.	-15.	-0.008	81.10	-7.331E-01	
CO-58	810.78	38.	11.	0.006	84.23	5.606E-01	
La-140	815.77	49.	5.	0.003	206.31	1.069E+00	
Cs-136	818.50	46.	10.	0.005	105.53	4.814E-01	
MN-54	834.85	23.	4.	0.002	284.30	1.885E-01	
NB-94	871.10	54.	-12.	-0.007	91.29	-6.367E-01	
EU-154	873.23	64.	7.	0.004	165.99	3.029E+00	
Sc-46	889.28	66.	-12.	-0.006	103.80	-6.188E-01	
Y-88	898.04	35.	-15.	-0.008	90.47	-8.674E-01	
AG-110M	937.49	30.	-2.	-0.001	606.22	-3.254E-01	
EU-152	964.11	36.	37.	0.021	28.07	1.452E+01	
EU-154	996.33	71.	-16.	-0.009	77.71	-8.932E+00	
PA-234M	1001.00	87.	-12.	-0.007	114.21	-8.380E+01	
EU-154	1004.77	133.	-19.	-0.011	86.93	-6.348E+00	
Cs-136	1048.07	27.	3.	0.002	225.83	2.527E-01	
RH-106	1050.36	44.	-8.	-0.005	118.19	-3.244E+01	
BI-207	1063.66	32.	-14.	-0.008	95.65	-1.152E+00	
FE-59	1099.25	11.	9.	0.005	87.98	1.012E+00	
EU-152	1112.07	122.	-13.	-0.007	123.53	-6.017E+00	
ZN-65	1115.55	109.	-5.	-0.003	316.66	-5.906E-01	
Ta-182	1121.30	128.	-16.	-0.009	103.57	-2.911E+00	
CO-60	1173.24	21.	6.	0.003	189.97	3.740E-01	
Ta-182	1189.05	0.	15.	0.008	25.82	6.166E+00	
Ta-182	1221.41	34.	-4.	-0.002	345.51	-1.007E+00	
NA-22	1274.53	34.	-12.	-0.007	74.54	-8.429E-01	
FE-59	1291.60	6.	7.	0.004	88.04	1.152E+00	
TL-210	1313.00	34.	-17.	-0.010	82.40	-5.934E+00	
CO-60	1332.50	17.	-7.	-0.004	143.21	-5.087E-01	
AG-110M	1384.30	17.	-8.	-0.004	125.93	-2.465E+00	
EU-152	1408.00	24.	-6.	-0.003	201.38	-2.167E+00	
La-140	1596.21	12.	-2.	-0.001	424.26	-1.760E-01	
Y-88	1836.06	0.	6.	0.003	40.82	5.728E-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	-4.9976E+00	-4.9976E+00	1.053E+02%	1.77E+01
NA-22	#A	-8.4291E-01	-8.4291E-01	7.454E+01%	2.10E+00
K-40		2.0498E+02	2.0498E+02	5.976E+00%	5.40E+00
Sc-46	#A	-6.1882E-01	-6.1882E-01	1.038E+02%	2.18E+00

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CR-51	#A	4.5361E+00	4.5362E+00	1.856E+02%	2.82E+01
MN-54	#A	1.8851E-01	1.8851E-01	2.843E+02%	1.30E+00
FE-59	#A	1.0731E+00	1.0731E+00	6.223E+01%	1.99E+00
Co-56	#C	2.0095E+00	2.0095E+00	1.819E+01%	1.47E+00
CO-57	#A	2.9709E-01	2.9709E-01	1.907E+02%	1.38E+00
CO-58	#A	5.6060E-01	5.6060E-01	8.423E+01%	1.59E+00
CO-60	#A	-6.7514E-02	-6.7514E-02	1.190E+02%	1.59E+00
ZN-65	#A	-5.9059E-01	-5.9060E-01	3.167E+02%	6.44E+00
NB-94	#A	-3.8627E-01	-3.8627E-01	1.856E+02%	1.67E+00
ZR-95	#A	-2.9307E-02	-2.9307E-02	3.079E+03%	2.22E+00
NB-95	#A	-5.0817E-01	-5.0817E-01	1.141E+02%	1.97E+00
RU-103	#A	3.8680E-01	3.8681E-01	1.152E+02%	1.12E+00
RH-106	#A	5.4513E+00	5.4513E+00	1.952E+02%	3.58E+01
AG-108M	#A	3.9912E-01	3.9912E-01	9.573E+01%	9.60E-01
AG-110M	#A	0.0000E+00	0.0000E+00	1.000E+03%	2.70E+00
SN-113	#A	1.9060E-01	1.9060E-01	4.806E+02%	3.13E+00
SB-124	#A	2.5480E-01	2.5480E-01	1.700E+02%	3.90E+00
SB-125	#A	1.7175E+00	1.7175E+00	3.727E+01%	3.85E+00
I-131	#A	8.2440E-01	8.2443E-01	4.858E+01%	1.32E+00
Gd-153	#A	-1.1271E+00	-1.1271E+00	1.485E+02%	5.60E+00
Ga-68	#	4.2828E+01	4.3055E+01	3.494E+01%	2.95E+01
Tc-99m	#A	0.0000E+00	0.0000E+00	1.000E+03%	2.14E+00
BA-133	#A	2.8567E-01	2.8567E-01	4.426E+02%	4.27E+00
CS-134	#A	1.1644E+00	1.1644E+00	6.186E+01%	1.92E+00
CS-137	#A	5.1573E-01	5.1573E-01	9.084E+01%	1.59E+00
CE-139	#A	-1.0210E-02	-1.0210E-02	4.654E+03%	1.62E+00
Ba-140	#A	-8.1489E-01	-8.1490E-01	2.152E+02%	4.34E+00
La-140	#A	3.8785E-01	3.8786E-01	9.899E+01%	1.66E+00
CE-141	#A	6.8073E-01	6.8074E-01	1.521E+02%	3.46E+00
CE-144	#A	-3.3061E+00	-3.3061E+00	1.615E+02%	1.78E+01
PM-144	#A	-1.9738E-01	-1.9738E-01	3.029E+02%	1.42E+00
EU-152	#A	3.8478E+00	3.8478E+00	2.807E+01%	3.95E+00
EU-154	#A	1.0147E+00	1.0147E+00	1.260E+02%	2.62E+00
EU-155	#A	2.3210E+00	2.3210E+00	5.007E+01%	3.12E+00
HF-181	#A	4.1129E-01	4.1129E-01	1.240E+02%	2.46E+00
Ta-182	#A	-3.3583E-02	-3.3583E-02	2.582E+01%	1.01E+01
Hg-203	#A	3.9314E-01	3.9315E-01	8.935E+01%	1.18E+00
TL-208		5.3883E+00	5.3884E+00	1.115E+01%	7.82E-01
PM-146	#A	7.7135E-01	7.7135E-01	6.623E+01%	1.47E+00
Y-88	#A	5.7281E-01	5.7281E-01	4.082E+01%	7.04E-01
Cd-113m	#A	1.0875E+03	1.0875E+03	5.175E+02%	1.94E+04
Cd-109	#A	6.6178E+00	6.6178E+00	2.321E+02%	5.14E+01
Cf-251	#A	-4.2879E-01	-4.2879E-01	5.119E+02%	5.71E+00
Cf-249	#A	-8.5819E-01	-8.5819E-01	1.114E+02%	3.20E+00
Sn-126	A	3.0274E+00	3.0274E+00	1.934E+02%	1.57E+01
PB-210	#	4.1951E+01	4.1951E+01	3.853E+01%	4.10E+01
PB-212		1.3063E+01	1.3063E+01	7.010E+00%	1.70E+00
PB-214		2.2502E+01	2.2502E+01	7.046E+00%	2.31E+00
BI-207	#A	-1.1519E+00	-1.1519E+00	9.565E+01%	2.39E+00

BI-212 #A	6.4959E+00	6.4959E+00	8.687E+01%		1.91E+01
U-235 #A	2.9782E+00	2.9782E+00	1.554E+02%		1.55E+01
BI-214	2.0388E+01	2.0388E+01	7.564E+00%		2.70E+00
BI-210M#A	6.3156E-01	6.3156E-01	9.045E+01%		1.92E+00
AC-228 #	1.0573E+01	1.0573E+01	2.206E+01%		4.45E+00
TH-227 #A	1.4039E+00	1.4039E+00	1.032E+02%		1.57E+01
TH-229 #A	3.4396E+00	3.4396E+00	1.607E+02%		2.14E+01
TH-234	1.8004E+01	1.8004E+01	3.351E+01%		1.63E+01
PA-231 #A	-1.5465E+01	-1.5465E+01	2.022E+02%		1.05E+02
PA-233 #A	-3.7570E-01	-3.7570E-01	6.311E+02%		7.98E+00
PA-234 A	1.9149E+00	1.9149E+00	5.199E+01%		2.93E+00
PA-234M#A	3.2121E+00	3.2121E+00	6.744E+01%		3.24E+02
AM-241 #A	1.3707E+00	1.3707E+00	1.303E+02%		5.96E+00
Np-237 #A	0.0000E+00	0.0000E+00	1.000E+03%		1.51E+01
Ir-192 #A	0.0000E+00	0.0000E+00	1.000E+03%		3.32E+00
Cs-136 #A	4.9207E-01	4.9208E-01	9.070E+01%		1.73E+00
Np-239 #A	9.3342E-01	9.3352E-01	2.224E+02%		6.97E+00
Nd-147 #A	3.2207E+00	3.2208E+00	9.652E+01%		7.52E+00
TL-210 #A	-7.3313E-01	-7.3313E-01	8.110E+01%		1.99E+00
Kr-85 #A	1.3275E+02	1.3275E+02	9.973E+01%		4.45E+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) 3.305E+02 Bq/Sample
Total Decayed Activity (25.1 to 1999.1 keV) 3.3051447E+02 Bq/Sample

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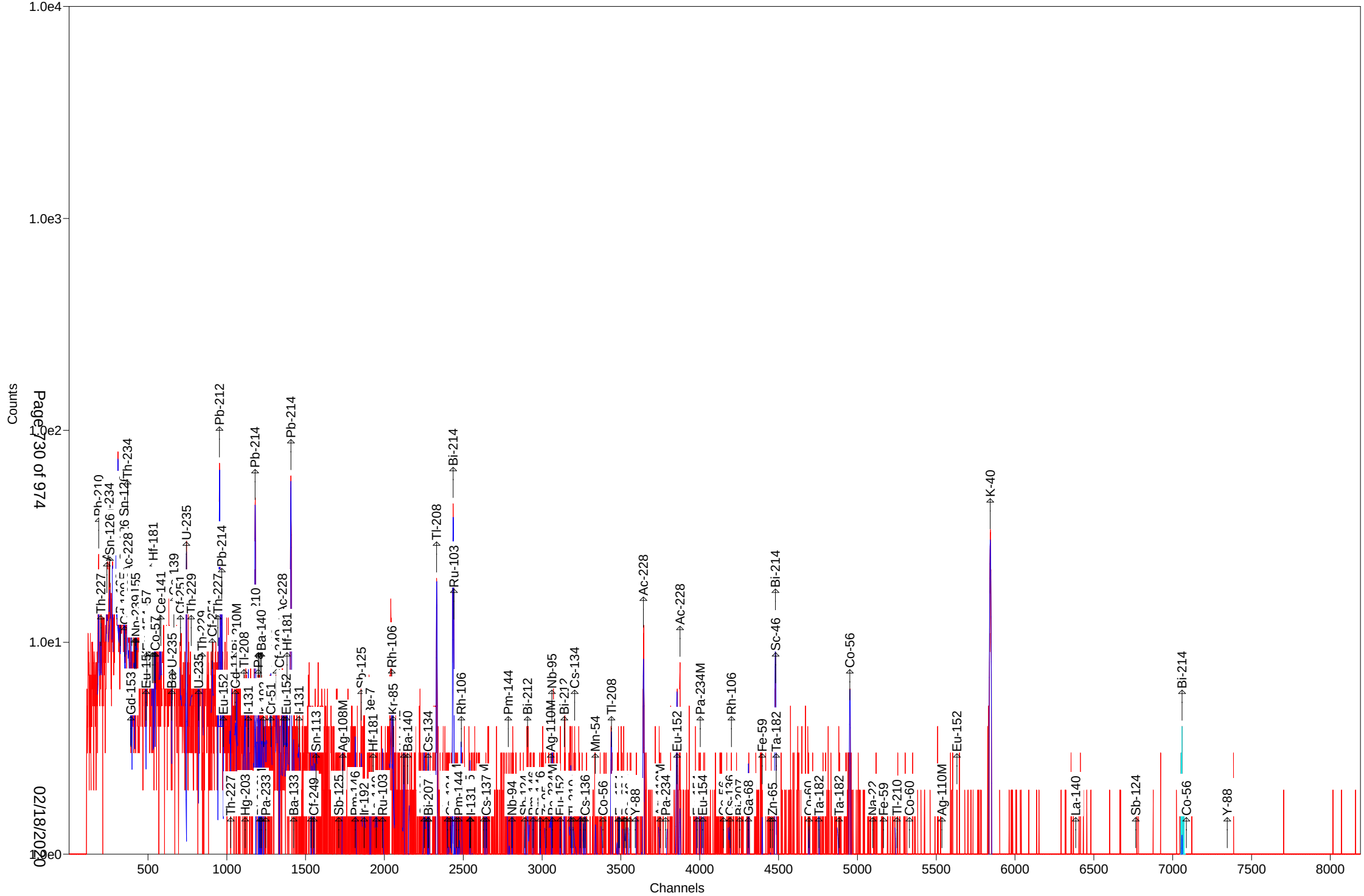
453329_Gamma_160-36593-A-12-B. 12_Gamma_20193738.spc.



Test America St. Louis Spectrum ID: 5_Gamma_20193409

Sample Description: 453329_Gamma_160-36593-A-13-B
Detector: Detector # 5
Batch ID: 453329
Work Order Number: Gamma
Lot Number: 160-36593-A-13-B

Decay to Time: 12/27/2019 10:14 Live Time: 1800 sec
Acquisition Time: 12/27/2019 10:14:44 Real Time: 1806 sec
Analysis Time: 12/27/2019 10:45 Dead Time: 0.31 %
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_2019-12-07_1448.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	1.720E+00	242.4	4.170E+00	4.171E+00	1.455E+01
NA-22	2.266E-01	208.5	4.724E-01	4.725E-01	1.741E+00
K-40	2.420E+02	6.6	1.591E+01	2.016E+01	1.076E+01
Sc-46	5.469E-01	99.5	5.445E-01	5.452E-01	1.866E+00
CR-51	2.984E+00	128.9	3.846E+00	3.849E+00	1.310E+01
MN-54	-6.108E-01	100.8	6.155E-01	6.163E-01	2.005E+00
FE-59	-1.626E-01	97.0	1.576E-01	1.578E-01	3.572E+00
Co-56	4.562E-01	184.9	8.437E-01	8.440E-01	1.588E+00
CO-57	3.136E-01	142.3	4.464E-01	4.467E-01	1.169E+00
CO-58	2.021E-01	297.3	6.007E-01	6.008E-01	2.122E+00
CO-60	7.346E-01	40.7	2.988E-01	3.011E-01	7.427E-01
ZN-65	0.000E+00	1.#INF	1.714E-01	1.714E-01	4.967E+00
NB-94	1.911E-01	304.9	5.826E-01	5.827E-01	1.472E+00
ZR-95	8.172E-01	92.5	7.561E-01	7.573E-01	1.890E+00
NB-95	3.044E-01	281.3	8.562E-01	8.564E-01	2.956E+00
RU-103	2.271E-01	51.5	1.170E-01	1.176E-01	3.574E-01
RH-106	8.921E-01	515.8	4.601E+00	4.601E+00	1.184E+01
AG-108M	1.708E-01	286.8	4.900E-01	4.900E-01	1.266E+00
AG-110M	5.364E-01	44.7	2.399E-01	2.415E-01	2.975E+00
SN-113	-7.717E-01	117.3	9.054E-01	9.062E-01	3.056E+00
SB-124	-4.890E-01	249.4	1.220E+00	1.220E+00	4.127E+00
SB-125	3.888E+00	22.3	8.658E-01	8.883E-01	4.419E+00
I-131	-3.473E-01	164.5	5.714E-01	5.716E-01	1.504E+00
Gd-153	2.236E-01	114.3	2.556E-01	2.560E-01	3.476E+00
Ga-68	1.757E+01	93.2	1.638E+01	1.641E+01	3.924E+01
Tc-99m	3.045E-01	126.1	3.841E-01	3.845E-01	1.292E+00
BA-133	-6.456E-01	175.2	1.131E+00	1.132E+00	3.822E+00
CS-134	6.909E-01	133.7	9.236E-01	9.242E-01	2.326E+00
CS-137	3.263E-01	185.4	6.050E-01	6.052E-01	2.107E+00
CE-139	-9.617E-02	423.2	4.070E-01	4.071E-01	1.393E+00
Ba-140	1.157E+00	136.8	1.583E+00	1.584E+00	4.118E+00
La-140	2.558E-01	193.2	4.942E-01	4.944E-01	1.720E+00
CE-141	-1.578E-02	4703.7	7.421E-01	7.421E-01	2.537E+00

CE-144	-3.176E+00	134.8	4.280E+00	4.283E+00	1.432E+01
PM-144	-1.032E+00	90.8	9.374E-01	9.390E-01	2.225E+00
EU-152	2.789E+00	46.4	1.295E+00	1.303E+00	3.354E+00
EU-154	1.684E+00	113.6	1.913E+00	1.915E+00	2.496E+00
EU-155	2.362E-01	157.3	3.714E-01	3.716E-01	6.439E+00
HF-181	-3.647E-01	165.9	6.050E-01	6.053E-01	2.084E+00
Ta-182	-3.344E+00	103.5	3.460E+00	3.464E+00	1.167E+01
Hg-203	-2.029E-01	250.3	5.079E-01	5.080E-01	1.742E+00
TL-208	6.317E+00	12.2	7.679E-01	8.349E-01	1.124E+00
PM-146	3.733E-01	196.7	7.344E-01	7.346E-01	1.734E+00
Y-88	-3.639E-02	2043.8	7.438E-01	7.438E-01	9.809E-01
Cd-113m	-7.093E+03	96.9	6.871E+03	6.886E+03	2.307E+04
Cd-109	7.699E+00	214.3	1.650E+01	1.650E+01	5.519E+01
Cf-251	-1.245E+00	176.9	2.202E+00	2.205E+00	5.983E+00
Cf-249	6.699E-01	109.8	7.356E-01	7.364E-01	2.488E+00
Sn-126	-4.337E+00	111.1	4.820E+00	4.825E+00	1.613E+01
PB-210	-2.094E+01	57.6	1.207E+01	1.213E+01	4.815E+01
PB-212	1.856E+01	6.0	1.106E+00	1.633E+00	1.607E+00
PB-214	1.251E+01	10.1	1.261E+00	1.419E+00	2.198E+00
BI-207	-2.309E+00	35.4	8.180E-01	8.262E-01	4.354E+00
BI-212	3.047E+01	21.1	6.413E+00	6.605E+00	1.056E+01
U-235	2.445E+00	130.5	3.189E+00	3.192E+00	1.073E+01
BI-214	1.295E+01	11.9	1.541E+00	1.681E+00	3.422E+00
BI-210M	-9.335E-01	100.3	9.360E-01	9.376E-01	3.139E+00
AC-228	2.110E+01	13.6	2.876E+00	3.071E+00	7.468E+00
TH-227	4.719E+00	110.3	5.204E+00	5.211E+00	1.353E+01
TH-229	5.627E+00	126.8	7.136E+00	7.150E+00	2.148E+01
TH-234	2.524E+01	21.6	5.445E+00	5.624E+00	1.551E+01
PA-231	0.000E+00	1.#INF	6.244E+00	6.244E+00	8.757E+01
PA-233	1.112E+00	177.1	1.969E+00	1.970E+00	6.635E+00
PA-234	2.218E-01	79.2	1.756E-01	1.760E-01	8.319E+00
PA-234M	7.197E+01	84.3	6.070E+01	6.080E+01	3.356E+02
AM-241	-3.721E-01	277.8	1.034E+00	1.034E+00	3.878E+00
Np-237	2.241E+00	204.2	4.575E+00	4.576E+00	1.531E+01
Ir-192	4.030E-01	102.7	4.139E-01	4.146E-01	1.401E+00
Cs-136	1.204E+00	22.9	2.761E-01	2.846E-01	1.968E+00
Np-239	-1.209E+00	152.2	1.840E+00	1.842E+00	6.174E+00
Nd-147	2.488E-01	163.3	4.062E-01	4.065E-01	9.151E+00
TL-210	9.943E-02	634.2	6.306E-01	6.306E-01	2.240E+00
Kr-85	6.412E+01	236.8	1.518E+02	1.519E+02	5.214E+02
Total	5.717E+02				

Analyst: Jasmine Stewart

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Sample description
453329_Gamma_160-36593-A-13-B

Spectrum Filename: C:\User\SPC\Det5\5_Gamma_20193409.An1

Acquisition information
Start time: 12/27/2019 10:14:44 AM
Live time: 1800
Real time: 1806
Dead time: 0.31 %
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	12/27/2019 10:14:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	5_2019-12-07_1448.PBC 12/7/2019 2:48:46 PM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 24 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 0.1107

***** 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
63.40	46.	34.94	1.01	2.717E-02	63.29	3.810	2.495E+01	TH234
74.73	172.	11.19	0.81	3.149E-02				
77.15	253.	8.51	0.82	3.221E-02				
80.99	18.	210.15	0.82	3.320E-02	80.99	34.060	PBC<MDA	BA133
83.81	37.	40.06	0.82	3.383E-02				
87.03	57.	29.20	0.83	3.445E-02	86.49	13.100	7.083E+00	Np237
					86.54	30.700	3.021E+00	EU155
					86.94	9.040	1.024E+01	Sn126
					87.57	37.500	2.461E+00	Sn126
88.04	18.	214.29	0.83	3.462E-02	88.04	3.790	PBC<MDA	Cd109
91.10	18.	216.04	0.83	3.508E-02	91.10	28.300	PBC<MDA	Nd147
92.91	90.	25.32	1.01	3.527E-02	92.59	5.584	2.544E+01	TH234
					93.35	5.561	2.548E+01	AC228
93.34	18.	217.04	0.83	3.536E-02	93.35	5.561	PBC<MDA	AC228
99.50	16.	110.50	0.84	3.592E-02	99.50	15.000	PBC<MDA	Np239
103.20	16.	114.30	0.84	3.612E-02	103.20	21.800	PBC<MDA	Gd153
103.70	16.	119.64	0.84	3.614E-02	103.70	24.000	PBC<MDA	Np239
123.10	4.	442.49	0.86	3.575E-02	123.10	40.790	PBC<MDA	EU154
136.47	19.	142.35	0.88	3.457E-02	136.30	5.850	PBC<MDA	HF181
					136.47	10.680	2.827E+00	CO57
140.51	16.	126.14	0.88	3.411E-02	140.51	89.300	PBC<MDA	Tc99m
143.79	16.	130.46	0.88	3.371E-02	143.79	10.960	PBC<MDA	U235

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
185.72	64.	27.83	0.93	2.854E-02	185.72	54.000	2.307E+00	U235
193.51	4.	425.00	0.93	2.758E-02	193.51	4.400	PBC<MDA	TH229
209.15	49.	23.59	0.73	2.587E-02				
210.85	16.	126.82	0.95	2.569E-02	210.85	2.990	PBC<MDA	TH229
227.00	27.	45.91	0.97	2.417E-02	227.00	6.300	PBC<MDA	Cf251
238.61	313.	6.91	0.96	2.319E-02	238.63	43.300	1.731E+01	PB212
241.97	64.	20.89	0.98	2.293E-02	242.00	7.430	2.076E+01	PB214
244.69	14.	242.83	0.98	2.272E-02	244.69	7.580	PBC<MDA	EU152
256.24	13.	110.27	1.00	2.186E-02	256.24	7.000	PBC<MDA	TH227
295.18	85.	20.09	0.81	1.944E-02	295.09	19.300	1.253E+01	PB214
					296.00	79.000	3.070E+00	TL210
312.01	13.	177.15	1.05	1.857E-02	312.01	36.000	PBC<MDA	PA233
316.49	12.	102.70	1.05	1.835E-02	316.49	87.040	PBC<MDA	Ir192
320.08	10.	128.86	1.06	1.818E-02	320.08	9.940	PBC<MDA	CR51
328.76	8.	193.25	1.07	1.778E-02	328.76	20.300	PBC<MDA	La140
338.28	68.	16.44	1.15	1.736E-02	338.32	12.010	PBC<MDA	AC228
351.90	142.	10.08	1.08	1.680E-02	351.93	37.600	1.250E+01	PB214
387.95	12.	109.81	1.12	1.549E-02	387.95	66.000	PBC<MDA	Cf249
433.94	4.	286.84	1.16	1.411E-02	433.94	90.480	PBC<MDA	AG108M
453.88	4.	302.11	1.18	1.360E-02	453.88	65.000	PBC<MDA	PM146
463.37	39.	22.27	1.19	1.336E-02	463.37	10.470	1.562E+01	SB125
468.06	1.	883.18	1.20	1.325E-02	468.06	51.750	PBC<MDA	Ir192
477.60	4.	242.39	1.20	1.303E-02	477.60	10.520	PBC<MDA	BE7
487.02	3.	316.59	1.21	1.282E-02	487.02	45.500	PBC<MDA	La140
497.05	5.	51.50	1.22	1.260E-02	497.05	90.900	PBC<MDA	RU103
511.86	87.	12.95	2.48	1.230E-02	511.86	20.000	1.965E+01	RH106
513.98	6.	236.79	1.24	1.226E-02	513.98	0.430	PBC<MDA	Kr85
537.26	6.	136.76	1.26	1.181E-02	537.26	24.390	PBC<MDA	Ba140
563.85	3.	373.67	1.28	1.135E-02	563.24	8.350	PBC<MDA	CS134
583.34	106.	12.15	1.11	1.103E-02	583.02	84.500	6.317E+00	TL208
604.80	2.	911.74	1.32	1.070E-02	604.71	97.620	PBC<MDA	CS134
609.37	122.	11.94	1.46	1.063E-02	609.31	46.090	1.378E+01	BI214
					610.30	5.750	1.106E+02	RU103
621.92	2.	515.75	1.33	1.045E-02	621.92	9.930	PBC<MDA	RH106
661.66	5.	185.40	1.37	9.924E-03	661.66	85.210	PBC<MDA	CS137
702.63	3.	304.88	1.40	9.438E-03	702.63	97.900	PBC<MDA	NB94
726.66	38.	21.05	1.40	9.170E-03	727.17	7.550	3.047E+01	BI212
735.72	3.	252.03	1.43	9.081E-03	735.72	22.500	PBC<MDA	PM146
756.73	7.	92.52	1.45	8.869E-03	756.73	54.460	PBC<MDA	ZR95
765.79	5.	281.33	1.45	8.781E-03	765.79	99.790	PBC<MDA	NB95
					766.41	0.294	1.034E+02	PA234M
766.41	13.	84.33	1.45	8.776E-03	765.79	99.790	PBC<MDA	NB95
					766.41	0.294	2.878E+02	PA234M
784.72	3.	314.29	1.47	8.597E-03	785.42	1.280	PBC<MDA	BI212
794.74	7.	133.67	1.48	8.503E-03	795.87	85.530	PBC<MDA	CS134
799.60	2.	634.21	1.48	8.469E-03	799.60	98.960	PBC<MDA	TL210
800.80	2.	519.61	1.48	8.448E-03	801.95	8.690	PBC<MDA	CS134
810.78	3.	297.28	1.49	8.371E-03	810.78	99.460	PBC<MDA	CO58

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
818.50	9.	95.98	1.50	8.305E-03	818.50	100.000	PBC<MDA	Cs136
846.77	3.	319.91	1.52	8.072E-03	846.77	99.935	PBC<MDA	Co56
860.83	7.	95.93	1.53	7.963E-03	860.56	12.420	PBC<MDA	TL208
873.23	6.	125.39	1.54	7.866E-03	873.23	12.270	PBC<MDA	EU154
880.53	4.	203.10	1.54	7.812E-03	880.53	6.000	PBC<MDA	PA234
889.28	8.	99.55	1.55	7.747E-03	889.28	99.984	PBC<MDA	Sc46
911.07	71.	20.93	1.57	7.591E-03	911.07	29.000	1.785E+01	AC228
946.02	6.	92.93	1.60	7.355E-03	946.02	13.400	PBC<MDA	PA234
964.11	17.	46.41	1.61	7.239E-03	964.11	14.605	PBC<MDA	EU152
968.77	60.	17.46	1.61	7.209E-03	968.97	17.460	2.650E+01	AC228
996.33	8.	113.63	1.63	7.042E-03	996.33	10.600	PBC<MDA	EU154
1004.77	3.	289.64	1.64	6.992E-03	1004.77	18.010	PBC<MDA	EU154
1037.84	4.	185.57	1.66	6.805E-03	1037.84	14.130	PBC<MDA	Co56
1048.07	19.	22.94	1.67	6.749E-03	1048.07	80.000	1.955E+00	Cs136
1077.40	6.	93.21	1.69	6.594E-03	1077.40	3.300	PBC<MDA	Ga68
1120.39	48.	18.24	1.72	6.381E-03	1120.29	15.100	2.790E+01	BI214
					1120.55	99.987	PBC<MDA	Sc46
1274.53	2.	208.49	1.83	5.725E-03	1274.53	99.940	PBC<MDA	NA22
					1274.54	35.190	6.435E-01	EU154
1291.60	5.	145.77	1.84	5.661E-03	1291.60	43.200	PBC<MDA	FE59
1332.50	7.	40.68	1.87	5.514E-03	1332.50	99.980	PBC<MDA	CO60
1384.30	5.	44.72	1.90	5.340E-03	1384.30	24.290	PBC<MDA	AG110M
1408.00	7.	87.98	1.91	5.264E-03	1408.00	21.005	PBC<MDA	EU152
1460.72	237.	6.57	1.34	5.104E-03	1460.83	10.670	2.420E+02	K40
1764.56	4.	134.73	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 Centroid Channel	Energy	Background Counts	Net Area Counts	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide
298.54	74.74	99.	172.	5.455E+03	11.19	0.813	- D
308.22	77.16	104.	253.	7.844E+03	8.51	0.815	- D
334.88	83.81	92.	37.	1.097E+03	40.06	0.822	- sD
347.78	87.03	138.	46.	1.343E+03	38.85	0.825	- sD
836.64	209.15	29.	49.	1.881E+03	23.59	0.732	-
1353.46	338.28	17.	69.	3.955E+03	16.19	1.145	-

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	185.69	46.54	184.	-29.	-0.016	57.63	0.783s
TH-227	200.11	50.14	138.	-19.	-0.010	87.54	0.787s
AM-241	237.72	59.54	170.	-6.	-0.003	277.75	0.797s
TH-234	253.20	63.40	85.	46.	0.026	34.94	1.011s
Sn-126	256.71	64.28	259.	-21.	-0.012	111.13	0.802
BA-133	323.61	80.99	680.	18.	0.010	210.15	0.819
Np-237	345.63	86.49	677.	18.	0.010	204.16	0.825s
EU-155	345.84	86.54	696.	18.	0.010	206.84	0.825s
Sn-126	347.43	86.94	714.	18.	0.010	209.42	0.825
Sn-126	349.95	87.57	732.	18.	0.010	211.84	0.826
Cd-109	351.83	88.04	750.	18.	0.010	214.29	0.826s
Nd-147	364.08	91.10	768.	18.	0.010	216.04	0.829s
TH-234	371.33	92.91	126.	90.	0.050	25.32	1.015s
AC-228	373.09	93.35	780.	18.	0.010	217.04	0.832
Gd-153	389.70	97.50	191.	-8.	-0.005	241.97	0.836s
Np-239	397.71	99.50	153.	16.	0.009	110.50	0.838s
Gd-153	412.52	103.20	155.	16.	0.009	114.30	0.842s
Np-239	414.52	103.70	170.	16.	0.009	119.64	0.842
EU-155	420.98	105.31	342.	-11.	-0.006	236.92	0.844
Np-239	424.25	106.13	362.	-18.	-0.010	152.24	0.845
EU-152	486.90	121.78	161.	-15.	-0.008	122.38	0.861s
CO-57	488.03	122.06	176.	0.	0.000	1000.00	0.861s
EU-154	492.18	123.10	182.	4.	0.002	442.49	0.862s
PA-234	524.99	131.29	389.	-22.	-0.012	128.23	0.871s
HF-181	531.91	133.02	411.	-22.	-0.012	131.45	0.872
CE-144	533.97	133.54	433.	-22.	-0.012	134.77	0.873
HF-181	545.02	136.30	455.	-22.	-0.012	137.65	0.876s
CO-57	545.72	136.47	348.	19.	0.010	142.35	0.876s
Tc-99m	561.88	140.51	201.	16.	0.009	126.14	0.880s
U-235	574.99	143.79	217.	16.	0.009	130.46	0.883s
Ba-140	650.54	162.66	162.	-8.	-0.004	227.76	0.902s
U-235	653.42	163.38	131.	-5.	-0.003	508.33	0.903s
CE-139	663.32	165.85	166.	-4.	-0.002	423.22	0.905s
Cf-251	706.34	176.60	123.	-11.	-0.006	176.89	0.916
U-235	742.85	185.72	80.	64.	0.036	27.83	0.925
TH-229	774.03	193.51	90.	4.	0.002	425.00	0.933s
U-235	821.35	205.33	212.	-18.	-0.010	126.35	0.945s
TH-229	843.44	210.85	186.	16.	0.009	126.82	0.950s
Cf-251	908.08	227.00	40.	27.	0.015	45.91	0.966s
TH-227	943.98	235.97	630.	-14.	-0.008	252.01	0.975s
PB-212	954.64	238.63	32.	335.	0.186	5.96	0.978D
PB-214	968.10	242.00	56.	64.	0.035	20.89	0.981D
EU-152	978.89	244.69	546.	14.	0.008	242.83	0.984s
TH-227	1025.11	256.24	55.	13.	0.007	110.27	0.995s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Cd-113m	1054.97	263.70	117.	-16.	-0.009	96.87	1.002s
BI-210M	1063.50	265.83	151.	-18.	-0.010	100.27	1.005
TL-208	1109.33	277.28	119.	-17.	-0.009	40.68	1.016s
Hg-203	1117.00	279.20	112.	-6.	-0.003	250.28	1.017s
PB-214	1180.97	295.18	51.	85.	0.047	20.09	0.812
TL-210	1184.24	296.00	380.	-15.	-0.008	187.81	1.034s
PB-212	1200.37	300.03	344.	-15.	-0.008	49.62	1.038s
PA-231	1200.53	300.07	329.	-6.	-0.003	409.59	1.038s
PA-231	1210.86	302.65	323.	0.	0.000	1000.00	1.040
BA-133	1211.66	302.85	323.	0.	0.000	1000.00	1.040
Ba-140	1219.66	304.85	323.	0.	0.000	1000.00	1.042s
BI-210M	1219.85	304.90	323.	0.	0.000	1000.00	1.042s
Ir-192	1234.03	308.44	323.	0.	0.000	1000.00	1.046s
PA-233	1248.32	312.01	274.	13.	0.007	177.15	1.049s
Ir-192	1266.25	316.49	65.	12.	0.006	102.70	1.053s
CR-51	1280.63	320.08	73.	10.	0.005	128.86	1.057s
La-140	1315.35	328.76	66.	8.	0.004	193.25	1.065s
Cf-249	1334.08	333.44	73.	-17.	-0.009	99.36	1.070s
AC-228	1353.61	338.32	225.	-17.	-0.009	75.55	1.074
Cs-136	1362.62	340.57	209.	-16.	-0.009	131.07	1.077s
EU-152	1377.49	344.29	193.	-16.	-0.009	125.79	1.080s
HF-181	1383.66	345.83	177.	-5.	-0.003	379.59	1.082s
PB-214	1407.97	351.90	23.	142.	0.079	10.08	1.076
BA-133	1424.36	356.00	215.	-12.	-0.007	175.21	1.091s
I-131	1458.32	364.48	51.	-8.	-0.005	164.54	1.099s
BA-133	1535.78	383.84	124.	-6.	-0.003	259.38	1.117s
Cf-249	1552.22	387.95	86.	12.	0.007	109.81	1.121
SN-113	1567.19	391.69	122.	-14.	-0.008	117.33	1.125s
SB-125	1711.99	427.88	44.	-2.	-0.001	653.20	1.158s
AG-108M	1736.25	433.94	32.	4.	0.002	286.84	1.164s
PM-146	1816.05	453.88	28.	4.	0.002	302.11	1.182s
SB-125	1854.01	463.37	19.	39.	0.022	22.27	1.191s
Ir-192	1872.79	468.06	69.	1.	0.001	883.18	1.195s
BE-7	1910.94	477.59	51.	4.	0.002	242.39	1.204
HF-181	1928.56	482.00	61.	-7.	-0.004	165.89	1.208s
La-140	1948.65	487.02	29.	3.	0.002	316.59	1.212s
RU-103	1988.80	497.05	1.	5.	0.003	51.50	1.221
RH-106	2048.06	511.86	20.	87.	0.048	12.95	2.485s
Kr-85	2056.53	513.98	101.	6.	0.003	236.79	1.237s
Nd-147	2124.62	531.00	24.	-4.	-0.002	244.95	1.252s
Ba-140	2149.67	537.26	16.	6.	0.003	136.76	1.258s
CS-134	2253.60	563.24	32.	3.	0.002	373.67	1.280s
CS-134	2277.94	569.32	40.	-12.	-0.007	79.93	1.286s
BI-207	2279.47	569.70	53.	0.	0.000	1000.00	1.286s
TL-208	2334.04	583.34	12.	106.	0.059	12.15	1.111s
SB-125	2402.69	600.50	277.	-13.	-0.007	19.78	1.313s
SB-124	2411.61	602.73	263.	-9.	-0.005	249.43	1.315s
CS-134	2419.53	604.71	252.	2.	0.001	911.74	1.317s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-214	2437.93	609.31	35.	114.	0.063	11.90	1.321D
RU-103	2441.89	610.30	254.	0.	0.000	1000.00	1.322
AG-108M	2457.82	614.28	254.	0.	0.000	1000.00	1.325s
RH-106	2488.37	621.92	17.	2.	0.001	515.75	1.332s
SB-125	2544.26	635.89	34.	-12.	-0.007	72.38	1.344s
I-131	2548.61	636.97	59.	-13.	-0.007	87.06	1.345s
AG-110M	2631.76	657.76	48.	-8.	-0.004	129.87	1.362s
CS-137	2647.36	661.66	40.	5.	0.003	185.40	1.366s
PM-144	2786.90	696.54	56.	-17.	-0.010	90.80	1.395s
NB-94	2811.25	702.63	22.	3.	0.002	304.88	1.400s
SB-124	2891.88	722.79	90.	-13.	-0.007	106.49	1.417s
AG-108M	2892.48	722.94	77.	-13.	-0.007	100.79	1.417s
EU-154	2894.17	723.36	64.	0.	0.000	1000.00	1.418s
BI-212	2907.37	726.66	5.	38.	0.021	21.05	1.400
PM-146	2943.61	735.72	13.	3.	0.002	252.03	1.428s
PM-146	2989.37	747.16	35.	-9.	-0.005	90.21	1.437s
ZR-95	3027.65	756.73	9.	7.	0.004	92.52	1.445s
AG-110M	3056.50	763.94	91.	-21.	-0.012	68.35	1.451s
NB-95	3063.89	765.79	89.	5.	0.003	281.33	1.453s
PA-234M	3066.38	766.41	57.	13.	0.007	84.33	1.453s
EU-152	3116.41	778.92	23.	-7.	-0.004	144.53	1.463
BI-212	3142.41	785.42	19.	3.	0.002	314.29	1.468
CS-134	3184.20	795.87	35.	7.	0.004	133.67	1.477s
TL-210	3199.12	799.60	44.	2.	0.001	634.21	1.480s
CS-134	3208.53	801.95	53.	2.	0.001	519.61	1.482s
CO-58	3243.82	810.78	39.	3.	0.002	297.28	1.489s
La-140	3263.80	815.77	42.	0.	0.000	1000.00	1.493s
Cs-136	3274.72	818.50	33.	9.	0.005	95.98	1.495s
MN-54	3340.10	834.85	33.	-9.	-0.005	100.78	1.508
Co-56	3387.78	846.77	19.	3.	0.002	319.91	1.518s
TL-208	3442.95	860.56	9.	7.	0.004	95.93	1.529s
NB-94	3485.08	871.10	23.	-5.	-0.003	135.21	1.537s
EU-154	3493.61	873.23	24.	6.	0.003	125.39	1.539s
PA-234	3522.80	880.53	31.	4.	0.002	203.10	1.544s
PA-234	3533.64	883.24	35.	0.	0.000	1000.00	1.547s
AG-110M	3539.41	884.68	35.	0.	0.000	1000.00	1.547s
Sc-46	3557.79	889.28	25.	8.	0.004	99.55	1.551s
Y-88	3592.83	898.04	25.	-4.	-0.002	168.71	1.558s
AC-228	3644.94	911.07	33.	71.	0.039	20.93	1.568
AG-110M	3750.60	937.49	14.	-1.	-0.001	800.00	1.589s
PA-234	3784.70	946.02	5.	6.	0.003	92.93	1.595s
EU-152	3857.05	964.11	23.	17.	0.010	46.41	1.609s
AC-228	3876.48	968.97	25.	60.	0.033	17.46	1.612
EU-154	3985.88	996.33	41.	8.	0.005	113.63	1.633s
EU-154	4019.65	1004.77	15.	3.	0.002	289.64	1.639s
Co-56	4151.87	1037.84	10.	4.	0.002	185.57	1.664
Cs-136	4192.77	1048.07	0.	19.	0.011	22.94	1.671s
RH-106	4201.93	1050.36	19.	0.	0.000	1000.00	1.673s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-207	4255.11	1063.66	60.	-21.	-0.011	35.43	1.682s
Ga-68	4310.04	1077.40	5.	6.	0.003	93.21	1.692s
FE-59	4397.41	1099.25	20.	-8.	-0.004	127.88	1.708s
ZN-65	4462.56	1115.55	32.	0.	0.000	1000.00	1.720s
BI-214	4481.51	1120.29	15.	48.	0.027	18.24	1.723s
Sc-46	4482.57	1120.55	61.	-6.	-0.003	188.68	1.723s
Ta-182	4485.56	1121.30	89.	-13.	-0.007	103.47	1.724s
CO-60	4693.21	1173.24	40.	-18.	-0.010	50.12	1.760s
Ta-182	4756.42	1189.05	25.	-4.	-0.002	279.32	1.771s
Ta-182	4885.79	1221.41	16.	-1.	-0.001	914.69	1.793
NA-22	5098.13	1274.53	11.	2.	0.001	208.49	1.828s
EU-154	5098.17	1274.54	13.	0.	0.000	1000.00	1.828s
FE-59	5166.35	1291.60	11.	5.	0.003	145.77	1.840s
TL-210	5251.91	1313.00	21.	-9.	-0.005	117.15	1.854s
CO-60	5329.85	1332.50	1.	7.	0.004	40.68	1.866s
AG-110M	5536.88	1384.30	0.	5.	0.003	44.72	1.899s
EU-152	5631.62	1408.00	5.	7.	0.004	87.98	1.914s
K-40	5842.31	1460.72	3.	237.	0.132	6.57	1.344s
SB-124	6762.39	1690.98	0.	0.	0.000	1000.00	2.076s
BI-214	7056.06	1764.49	13.	4.	0.002	134.73	2.114s
Co-56	7083.46	1771.35	28.	-5.	-0.003	147.48	2.117s

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	1.7203E+00				5.31E+01	
			477.60	1.720E+00	?(P	1.455E+01 2.42E+02 1.05E+01	G
NA-22	C	2.2657E-01				9.50E+02	
			1274.53	2.266E-01	?(	1.741E+00 2.08E+02 9.99E+01	G
K-40	N	2.4198E+02				4.66E+11	
			1460.83	2.420E+02	(P	1.076E+01 6.57E+00 1.07E+01	G
Sc-46	F	5.4693E-01				8.38E+01	
			889.28	5.469E-01	?(	1.866E+00 9.95E+01 1.00E+02	G
			1120.55	-5.215E-01	-	3.401E+00 1.89E+02 1.00E+02	G
CR-51	F	2.9844E+00				2.77E+01	
			320.08	2.984E+00	&(P	1.310E+01 1.29E+02 9.94E+00	G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

MN-54    C  -6.1078E-01                                     3.12E+02
                          834.85-6.108E-01 ?(P 2.005E+00 1.01E+02 1.00E+02 G

FE-59    F  -1.6258E-01                                     4.45E+01
                         1099.25-1.213E+00 ?(  3.572E+00 1.28E+02 5.65E+01 G
                         1291.60 1.212E+00 ?(  4.073E+00 1.46E+02 4.32E+01 G

Co-56    C   4.5623E-01                                     7.73E+01
                          846.77 2.018E-01 ?(P 1.588E+00 3.20E+02 9.99E+01 G
                         1238.28-1.434E-01 %   4.167E+00 1.29E+03 6.61E+01 G
                         1037.84 2.256E+00 ?(P 1.012E+01 1.86E+02 1.41E+01 G
                         1771.35-4.418E+00 +   2.277E+01 1.47E+02 1.55E+01  A

CO-57    C   3.1358E-01                                     2.72E+02
                          122.06 0.000E+00 &(  1.169E+00 1.00E+03 8.56E+01 G
                          136.47 2.827E+00 ?(  1.349E+01 1.42E+02 1.07E+01 G

CO-58    C   2.0207E-01                                     7.09E+01
                          810.78 2.021E-01 ?(P 2.122E+00 2.97E+02 9.95E+01 G

CO-60    F   7.3455E-01                                     1.93E+03
                         1332.50 7.346E-01 ?(P 7.427E-01 4.07E+01 1.00E+02 G
                         1173.24-1.606E+00 - P 2.930E+00 5.01E+01 9.99E+01 G

NB-94    I   1.9109E-01                                     7.41E+06
                          702.63 1.911E-01 ?(P 1.472E+00 3.05E+02 9.79E+01 G
                          871.10-3.763E-01 +   1.779E+00 1.35E+02 9.99E+01 G

ZR-95    I   8.1723E-01                                     6.40E+01
                          756.73 8.172E-01 ?(  1.890E+00 9.25E+01 5.45E+01 G
                          724.20-5.682E-04 % P 5.429E+00 2.70E+05 4.42E+01 G

NB-95    I   3.0435E-01                                     6.40E+01
                          765.79 3.044E-01 ?(  2.956E+00 2.81E+02 9.98E+01 G

RU-103   I   2.2715E-01                                     3.93E+01
                          497.05 2.271E-01  (P 3.574E-01 5.15E+01 9.09E+01 G
                          610.30 0.000E+00 -   7.005E+01 1.00E+03 5.75E+00 GA

RH-106   I   8.9212E-01                                     3.74E+02
                          621.92 8.921E-01 ?(  1.184E+01 5.16E+02 9.93E+00 G
                         1050.36 0.000E+00 &   1.217E+02 1.00E+03 1.56E+00 G
                          511.86 1.965E+01 ?   5.319E+00 1.30E+01 2.00E+01 GA

AG-108M  C   1.7082E-01                                     1.53E+05
                          433.94 1.708E-01  (P 1.266E+00 2.87E+02 9.05E+01 G
                          722.94-8.494E-01 +   2.890E+00 1.01E+02 9.08E+01 G
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Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
			614.28	0.000E+00	-	4.507E+00	1.00E+03	8.98E+01 G
AG-110M	F	5.3644E-01					2.50E+02	
			884.68	0.000E+00	?(	2.975E+00	1.00E+03	7.27E+01 G
			657.76	-4.611E-01	+	2.056E+00	1.30E+02	9.46E+01 G
			937.49	-2.182E-01	+	4.395E+00	8.00E+02	3.44E+01 G
			1384.30	2.142E+00	?(	3.157E+00	4.47E+01	2.43E+01 G
			763.94	-5.894E+00	+	1.334E+01	6.84E+01	2.23E+01 G
SN-113	F	-7.7166E-01					1.15E+02	
			391.69	-7.717E-01	?(	3.056E+00	1.17E+02	6.40E+01 G
SB-124	F	-4.8905E-01					6.02E+01	
			602.73	-4.890E-01	?(	4.127E+00	2.49E+02	9.83E+01 G
			1690.98	0.000E+00	+	1.899E+00	1.00E+03	4.78E+01 G
			722.79	-7.268E+00	+	2.614E+01	1.06E+02	1.08E+01 G
SB-125	I	3.8876E+00					1.01E+03	
			427.88	-2.629E-01	&(	4.419E+00	6.53E+02	2.96E+01 G
			600.50	-3.842E+00	+ P	2.318E+01	1.98E+01	1.79E+01 G
			635.89	-5.918E+00	+	1.427E+01	7.24E+01	1.13E+01 G
			463.37	1.562E+01	*(P	9.069E+00	2.23E+01	1.05E+01 G
I-131	I	-3.4726E-01					8.02E+00	
			364.48	-3.473E-01	?(	1.504E+00	1.65E+02	8.17E+01 G
			284.30	-3.007E-01	&	1.877E+01	2.35E+03	6.14E+00 G
			636.97	-9.938E+00	+	2.909E+01	8.71E+01	7.17E+00 G
Gd-153	F	2.2363E-01					2.42E+02	
			97.50	-4.228E-01	?(	3.476E+00	2.42E+02	3.00E+01 G
			103.20	1.113E+00	?(	4.281E+00	1.14E+02	2.18E+01 G
Ga-68	C	1.7574E+01					4.71E-02	
			1077.40	1.757E+01	?(	3.924E+01	9.32E+01	3.30E+00 G
Tc-99m	I	3.0449E-01					2.51E-01	
			140.51	3.045E-01	&(	1.292E+00	1.26E+02	8.93E+01 G
BA-133	F	-6.4558E-01					3.85E+03	
			356.00	-6.456E-01	&(	3.822E+00	1.75E+02	6.20E+01 G
			302.85	0.000E+00	+	1.377E+01	1.00E+03	1.83E+01 G
			383.84	-2.197E+00	+ P	2.167E+01	2.59E+02	8.94E+00 GA
			80.99	8.676E-01	? P	6.102E+00	2.10E+02	3.41E+01 GA
CS-134	I	6.9092E-01					7.54E+02	
			795.87	5.032E-01	&(P	2.326E+00	1.34E+02	8.55E+01 G
			604.71	1.312E-01	-	4.075E+00	9.12E+02	9.76E+01 G
			569.32	-3.852E+00	+	1.033E+01	7.99E+01	1.54E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
			801.95	1.513E+00	&(	2.772E+01	5.20E+02	8.69E+00 G
			563.24	1.758E+00	?(	1.703E+01	3.74E+02	8.35E+00 G
CS-137	I	3.2630E-01						1.10E+04
			661.66	3.263E-01	?(P	2.107E+00	1.85E+02	8.52E+01 G
CE-139	F	-9.6170E-02						1.38E+02
			165.85	-9.617E-02	&(	1.393E+00	4.23E+02	7.99E+01 G
Ba-140	I	1.1571E+00						1.28E+01
			537.26	1.157E+00	*(	4.118E+00	1.37E+02	2.44E+01 G
			162.66	-2.296E+00	+	1.780E+01	2.28E+02	6.22E+00 G
			304.85	0.000E+00	-	5.915E+01	1.00E+03	4.29E+00 G
La-140	I	2.5576E-01						1.28E+01
			1596.21	1.821E-02	%(P	1.720E+00	3.80E+03	9.54E+01 G
			487.02	3.185E-01	(P	2.634E+00	3.17E+02	4.55E+01 G
			328.76	1.231E+00	?(	6.244E+00	1.93E+02	2.03E+01 G
			815.77	0.000E+00	-	9.430E+00	1.00E+03	2.33E+01 G
CE-141	I	-1.5776E-02						3.25E+01
			145.44	-1.578E-02	%(	2.537E+00	4.70E+03	4.82E+01 G
CE-144	I	-3.1758E+00						2.85E+02
			133.54	-3.176E+00	?(	1.432E+01	1.35E+02	1.11E+01 G
PM-144	C	-1.0324E+00						3.63E+02
			696.54	-1.032E+00	(	2.225E+00	9.08E+01	9.90E+01 G
			618.06	-3.490E-02	% P	4.112E+00	2.09E+03	9.91E+01 G
EU-152	F	2.7894E+00						4.94E+03
			121.78	-8.136E-01	?(	3.354E+00	1.22E+02	2.86E+01 G
			344.29	-1.952E+00	+	8.262E+00	1.26E+02	2.65E+01 G
			1112.07	-2.801E-01	% P	1.849E+01	1.67E+03	1.36E+01 G
			778.92	-3.637E+00	&	1.251E+01	1.45E+02	1.29E+01 G
			964.11	8.996E+00	&(	1.317E+01	4.64E+01	1.46E+01 G
			244.69	4.417E+00	?(	3.600E+01	2.43E+02	7.58E+00 G
			1408.00	3.340E+00	?	6.769E+00	8.80E+01	2.10E+01 GA
EU-154	I	1.6837E+00						3.14E+03
			123.10	1.651E-01	(	2.496E+00	4.42E+02	4.08E+01 G
			1274.54	0.000E+00	-	5.381E+00	1.00E+03	3.52E+01 G
			723.36	0.000E+00	-	1.193E+01	1.00E+03	2.02E+01 G
			873.23	3.358E+00	?(	1.465E+01	1.25E+02	1.23E+01 G
			1004.77	1.323E+00	?(	9.158E+00	2.90E+02	1.80E+01 G
			996.33	6.202E+00	?(	2.413E+01	1.14E+02	1.06E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	I	2.3616E-01					1.81E+03	
			105.31	-8.061E-01	&(	6.439E+00	2.37E+02	2.12E+01 G
			86.54	9.559E-01	@(	6.615E+00	2.07E+02	3.07E+01 G
HF-181	F	-3.6471E-01					4.24E+01	
			482.00	-3.647E-01	(	2.084E+00	1.66E+02	8.05E+01 G
			133.02	-8.117E-01	&	3.569E+00	1.31E+02	4.33E+01 G
			345.83	-1.079E+00	+	1.399E+01	3.80E+02	1.51E+01 G
			136.30	-6.090E+00	+	2.804E+01	1.38E+02	5.85E+00 G
Ta-182	F	-3.3438E+00					1.14E+02	
			1121.30	-3.344E+00	?(	1.167E+01	1.03E+02	3.49E+01 G
			1221.41	-3.468E-01	+	7.403E+00	9.15E+02	2.70E+01 G
			1189.05	-2.260E+00	+	1.470E+01	2.79E+02	1.62E+01 G
Hg-203	F	-2.0292E-01					4.66E+01	
			279.20	-2.029E-01	?(	1.742E+00	2.50E+02	8.15E+01 G
TL-208	N	6.3173E+00					6.98E+02	
			583.02	6.317E+00	@(	1.124E+00	1.22E+01	8.45E+01 G
			277.28	-7.329E+00	& P	2.301E+01	4.07E+01	6.31E+00 G
			860.56	4.130E+00	- P	9.588E+00	9.59E+01	1.24E+01 G
PM-146	C	3.7331E-01					2.02E+03	
			453.88	2.202E-01	&(P	1.734E+00	3.02E+02	6.50E+01 G
			747.16	-1.624E+00	+ P	5.512E+00	9.02E+01	3.40E+01 G
			735.72	8.157E-01	?(	5.305E+00	2.52E+02	2.25E+01 G
Y-88	F	-3.6394E-02					1.07E+02	
			1836.06	-3.639E-02	%(P	9.809E-01	2.04E+03	9.92E+01 G
			898.04	-3.373E-01	+ P	2.020E+00	1.69E+02	9.37E+01 G
Cd-113m		-7.0928E+03					5.33E+03	
			263.70	-7.093E+03	&(	2.307E+04	9.69E+01	6.00E-03 K
Cd-109	F	7.6994E+00					4.53E+02	
			88.04	7.699E+00	?(	5.519E+01	2.14E+02	3.79E+00 G
Cf-251	T	-1.2450E+00					3.28E+05	
			176.60	-1.245E+00	(	5.983E+00	1.77E+02	1.70E+01 G
			227.00	9.850E+00		1.174E+01	4.59E+01	6.30E+00 GA
Cf-249	T	6.6989E-01					1.28E+05	
			387.95	6.699E-01	&(	2.488E+00	1.10E+02	6.60E+01 G
			333.44	-3.391E+00	+	8.687E+00	9.94E+01	1.55E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Sn-126		-4.3375E+00					3.65E+07	
			87.57	7.794E-01	+	5.523E+00	2.12E+02	3.75E+01 GA
			64.28	-4.337E+00	(	1.613E+01	1.11E+02	9.70E+00 G
			86.94	3.241E+00	+	2.270E+01	2.09E+02	9.04E+00 GA
PB-210	N	-2.0944E+01					8.14E+03	
			46.54	-2.094E+01	*(P	4.815E+01	5.76E+01	4.25E+00 G
PB-212	N	1.8558E+01					6.98E+02	
			238.63	1.856E+01	(P	1.607E+00	5.96E+00	4.33E+01 G
			300.03	-1.335E+01	- P	7.875E+01	4.96E+01	3.28E+00 GA
PB-214	N	1.2511E+01					5.84E+05	
			351.93	1.250E+01	(P	2.198E+00	1.01E+01	3.76E+01 G
			295.09	1.253E+01	(P	5.341E+00	2.01E+01	1.93E+01 G
			242.00	2.076E+01	+ P	1.229E+01	2.09E+01	7.43E+00 GA
BI-207	C	-2.3085E+00					1.18E+04	
			1063.66	-2.309E+00	?(P	4.354E+00	3.54E+01	7.45E+01 G
			569.70	0.000E+00	+	1.857E+00	1.00E+03	9.77E+01 G
BI-212	N	3.0465E+01					6.98E+02	
			727.17	3.047E+01	(P	1.056E+01	2.11E+01	7.55E+00 G
			785.42	1.505E+01	- P	1.163E+02	3.14E+02	1.28E+00 GA
U-235	N	2.4446E+00					2.57E+11	
			143.79	2.445E+00	(	1.073E+01	1.30E+02	1.10E+01 G
			205.33	-7.671E+00	+ P	2.977E+01	1.26E+02	5.01E+00 G
			163.38	-1.588E+00	+ P	1.972E+01	5.08E+02	5.08E+00 G
			185.72	2.307E+00		1.600E+00	2.78E+01	5.40E+01 GA
BI-214	N	1.2951E+01					5.84E+05	
			609.31	1.295E+01	(P	3.422E+00	1.19E+01	4.61E+01 G
			1120.29	2.790E+01	+ P	1.183E+01	1.82E+01	1.51E+01 G
			1764.49	3.404E+00	- P	1.621E+01	1.35E+02	1.54E+01 G
BI-210M	T	-9.3352E-01					1.10E+09	
			265.83	-9.335E-01	&(	3.139E+00	1.00E+02	5.00E+01 G
			304.90	0.000E+00	+	9.063E+00	1.00E+03	2.80E+01 G
AC-228	N	2.1100E+01					2.10E+03	
			911.07	1.785E+01	(P	7.468E+00	2.09E+01	2.90E+01 G
			968.97	2.650E+01	(	1.147E+01	1.75E+01	1.75E+01 G
			338.32	-4.438E+00	- P	1.937E+01	7.56E+01	1.20E+01 G
			93.35	5.170E+00	-	3.753E+01	2.17E+02	5.56E+00 XA

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-227	N	4.7189E+00					7.95E+03	
			256.24	4.719E+00	?(	1.353E+01	1.10E+02	7.00E+00 G
			235.97	-2.733E+00	-	2.309E+01	2.52E+02	1.23E+01 G
			50.14	-6.522E+00	+ P	1.986E+01	8.75E+01	8.00E+00 G
TH-229	N	5.6270E+00					2.68E+06	
			193.51	1.831E+00	?(	2.148E+01	4.25E+02	4.40E+00 G
			210.85	1.121E+01	?(	4.787E+01	1.27E+02	2.99E+00 G
TH-234	N	2.5239E+01					1.63E+12	
			92.59	2.544E+01	*(P	1.551E+01	2.53E+01	5.58E+00 G
			63.29	2.495E+01	(P	2.450E+01	3.49E+01	3.81E+00 G
PA-233	C	1.1116E+00					7.82E+08	
			312.01	1.112E+00	?(P	6.635E+00	1.77E+02	3.60E+01 G
			300.18	-1.783E-06	%	4.040E+01	6.66E+08	6.20E+00 G
PA-234	N	2.2181E-01					1.63E+12	
			131.29	-1.939E+00	?(	8.319E+00	1.28E+02	1.80E+01 G
			946.02	3.125E+00	?(	7.202E+00	9.29E+01	1.34E+01 G
			569.47	2.007E-01	%	2.219E+01	3.11E+03	8.20E+00 G
			883.24	0.000E+00	-	2.249E+01	1.00E+03	9.60E+00 G
			880.53	4.741E+00	?	3.397E+01	2.03E+02	6.00E+00 GA
PA-234M	N	7.1971E+01					1.63E+12	
			1001.00	-3.832E+00	%(P	3.356E+02	3.66E+03	8.37E-01 G
			766.41	2.878E+02	?(	8.148E+02	8.43E+01	2.94E-01 G
AM-241	T	-3.7212E-01					1.58E+05	
			59.54	-3.721E-01	(P	3.878E+00	2.78E+02	3.59E+01 G
Np-237	F	2.2407E+00					2.14E+06	
			86.49	2.241E+00	&(	1.531E+01	2.04E+02	1.31E+01 G
Ir-192	F	4.0301E-01					7.40E+01	
			316.49	4.030E-01	?(	1.401E+00	1.03E+02	8.70E+01 G
			468.06	1.080E-01	-	3.348E+00	8.83E+02	5.18E+01 G
			308.44	0.000E+00	&	8.070E+00	1.00E+03	3.18E+01 G
Cs-136	F	1.2036E+00					1.30E+01	
			818.50	6.023E-01	?(	1.968E+00	9.60E+01	1.00E+02 G
			1048.07	1.955E+00	?(	7.584E-01	2.29E+01	8.00E+01 G
			340.57	-1.090E+00	-	4.806E+00	1.31E+02	4.69E+01 G
Np-239	T	-1.2088E+00					2.36E+00	
			103.70	1.011E+00	&	4.071E+00	1.20E+02	2.40E+01 X
			106.13	-1.209E+00	?(	6.174E+00	1.52E+02	2.27E+01 G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                           99.50 1.674E+00 ?   6.220E+00 1.11E+02 1.50E+01 X

Nd-147       2.4876E-01                                      1.11E+01
                          531.00-1.433E+00 ?(  9.151E+00 2.45E+02 1.30E+01 G
                           91.10 1.021E+00 ?(  7.380E+00 2.16E+02 2.83E+01 G

TL-210   N   9.9429E-02                                      5.84E+05
                          799.60 9.943E-02 ?(  2.240E+00 6.34E+02 9.90E+01 G
                          296.00-5.374E-01 +   3.392E+00 1.88E+02 7.90E+01 G
                         1313.00-4.422E+00 +   1.148E+01 1.17E+02 2.10E+01 GA

Kr-85    I   6.4117E+01                                      3.92E+03
                          513.98 6.412E+01 ?(  5.214E+02 2.37E+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	184.	-29.	-0.016	57.63	-2.094E+01	P
TH-227	50.14	138.	-19.	-0.010	87.54	-6.522E+00	P
AM-241	59.54	170.	-6.	-0.003	277.75	-3.721E-01	P
BA-133	80.99	680.	18.	0.010	210.15	8.676E-01	P
EU-155	86.54	696.	18.	0.010	206.84	9.559E-01	
Cd-109	88.04	750.	18.	0.010	214.29	7.699E+00	
Nd-147	91.10	768.	18.	0.010	216.04	1.021E+00	
Gd-153	97.50	191.	-8.	-0.005	241.97	-4.228E-01	
Np-239	99.50	153.	16.	0.009	110.50	1.674E+00	
Gd-153	103.20	155.	16.	0.009	114.30	1.113E+00	
Np-239	103.70	170.	16.	0.009	119.64	1.011E+00	
EU-155	105.31	342.	-11.	-0.006	236.92	-8.061E-01	
Np-239	106.13	362.	-18.	-0.010	152.24	-1.209E+00	
EU-152	121.78	161.	-15.	-0.008	122.38	-8.136E-01	
EU-154	123.10	182.	4.	0.002	442.49	1.651E-01	
PA-234	131.29	389.	-22.	-0.012	128.23	-1.939E+00	
HF-181	133.02	411.	-22.	-0.012	131.45	-8.117E-01	
CE-144	133.54	433.	-22.	-0.012	134.77	-3.176E+00	
HF-181	136.30	455.	-22.	-0.012	137.65	-6.090E+00	
CO-57	136.47	348.	19.	0.010	142.35	2.827E+00	
Tc-99m	140.51	201.	16.	0.009	126.14	3.045E-01	
U-235	143.79	217.	16.	0.009	130.46	2.445E+00	
Ba-140	162.66	162.	-8.	-0.004	227.76	-2.296E+00	
U-235	163.38	131.	-5.	-0.003	508.33	-1.588E+00	P
CE-139	165.85	166.	-4.	-0.002	423.22	-9.617E-02	
Cf-251	176.60	123.	-11.	-0.006	176.89	-1.245E+00	
U-235	185.72	80.	64.	0.036	27.83	2.307E+00	
TH-229	193.51	90.	4.	0.002	425.00	1.831E+00	
U-235	205.33	212.	-18.	-0.010	126.35	-7.671E+00	P
TH-229	210.85	186.	16.	0.009	126.82	1.121E+01	
Cf-251	227.00	40.	27.	0.015	45.91	9.850E+00	
TH-227	235.97	630.	-14.	-0.008	252.01	-2.733E+00	
EU-152	244.69	546.	14.	0.008	242.83	4.417E+00	
TH-227	256.24	55.	13.	0.007	110.27	4.719E+00	
Cd-113m	263.70	117.	-16.	-0.009	96.87	-7.093E+03	
BI-210M	265.83	151.	-18.	-0.010	100.27	-9.335E-01	
Hg-203	279.20	112.	-6.	-0.003	250.28	-2.029E-01	
TL-210	296.00	380.	-15.	-0.008	187.81	-5.374E-01	
PA-231	300.07	329.	-6.	-0.003	409.59	-7.412E+00	
PA-233	312.01	274.	13.	0.007	177.15	1.112E+00	P
Ir-192	316.49	65.	12.	0.006	102.70	4.030E-01	
CR-51	320.08	73.	10.	0.005	128.86	2.984E+00	P
La-140	328.76	66.	8.	0.004	193.25	1.231E+00	
Cf-249	333.44	73.	-17.	-0.009	99.36	-3.391E+00	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Cs-136	340.57	209.	-16.	-0.009	131.07	-1.090E+00	
EU-152	344.29	193.	-16.	-0.009	125.79	-1.952E+00	
HF-181	345.83	177.	-5.	-0.003	379.59	-1.079E+00	
BA-133	356.00	215.	-12.	-0.007	175.21	-6.456E-01	
I-131	364.48	51.	-8.	-0.005	164.54	-3.473E-01	
BA-133	383.84	124.	-6.	-0.003	259.38	-2.197E+00	P
Cf-249	387.95	86.	12.	0.007	109.81	6.699E-01	
SN-113	391.69	122.	-14.	-0.008	117.33	-7.717E-01	
SB-125	427.88	44.	-2.	-0.001	653.20	-2.629E-01	
AG-108M	433.94	32.	4.	0.002	286.84	1.708E-01	P
PM-146	453.88	28.	4.	0.002	302.11	2.202E-01	P
SB-125	463.37	19.	39.	0.022	22.27	1.562E+01	P
Ir-192	468.06	69.	1.	0.001	883.18	1.080E-01	
BE-7	477.59	51.	4.	0.002	242.39	1.720E+00	P
HF-181	482.00	61.	-7.	-0.004	165.89	-3.647E-01	
La-140	487.02	29.	3.	0.002	316.59	3.185E-01	P
RH-106	511.86	20.	87.	0.048	12.95	1.965E+01	
Kr-85	513.98	101.	6.	0.003	236.79	6.412E+01	
Nd-147	531.00	24.	-4.	-0.002	244.95	-1.433E+00	
Ba-140	537.26	16.	6.	0.003	136.76	1.157E+00	
SB-125	600.50	277.	-13.	-0.007	19.78	-3.842E+00	P
SB-124	602.73	263.	-9.	-0.005	249.43	-4.890E-01	
RH-106	621.92	17.	2.	0.001	515.75	8.921E-01	
SB-125	635.89	34.	-12.	-0.007	72.38	-5.918E+00	
I-131	636.97	59.	-13.	-0.007	87.06	-9.938E+00	
AG-110M	657.76	48.	-8.	-0.004	129.87	-4.611E-01	
CS-137	661.66	40.	5.	0.003	185.40	3.263E-01	P
PM-144	696.54	56.	-17.	-0.010	90.80	-1.032E+00	
NB-94	702.63	22.	3.	0.002	304.88	1.911E-01	P
SB-124	722.79	90.	-13.	-0.007	106.49	-7.268E+00	
AG-108M	722.94	77.	-13.	-0.007	100.79	-8.494E-01	
PM-146	735.72	13.	3.	0.002	252.03	8.157E-01	
PM-146	747.16	35.	-9.	-0.005	90.21	-1.624E+00	P
ZR-95	756.73	9.	7.	0.004	92.52	8.172E-01	
AG-110M	763.94	91.	-21.	-0.012	68.35	-5.894E+00	
NB-95	765.79	89.	5.	0.003	281.33	3.044E-01	
PA-234M	766.41	57.	13.	0.007	84.33	2.878E+02	
EU-152	778.92	23.	-7.	-0.004	144.53	-3.637E+00	
TL-210	799.60	44.	2.	0.001	634.21	9.943E-02	
CO-58	810.78	39.	3.	0.002	297.28	2.021E-01	P
Cs-136	818.50	33.	9.	0.005	95.98	6.023E-01	
MN-54	834.85	33.	-9.	-0.005	100.78	-6.108E-01	P
Co-56	846.77	19.	3.	0.002	319.91	2.018E-01	P
NB-94	871.10	23.	-5.	-0.003	135.21	-3.763E-01	
EU-154	873.23	24.	6.	0.003	125.39	3.358E+00	
PA-234	880.53	31.	4.	0.002	203.10	4.741E+00	
Sc-46	889.28	25.	8.	0.004	99.55	5.469E-01	
Y-88	898.04	25.	-4.	-0.002	168.71	-3.373E-01	P

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
AG-110M	937.49	14.	-1.	-0.001	800.00	-2.182E-01		
PA-234	946.02	5.	6.	0.003	92.93	3.125E+00		
EU-152	964.11	23.	17.	0.010	46.41	8.996E+00		
EU-154	996.33	41.	8.	0.005	113.63	6.202E+00		
EU-154	1004.77	15.	3.	0.002	289.64	1.323E+00		
Co-56	1037.84	10.	4.	0.002	185.57	2.256E+00		P
Cs-136	1048.07	0.	19.	0.011	22.94	1.955E+00		
BI-207	1063.66	60.	-21.	-0.011	35.43	-2.309E+00		P
Ga-68	1077.40	5.	6.	0.003	93.21	1.757E+01		
FE-59	1099.25	20.	-8.	-0.004	127.88	-1.213E+00		
Sc-46	1120.55	61.	-6.	-0.003	188.68	-5.215E-01		
Ta-182	1121.30	89.	-13.	-0.007	103.47	-3.344E+00		
CO-60	1173.24	40.	-18.	-0.010	50.12	-1.606E+00		P
Ta-182	1189.05	25.	-4.	-0.002	279.32	-2.260E+00		
Ta-182	1221.41	16.	-1.	-0.001	914.69	-3.468E-01		
NA-22	1274.53	11.	2.	0.001	208.49	2.266E-01		
FE-59	1291.60	11.	5.	0.003	145.77	1.212E+00		
TL-210	1313.00	21.	-9.	-0.005	117.15	-4.422E+00		
CO-60	1332.50	1.	7.	0.004	40.68	7.346E-01		P
AG-110M	1384.30	0.	5.	0.003	44.72	2.142E+00		
EU-152	1408.00	5.	7.	0.004	87.98	3.340E+00		
Co-56	1771.35	28.	-5.	-0.003	147.48	-4.418E+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	1.7202E+00	1.7203E+00	2.424E+02%	1.46E+01
NA-22	#A	2.2657E-01	2.2657E-01	2.085E+02%	1.74E+00
K-40		2.4198E+02	2.4198E+02	6.574E+00%	1.08E+01
Sc-46	#A	5.4693E-01	5.4693E-01	9.955E+01%	1.87E+00
CR-51	#A	2.9843E+00	2.9844E+00	1.289E+02%	1.31E+01
MN-54	#A	-6.1078E-01	-6.1078E-01	1.008E+02%	2.00E+00
FE-59	#A	-1.6258E-01	-1.6258E-01	9.696E+01%	3.57E+00
Co-56	#A	4.5623E-01	4.5623E-01	1.849E+02%	1.59E+00
CO-57	#A	3.1358E-01	3.1358E-01	1.423E+02%	1.17E+00
CO-58	#A	2.0207E-01	2.0207E-01	2.973E+02%	2.12E+00
CO-60	#A	7.3455E-01	7.3455E-01	4.068E+01%	7.43E-01
ZN-65	#A	0.0000E+00	0.0000E+00	1.000E+03%	4.97E+00
NB-94	#A	1.9109E-01	1.9109E-01	3.049E+02%	1.47E+00
ZR-95	#A	8.1722E-01	8.1723E-01	9.252E+01%	1.89E+00
NB-95	#A	3.0435E-01	3.0435E-01	2.813E+02%	2.96E+00
RU-103	A	2.2714E-01	2.2715E-01	5.150E+01%	3.57E-01
RH-106	#A	8.9212E-01	8.9212E-01	5.158E+02%	1.18E+01
AG-108M	#A	1.7082E-01	1.7082E-01	2.868E+02%	1.27E+00

AG-110M#A	5.3643E-01	5.3644E-01	4.472E+01%	2.97E+00
SN-113 #A	-7.7166E-01	-7.7166E-01	1.173E+02%	3.06E+00
SB-124 #A	-4.8905E-01	-4.8905E-01	2.494E+02%	4.13E+00
SB-125 #A	3.8876E+00	3.8876E+00	2.227E+01%	4.42E+00
I-131 #A	-3.4724E-01	-3.4726E-01	1.645E+02%	1.50E+00
Gd-153 #A	2.2363E-01	2.2363E-01	1.143E+02%	3.48E+00
Ga-68 #A	1.7443E+01	1.7574E+01	9.321E+01%	3.92E+01
Tc-99m #A	3.0406E-01	3.0449E-01	1.261E+02%	1.29E+00
BA-133 #A	-6.4558E-01	-6.4558E-01	1.752E+02%	3.82E+00
CS-134 #A	6.9091E-01	6.9092E-01	1.337E+02%	2.33E+00
CS-137 #A	3.2630E-01	3.2630E-01	1.854E+02%	2.11E+00
CE-139 #A	-9.6170E-02	-9.6170E-02	4.232E+02%	1.39E+00
Ba-140 #A	1.1571E+00	1.1571E+00	1.368E+02%	4.12E+00
La-140 #A	2.5575E-01	2.5576E-01	1.932E+02%	1.72E+00
CE-141 #A	-1.5776E-02	-1.5776E-02	4.704E+03%	2.54E+00
CE-144 #A	-3.1758E+00	-3.1758E+00	1.348E+02%	1.43E+01
PM-144 #A	-1.0324E+00	-1.0324E+00	9.080E+01%	2.22E+00
EU-152 #A	2.7894E+00	2.7894E+00	4.641E+01%	3.35E+00
EU-154 #A	1.6837E+00	1.6837E+00	1.136E+02%	2.50E+00
EU-155 #A	2.3616E-01	2.3616E-01	1.573E+02%	6.44E+00
HF-181 #A	-3.6470E-01	-3.6471E-01	1.659E+02%	2.08E+00
Ta-182 #A	-3.3438E+00	-3.3438E+00	1.035E+02%	1.17E+01
Hg-203 #A	-2.0292E-01	-2.0292E-01	2.503E+02%	1.74E+00
TL-208 #	6.3173E+00	6.3173E+00	1.215E+01%	1.12E+00
PM-146 #A	3.7331E-01	3.7331E-01	1.967E+02%	1.73E+00
Y-88 #A	-3.6394E-02	-3.6394E-02	2.044E+03%	9.81E-01
Cd-113m#A	-7.0928E+03	-7.0928E+03	9.687E+01%	2.31E+04
Cd-109 #A	7.6994E+00	7.6994E+00	2.143E+02%	5.52E+01
Cf-251 #A	-1.2450E+00	-1.2450E+00	1.769E+02%	5.98E+00
Cf-249 #A	6.6989E-01	6.6989E-01	1.098E+02%	2.49E+00
Sn-126 A	-4.3375E+00	-4.3375E+00	1.111E+02%	1.61E+01
PB-210 #A	-2.0944E+01	-2.0944E+01	5.763E+01%	4.81E+01
PB-212	1.8558E+01	1.8558E+01	5.962E+00%	1.61E+00
PB-214	1.2511E+01	1.2511E+01	1.008E+01%	2.20E+00
BI-207 #A	-2.3085E+00	-2.3085E+00	3.543E+01%	4.35E+00
BI-212	3.0465E+01	3.0465E+01	2.105E+01%	1.06E+01
U-235 #A	2.4446E+00	2.4446E+00	1.305E+02%	1.07E+01
BI-214	1.2951E+01	1.2951E+01	1.190E+01%	3.42E+00
BI-210M#A	-9.3352E-01	-9.3352E-01	1.003E+02%	3.14E+00
AC-228 #	2.1100E+01	2.1100E+01	1.363E+01%	7.47E+00
TH-227 #A	4.7189E+00	4.7189E+00	1.103E+02%	1.35E+01
TH-229 #A	5.6270E+00	5.6270E+00	1.268E+02%	2.15E+01
TH-234	2.5239E+01	2.5239E+01	2.157E+01%	1.55E+01
PA-231 #A	0.0000E+00	0.0000E+00	1.000E+03%	8.76E+01
PA-233 #A	1.1116E+00	1.1116E+00	1.771E+02%	6.64E+00
PA-234 #A	2.2181E-01	2.2181E-01	7.918E+01%	8.32E+00
PA-234M#A	7.1971E+01	7.1971E+01	8.433E+01%	3.36E+02
AM-241 #A	-3.7212E-01	-3.7212E-01	2.778E+02%	3.88E+00
Np-237 #A	2.2407E+00	2.2407E+00	2.042E+02%	1.53E+01

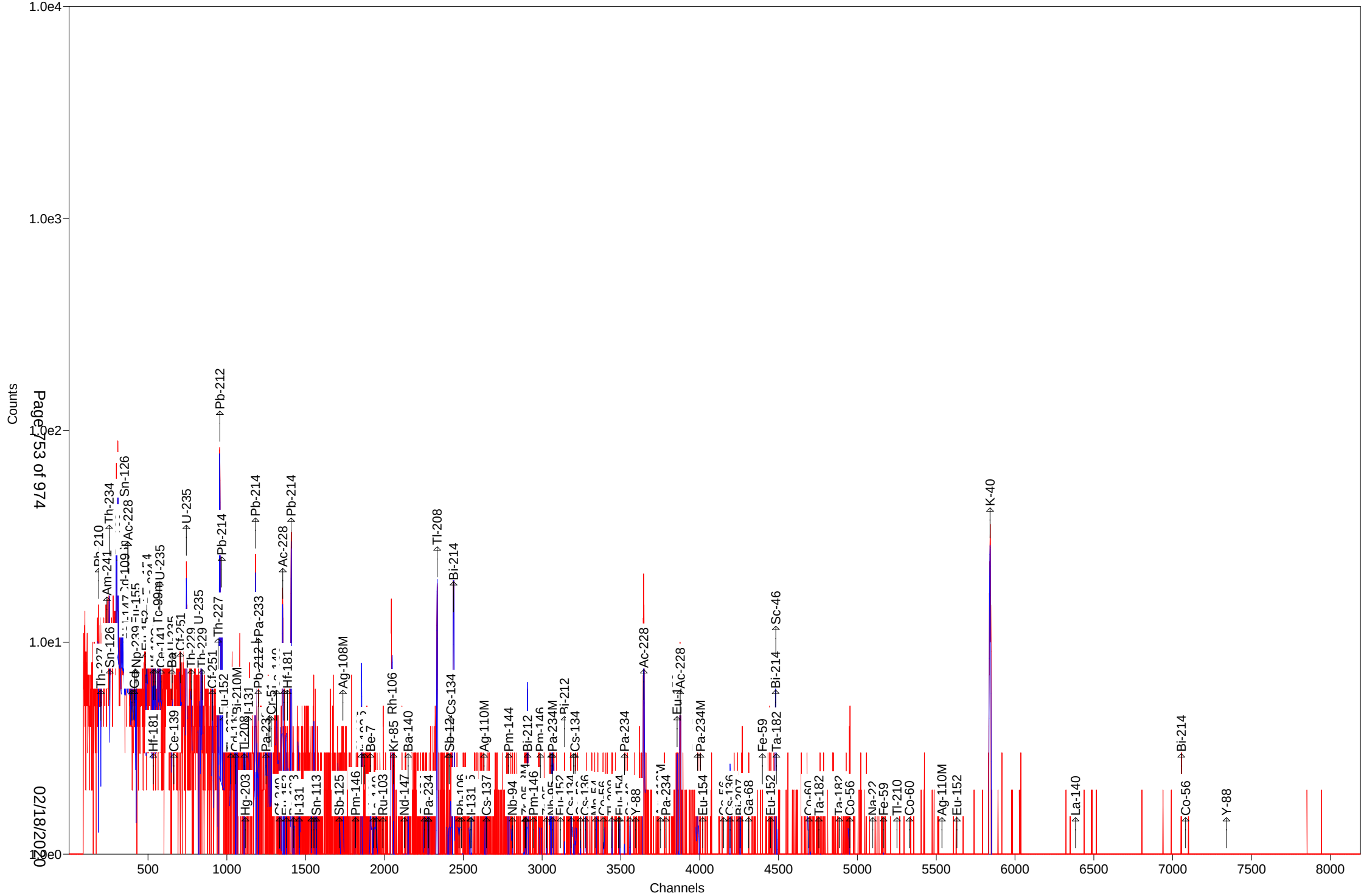
Ir-192	#A	4.0300E-01	4.0301E-01	1.027E+02%	1.40E+00
Cs-136	#A	1.2035E+00	1.2036E+00	2.294E+01%	1.97E+00
Np-239	#A	-1.2086E+00	-1.2088E+00	1.522E+02%	6.17E+00
Nd-147	#A	2.4875E-01	2.4876E-01	1.633E+02%	9.15E+00
TL-210	#A	9.9429E-02	9.9429E-02	6.342E+02%	2.24E+00
Kr-85	#A	6.4117E+01	6.4117E+01	2.368E+02%	5.21E+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) 3.483E+02 Bq/Sample
Total Decayed Activity (37.6 to 2000.8 keV) 3.4825269E+02 Bq/Sample

453329_Gamma_160-36593-A-13-B. 5_Gamma_20193409.spc.



Test America St. Louis Spectrum ID: 8_Gamma_20192231

Sample Description: 453329_Gamma_160-36593-A-14-B
Detector: Detector # 8
Batch ID: 453329
Work Order Number: Gamma
Lot Number: 160-36593-A-14-B

Decay to Time: 12/27/2019 10:15 Live Time: 1800 sec
Acquisition Time: 12/27/2019 10:15:41 Real Time: 1843 sec
Analysis Time: 12/27/2019 10:46 Dead Time: 2.31 %
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_2019-12-07_1517.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	-3.899E+00	124.3	4.846E+00	4.850E+00	1.166E+01
NA-22	1.869E-01	208.5	3.897E-01	3.898E-01	1.436E+00
K-40	2.471E+02	5.9	1.467E+01	1.937E+01	1.050E+01
Sc-46	0.000E+00	1.#INF	2.039E-01	2.039E-01	2.733E+00
CR-51	3.538E+00	213.2	7.545E+00	7.547E+00	2.535E+01
MN-54	-2.348E-01	260.5	6.115E-01	6.116E-01	1.533E+00
FE-59	-1.813E+00	51.6	9.362E-01	9.406E-01	3.804E+00
Co-56	6.462E-01	90.7	5.860E-01	5.869E-01	1.428E+00
CO-57	0.000E+00	1.#INF	2.712E-01	2.712E-01	1.212E+00
CO-58	3.650E-01	138.6	5.057E-01	5.061E-01	1.748E+00
CO-60	-6.640E-01	142.6	9.468E-01	9.474E-01	2.124E+00
ZN-65	0.000E+00	1.#INF	7.981E-01	7.981E-01	6.924E+00
NB-94	2.560E-01	74.2	1.899E-01	1.904E-01	1.448E+00
ZR-95	1.069E-01	109.7	1.173E-01	1.174E-01	3.127E+00
NB-95	-3.905E-01	197.5	7.712E-01	7.715E-01	2.638E+00
RU-103	-6.993E-01	93.9	6.568E-01	6.578E-01	1.558E+00
RH-106	4.374E+00	91.1	3.985E+00	3.991E+00	9.720E+00
AG-108M	2.662E-01	92.5	2.461E-01	2.465E-01	1.305E+00
AG-110M	5.103E-01	101.7	5.190E-01	5.197E-01	3.764E+00
SN-113	-1.585E-01	441.9	7.006E-01	7.007E-01	2.418E+00
SB-124	2.681E-01	101.1	2.709E-01	2.713E-01	3.776E+00
SB-125	-3.259E-01	455.8	1.486E+00	1.486E+00	3.802E+00
I-131	5.839E-01	88.9	5.194E-01	5.203E-01	8.156E-01
Gd-153	1.438E+00	164.1	2.360E+00	2.361E+00	7.852E+00
Ga-68	1.232E+01	201.7	2.484E+01	2.485E+01	5.802E+01
Tc-99m	3.830E-01	147.6	5.652E-01	5.657E-01	1.888E+00
BA-133	-7.745E-01	154.3	1.195E+00	1.196E+00	4.012E+00
CS-134	1.048E+00	90.4	9.470E-01	9.485E-01	1.923E+00
CS-137	2.497E-01	234.1	5.845E-01	5.847E-01	2.027E+00
CE-139	3.321E-01	126.6	4.205E-01	4.217E-01	1.080E+00
Ba-140	4.126E+00	34.4	1.421E+00	1.437E+00	3.096E+00
La-140	3.402E-01	176.2	5.995E-01	5.997E-01	1.409E+00
CE-141	3.768E-01	285.3	1.075E+00	1.075E+00	3.605E+00

CE-144	2.755E+00	166.7	4.592E+00	4.594E+00	1.534E+01
PM-144	3.391E-01	164.8	5.586E-01	5.589E-01	1.326E+00
EU-152	1.723E+00	130.4	2.248E+00	2.250E+00	3.601E+00
EU-154	1.757E+00	50.1	8.809E-01	8.857E-01	2.038E+00
EU-155	-1.792E+00	38.0	6.815E-01	6.885E-01	6.897E+00
HF-181	-2.348E-01	89.9	2.111E-01	2.114E-01	2.844E+00
Ta-182	4.097E-01	398.4	1.632E+00	1.632E+00	1.005E+01
Hg-203	-5.196E-01	94.9	4.930E-01	4.939E-01	1.651E+00
TL-208	4.315E+00	15.1	6.503E-01	6.877E-01	1.132E+00
PM-146	-1.087E+00	95.5	1.038E+00	1.039E+00	2.447E+00
Y-88	6.512E-01	42.3	2.757E-01	2.782E-01	8.180E-01
Cd-113m	1.459E+03	409.3	5.971E+03	5.972E+03	2.052E+04
Cd-109	0.000E+00	1.#INF	2.000E+01	2.000E+01	6.653E+01
Cf-251	-5.667E-01	389.1	2.205E+00	2.206E+00	5.718E+00
Cf-249	5.617E-01	104.8	5.888E-01	5.895E-01	1.990E+00
Sn-126	2.381E+00	254.4	6.057E+00	6.058E+00	2.033E+01
PB-210	1.286E+01	108.3	1.393E+01	1.395E+01	4.664E+01
PB-212	1.317E+01	7.9	1.037E+00	1.342E+00	2.351E+00
PB-214	1.693E+01	7.3	1.236E+00	1.517E+00	2.342E+00
BI-207	4.931E-01	138.5	6.828E-01	6.832E-01	1.648E+00
BI-212	1.743E+00	422.9	7.371E+00	7.372E+00	2.582E+01
U-235	2.330E+00	198.3	4.621E+00	4.622E+00	1.546E+01
BI-214	1.974E+01	7.3	1.433E+00	1.763E+00	1.560E+00
BI-210M	-9.726E-01	83.4	8.115E-01	8.135E-01	2.705E+00
AC-228	1.647E+01	8.9	1.463E+00	1.688E+00	1.527E+00
TH-227	-7.639E+00	52.7	4.023E+00	4.050E+00	1.817E+01
TH-229	4.174E+00	183.4	7.657E+00	7.665E+00	1.987E+01
TH-234	1.398E+01	36.8	5.144E+00	5.203E+00	1.901E+01
PA-231	0.000E+00	1.#INF	5.488E+00	5.488E+00	9.391E+01
PA-233	1.095E+00	193.3	2.118E+00	2.118E+00	7.106E+00
PA-234	1.911E+00	141.8	2.709E+00	2.711E+00	9.043E+00
PA-234M	7.579E+01	96.1	7.281E+01	7.291E+01	1.770E+02
AM-241	-2.172E+00	54.0	1.174E+00	1.179E+00	6.238E+00
Np-237	-3.409E+00	176.5	6.018E+00	6.021E+00	2.002E+01
Ir-192	6.650E-01	136.6	9.086E-01	9.094E-01	3.022E+00
Cs-136	5.152E-01	96.3	4.962E-01	4.971E-01	1.687E+00
Np-239	5.992E-01	221.8	1.329E+00	1.329E+00	4.494E+00
Nd-147	-3.047E+00	133.7	4.074E+00	4.078E+00	9.844E+00
TL-210	5.849E-01	94.3	5.517E-01	5.527E-01	1.868E+00
Kr-85	-6.365E+01	215.6	1.372E+02	1.373E+02	4.690E+02
Total	1.936E+03				

Analyst: Jasmine Stewart

Sample description
453329_Gamma_160-36593-A-14-B

Spectrum Filename: C:\User\SPC\Det8\8_Gamma_20192231.An1

Acquisition information
Start time: 12/27/2019 10:15:41 AM
Live time: 1800
Real time: 1843
Dead time: 2.31 %
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	12/27/2019 10:15:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	8_2019-12-07_1517.PBC 12/7/2019 3:17:53 PM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 27 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 0.1705

***** 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	20.	108.28	1.01	2.005E-02	46.54	4.250	PBC<MDA	PB210
49.80	23.	105.88	1.01	2.267E-02	50.14	8.000	PBC<MDA	TH227
63.56	57.	36.79	1.03	3.093E-02	63.29	3.810	PBC<MDA	TH234
64.55	13.	254.38	1.03	3.146E-02	64.28	9.700	PBC<MDA	Sn126
74.84	163.	15.72	1.03	3.616E-02				
77.16	252.	10.47	1.04	3.699E-02				
87.29	120.	24.00	0.58	3.977E-02	86.49	13.100	1.289E+01	Np237
					86.54	30.700	5.498E+00	EU155
					86.94	9.040	1.863E+01	Sn126
					87.57	37.500	4.476E+00	Sn126
					88.04	3.790	4.419E+01	Cd109
92.49	21.	109.27	1.05	4.072E-02	92.59	5.584	PBC<MDA	TH234
93.25	32.	166.53	1.05	4.083E-02	93.35	5.561	PBC<MDA	AC228
97.50	32.	164.13	1.05	4.133E-02	97.50	30.000	PBC<MDA	Gd153
99.50	23.	227.74	1.05	4.151E-02	99.50	15.000	PBC<MDA	Np239
106.13	10.	221.78	1.06	4.187E-02	106.13	22.700	PBC<MDA	Np239
123.10	22.	84.28	1.07	4.138E-02	123.10	40.790	PBC<MDA	EU154
131.29	25.	141.77	1.08	4.061E-02	131.29	18.000	PBC<MDA	PA234
133.02	25.	144.37	1.08	4.041E-02	133.02	43.300	PBC<MDA	HF181
					133.54	11.090	3.125E+00	CE144
133.54	22.	166.66	1.08	4.035E-02	133.02	43.300	PBC<MDA	HF181
					133.54	11.090	2.755E+00	CE144

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pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
140.51	24.	147.57	1.08	3.945E-02	140.51	89.300	PBC<MDA	Tc99m
143.79	18.	198.33	1.09	3.899E-02	143.79	10.960	PBC<MDA	U235
145.44	13.	285.27	1.09	3.874E-02	145.44	48.200	PBC<MDA	CE141
165.85	17.	126.62	1.10	3.629E-02	165.85	79.900	PBC<MDA	CE139
185.72	103.	23.26	1.12	3.329E-02	185.72	54.000	3.177E+00	U235
193.51	11.	183.43	1.13	3.226E-02	193.51	4.400	PBC<MDA	TH229
227.00	7.	298.41	1.15	2.853E-02	227.00	6.300	PBC<MDA	Cf251
235.97	21.	174.90	1.16	2.768E-02	235.97	12.300	PBC<MDA	TH227
238.64	296.	9.46	1.50	2.744E-02	238.63	43.300	1.386E+01	PB212
242.00	75.	20.97	1.16	2.714E-02	242.00	7.430	2.079E+01	PB214
244.69	20.	180.63	1.16	2.691E-02	244.69	7.580	PBC<MDA	EU152
263.70	4.	409.27	1.18	2.539E-02	263.70	0.006	PBC<MDA	Cd113m
277.48	38.	30.46	1.56	2.440E-02	277.28	6.310	1.371E+01	TL208
295.40	188.	9.71	1.10	2.322E-02	295.09	19.300	2.261E+01	PB214
					296.00	79.000	5.693E+00	TL210
300.23	26.	37.59	1.20	2.294E-02	300.03	3.280	PBC<MDA	PB212
					300.07	2.460	2.589E+01	PA231
					300.18	6.200	1.028E+01	PA233
304.90	16.	187.46	1.21	2.265E-02	304.85	4.290	8.986E+00	Ba140
					304.90	28.000	1.377E+00	BI210M
308.44	16.	190.40	1.21	2.244E-02	308.44	31.750	PBC<MDA	Ir192
312.01	16.	193.30	1.21	2.224E-02	312.01	36.000	PBC<MDA	PA233
316.49	16.	196.02	1.22	2.199E-02	316.49	87.040	PBC<MDA	Ir192
320.08	14.	213.23	1.22	2.179E-02	320.08	9.940	PBC<MDA	CR51
338.36	77.	17.75	1.56	2.085E-02	338.32	12.010	1.701E+01	AC228
344.29	17.	130.44	1.24	2.057E-02	344.29	26.500	PBC<MDA	EU152
352.00	227.	8.75	1.39	2.021E-02	351.93	37.600	1.663E+01	PB214
364.48	10.	96.02	1.25	1.965E-02	364.48	81.700	PBC<MDA	I131
383.84	14.	103.47	1.27	1.885E-02	383.84	8.940	PBC<MDA	BA133
387.95	12.	104.82	1.27	1.869E-02	387.95	66.000	PBC<MDA	Cf249
511.86	64.	19.89	2.61	1.494E-02	511.86	20.000	1.190E+01	RH106
537.26	26.	34.44	1.37	1.436E-02	537.26	24.390	4.126E+00	Ba140
563.24	9.	106.93	1.39	1.381E-02	563.24	8.350	PBC<MDA	CS134
569.32	2.	361.66	1.40	1.369E-02	569.32	15.380	PBC<MDA	CS134
					569.47	8.200	8.251E-01	PA234
					569.70	97.740	6.924E-02	BI207
583.41	88.	15.07	1.38	1.342E-02	583.02	84.500	4.302E+00	TL208
609.45	216.	7.26	1.42	1.294E-02	609.31	46.090	2.011E+01	BI214
621.92	10.	91.11	1.43	1.273E-02	621.92	9.930	PBC<MDA	RH106
636.97	6.	149.75	1.44	1.248E-02	636.97	7.170	PBC<MDA	I131
661.66	5.	234.12	1.46	1.209E-02	661.66	85.210	PBC<MDA	CS137
696.54	7.	164.75	1.48	1.158E-02	696.54	99.000	PBC<MDA	PM144
702.63	1.	934.91	1.48	1.150E-02	702.63	97.900	PBC<MDA	NB94
722.79	9.	101.07	1.50	1.123E-02	722.79	10.810	PBC<MDA	SB124
					722.94	90.840	4.629E-01	AG108M
					723.36	20.220	2.081E+00	EU154
722.94	10.	92.48	1.50	1.123E-02	722.79	10.810	4.764E+00	SB124
					722.94	90.840	5.671E-01	AG108M

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
					723.36	20.220	2.549E+00	EU154
723.36	10.	102.33	1.50	1.123E-02	722.79	10.810	PBC<MDA	SB124
					722.94	90.840	5.671E-01	AG108M
					723.36	20.220	2.549E+00	EU154
724.20	9.	119.20	1.50	1.121E-02	724.20	44.150	PBC<MDA	ZR95
727.17	3.	422.92	1.50	1.118E-02	727.17	7.550	PBC<MDA	BI212
766.41	12.	96.08	1.53	1.070E-02	765.79	99.790	PBC<MDA	NB95
					766.41	0.294	2.095E+02	PA234M
785.42	9.	91.79	1.54	1.048E-02	785.42	1.280	PBC<MDA	BI212
795.87	10.	90.39	1.54	1.036E-02	795.87	85.530	PBC<MDA	CS134
799.60	11.	94.32	1.55	1.032E-02	799.60	98.960	PBC<MDA	TL210
801.95	5.	231.31	1.55	1.030E-02	801.95	8.690	PBC<MDA	CS134
810.78	7.	138.56	1.55	1.020E-02	810.78	99.460	PBC<MDA	CO58
818.50	9.	96.30	1.56	1.012E-02	818.50	100.000	PBC<MDA	Cs136
860.87	10.	89.23	1.59	9.703E-03	860.56	12.420	PBC<MDA	TL208
871.10	8.	74.17	1.59	9.604E-03	871.10	99.890	PBC<MDA	NB94
898.04	3.	389.11	1.61	9.360E-03	898.04	93.700	PBC<MDA	Y88
911.12	74.	11.62	1.01	9.247E-03	911.07	29.000	1.533E+01	AC228
937.49	3.	289.64	1.63	9.026E-03	937.49	34.360	PBC<MDA	AG110M
964.11	8.	145.33	1.65	8.814E-03	964.11	14.605	PBC<MDA	EU152
968.98	50.	16.12	1.95	8.776E-03	968.97	17.460	1.801E+01	AC228
996.33	6.	87.67	1.67	8.571E-03	996.33	10.600	PBC<MDA	EU154
1001.00	4.	172.88	1.67	8.537E-03	1001.00	0.837	PBC<MDA	PA234M
1004.77	6.	122.30	1.67	8.509E-03	1004.77	18.010	PBC<MDA	EU154
1037.84	6.	122.85	1.69	8.278E-03	1037.84	14.130	PBC<MDA	Co56
1063.66	5.	138.46	1.71	8.106E-03	1063.66	74.500	PBC<MDA	BI207
1077.40	5.	201.66	1.72	8.017E-03	1077.40	3.300	PBC<MDA	Ga68
1120.28	63.	12.71	0.46	7.754E-03	1120.29	15.100	2.974E+01	BI214
1221.41	3.	398.43	1.80	7.199E-03	1221.41	27.000	PBC<MDA	Ta182
1238.28	12.	90.68	1.81	7.114E-03	1238.28	66.070	PBC<MDA	Co56
1274.53	2.	208.49	1.83	6.939E-03	1274.53	99.940	PBC<MDA	NA22
					1274.54	35.190	5.308E-01	EU154
1291.60	12.	28.87	1.84	6.860E-03	1291.60	43.200	2.250E+00	FE59
1313.00	6.	90.79	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	7.	88.63	1.90	6.366E-03	1408.00	21.005	PBC<MDA	EU152
1460.93	293.	5.94	2.01	6.165E-03	1460.83	10.670	2.471E+02	K40
1596.21	3.	176.21	1.99	5.706E-03	1596.21	95.400	PBC<MDA	La140
1764.59	27.	26.49	2.07	5.226E-03	1764.49	15.400	1.864E+01	BI214
1836.06	6.	42.33	2.10	5.046E-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 Channel	Centroid Energy	Background Counts	Net Area Counts	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide
299.17	74.79	248.	163.	4.520E+03	15.72	1.034	- sD

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Channel	Energy	Background	Net area	Eff*Area	Uncert	FWHM	Suspected
308.44	77.10	223.	252.	6.822E+03	10.47	1.036	- 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	185.96	46.54	218.	20.	0.011	108.28	1.012s
TH-227	200.36	50.14	272.	23.	0.013	105.88	1.015s
AM-241	237.95	59.54	593.	-40.	-0.022	54.04	1.022
TH-234	252.96	63.29	190.	57.	0.032	36.79	1.025D
Sn-126	256.93	64.28	547.	13.	0.007	254.38	1.026s
BA-133	323.77	80.99	1159.	-35.	-0.019	60.26	1.039s
Np-237	345.77	86.49	1562.	-32.	-0.018	176.52	1.043s
EU-155	345.98	86.54	1531.	-32.	-0.018	174.73	1.043
Sn-126	347.57	86.94	1499.	-32.	-0.018	172.86	1.044
Sn-126	350.09	87.57	1362.	64.	0.036	35.63	1.044D
Cd-109	351.97	88.04	1467.	0.	0.000	170.90	1.044A
Nd-147	364.21	91.10	1331.	-29.	-0.016	181.38	1.047s
TH-234	370.17	92.59	260.	21.	0.012	109.27	1.048D
AC-228	373.21	93.35	1403.	32.	0.018	166.53	1.049s
Gd-153	389.81	97.50	1371.	32.	0.018	164.13	1.052s
Np-239	397.81	99.50	1339.	23.	0.013	227.74	1.053
EU-155	421.07	105.31	531.	-29.	-0.016	38.03	1.058
Np-239	424.34	106.13	253.	10.	0.006	221.78	1.058s
EU-152	486.94	121.78	253.	-4.	-0.002	564.58	1.071s
CO-57	488.06	122.06	257.	0.	0.000	1000.00	1.071s
EU-154	492.22	123.10	162.	22.	0.012	84.28	1.072
PA-234	525.00	131.29	622.	25.	0.014	141.77	1.078s
HF-181	531.92	133.02	648.	25.	0.014	144.37	1.079
CE-144	533.98	133.54	673.	22.	0.012	166.66	1.080
HF-181	545.02	136.30	695.	0.	0.000	1000.00	1.082
CO-57	545.72	136.47	695.	0.	0.000	1000.00	1.082s
Tc-99m	561.86	140.51	592.	24.	0.013	147.57	1.085s
U-235	574.97	143.79	622.	18.	0.010	198.33	1.087s
CE-141	581.59	145.44	646.	13.	0.007	285.27	1.089s
CE-139	663.24	165.85	133.	17.	0.010	126.62	1.104s
Cf-251	706.23	176.60	154.	-6.	-0.003	389.09	1.112
U-235	742.71	185.72	143.	103.	0.057	23.26	1.119s
TH-229	773.87	193.51	106.	11.	0.006	183.43	1.125s
TH-229	843.24	210.85	172.	-8.	-0.004	322.91	1.138s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Cf-251	907.84	227.00	112.	7.	0.004	298.41	1.151s
TH-227	943.73	235.97	634.	21.	0.011	174.90	1.157s
PB-212	954.37	238.63	104.	282.	0.157	7.87	1.159D
PB-214	967.84	242.00	88.	75.	0.042	20.97	1.162D
EU-152	978.62	244.69	632.	20.	0.011	180.63	1.164s
TH-227	1024.81	256.24	148.	-25.	-0.014	52.67	1.172s
Cd-113m	1054.65	263.70	132.	4.	0.002	409.27	1.178
BI-210M	1063.18	265.83	159.	-22.	-0.012	83.43	1.179s
TL-208	1109.76	277.48	24.	38.	0.021	30.46	1.555s
Hg-203	1116.66	279.20	145.	-18.	-0.010	94.87	1.189s
I-131	1137.05	284.30	116.	-22.	-0.012	96.74	1.193s
PB-214	1180.22	295.09	66.	141.	0.079	11.70	1.201D
TL-210	1183.86	296.00	575.	-18.	-0.010	187.67	1.202s
PB-212	1199.98	300.03	36.	26.	0.015	37.59	1.205D
PA-231	1200.14	300.07	557.	-18.	-0.010	189.46	1.205
PA-233	1200.58	300.18	539.	0.	0.000	1000.00	1.205
PA-231	1210.46	302.65	539.	0.	0.000	1000.00	1.207s
BA-133	1211.27	302.85	539.	0.	0.000	1000.00	1.207s
Ba-140	1219.26	304.85	539.	0.	0.000	1000.00	1.208s
BI-210M	1219.45	304.90	426.	16.	0.009	187.46	1.208s
Ir-192	1233.62	308.44	442.	16.	0.009	190.40	1.211s
PA-233	1247.91	312.01	458.	16.	0.009	193.30	1.214s
Ir-192	1265.82	316.49	473.	16.	0.009	196.02	1.217s
CR-51	1280.20	320.08	426.	14.	0.008	213.23	1.219s
La-140	1314.91	328.76	449.	-21.	-0.012	137.66	1.226s
Cf-249	1333.63	333.44	428.	-21.	-0.012	141.41	1.229s
AC-228	1353.33	338.36	28.	77.	0.043	17.75	1.559s
Cs-136	1362.15	340.57	407.	-21.	-0.012	137.43	1.234s
EU-152	1377.01	344.29	243.	17.	0.010	130.44	1.237
HF-181	1383.19	345.83	399.	-21.	-0.012	135.73	1.238
PB-214	1407.88	352.00	40.	227.	0.126	8.75	1.395s
BA-133	1423.87	356.00	349.	-17.	-0.010	154.34	1.245s
I-131	1457.81	364.48	20.	10.	0.005	96.02	1.252s
BA-133	1535.24	383.84	97.	14.	0.008	103.47	1.266s
Cf-249	1551.68	387.95	79.	12.	0.007	104.82	1.269s
SN-113	1566.64	391.69	110.	-3.	-0.002	441.95	1.271s
SB-125	1711.39	427.88	48.	-3.	-0.002	455.83	1.297s
PM-146	1815.41	453.88	91.	-21.	-0.012	95.46	1.315s
SB-125	1853.36	463.37	103.	-8.	-0.004	190.36	1.322
Ir-192	1872.14	468.06	120.	-8.	-0.004	201.11	1.325s
BE-7	1910.28	477.60	48.	-12.	-0.006	124.29	1.332s
HF-181	1927.89	482.00	177.	-18.	-0.010	107.19	1.335
RU-103	1988.12	497.05	61.	-18.	-0.010	93.93	1.346s
RH-106	2047.36	511.86	49.	64.	0.036	19.89	2.606s
Kr-85	2055.83	513.98	121.	-7.	-0.004	215.61	1.357s
Nd-147	2123.91	531.00	43.	-10.	-0.006	133.71	1.369s
Ba-140	2148.95	537.26	13.	26.	0.014	34.44	1.373s
CS-134	2252.86	563.24	22.	9.	0.005	106.93	1.391s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
CS-134	2277.20	569.32	17.	2.	0.001	361.66	1.395
PA-234	2277.80	569.47	29.	-7.	-0.004	120.00	1.395
BI-207	2278.73	569.70	42.	-8.	-0.005	115.72	1.396
TL-208	2333.58	583.41	19.	88.	0.049	15.07	1.383
SB-125	2401.92	600.50	333.	-4.	-0.002	295.12	1.416s
SB-124	2410.85	602.73	329.	0.	0.000	1000.00	1.418s
CS-134	2418.76	604.71	329.	0.	0.000	1000.00	1.419s
BI-214	2437.72	609.45	9.	216.	0.120	7.26	1.422
RU-103	2441.12	610.30	329.	0.	0.000	1000.00	1.423s
AG-108M	2457.05	614.28	329.	0.	0.000	1000.00	1.426s
RH-106	2487.60	621.92	17.	10.	0.006	91.11	1.431s
SB-125	2543.49	635.89	30.	-5.	-0.003	152.33	1.440s
I-131	2547.83	636.97	31.	6.	0.003	149.75	1.441s
AG-110M	2630.98	657.76	60.	-14.	-0.008	81.01	1.455s
CS-137	2646.58	661.66	56.	5.	0.003	234.12	1.457s
PM-144	2786.11	696.54	28.	7.	0.004	164.75	1.480s
NB-94	2810.46	702.63	33.	1.	0.001	934.91	1.484s
SB-124	2891.09	722.79	33.	9.	0.005	101.07	1.497s
AG-108M	2891.70	722.94	41.	10.	0.006	92.48	1.498s
EU-154	2893.39	723.36	52.	10.	0.006	102.33	1.498s
ZR-95	2896.74	724.20	53.	9.	0.005	119.20	1.498s
BI-212	2908.63	727.17	61.	3.	0.001	422.92	1.500s
PM-146	2942.83	735.72	28.	-4.	-0.002	285.04	1.506s
PM-146	2988.59	747.16	33.	-5.	-0.003	263.90	1.513s
ZR-95	3026.87	756.73	43.	-7.	-0.004	184.25	1.519s
AG-110M	3055.73	763.94	86.	-20.	-0.011	69.98	1.524s
NB-95	3063.11	765.79	106.	-8.	-0.004	197.50	1.525s
PA-234M	3065.60	766.41	59.	12.	0.007	96.08	1.526s
EU-152	3115.64	778.92	28.	-5.	-0.003	228.91	1.534s
BI-212	3141.64	785.42	14.	9.	0.005	91.79	1.538s
CS-134	3183.44	795.87	36.	10.	0.006	90.39	1.544s
TL-210	3198.36	799.60	46.	11.	0.006	94.32	1.547s
CS-134	3207.77	801.95	57.	5.	0.003	231.31	1.548s
CO-58	3243.06	810.78	39.	7.	0.004	138.56	1.554
La-140	3263.04	815.77	46.	0.	0.000	1000.00	1.557
Cs-136	3273.97	818.50	36.	9.	0.005	96.30	1.559s
MN-54	3339.36	834.85	28.	-4.	-0.002	260.48	1.569s
Co-56	3387.05	846.77	23.	-3.	-0.002	318.86	1.577s
TL-208	3442.23	860.56	14.	10.	0.005	89.23	1.585s
NB-94	3484.36	871.10	12.	8.	0.004	74.17	1.592s
EU-154	3492.89	873.23	26.	-4.	-0.002	180.40	1.593s
PA-234	3522.10	880.53	65.	-14.	-0.008	77.07	1.598s
PA-234	3532.94	883.24	78.	-11.	-0.006	113.27	1.599s
Sc-46	3557.10	889.28	88.	0.	0.000	1000.00	1.603s
Y-88	3592.14	898.04	23.	3.	0.001	389.11	1.608s
AC-228	3644.46	911.12	0.	74.	0.041	11.62	1.009s
AG-110M	3749.96	937.49	15.	3.	0.002	289.64	1.633s
PA-234	3784.07	946.02	30.	-4.	-0.002	305.16	1.638s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
EU-152	3856.43	964.11	65.	8.	0.005	145.33	1.649s
AC-228	3875.93	968.98	3.	50.	0.028	16.12	1.946
EU-154	3985.31	996.33	10.	6.	0.003	87.67	1.668
PA-234M	4003.99	1001.00	19.	4.	0.002	172.88	1.671s
EU-154	4019.10	1004.77	22.	6.	0.003	122.30	1.673s
Co-56	4151.36	1037.84	10.	6.	0.003	122.85	1.693s
Cs-136	4192.29	1048.07	38.	-14.	-0.008	65.76	1.698s
RH-106	4201.45	1050.36	60.	-9.	-0.005	125.68	1.700s
BI-207	4254.65	1063.66	11.	5.	0.003	138.46	1.708s
Ga-68	4309.61	1077.40	20.	5.	0.003	201.66	1.716s
FE-59	4397.02	1099.25	36.	-15.	-0.008	51.65	1.728s
EU-152	4448.32	1112.07	108.	-9.	-0.005	161.07	1.736s
ZN-65	4462.20	1115.55	99.	0.	0.000	1000.00	1.738s
BI-214	4481.14	1120.28	0.	63.	0.035	12.71	0.464s
Sc-46	4482.22	1120.55	99.	0.	0.000	1000.00	1.740s
CO-60	4692.97	1173.24	43.	-20.	-0.011	41.22	1.770s
Ta-182	4756.23	1189.05	40.	-17.	-0.009	85.31	1.779
Ta-182	4885.67	1221.41	21.	3.	0.001	398.43	1.797
Co-56	4953.16	1238.28	22.	12.	0.007	90.68	1.806
NA-22	5098.16	1274.53	11.	2.	0.001	208.49	1.826s
EU-154	5098.20	1274.54	13.	0.	0.000	1000.00	1.826s
FE-59	5166.43	1291.60	0.	12.	0.007	28.87	1.835s
TL-210	5252.05	1313.00	5.	6.	0.004	90.79	1.847s
CO-60	5330.06	1332.50	24.	-8.	-0.004	142.59	1.857s
AG-110M	5537.25	1384.30	5.	6.	0.003	101.72	1.884s
EU-152	5632.07	1408.00	5.	7.	0.004	88.63	1.896s
K-40	5843.80	1460.93	4.	293.	0.163	5.94	2.015s
La-140	6384.93	1596.21	6.	3.	0.002	176.21	1.990s
SB-124	6764.03	1690.98	0.	0.	0.000	1000.00	2.034s
BI-214	7058.07	1764.49	12.	27.	0.015	26.49	2.067s
Co-56	7085.51	1771.35	29.	0.	0.000	1000.00	2.070s
Y-88	7344.36	1836.06	0.	6.	0.003	42.33	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	-3.8986E+00				5.31E+01	
			477.60	-3.899E+00	?(	1.166E+01 1.24E+02 1.05E+01	G
NA-22	C	1.8691E-01				9.50E+02	
			1274.53	1.869E-01	?(	1.436E+00 2.08E+02 9.99E+01	G

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Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
K-40	N	2.4715E+02					4.66E+11	
			1460.83	2.471E+02	(P	1.050E+01	5.94E+00	1.07E+01 G
CR-51	F	3.5383E+00					2.77E+01	
			320.08	3.538E+00	?(P	2.535E+01	2.13E+02	9.94E+00 G
MN-54	C	-2.3475E-01					3.12E+02	
			834.85	-2.348E-01	?(P	1.533E+00	2.60E+02	1.00E+02 G
FE-59	F	-1.8127E+00					4.45E+01	
			1099.25	-1.813E+00	?(P	3.804E+00	5.16E+01	5.65E+01 G
			1291.60	2.250E+00	+	1.382E+00	2.89E+01	4.32E+01 G
Co-56	C	6.4621E-01					7.73E+01	
			846.77	-1.945E-01	?(P	1.428E+00	3.19E+02	9.99E+01 G
			1238.28	1.447E+00	?(P	2.883E+00	9.07E+01	6.61E+01 G
			1037.84	2.850E+00	?(	8.287E+00	1.23E+02	1.41E+01 G
			1771.35	0.000E+00	-	1.921E+01	1.00E+03	1.55E+01 A
CO-58	C	3.6499E-01					7.09E+01	
			810.78	3.650E-01	?(	1.748E+00	1.39E+02	9.95E+01 G
CO-60	F	-6.6398E-01					1.93E+03	
			1332.50	-6.640E-01	&(P	2.124E+00	1.43E+02	1.00E+02 G
			1173.24	-1.515E+00	+ P	2.480E+00	4.12E+01	9.99E+01 G
NB-94	I	2.5605E-01					7.41E+06	
			702.63	6.431E-02	(P	1.448E+00	9.35E+02	9.79E+01 G
			871.10	4.440E-01	&(	1.105E+00	7.42E+01	9.99E+01 G
ZR-95	I	1.0690E-01					6.40E+01	
			756.73	-6.272E-01	?(P	3.127E+00	1.84E+02	5.45E+01 G
			724.20	1.012E+00	&(	4.122E+00	1.19E+02	4.42E+01 G
NB-95	I	-3.9047E-01					6.40E+01	
			765.79	-3.905E-01	?(	2.638E+00	1.98E+02	9.98E+01 G
RU-103	I	-6.9930E-01					3.93E+01	
			497.05	-6.993E-01	?(	1.558E+00	9.39E+01	9.09E+01 G
			610.30	0.000E+00	+	6.520E+01	1.00E+03	5.75E+00 GA
RH-106	I	4.3738E+00					3.74E+02	
			621.92	4.374E+00	?(	9.720E+00	9.11E+01	9.93E+00 G
			1050.36	-3.927E+01	+	1.686E+02	1.26E+02	1.56E+00 G
			511.86	1.190E+01	?	6.571E+00	1.99E+01	2.00E+01 GA

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
AG-108M	C 2.6615E-01					1.53E+05	
		433.94	-3.595E-02	%(	1.305E+00	1.48E+03	9.05E+01 G
		722.94	5.671E-01	?(	1.776E+00	9.25E+01	9.08E+01 G
		614.28	0.000E+00	-	4.195E+00	1.00E+03	8.98E+01 G
AG-110M	F 5.1027E-01					2.50E+02	
		884.68	-2.513E-03	%(P	3.764E+00	3.55E+04	7.27E+01 G
		657.76	-6.912E-01	&	1.875E+00	8.10E+01	9.46E+01 G
		937.49	5.374E-01	?(	3.719E+00	2.90E+02	3.44E+01 G
		1384.30	2.006E+00	?(	4.769E+00	1.02E+02	2.43E+01 G
		763.94	-4.610E+00	&	1.070E+01	7.00E+01	2.23E+01 G
SN-113	F -1.5853E-01					1.15E+02	
		391.69	-1.585E-01	?(	2.418E+00	4.42E+02	6.40E+01 G
SB-124	F 2.6805E-01					6.02E+01	
		602.73	0.000E+00	(	3.776E+00	1.00E+03	9.83E+01 G
		1690.98	0.000E+00	?(	1.579E+00	1.00E+03	4.78E+01 G
		722.79	3.890E+00	?(	1.343E+01	1.01E+02	1.08E+01 G
SB-125	I -3.2592E-01					1.01E+03	
		427.88	-3.259E-01	?(	3.802E+00	4.56E+02	2.96E+01 G
		600.50	-1.068E+00	+ P	2.085E+01	2.95E+02	1.79E+01 G
		635.89	-2.097E+00	+	1.115E+01	1.52E+02	1.13E+01 G
		463.37	-2.512E+00	+	1.636E+01	1.90E+02	1.05E+01 G
I-131	I 5.8394E-01					8.02E+00	
		364.48	3.354E-01	&(P	8.156E-01	9.60E+01	8.17E+01 G
		284.30	-8.446E+00	+	2.000E+01	9.67E+01	6.14E+00 G
		636.97	3.416E+00	?(	1.784E+01	1.50E+02	7.17E+00 G
Gd-153	F 1.4378E+00					2.42E+02	
		97.50	1.438E+00	&(	7.852E+00	1.64E+02	3.00E+01 G
		103.20	-2.328E-07	%	1.048E+01	1.34E+09	2.18E+01 G
Ga-68	C 1.2319E+01					4.71E-02	
		1077.40	1.232E+01	?(	5.802E+01	2.02E+02	3.30E+00 G
Tc-99m	I 3.8302E-01					2.51E-01	
		140.51	3.830E-01	?(	1.888E+00	1.48E+02	8.93E+01 G
BA-133	F -7.7446E-01					3.85E+03	
		356.00	-7.745E-01	?(	4.012E+00	1.54E+02	6.20E+01 G
		302.85	0.000E+00	+	1.476E+01	1.00E+03	1.83E+01 G
		383.84	4.586E+00	?	1.599E+01	1.03E+02	8.94E+00 GA
		80.99	-1.485E+00	+ P	6.890E+00	6.03E+01	3.41E+01 GA

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CS-134	I	1.0476E+00					7.54E+02	
			795.87	6.287E-01	?(P	1.923E+00	9.04E+01	8.55E+01 G
			604.71	0.000E+00	&	3.811E+00	1.00E+03	9.76E+01 G
			569.32	4.398E-01	?(	5.835E+00	3.62E+02	1.54E+01 G
			801.95	2.933E+00	?(P	2.358E+01	2.31E+02	8.69E+00 G
			563.24	4.497E+00	?(	1.176E+01	1.07E+02	8.35E+00 G
CS-137	I	2.4968E-01					1.10E+04	
			661.66	2.497E-01	?(P	2.027E+00	2.34E+02	8.52E+01 G
CE-139	F	3.3210E-01					1.38E+02	
			165.85	3.321E-01	*(	1.080E+00	1.27E+02	7.99E+01 G
Ba-140	I	4.1255E+00					1.28E+01	
			537.26	4.126E+00	?(	3.096E+00	3.44E+01	2.44E+01 G
			162.66	1.657E-01	&	1.983E+01	3.51E+03	6.22E+00 G
			304.85	0.000E+00	-	6.341E+01	1.00E+03	4.29E+00 G
La-140	I	3.4019E-01					1.28E+01	
			1596.21	3.402E-01	?(	1.409E+00	1.76E+02	9.54E+01 G
			487.02	5.054E-02	&	4.806E+00	2.76E+03	4.55E+01 G
			328.76	-2.743E+00	+ P	1.302E+01	1.38E+02	2.03E+01 G
			815.77	0.000E+00	-	8.068E+00	1.00E+03	2.33E+01 G
CE-141	I	3.7680E-01					3.25E+01	
			145.44	3.768E-01	?(	3.605E+00	2.85E+02	4.82E+01 G
CE-144	I	2.7550E+00					2.85E+02	
			133.54	2.755E+00	&(	1.534E+01	1.67E+02	1.11E+01 G
PM-144	C	3.3908E-01					3.63E+02	
			696.54	3.391E-01	?(	1.326E+00	1.65E+02	9.90E+01 G
			618.06	-4.228E-02	& P	3.828E+00	1.63E+03	9.91E+01 G
EU-152	F	1.7232E+00					4.94E+03	
			121.78	-1.875E-01	*(	3.601E+00	5.65E+02	2.86E+01 G
			344.29	1.754E+00	?(	7.684E+00	1.30E+02	2.65E+01 G
			1112.07	-4.870E+00	+	2.672E+01	1.61E+02	1.36E+01 G
			778.92	-2.034E+00	+	1.114E+01	2.29E+02	1.29E+01 G
			964.11	3.498E+00	?(	1.743E+01	1.45E+02	1.46E+01 G
			244.69	5.401E+00	?(P	3.263E+01	1.81E+02	7.58E+00 G
			1408.00	2.739E+00	?	5.597E+00	8.86E+01	2.10E+01 GA
EU-154	I	1.7571E+00					3.14E+03	
			123.10	7.254E-01	?(	2.038E+00	8.43E+01	4.08E+01 G
			1274.54	0.000E+00	-	4.439E+00	1.00E+03	3.52E+01 G
			723.36	2.549E+00	?(	8.855E+00	1.02E+02	2.02E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
			873.23	-1.968E+00	+	1.254E+01	1.80E+02	1.23E+01 G
			1004.77	2.108E+00	?(	8.976E+00	1.22E+02	1.80E+01 G
			996.33	3.619E+00	?(	1.089E+01	8.77E+01	1.06E+01 G
EU-155	I	-1.7918E+00						1.81E+03
			105.31	-1.792E+00	?(P	6.897E+00	3.80E+01	2.12E+01 G
			86.54	-1.454E+00	+	8.454E+00	1.75E+02	3.07E+01 G
HF-181	F	-2.3479E-01						4.24E+01
			482.00	-7.909E-01	(	2.844E+00	1.07E+02	8.05E+01 G
			133.02	7.992E-01	(	3.851E+00	1.44E+02	4.33E+01 G
			345.83	-3.794E+00	+	1.723E+01	1.36E+02	1.51E+01 G
			136.30	0.000E+00	+	2.980E+01	1.00E+03	5.85E+00 G
Ta-182	F	4.0968E-01						1.14E+02
			1121.30	1.370E-01	%(	1.005E+01	2.11E+03	3.49E+01 G
			1221.41	7.622E-01	(	6.926E+00	3.98E+02	2.70E+01 G
			1189.05	-7.913E+00	+	1.498E+01	8.53E+01	1.62E+01 G
Hg-203	F	-5.1960E-01						4.66E+01
			279.20	-5.196E-01	?(	1.651E+00	9.49E+01	8.15E+01 G
TL-208	N	4.3149E+00						6.98E+02
			583.02	4.302E+00	(P	1.132E+00	1.51E+01	8.45E+01 G
			277.28	1.371E+01	+	9.214E+00	3.05E+01	6.31E+00 G
			860.56	4.400E+00	?(	9.287E+00	8.92E+01	1.24E+01 G
PM-146	C	-1.0874E+00						2.02E+03
			453.88	-1.087E+00	?(	2.447E+00	9.55E+01	6.50E+01 G
			747.16	-6.979E-01	&	4.388E+00	2.64E+02	3.40E+01 G
			735.72	-8.924E-01	+	6.106E+00	2.85E+02	2.25E+01 G
Y-88	F	6.5122E-01						1.07E+02
			1836.06	6.512E-01	?(P	8.180E-01	4.23E+01	9.92E+01 G
			898.04	1.689E-01	-	1.598E+00	3.89E+02	9.37E+01 G
Cd-113m		1.4590E+03						5.33E+03
			263.70	1.459E+03	?(	2.052E+04	4.09E+02	6.00E-03 K
Cf-251	T	-5.6673E-01						3.28E+05
			176.60	-5.667E-01	?(	5.718E+00	3.89E+02	1.70E+01 G
			227.00	2.164E+00	?	1.608E+01	2.98E+02	6.30E+00 GA
Cf-249	T	5.6171E-01						1.28E+05
			387.95	5.617E-01	?(	1.990E+00	1.05E+02	6.60E+01 G
			333.44	-3.555E+00	+	1.682E+01	1.41E+02	1.55E+01 G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

Sn-126       2.3809E+00                                     3.65E+07
                           87.57 2.381E+00 }   6.500E+00 3.56E+01 3.75E+01 GA
                           64.28 2.381E+00 ?(  2.033E+01 2.54E+02 9.70E+00 G
                           86.94-4.930E+00 +   2.835E+01 1.73E+02 9.04E+00 GA

PB-210   N   1.2863E+01                                     8.14E+03
                           46.54 1.286E+01  (P 4.664E+01 1.08E+02 4.25E+00 G

PB-212   N   1.3173E+01                                     6.98E+02
                          238.63 1.317E+01  (P 2.351E+00 7.87E+00 4.33E+01 G
                          300.03 1.942E+01 +   2.256E+01 3.76E+01 3.28E+00 GA

PB-214   N   1.6928E+01                                     5.84E+05
                          351.93 1.663E+01  (P 2.342E+00 8.75E+00 3.76E+01 G
                          295.09 1.752E+01  (P 5.011E+00 1.17E+01 1.93E+01 G
                          242.00 2.079E+01 +   1.276E+01 2.10E+01 7.43E+00 GA

BI-207   C   4.9312E-01                                     1.18E+04
                         1063.66 4.931E-01 ?(P 1.648E+00 1.38E+02 7.45E+01 G
                          569.70-3.462E-01 +   1.372E+00 1.16E+02 9.77E+01 G

BI-212   N   1.7429E+00                                     6.98E+02
                          727.17 1.743E+00 ?(  2.582E+01 4.23E+02 7.55E+00 G
                          785.42 3.836E+01 ?   8.345E+01 9.18E+01 1.28E+00 GA

U-235    N   2.3298E+00                                     2.57E+11
                          143.79 2.330E+00 ?(P 1.546E+01 1.98E+02 1.10E+01 G
                          205.33 8.244E-02 % P 1.940E+01 8.93E+03 5.01E+00 G
                          163.38-8.552E-01 % P 2.451E+01 1.27E+03 5.08E+00 G
                          185.72 3.177E+00 @ P 1.807E+00 2.33E+01 5.40E+01 GA

BI-214   N   1.9739E+01                                     5.84E+05
                          609.31 2.011E+01  (P 1.560E+00 7.26E+00 4.61E+01 G
                         1120.29 2.974E+01 + P 3.497E+00 1.27E+01 1.51E+01 G
                         1764.49 1.864E+01 ?(P 1.302E+01 2.65E+01 1.54E+01 G

BI-210M  T  -9.7263E-01                                     1.10E+09
                          265.83-9.726E-01 ?(  2.705E+00 8.34E+01 5.00E+01 G
                          304.90 1.377E+00 &   8.666E+00 1.87E+02 2.80E+01 G

AC-228   N   1.6474E+01                                     2.10E+03
                          911.07 1.533E+01 @(  1.527E+00 1.16E+01 2.90E+01 G
                          968.97 1.801E+01  (  4.067E+00 1.61E+01 1.75E+01 G
                          338.32 1.701E+01  (  6.103E+00 1.78E+01 1.20E+01 G
                           93.35 7.828E+00 -   4.337E+01 1.67E+02 5.56E+00 XA
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Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-227	N	-7.6390E+00					7.95E+03	
			256.24	-7.639E+00	&(P	1.817E+01	5.27E+01	7.00E+00 G
			235.97	3.347E+00	+	1.958E+01	1.75E+02	1.23E+01 G
			50.14	6.893E+00	+	2.440E+01	1.06E+02	8.00E+00 G
TH-229	N	4.1745E+00					2.68E+06	
			193.51	4.174E+00	(	1.987E+01	1.83E+02	4.40E+00 G
			210.85	-4.922E+00	&	3.927E+01	3.23E+02	2.99E+00 G
TH-234	N	1.3984E+01					1.63E+12	
			92.59	5.225E+00	(P	1.901E+01	1.09E+02	5.58E+00 G
			63.29	2.682E+01	(P	3.154E+01	3.68E+01	3.81E+00 G
PA-233	C	1.0955E+00					7.82E+08	
			312.01	1.095E+00	?(	7.106E+00	1.93E+02	3.60E+01 G
			300.18	0.000E+00	-	4.334E+01	1.00E+03	6.20E+00 G
PA-234	N	1.9108E+00					1.63E+12	
			131.29	1.911E+00	?(	9.043E+00	1.42E+02	1.80E+01 G
			946.02	-1.852E+00	+	1.307E+01	3.05E+02	1.34E+01 G
			569.47	-3.300E+00	+	1.369E+01	1.20E+02	8.20E+00 G
			883.24	-6.947E+00	+	2.668E+01	1.13E+02	9.60E+00 G
			880.53	-1.395E+01	+ P	3.911E+01	7.71E+01	6.00E+00 GA
PA-234M	N	7.5787E+01					1.63E+12	
			1001.00	2.880E+01	?(P	1.770E+02	1.73E+02	8.37E-01 G
			766.41	2.095E+02	?(	6.803E+02	9.61E+01	2.94E-01 G
AM-241	T	-2.1724E+00					1.58E+05	
			59.54	-2.172E+00	?(P	6.238E+00	5.40E+01	3.59E+01 G
Np-237	F	-3.4091E+00					2.14E+06	
			86.49	-3.409E+00	&(	2.002E+01	1.77E+02	1.31E+01 G
Ir-192	F	6.6497E-01					7.40E+01	
			316.49	4.595E-01	&(	3.022E+00	1.96E+02	8.70E+01 G
			468.06	-5.235E-01	&	3.595E+00	2.01E+02	5.18E+01 G
			308.44	1.228E+00	?(	7.849E+00	1.90E+02	3.18E+01 G
Cs-136	F	5.1523E-01					1.30E+01	
			818.50	5.152E-01	?(	1.687E+00	9.63E+01	1.00E+02 G
			1048.07	-1.224E+00	+	2.659E+00	6.58E+01	8.00E+01 G
			340.57	-1.200E+00	+	5.522E+00	1.37E+02	4.69E+01 G
Np-239	T	5.9918E-01					2.36E+00	
			103.70	-2.114E-07	&	9.517E+00	1.34E+09	2.40E+01 X
			106.13	5.992E-01	?(	4.494E+00	2.22E+02	2.27E+01 G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                           99.50 2.036E+00 &   1.546E+01 2.28E+02 1.50E+01 X

Nd-147      -3.0468E+00                                      1.11E+01
                          531.00-3.047E+00 ?(  9.844E+00 1.34E+02 1.30E+01 G
                           91.10-1.387E+00 +   8.375E+00 1.81E+02 2.83E+01 G

TL-210   N   5.8494E-01                                      5.84E+05
                          799.60 5.849E-01 ?(  1.868E+00 9.43E+01 9.90E+01 G
                          296.00-5.525E-01 -   3.472E+00 1.88E+02 7.90E+01 G
                         1313.00 2.511E+00 ?   5.270E+00 9.08E+01 2.10E+01 GA

Kr-85    I  -6.3650E+01                                      3.92E+03
                          513.98-6.365E+01 ?(  4.690E+02 2.16E+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	
PB-210	46.54	218.	20.	0.011	108.28	1.286E+01	P
AM-241	59.54	593.	-40.	-0.022	54.04	-2.172E+00	P
BA-133	80.99	1159.	-35.	-0.019	60.26	-1.485E+00	P
Np-237	86.49	1562.	-32.	-0.018	176.52	-3.409E+00	
EU-155	86.54	1531.	-32.	-0.018	174.73	-1.454E+00	
Nd-147	91.10	1331.	-29.	-0.016	181.38	-1.387E+00	
Gd-153	97.50	1371.	32.	0.018	164.13	1.438E+00	
Np-239	99.50	1339.	23.	0.013	227.74	2.036E+00	
EU-155	105.31	531.	-29.	-0.016	38.03	-1.792E+00	P
Np-239	106.13	253.	10.	0.006	221.78	5.992E-01	
EU-152	121.78	253.	-4.	-0.002	564.58	-1.875E-01	
EU-154	123.10	162.	22.	0.012	84.28	7.254E-01	
PA-234	131.29	622.	25.	0.014	141.77	1.911E+00	
CE-144	133.54	673.	22.	0.012	166.66	2.755E+00	
Tc-99m	140.51	592.	24.	0.013	147.57	3.830E-01	
U-235	143.79	622.	18.	0.010	198.33	2.330E+00	P
CE-141	145.44	646.	13.	0.007	285.27	3.768E-01	
CE-139	165.85	133.	17.	0.010	126.62	3.321E-01	
Cf-251	176.60	154.	-6.	-0.003	389.09	-5.667E-01	
U-235	185.72	143.	103.	0.057	23.26	3.177E+00	P
TH-229	193.51	106.	11.	0.006	183.43	4.174E+00	
TH-229	210.85	172.	-8.	-0.004	322.91	-4.922E+00	
Cf-251	227.00	112.	7.	0.004	298.41	2.164E+00	
EU-152	244.69	632.	20.	0.011	180.63	5.401E+00	P
Cd-113m	263.70	132.	4.	0.002	409.27	1.459E+03	
BI-210M	265.83	159.	-22.	-0.012	83.43	-9.726E-01	
Hg-203	279.20	145.	-18.	-0.010	94.87	-5.196E-01	
I-131	284.30	116.	-22.	-0.012	96.74	-8.446E+00	
TL-210	296.00	575.	-18.	-0.010	187.67	-5.525E-01	
PA-231	300.07	557.	-18.	-0.010	189.46	-1.748E+01	
BI-210M	304.90	426.	16.	0.009	187.46	1.377E+00	
Ir-192	308.44	442.	16.	0.009	190.40	1.228E+00	
PA-233	312.01	458.	16.	0.009	193.30	1.095E+00	
Ir-192	316.49	473.	16.	0.009	196.02	4.595E-01	
CR-51	320.08	426.	14.	0.008	213.23	3.538E+00	P
La-140	328.76	449.	-21.	-0.012	137.66	-2.743E+00	P
Cf-249	333.44	428.	-21.	-0.012	141.41	-3.555E+00	
Cs-136	340.57	407.	-21.	-0.012	137.43	-1.200E+00	
EU-152	344.29	243.	17.	0.010	130.44	1.754E+00	
BA-133	356.00	349.	-17.	-0.010	154.34	-7.745E-01	
I-131	364.48	20.	10.	0.005	96.02	3.354E-01	P
BA-133	383.84	97.	14.	0.008	103.47	4.586E+00	
Cf-249	387.95	79.	12.	0.007	104.82	5.617E-01	
SN-113	391.69	110.	-3.	-0.002	441.95	-1.585E-01	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
SB-125	427.88	48.	-3.	-0.002	455.83	-3.259E-01	
PM-146	453.88	91.	-21.	-0.012	95.46	-1.087E+00	
SB-125	463.37	103.	-8.	-0.004	190.36	-2.512E+00	
Ir-192	468.06	120.	-8.	-0.004	201.11	-5.235E-01	
BE-7	477.60	48.	-12.	-0.006	124.29	-3.899E+00	
RU-103	497.05	61.	-18.	-0.010	93.93	-6.993E-01	
RH-106	511.86	49.	64.	0.036	19.89	1.190E+01	
Kr-85	513.98	121.	-7.	-0.004	215.61	-6.365E+01	
Nd-147	531.00	43.	-10.	-0.006	133.71	-3.047E+00	
CS-134	563.24	22.	9.	0.005	106.93	4.497E+00	
CS-134	569.32	17.	2.	0.001	361.66	4.398E-01	
PA-234	569.47	29.	-7.	-0.004	120.00	-3.300E+00	
BI-207	569.70	42.	-8.	-0.005	115.72	-3.462E-01	
SB-125	600.50	333.	-4.	-0.002	295.12	-1.068E+00	P
RH-106	621.92	17.	10.	0.006	91.11	4.374E+00	
SB-125	635.89	30.	-5.	-0.003	152.33	-2.097E+00	
I-131	636.97	31.	6.	0.003	149.75	3.416E+00	
AG-110M	657.76	60.	-14.	-0.008	81.01	-6.912E-01	
CS-137	661.66	56.	5.	0.003	234.12	2.497E-01	P
PM-144	696.54	28.	7.	0.004	164.75	3.391E-01	
NB-94	702.63	33.	1.	0.001	934.91	6.431E-02	P
SB-124	722.79	33.	9.	0.005	101.07	3.890E+00	
AG-108M	722.94	41.	10.	0.006	92.48	5.671E-01	
EU-154	723.36	52.	10.	0.006	102.33	2.549E+00	
ZR-95	724.20	53.	9.	0.005	119.20	1.012E+00	
BI-212	727.17	61.	3.	0.001	422.92	1.743E+00	
PM-146	735.72	28.	-4.	-0.002	285.04	-8.924E-01	
PM-146	747.16	33.	-5.	-0.003	263.90	-6.979E-01	
ZR-95	756.73	43.	-7.	-0.004	184.25	-6.272E-01	P
AG-110M	763.94	86.	-20.	-0.011	69.98	-4.610E+00	
NB-95	765.79	106.	-8.	-0.004	197.50	-3.905E-01	
PA-234M	766.41	59.	12.	0.007	96.08	2.095E+02	
EU-152	778.92	28.	-5.	-0.003	228.91	-2.034E+00	
BI-212	785.42	14.	9.	0.005	91.79	3.836E+01	
CS-134	795.87	36.	10.	0.006	90.39	6.287E-01	P
TL-210	799.60	46.	11.	0.006	94.32	5.849E-01	
CS-134	801.95	57.	5.	0.003	231.31	2.933E+00	P
CO-58	810.78	39.	7.	0.004	138.56	3.650E-01	
Cs-136	818.50	36.	9.	0.005	96.30	5.152E-01	
MN-54	834.85	28.	-4.	-0.002	260.48	-2.348E-01	P
Co-56	846.77	23.	-3.	-0.002	318.86	-1.945E-01	P
NB-94	871.10	12.	8.	0.004	74.17	4.440E-01	
EU-154	873.23	26.	-4.	-0.002	180.40	-1.968E+00	
PA-234	880.53	65.	-14.	-0.008	77.07	-1.395E+01	P
PA-234	883.24	78.	-11.	-0.006	113.27	-6.947E+00	
Y-88	898.04	23.	3.	0.001	389.11	1.689E-01	
AG-110M	937.49	15.	3.	0.002	289.64	5.374E-01	
PA-234	946.02	30.	-4.	-0.002	305.16	-1.852E+00	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
EU-152	964.11	65.	8.	0.005	145.33	3.498E+00		
EU-154	996.33	10.	6.	0.003	87.67	3.619E+00		
PA-234M	1001.00	19.	4.	0.002	172.88	2.880E+01		P
EU-154	1004.77	22.	6.	0.003	122.30	2.108E+00		
Co-56	1037.84	10.	6.	0.003	122.85	2.850E+00		
Cs-136	1048.07	38.	-14.	-0.008	65.76	-1.224E+00		
RH-106	1050.36	60.	-9.	-0.005	125.68	-3.927E+01		
BI-207	1063.66	11.	5.	0.003	138.46	4.931E-01		P
Ga-68	1077.40	20.	5.	0.003	201.66	1.232E+01		
FE-59	1099.25	36.	-15.	-0.008	51.65	-1.813E+00		P
EU-152	1112.07	108.	-9.	-0.005	161.07	-4.870E+00		
CO-60	1173.24	43.	-20.	-0.011	41.22	-1.515E+00		P
Ta-182	1189.05	40.	-17.	-0.009	85.31	-7.913E+00		
Ta-182	1221.41	21.	3.	0.001	398.43	7.622E-01		
Co-56	1238.28	22.	12.	0.007	90.68	1.447E+00		P
NA-22	1274.53	11.	2.	0.001	208.49	1.869E-01		
FE-59	1291.60	0.	12.	0.007	28.87	2.250E+00		
TL-210	1313.00	5.	6.	0.004	90.79	2.511E+00		
CO-60	1332.50	24.	-8.	-0.004	142.59	-6.640E-01		P
AG-110M	1384.30	5.	6.	0.003	101.72	2.006E+00		
EU-152	1408.00	5.	7.	0.004	88.63	2.739E+00		
La-140	1596.21	6.	3.	0.002	176.21	3.402E-01		
Y-88	1836.06	0.	6.	0.003	42.33	6.512E-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	-3.8986E+00	-3.8986E+00	1.243E+02%	1.17E+01
NA-22	#A	1.8691E-01	1.8691E-01	2.085E+02%	1.44E+00
K-40	#	2.4715E+02	2.4715E+02	5.936E+00%	1.05E+01
Sc-46	#A	0.0000E+00	0.0000E+00	7.071E+02%	2.73E+00
CR-51	#A	3.5383E+00	3.5383E+00	2.132E+02%	2.54E+01
MN-54	#A	-2.3475E-01	-2.3475E-01	2.605E+02%	1.53E+00
FE-59	#A	-1.8127E+00	-1.8127E+00	5.165E+01%	3.80E+00
Co-56	#A	6.4620E-01	6.4621E-01	9.068E+01%	1.43E+00
CO-57	#A	0.0000E+00	0.0000E+00	7.071E+02%	1.21E+00
CO-58	#A	3.6498E-01	3.6499E-01	1.386E+02%	1.75E+00
CO-60	#A	-6.6398E-01	-6.6398E-01	1.426E+02%	2.12E+00
ZN-65	#A	0.0000E+00	0.0000E+00	1.000E+03%	6.92E+00
NB-94	#A	2.5605E-01	2.5605E-01	7.417E+01%	1.45E+00
ZR-95	#A	1.0690E-01	1.0690E-01	1.097E+02%	3.13E+00
NB-95	#A	-3.9047E-01	-3.9047E-01	1.975E+02%	2.64E+00
RU-103	#A	-6.9929E-01	-6.9930E-01	9.393E+01%	1.56E+00
RH-106	#A	4.3738E+00	4.3738E+00	9.111E+01%	9.72E+00

AG-108M#A	2.6615E-01	2.6615E-01	9.248E+01%	1.31E+00
AG-110M#A	5.1027E-01	5.1027E-01	1.017E+02%	3.76E+00
SN-113 #A	-1.5853E-01	-1.5853E-01	4.419E+02%	2.42E+00
SB-124 #A	2.6805E-01	2.6805E-01	1.011E+02%	3.78E+00
SB-125 #A	-3.2592E-01	-3.2592E-01	4.558E+02%	3.80E+00
I-131 #A	5.8392E-01	5.8394E-01	8.895E+01%	8.16E-01
Gd-153 #A	1.4378E+00	1.4378E+00	1.641E+02%	7.85E+00
Ga-68 #A	1.2233E+01	1.2319E+01	2.017E+02%	5.80E+01
Tc-99m #A	3.8252E-01	3.8302E-01	1.476E+02%	1.89E+00
BA-133 #A	-7.7446E-01	-7.7446E-01	1.543E+02%	4.01E+00
CS-134 #A	1.0476E+00	1.0476E+00	9.039E+01%	1.92E+00
CS-137 #A	2.4968E-01	2.4968E-01	2.341E+02%	2.03E+00
CE-139 #A	3.3210E-01	3.3210E-01	1.266E+02%	1.08E+00
Ba-140 #	4.1254E+00	4.1255E+00	3.444E+01%	3.10E+00
La-140 #A	3.4019E-01	3.4019E-01	1.762E+02%	1.41E+00
CE-141 #A	3.7679E-01	3.7680E-01	2.853E+02%	3.61E+00
CE-144 #A	2.7550E+00	2.7550E+00	1.667E+02%	1.53E+01
PM-144 #A	3.3908E-01	3.3908E-01	1.648E+02%	1.33E+00
EU-152 #A	1.7232E+00	1.7232E+00	1.304E+02%	3.60E+00
EU-154 #A	1.7571E+00	1.7571E+00	5.014E+01%	2.04E+00
EU-155 #A	-1.7918E+00	-1.7918E+00	3.803E+01%	6.90E+00
HF-181 A	-2.3479E-01	-2.3479E-01	8.991E+01%	2.84E+00
Ta-182 #A	4.0968E-01	4.0968E-01	3.984E+02%	1.01E+01
Hg-203 #A	-5.1959E-01	-5.1960E-01	9.487E+01%	1.65E+00
TL-208	4.3149E+00	4.3149E+00	1.507E+01%	1.13E+00
PM-146 #A	-1.0874E+00	-1.0874E+00	9.546E+01%	2.45E+00
Y-88 #A	6.5121E-01	6.5122E-01	4.233E+01%	8.18E-01
Cd-113m#A	1.4590E+03	1.4590E+03	4.093E+02%	2.05E+04
Cd-109 #A	0.0000E+00	0.0000E+00	1.000E+03%	6.65E+01
Cf-251 #A	-5.6673E-01	-5.6673E-01	3.891E+02%	5.72E+00
Cf-249 #A	5.6171E-01	5.6171E-01	1.048E+02%	1.99E+00
Sn-126 #A	2.3809E+00	2.3809E+00	2.544E+02%	2.03E+01
PB-210 #A	1.2863E+01	1.2863E+01	1.083E+02%	4.66E+01
PB-212	1.3173E+01	1.3173E+01	7.870E+00%	2.35E+00
PB-214	1.6928E+01	1.6928E+01	7.303E+00%	2.34E+00
BI-207 #A	4.9312E-01	4.9312E-01	1.385E+02%	1.65E+00
BI-212 #A	1.7429E+00	1.7429E+00	4.229E+02%	2.58E+01
U-235 #A	2.3298E+00	2.3298E+00	1.983E+02%	1.55E+01
BI-214	1.9739E+01	1.9739E+01	7.262E+00%	1.56E+00
BI-210M#A	-9.7263E-01	-9.7263E-01	8.343E+01%	2.70E+00
AC-228	1.6474E+01	1.6474E+01	8.884E+00%	1.53E+00
TH-227 #A	-7.6390E+00	-7.6390E+00	5.267E+01%	1.82E+01
TH-229 #A	4.1745E+00	4.1745E+00	1.834E+02%	1.99E+01
TH-234 #A	1.3984E+01	1.3984E+01	3.679E+01%	1.90E+01
PA-231 #A	0.0000E+00	0.0000E+00	1.000E+03%	9.39E+01
PA-233 #A	1.0955E+00	1.0955E+00	1.933E+02%	7.11E+00
PA-234 #A	1.9108E+00	1.9108E+00	1.418E+02%	9.04E+00
PA-234M#A	7.5787E+01	7.5787E+01	9.608E+01%	1.77E+02
AM-241 #A	-2.1724E+00	-2.1724E+00	5.404E+01%	6.24E+00

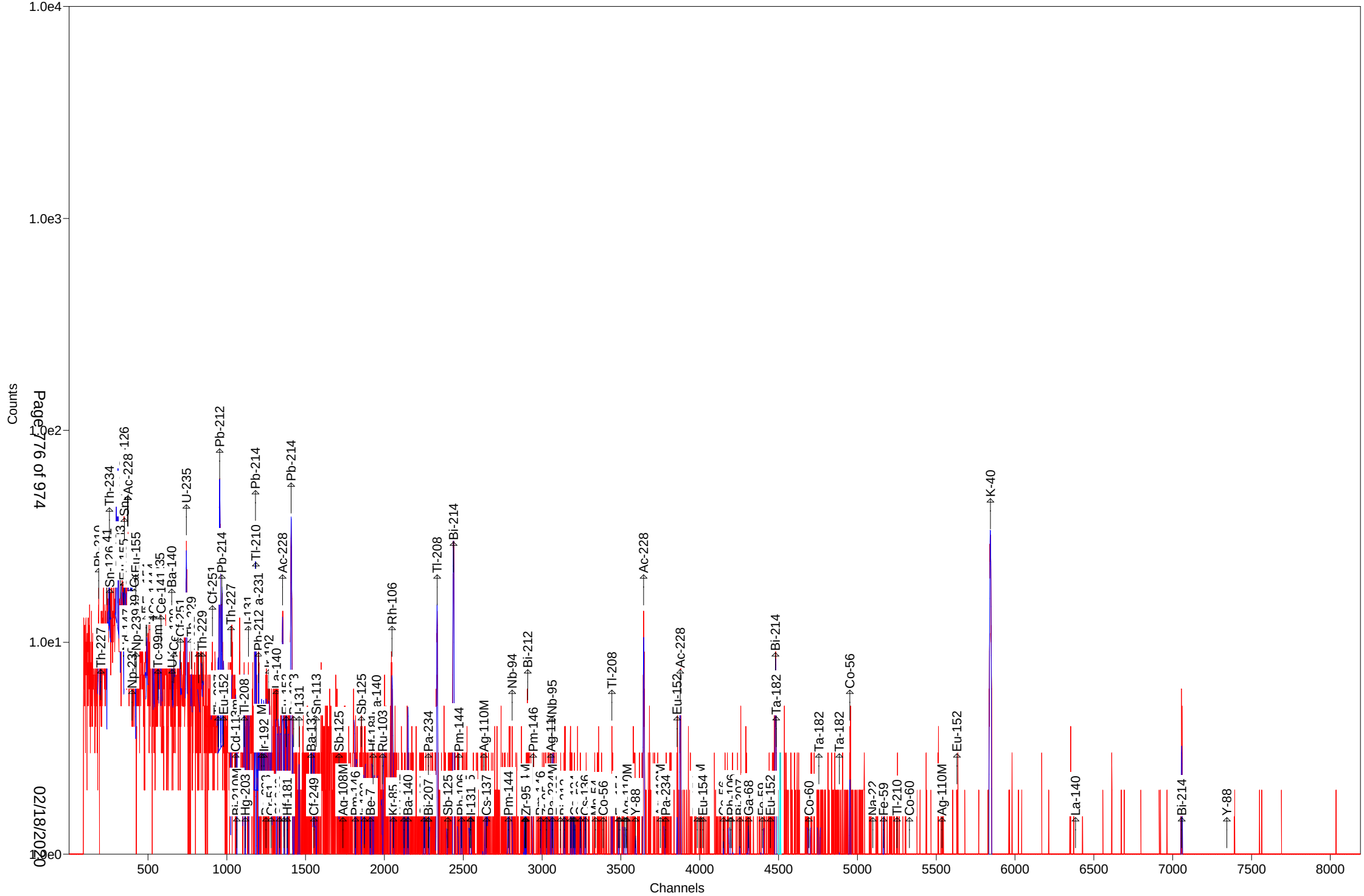
Np-237	#A	-3.4091E+00	-3.4091E+00	1.765E+02%	2.00E+01
Ir-192	#A	6.6496E-01	6.6497E-01	1.366E+02%	3.02E+00
Cs-136	#A	5.1522E-01	5.1523E-01	9.630E+01%	1.69E+00
Np-239	#A	5.9909E-01	5.9918E-01	2.218E+02%	4.49E+00
Nd-147	#A	-3.0467E+00	-3.0468E+00	1.337E+02%	9.84E+00
TL-210	#A	5.8494E-01	5.8494E-01	9.432E+01%	1.87E+00
Kr-85	#A	-6.3650E+01	-6.3650E+01	2.156E+02%	4.69E+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 (37.5 to 2000.0 keV) 3.178E+02 Bq/Sample
Total Decayed Activity (37.5 to 2000.0 keV) 3.1777618E+02 Bq/Sample

453329_Gamma_160-36593-A-14-B. 8_Gamma_20192231.spc.



Test America St. Louis Spectrum ID: 9_Gamma_20193886

Sample Description: 453329_Gamma_160-36593-A-15-B
Detector: Detector # 9
Batch ID: 453329
Work Order Number: Gamma
Lot Number: 160-36593-A-15-B

Decay to Time: 12/27/2019 10:52 Live Time: 1800 sec
Acquisition Time: 12/27/2019 10:53:05 Real Time: 1802 sec
Analysis Time: 12/27/2019 11:23 Dead Time: 0.12 %
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_2019-12-07_1444.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	-2.371E+00	173.9	4.124E+00	4.126E+00	1.399E+01
NA-22	1.873E-01	140.0	2.621E-01	2.623E-01	9.397E-01
K-40	2.626E+02	4.7	1.245E+01	1.832E+01	1.053E+01
Sc-46	-8.337E-01	81.3	6.778E-01	6.791E-01	2.258E+00
CR-51	3.575E+00	218.4	7.809E+00	7.812E+00	2.609E+01
MN-54	3.894E-01	117.7	4.583E-01	4.587E-01	1.040E+00
FE-59	8.848E-01	88.2	7.806E-01	7.819E-01	1.731E+00
Co-56	1.432E+00	31.3	4.484E-01	4.544E-01	8.790E-01
CO-57	0.000E+00	1.#INF	1.880E-01	1.880E-01	1.089E+00
CO-58	6.394E-01	49.7	3.175E-01	3.192E-01	1.016E+00
CO-60	5.330E-01	84.5	4.503E-01	4.510E-01	9.735E-01
ZN-65	0.000E+00	1.#INF	4.057E-01	4.057E-01	5.577E+00
NB-94	-7.450E-01	110.9	8.258E-01	8.267E-01	2.022E+00
ZR-95	-8.733E-01	119.5	1.043E+00	1.044E+00	2.325E+00
NB-95	7.551E-01	74.2	5.607E-01	5.620E-01	1.863E+00
RU-103	1.185E-01	328.8	3.895E-01	3.895E-01	9.536E-01
RH-106	5.156E+00	200.9	1.036E+01	1.036E+01	3.468E+01
AG-108M	8.881E-01	41.2	3.661E-01	3.689E-01	8.313E-01
AG-110M	2.803E-01	56.6	1.585E-01	1.592E-01	2.459E+00
SN-113	-2.122E-01	363.5	7.713E-01	7.714E-01	2.615E+00
SB-124	2.445E-01	44.7	1.093E-01	1.101E-01	3.528E+00
SB-125	1.238E+00	94.2	1.167E+00	1.169E+00	2.516E+00
I-131	6.178E-01	74.7	4.618E-01	4.629E-01	1.030E+00
Gd-153	1.186E+00	139.0	1.648E+00	1.650E+00	5.484E+00
Ga-68	-2.861E+01	90.6	2.592E+01	2.597E+01	5.562E+01
Tc-99m	1.071E+00	27.4	2.931E-01	2.994E-01	6.612E-01
BA-133	-8.100E-01	158.7	1.286E+00	1.286E+00	4.289E+00
CS-134	-8.894E-01	76.8	6.827E-01	6.842E-01	2.271E+00
CS-137	3.877E-01	93.0	3.605E-01	3.610E-01	1.220E+00
CE-139	-3.251E-01	211.7	6.883E-01	6.889E-01	1.501E+00
Ba-140	1.382E-01	1156.4	1.598E+00	1.598E+00	3.941E+00
La-140	3.643E-01	59.0	2.150E-01	2.159E-01	1.640E+00
CE-141	-8.143E-01	138.0	1.124E+00	1.125E+00	3.739E+00

CE-144	-3.023E+00	146.0	4.414E+00	4.416E+00	1.470E+01
PM-144	-6.943E-01	116.7	8.102E-01	8.110E-01	1.617E+00
EU-152	2.023E+00	76.8	1.554E+00	1.557E+00	3.179E+00
EU-154	1.253E+00	79.4	9.946E-01	9.967E-01	2.005E+00
EU-155	1.674E+00	159.6	2.672E+00	2.674E+00	8.889E+00
HF-181	4.454E-01	133.4	5.944E-01	5.948E-01	1.898E+00
Ta-182	2.463E-01	687.4	1.693E+00	1.693E+00	8.139E+00
Hg-203	-5.295E-01	82.5	4.366E-01	4.377E-01	1.453E+00
TL-208	3.784E+00	13.7	5.168E-01	5.528E-01	9.126E-01
PM-146	5.306E-01	98.9	5.249E-01	5.256E-01	1.306E+00
Y-88	4.989E-01	33.8	1.689E-01	1.713E-01	5.109E-01
Cd-113m	4.379E+03	94.2	4.124E+03	4.134E+03	1.384E+04
Cd-109	9.651E+00	167.4	1.616E+01	1.616E+01	5.373E+01
Cf-251	1.413E+00	138.2	1.952E+00	1.956E+00	4.992E+00
Cf-249	-7.340E-01	103.5	7.598E-01	7.607E-01	2.538E+00
Sn-126	1.341E+00	221.4	2.969E+00	2.970E+00	8.769E+00
PB-210	1.270E+01	103.1	1.309E+01	1.311E+01	4.369E+01
PB-212	1.209E+01	6.5	7.885E-01	1.110E+00	1.583E+00
PB-214	2.907E+01	4.2	1.212E+00	1.937E+00	2.252E+00
BI-207	-3.417E-02	218.1	7.453E-02	7.455E-02	1.851E+00
BI-212	6.430E+00	84.2	5.413E+00	5.423E+00	1.814E+01
U-235	-3.577E+00	133.5	4.778E+00	4.781E+00	1.589E+01
BI-214	2.655E+01	5.9	1.571E+00	2.091E+00	2.061E+00
BI-210M	6.651E-02	893.1	5.940E-01	5.940E-01	2.037E+00
AC-228	1.109E+01	18.5	2.054E+00	2.131E+00	3.924E+00
TH-227	2.873E+00	125.3	3.599E+00	3.604E+00	1.237E+01
TH-229	-1.622E+00	129.1	2.094E+00	2.098E+00	2.206E+01
TH-234	-4.492E+00	111.2	4.996E+00	5.002E+00	2.840E+01
PA-231	-1.478E+01	182.0	2.690E+01	2.691E+01	8.972E+01
PA-233	0.000E+00	1.#INF	4.382E-01	4.382E-01	7.171E+00
PA-234	-5.159E-02	107.0	5.521E-02	5.527E-02	9.276E+00
PA-234M	1.048E+02	57.3	5.999E+01	6.022E+01	1.676E+02
AM-241	-4.935E-01	324.7	1.602E+00	1.602E+00	5.373E+00
Np-237	0.000E+00	1.#INF	4.929E+00	4.929E+00	1.639E+01
Ir-192	1.543E-01	169.6	2.617E-01	2.618E-01	2.995E+00
Cs-136	-5.555E-01	94.3	5.240E-01	5.250E-01	1.760E+00
Np-239	1.555E+00	163.7	2.545E+00	2.547E+00	8.464E+00
Nd-147	1.191E+00	167.6	1.996E+00	1.997E+00	7.285E+00
TL-210	-7.323E-01	86.9	6.360E-01	6.374E-01	2.124E+00
Kr-85	0.000E+00	1.#INF	1.873E+01	1.873E+01	3.842E+02
Total	4.893E+03				

Analyst: Caleb Quinn

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Sample description
453329_Gamma_160-36593-A-15-B

Spectrum Filename: C:\User\SPC\Det9\9_Gamma_20193886.An1

Acquisition information
Start time: 12/27/2019 10:53:05 AM
Live time: 1800
Real time: 1802
Dead time: 0.12 %
Detector ID: 9

Detector system
Ge9 S/N09363993

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	12/27/2019 10:52:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	9_2019-12-07_1444.PBC 12/7/2019 2:44:35 PM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 22 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 0.1646

***** 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	25.	103.06	1.00	2.577E-02	46.54	4.250	PBC<MDA	PB210
64.31	9.	221.43	1.89	3.987E-02	64.28	9.700	PBC<MDA	Sn126
74.85	247.	11.70	1.03	4.576E-02				
77.21	431.	6.85	1.03	4.681E-02				
87.23	131.	19.14	1.19	5.029E-02	86.49	13.100	1.109E+01	Np237
					86.54	30.700	4.732E+00	EU155
					86.94	9.040	1.603E+01	Sn126
					87.57	37.500	3.852E+00	Sn126
					88.04	3.790	3.802E+01	Cd109
91.10	33.	167.58	1.04	5.124E-02	91.10	28.300	PBC<MDA	Nd147
93.35	25.	189.52	1.04	5.171E-02	93.35	5.561	PBC<MDA	AC228
97.50	34.	139.01	1.05	5.240E-02	97.50	30.000	PBC<MDA	Gd153
104.99	51.	44.21	0.45	5.316E-02	105.31	21.200	2.497E+00	EU155
106.13	34.	163.69	1.05	5.323E-02	106.13	22.700	PBC<MDA	Np239
121.78	18.	146.33	1.07	5.305E-02	121.78	28.580	PBC<MDA	EU152
					122.06	85.600	2.162E-01	CO57
123.10	20.	114.46	1.07	5.296E-02	123.10	40.790	PBC<MDA	EU154
140.15	85.	27.36	3.43	5.091E-02	140.51	89.300	1.071E+00	Tc99m
176.60	20.	138.16	1.12	4.549E-02	176.60	17.000	PBC<MDA	Cf251
185.72	126.	22.71	1.13	4.403E-02	185.72	54.000	2.944E+00	U235
210.85	13.	221.03	1.15	4.052E-02	210.85	2.990	PBC<MDA	TH229
227.00	10.	217.96	1.17	3.858E-02	227.00	6.300	PBC<MDA	Cf251

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
235.97	18.	231.59	1.18	3.760E-02	235.97	12.300	PBC<MDA	TH227
238.46	356.	6.40	1.18	3.735E-02	238.63	43.300	1.209E+01	PB212
241.78	171.	11.10	1.18	3.700E-02	242.00	7.430	3.454E+01	PB214
256.24	18.	125.30	1.20	3.558E-02	256.24	7.000	PBC<MDA	TH227
263.70	16.	94.18	1.20	3.489E-02	263.70	0.006	PBC<MDA	Cd113m
265.83	2.	893.07	1.20	3.470E-02	265.83	50.000	PBC<MDA	BI210M
277.28	21.	84.41	1.21	3.372E-02	277.28	6.310	PBC<MDA	TL208
284.30	21.	94.84	1.22	3.315E-02	284.30	6.140	PBC<MDA	I131
294.97	340.	8.09	1.08	3.233E-02	295.09	19.300	3.030E+01	PB214
					296.00	79.000	7.418E+00	TL210
299.88	42.	29.80	1.23	3.195E-02	300.03	3.280	2.235E+01	PB212
					300.07	2.460	2.980E+01	PA231
					300.18	6.200	1.183E+01	PA233
320.08	20.	218.43	1.25	3.056E-02	320.08	9.940	PBC<MDA	CR51
328.76	24.	107.33	1.26	2.999E-02	328.76	20.300	PBC<MDA	La140
345.83	22.	133.45	1.28	2.896E-02	345.83	15.070	PBC<MDA	HF181
351.69	557.	5.38	1.36	2.862E-02	351.93	37.600	2.877E+01	PB214
427.88	15.	94.25	1.35	2.491E-02	427.88	29.600	PBC<MDA	SB125
433.94	36.	41.23	1.35	2.466E-02	433.94	90.480	8.881E-01	AG108M
453.88	15.	98.94	1.37	2.388E-02	453.88	65.000	PBC<MDA	PM146
463.37	7.	224.52	1.38	2.352E-02	463.37	10.470	PBC<MDA	SB125
468.06	9.	169.60	1.38	2.335E-02	468.06	51.750	PBC<MDA	Ir192
487.02	15.	103.27	1.40	2.269E-02	487.02	45.500	PBC<MDA	La140
497.05	4.	328.75	1.41	2.236E-02	497.05	90.900	PBC<MDA	RU103
511.86	80.	20.77	2.67	2.188E-02	511.86	20.000	1.015E+01	RH106
531.00	5.	297.77	1.44	2.130E-02	531.00	13.000	PBC<MDA	Nd147
569.70	5.	291.99	1.47	2.023E-02	569.32	15.380	PBC<MDA	CS134
					569.47	8.200	1.618E+00	PA234
					569.70	97.740	1.358E-01	BI207
583.18	114.	13.66	1.29	1.989E-02	583.02	84.500	3.784E+00	TL208
609.10	424.	5.92	1.55	1.925E-02	609.31	46.090	2.655E+01	BI214
					610.30	5.750	2.131E+02	RU103
621.92	17.	200.89	1.51	1.896E-02	621.92	9.930	PBC<MDA	RH106
636.97	13.	74.75	1.53	1.862E-02	636.97	7.170	PBC<MDA	I131
657.76	15.	56.56	1.54	1.818E-02	657.76	94.640	PBC<MDA	AG110M
661.66	11.	92.97	1.55	1.810E-02	661.66	85.210	PBC<MDA	CS137
722.79	17.	80.44	1.60	1.693E-02	722.79	10.810	PBC<MDA	SB124
					722.94	90.840	6.141E-01	AG108M
					723.36	20.220	2.760E+00	EU154
727.17	15.	84.17	1.60	1.686E-02	727.17	7.550	PBC<MDA	BI212
735.72	5.	251.65	1.61	1.671E-02	735.72	22.500	PBC<MDA	PM146
747.16	3.	372.09	1.62	1.651E-02	747.16	34.000	PBC<MDA	PM146
765.79	22.	74.25	1.63	1.621E-02	765.79	99.790	PBC<MDA	NB95
					766.41	0.294	2.565E+02	PA234M
766.41	21.	69.56	1.63	1.620E-02	765.79	99.790	PBC<MDA	NB95
					766.41	0.294	2.478E+02	PA234M
778.92	8.	154.62	1.64	1.600E-02	778.92	12.940	PBC<MDA	EU152
810.78	18.	49.66	1.67	1.551E-02	810.78	99.460	PBC<MDA	CO58

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
815.77	10.	102.05	1.67	1.544E-02	815.77	23.280	PBC<MDA	La140
834.85	11.	117.68	1.69	1.517E-02	834.85	99.980	PBC<MDA	MN54
846.77	11.	91.12	1.70	1.501E-02	846.77	99.935	PBC<MDA	Co56
871.10	1.	781.02	1.71	1.468E-02	871.10	99.890	PBC<MDA	NB94
873.23	3.	248.60	1.72	1.465E-02	873.23	12.270	PBC<MDA	EU154
880.53	4.	360.10	1.72	1.456E-02	880.53	6.000	PBC<MDA	PA234
898.04	9.	114.22	1.74	1.434E-02	898.04	93.700	PBC<MDA	Y88
911.07	82.	18.53	1.75	1.418E-02	911.07	29.000	1.109E+01	AC228
946.02	8.	154.62	1.77	1.377E-02	946.02	13.400	PBC<MDA	PA234
964.11	16.	88.04	1.79	1.357E-02	964.11	14.605	PBC<MDA	EU152
968.97	12.	86.71	1.79	1.352E-02	968.97	17.460	PBC<MDA	AC228
996.33	11.	79.38	1.81	1.323E-02	996.33	10.600	PBC<MDA	EU154
1001.00	11.	90.98	1.81	1.318E-02	1001.00	0.837	PBC<MDA	PA234M
1037.84	2.	507.29	1.84	1.281E-02	1037.84	14.130	PBC<MDA	Co56
1048.07	9.	104.82	1.85	1.271E-02	1048.07	80.000	PBC<MDA	Cs136
1099.25	11.	88.23	1.89	1.224E-02	1099.25	56.500	PBC<MDA	FE59
1119.97	104.	14.67	1.90	1.206E-02	1120.29	15.100	3.174E+01	BI214
					1120.55	99.987	PBC<MDA	Sc46
1221.41	2.	687.39	1.97	1.126E-02	1221.41	27.000	PBC<MDA	Ta182
1238.28	41.	31.32	1.98	1.114E-02	1238.28	66.070	3.108E+00	Co56
1274.53	4.	139.95	2.01	1.088E-02	1274.53	99.940	PBC<MDA	NA22
					1274.54	35.190	5.319E-01	EU154
1332.50	10.	84.48	2.05	1.050E-02	1332.50	99.980	PBC<MDA	CO60
1408.00	17.	40.18	2.10	1.004E-02	1408.00	21.005	4.564E+00	EU152
1460.63	492.	4.74	1.82	9.750E-03	1460.83	10.670	2.626E+02	K40
1690.98	5.	44.72	2.27	8.649E-03	1690.98	47.790	PBC<MDA	SB124
1764.14	88.	11.09	2.23	8.350E-03	1764.49	15.400	3.817E+01	BI214
1836.06	9.	33.85	2.35	8.079E-03	1836.06	99.200	6.186E-01	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 Channel	Centroid Energy	Background Counts	Net Area Counts	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide
299.00	74.87	295.	247.	5.405E+03	11.70	1.025	- D
308.44	77.23	221.	431.	9.215E+03	6.85	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

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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	185.80	46.54	320.	25.	0.014	103.06	0.998s
TH-227	200.20	50.14	435.	-29.	-0.016	88.30	1.001
AM-241	237.77	59.54	712.	-12.	-0.006	324.70	1.010
TH-234	252.77	63.29	659.	-13.	-0.007	277.07	1.014s
Sn-126	256.85	64.31	157.	9.	0.005	221.43	1.885s
BA-133	323.56	80.99	1821.	-42.	-0.024	61.14	1.031s
Np-237	345.55	86.49	1678.	0.	0.000	175.30	1.036A
EU-155	345.76	86.54	1576.	44.	0.024	55.21	1.036D
Sn-126	347.35	86.94	1499.	11.	0.006	226.01	1.037D
Sn-126	349.87	87.57	1511.	46.	0.025	55.06	1.037D
Cd-109	351.75	88.04	1533.	33.	0.018	167.39	1.038A
Nd-147	363.99	91.10	1545.	33.	0.019	167.58	1.041s
TH-234	369.94	92.59	961.	-23.	-0.013	111.22	1.042s
AC-228	372.98	93.35	1084.	25.	0.014	189.52	1.043
Gd-153	389.58	97.50	1070.	34.	0.019	139.01	1.047s
Np-239	397.58	99.50	1661.	-35.	-0.020	164.84	1.049
Gd-153	412.37	103.20	1626.	-35.	-0.020	162.59	1.052s
Np-239	414.37	103.70	1591.	-35.	-0.020	160.76	1.053
EU-155	420.82	105.31	1454.	34.	0.019	159.61	1.054s
Np-239	424.09	106.13	1514.	34.	0.019	163.69	1.055
EU-152	486.67	121.78	325.	18.	0.010	146.33	1.070s
CO-57	487.80	122.06	343.	0.	0.000	1000.00	1.070s
EU-154	491.95	123.10	261.	20.	0.011	114.46	1.071s
PA-234	524.72	131.29	1093.	-32.	-0.018	148.00	1.079s
HF-181	531.64	133.02	1061.	-32.	-0.018	145.64	1.081s
CE-144	533.69	133.54	1029.	-31.	-0.017	146.00	1.081s
HF-181	544.74	136.30	1018.	0.	0.000	1000.00	1.084s
CO-57	545.43	136.47	1018.	0.	0.000	1000.00	1.084s
Tc-99m	560.14	140.15	114.	85.	0.047	27.36	3.433s
U-235	574.67	143.79	1110.	-36.	-0.020	133.55	1.091s
CE-141	581.29	145.44	1177.	-35.	-0.020	138.03	1.092s
Ba-140	650.15	162.66	397.	-10.	-0.006	448.23	1.108
U-235	653.03	163.38	400.	-32.	-0.018	90.14	1.109
CE-139	662.92	165.85	456.	-22.	-0.012	211.72	1.111s
Cf-251	705.90	176.60	205.	20.	0.011	138.16	1.122s
U-235	742.37	185.72	198.	126.	0.070	22.71	1.130s
TH-229	773.52	193.51	240.	-23.	-0.013	133.51	1.137s
U-235	820.80	205.33	200.	-19.	-0.011	243.53	1.148s
TH-229	842.87	210.85	212.	13.	0.007	221.03	1.153s
Cf-251	907.45	227.00	120.	10.	0.006	217.96	1.168
TH-227	943.33	235.97	909.	18.	0.010	231.59	1.176s
PB-212	953.97	238.63	86.	352.	0.195	6.52	1.179D
PB-214	967.43	242.00	95.	170.	0.094	11.16	1.182D
EU-152	978.21	244.69	928.	-18.	-0.010	238.32	1.185s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
TH-227	1024.39	256.24	128.	18.	0.010	125.30	1.195s
Cd-113m	1054.23	263.70	112.	16.	0.009	94.18	1.202
BI-210M	1062.75	265.83	171.	2.	0.001	893.07	1.204
TL-208	1108.55	277.28	152.	21.	0.012	84.41	1.215
Hg-203	1116.22	279.20	218.	-26.	-0.014	82.46	1.216s
I-131	1136.61	284.30	96.	21.	0.012	94.84	1.221s
PB-214	1179.77	295.09	58.	333.	0.185	6.37	1.231D
TL-210	1183.41	296.00	1040.	-24.	-0.013	192.49	1.231s
PB-212	1199.52	300.03	58.	42.	0.023	29.80	1.235D
PA-231	1199.68	300.07	1016.	-24.	-0.013	189.71	1.235
PA-233	1200.12	300.18	993.	-24.	-0.013	184.56	1.235
PA-231	1210.00	302.65	968.	-24.	-0.014	181.98	1.237s
BA-133	1210.81	302.85	944.	-18.	-0.010	243.42	1.238s
Ba-140	1218.80	304.85	926.	0.	0.000	1000.00	1.240
BI-210M	1218.99	304.90	926.	0.	0.000	1000.00	1.240
Ir-192	1233.16	308.44	926.	0.	0.000	1000.00	1.243s
PA-233	1247.44	312.01	926.	0.	0.000	1000.00	1.246
Ir-192	1265.35	316.49	926.	0.	0.000	1000.00	1.250s
CR-51	1279.73	320.08	901.	20.	0.011	218.43	1.253s
La-140	1314.43	328.76	320.	24.	0.013	107.33	1.261
Cf-249	1333.15	333.44	246.	-24.	-0.014	92.84	1.265s
AC-228	1352.66	338.32	512.	-30.	-0.016	144.58	1.270
Cs-136	1361.66	340.57	532.	-14.	-0.008	230.96	1.272s
EU-152	1376.53	344.29	546.	0.	0.000	1000.00	1.275s
HF-181	1382.70	345.83	427.	22.	0.012	133.45	1.276s
PB-214	1406.13	351.69	77.	557.	0.309	5.38	1.357
BA-133	1423.37	356.00	817.	-26.	-0.014	158.74	1.285s
I-131	1457.31	364.48	72.	-8.	-0.004	210.65	1.293
BA-133	1534.73	383.84	256.	-23.	-0.013	99.54	1.310s
Cf-249	1551.17	387.95	279.	-23.	-0.013	103.50	1.314s
SN-113	1566.12	391.69	275.	-6.	-0.004	363.47	1.317s
SB-125	1710.86	427.88	43.	15.	0.008	94.25	1.349s
AG-108M	1735.10	433.94	43.	36.	0.020	41.23	1.354
PM-146	1814.87	453.88	53.	15.	0.009	98.94	1.372s
SB-125	1852.82	463.37	120.	7.	0.004	224.52	1.380s
Ir-192	1871.59	468.06	112.	9.	0.005	169.60	1.384s
BE-7	1909.73	477.60	156.	-10.	-0.006	173.92	1.392s
HF-181	1927.34	482.00	167.	0.	0.000	1000.00	1.396s
La-140	1947.43	487.02	105.	15.	0.008	103.27	1.400s
RU-103	1987.56	497.05	48.	4.	0.002	328.75	1.409
RH-106	2046.81	511.86	98.	80.	0.044	20.77	2.672s
Kr-85	2055.27	513.98	178.	0.	0.000	1000.00	1.424s
Nd-147	2123.35	531.00	52.	5.	0.003	297.77	1.438
CS-134	2252.30	563.24	75.	-21.	-0.012	70.17	1.466
CS-134	2276.64	569.32	84.	-15.	-0.008	90.18	1.471s
PA-234	2277.24	569.47	99.	0.	0.000	1000.00	1.471s
BI-207	2278.16	569.70	97.	5.	0.003	291.99	1.471s
TL-208	2332.06	583.18	29.	114.	0.064	13.66	1.290

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
SB-125	2401.36	600.50	663.	-18.	-0.010	203.39	1.497s
SB-124	2410.29	602.73	645.	-17.	-0.010	209.00	1.499s
CS-134	2418.21	604.71	628.	0.	0.000	1000.00	1.500s
BI-214	2435.77	609.10	42.	424.	0.236	5.92	1.548
RU-103	2440.56	610.30	628.	0.	0.000	1000.00	1.505s
AG-108M	2456.49	614.28	628.	0.	0.000	1000.00	1.508
PM-144	2471.62	618.06	628.	0.	0.000	1000.00	1.512s
RH-106	2487.04	621.92	607.	17.	0.010	200.89	1.515
SB-125	2542.94	635.89	47.	-6.	-0.003	175.59	1.526s
I-131	2547.28	636.97	43.	13.	0.007	74.75	1.527s
AG-110M	2630.43	657.76	30.	15.	0.009	56.56	1.544s
CS-137	2646.03	661.66	45.	11.	0.006	92.97	1.548s
PM-144	2785.58	696.54	104.	-22.	-0.012	116.69	1.576s
NB-94	2809.93	702.63	160.	-23.	-0.013	110.85	1.581
SB-124	2890.57	722.79	85.	17.	0.009	80.44	1.598s
AG-108M	2891.17	722.94	102.	0.	0.000	1000.00	1.598s
EU-154	2892.86	723.36	102.	0.	0.000	1000.00	1.598
ZR-95	2896.22	724.20	102.	0.	0.000	1000.00	1.599
BI-212	2908.11	727.17	70.	15.	0.008	84.17	1.601s
PM-146	2942.31	735.72	38.	5.	0.003	251.65	1.608s
PM-146	2988.08	747.16	33.	3.	0.002	372.09	1.617s
ZR-95	3026.36	756.73	55.	-14.	-0.008	119.49	1.625s
AG-110M	3055.23	763.94	115.	-27.	-0.015	58.98	1.631s
NB-95	3062.61	765.79	122.	22.	0.012	74.25	1.632s
PA-234M	3065.10	766.41	99.	21.	0.012	69.56	1.633s
EU-152	3115.14	778.92	30.	8.	0.004	154.62	1.643s
BI-212	3141.15	785.42	111.	-19.	-0.011	63.62	1.648s
CS-134	3182.96	795.87	126.	-22.	-0.012	76.76	1.656s
TL-210	3197.88	799.60	148.	-20.	-0.011	86.85	1.659
CS-134	3207.29	801.95	168.	0.	0.000	1000.00	1.661s
CO-58	3242.59	810.78	30.	18.	0.010	49.66	1.668
La-140	3262.58	815.77	48.	10.	0.006	102.05	1.672s
Cs-136	3273.50	818.50	98.	-15.	-0.009	94.34	1.674s
MN-54	3338.91	834.85	30.	11.	0.006	117.68	1.687s
Co-56	3386.61	846.77	20.	11.	0.006	91.12	1.696s
TL-208	3441.80	860.56	41.	-1.	-0.001	393.57	1.707s
NB-94	3483.94	871.10	30.	1.	0.001	781.02	1.715s
EU-154	3492.47	873.23	33.	3.	0.002	248.60	1.717s
PA-234	3521.68	880.53	85.	4.	0.002	360.10	1.722s
PA-234	3532.53	883.24	89.	0.	0.000	1000.00	1.724s
AG-110M	3538.30	884.68	89.	0.	0.000	1000.00	1.725s
Sc-46	3556.69	889.28	144.	-22.	-0.012	81.30	1.729s
Y-88	3591.74	898.04	20.	9.	0.005	114.22	1.736s
AC-228	3643.88	911.07	32.	82.	0.046	18.53	1.746
AG-110M	3749.60	937.49	65.	-22.	-0.012	82.82	1.766s
PA-234	3783.72	946.02	30.	8.	0.004	154.62	1.772s
EU-152	3856.11	964.11	37.	16.	0.009	88.04	1.786s
AC-228	3875.56	968.97	51.	12.	0.007	86.71	1.790

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
EU-154	3985.03	996.33	32.	11.	0.006	79.38	1.810s
PA-234M	4003.71	1001.00	43.	11.	0.006	90.98	1.814s
EU-154	4018.82	1004.77	77.	-14.	-0.008	91.70	1.816s
Co-56	4151.13	1037.84	27.	2.	0.001	507.29	1.841s
Cs-136	4192.07	1048.07	40.	9.	0.005	104.82	1.848s
RH-106	4201.23	1050.36	70.	-18.	-0.010	68.27	1.850s
BI-207	4254.46	1063.66	37.	-4.	-0.002	324.08	1.860s
Ga-68	4309.44	1077.40	48.	-18.	-0.010	90.61	1.870s
FE-59	4396.88	1099.25	16.	11.	0.006	88.23	1.886s
EU-152	4448.20	1112.07	164.	-5.	-0.003	390.45	1.895s
ZN-65	4462.09	1115.55	159.	0.	0.000	1000.00	1.897s
BI-214	4481.06	1120.29	64.	104.	0.058	14.67	1.901
Sc-46	4482.12	1120.55	159.	0.	0.000	1000.00	1.901s
CO-60	4692.96	1173.24	70.	-25.	-0.014	62.07	1.938s
Ta-182	4756.25	1189.05	91.	-27.	-0.015	84.55	1.949
Ta-182	4885.75	1221.41	34.	2.	0.001	687.39	1.972
Co-56	4953.27	1238.28	23.	41.	0.023	31.32	1.984s
NA-22	5098.35	1274.53	11.	4.	0.002	139.95	2.008s
EU-154	5098.39	1274.54	15.	0.	0.000	1000.00	2.008s
FE-59	5166.65	1291.60	45.	-5.	-0.003	299.22	2.020s
TL-210	5252.32	1313.00	45.	-16.	-0.009	99.79	2.034s
CO-60	5330.37	1332.50	11.	10.	0.006	84.48	2.047s
AG-110M	5537.69	1384.30	17.	-1.	-0.001	972.11	2.082s
EU-152	5632.56	1408.00	6.	17.	0.010	40.18	2.097s
K-40	5843.24	1460.63	13.	492.	0.273	4.74	1.822
La-140	6385.95	1596.21	24.	-8.	-0.004	152.07	2.215s
SB-124	6765.35	1690.98	0.	5.	0.003	44.72	2.272s
BI-214	7058.25	1764.14	4.	88.	0.049	11.09	2.227
Co-56	7087.11	1771.35	92.	0.	0.000	1000.00	2.318s
Y-88	7346.20	1836.06	0.	9.	0.005	33.85	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	Peak Code	Peak MDA Value Bq/Sample	COMMENTS
BE-7	C	-2.3712E+00				5.31E+01	
			477.60	-2.371E+00	?(	1.399E+01 1.74E+02 1.05E+01	G
NA-22	C	1.8728E-01				9.50E+02	
			1274.53	1.873E-01	?(	9.397E-01 1.40E+02 9.99E+01	G

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Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
K-40	N	2.6260E+02					4.66E+11	
			1460.83	2.626E+02	(P	1.053E+01	4.74E+00	1.07E+01 G
Sc-46	F	-8.3367E-01					8.38E+01	
			889.28	-8.337E-01	?(	2.258E+00	8.13E+01	1.00E+02 G
			1120.55	0.000E+00	+	2.832E+00	1.00E+03	1.00E+02 G
CR-51	F	3.5753E+00					2.77E+01	
			320.08	3.575E+00	*(P	2.609E+01	2.18E+02	9.94E+00 G
MN-54	C	3.8944E-01					3.12E+02	
			834.85	3.894E-01	?(P	1.040E+00	1.18E+02	1.00E+02 G
FE-59	F	8.8477E-01					4.45E+01	
			1099.25	8.848E-01	&(P	1.731E+00	8.82E+01	5.65E+01 G
			1291.60	-6.370E-01	-	4.071E+00	2.99E+02	4.32E+01 G
Co-56	C	1.4315E+00					7.73E+01	
			846.77	4.244E-01	?(P	8.790E-01	9.11E+01	9.99E+01 G
			1238.28	3.108E+00	(P	1.886E+00	3.13E+01	6.61E+01 G
			1037.84	7.161E-01	?(	8.217E+00	5.07E+02	1.41E+01 G
			1771.35	0.000E+00	-	2.044E+01	1.00E+03	1.55E+01 A
CO-58	C	6.3936E-01					7.09E+01	
			810.78	6.394E-01	&(	1.016E+00	4.97E+01	9.95E+01 G
CO-60	F	5.3297E-01					1.93E+03	
			1332.50	5.330E-01	?(	9.735E-01	8.45E+01	1.00E+02 G
			1173.24	-1.178E+00	+ P	1.990E+00	6.21E+01	9.99E+01 G
NB-94	I	-7.4498E-01					7.41E+06	
			702.63	-7.450E-01	?(P	2.022E+00	1.11E+02	9.79E+01 G
			871.10	3.788E-02	+	1.070E+00	7.81E+02	9.99E+01 G
ZR-95	I	-8.7331E-01					6.40E+01	
			756.73	-8.733E-01	?(	2.325E+00	1.19E+02	5.45E+01 G
			724.20	0.000E+00	+	3.704E+00	1.00E+03	4.42E+01 G
NB-95	I	7.5514E-01					6.40E+01	
			765.79	7.551E-01	?(	1.863E+00	7.42E+01	9.98E+01 G
RU-103	I	1.1846E-01					3.93E+01	
			497.05	1.185E-01	?(	9.536E-01	3.29E+02	9.09E+01 G
			610.30	0.000E+00	-	6.005E+01	1.00E+03	5.75E+00 GA

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
RH-106	I	5.1557E+00					3.74E+02	
			621.92	5.156E+00	?(	3.468E+01	2.01E+02	9.93E+00 G
			1050.36	-5.192E+01	+	1.174E+02	6.83E+01	1.56E+00 G
			511.86	1.015E+01	?	6.200E+00	2.08E+01	2.00E+01 GA
AG-108M	C	8.8809E-01					1.53E+05	
			433.94	8.881E-01	&(	8.313E-01	4.12E+01	9.05E+01 G
			722.94	0.000E+00	&	1.798E+00	1.00E+03	9.08E+01 G
			614.28	0.000E+00	-	3.862E+00	1.00E+03	8.98E+01 G
AG-110M	F	2.8029E-01					2.50E+02	
			884.68	0.000E+00	?(	2.459E+00	1.00E+03	7.27E+01 G
			657.76	4.955E-01	?(	9.117E-01	5.66E+01	9.46E+01 G
			937.49	-2.581E+00	+	4.696E+00	8.28E+01	3.44E+01 G
			1384.30	-2.246E-01	+	4.924E+00	9.72E+02	2.43E+01 G
			763.94	-4.176E+00	+	8.091E+00	5.90E+01	2.23E+01 G
SN-113	F	-2.1220E-01					1.15E+02	
			391.69	-2.122E-01	&(	2.615E+00	3.63E+02	6.40E+01 G
SB-124	F	2.4447E-01					6.02E+01	
			602.73	-5.042E-01	&(	3.528E+00	2.09E+02	9.83E+01 G
			1690.98	6.721E-01	?(	9.906E-01	4.47E+01	4.78E+01 G
			722.79	5.160E+00	?(	1.386E+01	8.04E+01	1.08E+01 G
SB-125	I	1.2381E+00					1.01E+03	
			427.88	1.118E+00	&(	2.516E+00	9.42E+01	2.96E+01 G
			600.50	-2.882E+00	+	1.962E+01	2.03E+02	1.79E+01 G
			635.89	-1.493E+00	+	9.101E+00	1.76E+02	1.13E+01 G
			463.37	1.579E+00	&(	1.213E+01	2.25E+02	1.05E+01 G
I-131	I	6.1782E-01					8.02E+00	
			364.48	-1.949E-01	?(	1.030E+00	2.11E+02	8.17E+01 G
			284.30	5.675E+00	&(	1.320E+01	9.48E+01	6.14E+00 G
			636.97	5.548E+00	?(	1.384E+01	7.47E+01	7.17E+00 G
Gd-153	F	1.1855E+00					2.42E+02	
			97.50	1.186E+00	&(	5.484E+00	1.39E+02	3.00E+01 G
			103.20	-1.695E+00	+	9.160E+00	1.63E+02	2.18E+01 G
Ga-68	C	-2.8608E+01					4.71E-02	
			1077.40	-2.861E+01	?(	5.562E+01	9.06E+01	3.30E+00 G
Tc-99m	I	1.0712E+00					2.51E-01	
			140.51	1.071E+00	*(	6.612E-01	2.74E+01	8.93E+01 G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

BA-133   F  -8.0997E-01                                     3.85E+03
                         356.00-8.100E-01 &(  4.289E+00 1.59E+02 6.20E+01 G
                         302.85-1.712E+00 +   1.393E+01 2.43E+02 1.83E+01 G
                         383.84-5.364E+00 +   1.783E+01 9.95E+01 8.94E+00 GA
                          80.99-1.429E+00 + P 6.806E+00 6.11E+01 3.41E+01 GA

CS-134   I  -8.8937E-01                                     7.54E+02
                         795.87-8.894E-01 ?(  2.271E+00 7.68E+01 8.55E+01 G
                         604.71 0.000E+00 +   3.513E+00 1.00E+03 9.76E+01 G
                         569.32-2.677E+00 &   8.106E+00 9.02E+01 1.54E+01 G
                         801.95 0.000E+00 +   2.579E+01 1.00E+03 8.69E+00 G
                         563.24-6.917E+00 + P 1.409E+01 7.02E+01 8.35E+00 G

CS-137   I   3.8772E-01                                     1.10E+04
                         661.66 3.877E-01 ?(  1.220E+00 9.30E+01 8.52E+01 G

CE-139   F  -3.2507E-01                                     1.38E+02
                         165.85-3.251E-01 &(P 1.501E+00 2.12E+02 7.99E+01 G

Ba-140   I   1.3819E-01                                     1.28E+01
                         537.26 1.382E-01 %(P 3.941E+00 1.16E+03 2.44E+01 G
                         162.66-1.991E+00 + P 1.821E+01 4.48E+02 6.22E+00 G
                         304.85 0.000E+00 -   5.922E+01 1.00E+03 4.29E+00 G

La-140   I   3.6434E-01                                     1.28E+01
                        1596.21-5.137E-01 ?(  1.640E+00 1.52E+02 9.54E+01 G
                         487.02 7.808E-01 ?(P 2.715E+00 1.03E+02 4.55E+01 G
                         328.76 2.191E+00 ?(  7.854E+00 1.07E+02 2.03E+01 G
                         815.77 1.556E+00 &(  5.396E+00 1.02E+02 2.33E+01 G

CE-141   I  -8.1432E-01                                     3.25E+01
                         145.44-8.143E-01 &(  3.739E+00 1.38E+02 4.82E+01 G

CE-144   I  -3.0230E+00                                     2.85E+02
                         133.54-3.023E+00 &(  1.470E+01 1.46E+02 1.11E+01 G

PM-144   C  -6.9432E-01                                     3.63E+02
                         696.54-6.943E-01 &(P 1.617E+00 1.17E+02 9.90E+01 G
                         618.06 0.000E+00 +   3.517E+00 1.00E+03 9.91E+01 G

EU-152   F   2.0232E+00                                     4.94E+03
                         121.78 6.473E-01 ?(  3.179E+00 1.46E+02 2.86E+01 G
                         344.29 0.000E+00 -   8.057E+00 1.00E+03 2.65E+01 G
                        1112.07-1.566E+00 +   2.092E+01 3.90E+02 1.36E+01 G
                         778.92 2.147E+00 ?(  7.577E+00 1.55E+02 1.29E+01 G
                         964.11 4.606E+00 ?(  8.740E+00 8.80E+01 1.46E+01 G
                         244.69-3.628E+00 +   2.890E+01 2.38E+02 7.58E+00 G
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Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
			1408.00	4.564E+00	?	3.635E+00	4.02E+01	2.10E+01 GA
EU-154	I	1.2530E+00					3.14E+03	
			123.10	5.230E-01	(	2.005E+00	1.14E+02	4.08E+01 G
			1274.54	0.000E+00	-	3.011E+00	1.00E+03	3.52E+01 G
			723.36	0.000E+00	-	8.081E+00	1.00E+03	2.02E+01 G
			873.23	1.030E+00	&(	9.066E+00	2.49E+02	1.23E+01 G
			1004.77	-3.316E+00	+	1.022E+01	9.17E+01	1.80E+01 G
			996.33	4.320E+00	?(	1.152E+01	7.94E+01	1.06E+01 G
EU-155	I	1.6744E+00					1.81E+03	
			105.31	1.674E+00	?(	8.889E+00	1.60E+02	2.12E+01 G
			86.54	1.589E+00	}	6.779E+00	5.52E+01	3.07E+01 G
HF-181	F	4.4541E-01					4.24E+01	
			482.00	0.000E+00	?(	1.898E+00	1.00E+03	8.05E+01 G
			133.02	-7.870E-01	+	3.816E+00	1.46E+02	4.33E+01 G
			345.83	2.825E+00	?(	1.261E+01	1.33E+02	1.51E+01 G
			136.30	0.000E+00	-	2.791E+01	1.00E+03	5.85E+00 G
Ta-182	F	2.4629E-01					1.14E+02	
			1121.30	1.541E-01	%(	8.139E+00	1.54E+03	3.49E+01 G
			1221.41	3.655E-01	(	5.460E+00	6.87E+02	2.70E+01 G
			1189.05	-8.085E+00	+	1.404E+01	8.45E+01	1.62E+01 G
Hg-203	F	-5.2950E-01					4.66E+01	
			279.20	-5.295E-01	&(	1.453E+00	8.25E+01	8.15E+01 G
TL-208	N	3.7839E+00					6.98E+02	
			583.02	3.784E+00	(P	9.126E-01	1.37E+01	8.45E+01 G
			277.28	5.578E+00	+ P	1.570E+01	8.44E+01	6.31E+00 G
			860.56	-3.004E-01	& P	9.823E+00	3.94E+02	1.24E+01 G
PM-146	C	5.3057E-01					2.02E+03	
			453.88	5.528E-01	?(P	1.306E+00	9.89E+01	6.50E+01 G
			747.16	3.262E-01	?(P	2.905E+00	3.72E+02	3.40E+01 G
			735.72	7.751E-01	?(P	4.632E+00	2.52E+02	2.25E+01 G
Y-88	F	4.9888E-01					1.07E+02	
			1836.06	6.186E-01	?(P	5.109E-01	3.38E+01	9.92E+01 G
			898.04	3.721E-01	?(	9.737E-01	1.14E+02	9.37E+01 G
Cd-113m		4.3786E+03					5.33E+03	
			263.70	4.379E+03	(	1.384E+04	9.42E+01	6.00E-03 K
Cd-109	F	9.6513E+00					4.53E+02	
								Derived Ave Activity
			88.04	9.651E+00	}(	5.373E+01	1.67E+02	3.79E+00 G

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Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Cf-251	T	1.4129E+00					3.28E+05	
			176.60	1.413E+00	&(	4.992E+00	1.38E+02	1.70E+01 G
			227.00	2.273E+00	&	1.229E+01	2.18E+02	6.30E+00 GA
Cf-249	T	-7.3403E-01					1.28E+05	
			387.95	-7.340E-01	?(	2.538E+00	1.04E+02	6.60E+01 G
			333.44	-2.953E+00	+	9.144E+00	9.28E+01	1.55E+01 G
Sn-126		1.3409E+00					3.65E+07	
			87.57	1.341E+00	}	5.407E+00	5.51E+01	3.75E+01 GA
			64.28	1.341E+00	(	8.769E+00	2.21E+02	9.70E+00 G
			86.94	1.341E+00	}	2.242E+01	2.26E+02	9.04E+00 GA
PB-210	N	1.2704E+01					8.14E+03	
			46.54	1.270E+01	(P	4.369E+01	1.03E+02	4.25E+00 G
PB-212	N	1.2086E+01					6.98E+02	
			238.63	1.209E+01	(P	1.583E+00	6.52E+00	4.33E+01 G
			300.03	2.235E+01	+	2.022E+01	2.98E+01	3.28E+00 GA
PB-214	N	2.9072E+01					5.84E+05	
			351.93	2.877E+01	(P	2.252E+00	5.38E+00	3.76E+01 G
			295.09	2.966E+01	(P	3.404E+00	6.37E+00	1.93E+01 G
			242.00	3.437E+01	+	9.736E+00	1.12E+01	7.43E+00 GA
BI-207	C	-3.4172E-02					1.18E+04	
			1063.66	-2.572E-01	?(	1.851E+00	3.24E+02	7.45E+01 G
			569.70	1.358E-01	?(	1.367E+00	2.92E+02	9.77E+01 G
BI-212	N	6.4303E+00					6.98E+02	
			727.17	6.430E+00	?(	1.814E+01	8.42E+01	7.55E+00 G
			785.42	-5.281E+01	+ P	1.415E+02	6.36E+01	1.28E+00 GA
U-235	N	-3.5775E+00					2.57E+11	
			143.79	-3.577E+00	(	1.589E+01	1.34E+02	1.10E+01 G
			205.33	-5.178E+00	+ P	1.846E+01	2.44E+02	5.01E+00 G
			163.38	-7.490E+00	&	2.245E+01	9.01E+01	5.08E+00 G
			185.72	2.944E+00		1.596E+00	2.27E+01	5.40E+01 GA
BI-214	N	2.6554E+01					5.84E+05	
			609.31	2.655E+01	(P	2.061E+00	5.92E+00	4.61E+01 G
			1120.29	3.174E+01	+ P	1.222E+01	1.47E+01	1.51E+01 G
			1764.49	3.817E+01	+ P	5.021E+00	1.11E+01	1.54E+01 G
BI-210M	T	6.6508E-02					1.10E+09	
			265.83	6.651E-02	?(P	2.037E+00	8.93E+02	5.00E+01 G
			304.90	0.000E+00	-	9.074E+00	1.00E+03	2.80E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
AC-228	N	1.1086E+01					2.10E+03	
			911.07	1.109E+01	(P	3.924E+00	1.85E+01	2.90E+01 G
			968.97	2.910E+00	- P	8.485E+00	8.67E+01	1.75E+01 G
			338.32	-4.662E+00	- P	1.701E+01	1.45E+02	1.20E+01 G
			93.35	4.775E+00	- P	3.017E+01	1.90E+02	5.56E+00 XA
TH-227	N	2.8727E+00					7.95E+03	
			256.24	4.016E+00	?(	1.237E+01	1.25E+02	7.00E+00 G
			235.97	2.222E+00	?(	1.720E+01	2.32E+02	1.23E+01 G
			50.14	-7.008E+00	+ P	2.392E+01	8.83E+01	8.00E+00 G
TH-229	N	-1.6217E+00					2.68E+06	
			193.51	-6.775E+00	?(	2.206E+01	1.34E+02	4.40E+00 G
			210.85	5.961E+00	?(	3.236E+01	2.21E+02	2.99E+00 G
TH-234	N	-4.4919E+00					1.63E+12	
			92.59	-4.492E+00	&(P	2.840E+01	1.11E+02	5.58E+00 G
			63.29	-4.896E+00	+	4.549E+01	2.77E+02	3.81E+00 G
PA-231	N	-1.4779E+01					1.20E+07	
			302.65	-1.478E+01	?(	8.972E+01	1.82E+02	2.88E+00 G
			300.07	-1.690E+01	+	1.069E+02	1.90E+02	2.46E+00 G
PA-234	N	-5.1585E-02					1.63E+12	
			131.29	-1.883E+00	&(	9.276E+00	1.48E+02	1.80E+01 G
			946.02	2.408E+00	?(	8.499E+00	1.55E+02	1.34E+01 G
			569.47	0.000E+00	&	1.643E+01	1.00E+03	8.20E+00 G
			883.24	0.000E+00	&	1.859E+01	1.00E+03	9.60E+00 G
			880.53	2.332E+00	&	2.910E+01	3.60E+02	6.00E+00 GA
PA-234M	N	1.0476E+02					1.63E+12	
			1001.00	5.451E+01	?(P	1.676E+02	9.10E+01	8.37E-01 G
			766.41	2.478E+02	&(	5.713E+02	6.96E+01	2.94E-01 G
AM-241	T	-4.9347E-01					1.58E+05	
			59.54	-4.935E-01	(	5.373E+00	3.25E+02	3.59E+01 G
Ir-192	F	1.5427E-01					7.40E+01	
			316.49	0.000E+00	*(	2.995E+00	1.00E+03	8.70E+01 G
			468.06	4.137E-01	(	2.392E+00	1.70E+02	5.18E+01 G
			308.44	0.000E+00	-	8.066E+00	1.00E+03	3.18E+01 G
Cs-136	F	-5.5547E-01					1.30E+01	
			818.50	-5.555E-01	?(	1.760E+00	9.43E+01	1.00E+02 G
			1048.07	4.917E-01	+	1.758E+00	1.05E+02	8.00E+01 G
			340.57	-5.755E-01	+	4.461E+00	2.31E+02	4.69E+01 G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

Np-239   T   1.5547E+00                                      2.36E+00
                          103.70-1.539E+00 +   8.227E+00 1.61E+02 2.40E+01 X
                          106.13 1.555E+00  (  8.464E+00 1.64E+02 2.27E+01 G
                           99.50-2.473E+00 +   1.355E+01 1.65E+02 1.50E+01 X

Nd-147       1.1911E+00                                      1.11E+01
                          531.00 1.003E+00 ?(  7.285E+00 2.98E+02 1.30E+01 G
                           91.10 1.278E+00 ?(  7.120E+00 1.68E+02 2.83E+01 G

TL-210   N  -7.3225E-01                                      5.84E+05
                          799.60-7.323E-01 ?(  2.124E+00 8.69E+01 9.90E+01 G
                          296.00-5.197E-01 +   3.337E+00 1.92E+02 7.90E+01 G
                         1313.00-4.066E+00 +   8.486E+00 9.98E+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	
PB-210	46.54	320.	25.	0.014	103.06	1.270E+01	P
TH-227	50.14	435.	-29.	-0.016	88.30	-7.008E+00	P
AM-241	59.54	712.	-12.	-0.006	324.70	-4.935E-01	
TH-234	63.29	659.	-13.	-0.007	277.07	-4.896E+00	
BA-133	80.99	1821.	-42.	-0.024	61.14	-1.429E+00	P
Nd-147	91.10	1545.	33.	0.019	167.58	1.278E+00	
TH-234	92.59	961.	-23.	-0.013	111.22	-4.492E+00	P
Gd-153	97.50	1070.	34.	0.019	139.01	1.186E+00	
Gd-153	103.20	1626.	-35.	-0.020	162.59	-1.695E+00	
EU-152	121.78	325.	18.	0.010	146.33	6.473E-01	
EU-154	123.10	261.	20.	0.011	114.46	5.230E-01	
PA-234	131.29	1093.	-32.	-0.018	148.00	-1.883E+00	
HF-181	133.02	1061.	-32.	-0.018	145.64	-7.870E-01	
CE-144	133.54	1029.	-31.	-0.017	146.00	-3.023E+00	
U-235	143.79	1110.	-36.	-0.020	133.55	-3.577E+00	
CE-141	145.44	1177.	-35.	-0.020	138.03	-8.143E-01	
Ba-140	162.66	397.	-10.	-0.006	448.23	-1.991E+00	P
U-235	163.38	400.	-32.	-0.018	90.14	-7.490E+00	
CE-139	165.85	456.	-22.	-0.012	211.72	-3.251E-01	P
Cf-251	176.60	205.	20.	0.011	138.16	1.413E+00	
U-235	185.72	198.	126.	0.070	22.71	2.944E+00	
TH-229	193.51	240.	-23.	-0.013	133.51	-6.775E+00	
U-235	205.33	200.	-19.	-0.011	243.53	-5.178E+00	P
TH-229	210.85	212.	13.	0.007	221.03	5.961E+00	
Cf-251	227.00	120.	10.	0.006	217.96	2.273E+00	
TH-227	235.97	909.	18.	0.010	231.59	2.222E+00	
EU-152	244.69	928.	-18.	-0.010	238.32	-3.628E+00	
TH-227	256.24	128.	18.	0.010	125.30	4.016E+00	
Cd-113m	263.70	112.	16.	0.009	94.18	4.379E+03	
BI-210M	265.83	171.	2.	0.001	893.07	6.651E-02	P
Hg-203	279.20	218.	-26.	-0.014	82.46	-5.295E-01	
I-131	284.30	96.	21.	0.012	94.84	5.675E+00	
TL-210	296.00	1040.	-24.	-0.013	192.49	-5.197E-01	
PA-231	300.07	1016.	-24.	-0.013	189.71	-1.690E+01	
PA-233	300.18	993.	-24.	-0.013	184.56	-6.814E+00	
PA-231	302.65	968.	-24.	-0.014	181.98	-1.478E+01	
BA-133	302.85	944.	-18.	-0.010	243.42	-1.712E+00	
CR-51	320.08	901.	20.	0.011	218.43	3.575E+00	P
La-140	328.76	320.	24.	0.013	107.33	2.191E+00	
Cf-249	333.44	246.	-24.	-0.014	92.84	-2.953E+00	
Cs-136	340.57	532.	-14.	-0.008	230.96	-5.755E-01	
HF-181	345.83	427.	22.	0.012	133.45	2.825E+00	
BA-133	356.00	817.	-26.	-0.014	158.74	-8.100E-01	
I-131	364.48	72.	-8.	-0.004	210.65	-1.949E-01	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BA-133	383.84	256.	-23.	-0.013	99.54	-5.364E+00	
Cf-249	387.95	279.	-23.	-0.013	103.50	-7.340E-01	
SN-113	391.69	275.	-6.	-0.004	363.47	-2.122E-01	
SB-125	427.88	43.	15.	0.008	94.25	1.118E+00	
PM-146	453.88	53.	15.	0.009	98.94	5.528E-01	P
SB-125	463.37	120.	7.	0.004	224.52	1.579E+00	
Ir-192	468.06	112.	9.	0.005	169.60	4.137E-01	
BE-7	477.60	156.	-10.	-0.006	173.92	-2.371E+00	
La-140	487.02	105.	15.	0.008	103.27	7.808E-01	P
RU-103	497.05	48.	4.	0.002	328.75	1.185E-01	
RH-106	511.86	98.	80.	0.044	20.77	1.015E+01	
Nd-147	531.00	52.	5.	0.003	297.77	1.003E+00	
CS-134	563.24	75.	-21.	-0.012	70.17	-6.917E+00	P
CS-134	569.32	84.	-15.	-0.008	90.18	-2.677E+00	
BI-207	569.70	97.	5.	0.003	291.99	1.358E-01	
SB-125	600.50	663.	-18.	-0.010	203.39	-2.882E+00	
SB-124	602.73	645.	-17.	-0.010	209.00	-5.042E-01	
RH-106	621.92	607.	17.	0.010	200.89	5.156E+00	
SB-125	635.89	47.	-6.	-0.003	175.59	-1.493E+00	
I-131	636.97	43.	13.	0.007	74.75	5.548E+00	
AG-110M	657.76	30.	15.	0.009	56.56	4.955E-01	
CS-137	661.66	45.	11.	0.006	92.97	3.877E-01	
PM-144	696.54	104.	-22.	-0.012	116.69	-6.943E-01	P
NB-94	702.63	160.	-23.	-0.013	110.85	-7.450E-01	P
SB-124	722.79	85.	17.	0.009	80.44	5.160E+00	
BI-212	727.17	70.	15.	0.008	84.17	6.430E+00	
PM-146	735.72	38.	5.	0.003	251.65	7.751E-01	P
PM-146	747.16	33.	3.	0.002	372.09	3.262E-01	P
ZR-95	756.73	55.	-14.	-0.008	119.49	-8.733E-01	
AG-110M	763.94	115.	-27.	-0.015	58.98	-4.176E+00	
NB-95	765.79	122.	22.	0.012	74.25	7.551E-01	
PA-234M	766.41	99.	21.	0.012	69.56	2.478E+02	
EU-152	778.92	30.	8.	0.004	154.62	2.147E+00	
BI-212	785.42	111.	-19.	-0.011	63.62	-5.281E+01	P
CS-134	795.87	126.	-22.	-0.012	76.76	-8.894E-01	
TL-210	799.60	148.	-20.	-0.011	86.85	-7.323E-01	
CO-58	810.78	30.	18.	0.010	49.66	6.394E-01	
La-140	815.77	48.	10.	0.006	102.05	1.556E+00	
Cs-136	818.50	98.	-15.	-0.009	94.34	-5.555E-01	
MN-54	834.85	30.	11.	0.006	117.68	3.894E-01	P
NB-94	871.10	30.	1.	0.001	781.02	3.788E-02	
EU-154	873.23	33.	3.	0.002	248.60	1.030E+00	
PA-234	880.53	85.	4.	0.002	360.10	2.332E+00	
Sc-46	889.28	144.	-22.	-0.012	81.30	-8.337E-01	
Y-88	898.04	20.	9.	0.005	114.22	3.721E-01	
AG-110M	937.49	65.	-22.	-0.012	82.82	-2.581E+00	
PA-234	946.02	30.	8.	0.004	154.62	2.408E+00	
EU-152	964.11	37.	16.	0.009	88.04	4.606E+00	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
EU-154	996.33	32.	11.	0.006	79.38	4.320E+00		
PA-234M	1001.00	43.	11.	0.006	90.98	5.451E+01		P
EU-154	1004.77	77.	-14.	-0.008	91.70	-3.316E+00		
Cs-136	1048.07	40.	9.	0.005	104.82	4.917E-01		
RH-106	1050.36	70.	-18.	-0.010	68.27	-5.192E+01		
BI-207	1063.66	37.	-4.	-0.002	324.08	-2.572E-01		
Ga-68	1077.40	48.	-18.	-0.010	90.61	-2.861E+01		
FE-59	1099.25	16.	11.	0.006	88.23	8.848E-01		P
EU-152	1112.07	164.	-5.	-0.003	390.45	-1.566E+00		
CO-60	1173.24	70.	-25.	-0.014	62.07	-1.178E+00		P
Ta-182	1189.05	91.	-27.	-0.015	84.55	-8.085E+00		
Ta-182	1221.41	34.	2.	0.001	687.39	3.655E-01		
NA-22	1274.53	11.	4.	0.002	139.95	1.873E-01		
FE-59	1291.60	45.	-5.	-0.003	299.22	-6.370E-01		
TL-210	1313.00	45.	-16.	-0.009	99.79	-4.066E+00		
CO-60	1332.50	11.	10.	0.006	84.48	5.330E-01		
AG-110M	1384.30	17.	-1.	-0.001	972.11	-2.246E-01		
EU-152	1408.00	6.	17.	0.010	40.18	4.564E+00		
La-140	1596.21	24.	-8.	-0.004	152.07	-5.137E-01		
SB-124	1690.98	0.	5.	0.003	44.72	6.721E-01		
Y-88	1836.06	0.	9.	0.005	33.85	6.186E-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	-2.3712E+00	-2.3712E+00	1.739E+02%	1.40E+01
NA-22	#A	1.8728E-01	1.8728E-01	1.400E+02%	9.40E-01
K-40		2.6260E+02	2.6260E+02	4.742E+00%	1.05E+01
Sc-46	#A	-8.3367E-01	-8.3367E-01	8.130E+01%	2.26E+00
CR-51	#A	3.5753E+00	3.5753E+00	2.184E+02%	2.61E+01
MN-54	#A	3.8944E-01	3.8944E-01	1.177E+02%	1.04E+00
FE-59	#A	8.8476E-01	8.8477E-01	8.823E+01%	1.73E+00
Co-56	#	1.4315E+00	1.4315E+00	3.132E+01%	8.79E-01
CO-57	#A	0.0000E+00	0.0000E+00	7.071E+02%	1.09E+00
CO-58	#A	6.3935E-01	6.3936E-01	4.966E+01%	1.02E+00
CO-60	#A	5.3297E-01	5.3297E-01	8.448E+01%	9.74E-01
ZN-65	#A	0.0000E+00	0.0000E+00	1.000E+03%	5.58E+00
NB-94	#A	-7.4498E-01	-7.4498E-01	1.109E+02%	2.02E+00
ZR-95	#A	-8.7330E-01	-8.7331E-01	1.195E+02%	2.32E+00
NB-95	#A	7.5513E-01	7.5514E-01	7.425E+01%	1.86E+00
RU-103	#A	1.1846E-01	1.1846E-01	3.288E+02%	9.54E-01
RH-106	#A	5.1556E+00	5.1557E+00	2.009E+02%	3.47E+01
AG-108M	#	8.8809E-01	8.8809E-01	4.123E+01%	8.31E-01
AG-110M	#A	2.8029E-01	2.8029E-01	5.656E+01%	2.46E+00

SN-113 #A	-2.1220E-01	-2.1220E-01	3.635E+02%	2.62E+00
SB-124 #A	2.4447E-01	2.4447E-01	4.472E+01%	3.53E+00
SB-125 #A	1.2381E+00	1.2381E+00	9.425E+01%	2.52E+00
I-131 #A	6.1778E-01	6.1782E-01	7.475E+01%	1.03E+00
Gd-153 #A	1.1855E+00	1.1855E+00	1.390E+02%	5.48E+00
Ga-68 #A	-2.8293E+01	-2.8608E+01	9.061E+01%	5.56E+01
Tc-99m #	1.0690E+00	1.0712E+00	2.736E+01%	6.61E-01
BA-133 #A	-8.0997E-01	-8.0997E-01	1.587E+02%	4.29E+00
CS-134 #A	-8.8937E-01	-8.8937E-01	7.676E+01%	2.27E+00
CS-137 #A	3.8772E-01	3.8772E-01	9.297E+01%	1.22E+00
CE-139 #A	-3.2507E-01	-3.2507E-01	2.117E+02%	1.50E+00
Ba-140 #A	1.3818E-01	1.3819E-01	1.156E+03%	3.94E+00
La-140 #A	3.6433E-01	3.6434E-01	5.901E+01%	1.64E+00
CE-141 #A	-8.1431E-01	-8.1432E-01	1.380E+02%	3.74E+00
CE-144 #A	-3.0230E+00	-3.0230E+00	1.460E+02%	1.47E+01
PM-144 #A	-6.9432E-01	-6.9432E-01	1.167E+02%	1.62E+00
EU-152 #A	2.0232E+00	2.0232E+00	7.679E+01%	3.18E+00
EU-154 #A	1.2530E+00	1.2530E+00	7.938E+01%	2.00E+00
EU-155 #A	1.6744E+00	1.6744E+00	1.596E+02%	8.89E+00
HF-181 #A	4.4541E-01	4.4541E-01	1.334E+02%	1.90E+00
Ta-182 #A	2.4628E-01	2.4629E-01	6.874E+02%	8.14E+00
Hg-203 #A	-5.2950E-01	-5.2950E-01	8.246E+01%	1.45E+00
TL-208	3.7839E+00	3.7839E+00	1.366E+01%	9.13E-01
PM-146 #A	5.3057E-01	5.3057E-01	9.894E+01%	1.31E+00
Y-88 #A	4.9888E-01	4.9888E-01	3.385E+01%	5.11E-01
Cd-113m#A	4.3786E+03	4.3786E+03	9.418E+01%	1.38E+04
Cd-109 #A	9.6513E+00	9.6513E+00	1.674E+02%	5.37E+01
Cf-251 #A	1.4129E+00	1.4129E+00	1.382E+02%	4.99E+00
Cf-249 #A	-7.3403E-01	-7.3403E-01	1.035E+02%	2.54E+00
Sn-126 A	1.3409E+00	1.3409E+00	2.214E+02%	8.77E+00
PB-210 #A	1.2704E+01	1.2704E+01	1.031E+02%	4.37E+01
PB-212	1.2086E+01	1.2086E+01	6.524E+00%	1.58E+00
PB-214	2.9072E+01	2.9072E+01	4.169E+00%	2.25E+00
BI-207 #A	-3.4172E-02	-3.4172E-02	2.181E+02%	1.85E+00
BI-212 #A	6.4303E+00	6.4303E+00	8.417E+01%	1.81E+01
U-235 #A	-3.5775E+00	-3.5775E+00	1.335E+02%	1.59E+01
BI-214	2.6554E+01	2.6554E+01	5.918E+00%	2.06E+00
BI-210M#A	6.6508E-02	6.6508E-02	8.931E+02%	2.04E+00
AC-228	1.1086E+01	1.1086E+01	1.853E+01%	3.92E+00
TH-227 #A	2.8727E+00	2.8727E+00	1.253E+02%	1.24E+01
TH-229 #A	-1.6217E+00	-1.6217E+00	1.291E+02%	2.21E+01
TH-234 #A	-4.4919E+00	-4.4919E+00	1.112E+02%	2.84E+01
PA-231 #A	-1.4779E+01	-1.4779E+01	1.820E+02%	8.97E+01
PA-233 #A	0.0000E+00	0.0000E+00	1.000E+03%	7.17E+00
PA-234 #A	-5.1585E-02	-5.1585E-02	1.070E+02%	9.28E+00
PA-234M#A	1.0476E+02	1.0476E+02	5.726E+01%	1.68E+02
AM-241 #A	-4.9347E-01	-4.9347E-01	3.247E+02%	5.37E+00
Np-237 #A	0.0000E+00	0.0000E+00	1.000E+03%	1.64E+01
Ir-192 #A	1.5427E-01	1.5427E-01	1.696E+02%	3.00E+00

Cs-136	#A	-5.5545E-01	-5.5547E-01	9.434E+01%	1.76E+00
Np-239	A	1.5543E+00	1.5547E+00	1.637E+02%	8.46E+00
Nd-147	#A	1.1911E+00	1.1911E+00	1.676E+02%	7.28E+00
TL-210	#A	-7.3225E-01	-7.3225E-01	8.685E+01%	2.12E+00
Kr-85	#A	0.0000E+00	0.0000E+00	1.000E+03%	3.84E+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

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

Total Activity (25.1 to 1999.3 keV) 3.463E+02 Bq/Sample
Total Decayed Activity (25.1 to 1999.3 keV) 3.4625818E+02 Bq/Sample

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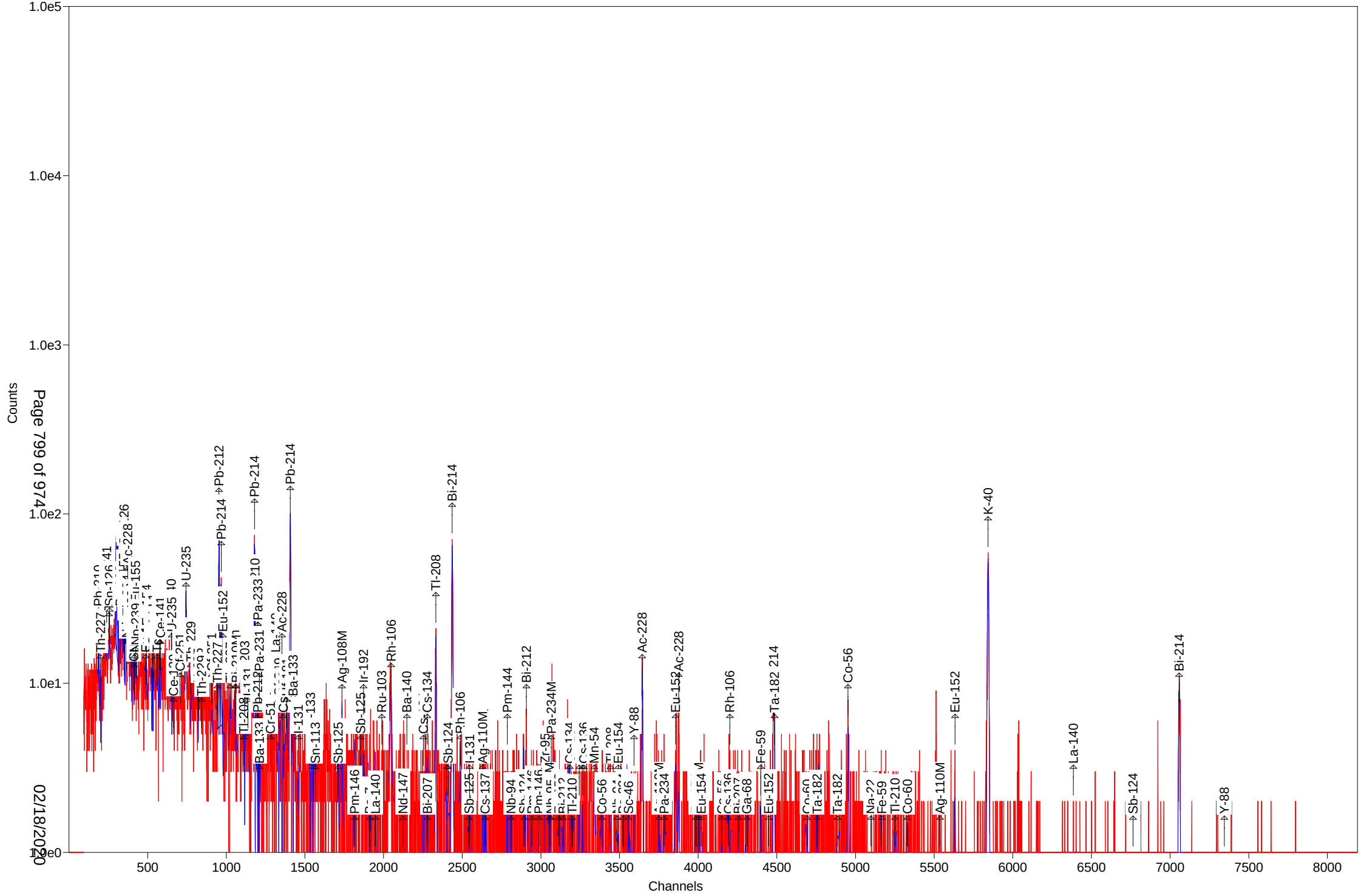
453329_Gamma_160-36593-A-15-B. 9_Gamma_20193886.spc.



Test America St. Louis Spectrum ID: 8_Gamma_20192232

Sample Description: 453329_Gamma_160-36593-A-16-B
Detector: Detector # 8
Batch ID: 453329
Work Order Number: Gamma
Lot Number: 160-36593-A-16-B

Decay to Time: 12/27/2019 10:53 Live Time: 1800 sec
Acquisition Time: 12/27/2019 10:54:06 Real Time: 1843 sec
Analysis Time: 12/27/2019 11:25 Dead Time: 2.32 %
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_2019-12-07_1517.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	1.671E+00	314.3	5.252E+00	5.253E+00	1.804E+01
NA-22	4.272E-01	138.6	5.923E-01	5.927E-01	2.071E+00
K-40	2.590E+02	5.8	1.501E+01	2.002E+01	1.050E+01
Sc-46	8.681E-01	111.9	9.716E-01	9.726E-01	3.273E+00
CR-51	-5.282E+00	102.2	5.400E+00	5.408E+00	3.553E+01
MN-54	-3.092E-01	168.7	5.215E-01	5.217E-01	1.745E+00
FE-59	-1.803E-01	112.3	2.026E-01	2.028E-01	3.804E+00
Co-56	-8.823E-01	60.0	5.293E-01	5.312E-01	1.765E+00
CO-57	0.000E+00	1.#INF	2.675E-01	2.675E-01	1.370E+00
CO-58	5.915E-01	86.9	5.140E-01	5.149E-01	1.735E+00
CO-60	1.682E-01	294.2	4.948E-01	4.949E-01	1.321E+00
ZN-65	-2.088E+00	114.4	2.389E+00	2.391E+00	8.048E+00
NB-94	-4.949E-01	222.0	1.099E+00	1.099E+00	1.855E+00
ZR-95	6.939E-01	115.2	7.993E-01	8.001E-01	1.939E+00
NB-95	-1.202E+00	75.4	9.064E-01	9.085E-01	3.012E+00
RU-103	8.523E-01	49.5	4.221E-01	4.243E-01	9.749E-01
RH-106	6.565E+00	84.5	5.548E+00	5.559E+00	9.720E+00
AG-108M	2.281E-01	139.8	3.190E-01	3.192E-01	1.448E+00
AG-110M	-1.490E+00	51.2	7.632E-01	7.670E-01	4.885E+00
SN-113	5.070E-01	160.7	8.148E-01	8.152E-01	2.763E+00
SB-124	-1.991E-01	126.8	2.525E-01	2.527E-01	4.904E+00
SB-125	2.729E+00	49.3	1.345E+00	1.352E+00	3.496E+00
I-131	8.474E-01	90.8	7.694E-01	7.706E-01	1.257E+00
Gd-153	-1.589E+00	147.1	2.337E+00	2.339E+00	7.771E+00
Ga-68	-1.237E+01	201.7	2.495E+01	2.496E+01	5.827E+01
Tc-99m	-5.024E-01	138.4	6.954E-01	6.960E-01	2.316E+00
BA-133	-6.981E-01	238.1	1.662E+00	1.663E+00	5.568E+00
CS-134	1.162E+00	63.9	7.417E-01	7.442E-01	1.923E+00
CS-137	-1.420E+00	84.6	1.200E+00	1.203E+00	2.991E+00
CE-139	2.842E-01	167.3	4.755E-01	4.762E-01	1.600E+00
Ba-140	-2.169E+00	106.6	2.312E+00	2.315E+00	5.535E+00
La-140	1.136E+00	59.3	6.740E-01	6.767E-01	1.409E+00
CE-141	-9.080E-01	141.2	1.282E+00	1.283E+00	4.270E+00

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CE-144	0.000E+00	1.#INF	2.017E+00	2.017E+00	1.666E+01
PM-144	-4.683E-01	153.3	7.179E-01	7.184E-01	1.673E+00
EU-152	1.418E+00	106.6	1.511E+00	1.513E+00	4.094E+00
EU-154	2.428E+00	40.2	9.759E-01	9.842E-01	2.329E+00
EU-155	1.848E+00	141.8	2.622E+00	2.624E+00	8.735E+00
HF-181	3.985E-01	140.4	5.593E-01	5.596E-01	2.421E+00
Ta-182	0.000E+00	1.#INF	2.635E+00	2.635E+00	1.078E+01
Hg-203	2.153E-01	217.7	4.688E-01	4.689E-01	1.599E+00
TL-208	5.435E+00	13.5	7.352E-01	7.874E-01	1.195E+00
PM-146	4.214E-01	174.7	7.361E-01	7.364E-01	1.810E+00
Y-88	-1.476E-02	5350.7	7.899E-01	7.899E-01	8.180E-01
Cd-113m	-8.317E+03	77.5	6.444E+03	6.467E+03	2.143E+04
Cd-109	0.000E+00	1.#INF	2.048E+01	2.048E+01	6.812E+01
Cf-251	-8.816E-01	281.3	2.480E+00	2.481E+00	6.392E+00
Cf-249	0.000E+00	1.#INF	1.560E-01	1.560E-01	2.760E+00
Sn-126	5.111E+00	125.3	6.405E+00	6.411E+00	2.136E+01
PB-210	1.727E+01	100.5	1.735E+01	1.738E+01	5.784E+01
PB-212	1.345E+01	7.9	1.064E+00	1.374E+00	2.457E+00
PB-214	4.219E+01	4.7	1.967E+00	2.945E+00	2.062E+00
BI-207	6.771E-01	139.5	9.446E-01	9.452E-01	2.197E+00
BI-212	2.666E+01	24.2	6.454E+00	6.600E+00	1.219E+01
U-235	-1.250E+00	81.2	1.015E+00	1.017E+00	1.878E+01
BI-214	3.716E+01	5.7	2.101E+00	2.853E+00	2.253E+00
BI-210M	-5.279E-02	1598.1	8.436E-01	8.436E-01	2.895E+00
AC-228	1.001E+01	18.5	1.850E+00	1.919E+00	5.225E+00
TH-227	-3.653E-01	1907.7	6.969E+00	6.969E+00	1.537E+01
TH-229	4.231E+00	151.2	6.399E+00	6.408E+00	4.143E+01
TH-234	3.311E+01	23.7	7.848E+00	8.062E+00	1.784E+01
PA-231	1.382E+01	186.8	2.581E+01	2.582E+01	1.098E+02
PA-233	1.020E+00	215.5	2.199E+00	2.200E+00	9.074E+00
PA-234	2.148E+00	136.1	2.925E+00	2.927E+00	9.976E+00
PA-234M	3.836E+01	99.5	3.818E+01	3.823E+01	3.006E+02
AM-241	-2.258E+00	64.3	1.451E+00	1.455E+00	6.805E+00
Np-237	-3.497E+00	176.4	6.167E+00	6.170E+00	2.051E+01
Ir-192	3.247E-01	96.8	3.142E-01	3.148E-01	3.796E+00
Cs-136	-3.659E-02	1643.2	6.013E-01	6.013E-01	2.125E+00
Np-239	-8.272E-01	313.5	2.593E+00	2.593E+00	8.672E+00
Nd-147	-2.949E-01	1278.7	3.770E+00	3.770E+00	9.380E+00
TL-210	-7.109E-01	93.4	6.644E-01	6.656E-01	2.238E+00
Kr-85	1.283E+02	103.7	1.331E+02	1.333E+02	4.481E+02
Total	6.637E+02				

Analyst: Caleb Quinn

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Sample description
453329_Gamma_160-36593-A-16-B

Spectrum Filename: C:\User\SPC\Det8\8_Gamma_20192232.An1

Acquisition information
Start time: 12/27/2019 10:54:06 AM
Live time: 1800
Real time: 1843
Dead time: 2.32 %
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	12/27/2019 10:53:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	8_2019-12-07_1517.PBC 12/7/2019 3:17:53 PM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 22 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 0.1761

***** 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	26.	100.48	1.01	2.005E-02	46.54	4.250	PBC<MDA	PB210
63.44	130.	25.15	1.41	3.093E-02	63.29	3.810	6.135E+01	TH234
64.28	28.	125.33	1.03	3.146E-02	64.28	9.700	PBC<MDA	Sn126
74.66	229.	12.12	1.03	3.610E-02				
77.27	322.	9.95	1.04	3.703E-02				
87.71	122.	18.59	1.04	3.982E-02	87.57	37.500	PBC<MDA	Sn126
					88.04	3.790	4.479E+01	Cd109
92.67	80.	32.40	1.07	4.073E-02	92.59	5.584	1.962E+01	TH234
					93.35	5.561	1.965E+01	AC228
105.31	30.	141.84	1.06	4.185E-02	105.31	21.200	PBC<MDA	EU155
123.10	26.	81.59	1.07	4.138E-02	123.10	40.790	PBC<MDA	EU154
131.29	28.	141.63	1.08	4.061E-02	131.29	18.000	PBC<MDA	PA234
133.02	7.	539.79	1.08	4.041E-02	133.02	43.300	PBC<MDA	HF181
					133.54	11.090	9.156E-01	CE144
165.85	15.	167.30	1.10	3.629E-02	165.85	79.900	PBC<MDA	CE139
185.72	134.	21.76	1.12	3.329E-02	185.72	54.000	4.135E+00	U235
189.29	16.	54.72	0.49	3.281E-02				
205.33	18.	114.98	1.13	3.083E-02	205.33	5.010	PBC<MDA	U235
210.85	17.	151.23	1.14	3.020E-02	210.85	2.990	PBC<MDA	TH229
238.75	274.	10.73	0.93	2.743E-02	238.63	43.300	1.283E+01	PB212
242.10	131.	13.81	1.16	2.714E-02	242.00	7.430	3.616E+01	PB214
277.28	18.	91.56	1.19	2.440E-02	277.28	6.310	PBC<MDA	TL208

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
279.36	8.	217.68	1.19	2.427E-02	279.20	81.460	PBC<MDA	Hg203
284.30	18.	97.29	1.19	2.393E-02	284.30	6.140	PBC<MDA	I131
295.32	326.	6.83	1.37	2.322E-02	295.09	19.300	4.041E+01	PB214
					296.00	79.000	9.896E+00	TL210
300.07	18.	212.92	1.20	2.293E-02	300.03	3.280	PBC<MDA	PB212
					300.07	2.460	1.750E+01	PA231
					300.18	6.200	6.945E+00	PA233
300.18	18.	215.51	1.20	2.293E-02	300.03	3.280	PBC<MDA	PB212
					300.07	2.460	1.750E+01	PA231
					300.18	6.200	6.946E+00	PA233
300.23	33.	37.48	1.20	2.294E-02	300.03	3.280	PBC<MDA	PB212
					300.07	2.460	3.211E+01	PA231
					300.18	6.200	1.275E+01	PA233
302.65	13.	306.89	1.21	2.278E-02	302.65	2.880	PBC<MDA	PA231
					302.85	18.330	1.679E+00	BA133
328.76	17.	158.81	1.23	2.133E-02	328.76	20.300	PBC<MDA	La140
338.10	77.	23.55	0.93	2.085E-02	338.32	12.010	1.715E+01	AC228
345.83	17.	140.36	1.24	2.049E-02	345.83	15.070	PBC<MDA	HF181
351.97	577.	4.66	1.40	2.021E-02	351.93	37.600	4.219E+01	PB214
383.84	16.	111.84	1.27	1.885E-02	383.84	8.940	PBC<MDA	BA133
391.69	11.	160.72	1.27	1.855E-02	391.69	64.000	PBC<MDA	SN113
427.88	14.	90.79	1.30	1.728E-02	427.88	29.600	PBC<MDA	SB125
453.88	5.	267.77	1.32	1.647E-02	453.88	65.000	PBC<MDA	PM146
463.37	13.	91.34	1.32	1.620E-02	463.37	10.470	PBC<MDA	SB125
468.06	13.	96.77	1.33	1.606E-02	468.06	51.750	PBC<MDA	Ir192
477.60	5.	314.32	1.33	1.580E-02	477.60	10.520	PBC<MDA	BE7
487.02	13.	105.77	1.34	1.555E-02	487.02	45.500	PBC<MDA	La140
497.05	21.	49.52	1.35	1.530E-02	497.05	90.900	PBC<MDA	RU103
511.86	31.	46.11	2.61	1.494E-02	511.86	20.000	PBC<MDA	RH106
513.63	15.	103.74	1.36	1.489E-02	513.98	0.430	PBC<MDA	Kr85
569.47	4.	232.54	1.40	1.369E-02	569.32	15.380	PBC<MDA	CS134
					569.47	8.200	2.228E+00	PA234
					569.70	97.740	1.870E-01	BI207
569.70	4.	242.38	1.40	1.368E-02	569.32	15.380	PBC<MDA	CS134
					569.47	8.200	1.980E+00	PA234
					569.70	97.740	1.662E-01	BI207
583.01	109.	13.53	1.38	1.342E-02	583.02	84.500	5.355E+00	TL208
609.37	387.	5.65	1.55	1.294E-02	609.31	46.090	3.601E+01	BI214
					610.30	5.750	2.891E+02	RU103
621.92	7.	133.23	1.43	1.273E-02	621.92	9.930	PBC<MDA	RH106
635.89	11.	72.67	1.44	1.250E-02	635.89	11.310	PBC<MDA	SB125
636.97	9.	90.80	1.44	1.248E-02	636.97	7.170	PBC<MDA	I131
722.79	9.	131.69	1.50	1.123E-02	722.79	10.810	PBC<MDA	SB124
					722.94	90.840	4.910E-01	AG108M
					723.36	20.220	2.207E+00	EU154
722.94	9.	139.85	1.50	1.123E-02	722.79	10.810	4.126E+00	SB124
					722.94	90.840	4.911E-01	AG108M
					723.36	20.220	2.207E+00	EU154

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
723.36	1.	886.49	1.50	1.123E-02	722.79	10.810	PBC<MDA	SB124
					722.94	90.840	7.974E-02	AG108M
					723.36	20.220	3.584E-01	EU154
727.49	40.	24.20	2.11	1.118E-02	727.17	7.550	2.666E+01	BI212
747.16	5.	224.40	1.51	1.093E-02	747.16	34.000	PBC<MDA	PM146
756.73	7.	115.19	1.52	1.081E-02	756.73	54.460	PBC<MDA	ZR95
766.41	14.	99.53	1.53	1.070E-02	765.79	99.790	PBC<MDA	NB95
					766.41	0.294	2.479E+02	PA234M
785.51	5.	164.92	1.54	1.048E-02	785.42	1.280	PBC<MDA	BI212
795.87	10.	90.39	1.54	1.036E-02	795.87	85.530	PBC<MDA	CS134
801.95	10.	90.23	1.55	1.030E-02	801.95	8.690	PBC<MDA	CS134
810.78	11.	86.89	1.55	1.020E-02	810.78	99.460	PBC<MDA	CO58
815.77	10.	109.30	1.56	1.015E-02	815.77	23.280	PBC<MDA	La140
860.63	9.	123.02	1.59	9.703E-03	860.56	12.420	PBC<MDA	TL208
873.23	10.	103.26	1.59	9.584E-03	873.23	12.270	PBC<MDA	EU154
889.28	15.	111.93	1.60	9.438E-03	889.28	99.984	PBC<MDA	Sc46
911.35	35.	34.09	1.62	9.247E-03	911.07	29.000	7.182E+00	AC228
964.11	10.	106.57	1.65	8.814E-03	964.11	14.605	PBC<MDA	EU152
969.15	27.	36.85	0.92	8.776E-03	968.97	17.460	9.789E+00	AC228
996.33	12.	84.31	1.67	8.571E-03	996.33	10.600	PBC<MDA	EU154
1004.77	10.	95.42	1.67	8.509E-03	1004.77	18.010	PBC<MDA	EU154
1037.84	4.	218.66	1.69	8.278E-03	1037.84	14.130	PBC<MDA	Co56
1050.36	7.	104.00	1.70	8.193E-03	1050.36	1.560	PBC<MDA	RH106
1063.66	7.	139.50	1.71	8.106E-03	1063.66	74.500	PBC<MDA	BI207
1120.43	86.	10.85	1.59	7.754E-03	1120.29	15.100	4.065E+01	BI214
					1120.55	99.987	6.140E+00	Sc46
1238.28	15.	94.20	1.81	7.114E-03	1238.28	66.070	PBC<MDA	Co56
1274.53	5.	138.63	1.83	6.939E-03	1274.53	99.940	PBC<MDA	NA22
					1274.54	35.190	1.213E+00	EU154
1274.54	6.	82.88	1.83	6.939E-03	1274.53	99.940	PBC<MDA	NA22
					1274.54	35.190	1.444E+00	EU154
1291.60	4.	177.92	1.84	6.860E-03	1291.60	43.200	PBC<MDA	FE59
1313.00	4.	232.74	1.85	6.763E-03	1313.00	21.000	PBC<MDA	TL210
1332.50	2.	294.25	1.86	6.678E-03	1332.50	99.980	PBC<MDA	CO60
1384.30	2.	324.35	1.88	6.460E-03	1384.30	24.290	PBC<MDA	AG110M
1460.97	307.	5.79	2.10	6.165E-03	1460.83	10.670	2.590E+02	K40
1596.21	7.	89.21	1.99	5.706E-03	1596.21	95.400	PBC<MDA	La140
1764.67	46.	15.47	2.07	5.226E-03	1764.49	15.400	3.164E+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	
298.44	74.62	272.	229.	6.354E+03	12.12	1.034	-	sD
308.88	77.23	353.	322.	8.699E+03	9.95	1.036	-	sD
756.98	189.29	28.	16.	4.876E+02	54.72	0.492	-	s

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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	185.96	46.54	341.	26.	0.015	100.48	1.012s
TH-227	200.36	50.14	477.	-30.	-0.017	103.72	1.015s
AM-241	237.95	59.54	708.	-42.	-0.023	64.25	1.022s
TH-234	253.55	63.44	229.	130.	0.072	25.15	1.408s
Sn-126	256.93	64.28	605.	28.	0.016	125.33	1.026
BA-133	323.77	80.99	1510.	-41.	-0.023	80.45	1.039s
Np-237	345.77	86.49	1641.	-33.	-0.018	176.37	1.043s
EU-155	345.98	86.54	1606.	-33.	-0.018	171.33	1.043s
Sn-126	347.57	86.94	1572.	-33.	-0.018	169.50	1.044
Sn-126	350.09	87.57	1430.	122.	0.068	18.59	1.044D
Cd-109	351.97	88.04	1539.	0.	0.000	167.60	1.044A
TH-234	370.17	92.59	228.	57.	0.031	40.19	1.048D
AC-228	373.21	93.35	1377.	-35.	-0.020	149.45	1.049s
Gd-153	389.81	97.50	1342.	-35.	-0.020	147.09	1.052s
Np-239	397.81	99.50	1307.	-36.	-0.020	144.95	1.053s
Gd-153	412.62	103.20	1271.	-36.	-0.020	142.60	1.056s
Np-239	414.62	103.70	1302.	-36.	-0.020	144.27	1.057s
EU-155	421.07	105.31	861.	30.	0.016	141.84	1.058s
Np-239	424.34	106.13	977.	-14.	-0.008	313.46	1.058s
CO-57	488.06	122.06	331.	0.	0.000	1000.00	1.071s
EU-154	492.22	123.10	213.	26.	0.014	81.59	1.072s
PA-234	525.00	131.29	761.	28.	0.015	141.63	1.078
HF-181	531.92	133.02	789.	7.	0.004	539.79	1.079s
CE-144	533.98	133.54	796.	0.	0.000	1000.00	1.080s
HF-181	545.02	136.30	796.	0.	0.000	1000.00	1.082s
CO-57	545.72	136.47	928.	-31.	-0.017	141.12	1.082s
Tc-99m	561.86	140.51	898.	-31.	-0.017	138.41	1.085s
U-235	574.97	143.79	926.	-37.	-0.020	114.74	1.087s
CE-141	581.59	145.44	913.	-31.	-0.017	141.20	1.089s
Ba-140	650.47	162.66	347.	-15.	-0.008	181.42	1.102
CE-139	663.24	165.85	300.	15.	0.008	167.30	1.104s
Cf-251	706.23	176.60	194.	-9.	-0.005	281.34	1.112s
U-235	742.71	185.72	356.	134.	0.074	21.76	1.119s
TH-229	773.87	193.51	490.	0.	0.000	1000.00	1.125s
U-235	821.17	205.33	117.	18.	0.010	114.98	1.134s
TH-229	843.24	210.85	168.	17.	0.009	151.23	1.138s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Cf-251	907.84	227.00	172.	-15.	-0.008	173.12	1.151s
TH-227	943.73	235.97	830.	-26.	-0.014	159.34	1.157s
PB-212	954.37	238.63	114.	288.	0.160	7.91	1.159D
PB-214	967.84	242.00	99.	131.	0.073	13.81	1.162D
EU-152	978.62	244.69	804.	-26.	-0.015	86.60	1.164s
Cd-113m	1054.65	263.70	145.	-23.	-0.013	77.48	1.178s
TL-208	1108.99	277.28	127.	18.	0.010	91.56	1.188
Hg-203	1116.66	279.20	135.	8.	0.004	217.68	1.189s
I-131	1137.05	284.30	76.	18.	0.010	97.29	1.193s
PB-214	1180.22	295.09	86.	270.	0.150	7.78	1.201D
TL-210	1183.86	296.00	689.	18.	0.010	210.78	1.202s
PB-212	1199.98	300.03	58.	33.	0.018	37.48	1.205D
PA-231	1200.14	300.07	707.	18.	0.010	212.92	1.205s
PA-233	1200.58	300.18	725.	18.	0.010	215.51	1.205s
PA-231	1210.46	302.65	742.	13.	0.007	306.89	1.207s
BA-133	1211.27	302.85	755.	0.	0.000	1000.00	1.207s
Ba-140	1219.26	304.85	755.	0.	0.000	1000.00	1.208s
BI-210M	1219.45	304.90	755.	0.	0.000	1000.00	1.208s
Ir-192	1233.62	308.44	755.	0.	0.000	1000.00	1.211s
PA-233	1247.91	312.01	755.	0.	0.000	1000.00	1.214s
Ir-192	1265.82	316.49	755.	0.	0.000	1000.00	1.217s
CR-51	1280.20	320.08	850.	-21.	-0.011	102.24	1.219s
La-140	1314.91	328.76	337.	17.	0.009	158.81	1.226s
Cf-249	1333.63	333.44	423.	-20.	-0.011	150.30	1.229s
AC-228	1352.27	338.10	48.	77.	0.043	23.55	0.929s
Cs-136	1362.15	340.57	404.	-20.	-0.011	146.26	1.234s
EU-152	1377.01	344.29	384.	-20.	-0.011	142.43	1.237
HF-181	1383.19	345.83	265.	17.	0.009	140.36	1.238s
PB-214	1407.76	351.97	30.	577.	0.321	4.66	1.396s
BA-133	1423.87	356.00	683.	-16.	-0.009	238.13	1.245s
BA-133	1535.24	383.84	142.	16.	0.009	111.84	1.266s
Cf-249	1551.68	387.95	158.	0.	0.000	1000.00	1.269s
SN-113	1566.64	391.69	146.	11.	0.006	160.72	1.271s
SB-125	1711.39	427.88	40.	14.	0.008	90.79	1.297s
PM-146	1815.41	453.88	48.	5.	0.003	267.77	1.315s
SB-125	1853.36	463.37	64.	13.	0.007	91.34	1.322s
Ir-192	1872.14	468.06	73.	13.	0.007	96.77	1.325s
BE-7	1910.28	477.60	121.	5.	0.003	314.32	1.332s
HF-181	1927.89	482.00	126.	0.	0.000	1000.00	1.335s
La-140	1947.98	487.02	90.	13.	0.007	105.77	1.339s
RU-103	1988.12	497.05	22.	21.	0.012	49.52	1.346s
RH-106	2047.36	511.86	89.	31.	0.017	46.11	2.606s
Kr-85	2055.83	513.98	110.	15.	0.008	103.74	1.357s
Ba-140	2148.95	537.26	48.	-14.	-0.008	106.61	1.373s
CS-134	2252.86	563.24	43.	-2.	-0.001	579.58	1.391
CS-134	2277.20	569.32	50.	-8.	-0.004	137.60	1.395s
PA-234	2277.80	569.47	52.	4.	0.002	232.54	1.395s
BI-207	2278.73	569.70	45.	4.	0.002	242.38	1.396s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
TL-208	2331.95	583.01	22.	109.	0.061	13.53	1.377s
SB-125	2401.92	600.50	579.	-16.	-0.009	93.22	1.416s
SB-124	2410.85	602.73	563.	-16.	-0.009	216.75	1.418s
CS-134	2418.76	604.71	548.	-16.	-0.009	213.57	1.419s
BI-214	2437.39	609.37	21.	387.	0.215	5.65	1.548s
RU-103	2441.12	610.30	532.	-7.	-0.004	474.20	1.423s
AG-108M	2457.05	614.28	525.	0.	0.000	1000.00	1.426s
RH-106	2487.60	621.92	17.	7.	0.004	133.23	1.431s
SB-125	2543.49	635.89	28.	11.	0.006	72.67	1.440s
I-131	2547.83	636.97	27.	9.	0.005	90.80	1.441s
AG-110M	2630.98	657.76	82.	-16.	-0.009	81.65	1.455
CS-137	2646.58	661.66	128.	-26.	-0.015	84.56	1.457
PM-144	2786.11	696.54	47.	-10.	-0.005	153.32	1.480s
NB-94	2810.46	702.63	56.	-10.	-0.006	222.00	1.484s
SB-124	2891.09	722.79	66.	9.	0.005	131.69	1.497s
AG-108M	2891.70	722.94	75.	9.	0.005	139.85	1.498s
EU-154	2893.39	723.36	84.	1.	0.001	886.49	1.498s
ZR-95	2896.74	724.20	85.	0.	0.000	1000.00	1.498
BI-212	2909.90	727.49	12.	40.	0.023	24.20	2.106s
PM-146	2988.59	747.16	23.	5.	0.003	224.40	1.513s
ZR-95	3026.87	756.73	15.	7.	0.004	115.19	1.519s
AG-110M	3055.73	763.94	117.	-23.	-0.013	69.47	1.524s
NB-95	3063.11	765.79	140.	-23.	-0.013	75.39	1.525s
PA-234M	3065.60	766.41	91.	14.	0.008	99.53	1.526s
BI-212	3141.64	785.42	14.	5.	0.003	164.92	1.538s
CS-134	3183.44	795.87	36.	10.	0.006	90.39	1.544s
TL-210	3198.36	799.60	68.	-13.	-0.007	93.45	1.547s
CS-134	3207.77	801.95	38.	10.	0.006	90.23	1.548s
CO-58	3243.06	810.78	39.	11.	0.006	86.89	1.554s
La-140	3263.04	815.77	49.	10.	0.005	109.30	1.557s
MN-54	3339.36	834.85	38.	-6.	-0.003	168.66	1.569s
Co-56	3387.05	846.77	37.	-16.	-0.009	59.99	1.577s
TL-208	3442.23	860.56	23.	9.	0.005	123.02	1.585s
NB-94	3484.36	871.10	37.	-16.	-0.009	60.72	1.592s
EU-154	3492.89	873.23	46.	10.	0.005	103.26	1.593s
PA-234	3522.10	880.53	118.	-19.	-0.011	49.36	1.598s
PA-234	3532.94	883.24	136.	-18.	-0.010	92.34	1.599s
AG-110M	3538.71	884.68	154.	-18.	-0.010	51.21	1.600s
Sc-46	3557.10	889.28	129.	15.	0.008	111.93	1.603s
Y-88	3592.14	898.04	37.	-1.	-0.001	975.96	1.608s
AC-228	3644.26	911.07	23.	35.	0.019	34.09	1.616
AG-110M	3749.96	937.49	70.	-17.	-0.009	110.88	1.633s
PA-234	3784.07	946.02	25.	-3.	-0.002	370.93	1.638s
EU-152	3856.43	964.11	51.	10.	0.006	106.57	1.649s
AC-228	3876.59	969.15	18.	27.	0.015	36.85	0.917s
EU-154	3985.31	996.33	42.	12.	0.006	84.31	1.668s
PA-234M	4003.99	1001.00	60.	-5.	-0.003	214.16	1.671s
EU-154	4019.10	1004.77	41.	10.	0.006	95.42	1.673s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Co-56	4151.36	1037.84	15.	4.	0.002	218.66	1.693s
Cs-136	4192.29	1048.07	25.	-2.	-0.001	312.00	1.698s
RH-106	4201.45	1050.36	22.	7.	0.004	104.00	1.700s
BI-207	4254.65	1063.66	21.	7.	0.004	139.50	1.708s
Ga-68	4309.61	1077.40	20.	-5.	-0.003	201.66	1.716s
FE-59	4397.02	1099.25	36.	-8.	-0.004	137.16	1.728s
EU-152	4448.32	1112.07	177.	-17.	-0.009	112.77	1.736s
ZN-65	4462.20	1115.55	136.	-15.	-0.008	114.42	1.738s
BI-214	4481.72	1120.43	0.	86.	0.048	10.85	1.594s
Sc-46	4482.22	1120.55	121.	-7.	-0.004	221.29	1.740s
Ta-182	4485.22	1121.30	114.	0.	0.000	1000.00	1.741
CO-60	4692.97	1173.24	33.	-7.	-0.004	139.81	1.770s
Ta-182	4756.23	1189.05	25.	-6.	-0.003	187.70	1.779
Ta-182	4885.67	1221.41	43.	-10.	-0.005	156.93	1.797
Co-56	4953.16	1238.28	38.	15.	0.009	94.20	1.806
NA-22	5098.16	1274.53	25.	5.	0.003	138.63	1.826
EU-154	5098.20	1274.54	11.	6.	0.004	82.88	1.826
FE-59	5166.43	1291.60	11.	4.	0.002	177.92	1.835s
TL-210	5252.05	1313.00	16.	4.	0.002	232.74	1.847s
CO-60	5330.06	1332.50	8.	2.	0.001	294.25	1.857s
AG-110M	5537.25	1384.30	5.	2.	0.001	324.35	1.884s
EU-152	5632.07	1408.00	21.	-4.	-0.002	246.99	1.896s
K-40	5843.96	1460.97	4.	307.	0.170	5.79	2.104
La-140	6384.93	1596.21	6.	7.	0.004	89.21	1.990s
BI-214	7058.07	1764.49	2.	46.	0.025	15.47	2.067
Co-56	7085.51	1771.35	48.	0.	0.000	1000.00	2.070s

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	1.6708E+00				5.31E+01	
			477.60	1.671E+00	@(	1.804E+01 3.14E+02 1.05E+01	G
NA-22	C	4.2723E-01				9.50E+02	
			1274.53	4.272E-01	?(	2.071E+00 1.39E+02 9.99E+01	G
K-40	N	2.5897E+02				4.66E+11	
			1460.83	2.590E+02	(P	1.050E+01 5.79E+00 1.07E+01	G
Sc-46	F	8.6807E-01				8.38E+01	
			889.28	8.681E-01	?(	3.273E+00 1.12E+02 1.00E+02	G
			1120.55	-5.115E-01	-	3.870E+00 2.21E+02 1.00E+02	G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CR-51	F	-5.2822E+00					2.77E+01	
			320.08	-5.282E+00	?(P	3.553E+01	1.02E+02	9.94E+00 G
MN-54	C	-3.0918E-01					3.12E+02	
			834.85	-3.092E-01	?(P	1.745E+00	1.69E+02	1.00E+02 G
FE-59	F	-1.8035E-01					4.45E+01	
			1099.25	-9.394E-01	?(P	3.804E+00	1.37E+02	5.65E+01 G
			1291.60	8.123E-01	?(	3.361E+00	1.78E+02	4.32E+01 G
Co-56	C	-8.8230E-01					7.73E+01	
			846.77	-8.823E-01	?(P	1.765E+00	6.00E+01	9.99E+01 G
			1238.28	1.814E+00	+ P	3.700E+00	9.42E+01	6.61E+01 G
			1037.84	1.900E+00	+	9.860E+00	2.19E+02	1.41E+01 G
			1771.35	0.000E+00	+	2.412E+01	1.00E+03	1.55E+01 A
CO-58	C	5.9155E-01					7.09E+01	
			810.78	5.915E-01	?(	1.735E+00	8.69E+01	9.95E+01 G
CO-60	F	1.6816E-01					1.93E+03	
			1332.50	1.682E-01	?(P	1.321E+00	2.94E+02	1.00E+02 G
			1173.24	-5.149E-01	+ P	2.197E+00	1.40E+02	9.99E+01 G
ZN-65	F	-2.0876E+00					2.44E+02	
			1115.55	-2.088E+00	?(	8.048E+00	1.14E+02	5.06E+01 G
NB-94	I	-4.9489E-01					7.41E+06	
			702.63	-4.949E-01	?(P	1.855E+00	2.22E+02	9.79E+01 G
			871.10	-9.064E-01	&	1.806E+00	6.07E+01	9.99E+01 G
ZR-95	I	6.9391E-01					6.40E+01	
			756.73	6.939E-01	?(P	1.939E+00	1.15E+02	5.45E+01 G
			724.20	0.000E+00	-	5.125E+00	1.00E+03	4.42E+01 G
NB-95	I	-1.2023E+00					6.40E+01	
			765.79	-1.202E+00	&(	3.012E+00	7.54E+01	9.98E+01 G
RU-103	I	8.5231E-01					3.93E+01	
			497.05	8.523E-01	?(	9.749E-01	4.95E+01	9.09E+01 G
			610.30	-5.158E+00	-	8.236E+01	4.74E+02	5.75E+00 GA
RH-106	I	6.5652E+00					3.74E+02	
			621.92	2.931E+00	?(	9.720E+00	1.33E+02	9.93E+00 G
			1050.36	2.970E+01	?(	1.064E+02	1.04E+02	1.56E+00 G
			511.86	5.837E+00	?	8.680E+00	4.61E+01	2.00E+01 GA

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
AG-108M	C	2.2809E-01					1.53E+05	
			433.94	-3.595E-02	%(	1.448E+00	1.65E+03	9.05E+01 G
			722.94	4.911E-01	?(	2.345E+00	1.40E+02	9.08E+01 G
			614.28	0.000E+00	&	5.265E+00	1.00E+03	8.98E+01 G
AG-110M	F	-1.4904E+00					2.50E+02	
			884.68	-1.490E+00	?(P	4.885E+00	5.12E+01	7.27E+01 G
			657.76	-7.972E-01	&	2.176E+00	8.16E+01	9.46E+01 G
			937.49	-3.045E+00	+	7.470E+00	1.11E+02	3.44E+01 G
			1384.30	5.901E-01	+	4.769E+00	3.24E+02	2.43E+01 G
			763.94	-5.370E+00	+	1.236E+01	6.95E+01	2.23E+01 G
SN-113	F	5.0695E-01					1.15E+02	
			391.69	5.070E-01	(	2.763E+00	1.61E+02	6.40E+01 G
SB-124	F	-1.9910E-01					6.02E+01	
			602.73	-6.749E-01	?(	4.904E+00	2.17E+02	9.83E+01 G
			1690.98	7.143E-02	%	2.958E+00	1.68E+03	4.78E+01 G
			722.79	4.126E+00	?(	1.856E+01	1.32E+02	1.08E+01 G
SB-125	I	2.7291E+00					1.01E+03	
			427.88	1.549E+00	(	3.496E+00	9.08E+01	2.96E+01 G
			600.50	-3.776E+00	& P	2.727E+01	9.32E+01	1.79E+01 G
			635.89	4.401E+00	?(	1.067E+01	7.27E+01	1.13E+01 G
			463.37	4.259E+00	?(	1.310E+01	9.13E+01	1.05E+01 G
I-131	I	8.4739E-01					8.02E+00	
			364.48	-1.281E-03	%(P	1.257E+00	7.27E+04	8.17E+01 G
			284.30	6.837E+00	(	1.639E+01	9.73E+01	6.14E+00 G
			636.97	5.389E+00	(	1.664E+01	9.08E+01	7.17E+00 G
Gd-153	F	-1.5886E+00					2.42E+02	
			97.50	-1.589E+00	?(	7.771E+00	1.47E+02	3.00E+01 G
			103.20	-2.173E+00	+	1.030E+01	1.43E+02	2.18E+01 G
Ga-68	C	-1.2372E+01					4.71E-02	
			1077.40	-1.237E+01	?(	5.827E+01	2.02E+02	3.30E+00 G
Tc-99m	I	-5.0243E-01					2.51E-01	
			140.51	-5.024E-01	(	2.316E+00	1.38E+02	8.93E+01 G
BA-133	F	-6.9809E-01					3.85E+03	
			356.00	-6.981E-01	?(	5.568E+00	2.38E+02	6.20E+01 G
			302.85	0.000E+00	+	1.741E+01	1.00E+03	1.83E+01 G
			383.84	5.109E+00	?	1.923E+01	1.12E+02	8.94E+00 GA
			80.99	-1.738E+00	+ P	7.847E+00	8.05E+01	3.41E+01 GA

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CS-134	I	1.1615E+00					7.54E+02	
			795.87	6.287E-01	?(P	1.923E+00	9.04E+01	8.55E+01 G
			604.71	-6.818E-01	-	4.883E+00	2.14E+02	9.76E+01 G
			569.32	-1.979E+00	+	9.367E+00	1.38E+02	1.54E+01 G
			801.95	6.406E+00	?(P	1.954E+01	9.02E+01	8.69E+00 G
			563.24	-1.124E+00	&	1.608E+01	5.80E+02	8.35E+00 G
CS-137	I	-1.4196E+00					1.10E+04	
			661.66	-1.420E+00	(P	2.991E+00	8.46E+01	8.52E+01 G
CE-139	F	2.8420E-01					1.38E+02	
			165.85	2.842E-01	&(	1.600E+00	1.67E+02	7.99E+01 G
Ba-140	I	-2.1686E+00					1.28E+01	
			537.26	-2.169E+00	?(	5.535E+00	1.07E+02	2.44E+01 G
			162.66	-3.646E+00	+	2.224E+01	1.81E+02	6.22E+00 G
			304.85	0.000E+00	+	7.476E+01	1.00E+03	4.29E+00 G
La-140	I	1.1361E+00					1.28E+01	
			1596.21	7.060E-01	?(	1.409E+00	8.92E+01	9.54E+01 G
			487.02	1.033E+00	?(	3.690E+00	1.06E+02	4.55E+01 G
			328.76	2.121E+00	?(P	1.131E+01	1.59E+02	2.03E+01 G
			815.77	2.240E+00	?(	8.344E+00	1.09E+02	2.33E+01 G
CE-141	I	-9.0798E-01					3.25E+01	
			145.44	-9.080E-01	*(	4.270E+00	1.41E+02	4.82E+01 G
PM-144	C	-4.6826E-01					3.63E+02	
			696.54	-4.683E-01	?(	1.673E+00	1.53E+02	9.90E+01 G
			618.06	-4.228E-02	% P	4.802E+00	2.27E+03	9.91E+01 G
EU-152	F	1.4180E+00					4.94E+03	
			121.78	-4.687E-02	%(	4.094E+00	2.57E+03	2.86E+01 G
			344.29	-2.009E+00	&	9.587E+00	1.42E+02	2.65E+01 G
			1112.07	-8.906E+00	+	3.374E+01	1.13E+02	1.36E+01 G
			778.92	-4.069E-01	%	1.114E+01	1.13E+03	1.29E+01 G
			964.11	4.285E+00	?(	1.553E+01	1.07E+02	1.46E+01 G
			244.69	-7.164E+00	+ P	3.673E+01	8.66E+01	7.58E+00 G
			1408.00	-1.800E+00	+	1.007E+01	2.47E+02	2.10E+01 GA
EU-154	I	2.4276E+00					3.14E+03	
			123.10	8.583E-01	?(	2.329E+00	8.16E+01	4.08E+01 G
			1274.54	1.444E+00	?(	4.079E+00	8.29E+01	3.52E+01 G
			723.36	3.584E-01	-	1.109E+01	8.86E+02	2.02E+01 G
			873.23	4.638E+00	?(	1.629E+01	1.03E+02	1.23E+01 G
			1004.77	3.652E+00	?(	1.182E+01	9.54E+01	1.80E+01 G
			996.33	7.092E+00	?(	2.012E+01	8.43E+01	1.06E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	I	1.8483E+00					1.81E+03	
			105.31	1.848E+00	*(P	8.735E+00	1.42E+02	2.12E+01 G
			86.54	-1.519E+00	&	8.655E+00	1.71E+02	3.07E+01 G
HF-181	F	3.9846E-01					4.24E+01	
			482.00	0.000E+00	(	2.421E+00	1.00E+03	8.05E+01 G
			133.02	2.341E-01	?(	4.241E+00	5.40E+02	4.33E+01 G
			345.83	2.999E+00	*(	1.415E+01	1.40E+02	1.51E+01 G
			136.30	0.000E+00	&	3.185E+01	1.00E+03	5.85E+00 G
Hg-203	F	2.1534E-01					4.66E+01	
			279.20	2.153E-01	?(	1.599E+00	2.18E+02	8.15E+01 G
TL-208	N	5.4345E+00					6.98E+02	
			583.02	5.355E+00	*(P	1.195E+00	1.35E+01	8.45E+01 G
			277.28	6.495E+00	(	1.991E+01	9.16E+01	6.31E+00 G
			860.56	3.995E+00	-	1.163E+01	1.23E+02	1.24E+01 G
PM-146	C	4.2139E-01					2.02E+03	
			453.88	2.768E-01	?(	1.810E+00	2.68E+02	6.50E+01 G
			747.16	6.979E-01	?(	3.772E+00	2.24E+02	3.40E+01 G
			735.72	-2.231E-01	%	6.106E+00	1.13E+03	2.25E+01 G
Y-88	F	-1.4762E-02					1.07E+02	
			1836.06	-1.476E-02	%(P	8.180E-01	5.35E+03	9.92E+01 G
			898.04	-8.446E-02	+	1.975E+00	9.76E+02	9.37E+01 G
Cd-113m		-8.3169E+03					5.33E+03	
			263.70	-8.317E+03	?(	2.143E+04	7.75E+01	6.00E-03 K
Cf-251	T	-8.8157E-01					3.28E+05	
			176.60	-8.816E-01	?(	6.392E+00	2.81E+02	1.70E+01 G
			227.00	-4.637E+00	+	1.973E+01	1.73E+02	6.30E+00 GA
Sn-126		5.1105E+00					3.65E+07	
			87.57	4.537E+00	}	6.655E+00	1.86E+01	3.75E+01 GA
			64.28	5.111E+00	(	2.136E+01	1.25E+02	9.70E+00 G
			86.94	-5.149E+00	+	2.903E+01	1.70E+02	9.04E+00 GA
PB-210	N	1.7267E+01					8.14E+03	
			46.54	1.727E+01	*(P	5.784E+01	1.00E+02	4.25E+00 G
PB-212	N	1.3447E+01					6.98E+02	
			238.63	1.345E+01	(P	2.457E+00	7.91E+00	4.33E+01 G
			300.03	2.408E+01	+	2.830E+01	3.75E+01	3.28E+00 GA

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PB-214	N	4.2191E+01					5.84E+05	
			351.93	4.219E+01	*(P	2.062E+00	4.66E+00	3.76E+01 G
			295.09	3.350E+01	- P	5.676E+00	7.78E+00	1.93E+01 G
			242.00	3.616E+01	-	1.350E+01	1.38E+01	7.43E+00 GA
BI-207	C	6.7711E-01					1.18E+04	
			1063.66	6.771E-01	?(P	2.197E+00	1.39E+02	7.45E+01 G
			569.70	1.662E-01	-	1.411E+00	2.42E+02	9.77E+01 G
BI-212	N	2.6664E+01					6.98E+02	
			727.17	2.666E+01	(	1.219E+01	2.42E+01	7.55E+00 G
			785.42	2.071E+01	?	8.345E+01	1.65E+02	1.28E+00 GA
U-235	N	-1.2497E+00					2.57E+11	
			143.79	-4.764E+00	(P	1.878E+01	1.15E+02	1.10E+01 G
			205.33	6.438E+00	&(P	1.912E+01	1.15E+02	5.01E+00 G
			163.38	-8.552E-01	& P	2.799E+01	1.50E+03	5.08E+00 G
			185.72	4.135E+00	* P	2.801E+00	2.18E+01	5.40E+01 GA
BI-214	N	3.7159E+01					5.84E+05	
			609.31	3.601E+01	*(P	2.253E+00	5.65E+00	4.61E+01 G
			1120.29	4.065E+01	@(P	3.497E+00	1.09E+01	1.51E+01 G
			1764.49	3.164E+01	- P	6.606E+00	1.55E+01	1.54E+01 G
BI-210M	T	-5.2789E-02					1.10E+09	
			265.83	-5.279E-02	%(	2.895E+00	1.60E+03	5.00E+01 G
			304.90	0.000E+00	+	1.146E+01	1.00E+03	2.80E+01 G
AC-228	N	1.0009E+01					2.10E+03	
			911.07	7.182E+00	?(	5.225E+00	3.41E+01	2.90E+01 G
			968.97	9.789E+00	(	8.151E+00	3.69E+01	1.75E+01 G
			338.32	1.715E+01	(	7.738E+00	2.35E+01	1.20E+01 G
			93.35	-8.649E+00	-	4.298E+01	1.49E+02	5.56E+00 XA
TH-227	N	-3.6532E-01					7.95E+03	
			256.24	-3.653E-01	%(P	1.537E+01	1.91E+03	7.00E+00 G
			235.97	-4.203E+00	+	2.234E+01	1.59E+02	1.23E+01 G
			50.14	-9.269E+00	+	3.202E+01	1.04E+02	8.00E+00 G
TH-229	N	4.2314E+00					2.68E+06	
			193.51	0.000E+00	?(	4.143E+01	1.00E+03	4.40E+00 G
			210.85	1.046E+01	?(	3.883E+01	1.51E+02	2.99E+00 G
TH-234	N	3.3106E+01					1.63E+12	
			92.59	1.383E+01	(P	1.784E+01	4.02E+01	5.58E+00 G
			63.29	6.135E+01	*(P	3.451E+01	2.51E+01	3.81E+00 G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

PA-231   N   1.3820E+01                                     1.20E+07
                         302.65 1.068E+01 &(  1.098E+02 3.07E+02 2.88E+00 G
                         300.07 1.750E+01 *(  1.247E+02 2.13E+02 2.46E+00 G

PA-233   C   1.0205E+00                                     7.82E+08
                         312.01 0.000E+00  (  9.074E+00 1.00E+03 3.60E+01 G
                         300.18 6.946E+00 *(  5.009E+01 2.16E+02 6.20E+00 G

PA-234   N   2.1485E+00                                     1.63E+12
                         131.29 2.112E+00  (  9.976E+00 1.42E+02 1.80E+01 G
                         946.02-1.389E+00 +   1.204E+01 3.71E+02 1.34E+01 G
                         569.47 2.228E+00 &(  1.806E+01 2.33E+02 8.20E+00 G
                         883.24-1.124E+01 +   3.475E+01 9.23E+01 9.60E+00 G
                         880.53-1.863E+01 + P 5.190E+01 4.94E+01 6.00E+00 GA

PA-234M  N   3.8357E+01                                     1.63E+12
                        1001.00-3.526E+01 ?(P 3.006E+02 2.14E+02 8.37E-01 G
                         766.41 2.479E+02 ?(  8.313E+02 9.95E+01 2.94E-01 G

AM-241   T  -2.2578E+00                                     1.58E+05
                          59.54-2.258E+00 ?(P 6.805E+00 6.43E+01 3.59E+01 G

Np-237   F  -3.4966E+00                                     2.14E+06
                          86.49-3.497E+00 &(  2.051E+01 1.76E+02 1.31E+01 G

Ir-192   F   3.2473E-01                                     7.40E+01
                         316.49 0.000E+00 ?(  3.796E+00 1.00E+03 8.70E+01 G
                         468.06 8.709E-01 &(  2.842E+00 9.68E+01 5.18E+01 G
                         308.44 0.000E+00 &   1.020E+01 1.00E+03 3.18E+01 G

Cs-136   F  -3.6593E-02                                     1.30E+01
                         818.50-3.659E-02 &(  2.125E+00 1.64E+03 1.00E+02 G
                        1048.07-1.974E-01 +   2.214E+00 3.12E+02 8.00E+01 G
                         340.57-1.123E+00 +   5.502E+00 1.46E+02 4.69E+01 G

Np-239   T  -8.2723E-01                                     2.36E+00
                         103.70-1.974E+00 +   9.469E+00 1.44E+02 2.40E+01 X
                         106.13-8.272E-01 &(  8.672E+00 3.13E+02 2.27E+01 G
                          99.50-3.169E+00 &   1.527E+01 1.45E+02 1.50E+01 X

Nd-147      -2.9486E-01                                     1.11E+01
                         531.00-2.949E-01 &(  9.380E+00 1.28E+03 1.30E+01 G
                          91.10-3.700E-07 %   8.743E+00 7.06E+08 2.83E+01 G

TL-210   N  -7.1094E-01                                     5.84E+05
                         799.60-7.109E-01 ?(  2.238E+00 9.34E+01 9.90E+01 G
                         296.00 5.377E-01 +   3.793E+00 2.11E+02 7.90E+01 G
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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                         1313.00 1.565E+00 ?   8.351E+00 2.33E+02 2.10E+01 GA

Kr-85    I   1.2832E+02                                      3.92E+03
                         513.98 1.283E+02 ?(  4.481E+02 1.04E+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	341.	26.	0.015	100.48	1.727E+01	P
TH-227	50.14	477.	-30.	-0.017	103.72	-9.269E+00	
AM-241	59.54	708.	-42.	-0.023	64.25	-2.258E+00	P
BA-133	80.99	1510.	-41.	-0.023	80.45	-1.738E+00	P
Np-237	86.49	1641.	-33.	-0.018	176.37	-3.497E+00	
EU-155	86.54	1606.	-33.	-0.018	171.33	-1.519E+00	
Gd-153	97.50	1342.	-35.	-0.020	147.09	-1.589E+00	
Np-239	99.50	1307.	-36.	-0.020	144.95	-3.169E+00	
Gd-153	103.20	1271.	-36.	-0.020	142.60	-2.173E+00	
Np-239	103.70	1302.	-36.	-0.020	144.27	-1.974E+00	
EU-155	105.31	861.	30.	0.016	141.84	1.848E+00	P

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Np-239	106.13	977.	-14.	-0.008	313.46	-8.272E-01	
PA-234	131.29	761.	28.	0.015	141.63	2.112E+00	
HF-181	133.02	789.	7.	0.004	539.79	2.341E-01	
CO-57	136.47	928.	-31.	-0.017	141.12	-4.005E+00	
Tc-99m	140.51	898.	-31.	-0.017	138.41	-5.024E-01	
U-235	143.79	926.	-37.	-0.020	114.74	-4.764E+00	P
CE-141	145.44	913.	-31.	-0.017	141.20	-9.080E-01	
Ba-140	162.66	347.	-15.	-0.008	181.42	-3.646E+00	
CE-139	165.85	300.	15.	0.008	167.30	2.842E-01	
Cf-251	176.60	194.	-9.	-0.005	281.34	-8.816E-01	
U-235	185.72	356.	134.	0.074	21.76	4.135E+00	P
U-235	205.33	117.	18.	0.010	114.98	6.438E+00	P
TH-229	210.85	168.	17.	0.009	151.23	1.046E+01	
Cf-251	227.00	172.	-15.	-0.008	173.12	-4.637E+00	
TH-227	235.97	830.	-26.	-0.014	159.34	-4.203E+00	
EU-152	244.69	804.	-26.	-0.015	86.60	-7.164E+00	P
Cd-113m	263.70	145.	-23.	-0.013	77.48	-8.317E+03	
I-131	284.30	76.	18.	0.010	97.29	6.837E+00	
TL-210	296.00	689.	18.	0.010	210.78	5.377E-01	
PA-231	300.07	707.	18.	0.010	212.92	1.750E+01	
PA-233	300.18	725.	18.	0.010	215.51	6.946E+00	
PA-231	302.65	742.	13.	0.007	306.89	1.068E+01	
CR-51	320.08	850.	-21.	-0.011	102.24	-5.282E+00	P
La-140	328.76	337.	17.	0.009	158.81	2.121E+00	P
Cf-249	333.44	423.	-20.	-0.011	150.30	-3.325E+00	
Cs-136	340.57	404.	-20.	-0.011	146.26	-1.123E+00	
EU-152	344.29	384.	-20.	-0.011	142.43	-2.009E+00	
HF-181	345.83	265.	17.	0.009	140.36	2.999E+00	
BA-133	356.00	683.	-16.	-0.009	238.13	-6.981E-01	
BA-133	383.84	142.	16.	0.009	111.84	5.109E+00	
SN-113	391.69	146.	11.	0.006	160.72	5.070E-01	
SB-125	427.88	40.	14.	0.008	90.79	1.549E+00	
PM-146	453.88	48.	5.	0.003	267.77	2.768E-01	
SB-125	463.37	64.	13.	0.007	91.34	4.259E+00	
Ir-192	468.06	73.	13.	0.007	96.77	8.709E-01	
BE-7	477.60	121.	5.	0.003	314.32	1.671E+00	
La-140	487.02	90.	13.	0.007	105.77	1.033E+00	
RU-103	497.05	22.	21.	0.012	49.52	8.523E-01	
RH-106	511.86	89.	31.	0.017	46.11	5.837E+00	
Ba-140	537.26	48.	-14.	-0.008	106.61	-2.169E+00	
CS-134	563.24	43.	-2.	-0.001	579.58	-1.124E+00	
CS-134	569.32	50.	-8.	-0.004	137.60	-1.979E+00	
PA-234	569.47	52.	4.	0.002	232.54	2.228E+00	
BI-207	569.70	45.	4.	0.002	242.38	1.662E-01	
SB-125	600.50	579.	-16.	-0.009	93.22	-3.776E+00	P
SB-124	602.73	563.	-16.	-0.009	216.75	-6.749E-01	
CS-134	604.71	548.	-16.	-0.009	213.57	-6.818E-01	
RU-103	610.30	532.	-7.	-0.004	474.20	-5.158E+00	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
RH-106	621.92	17.	7.	0.004	133.23	2.931E+00		
SB-125	635.89	28.	11.	0.006	72.67	4.401E+00		
I-131	636.97	27.	9.	0.005	90.80	5.389E+00		
AG-110M	657.76	82.	-16.	-0.009	81.65	-7.972E-01		
CS-137	661.66	128.	-26.	-0.015	84.56	-1.420E+00		P
PM-144	696.54	47.	-10.	-0.005	153.32	-4.683E-01		
NB-94	702.63	56.	-10.	-0.006	222.00	-4.949E-01		P
SB-124	722.79	66.	9.	0.005	131.69	4.126E+00		
AG-108M	722.94	75.	9.	0.005	139.85	4.911E-01		
PM-146	747.16	23.	5.	0.003	224.40	6.979E-01		
ZR-95	756.73	15.	7.	0.004	115.19	6.939E-01		P
AG-110M	763.94	117.	-23.	-0.013	69.47	-5.370E+00		
NB-95	765.79	140.	-23.	-0.013	75.39	-1.202E+00		
PA-234M	766.41	91.	14.	0.008	99.53	2.479E+02		
CS-134	795.87	36.	10.	0.006	90.39	6.287E-01		P
TL-210	799.60	68.	-13.	-0.007	93.45	-7.109E-01		
CS-134	801.95	38.	10.	0.006	90.23	6.406E+00		P
CO-58	810.78	39.	11.	0.006	86.89	5.915E-01		
La-140	815.77	49.	10.	0.005	109.30	2.240E+00		
MN-54	834.85	38.	-6.	-0.003	168.66	-3.092E-01		P
Co-56	846.77	37.	-16.	-0.009	59.99	-8.823E-01		P
NB-94	871.10	37.	-16.	-0.009	60.72	-9.064E-01		
PA-234	880.53	118.	-19.	-0.011	49.36	-1.863E+01		P
PA-234	883.24	136.	-18.	-0.010	92.34	-1.124E+01		
AG-110M	884.68	154.	-18.	-0.010	51.21	-1.490E+00		P
Sc-46	889.28	129.	15.	0.008	111.93	8.681E-01		
Y-88	898.04	37.	-1.	-0.001	975.96	-8.446E-02		
AG-110M	937.49	70.	-17.	-0.009	110.88	-3.045E+00		
PA-234	946.02	25.	-3.	-0.002	370.93	-1.389E+00		
EU-152	964.11	51.	10.	0.006	106.57	4.285E+00		
PA-234M	1001.00	60.	-5.	-0.003	214.16	-3.526E+01		P
Co-56	1037.84	15.	4.	0.002	218.66	1.900E+00		
Cs-136	1048.07	25.	-2.	-0.001	312.00	-1.974E-01		
RH-106	1050.36	22.	7.	0.004	104.00	2.970E+01		
BI-207	1063.66	21.	7.	0.004	139.50	6.771E-01		P
Ga-68	1077.40	20.	-5.	-0.003	201.66	-1.237E+01		
FE-59	1099.25	36.	-8.	-0.004	137.16	-9.394E-01		P
EU-152	1112.07	177.	-17.	-0.009	112.77	-8.906E+00		
ZN-65	1115.55	136.	-15.	-0.008	114.42	-2.088E+00		
Sc-46	1120.55	121.	-7.	-0.004	221.29	-5.115E-01		
CO-60	1173.24	33.	-7.	-0.004	139.81	-5.149E-01		P
Ta-182	1189.05	25.	-6.	-0.003	187.70	-2.793E+00		
Ta-182	1221.41	43.	-10.	-0.005	156.93	-2.763E+00		
Co-56	1238.28	38.	15.	0.009	94.20	1.814E+00		P
NA-22	1274.53	25.	5.	0.003	138.63	4.272E-01		
FE-59	1291.60	11.	4.	0.002	177.92	8.123E-01		
TL-210	1313.00	16.	4.	0.002	232.74	1.565E+00		
CO-60	1332.50	8.	2.	0.001	294.25	1.682E-01		P

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
AG-110M	1384.30	5.	2.	0.001	324.35	5.901E-01	
EU-152	1408.00	21.	-4.	-0.002	246.99	-1.800E+00	
La-140	1596.21	6.	7.	0.004	89.21	7.060E-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	1.6708E+00	1.6708E+00	3.143E+02%	1.80E+01
NA-22	#A	4.2723E-01	4.2723E-01	1.386E+02%	2.07E+00
K-40		2.5897E+02	2.5897E+02	5.795E+00%	1.05E+01
Sc-46	#A	8.6807E-01	8.6807E-01	1.119E+02%	3.27E+00
CR-51	#A	-5.2821E+00	-5.2822E+00	1.022E+02%	3.55E+01
MN-54	#A	-3.0918E-01	-3.0918E-01	1.687E+02%	1.75E+00
FE-59	#A	-1.8035E-01	-1.8035E-01	1.123E+02%	3.80E+00
Co-56	#A	-8.8229E-01	-8.8230E-01	5.999E+01%	1.76E+00
CO-57	#A	0.0000E+00	0.0000E+00	1.000E+03%	1.37E+00
CO-58	#A	5.9154E-01	5.9155E-01	8.689E+01%	1.73E+00
CO-60	#A	1.6816E-01	1.6816E-01	2.942E+02%	1.32E+00
ZN-65	#A	-2.0876E+00	-2.0876E+00	1.144E+02%	8.05E+00
NB-94	#A	-4.9489E-01	-4.9489E-01	2.220E+02%	1.85E+00
ZR-95	#A	6.9391E-01	6.9391E-01	1.152E+02%	1.94E+00
NB-95	#A	-1.2023E+00	-1.2023E+00	7.539E+01%	3.01E+00
RU-103	#A	8.5230E-01	8.5231E-01	4.952E+01%	9.75E-01
RH-106	#A	6.5652E+00	6.5652E+00	8.451E+01%	9.72E+00
AG-108M	#A	2.2809E-01	2.2809E-01	1.398E+02%	1.45E+00
AG-110M	#A	-1.4904E+00	-1.4904E+00	5.121E+01%	4.89E+00
SN-113	#A	5.0695E-01	5.0695E-01	1.607E+02%	2.76E+00
SB-124	#A	-1.9910E-01	-1.9910E-01	1.268E+02%	4.90E+00
SB-125	#A	2.7291E+00	2.7291E+00	4.929E+01%	3.50E+00
I-131	#A	8.4733E-01	8.4739E-01	9.080E+01%	1.26E+00
Gd-153	#A	-1.5886E+00	-1.5886E+00	1.471E+02%	7.77E+00
Ga-68	#A	-1.2233E+01	-1.2372E+01	2.017E+02%	5.83E+01
Tc-99m	#A	-5.0137E-01	-5.0243E-01	1.384E+02%	2.32E+00
BA-133	#A	-6.9809E-01	-6.9809E-01	2.381E+02%	5.57E+00
CS-134	#A	1.1615E+00	1.1615E+00	6.386E+01%	1.92E+00
CS-137	#A	-1.4196E+00	-1.4196E+00	8.456E+01%	2.99E+00
CE-139	#A	2.8420E-01	2.8420E-01	1.673E+02%	1.60E+00
Ba-140	#A	-2.1685E+00	-2.1686E+00	1.066E+02%	5.54E+00
La-140	#A	1.1360E+00	1.1361E+00	5.933E+01%	1.41E+00
CE-141	#A	-9.0797E-01	-9.0798E-01	1.412E+02%	4.27E+00
CE-144	#A	0.0000E+00	0.0000E+00	1.000E+03%	1.67E+01
PM-144	#A	-4.6826E-01	-4.6826E-01	1.533E+02%	1.67E+00
EU-152	#A	1.4180E+00	1.4180E+00	1.066E+02%	4.09E+00
EU-154	#C	2.4276E+00	2.4276E+00	4.020E+01%	2.33E+00

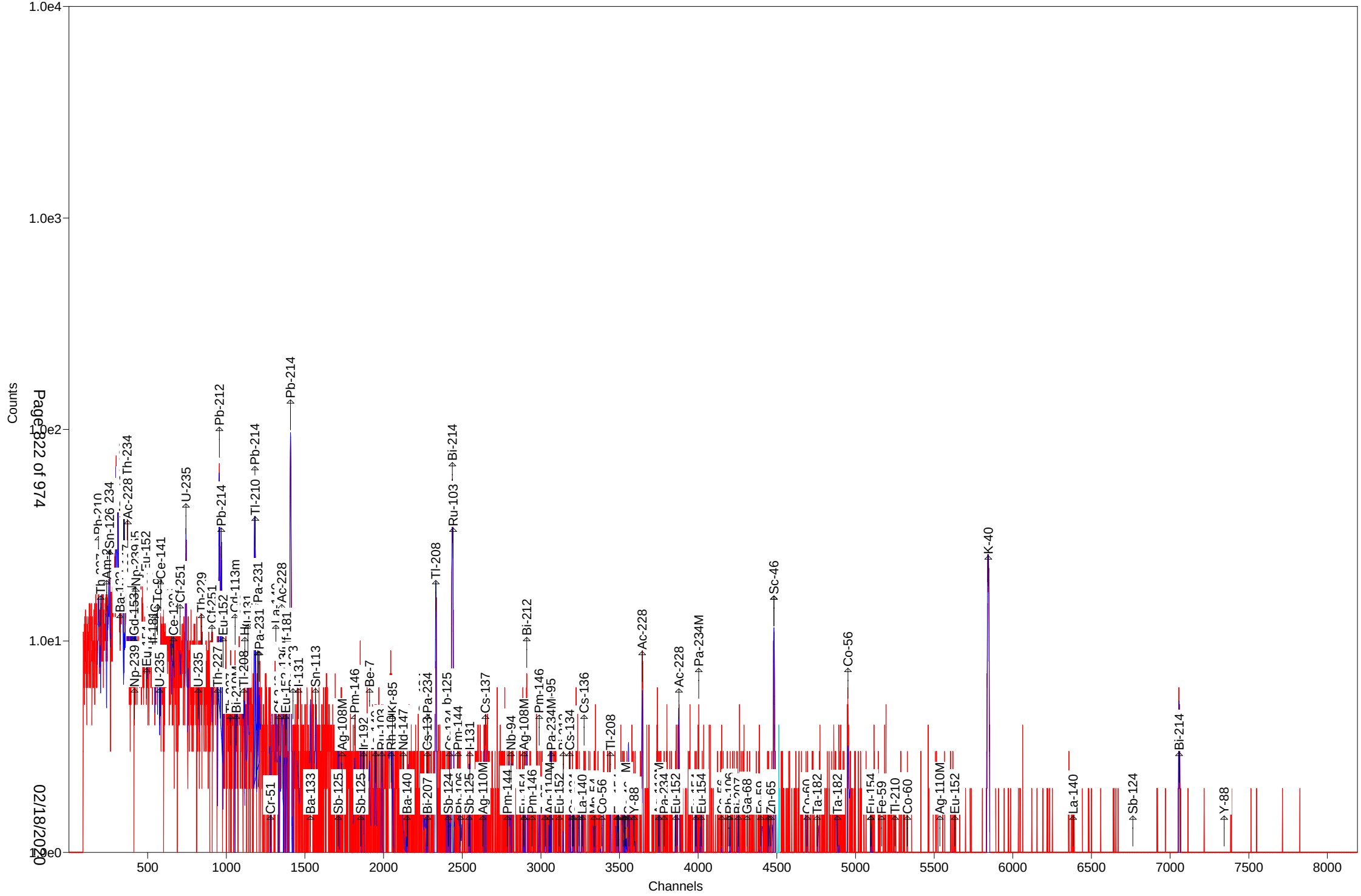
EU-155 #A	1.8483E+00	1.8483E+00	1.418E+02%		8.73E+00
HF-181 #A	3.9846E-01	3.9846E-01	1.404E+02%		2.42E+00
Ta-182 #A	0.0000E+00	0.0000E+00	1.000E+03%		1.08E+01
Hg-203 #A	2.1534E-01	2.1534E-01	2.177E+02%		1.60E+00
TL-208	5.4345E+00	5.4345E+00	1.353E+01%		1.19E+00
PM-146 #A	4.2139E-01	4.2139E-01	1.747E+02%		1.81E+00
Y-88 #A	-1.4762E-02	-1.4762E-02	5.351E+03%		8.18E-01
Cd-113m#A	-8.3169E+03	-8.3169E+03	7.748E+01%		2.14E+04
Cd-109 #A	0.0000E+00	0.0000E+00	1.000E+03%		6.81E+01
Cf-251 #A	-8.8157E-01	-8.8157E-01	2.813E+02%		6.39E+00
Cf-249 #A	0.0000E+00	0.0000E+00	1.000E+03%		2.76E+00
Sn-126 A	5.1105E+00	5.1105E+00	1.253E+02%		2.14E+01
PB-210 #A	1.7267E+01	1.7267E+01	1.005E+02%		5.78E+01
PB-212	1.3447E+01	1.3447E+01	7.912E+00%		2.46E+00
PB-214 #	4.2191E+01	4.2191E+01	4.662E+00%		2.06E+00
BI-207 #A	6.7711E-01	6.7711E-01	1.395E+02%		2.20E+00
BI-212	2.6664E+01	2.6664E+01	2.420E+01%		1.22E+01
U-235 #A	-1.2497E+00	-1.2497E+00	8.122E+01%		1.88E+01
BI-214 #	3.7159E+01	3.7159E+01	5.654E+00%		2.25E+00
BI-210M#A	-5.2789E-02	-5.2789E-02	1.598E+03%		2.89E+00
AC-228	1.0009E+01	1.0009E+01	1.848E+01%		5.22E+00
TH-227 #A	-3.6532E-01	-3.6532E-01	1.908E+03%		1.54E+01
TH-229 #A	4.2314E+00	4.2314E+00	1.512E+02%		4.14E+01
TH-234	3.3106E+01	3.3106E+01	2.371E+01%		1.78E+01
PA-231 #A	1.3820E+01	1.3820E+01	1.868E+02%		1.10E+02
PA-233 #A	1.0205E+00	1.0205E+00	2.155E+02%		9.07E+00
PA-234 #A	2.1485E+00	2.1485E+00	1.361E+02%		9.98E+00
PA-234M#A	3.8357E+01	3.8357E+01	9.953E+01%		3.01E+02
AM-241 #A	-2.2578E+00	-2.2578E+00	6.425E+01%		6.80E+00
Np-237 #A	-3.4966E+00	-3.4966E+00	1.764E+02%		2.05E+01
Ir-192 #A	3.2473E-01	3.2473E-01	9.677E+01%		3.80E+00
Cs-136 #A	-3.6592E-02	-3.6593E-02	1.643E+03%		2.12E+00
Np-239 #A	-8.2704E-01	-8.2723E-01	3.135E+02%		8.67E+00
Nd-147 #A	-2.9484E-01	-2.9486E-01	1.279E+03%		9.38E+00
TL-210 #A	-7.1094E-01	-7.1094E-01	9.345E+01%		2.24E+00
Kr-85 #A	1.2832E+02	1.2832E+02	1.037E+02%		4.48E+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) 4.270E+02 Bq/Sample
Total Decayed Activity (37.5 to 2000.0 keV) 4.2698129E+02 Bq/Sample

453329_Gamma_160-36593-A-16-B. 8_Gamma_20192232.spc.



Test America St. Louis Spectrum ID: 9_Gamma_20193887

Sample Description: 453329_Gamma_160-36593-A-17-B
Detector: Detector # 9
Batch ID: 453329
Work Order Number: Gamma
Lot Number: 160-36593-A-17-B

Decay to Time: 12/27/2019 11:37 Live Time: 1800 sec
Acquisition Time: 12/27/2019 11:37:18 Real Time: 1802 sec
Analysis Time: 12/27/2019 12:07 Dead Time: 0.13 %
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_2019-12-07_1444.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	-5.327E+00	90.1	4.798E+00	4.806E+00	1.601E+01
NA-22	-1.070E+00	52.9	5.664E-01	5.689E-01	1.838E+00
K-40	2.411E+02	5.0	1.203E+01	1.723E+01	1.064E+01
Sc-46	6.117E-01	97.5	5.964E-01	5.973E-01	2.003E+00
CR-51	-2.354E-01	1876.0	4.417E+00	4.417E+00	2.862E+01
MN-54	2.063E-01	265.8	5.482E-01	5.483E-01	1.249E+00
FE-59	9.499E-01	65.6	6.235E-01	6.254E-01	1.731E+00
Co-56	9.016E-01	47.9	4.315E-01	4.339E-01	1.441E+00
CO-57	2.145E-01	159.1	3.413E-01	3.415E-01	1.278E+00
CO-58	4.669E-01	82.0	3.827E-01	3.834E-01	1.284E+00
CO-60	4.016E-01	102.2	4.105E-01	4.110E-01	1.317E+00
ZN-65	-2.175E-01	858.0	1.866E+00	1.866E+00	6.378E+00
NB-94	4.866E-01	88.0	4.282E-01	4.290E-01	1.437E+00
ZR-95	2.319E-01	76.3	1.770E-01	1.774E-01	2.119E+00
NB-95	5.271E-02	1181.4	6.227E-01	6.227E-01	2.140E+00
RU-103	-2.005E-01	212.2	4.253E-01	4.254E-01	1.030E+00
RH-106	6.974E+00	126.6	8.826E+00	8.833E+00	3.766E+01
AG-108M	-9.960E-02	453.5	4.516E-01	4.517E-01	1.092E+00
AG-110M	1.372E-01	395.5	5.427E-01	5.427E-01	3.170E+00
SN-113	6.436E-01	108.1	6.960E-01	6.968E-01	2.332E+00
SB-124	4.257E-01	226.1	9.623E-01	9.626E-01	3.825E+00
SB-125	1.406E+00	100.8	1.417E+00	1.419E+00	3.218E+00
I-131	-3.898E-01	129.6	5.053E-01	5.057E-01	1.246E+00
Gd-153	-1.318E+00	148.1	1.951E+00	1.953E+00	6.487E+00
Ga-68	2.312E+01	44.3	1.024E+01	1.033E+01	2.124E+01
Tc-99m	-4.064E-01	153.1	6.224E-01	6.229E-01	2.071E+00
BA-133	-3.261E-01	405.6	1.323E+00	1.323E+00	4.431E+00
CS-134	6.187E-01	66.3	4.104E-01	4.117E-01	1.937E+00
CS-137	-7.993E-01	80.1	6.402E-01	6.415E-01	2.132E+00
CE-139	-5.240E-01	66.7	3.496E-01	3.532E-01	1.622E+00
Ba-140	-1.494E-01	1456.7	2.176E+00	2.176E+00	4.230E+00
La-140	6.675E-01	106.4	7.106E-01	7.114E-01	1.444E+00
CE-141	-2.399E-01	431.9	1.036E+00	1.036E+00	3.467E+00

CE-144	2.666E+00	154.9	4.129E+00	4.131E+00	1.376E+01
PM-144	2.137E-01	210.9	4.507E-01	4.508E-01	1.546E+00
EU-152	9.184E-01	67.4	6.191E-01	6.210E-01	3.692E+00
EU-154	1.297E+00	78.1	1.012E+00	1.015E+00	2.515E+00
EU-155	-1.928E+00	145.8	2.812E+00	2.814E+00	9.342E+00
HF-181	1.478E-01	77.9	1.151E-01	1.154E-01	2.216E+00
Ta-182	1.915E+00	90.3	1.729E+00	1.732E+00	8.410E+00
Hg-203	-3.049E-01	143.7	4.382E-01	4.385E-01	1.475E+00
TL-208	3.233E+00	16.4	5.289E-01	5.548E-01	1.004E+00
PM-146	1.232E-01	569.2	7.014E-01	7.015E-01	1.693E+00
Y-88	2.239E-01	144.2	3.229E-01	3.232E-01	1.006E+00
Cd-113m	-4.644E+03	105.8	4.911E+03	4.920E+03	1.648E+04
Cd-109	0.000E+00	1.#INF	1.804E+01	1.804E+01	5.995E+01
Cf-251	-9.579E-01	228.0	2.184E+00	2.186E+00	5.597E+00
Cf-249	4.596E-01	158.1	7.264E-01	7.268E-01	2.375E+00
Sn-126	4.940E+00	106.2	5.248E+00	5.255E+00	1.746E+01
PB-210	5.004E+01	23.9	1.197E+01	1.233E+01	2.847E+01
PB-212	9.512E+00	8.2	7.831E-01	9.959E-01	1.851E+00
PB-214	3.744E+01	3.6	1.335E+00	2.360E+00	1.984E+00
BI-207	-1.088E+00	93.5	1.017E+00	1.019E+00	2.181E+00
BI-212	2.008E+01	30.3	6.088E+00	6.177E+00	1.175E+01
U-235	-3.258E+00	147.5	4.807E+00	4.810E+00	1.600E+01
BI-214	3.621E+01	4.8	1.740E+00	2.563E+00	2.034E+00
BI-210M	5.468E-01	121.0	6.617E-01	6.625E-01	2.223E+00
AC-228	1.082E+01	19.9	2.150E+00	2.220E+00	4.192E+00
TH-227	-7.058E+00	95.9	6.770E+00	6.784E+00	1.644E+01
TH-229	-4.124E+00	220.1	9.076E+00	9.082E+00	2.224E+01
TH-234	-7.205E+00	63.4	4.570E+00	4.587E+00	3.463E+01
PA-231	-1.168E+01	245.7	2.869E+01	2.870E+01	9.578E+01
PA-233	0.000E+00	1.#INF	5.913E-01	5.913E-01	7.758E+00
PA-234	2.476E+00	93.2	2.307E+00	2.310E+00	8.388E+00
PA-234M	1.110E+02	62.0	6.876E+01	6.899E+01	2.065E+02
AM-241	-1.396E+00	124.5	1.738E+00	1.740E+00	5.786E+00
Np-237	0.000E+00	1.#INF	5.548E+00	5.548E+00	1.843E+01
Ir-192	0.000E+00	1.#INF	2.251E-01	2.252E-01	3.241E+00
Cs-136	4.694E-01	93.2	4.373E-01	4.382E-01	1.474E+00
Np-239	-5.372E-01	489.4	2.629E+00	2.629E+00	8.771E+00
Nd-147	1.070E+00	267.8	2.865E+00	2.865E+00	6.998E+00
TL-210	0.000E+00	1.#INF	1.013E-01	1.013E-01	1.757E+00
Kr-85	0.000E+00	1.#INF	2.901E+01	2.901E+01	3.596E+02
Total	5.753E+02				

Analyst: Caleb Quinn

(Page 2 of 22)

Sample description
453329_Gamma_160-36593-A-17-B

Spectrum Filename: C:\User\SPC\Det9\9_Gamma_20193887.An1

Acquisition information
Start time: 12/27/2019 11:37:18 AM
Live time: 1800
Real time: 1802
Dead time: 0.13 %
Detector ID: 9

Detector system
Ge9 S/N09363993

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	12/27/2019 11:37:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	9_2019-12-07_1444.PBC 12/7/2019 2:44:35 PM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 22 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 0.1310

***** 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
46.31	100.	23.56	0.56	2.556E-02	46.54	4.250	5.004E+01	PB210
63.29	32.	104.31	1.01	3.921E-02	63.29	3.810	PBC<MDA	TH234
64.28	34.	106.24	1.02	3.987E-02	64.28	9.700	PBC<MDA	Sn126
74.70	247.	11.21	1.02	4.569E-02				
77.13	454.	6.87	1.03	4.677E-02				
79.42	58.	34.53	1.03	4.771E-02				
87.11	162.	18.73	0.84	5.026E-02	86.49	13.100	1.375E+01	Np237
					86.54	30.700	5.864E+00	EU155
					86.94	9.040	1.987E+01	Sn126
					87.57	37.500	4.773E+00	Sn126
					88.04	3.790	4.711E+01	Cd109
123.10	7.	404.29	1.07	5.296E-02	123.10	40.790	PBC<MDA	EU154
131.29	28.	154.32	1.08	5.216E-02	131.29	18.000	PBC<MDA	PA234
132.36	28.	154.88	1.08	5.189E-02	133.54	11.090	PBC<MDA	CE144
133.02	28.	156.41	1.08	5.195E-02				
136.30	28.	156.83	1.08	5.152E-02	136.30	5.850	PBC<MDA	HF181
					136.47	10.680	2.796E+00	CO57
136.47	28.	159.11	1.08	5.150E-02	136.30	5.850	PBC<MDA	HF181
					136.47	10.680	2.796E+00	CO57
186.19	202.	15.94	0.96	4.396E-02	185.72	54.000	4.728E+00	U235
227.00	20.	136.08	1.17	3.858E-02	227.00	6.300	PBC<MDA	Cf251
235.97	25.	167.52	1.18	3.760E-02	235.97	12.300	PBC<MDA	TH227

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pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
238.48	277.	8.22	1.18	3.734E-02	238.63	43.300	9.528E+00	PB212
241.75	193.	10.55	1.18	3.700E-02	242.00	7.430	3.913E+01	PB214
244.69	7.	635.67	1.18	3.670E-02	244.69	7.580	PBC<MDA	EU152
265.83	17.	121.02	1.20	3.470E-02	265.83	50.000	PBC<MDA	BI210M
277.28	23.	84.11	1.21	3.372E-02	277.28	6.310	PBC<MDA	TL208
294.94	435.	7.21	1.00	3.233E-02	295.09	19.300	3.876E+01	PB214
					296.00	79.000	9.489E+00	TL210
328.76	21.	144.32	1.26	2.999E-02	328.76	20.300	PBC<MDA	La140
333.44	20.	158.06	1.27	2.970E-02	333.44	15.510	PBC<MDA	Cf249
338.13	93.	21.63	0.94	2.941E-02	338.32	12.010	PBC<MDA	AC228
345.83	22.	145.31	1.28	2.896E-02	345.83	15.070	PBC<MDA	HF181
351.70	720.	4.34	1.22	2.862E-02	351.93	37.600	3.721E+01	PB214
383.84	17.	128.67	1.31	2.691E-02	383.84	8.940	PBC<MDA	BA133
391.69	20.	108.14	1.32	2.653E-02	391.69	64.000	PBC<MDA	SN113
427.88	17.	103.89	1.35	2.491E-02	427.88	29.600	PBC<MDA	SB125
453.88	3.	569.19	1.37	2.388E-02	453.88	65.000	PBC<MDA	PM146
487.02	18.	111.13	1.40	2.269E-02	487.02	45.500	PBC<MDA	La140
511.86	85.	17.65	2.67	2.188E-02	511.86	20.000	1.079E+01	RH106
531.00	5.	267.77	1.44	2.130E-02	531.00	13.000	PBC<MDA	Nd147
563.24	7.	226.37	1.47	2.040E-02	563.24	8.350	PBC<MDA	CS134
569.32	15.	66.33	1.47	2.024E-02	569.32	15.380	PBC<MDA	CS134
					569.47	8.200	5.022E+00	PA234
					569.70	97.740	4.215E-01	BI207
569.70	6.	168.34	1.47	2.023E-02	569.32	15.380	1.130E+00	CS134
					569.47	8.200	2.120E+00	PA234
					569.70	97.740	1.779E-01	BI207
583.15	98.	16.36	0.39	1.988E-02	583.02	84.500	3.233E+00	TL208
602.73	16.	238.04	1.50	1.940E-02	602.73	98.260	PBC<MDA	SB124
604.71	16.	240.31	1.50	1.936E-02	604.71	97.620	PBC<MDA	CS134
609.21	578.	4.81	0.95	1.925E-02	609.31	46.090	3.621E+01	BI214
					610.30	5.750	2.906E+02	RU103
621.92	13.	295.11	1.51	1.896E-02	621.92	9.930	PBC<MDA	RH106
635.89	6.	172.72	1.53	1.864E-02	635.89	11.310	PBC<MDA	SB125
696.54	7.	210.88	1.58	1.741E-02	696.54	99.000	PBC<MDA	PM144
702.63	15.	88.01	1.58	1.730E-02	702.63	97.900	PBC<MDA	NB94
724.20	18.	76.30	1.60	1.691E-02	724.20	44.150	PBC<MDA	ZR95
727.12	46.	30.32	1.16	1.686E-02	727.17	7.550	2.008E+01	BI212
766.41	21.	76.77	1.63	1.620E-02	765.79	99.790	PBC<MDA	NB95
					766.41	0.294	2.478E+02	PA234M
785.63	15.	86.48	1.65	1.590E-02	785.42	1.280	PBC<MDA	BI212
801.95	16.	81.75	1.66	1.565E-02	801.95	8.690	PBC<MDA	CS134
810.78	13.	81.95	1.67	1.551E-02	810.78	99.460	PBC<MDA	CO58
815.77	4.	282.82	1.67	1.544E-02	815.77	23.280	PBC<MDA	La140
818.50	13.	93.16	1.67	1.540E-02	818.50	100.000	PBC<MDA	Cs136
834.85	6.	265.75	1.69	1.517E-02	834.85	99.980	PBC<MDA	MN54
862.62	2.	656.69	1.71	1.482E-02	860.56	12.420	PBC<MDA	TL208
889.28	16.	97.50	1.73	1.445E-02	889.28	99.984	PBC<MDA	Sc46
898.04	3.	437.37	1.74	1.434E-02	898.04	93.700	PBC<MDA	Y88

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
911.07	80.	19.88	1.75	1.418E-02	911.07	29.000	1.082E+01	AC228
933.76	67.	17.25	0.50	1.391E-02				
937.49	4.	395.53	1.77	1.387E-02	937.49	34.360	PBC<MDA	AG110M
946.02	12.	104.42	1.77	1.377E-02	946.02	13.400	PBC<MDA	PA234
964.11	18.	67.41	1.79	1.357E-02	964.11	14.605	PBC<MDA	EU152
968.86	3.	417.20	1.79	1.352E-02	968.97	17.460	PBC<MDA	AC228
996.33	14.	78.06	1.81	1.323E-02	996.33	10.600	PBC<MDA	EU154
1001.00	12.	97.29	1.81	1.318E-02	1001.00	0.837	PBC<MDA	PA234M
1050.36	10.	126.56	1.85	1.269E-02	1050.36	1.560	PBC<MDA	RH106
1077.40	15.	44.30	1.87	1.244E-02	1077.40	3.300	2.312E+01	Ga68
1099.25	11.	88.23	1.89	1.224E-02	1099.25	56.500	PBC<MDA	FE59
1120.17	142.	11.66	2.88	1.206E-02	1120.29	15.100	4.333E+01	BI214
					1120.55	99.987	PBC<MDA	Sc46
					1121.30	34.900	1.876E+01	Ta182
1121.21	13.	142.57	1.90	1.205E-02	1120.55	99.987	PBC<MDA	Sc46
					1121.30	34.900	1.747E+00	Ta182
1173.24	12.	102.23	1.94	1.163E-02	1173.24	99.900	PBC<MDA	CO60
1221.41	12.	110.93	1.97	1.126E-02	1221.41	27.000	PBC<MDA	Ta182
1238.28	39.	47.85	1.98	1.114E-02	1238.28	66.070	2.957E+00	Co56
1291.60	9.	97.22	2.02	1.077E-02	1291.60	43.200	PBC<MDA	FE59
1313.00	8.	109.13	2.03	1.063E-02	1313.00	21.000	PBC<MDA	TL210
1332.50	4.	262.10	2.05	1.050E-02	1332.50	99.980	PBC<MDA	CO60
1408.00	13.	81.52	2.10	1.004E-02	1408.00	21.005	PBC<MDA	EU152
1460.66	451.	4.99	1.66	9.750E-03	1460.83	10.670	2.411E+02	K40
1596.21	4.	261.01	2.22	9.069E-03	1596.21	95.400	PBC<MDA	La140
1690.98	2.	384.39	2.27	8.649E-03	1690.98	47.790	PBC<MDA	SB124
1764.07	108.	9.94	0.72	8.352E-03	1764.49	15.400	4.681E+01	BI214
1836.06	5.	144.22	2.35	8.079E-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	
298.41	74.70	259.	247.	5.403E+03	11.21	1.025	-	sD
308.12	77.13	260.	454.	9.712E+03	6.87	1.027	-	sD
317.29	79.43	169.	58.	1.208E+03	34.53	1.030	-	sD
744.38	186.19	183.	149.	3.393E+03	15.22	1.130	-	sD
1351.90	338.13	66.	98.	3.315E+03	20.43	0.938	-	s
3734.67	933.76	11.	67.	4.840E+03	17.25	0.497	-	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	184.89	46.31	131.	99.	0.055	23.92	0.555s
TH-227	200.20	50.14	545.	-30.	-0.017	78.51	1.001s
AM-241	237.77	59.54	828.	-33.	-0.018	124.54	1.010s
TH-234	252.77	63.29	545.	32.	0.018	104.31	1.014s
Sn-126	256.74	64.28	650.	34.	0.019	106.24	1.015
BA-133	323.56	80.99	2051.	-45.	-0.025	52.60	1.031
Np-237	345.55	86.49	2127.	0.	0.000	171.87	1.036A
EU-155	345.76	86.54	1963.	-38.	-0.021	167.43	1.036s
Sn-126	347.35	86.94	1876.	17.	0.010	156.11	1.037D
Sn-126	349.87	87.57	2004.	104.	0.058	24.92	1.037D
Cd-109	351.75	88.04	1914.	0.	0.000	165.09	1.038A
TH-234	369.94	92.59	1439.	-37.	-0.021	63.43	1.042s
AC-228	372.98	93.35	1470.	-38.	-0.021	62.56	1.043
Gd-153	389.58	97.50	1506.	-37.	-0.021	148.10	1.047s
Np-239	397.58	99.50	1543.	-37.	-0.021	149.63	1.049s
Gd-153	412.37	103.20	1581.	-37.	-0.021	150.93	1.052
Np-239	414.37	103.70	1437.	-38.	-0.021	141.26	1.053
EU-155	420.82	105.31	1608.	-39.	-0.022	145.84	1.054s
Np-239	424.09	106.13	1628.	-12.	-0.006	489.37	1.055s
EU-152	486.67	121.78	443.	-34.	-0.019	89.49	1.070s
CO-57	487.80	122.06	477.	-9.	-0.005	352.92	1.070s
EU-154	491.95	123.10	416.	7.	0.004	404.29	1.071s
PA-234	524.72	131.29	890.	28.	0.015	154.32	1.079s
HF-181	531.64	133.02	918.	28.	0.015	156.41	1.081s
CE-144	533.69	133.54	901.	28.	0.015	154.88	1.081s
HF-181	544.74	136.30	928.	28.	0.015	156.83	1.084s
CO-57	545.43	136.47	956.	28.	0.015	159.11	1.084s
Tc-99m	561.57	140.51	1207.	-32.	-0.018	153.14	1.088s
U-235	574.67	143.79	1125.	-32.	-0.018	147.52	1.091s
CE-141	581.29	145.44	1009.	-10.	-0.006	431.86	1.092s
Ba-140	650.15	162.66	503.	-34.	-0.019	69.30	1.108
U-235	653.03	163.38	521.	-17.	-0.010	189.88	1.109
CE-139	662.92	165.85	535.	-36.	-0.020	66.73	1.111
Cf-251	705.90	176.60	260.	-13.	-0.007	228.04	1.122s
U-235	742.37	185.72	300.	22.	0.012	113.68	1.130D
TH-229	773.52	193.51	244.	-14.	-0.008	220.08	1.137s
U-235	820.80	205.33	232.	-23.	-0.013	61.32	1.148
TH-229	842.87	210.85	272.	-9.	-0.005	360.33	1.153s
Cf-251	907.45	227.00	188.	20.	0.011	136.08	1.168s
TH-227	943.33	235.97	856.	25.	0.014	167.52	1.176s
PB-212	953.97	238.63	120.	277.	0.154	8.23	1.179D
PB-214	967.43	242.00	113.	192.	0.107	10.64	1.182D
EU-152	978.21	244.69	911.	7.	0.004	635.67	1.185s
TH-227	1024.39	256.24	232.	-32.	-0.018	95.92	1.195s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Cd-113m	1054.23	263.70	162.	-18.	-0.010	105.75	1.202s
BI-210M	1062.75	265.83	205.	17.	0.009	121.02	1.204s
TL-208	1108.55	277.28	181.	23.	0.013	84.11	1.215
Hg-203	1116.22	279.20	225.	-15.	-0.008	143.71	1.216s
PB-214	1179.77	295.09	77.	425.	0.236	5.66	1.231D
TL-210	1183.41	296.00	1226.	-26.	-0.014	193.84	1.231s
PB-212	1199.52	300.03	1184.	-26.	-0.014	189.88	1.235
PA-231	1199.68	300.07	1158.	-26.	-0.014	187.82	1.235
PA-233	1200.12	300.18	1132.	-26.	-0.014	185.74	1.235
PA-231	1210.00	302.65	1106.	-19.	-0.011	245.66	1.237s
BA-133	1210.81	302.85	1087.	0.	0.000	1000.00	1.238s
Ba-140	1218.80	304.85	1087.	0.	0.000	1000.00	1.240s
BI-210M	1218.99	304.90	1087.	0.	0.000	1000.00	1.240s
Ir-192	1233.16	308.44	1087.	0.	0.000	1000.00	1.243s
PA-233	1247.44	312.01	1087.	0.	0.000	1000.00	1.246s
Ir-192	1265.35	316.49	1087.	0.	0.000	1000.00	1.250s
La-140	1314.43	328.76	470.	21.	0.012	144.32	1.261s
Cf-249	1333.15	333.44	491.	20.	0.011	158.06	1.265s
AC-228	1352.66	338.32	516.	-5.	-0.003	523.15	1.270s
Cs-136	1361.66	340.57	511.	0.	0.000	1000.00	1.272s
EU-152	1376.53	344.29	530.	-23.	-0.013	142.95	1.275s
HF-181	1382.70	345.83	488.	22.	0.012	145.31	1.276s
PB-214	1406.17	351.70	59.	720.	0.400	4.34	1.222
BA-133	1423.37	356.00	873.	-10.	-0.006	405.64	1.285s
I-131	1457.31	364.48	108.	-16.	-0.009	129.60	1.293s
BA-133	1534.73	383.84	226.	17.	0.009	128.67	1.310s
Cf-249	1551.17	387.95	243.	0.	0.000	1000.00	1.314s
SN-113	1566.12	391.69	216.	20.	0.011	108.14	1.317s
SB-125	1710.86	427.88	74.	17.	0.010	103.89	1.349s
AG-108M	1735.10	433.94	78.	-4.	-0.002	453.46	1.354s
PM-146	1814.87	453.88	92.	3.	0.002	569.19	1.372s
Ir-192	1871.59	468.06	83.	-17.	-0.010	110.15	1.384
BE-7	1909.73	477.60	207.	-23.	-0.013	90.06	1.392s
HF-181	1927.34	482.00	230.	-23.	-0.013	94.48	1.396s
La-140	1947.43	487.02	194.	18.	0.010	111.13	1.400s
RU-103	1987.56	497.05	56.	-7.	-0.004	212.16	1.409s
RH-106	2046.81	511.86	70.	85.	0.047	17.65	2.672
Kr-85	2055.27	513.98	155.	0.	0.000	1000.00	1.424s
Nd-147	2123.35	531.00	48.	5.	0.003	267.77	1.438s
CS-134	2252.30	563.24	52.	7.	0.004	226.37	1.466s
CS-134	2276.64	569.32	42.	15.	0.008	66.33	1.471s
PA-234	2277.24	569.47	57.	0.	0.000	1000.00	1.471s
BI-207	2278.16	569.70	54.	6.	0.004	168.34	1.471s
TL-208	2331.97	583.15	35.	98.	0.054	16.36	0.394s
SB-125	2401.36	600.50	820.	-18.	-0.010	225.78	1.497s
SB-124	2410.29	602.73	761.	16.	0.009	238.04	1.499s
CS-134	2418.21	604.71	778.	16.	0.009	240.31	1.500s
BI-214	2436.22	609.21	41.	578.	0.321	4.81	0.951s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
AG-108M	2456.49	614.28	796.	0.	0.000	1000.00	1.508s
PM-144	2471.62	618.06	796.	0.	0.000	1000.00	1.512s
RH-106	2487.04	621.92	718.	13.	0.007	295.11	1.515
SB-125	2542.94	635.89	57.	6.	0.004	172.72	1.526s
I-131	2547.28	636.97	65.	-6.	-0.003	194.37	1.527s
AG-110M	2630.43	657.76	128.	-22.	-0.012	75.19	1.544s
CS-137	2646.03	661.66	147.	-22.	-0.012	80.09	1.548s
PM-144	2785.58	696.54	94.	7.	0.004	210.88	1.576s
NB-94	2809.93	702.63	78.	15.	0.008	88.01	1.581s
SB-124	2890.57	722.79	154.	-20.	-0.011	90.51	1.598s
AG-108M	2891.17	722.94	134.	-20.	-0.011	84.82	1.598s
EU-154	2892.86	723.36	114.	-5.	-0.003	289.99	1.598s
ZR-95	2896.22	724.20	89.	18.	0.010	76.30	1.599s
BI-212	2907.89	727.12	27.	46.	0.026	30.32	1.162s
PM-146	2942.31	735.72	47.	-12.	-0.007	108.33	1.608s
PM-146	2988.08	747.16	56.	-14.	-0.008	93.37	1.617s
ZR-95	3026.36	756.73	45.	-11.	-0.006	137.42	1.625s
AG-110M	3055.23	763.94	174.	-31.	-0.017	63.72	1.631s
PA-234M	3065.10	766.41	122.	21.	0.012	76.77	1.633s
EU-152	3115.14	778.92	45.	-9.	-0.005	167.22	1.643s
BI-212	3141.15	785.42	75.	15.	0.008	86.48	1.648s
CS-134	3182.96	795.87	90.	-9.	-0.005	152.75	1.656s
TL-210	3197.88	799.60	99.	0.	0.000	1000.00	1.659s
CS-134	3207.29	801.95	81.	16.	0.009	81.75	1.661s
CO-58	3242.59	810.78	50.	13.	0.007	81.95	1.668s
La-140	3262.58	815.77	63.	4.	0.002	282.82	1.672s
Cs-136	3273.50	818.50	67.	13.	0.007	93.16	1.674s
MN-54	3338.91	834.85	45.	6.	0.003	265.75	1.687s
Co-56	3386.61	846.77	60.	-12.	-0.007	121.57	1.696s
TL-208	3441.80	860.56	36.	2.	0.001	656.69	1.707
NB-94	3483.94	871.10	51.	-4.	-0.002	279.46	1.715s
EU-154	3492.47	873.23	80.	-21.	-0.011	64.88	1.717s
PA-234	3521.68	880.53	116.	-20.	-0.011	79.73	1.722s
PA-234	3532.53	883.24	135.	-17.	-0.009	101.90	1.724s
AG-110M	3538.30	884.68	152.	0.	0.000	1000.00	1.725s
Sc-46	3556.69	889.28	112.	16.	0.009	97.50	1.729s
Y-88	3591.74	898.04	35.	3.	0.002	437.37	1.736
AC-228	3643.88	911.07	37.	80.	0.044	19.88	1.746
AG-110M	3749.60	937.49	103.	4.	0.002	395.53	1.766s
PA-234	3783.72	946.02	30.	12.	0.007	104.42	1.772s
EU-152	3856.11	964.11	61.	18.	0.010	67.41	1.786s
AC-228	3875.56	968.97	96.	3.	0.002	417.20	1.790s
EU-154	3985.03	996.33	53.	14.	0.008	78.06	1.810s
PA-234M	4003.71	1001.00	68.	12.	0.007	97.29	1.814s
EU-154	4018.82	1004.77	93.	-12.	-0.006	120.31	1.816
Co-56	4151.13	1037.84	48.	-6.	-0.003	265.62	1.841s
Cs-136	4192.07	1048.07	53.	-15.	-0.009	72.03	1.848s
RH-106	4201.23	1050.36	70.	10.	0.005	126.56	1.850s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-207	4254.46	1063.66	53.	-18.	-0.010	93.51	1.860s
Ga-68	4309.44	1077.40	5.	15.	0.008	44.30	1.870s
FE-59	4396.88	1099.25	16.	11.	0.006	88.23	1.886s
EU-152	4448.20	1112.07	228.	-17.	-0.010	124.75	1.895s
ZN-65	4462.09	1115.55	210.	-2.	-0.001	858.02	1.897s
BI-214	4480.60	1120.17	21.	142.	0.079	11.66	2.877s
Sc-46	4482.12	1120.55	208.	0.	0.000	1000.00	1.901s
Ta-182	4485.12	1121.30	171.	13.	0.007	142.57	1.901
CO-60	4692.96	1173.24	27.	12.	0.007	102.23	1.938s
Ta-182	4756.25	1189.05	51.	-11.	-0.006	155.21	1.949
Ta-182	4885.75	1221.41	28.	12.	0.006	110.93	1.972
Co-56	4953.27	1238.28	57.	39.	0.022	47.85	1.984s
NA-22	5098.35	1274.53	51.	-21.	-0.012	52.91	2.008s
EU-154	5098.39	1274.54	72.	-3.	-0.002	398.53	2.008s
FE-59	5166.65	1291.60	11.	9.	0.005	97.22	2.020s
TL-210	5252.32	1313.00	11.	8.	0.004	109.13	2.034s
CO-60	5330.37	1332.50	23.	4.	0.002	262.10	2.047s
AG-110M	5537.69	1384.30	34.	-11.	-0.006	127.92	2.082s
EU-152	5632.56	1408.00	17.	13.	0.007	81.52	2.097s
K-40	5843.35	1460.66	14.	451.	0.251	4.99	1.663
La-140	6385.95	1596.21	18.	4.	0.002	261.01	2.215s
SB-124	6765.35	1690.98	13.	2.	0.001	384.39	2.272s
BI-214	7057.96	1764.07	4.	108.	0.060	9.94	0.722s
Co-56	7087.11	1771.35	112.	0.	0.000	1000.00	2.318s
Y-88	7346.20	1836.06	6.	5.	0.003	144.22	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	-5.3274E+00				5.31E+01	
			477.60	-5.327E+00	&(	1.601E+01 9.01E+01 1.05E+01	G
NA-22	C	-1.0705E+00				9.50E+02	
			1274.53	-1.070E+00	?(	1.838E+00 5.29E+01 9.99E+01	G
K-40	N	2.4106E+02				4.66E+11	
			1460.83	2.411E+02	(P	1.064E+01 4.99E+00 1.07E+01	G
Sc-46	F	6.1175E-01				8.38E+01	
			889.28	6.117E-01	?(	2.003E+00 9.75E+01 1.00E+02	G
			1120.55	0.000E+00	-	3.222E+00 1.00E+03 1.00E+02	G

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Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CR-51	F	-2.3545E-01					2.77E+01	
			320.08	-2.354E-01	%(P	2.862E+01	1.88E+03	9.94E+00 G
MN-54	C	2.0630E-01					3.12E+02	
			834.85	2.063E-01	@(P	1.249E+00	2.66E+02	1.00E+02 G
FE-59	F	9.4989E-01					4.45E+01	
			1099.25	8.848E-01	&(P	1.731E+00	8.82E+01	5.65E+01 G
			1291.60	1.035E+00	?(	2.197E+00	9.72E+01	4.32E+01 G
Co-56	C	9.0161E-01					7.73E+01	
			846.77	-4.572E-01	?(P	1.441E+00	1.22E+02	9.99E+01 G
			1238.28	2.957E+00	?(P	2.857E+00	4.79E+01	6.61E+01 G
			1037.84	-1.841E+00	+	1.074E+01	2.66E+02	1.41E+01 G
			1771.35	0.000E+00	-	2.243E+01	1.00E+03	1.55E+01 A
CO-57	C	2.1450E-01					2.72E+02	
			122.06	-1.075E-01	?(	1.278E+00	3.53E+02	8.56E+01 G
			136.47	2.796E+00	&(	1.483E+01	1.59E+02	1.07E+01 G
CO-58	C	4.6692E-01					7.09E+01	
			810.78	4.669E-01	?(	1.284E+00	8.20E+01	9.95E+01 G
CO-60	F	4.0157E-01					1.93E+03	
			1332.50	2.293E-01	?(	1.317E+00	2.62E+02	1.00E+02 G
			1173.24	5.740E-01	?(P	1.288E+00	1.02E+02	9.99E+01 G
ZN-65	F	-2.1752E-01					2.44E+02	
			1115.55	-2.175E-01	&(	6.378E+00	8.58E+02	5.06E+01 G
NB-94	I	4.8661E-01					7.41E+06	
			702.63	4.866E-01	(P	1.437E+00	8.80E+01	9.79E+01 G
			871.10	-1.389E-01	-	1.359E+00	2.79E+02	9.99E+01 G
ZR-95	I	2.3193E-01					6.40E+01	
			756.73	-6.862E-01	?(	2.119E+00	1.37E+02	5.45E+01 G
			724.20	1.364E+00	?(	3.467E+00	7.63E+01	4.42E+01 G
NB-95	I	5.2712E-02					6.40E+01	
			765.79	5.271E-02	%(	2.140E+00	1.18E+03	9.98E+01 G
RU-103	I	-2.0048E-01					3.93E+01	
			497.05	-2.005E-01	?(	1.030E+00	2.12E+02	9.09E+01 G
			610.30	9.479E-01	%	6.736E+01	2.11E+03	5.75E+00 GA

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
RH-106	I	6.9738E+00					3.74E+02	
			621.92	3.808E+00	(	3.766E+01	2.95E+02	9.93E+00 G
			1050.36	2.713E+01	?(	1.170E+02	1.27E+02	1.56E+00 G
			511.86	1.079E+01	&	5.293E+00	1.76E+01	2.00E+01 GA
AG-108M	C	-9.9599E-02					1.53E+05	
			433.94	-9.960E-02	?(	1.092E+00	4.53E+02	9.05E+01 G
			722.94	-7.236E-01	+	2.049E+00	8.48E+01	9.08E+01 G
			614.28	0.000E+00	+	4.337E+00	1.00E+03	8.98E+01 G
AG-110M	F	1.3721E-01					2.50E+02	
			884.68	0.000E+00	?(	3.170E+00	1.00E+03	7.27E+01 G
			657.76	-7.150E-01	&	1.787E+00	7.52E+01	9.46E+01 G
			937.49	4.274E-01	?(	5.838E+00	3.96E+02	3.44E+01 G
			1384.30	-2.471E+00	+	6.712E+00	1.28E+02	2.43E+01 G
			763.94	-4.689E+00	+	9.857E+00	6.37E+01	2.23E+01 G
SN-113	F	6.4358E-01					1.15E+02	
			391.69	6.436E-01	&(	2.332E+00	1.08E+02	6.40E+01 G
SB-124	F	4.2568E-01					6.02E+01	
			602.73	4.802E-01	&(	3.825E+00	2.38E+02	9.83E+01 G
			1690.98	3.136E-01	?(	2.593E+00	3.84E+02	4.78E+01 G
			722.79	-6.079E+00	+	1.839E+01	9.05E+01	1.08E+01 G
SB-125	I	1.4063E+00					1.01E+03	
			427.88	1.306E+00	?(	3.218E+00	1.04E+02	2.96E+01 G
			600.50	-2.882E+00	&	2.176E+01	2.26E+02	1.79E+01 G
			635.89	1.669E+00	?(	9.956E+00	1.73E+02	1.13E+01 G
			463.37	-2.256E-01	&	1.287E+01	1.65E+03	1.05E+01 G
I-131	I	-3.8985E-01					8.02E+00	
			364.48	-3.898E-01	?(	1.246E+00	1.30E+02	8.17E+01 G
			284.30	2.729E-01	%	1.535E+01	2.25E+03	6.14E+00 G
			636.97	-2.497E+00	+	1.676E+01	1.94E+02	7.17E+00 G
Gd-153	F	-1.3176E+00					2.42E+02	
			97.50	-1.318E+00	?(	6.487E+00	1.48E+02	3.00E+01 G
			103.20	-1.801E+00	+	9.033E+00	1.51E+02	2.18E+01 G
Ga-68	C	2.3124E+01					4.71E-02	
			1077.40	2.312E+01	?(	2.124E+01	4.43E+01	3.30E+00 G
Tc-99m	I	-4.0644E-01					2.51E-01	
			140.51	-4.064E-01	&(	2.071E+00	1.53E+02	8.93E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
BA-133	F	-3.2607E-01					3.85E+03	
			356.00	-3.261E-01	&(	4.431E+00	4.06E+02	6.20E+01 G
			302.85	0.000E+00	&	1.493E+01	1.00E+03	1.83E+01 G
			383.84	3.887E+00	&	1.681E+01	1.29E+02	8.94E+00 GA
			80.99	-1.519E+00	+ P	7.218E+00	5.26E+01	3.41E+01 GA
CS-134	I	6.1871E-01					7.54E+02	
			795.87	-3.715E-01	?(	1.937E+00	1.53E+02	8.55E+01 G
			604.71	4.850E-01	?(	3.900E+00	2.40E+02	9.76E+01 G
			569.32	2.677E+00	?(	5.873E+00	6.63E+01	1.54E+01 G
			801.95	6.675E+00	&(	1.824E+01	8.18E+01	8.69E+00 G
			563.24	2.230E+00	?(P	1.186E+01	2.26E+02	8.35E+00 G
CS-137	I	-7.9931E-01					1.10E+04	
			661.66	-7.993E-01	?(	2.132E+00	8.01E+01	8.52E+01 G
CE-139	F	-5.2397E-01					1.38E+02	
			165.85	-5.240E-01	?(P	1.622E+00	6.67E+01	7.99E+01 G
Ba-140	I	-1.4940E-01					1.28E+01	
			537.26	-1.494E-01	%(P	4.230E+00	1.46E+03	2.44E+01 G
			162.66	-6.536E+00	& P	2.043E+01	6.93E+01	6.22E+00 G
			304.85	0.000E+00	+	6.407E+01	1.00E+03	4.29E+00 G
La-140	I	6.6754E-01					1.28E+01	
			1596.21	2.569E-01	?(	1.444E+00	2.61E+02	9.54E+01 G
			487.02	9.751E-01	&(P	3.635E+00	1.11E+02	4.55E+01 G
			328.76	1.959E+00	(	9.460E+00	1.44E+02	2.03E+01 G
			815.77	6.229E-01	?(	6.134E+00	2.83E+02	2.33E+01 G
CE-141	I	-2.3990E-01					3.25E+01	
			145.44	-2.399E-01	&(	3.467E+00	4.32E+02	4.82E+01 G
CE-144	I	2.6657E+00					2.85E+02	
			133.54	2.666E+00	&(	1.376E+01	1.55E+02	1.11E+01 G
PM-144	C	2.1370E-01					3.63E+02	
			696.54	2.137E-01	?(P	1.546E+00	2.11E+02	9.90E+01 G
			618.06	0.000E+00	-	3.950E+00	1.00E+03	9.91E+01 G
EU-152	F	9.1840E-01					4.94E+03	
			121.78	-1.241E+00	?(	3.692E+00	8.95E+01	2.86E+01 G
			344.29	-1.662E+00	+	7.943E+00	1.43E+02	2.65E+01 G
			1112.07	-5.852E+00	+	2.452E+01	1.25E+02	1.36E+01 G
			778.92	-2.415E+00	&	9.117E+00	1.67E+02	1.29E+01 G
			964.11	4.924E+00	?(	1.099E+01	6.74E+01	1.46E+01 G
			244.69	1.344E+00	?(	2.864E+01	6.36E+02	7.58E+00 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
			1408.00	3.328E+00	?	5.773E+00	8.15E+01	2.10E+01 GA
EU-154	I	1.2968E+00					3.14E+03	
			123.10	1.843E-01	?(	2.515E+00	4.04E+02	4.08E+01 G
			1274.54	-4.412E-01	+	6.127E+00	3.99E+02	3.52E+01 G
			723.36	-8.561E-01	+	8.528E+00	2.90E+02	2.02E+01 G
			873.23	-6.389E+00	+	1.369E+01	6.49E+01	1.23E+01 G
			1004.77	-2.739E+00	+	1.117E+01	1.20E+02	1.80E+01 G
			996.33	5.578E+00	?(	1.456E+01	7.81E+01	1.06E+01 G
EU-155	I	-1.9278E+00					1.81E+03	
			105.31	-1.928E+00	(	9.342E+00	1.46E+02	2.12E+01 G
			86.54	-1.358E+00	+	7.556E+00	1.67E+02	3.07E+01 G
HF-181	F	1.4775E-01					4.24E+01	
			482.00	-7.027E-01	?(	2.216E+00	9.45E+01	8.05E+01 G
			133.02	6.816E-01	+	3.554E+00	1.56E+02	4.33E+01 G
			345.83	2.768E+00	?(	1.345E+01	1.45E+02	1.51E+01 G
			136.30	5.102E+00	?(	2.667E+01	1.57E+02	5.85E+00 G
Ta-182	F	1.9148E+00					1.14E+02	
			1121.30	1.747E+00	(	8.410E+00	1.43E+02	3.49E+01 G
			1221.41	2.132E+00	(	5.028E+00	1.11E+02	2.70E+01 G
			1189.05	-3.279E+00	+	1.073E+01	1.55E+02	1.62E+01 G
Hg-203	F	-3.0490E-01					4.66E+01	
			279.20	-3.049E-01	&(	1.475E+00	1.44E+02	8.15E+01 G
TL-208	N	3.2329E+00					6.98E+02	
			583.02	3.233E+00	(P	1.004E+00	1.64E+01	8.45E+01 G
			277.28	6.095E+00	+ P	1.708E+01	8.41E+01	6.31E+00 G
			860.56	6.051E-01	& P	9.256E+00	6.57E+02	1.24E+01 G
PM-146	C	1.2323E-01					2.02E+03	
			453.88	1.232E-01	?(P	1.693E+00	5.69E+02	6.50E+01 G
			747.16	-1.389E+00	+ P	3.720E+00	9.34E+01	3.40E+01 G
			735.72	-1.787E+00	+ P	5.126E+00	1.08E+02	2.25E+01 G
Y-88	F	2.2392E-01					1.07E+02	
			1836.06	3.183E-01	?(P	1.006E+00	1.44E+02	9.92E+01 G
			898.04	1.240E-01	?(	1.252E+00	4.37E+02	9.37E+01 G
Cd-113m		-4.6439E+03					5.33E+03	
			263.70	-4.644E+03	?(	1.648E+04	1.06E+02	6.00E-03 K
Cf-251	T	-9.5793E-01					3.28E+05	
			176.60	-9.579E-01	&(	5.597E+00	2.28E+02	1.70E+01 G
			227.00	4.571E+00	?	1.522E+01	1.36E+02	6.30E+00 GA

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Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Cf-249	T	4.5957E-01					1.28E+05	
			387.95	0.000E+00	?(	2.375E+00	1.00E+03	6.60E+01 G
			333.44	2.415E+00	?(	1.278E+01	1.58E+02	1.55E+01 G
Sn-126		4.9398E+00					3.65E+07	
			87.57	3.072E+00	}	6.214E+00	2.49E+01	3.75E+01 GA
			64.28	4.940E+00	(	1.746E+01	1.06E+02	9.70E+00 G
			86.94	2.111E+00	}	2.504E+01	1.56E+02	9.04E+00 GA
PB-210	N	5.0036E+01					8.14E+03	
			46.54	5.004E+01	@(P	2.847E+01	2.39E+01	4.25E+00 G
PB-212	N	9.5117E+00					6.98E+02	
			238.63	9.512E+00	(P	1.851E+00	8.23E+00	4.33E+01 G
			300.03	-1.366E+01	&	8.642E+01	1.90E+02	3.28E+00 GA
PB-214	N	3.7439E+01					5.84E+05	
			351.93	3.721E+01	(P	1.984E+00	4.34E+00	3.76E+01 G
			295.09	3.789E+01	(P	3.882E+00	5.66E+00	1.93E+01 G
			242.00	3.885E+01		1.056E+01	1.06E+01	7.43E+00 GA
BI-207	C	-1.0880E+00					1.18E+04	
			1063.66	-1.088E+00	?(	2.181E+00	9.35E+01	7.45E+01 G
			569.70	1.779E-01	+	1.035E+00	1.68E+02	9.77E+01 G
BI-212	N	2.0081E+01					6.98E+02	
			727.17	2.008E+01	(	1.175E+01	3.03E+01	7.55E+00 G
			785.42	4.047E+01	? P	1.173E+02	8.65E+01	1.28E+00 GA
U-235	N	-3.2583E+00					2.57E+11	
			143.79	-3.258E+00	?(	1.600E+01	1.48E+02	1.10E+01 G
			205.33	-6.254E+00	+ P	1.983E+01	6.13E+01	5.01E+00 G
			163.38	-4.008E+00	+	2.551E+01	1.90E+02	5.08E+00 G
			185.72	5.122E-01	+	1.948E+00	1.14E+02	5.40E+01 GA
BI-214	N	3.6209E+01					5.84E+05	
			609.31	3.621E+01	(P	2.034E+00	4.81E+00	4.61E+01 G
			1120.29	4.333E+01	+ P	7.333E+00	1.17E+01	1.51E+01 G
			1764.49	4.681E+01	+ P	5.021E+00	9.94E+00	1.54E+01 G
BI-210M	T	5.4678E-01					1.10E+09	
			265.83	5.468E-01	&(P	2.223E+00	1.21E+02	5.00E+01 G
			304.90	0.000E+00	-	9.817E+00	1.00E+03	2.80E+01 G
AC-228	N	1.0815E+01					2.10E+03	
			911.07	1.082E+01	(P	4.192E+00	1.99E+01	2.90E+01 G
			968.97	7.875E-01	- P	1.137E+01	4.17E+02	1.75E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
			338.32	-7.342E-01	- P	1.707E+01	5.23E+02	1.20E+01 G
			93.35	-7.327E+00	- P	3.504E+01	6.26E+01	5.56E+00 XA
TH-227	N	-7.0578E+00					7.95E+03	
			256.24	-7.058E+00	?(	1.644E+01	9.59E+01	7.00E+00 G
			235.97	2.988E+00	+	1.670E+01	1.68E+02	1.23E+01 G
			50.14	-7.208E+00	& P	2.669E+01	7.85E+01	8.00E+00 G
TH-229	N	-4.1238E+00					2.68E+06	
			193.51	-4.124E+00	&(	2.224E+01	2.20E+02	4.40E+00 G
			210.85	-4.127E+00	+	3.649E+01	3.60E+02	2.99E+00 G
TH-234	N	-7.2046E+00					1.63E+12	
			92.59	-7.205E+00	&(P	3.463E+01	6.34E+01	5.58E+00 G
			63.29	1.194E+01	+	4.146E+01	1.04E+02	3.81E+00 G
PA-231	N	-1.1680E+01					1.20E+07	
			302.65	-1.168E+01	?(	9.578E+01	2.46E+02	2.88E+00 G
			300.07	-1.821E+01	&	1.140E+02	1.88E+02	2.46E+00 G
PA-234	N	2.4762E+00					1.63E+12	
			131.29	1.631E+00	?(	8.388E+00	1.54E+02	1.80E+01 G
			946.02	3.612E+00	?(	8.499E+00	1.04E+02	1.34E+01 G
			569.47	0.000E+00	-	1.269E+01	1.00E+03	8.20E+00 G
			883.24	-6.627E+00	+	2.268E+01	1.02E+02	9.60E+00 G
			880.53	-1.263E+01	+	3.357E+01	7.97E+01	6.00E+00 GA
PA-234M	N	1.1097E+02					1.63E+12	
			1001.00	6.290E+01	?(P	2.065E+02	9.73E+01	8.37E-01 G
			766.41	2.478E+02	?(	6.330E+02	7.68E+01	2.94E-01 G
AM-241	T	-1.3958E+00					1.58E+05	
			59.54	-1.396E+00	&(	5.786E+00	1.25E+02	3.59E+01 G
Cs-136	F	4.6945E-01					1.30E+01	
			818.50	4.694E-01	?(	1.474E+00	9.32E+01	1.00E+02 G
			1048.07	-8.376E-01	+	2.007E+00	7.20E+01	8.00E+01 G
			340.57	0.000E+00	-	4.373E+00	1.00E+03	4.69E+01 G
Np-239	T	-5.3718E-01					2.36E+00	
			103.70	-1.666E+00	&	7.822E+00	1.41E+02	2.40E+01 X
			106.13	-5.372E-01	&(	8.771E+00	4.89E+02	2.27E+01 G
			99.50	-2.627E+00	+	1.307E+01	1.50E+02	1.50E+01 X
Nd-147		1.0699E+00					1.11E+01	
			531.00	1.070E+00	?(	6.998E+00	2.68E+02	1.30E+01 G
			91.10	1.286E-01	%	8.020E+00	1.87E+03	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.
@ - 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	545.	-30.	-0.017	78.51	-7.208E+00	P
AM-241	59.54	828.	-33.	-0.018	124.54	-1.396E+00	
TH-234	63.29	545.	32.	0.018	104.31	1.194E+01	
BA-133	80.99	2051.	-45.	-0.025	52.60	-1.519E+00	P
EU-155	86.54	1963.	-38.	-0.021	167.43	-1.358E+00	
TH-234	92.59	1439.	-37.	-0.021	63.43	-7.205E+00	P
Gd-153	97.50	1506.	-37.	-0.021	148.10	-1.318E+00	
Np-239	99.50	1543.	-37.	-0.021	149.63	-2.627E+00	
Gd-153	103.20	1581.	-37.	-0.021	150.93	-1.801E+00	
Np-239	103.70	1437.	-38.	-0.021	141.26	-1.666E+00	
EU-155	105.31	1608.	-39.	-0.022	145.84	-1.928E+00	
Np-239	106.13	1628.	-12.	-0.006	489.37	-5.372E-01	
EU-152	121.78	443.	-34.	-0.019	89.49	-1.241E+00	
CO-57	122.06	477.	-9.	-0.005	352.92	-1.075E-01	
EU-154	123.10	416.	7.	0.004	404.29	1.843E-01	
PA-234	131.29	890.	28.	0.015	154.32	1.631E+00	
HF-181	133.02	918.	28.	0.015	156.41	6.816E-01	
HF-181	136.30	928.	28.	0.015	156.83	5.102E+00	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
CO-57	136.47	956.	28.	0.015	159.11	2.796E+00		
Tc-99m	140.51	1207.	-32.	-0.018	153.14	-4.064E-01		
CE-141	145.44	1009.	-10.	-0.006	431.86	-2.399E-01		
Ba-140	162.66	503.	-34.	-0.019	69.30	-6.536E+00		P
CE-139	165.85	535.	-36.	-0.020	66.73	-5.240E-01		P
Cf-251	176.60	260.	-13.	-0.007	228.04	-9.579E-01		
TH-229	193.51	244.	-14.	-0.008	220.08	-4.124E+00		
TH-229	210.85	272.	-9.	-0.005	360.33	-4.127E+00		
Cf-251	227.00	188.	20.	0.011	136.08	4.571E+00		
TH-227	235.97	856.	25.	0.014	167.52	2.988E+00		
EU-152	244.69	911.	7.	0.004	635.67	1.344E+00		
TH-227	256.24	232.	-32.	-0.018	95.92	-7.058E+00		
Cd-113m	263.70	162.	-18.	-0.010	105.75	-4.644E+03		
BI-210M	265.83	205.	17.	0.009	121.02	5.468E-01		P
Hg-203	279.20	225.	-15.	-0.008	143.71	-3.049E-01		
TL-210	296.00	1226.	-26.	-0.014	193.84	-5.600E-01		
PA-231	300.07	1158.	-26.	-0.014	187.82	-1.821E+01		
PA-233	300.18	1132.	-26.	-0.014	185.74	-7.227E+00		
PA-231	302.65	1106.	-19.	-0.011	245.66	-1.168E+01		
La-140	328.76	470.	21.	0.012	144.32	1.959E+00		
Cf-249	333.44	491.	20.	0.011	158.06	2.415E+00		
EU-152	344.29	530.	-23.	-0.013	142.95	-1.662E+00		
HF-181	345.83	488.	22.	0.012	145.31	2.768E+00		
BA-133	356.00	873.	-10.	-0.006	405.64	-3.261E-01		
I-131	364.48	108.	-16.	-0.009	129.60	-3.898E-01		
BA-133	383.84	226.	17.	0.009	128.67	3.887E+00		
SN-113	391.69	216.	20.	0.011	108.14	6.436E-01		
SB-125	427.88	74.	17.	0.010	103.89	1.306E+00		
AG-108M	433.94	78.	-4.	-0.002	453.46	-9.960E-02		
PM-146	453.88	92.	3.	0.002	569.19	1.232E-01		P
Ir-192	468.06	83.	-17.	-0.010	110.15	-7.968E-01		
BE-7	477.60	207.	-23.	-0.013	90.06	-5.327E+00		
HF-181	482.00	230.	-23.	-0.013	94.48	-7.027E-01		
La-140	487.02	194.	18.	0.010	111.13	9.751E-01		P
RU-103	497.05	56.	-7.	-0.004	212.16	-2.005E-01		
RH-106	511.86	70.	85.	0.047	17.65	1.079E+01		
Nd-147	531.00	48.	5.	0.003	267.77	1.070E+00		
CS-134	563.24	52.	7.	0.004	226.37	2.230E+00		P
CS-134	569.32	42.	15.	0.008	66.33	2.677E+00		
BI-207	569.70	54.	6.	0.004	168.34	1.779E-01		
SB-125	600.50	820.	-18.	-0.010	225.78	-2.882E+00		
SB-124	602.73	761.	16.	0.009	238.04	4.802E-01		
CS-134	604.71	778.	16.	0.009	240.31	4.850E-01		
RH-106	621.92	718.	13.	0.007	295.11	3.808E+00		
SB-125	635.89	57.	6.	0.004	172.72	1.669E+00		
I-131	636.97	65.	-6.	-0.003	194.37	-2.497E+00		
AG-110M	657.76	128.	-22.	-0.012	75.19	-7.150E-01		
CS-137	661.66	147.	-22.	-0.012	80.09	-7.993E-01		

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
PM-144	696.54	94.	7.	0.004	210.88	2.137E-01	P
NB-94	702.63	78.	15.	0.008	88.01	4.866E-01	P
SB-124	722.79	154.	-20.	-0.011	90.51	-6.079E+00	
AG-108M	722.94	134.	-20.	-0.011	84.82	-7.236E-01	
EU-154	723.36	114.	-5.	-0.003	289.99	-8.561E-01	
ZR-95	724.20	89.	18.	0.010	76.30	1.364E+00	
PM-146	735.72	47.	-12.	-0.007	108.33	-1.787E+00	P
PM-146	747.16	56.	-14.	-0.008	93.37	-1.389E+00	P
ZR-95	756.73	45.	-11.	-0.006	137.42	-6.862E-01	
AG-110M	763.94	174.	-31.	-0.017	63.72	-4.689E+00	
PA-234M	766.41	122.	21.	0.012	76.77	2.478E+02	
EU-152	778.92	45.	-9.	-0.005	167.22	-2.415E+00	
CS-134	795.87	90.	-9.	-0.005	152.75	-3.715E-01	
CS-134	801.95	81.	16.	0.009	81.75	6.675E+00	
CO-58	810.78	50.	13.	0.007	81.95	4.669E-01	
La-140	815.77	63.	4.	0.002	282.82	6.229E-01	
Cs-136	818.50	67.	13.	0.007	93.16	4.694E-01	
MN-54	834.85	45.	6.	0.003	265.75	2.063E-01	P
Co-56	846.77	60.	-12.	-0.007	121.57	-4.572E-01	P
NB-94	871.10	51.	-4.	-0.002	279.46	-1.389E-01	
EU-154	873.23	80.	-21.	-0.011	64.88	-6.389E+00	
PA-234	880.53	116.	-20.	-0.011	79.73	-1.263E+01	
PA-234	883.24	135.	-17.	-0.009	101.90	-6.627E+00	
Sc-46	889.28	112.	16.	0.009	97.50	6.117E-01	
Y-88	898.04	35.	3.	0.002	437.37	1.240E-01	
AG-110M	937.49	103.	4.	0.002	395.53	4.274E-01	
PA-234	946.02	30.	12.	0.007	104.42	3.612E+00	
EU-152	964.11	61.	18.	0.010	67.41	4.924E+00	
EU-154	996.33	53.	14.	0.008	78.06	5.578E+00	
PA-234M	1001.00	68.	12.	0.007	97.29	6.290E+01	P
EU-154	1004.77	93.	-12.	-0.006	120.31	-2.739E+00	
Co-56	1037.84	48.	-6.	-0.003	265.62	-1.841E+00	
Cs-136	1048.07	53.	-15.	-0.009	72.03	-8.376E-01	
RH-106	1050.36	70.	10.	0.005	126.56	2.713E+01	
BI-207	1063.66	53.	-18.	-0.010	93.51	-1.088E+00	
FE-59	1099.25	16.	11.	0.006	88.23	8.848E-01	P
EU-152	1112.07	228.	-17.	-0.010	124.75	-5.852E+00	
ZN-65	1115.55	210.	-2.	-0.001	858.02	-2.175E-01	
Ta-182	1121.30	171.	13.	0.007	142.57	1.747E+00	
CO-60	1173.24	27.	12.	0.007	102.23	5.740E-01	P
Ta-182	1189.05	51.	-11.	-0.006	155.21	-3.279E+00	
Ta-182	1221.41	28.	12.	0.006	110.93	2.132E+00	
Co-56	1238.28	57.	39.	0.022	47.85	2.957E+00	P
NA-22	1274.53	51.	-21.	-0.012	52.91	-1.070E+00	
EU-154	1274.54	72.	-3.	-0.002	398.53	-4.412E-01	
FE-59	1291.60	11.	9.	0.005	97.22	1.035E+00	
TL-210	1313.00	11.	8.	0.004	109.13	1.909E+00	
CO-60	1332.50	23.	4.	0.002	262.10	2.293E-01	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
AG-110M	1384.30	34.	-11.	-0.006	127.92	-2.471E+00		
EU-152	1408.00	17.	13.	0.007	81.52	3.328E+00		
La-140	1596.21	18.	4.	0.002	261.01	2.569E-01		
SB-124	1690.98	13.	2.	0.001	384.39	3.136E-01		
Y-88	1836.06	6.	5.	0.003	144.22	3.183E-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 *****

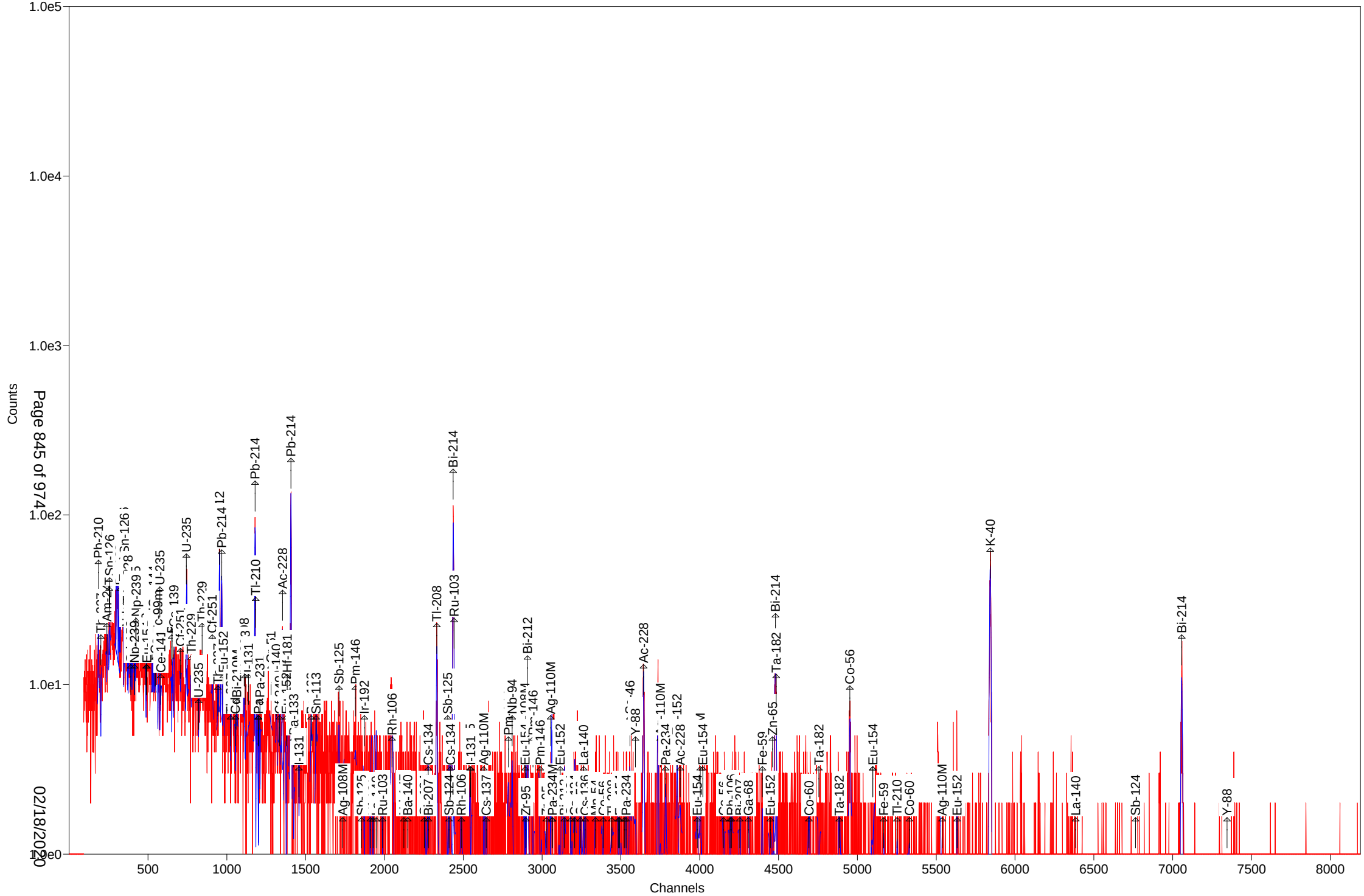
Nuclide		Time of Count Activity Bq/Sample	Time Corrected Activity Bq/Sample	Uncertainty Counting	1 Sigma MDA Bq/Sample
BE-7	#A	-5.3274E+00	-5.3274E+00	9.006E+01%	1.60E+01
NA-22	#A	-1.0705E+00	-1.0705E+00	5.291E+01%	1.84E+00
K-40		2.4106E+02	2.4106E+02	4.990E+00%	1.06E+01
Sc-46	#A	6.1175E-01	6.1175E-01	9.750E+01%	2.00E+00
CR-51	#A	-2.3545E-01	-2.3545E-01	1.876E+03%	2.86E+01
MN-54	#A	2.0630E-01	2.0630E-01	2.658E+02%	1.25E+00
FE-59	#A	9.4989E-01	9.4989E-01	6.564E+01%	1.73E+00
Co-56	#A	9.0161E-01	9.0161E-01	4.785E+01%	1.44E+00
CO-57	#A	2.1450E-01	2.1450E-01	1.591E+02%	1.28E+00
CO-58	#A	4.6692E-01	4.6692E-01	8.195E+01%	1.28E+00
CO-60	#A	4.0157E-01	4.0157E-01	1.022E+02%	1.32E+00
ZN-65	#A	-2.1752E-01	-2.1752E-01	8.580E+02%	6.38E+00
NB-94	#A	4.8661E-01	4.8661E-01	8.801E+01%	1.44E+00
ZR-95	#A	2.3193E-01	2.3193E-01	7.630E+01%	2.12E+00
NB-95	#A	5.2712E-02	5.2712E-02	1.181E+03%	2.14E+00
RU-103	#A	-2.0048E-01	-2.0048E-01	2.122E+02%	1.03E+00
RH-106	#A	6.9738E+00	6.9738E+00	1.266E+02%	3.77E+01
AG-108M	#A	-9.9599E-02	-9.9599E-02	4.535E+02%	1.09E+00
AG-110M	#A	1.3721E-01	1.3721E-01	3.955E+02%	3.17E+00
SN-113	#A	6.4358E-01	6.4358E-01	1.081E+02%	2.33E+00
SB-124	#A	4.2568E-01	4.2568E-01	2.261E+02%	3.83E+00
SB-125	#A	1.4063E+00	1.4063E+00	1.008E+02%	3.22E+00
I-131	#A	-3.8984E-01	-3.8985E-01	1.296E+02%	1.25E+00
Gd-153	#A	-1.3176E+00	-1.3176E+00	1.481E+02%	6.49E+00
Ga-68	#	2.3054E+01	2.3124E+01	4.430E+01%	2.12E+01
Tc-99m	#A	-4.0620E-01	-4.0644E-01	1.531E+02%	2.07E+00
BA-133	#A	-3.2607E-01	-3.2607E-01	4.056E+02%	4.43E+00
CS-134	#A	6.1871E-01	6.1871E-01	6.633E+01%	1.94E+00
CS-137	#A	-7.9931E-01	-7.9931E-01	8.009E+01%	2.13E+00
CE-139	#A	-5.2397E-01	-5.2397E-01	6.673E+01%	1.62E+00
Ba-140	#A	-1.4940E-01	-1.4940E-01	1.457E+03%	4.23E+00
La-140	#A	6.6753E-01	6.6754E-01	1.064E+02%	1.44E+00
CE-141	#A	-2.3990E-01	-2.3990E-01	4.319E+02%	3.47E+00
CE-144	#A	2.6657E+00	2.6657E+00	1.549E+02%	1.38E+01
PM-144	#A	2.1370E-01	2.1370E-01	2.109E+02%	1.55E+00

EU-152 #A	9.1840E-01	9.1840E-01	6.741E+01%	3.69E+00
EU-154 #A	1.2968E+00	1.2968E+00	7.806E+01%	2.51E+00
EU-155 #A	-1.9278E+00	-1.9278E+00	1.458E+02%	9.34E+00
HF-181 #A	1.4775E-01	1.4775E-01	7.791E+01%	2.22E+00
Ta-182 #A	1.9148E+00	1.9148E+00	9.032E+01%	8.41E+00
Hg-203 #A	-3.0490E-01	-3.0490E-01	1.437E+02%	1.48E+00
TL-208	3.2329E+00	3.2329E+00	1.636E+01%	1.00E+00
PM-146 #A	1.2323E-01	1.2323E-01	5.692E+02%	1.69E+00
Y-88 #A	2.2392E-01	2.2392E-01	1.442E+02%	1.01E+00
Cd-113m#A	-4.6439E+03	-4.6439E+03	1.058E+02%	1.65E+04
Cd-109 #A	0.0000E+00	0.0000E+00	1.000E+03%	5.99E+01
Cf-251 #A	-9.5793E-01	-9.5793E-01	2.280E+02%	5.60E+00
Cf-249 #A	4.5957E-01	4.5957E-01	1.581E+02%	2.37E+00
Sn-126 A	4.9398E+00	4.9398E+00	1.062E+02%	1.75E+01
PB-210 #	5.0036E+01	5.0036E+01	2.392E+01%	2.85E+01
PB-212	9.5117E+00	9.5117E+00	8.233E+00%	1.85E+00
PB-214	3.7439E+01	3.7439E+01	3.566E+00%	1.98E+00
BI-207 #A	-1.0880E+00	-1.0880E+00	9.351E+01%	2.18E+00
BI-212 #	2.0081E+01	2.0081E+01	3.032E+01%	1.18E+01
U-235 #A	-3.2583E+00	-3.2583E+00	1.475E+02%	1.60E+01
BI-214	3.6209E+01	3.6209E+01	4.805E+00%	2.03E+00
BI-210M#A	5.4678E-01	5.4678E-01	1.210E+02%	2.22E+00
AC-228 #	1.0815E+01	1.0815E+01	1.988E+01%	4.19E+00
TH-227 #A	-7.0578E+00	-7.0578E+00	9.592E+01%	1.64E+01
TH-229 #A	-4.1238E+00	-4.1238E+00	2.201E+02%	2.22E+01
TH-234 #A	-7.2046E+00	-7.2046E+00	6.343E+01%	3.46E+01
PA-231 #A	-1.1680E+01	-1.1680E+01	2.457E+02%	9.58E+01
PA-233 #A	0.0000E+00	0.0000E+00	1.000E+03%	7.76E+00
PA-234 #A	2.4762E+00	2.4762E+00	9.316E+01%	8.39E+00
PA-234M#A	1.1097E+02	1.1097E+02	6.197E+01%	2.06E+02
AM-241 #A	-1.3958E+00	-1.3958E+00	1.245E+02%	5.79E+00
Np-237 #A	0.0000E+00	0.0000E+00	1.000E+03%	1.84E+01
Ir-192 #A	0.0000E+00	0.0000E+00	7.071E+02%	3.24E+00
Cs-136 #A	4.6944E-01	4.6945E-01	9.316E+01%	1.47E+00
Np-239 #A	-5.3715E-01	-5.3718E-01	4.894E+02%	8.77E+00
Nd-147 #A	1.0698E+00	1.0699E+00	2.678E+02%	7.00E+00
TL-210 #A	0.0000E+00	0.0000E+00	1.000E+03%	1.76E+00
Kr-85 #A	0.0000E+00	0.0000E+00	1.000E+03%	3.60E+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)     3.976E+02  Bq/Sample
Total Decayed Activity (   25.1 to  1999.3 keV) 3.9757358E+02  Bq/Sample
```

453329_Gamma_160-36593-A-17-B. 9_Gamma_20193887.spc.



Test America St. Louis Spectrum ID: 12_Gamma_20193740

Sample Description: 453329_Gamma_160-36593-A-18-B
Detector: Detector #12
Batch ID: 453329
Work Order Number: Gamma
Lot Number: 160-36593-A-18-B

Decay to Time: 12/27/2019 11:37 Live Time: 1800 sec
Acquisition Time: 12/27/2019 11:37:52 Real Time: 1802 sec
Analysis Time: 12/27/2019 12:08 Dead Time: 0.12 %
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_2019-12-07_1443.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	6.289E+00	104.7	6.584E+00	6.591E+00	2.206E+01
NA-22	8.478E-01	56.2	4.768E-01	4.786E-01	1.540E+00
K-40	3.250E+02	5.1	1.659E+01	2.334E+01	1.428E+01
Sc-46	-9.850E-01	91.4	9.004E-01	9.018E-01	3.014E+00
CR-51	5.059E+00	268.1	1.356E+01	1.357E+01	4.523E+01
MN-54	-6.855E-01	117.2	8.036E-01	8.044E-01	1.856E+00
FE-59	3.557E+00	33.5	1.190E+00	1.204E+00	2.373E+00
Co-56	4.157E-01	187.7	7.803E-01	7.806E-01	1.765E+00
CO-57	-3.921E-01	126.8	4.971E-01	4.975E-01	1.662E+00
CO-58	4.301E-01	173.5	7.463E-01	7.466E-01	2.548E+00
CO-60	4.360E-01	166.2	7.248E-01	7.251E-01	1.593E+00
ZN-65	1.956E+00	143.5	2.807E+00	2.809E+00	9.445E+00
NB-94	-5.253E-01	169.3	8.896E-01	8.900E-01	2.050E+00
ZR-95	1.758E-01	691.0	1.215E+00	1.215E+00	2.894E+00
NB-95	-1.588E+00	71.4	1.133E+00	1.136E+00	3.752E+00
RU-103	-7.736E-02	833.7	6.449E-01	6.450E-01	1.634E+00
RH-106	-9.442E+00	221.1	2.088E+01	2.089E+01	6.962E+01
AG-108M	2.556E-01	87.4	2.233E-01	2.237E-01	1.662E+00
AG-110M	7.249E-01	72.7	5.270E-01	5.283E-01	3.567E+00
SN-113	9.533E-01	109.9	1.047E+00	1.048E+00	3.506E+00
SB-124	2.017E+00	21.8	4.402E-01	4.520E-01	6.517E+00
SB-125	2.131E+00	110.1	2.347E+00	2.350E+00	5.327E+00
I-131	6.798E-02	1074.7	7.306E-01	7.306E-01	1.827E+00
Gd-153	-1.743E+00	147.6	2.573E+00	2.575E+00	8.558E+00
Ga-68	7.324E+00	356.4	2.610E+01	2.610E+01	5.883E+01
Tc-99m	0.000E+00	1.#INF	3.704E-01	3.704E-01	3.018E+00
BA-133	-1.122E+00	206.6	2.318E+00	2.319E+00	7.722E+00
CS-134	1.569E+00	72.1	1.131E+00	1.134E+00	2.652E+00
CS-137	-1.182E+00	80.2	9.479E-01	9.498E-01	3.155E+00
CE-139	-2.131E-03	30726.2	6.547E-01	6.547E-01	2.212E+00
Ba-140	-3.621E+00	93.7	3.393E+00	3.398E+00	7.972E+00
La-140	-2.086E+00	77.7	1.620E+00	1.624E+00	3.253E+00
CE-141	1.058E+00	146.7	1.552E+00	1.553E+00	5.165E+00

CE-144	-4.654E+00	148.2	6.898E+00	6.902E+00	2.295E+01
PM-144	-6.529E-01	134.4	8.777E-01	8.784E-01	2.014E+00
EU-152	2.388E+00	127.9	3.056E+00	3.058E+00	5.606E+00
EU-154	3.886E-01	266.7	1.037E+00	1.037E+00	3.673E+00
EU-155	2.293E+00	143.0	3.278E+00	3.281E+00	1.091E+01
HF-181	-9.524E-01	103.8	9.882E-01	9.894E-01	3.303E+00
Ta-182	1.411E+00	146.3	2.064E+00	2.065E+00	1.417E+01
Hg-203	-3.481E-01	188.6	6.563E-01	6.566E-01	2.214E+00
TL-208	3.061E+00	29.5	9.040E-01	9.173E-01	2.001E+00
PM-146	-9.597E-01	103.5	9.936E-01	9.948E-01	2.443E+00
Y-88	1.241E+00	27.7	3.442E-01	3.514E-01	7.036E-01
Cd-113m	7.508E+03	90.6	6.798E+03	6.812E+03	2.271E+04
Cd-109	0.000E+00	1.#INF	2.200E+01	2.200E+01	7.361E+01
Cf-251	-1.517E+00	218.2	3.310E+00	3.311E+00	8.457E+00
Cf-249	6.902E-01	101.6	7.012E-01	7.021E-01	3.579E+00
Sn-126	6.264E+00	132.9	8.325E+00	8.333E+00	2.771E+01
PB-210	7.599E+01	27.1	2.063E+01	2.117E+01	5.248E+01
PB-212	1.394E+01	8.2	1.146E+00	1.357E+00	2.806E+00
PB-214	8.066E+01	3.1	2.527E+00	4.808E+00	3.329E+00
BI-207	-1.563E+00	86.0	1.344E+00	1.347E+00	2.879E+00
BI-212	0.000E+00	1.#INF	6.037E+00	6.037E+00	2.906E+01
U-235	3.194E+00	94.4	3.017E+00	3.021E+00	2.402E+01
BI-214	7.939E+01	3.8	3.008E+00	5.039E+00	3.025E+00
BI-210M	1.060E+00	63.0	6.682E-01	6.705E-01	2.935E+00
AC-228	1.622E+01	14.5	2.353E+00	2.493E+00	4.998E+00
TH-227	2.538E+00	91.4	2.320E+00	2.324E+00	2.168E+01
TH-229	1.246E+01	91.1	1.136E+01	1.138E+01	3.089E+01
TH-234	3.888E+00	316.7	1.231E+01	1.232E+01	4.817E+01
PA-231	-2.115E+01	217.2	4.592E+01	4.594E+01	1.530E+02
PA-233	0.000E+00	1.#INF	3.752E-01	3.752E-01	1.236E+01
PA-234	2.347E+00	122.0	2.864E+00	2.866E+00	1.144E+01
PA-234M	7.293E+01	98.2	7.161E+01	7.170E+01	3.383E+02
AM-241	-2.021E+00	115.7	2.338E+00	2.341E+00	7.774E+00
Np-237	0.000E+00	1.#INF	6.809E+00	6.809E+00	2.263E+01
Ir-192	0.000E+00	1.#INF	2.593E-01	2.593E-01	5.170E+00
Cs-136	1.009E+00	56.2	5.672E-01	5.700E-01	2.463E+00
Np-239	1.516E+00	85.4	1.295E+00	1.298E+00	4.315E+00
Nd-147	3.600E+00	137.1	4.935E+00	4.939E+00	1.180E+01
TL-210	4.347E-01	169.2	7.355E-01	7.359E-01	2.510E+00
Kr-85	1.714E+02	95.9	1.643E+02	1.646E+02	5.495E+02
Total	8.428E+03				

Analyst: Caleb Quinn

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Sample description
453329_Gamma_160-36593-A-18-B

Spectrum Filename: C:\User\SPC\Det12\12_Gamma_20193740.An1

Acquisition information

Start time:	12/27/2019 11:37:52 AM
Live time:	1800
Real time:	1802
Dead time:	0.12 %
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	12/27/2019 11:37:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	12_2019-12-07_1443.PBC 12/7/2019 2:43:53 PM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 29 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 0.1605

***** 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
46.55	105.	27.15	0.85	1.801E-02	46.54	4.250	7.599E+01	PB210
50.14	23.	157.74	0.85	2.193E-02	50.14	8.000	PBC<MDA	TH227
63.45	11.	373.15	0.87	2.978E-02	63.29	3.810	PBC<MDA	TH234
64.44	33.	132.92	0.87	3.015E-02	64.28	9.700	PBC<MDA	Sn126
74.78	339.	9.36	0.88	3.331E-02				
77.20	578.	5.92	0.88	3.387E-02				
87.04	193.	18.90	1.08	3.567E-02	86.49	13.100	2.300E+01	Np237
					86.54	30.700	9.811E+00	EU155
					86.94	9.040	3.326E+01	Sn126
					87.57	37.500	7.998E+00	Sn126
92.73	74.	42.10	0.78	3.639E-02	92.59	5.584	PBC<MDA	TH234
					93.35	5.561	2.037E+01	AC228
105.31	33.	143.00	0.91	3.726E-02	105.31	21.200	PBC<MDA	EU155
106.03	23.	85.39	0.91	3.729E-02	106.13	22.700	PBC<MDA	Np239
121.78	21.	152.90	0.93	3.725E-02	121.78	28.580	PBC<MDA	EU152
					122.06	85.600	3.660E-01	CO57
123.10	6.	495.54	0.93	3.721E-02	123.10	40.790	PBC<MDA	EU154
145.44	33.	146.72	0.95	3.586E-02	145.44	48.200	PBC<MDA	CE141
163.38	32.	94.44	0.97	3.428E-02	163.38	5.080	PBC<MDA	U235
186.15	270.	12.67	1.19	3.211E-02	185.72	54.000	8.061E+00	U235
193.51	20.	150.46	1.00	3.140E-02	193.51	4.400	PBC<MDA	TH229
210.85	30.	102.90	1.02	2.980E-02	210.85	2.990	PBC<MDA	TH229
227.00	16.	177.20	1.03	2.839E-02	227.00	6.300	PBC<MDA	Cf251
235.97	27.	177.54	1.04	2.764E-02	235.97	12.300	PBC<MDA	TH227
238.51	288.	8.59	1.05	2.744E-02	238.63	43.300	1.346E+01	PB212
241.82	275.	8.73	1.05	2.718E-02	242.00	7.430	7.571E+01	PB214
244.69	15.	325.12	1.05	2.695E-02	244.69	7.580	PBC<MDA	EU152

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
263.70	21.	90.55	1.07	2.554E-02	263.70	0.006	PBC<MDA	Cd113m
266.13	22.	92.40	1.07	2.539E-02	265.83	50.000	PBC<MDA	BI210M
295.09	670.	5.27	0.88	2.350E-02	295.09	19.300	8.213E+01	PB214
					296.00	79.000	2.011E+01	TL210
304.97	14.	85.79	1.23	2.293E-02	304.85	4.290	8.189E+00	Ba140
					304.90	28.000	1.255E+00	BI210M
320.08	20.	268.14	1.13	2.210E-02	320.08	9.940	PBC<MDA	CR51
328.76	22.	98.35	1.13	2.165E-02	328.76	20.300	PBC<MDA	La140
333.44	22.	101.60	1.14	2.142E-02	333.44	15.510	PBC<MDA	Cf249
338.48	78.	22.94	0.77	2.118E-02	338.32	12.010	1.711E+01	AC228
351.77	1102.	3.43	1.15	2.056E-02	351.93	37.600	7.921E+01	PB214
383.84	17.	136.47	1.19	1.923E-02	383.84	8.940	PBC<MDA	BA133
391.69	21.	109.86	1.20	1.893E-02	391.69	64.000	PBC<MDA	SN113
408.94	32.	47.60	0.31	1.832E-02				
463.37	10.	168.64	1.27	1.666E-02	463.37	10.470	PBC<MDA	SB125
477.60	19.	104.69	1.28	1.628E-02	477.60	10.520	PBC<MDA	BE7
487.02	19.	104.81	1.29	1.604E-02	487.02	45.500	PBC<MDA	La140
511.86	42.	43.81	2.56	1.546E-02	511.86	20.000	PBC<MDA	RH106
513.98	20.	95.88	1.31	1.541E-02	513.98	0.430	PBC<MDA	Kr85
531.00	13.	137.09	1.33	1.504E-02	531.00	13.000	PBC<MDA	Nd147
563.24	16.	93.24	1.36	1.439E-02	563.24	8.350	PBC<MDA	CS134
569.32	6.	178.40	1.37	1.428E-02	569.32	15.380	PBC<MDA	CS134
					569.47	8.200	3.005E+00	PA234
					569.70	97.740	2.522E-01	BI207
583.04	85.	21.07	0.39	1.403E-02	583.02	84.500	3.991E+00	TL208
600.50	15.	305.42	1.40	1.373E-02	600.50	17.860	PBC<MDA	SB125
602.73	15.	307.07	1.40	1.369E-02	602.73	98.260	PBC<MDA	SB124
609.22	895.	3.79	1.46	1.359E-02	609.31	46.090	7.939E+01	BI214
					610.30	5.750	6.371E+02	RU103
635.89	11.	110.13	1.43	1.317E-02	635.89	11.310	PBC<MDA	SB125
657.76	14.	72.69	1.45	1.284E-02	657.76	94.640	PBC<MDA	AG110M
722.79	15.	78.88	1.51	1.199E-02	722.79	10.810	PBC<MDA	SB124
					722.94	90.840	7.582E-01	AG108M
					723.36	20.220	3.408E+00	EU154
722.94	15.	87.37	1.51	1.199E-02	722.79	10.810	6.341E+00	SB124
					722.94	90.840	7.547E-01	AG108M
					723.36	20.220	3.392E+00	EU154
756.73	2.	691.01	1.54	1.160E-02	756.73	54.460	PBC<MDA	ZR95
766.41	17.	98.19	1.55	1.150E-02	765.79	99.790	PBC<MDA	NB95
					766.41	0.294	2.806E+02	PA234M
785.42	12.	120.90	1.57	1.129E-02	785.42	1.280	PBC<MDA	BI212
795.87	17.	78.82	1.58	1.119E-02	795.87	85.530	PBC<MDA	CS134
799.60	9.	169.17	1.58	1.115E-02	799.60	98.960	PBC<MDA	TL210
810.78	8.	173.50	1.59	1.104E-02	810.78	99.460	PBC<MDA	CO58
818.50	17.	86.96	1.60	1.096E-02	818.50	100.000	PBC<MDA	Cs136
846.77	8.	187.71	1.63	1.070E-02	846.77	99.935	PBC<MDA	Co56
861.00	22.	34.21	1.72	1.057E-02	860.56	12.420	9.095E+00	TL208
880.53	15.	83.57	1.66	1.040E-02	880.53	6.000	PBC<MDA	PA234

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
883.24	7.	187.27	1.66	1.038E-02	883.24	9.600	PBC<MDA	PA234
911.05	84.	17.76	1.38	1.015E-02	911.07	29.000	1.586E+01	AC228
946.02	11.	122.02	1.72	9.873E-03	946.02	13.400	PBC<MDA	PA234
964.11	10.	135.13	1.73	9.739E-03	964.11	14.605	PBC<MDA	EU152
969.03	90.	14.04	1.74	9.703E-03	968.97	17.460	2.954E+01	AC228
1048.07	16.	71.26	1.81	9.162E-03	1048.07	80.000	PBC<MDA	Cs136
1077.40	3.	356.37	1.83	8.978E-03	1077.40	3.300	PBC<MDA	Ga68
1099.25	32.	33.46	1.85	8.846E-03	1099.25	56.500	3.557E+00	FE59
1115.56	16.	143.53	1.87	8.750E-03	1115.55	50.600	PBC<MDA	ZN65
1120.33	190.	8.81	1.13	8.722E-03	1120.29	15.100	8.015E+01	BI214
					1120.55	99.987	1.211E+01	Sc46
					1121.30	34.900	3.470E+01	Ta182
1189.05	6.	218.16	1.93	8.342E-03	1189.05	16.200	PBC<MDA	Ta182
1221.41	10.	146.29	1.96	8.175E-03	1221.41	27.000	PBC<MDA	Ta182
1238.47	78.	17.32	1.18	8.089E-03	1238.28	66.070	8.142E+00	Co56
1274.53	12.	56.23	2.00	7.914E-03	1274.53	99.940	PBC<MDA	NA22
					1274.54	35.190	2.408E+00	EU154
1274.54	3.	266.73	2.00	7.914E-03	1274.53	99.940	PBC<MDA	NA22
					1274.54	35.190	5.845E-01	EU154
1313.00	3.	339.41	2.04	7.735E-03	1313.00	21.000	PBC<MDA	TL210
1332.50	6.	166.25	2.05	7.647E-03	1332.50	99.980	PBC<MDA	CO60
1384.30	10.	82.66	2.10	7.423E-03	1384.30	24.290	PBC<MDA	AG110M
1408.00	16.	84.07	2.12	7.324E-03	1408.00	21.005	PBC<MDA	EU152
1460.66	444.	5.10	1.74	7.113E-03	1460.83	10.670	3.250E+02	K40
1690.98	21.	21.82	2.35	6.302E-03	1690.98	47.790	3.874E+00	SB124
1764.06	170.	7.67	2.04	6.075E-03	1764.49	15.400	1.009E+02	BI214
1836.06	13.	27.74	2.46	5.866E-03	1836.06	99.200	1.241E+00	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 Channel	Centroid Energy	Background Counts	Net Area Counts	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide	
298.70	74.77	334.	339.	1.018E+04	9.36	0.880	-	D
308.35	77.18	296.	578.	1.706E+04	5.92	0.883	-	D
743.92	186.15	225.	270.	8.410E+03	12.67	1.191	-	
1634.72	408.94	53.	32.	1.729E+03	47.60	0.308	-	s
4953.69	1238.47	19.	78.	9.684E+03	17.32	1.184	-	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	185.84	46.55	224.	105.	0.058	27.15	0.848
TH-227	200.18	50.14	666.	23.	0.013	157.74	0.855s
AM-241	237.74	59.54	887.	-37.	-0.020	115.68	0.865s
TH-234	252.74	63.29	857.	11.	0.006	373.15	0.868s
Sn-126	256.71	64.28	944.	33.	0.018	132.92	0.869s
BA-133	323.50	80.99	2271.	-29.	-0.016	235.07	0.887
Np-237	345.49	86.49	1614.	0.	0.000	149.08	0.892A
EU-155	345.70	86.54	1529.	-39.	-0.022	141.95	0.892D
Sn-126	347.29	86.94	398.	36.	0.020	77.12	0.893D
Sn-126	349.81	87.57	1413.	125.	0.069	22.65	0.893D
Cd-109	351.68	88.04	1445.	0.	0.000	1000.00	0.894A
Nd-147	363.92	91.10	1445.	0.	0.000	1000.00	0.897s
TH-234	369.87	92.59	1385.	10.	0.006	511.92	0.898
AC-228	372.91	93.35	1386.	39.	0.022	135.46	0.899s
Gd-153	389.50	97.50	1292.	-35.	-0.019	147.59	0.903s
Np-239	397.50	99.50	1242.	-35.	-0.019	144.48	0.905
Gd-153	412.29	103.20	1233.	-35.	-0.019	143.34	0.909s
Np-239	414.29	103.70	1301.	-35.	-0.019	147.14	0.909s
EU-155	420.73	105.31	1070.	33.	0.018	143.00	0.911s
Np-239	424.00	106.13	183.	23.	0.013	85.39	0.912D
EU-152	486.56	121.78	505.	21.	0.012	152.90	0.928s
CO-57	487.69	122.06	396.	-22.	-0.013	126.76	0.928s
EU-154	491.84	123.10	439.	6.	0.003	495.54	0.929s
CE-144	533.57	133.54	1260.	-34.	-0.019	148.21	0.940s
CO-57	545.30	136.47	1297.	0.	0.000	1000.00	0.943s
Tc-99m	561.44	140.51	1297.	0.	0.000	1000.00	0.947s
U-235	574.53	143.79	1297.	0.	0.000	1000.00	0.950
CE-141	581.15	145.44	1149.	33.	0.018	146.72	0.952s
Ba-140	649.99	162.66	646.	-34.	-0.019	107.06	0.969
U-235	652.87	163.38	430.	32.	0.018	94.44	0.970s
Cf-251	705.72	176.60	315.	-15.	-0.009	218.16	0.983
U-235	742.18	185.72	695.	-52.	-0.029	103.05	0.992
TH-229	773.32	193.51	253.	20.	0.011	150.46	1.000
U-235	820.59	205.33	282.	-21.	-0.012	148.93	1.012s
TH-229	842.65	210.85	271.	30.	0.017	102.90	1.018s
Cf-251	907.22	227.00	235.	16.	0.009	177.20	1.034s
TH-227	943.09	235.97	1104.	27.	0.015	177.54	1.043s
PB-212	953.73	238.63	151.	298.	0.166	8.22	1.045D
PB-214	967.18	242.00	151.	275.	0.153	8.73	1.049D
EU-152	977.96	244.69	1141.	15.	0.008	325.12	1.051s
TH-227	1024.13	256.24	216.	-20.	-0.011	137.13	1.063s
Cd-113m	1053.96	263.70	166.	21.	0.012	90.55	1.070s
BI-210M	1062.48	265.83	191.	22.	0.012	92.40	1.072s
TL-208	1108.27	277.28	196.	-6.	-0.004	306.73	1.084

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Hg-203	1115.93	279.20	272.	-12.	-0.007	188.55	1.086s
I-131	1136.32	284.30	224.	-30.	-0.016	96.28	1.091s
PB-214	1179.48	295.09	128.	670.	0.372	5.27	0.884
TL-210	1183.11	296.00	1594.	-25.	-0.014	225.67	1.102s
PB-212	1199.22	300.03	1569.	-25.	-0.014	223.10	1.106
PA-231	1199.38	300.07	1544.	-25.	-0.014	221.32	1.106s
PA-233	1199.82	300.18	1519.	-25.	-0.014	219.47	1.107s
PA-231	1209.70	302.65	1494.	-25.	-0.014	217.17	1.109s
BA-133	1210.50	302.85	1468.	-12.	-0.007	435.83	1.109s
Ba-140	1218.49	304.85	1456.	0.	0.000	1000.00	1.111
BI-210M	1218.97	304.97	50.	14.	0.008	85.79	1.225
Ir-192	1232.85	308.44	1456.	0.	0.000	1000.00	1.115
PA-233	1247.13	312.01	1456.	0.	0.000	1000.00	1.118s
Ir-192	1265.04	316.49	1456.	0.	0.000	1000.00	1.123
CR-51	1279.41	320.08	1428.	20.	0.011	268.14	1.126s
La-140	1314.10	328.76	222.	22.	0.012	98.35	1.135s
Cf-249	1332.81	333.44	232.	22.	0.012	101.60	1.139s
AC-228	1352.96	338.48	67.	78.	0.044	22.94	0.766s
Cs-136	1361.32	340.57	528.	-28.	-0.015	118.00	1.146s
EU-152	1376.18	344.29	500.	-28.	-0.016	114.56	1.150
HF-181	1382.35	345.83	438.	-27.	-0.015	109.51	1.151
PB-214	1406.10	351.77	88.	1112.	0.618	3.39	1.151
BA-133	1423.02	356.00	1378.	-26.	-0.014	206.58	1.162s
BA-133	1534.35	383.84	266.	17.	0.010	136.47	1.189s
Cf-249	1550.79	387.95	283.	0.	0.000	1000.00	1.193
SN-113	1565.74	391.69	250.	21.	0.012	109.86	1.196s
AG-108M	1734.69	433.94	92.	-7.	-0.004	270.93	1.238s
PM-146	1814.45	453.88	96.	-19.	-0.011	103.54	1.257
SB-125	1852.39	463.37	147.	10.	0.006	168.64	1.266s
Ir-192	1871.16	468.06	168.	-13.	-0.007	143.70	1.271s
BE-7	1909.29	477.60	196.	19.	0.011	104.69	1.280s
HF-181	1926.90	482.00	257.	-22.	-0.012	103.75	1.284s
La-140	1946.98	487.02	189.	19.	0.011	104.81	1.289s
RU-103	1987.11	497.05	72.	-2.	-0.001	833.67	1.298s
RH-106	2046.35	511.86	147.	42.	0.023	43.81	2.563s
Kr-85	2054.81	513.98	182.	20.	0.011	95.88	1.315s
Nd-147	2122.88	531.00	69.	13.	0.007	137.09	1.331s
Ba-140	2147.92	537.26	113.	-24.	-0.013	93.70	1.337
CS-134	2251.82	563.24	48.	16.	0.009	93.24	1.362
CS-134	2276.15	569.32	61.	6.	0.004	178.40	1.367s
PA-234	2276.75	569.47	67.	0.	0.000	1000.00	1.368s
BI-207	2277.68	569.70	67.	0.	0.000	1000.00	1.368s
TL-208	2330.96	583.02	74.	65.	0.036	29.53	1.381s
SB-125	2400.87	600.50	1093.	15.	0.009	305.42	1.397
SB-124	2409.79	602.73	1108.	15.	0.009	307.07	1.399s
CS-134	2417.71	604.71	1325.	-22.	-0.012	231.61	1.401s
BI-214	2435.74	609.22	45.	895.	0.497	3.79	1.465
RU-103	2440.06	610.30	1303.	-22.	-0.012	228.82	1.406s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
AG-108M	2455.99	614.28	1281.	-22.	-0.012	226.26	1.410s
PM-144	2471.12	618.06	1258.	-23.	-0.013	223.72	1.414
RH-106	2486.54	621.92	1236.	-23.	-0.013	221.14	1.417
SB-125	2542.43	635.89	35.	11.	0.006	110.13	1.430
I-131	2546.77	636.97	73.	-16.	-0.009	78.17	1.432
AG-110M	2629.92	657.76	47.	14.	0.008	72.69	1.451s
CS-137	2645.51	661.66	161.	-23.	-0.013	80.22	1.455
PM-144	2785.05	696.54	79.	-14.	-0.008	134.44	1.487s
NB-94	2809.41	702.63	79.	-11.	-0.006	169.34	1.493s
SB-124	2890.04	722.79	61.	15.	0.008	78.88	1.512s
AG-108M	2890.65	722.94	76.	15.	0.008	87.37	1.512s
EU-154	2892.34	723.36	91.	0.	0.000	1000.00	1.512s
ZR-95	2895.69	724.20	91.	0.	0.000	1000.00	1.513s
BI-212	2907.58	727.17	91.	0.	0.000	1000.00	1.516s
PM-146	2941.78	735.72	56.	-14.	-0.008	116.50	1.524s
PM-146	2987.55	747.16	42.	-2.	-0.001	691.01	1.535
ZR-95	3025.83	756.73	42.	2.	0.001	691.01	1.543s
AG-110M	3054.69	763.94	257.	-36.	-0.020	65.54	1.550s
NB-95	3062.08	765.79	258.	-33.	-0.018	71.35	1.552s
PA-234M	3064.57	766.41	132.	17.	0.009	98.19	1.552s
BI-212	3140.62	785.42	47.	12.	0.007	120.90	1.570s
CS-134	3182.43	795.87	85.	17.	0.010	78.82	1.579s
TL-210	3197.35	799.60	102.	9.	0.005	169.17	1.583s
CS-134	3206.76	801.95	150.	-21.	-0.011	86.74	1.585s
CO-58	3242.06	810.78	104.	8.	0.005	173.50	1.593s
La-140	3262.05	815.77	113.	0.	0.000	1000.00	1.598s
Cs-136	3272.97	818.50	97.	17.	0.009	86.96	1.600s
MN-54	3338.38	834.85	51.	-13.	-0.007	117.23	1.615s
Co-56	3386.08	846.77	45.	8.	0.004	187.71	1.626s
TL-208	3443.00	861.00	8.	22.	0.012	34.21	1.723
NB-94	3483.41	871.10	60.	0.	0.000	1000.00	1.648
EU-154	3491.95	873.23	65.	0.	0.000	1000.00	1.650s
PA-234	3521.16	880.53	74.	15.	0.008	83.57	1.657s
PA-234	3532.00	883.24	89.	7.	0.004	187.27	1.659s
AG-110M	3537.78	884.68	96.	0.	0.000	1000.00	1.660s
Sc-46	3556.17	889.28	131.	-18.	-0.010	91.41	1.664s
Y-88	3591.22	898.04	60.	-14.	-0.008	124.54	1.672s
AC-228	3643.27	911.05	26.	84.	0.047	17.76	1.383
AG-110M	3749.09	937.49	165.	-34.	-0.019	84.51	1.708s
PA-234	3783.21	946.02	35.	11.	0.006	122.02	1.716
EU-152	3855.60	964.11	94.	10.	0.006	135.13	1.732
AC-228	3875.05	968.97	35.	90.	0.050	14.04	1.736s
EU-154	3984.54	996.33	81.	-14.	-0.008	92.82	1.761s
PA-234M	4003.22	1001.00	96.	0.	0.000	1000.00	1.765s
EU-154	4018.33	1004.77	151.	-22.	-0.012	81.16	1.768
Co-56	4150.66	1037.84	59.	-14.	-0.008	130.23	1.798s
Cs-136	4191.60	1048.07	57.	16.	0.009	71.26	1.807s
RH-106	4200.76	1050.36	84.	-5.	-0.003	247.33	1.809s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-207	4253.99	1063.66	48.	-19.	-0.011	86.02	1.820s
Ga-68	4308.98	1077.40	27.	3.	0.002	356.37	1.833s
FE-59	4396.44	1099.25	16.	32.	0.018	33.46	1.852s
EU-152	4447.76	1112.07	277.	-18.	-0.010	130.52	1.863s
ZN-65	4461.66	1115.55	242.	16.	0.009	143.53	1.866s
BI-214	4480.63	1120.29	28.	169.	0.094	8.89	1.870D
Sc-46	4481.68	1120.55	258.	0.	0.000	1000.00	1.870s
Ta-182	4484.69	1121.30	258.	0.	0.000	1000.00	1.871s
CO-60	4692.57	1173.24	37.	-6.	-0.004	222.86	1.916s
Ta-182	4755.86	1189.05	32.	6.	0.003	218.16	1.930
Ta-182	4885.39	1221.41	40.	10.	0.006	146.29	1.957
Co-56	4952.92	1238.28	126.	-18.	-0.010	89.79	1.972s
NA-22	5098.03	1274.53	17.	12.	0.007	56.23	2.003s
EU-154	5098.08	1274.54	29.	3.	0.002	266.73	2.003s
TL-210	5252.04	1313.00	23.	3.	0.002	339.41	2.036s
CO-60	5330.11	1332.50	17.	6.	0.003	166.25	2.052s
AG-110M	5537.48	1384.30	11.	10.	0.006	82.66	2.096s
EU-152	5632.39	1408.00	30.	16.	0.009	84.07	2.115
K-40	5843.24	1460.66	13.	444.	0.247	5.10	1.740
La-140	6386.02	1596.21	54.	-24.	-0.013	77.66	2.269s
SB-124	6765.58	1690.98	0.	21.	0.012	21.82	2.345s
BI-214	7058.27	1764.06	0.	170.	0.094	7.67	2.045
Co-56	7087.48	1771.35	194.	-12.	-0.007	168.51	2.408s
Y-88	7346.69	1836.06	0.	13.	0.007	27.74	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	6.2885E+00				5.31E+01	
			477.60	6.289E+00	(	2.206E+01 1.05E+02 1.05E+01	G
NA-22	C	8.4783E-01				9.50E+02	
			1274.53	8.478E-01	?(	1.540E+00 5.62E+01 9.99E+01	G
K-40	N	3.2504E+02				4.66E+11	
			1460.83	3.250E+02	(	1.428E+01 5.10E+00 1.07E+01	G
Sc-46	F	-9.8501E-01				8.38E+01	
			889.28	-9.850E-01	?(	3.014E+00 9.14E+01 1.00E+02	G
			1120.55	0.000E+00	+	4.942E+00 1.00E+03 1.00E+02	G

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Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CR-51	F	5.0587E+00					2.77E+01	
			320.08	5.059E+00	&(	4.523E+01	2.68E+02	9.94E+00 G
MN-54	C	-6.8550E-01					3.12E+02	
			834.85	-6.855E-01	?(	1.856E+00	1.17E+02	1.00E+02 G
FE-59	F	3.5572E+00					4.45E+01	
			1099.25	3.557E+00	*(	2.373E+00	3.35E+01	5.65E+01 G
			1291.60	-1.094E-01	%	4.087E+00	1.68E+03	4.32E+01 G
Co-56	C	4.1572E-01					7.73E+01	
			846.77	4.157E-01	&(	1.765E+00	1.88E+02	9.99E+01 G
			1238.28	-1.906E+00	+	5.726E+00	8.98E+01	6.61E+01 G
			1037.84	-5.823E+00	+	1.636E+01	1.30E+02	1.41E+01 G
			1771.35	-7.028E+00	+	4.005E+01	1.69E+02	1.55E+01 A
CO-57	C	-3.9212E-01					2.72E+02	
			122.06	-3.921E-01	&(	1.662E+00	1.27E+02	8.56E+01 G
			136.47	0.000E+00	&	2.430E+01	1.00E+03	1.07E+01 G
CO-58	C	4.3011E-01					7.09E+01	
			810.78	4.301E-01	?(	2.548E+00	1.74E+02	9.95E+01 G
CO-60	F	4.3599E-01					1.93E+03	
			1332.50	4.360E-01	?(	1.593E+00	1.66E+02	1.00E+02 G
			1173.24	-4.180E-01	&	2.058E+00	2.23E+02	9.99E+01 G
ZN-65	F	1.9558E+00					2.44E+02	
			1115.55	1.956E+00	&(	9.445E+00	1.44E+02	5.06E+01 G
NB-94	I	-5.2532E-01					7.41E+06	
			702.63	-5.253E-01	?(	2.050E+00	1.69E+02	9.79E+01 G
			871.10	0.000E+00	+	2.059E+00	1.00E+03	9.99E+01 G
ZR-95	I	1.7584E-01					6.40E+01	
			756.73	1.758E-01	?(	2.894E+00	6.91E+02	5.45E+01 G
			724.20	0.000E+00	-	4.955E+00	1.00E+03	4.42E+01 G
NB-95	I	-1.5883E+00					6.40E+01	
			765.79	-1.588E+00	&(	3.752E+00	7.14E+01	9.98E+01 G
RU-103	I	-7.7362E-02					3.93E+01	
			497.05	-7.736E-02	(	1.634E+00	8.34E+02	9.09E+01 G
			610.30	-1.596E+01	+	1.217E+02	2.29E+02	5.75E+00 GA

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
RH-106	I	-9.4419E+00					3.74E+02	
			621.92	-9.442E+00	(	6.962E+01	2.21E+02	9.93E+00 G
			1050.36	-2.076E+01	+	1.772E+02	2.47E+02	1.56E+00 G
			511.86	7.509E+00	?	1.063E+01	4.38E+01	2.00E+01 GA
AG-108M	C	2.5561E-01					1.53E+05	
			433.94	-2.455E-01	?(	1.662E+00	2.71E+02	9.05E+01 G
			722.94	7.547E-01	?(	2.213E+00	8.74E+01	9.08E+01 G
			614.28	-1.029E+00	+	7.760E+00	2.26E+02	8.98E+01 G
AG-110M	F	7.2491E-01					2.50E+02	
			884.68	0.000E+00	?(	3.567E+00	1.00E+03	7.27E+01 G
			657.76	6.522E-01	?(	1.579E+00	7.27E+01	9.46E+01 G
			937.49	-5.552E+00	+	1.018E+01	8.45E+01	3.44E+01 G
			1384.30	3.177E+00	&(	5.669E+00	8.27E+01	2.43E+01 G
			763.94	-7.736E+00	+	1.674E+01	6.55E+01	2.23E+01 G
SN-113	F	9.5331E-01					1.15E+02	
			391.69	9.533E-01	(	3.506E+00	1.10E+02	6.40E+01 G
SB-124	F	2.0171E+00					6.02E+01	
			602.73	6.352E-01	?(	6.517E+00	3.07E+02	9.83E+01 G
			1690.98	3.874E+00	?(	1.359E+00	2.18E+01	4.78E+01 G
			722.79	6.370E+00	?(	1.680E+01	7.89E+01	1.08E+01 G
SB-125	I	2.1314E+00					1.01E+03	
			427.88	1.061E-01	&(	5.327E+00	2.00E+03	2.96E+01 G
			600.50	3.480E+00	?(	3.551E+01	3.05E+02	1.79E+01 G
			635.89	4.229E+00	&(	1.125E+01	1.10E+02	1.13E+01 G
			463.37	3.291E+00	&(	1.884E+01	1.69E+02	1.05E+01 G
I-131	I	6.7977E-02					8.02E+00	
			364.48	6.798E-02	%(	1.827E+00	1.07E+03	8.17E+01 G
			284.30	-1.109E+01	+	2.711E+01	9.63E+01	6.14E+00 G
			636.97	-9.625E+00	+	2.511E+01	7.82E+01	7.17E+00 G
Gd-153	F	-1.7433E+00					2.42E+02	
			97.50	-1.743E+00	(	8.558E+00	1.48E+02	3.00E+01 G
			103.20	-2.391E+00	+	1.140E+01	1.43E+02	2.18E+01 G
Ga-68	C	7.3239E+00					4.71E-02	
			1077.40	7.324E+00	?(	5.883E+01	3.56E+02	3.30E+00 G
BA-133	F	-1.1221E+00					3.85E+03	
			356.00	-1.122E+00	?(	7.722E+00	2.07E+02	6.20E+01 G
			302.85	-1.639E+00	+	2.384E+01	4.36E+02	1.83E+01 G
			383.84	5.548E+00	?	2.543E+01	1.36E+02	8.94E+00 GA

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
			80.99	-1.353E+00	+	1.058E+01	2.35E+02	3.41E+01 GA
CS-134	I	1.5694E+00					7.54E+02	
			795.87	1.008E+00	?(	2.652E+00	7.88E+01	8.55E+01 G
			604.71	-9.300E-01	-	7.181E+00	2.32E+02	9.76E+01 G
			569.32	1.602E+00	&(	9.867E+00	1.78E+02	1.54E+01 G
			801.95	-1.185E+01	+	3.431E+01	8.67E+01	8.69E+00 G
			563.24	7.257E+00	(	1.612E+01	9.32E+01	8.35E+00 G
CS-137	I	-1.1817E+00					1.10E+04	
			661.66	-1.182E+00	?(	3.155E+00	8.02E+01	8.52E+01 G
CE-139	F	-2.1306E-03					1.38E+02	
			165.85	-2.131E-03	%(	2.212E+00	3.07E+04	7.99E+01 G
Ba-140	I	-3.6212E+00					1.28E+01	
			537.26	-3.621E+00	&(	7.972E+00	9.37E+01	2.44E+01 G
			162.66	-8.844E+00	&	3.150E+01	1.07E+02	6.22E+00 G
			304.85	0.000E+00	+	1.020E+02	1.00E+03	4.29E+00 G
La-140	I	-2.0859E+00					1.28E+01	
			1596.21	-2.086E+00	?(	3.253E+00	7.77E+01	9.54E+01 G
			487.02	1.446E+00	+	5.081E+00	1.05E+02	4.55E+01 G
			328.76	2.775E+00	&	9.122E+00	9.83E+01	2.03E+01 G
			815.77	0.000E+00	+	1.135E+01	1.00E+03	2.33E+01 G
CE-141	I	1.0578E+00					3.25E+01	
			145.44	1.058E+00	&(	5.165E+00	1.47E+02	4.82E+01 G
CE-144	I	-4.6543E+00					2.85E+02	
			133.54	-4.654E+00	?(	2.295E+01	1.48E+02	1.11E+01 G
PM-144	C	-6.5286E-01					3.63E+02	
			696.54	-6.529E-01	?(	2.014E+00	1.34E+02	9.90E+01 G
			618.06	-9.393E-01	+	7.007E+00	2.24E+02	9.91E+01 G
EU-152	F	2.3881E+00					4.94E+03	
			121.78	1.096E+00	(	5.606E+00	1.53E+02	2.86E+01 G
			344.29	-2.806E+00	+	1.072E+01	1.15E+02	2.65E+01 G
			1112.07	-8.510E+00	+	3.727E+01	1.31E+02	1.36E+01 G
			778.92	-2.519E-01	&	1.109E+01	1.82E+03	1.29E+01 G
			964.11	4.075E+00	(	1.872E+01	1.35E+02	1.46E+01 G
			244.69	4.009E+00	&(	4.355E+01	3.25E+02	7.58E+00 G
			1408.00	5.944E+00	?	1.020E+01	8.41E+01	2.10E+01 GA
EU-154	I	3.8861E-01					3.14E+03	
			123.10	2.196E-01	&(	3.673E+00	4.96E+02	4.08E+01 G
			1274.54	5.845E-01	?(	5.553E+00	2.67E+02	3.52E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
			723.36	0.000E+00	-	1.081E+01	1.00E+03	2.02E+01 G
			873.23	0.000E+00	-	1.743E+01	1.00E+03	1.23E+01 G
			1004.77	-7.238E+00	+	1.957E+01	8.12E+01	1.80E+01 G
			996.33	-7.901E+00	+	2.466E+01	9.28E+01	1.06E+01 G
EU-155	I	2.2927E+00					1.81E+03	
			105.31	2.293E+00	&(	1.091E+01	1.43E+02	2.12E+01 G
			86.54	-1.993E+00	+	9.401E+00	1.42E+02	3.07E+01 G
HF-181	F	-9.5244E-01					4.24E+01	
			482.00	-9.524E-01	?(	3.303E+00	1.04E+02	8.05E+01 G
			133.02	-1.164E-01	%	5.867E+00	1.51E+03	4.33E+01 G
			345.83	-4.856E+00	+	1.773E+01	1.10E+02	1.51E+01 G
			136.30	-7.982E-01	&	4.429E+01	1.66E+03	5.85E+00 G
Ta-182	F	1.4108E+00					1.14E+02	
			1121.30	0.000E+00	?(	1.417E+01	1.00E+03	3.49E+01 G
			1221.41	2.601E+00	(	8.069E+00	1.46E+02	2.70E+01 G
			1189.05	2.467E+00	(	1.195E+01	2.18E+02	1.62E+01 G
Hg-203	F	-3.4808E-01					4.66E+01	
			279.20	-3.481E-01	?(	2.214E+00	1.89E+02	8.15E+01 G
TL-208	N	3.0612E+00					6.98E+02	
			583.02	3.061E+00	?(	2.001E+00	2.95E+01	8.45E+01 G
			277.28	-2.325E+00	-	2.427E+01	3.07E+02	6.31E+00 G
			860.56	9.095E+00	+	6.894E+00	3.42E+01	1.24E+01 G
PM-146	C	-9.5967E-01					2.02E+03	
			453.88	-9.597E-01	(	2.443E+00	1.04E+02	6.50E+01 G
			747.16	-2.791E-01	+	4.592E+00	6.91E+02	3.40E+01 G
			735.72	-2.919E+00	+	7.837E+00	1.16E+02	2.25E+01 G
Y-88	F	1.2411E+00					1.07E+02	
			1836.06	1.241E+00	?(	7.036E-01	2.77E+01	9.92E+01 G
			898.04	-8.096E-01	-	2.244E+00	1.25E+02	9.37E+01 G
Cd-113m		7.5078E+03					5.33E+03	
			263.70	7.508E+03	&(	2.271E+04	9.06E+01	6.00E-03 K
Cf-251	T	-1.5173E+00					3.28E+05	
			176.60	-1.517E+00	?(	8.457E+00	2.18E+02	1.70E+01 G
			227.00	5.074E+00		2.302E+01	1.77E+02	6.30E+00 GA
Cf-249	T	6.9018E-01					1.28E+05	
			387.95	0.000E+00	&(	3.579E+00	1.00E+03	6.60E+01 G
			333.44	3.627E+00	&(	1.232E+01	1.02E+02	1.55E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Sn-126		6.2635E+00					3.65E+07	
			87.57	5.179E+00	}	7.370E+00	2.26E+01	3.75E+01 GA
			64.28	6.264E+00	?(	2.771E+01	1.33E+02	9.70E+00 G
			86.94	6.264E+00	}	1.649E+01	7.71E+01	9.04E+00 GA
PB-210	N	7.5987E+01					8.14E+03	
			46.54	7.599E+01	(P	5.248E+01	2.71E+01	4.25E+00 G
PB-212	N	1.3938E+01					6.98E+02	
			238.63	1.394E+01	(	2.806E+00	8.22E+00	4.33E+01 G
			300.03	-1.840E+01	-	1.367E+02	2.23E+02	3.28E+00 GA
PB-214	N	8.0661E+01					5.84E+05	
			351.93	7.991E+01	(	3.329E+00	3.39E+00	3.76E+01 G
			295.09	8.213E+01	(P	6.778E+00	5.27E+00	1.93E+01 G
			242.00	7.575E+01		1.650E+01	8.73E+00	7.43E+00 GA
BI-207	C	-1.5629E+00					1.18E+04	
			1063.66	-1.563E+00	?(	2.879E+00	8.60E+01	7.45E+01 G
			569.70	0.000E+00	+	1.627E+00	1.00E+03	9.77E+01 G
U-235	N	3.1942E+00					2.57E+11	
			143.79	0.000E+00	(	2.402E+01	1.00E+03	1.10E+01 G
			205.33	-7.808E+00	+	2.965E+01	1.49E+02	5.01E+00 G
			163.38	1.009E+01	(	3.169E+01	9.44E+01	5.08E+00 G
			185.72	-1.650E+00	+ P	4.020E+00	1.03E+02	5.40E+01 GA
BI-214	N	7.9388E+01					5.84E+05	
			609.31	7.939E+01	(P	3.025E+00	3.79E+00	4.61E+01 G
			1120.29	7.118E+01	-	1.155E+01	8.89E+00	1.51E+01 G
			1764.49	1.009E+02	+	4.376E+00	7.67E+00	1.54E+01 G
BI-210M	T	1.0600E+00					1.10E+09	
			265.83	9.508E-01	?(	2.935E+00	9.24E+01	5.00E+01 G
			304.90	1.255E+00	(	3.072E+00	8.58E+01	2.80E+01 G
AC-228	N	1.6225E+01					2.10E+03	
			911.07	1.586E+01	(	4.998E+00	1.78E+01	2.90E+01 G
			968.97	2.954E+01	+	9.921E+00	1.40E+01	1.75E+01 G
			338.32	1.711E+01	(	8.901E+00	2.29E+01	1.20E+01 G
			93.35	1.073E+01	-	4.828E+01	1.35E+02	5.56E+00 XA
TH-227	N	2.5384E+00					7.95E+03	
			256.24	-6.188E+00	?(	2.168E+01	1.37E+02	7.00E+00 G
			235.97	4.351E+00	(	2.574E+01	1.78E+02	1.23E+01 G
			50.14	7.388E+00	?(	3.892E+01	1.58E+02	8.00E+00 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-229	N	1.2464E+01					2.68E+06	
			193.51	8.041E+00	?(	3.089E+01	1.50E+02	4.40E+00 G
			210.85	1.897E+01	?(	4.956E+01	1.03E+02	2.99E+00 G
TH-234	N	3.8877E+00					1.63E+12	
			92.59	2.818E+00	?(P	4.817E+01	5.12E+02	5.58E+00 G
			63.29	5.455E+00	?(P	6.812E+01	3.73E+02	3.81E+00 G
PA-231	N	-2.1146E+01					1.20E+07	
			302.65	-2.115E+01	&(	1.530E+02	2.17E+02	2.88E+00 G
			300.07	-2.454E+01	+	1.808E+02	2.21E+02	2.46E+00 G
PA-234	N	2.3470E+00					1.63E+12	
			131.29	-2.514E-01	%(	1.144E+01	1.36E+03	1.80E+01 G
			946.02	4.619E+00	?(	1.271E+01	1.22E+02	1.34E+01 G
			569.47	0.000E+00	-	1.939E+01	1.00E+03	8.20E+00 G
			883.24	4.048E+00	?(	2.599E+01	1.87E+02	9.60E+00 G
			880.53	1.357E+01	&	3.798E+01	8.36E+01	6.00E+00 GA
PA-234M	N	7.2929E+01					1.63E+12	
			1001.00	0.000E+00	&(	3.383E+02	1.00E+03	8.37E-01 G
			766.41	2.806E+02	?(	9.242E+02	9.82E+01	2.94E-01 G
AM-241	T	-2.0209E+00					1.58E+05	
			59.54	-2.021E+00	?(	7.774E+00	1.16E+02	3.59E+01 G
Cs-136	F	1.0089E+00					1.30E+01	
			818.50	8.459E-01	?(	2.463E+00	8.70E+01	1.00E+02 G
			1048.07	1.213E+00	?(	2.872E+00	7.13E+01	8.00E+01 G
			340.57	-1.567E+00	&	6.168E+00	1.18E+02	4.69E+01 G
Np-239	T	1.5161E+00					2.36E+00	
			103.70	-2.172E+00	+	1.063E+01	1.47E+02	2.40E+01 X
			106.13	1.516E+00	(	4.315E+00	8.54E+01	2.27E+01 G
			99.50	-3.481E+00	+	1.673E+01	1.44E+02	1.50E+01 X
Nd-147		3.5996E+00					1.11E+01	
			531.00	3.600E+00	?(	1.180E+01	1.37E+02	1.30E+01 G
			91.10	0.000E+00	-	9.752E+00	1.00E+03	2.83E+01 G
TL-210	N	4.3475E-01					5.84E+05	
			799.60	4.347E-01	?(	2.510E+00	1.69E+02	9.90E+01 G
			296.00	-7.535E-01	+	5.663E+00	2.26E+02	7.90E+01 G
			1313.00	1.140E+00	?	8.515E+00	3.39E+02	2.10E+01 GA

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

Kr-85    I   1.7138E+02                                      3.92E+03
                            513.98 1.714E+02 ?(  5.495E+02 9.59E+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 ***************
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Nuclide	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	Activity
TH-227	50.14	666.	23.	0.013	157.74	7.388E+00
AM-241	59.54	887.	-37.	-0.020	115.68	-2.021E+00
BA-133	80.99	2271.	-29.	-0.016	235.07	-1.353E+00
EU-155	86.54	1529.	-39.	-0.022	141.95	-1.993E+00
Gd-153	97.50	1292.	-35.	-0.019	147.59	-1.743E+00
Gd-153	103.20	1233.	-35.	-0.019	143.34	-2.391E+00
EU-155	105.31	1070.	33.	0.018	143.00	2.293E+00
EU-152	121.78	505.	21.	0.012	152.90	1.096E+00
CO-57	122.06	396.	-22.	-0.013	126.76	-3.921E-01
EU-154	123.10	439.	6.	0.003	495.54	2.196E-01
CE-144	133.54	1260.	-34.	-0.019	148.21	-4.654E+00
CE-141	145.44	1149.	33.	0.018	146.72	1.058E+00

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
Ba-140	162.66	646.	-34.	-0.019	107.06	-8.844E+00		
U-235	163.38	430.	32.	0.018	94.44	1.009E+01		
Cf-251	176.60	315.	-15.	-0.009	218.16	-1.517E+00		
U-235	185.72	695.	-52.	-0.029	103.05	-1.650E+00		P
TH-229	193.51	253.	20.	0.011	150.46	8.041E+00		
U-235	205.33	282.	-21.	-0.012	148.93	-7.808E+00		
TH-229	210.85	271.	30.	0.017	102.90	1.897E+01		
Cf-251	227.00	235.	16.	0.009	177.20	5.074E+00		
TH-227	235.97	1104.	27.	0.015	177.54	4.351E+00		
EU-152	244.69	1141.	15.	0.008	325.12	4.009E+00		
TH-227	256.24	216.	-20.	-0.011	137.13	-6.188E+00		
Cd-113m	263.70	166.	21.	0.012	90.55	7.508E+03		
Hg-203	279.20	272.	-12.	-0.007	188.55	-3.481E-01		
I-131	284.30	224.	-30.	-0.016	96.28	-1.109E+01		
TL-210	296.00	1594.	-25.	-0.014	225.67	-7.535E-01		
PA-231	300.07	1544.	-25.	-0.014	221.32	-2.454E+01		
PA-233	300.18	1519.	-25.	-0.014	219.47	-9.740E+00		
PA-231	302.65	1494.	-25.	-0.014	217.17	-2.115E+01		
BA-133	302.85	1468.	-12.	-0.007	435.83	-1.639E+00		
CR-51	320.08	1428.	20.	0.011	268.14	5.059E+00		
La-140	328.76	222.	22.	0.012	98.35	2.775E+00		
Cf-249	333.44	232.	22.	0.012	101.60	3.627E+00		
Cs-136	340.57	528.	-28.	-0.015	118.00	-1.567E+00		
EU-152	344.29	500.	-28.	-0.016	114.56	-2.806E+00		
HF-181	345.83	438.	-27.	-0.015	109.51	-4.856E+00		
BA-133	356.00	1378.	-26.	-0.014	206.58	-1.122E+00		
BA-133	383.84	266.	17.	0.010	136.47	5.548E+00		
SN-113	391.69	250.	21.	0.012	109.86	9.533E-01		
AG-108M	433.94	92.	-7.	-0.004	270.93	-2.455E-01		
PM-146	453.88	96.	-19.	-0.011	103.54	-9.597E-01		
SB-125	463.37	147.	10.	0.006	168.64	3.291E+00		
Ir-192	468.06	168.	-13.	-0.007	143.70	-8.442E-01		
BE-7	477.60	196.	19.	0.011	104.69	6.289E+00		
HF-181	482.00	257.	-22.	-0.012	103.75	-9.524E-01		
La-140	487.02	189.	19.	0.011	104.81	1.446E+00		
RU-103	497.05	72.	-2.	-0.001	833.67	-7.736E-02		
RH-106	511.86	147.	42.	0.023	43.81	7.509E+00		
Kr-85	513.98	182.	20.	0.011	95.88	1.714E+02		
Nd-147	531.00	69.	13.	0.007	137.09	3.600E+00		
Ba-140	537.26	113.	-24.	-0.013	93.70	-3.621E+00		
CS-134	563.24	48.	16.	0.009	93.24	7.257E+00		
CS-134	569.32	61.	6.	0.004	178.40	1.602E+00		
SB-125	600.50	1093.	15.	0.009	305.42	3.480E+00		
SB-124	602.73	1108.	15.	0.009	307.07	6.352E-01		
CS-134	604.71	1325.	-22.	-0.012	231.61	-9.300E-01		
RU-103	610.30	1303.	-22.	-0.012	228.82	-1.596E+01		
AG-108M	614.28	1281.	-22.	-0.012	226.26	-1.029E+00		
PM-144	618.06	1258.	-23.	-0.013	223.72	-9.393E-01		

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
RH-106	621.92	1236.	-23.	-0.013	221.14	-9.442E+00	
SB-125	635.89	35.	11.	0.006	110.13	4.229E+00	
I-131	636.97	73.	-16.	-0.009	78.17	-9.625E+00	
AG-110M	657.76	47.	14.	0.008	72.69	6.522E-01	
CS-137	661.66	161.	-23.	-0.013	80.22	-1.182E+00	
PM-144	696.54	79.	-14.	-0.008	134.44	-6.529E-01	
NB-94	702.63	79.	-11.	-0.006	169.34	-5.253E-01	
SB-124	722.79	61.	15.	0.008	78.88	6.370E+00	
AG-108M	722.94	76.	15.	0.008	87.37	7.547E-01	
PM-146	735.72	56.	-14.	-0.008	116.50	-2.919E+00	
PM-146	747.16	42.	-2.	-0.001	691.01	-2.791E-01	
ZR-95	756.73	42.	2.	0.001	691.01	1.758E-01	
AG-110M	763.94	257.	-36.	-0.020	65.54	-7.736E+00	
NB-95	765.79	258.	-33.	-0.018	71.35	-1.588E+00	
PA-234M	766.41	132.	17.	0.009	98.19	2.806E+02	
BI-212	785.42	47.	12.	0.007	120.90	4.739E+01	
CS-134	795.87	85.	17.	0.010	78.82	1.008E+00	
TL-210	799.60	102.	9.	0.005	169.17	4.347E-01	
CS-134	801.95	150.	-21.	-0.011	86.74	-1.185E+01	
CO-58	810.78	104.	8.	0.005	173.50	4.301E-01	
Cs-136	818.50	97.	17.	0.009	86.96	8.459E-01	
MN-54	834.85	51.	-13.	-0.007	117.23	-6.855E-01	
Co-56	846.77	45.	8.	0.004	187.71	4.157E-01	
PA-234	880.53	74.	15.	0.008	83.57	1.357E+01	
PA-234	883.24	89.	7.	0.004	187.27	4.048E+00	
Sc-46	889.28	131.	-18.	-0.010	91.41	-9.850E-01	
AG-110M	937.49	165.	-34.	-0.019	84.51	-5.552E+00	
PA-234	946.02	35.	11.	0.006	122.02	4.619E+00	
EU-152	964.11	94.	10.	0.006	135.13	4.075E+00	
EU-154	996.33	81.	-14.	-0.008	92.82	-7.901E+00	
EU-154	1004.77	151.	-22.	-0.012	81.16	-7.238E+00	
Co-56	1037.84	59.	-14.	-0.008	130.23	-5.823E+00	
Cs-136	1048.07	57.	16.	0.009	71.26	1.213E+00	
RH-106	1050.36	84.	-5.	-0.003	247.33	-2.076E+01	
BI-207	1063.66	48.	-19.	-0.011	86.02	-1.563E+00	
Ga-68	1077.40	27.	3.	0.002	356.37	7.324E+00	
EU-152	1112.07	277.	-18.	-0.010	130.52	-8.510E+00	
CO-60	1173.24	37.	-6.	-0.004	222.86	-4.180E-01	
Ta-182	1189.05	32.	6.	0.003	218.16	2.467E+00	
Ta-182	1221.41	40.	10.	0.006	146.29	2.601E+00	
Co-56	1238.28	126.	-18.	-0.010	89.79	-1.906E+00	
NA-22	1274.53	17.	12.	0.007	56.23	8.478E-01	
EU-154	1274.54	29.	3.	0.002	266.73	5.845E-01	
TL-210	1313.00	23.	3.	0.002	339.41	1.140E+00	
CO-60	1332.50	17.	6.	0.003	166.25	4.360E-01	
AG-110M	1384.30	11.	10.	0.006	82.66	3.177E+00	
EU-152	1408.00	30.	16.	0.009	84.07	5.944E+00	
La-140	1596.21	54.	-24.	-0.013	77.66	-2.086E+00	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
SB-124	1690.98	0.	21.	0.012	21.82	3.874E+00	
Co-56	1771.35	194.	-12.	-0.007	168.51	-7.028E+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	6.2885E+00	6.2885E+00	1.047E+02%	2.21E+01
NA-22	#A	8.4783E-01	8.4783E-01	5.623E+01%	1.54E+00
K-40		3.2504E+02	3.2504E+02	5.103E+00%	1.43E+01
Sc-46	#A	-9.8500E-01	-9.8501E-01	9.141E+01%	3.01E+00
CR-51	#A	5.0586E+00	5.0587E+00	2.681E+02%	4.52E+01
MN-54	#A	-6.8550E-01	-6.8550E-01	1.172E+02%	1.86E+00
FE-59	#	3.5572E+00	3.5572E+00	3.346E+01%	2.37E+00
Co-56	#A	4.1572E-01	4.1572E-01	1.877E+02%	1.77E+00
CO-57	#A	-3.9212E-01	-3.9212E-01	1.268E+02%	1.66E+00
CO-58	#A	4.3011E-01	4.3011E-01	1.735E+02%	2.55E+00
CO-60	#A	4.3599E-01	4.3599E-01	1.662E+02%	1.59E+00
ZN-65	#A	1.9558E+00	1.9558E+00	1.435E+02%	9.44E+00
NB-94	#A	-5.2532E-01	-5.2532E-01	1.693E+02%	2.05E+00
ZR-95	#A	1.7584E-01	1.7584E-01	6.910E+02%	2.89E+00
NB-95	#A	-1.5883E+00	-1.5883E+00	7.135E+01%	3.75E+00
RU-103	#A	-7.7361E-02	-7.7362E-02	8.337E+02%	1.63E+00
RH-106	#A	-9.4419E+00	-9.4419E+00	2.211E+02%	6.96E+01
AG-108M	#A	2.5561E-01	2.5561E-01	8.737E+01%	1.66E+00
AG-110M	#A	7.2491E-01	7.2491E-01	7.269E+01%	3.57E+00
SN-113	#A	9.5330E-01	9.5331E-01	1.099E+02%	3.51E+00
SB-124	#A	2.0171E+00	2.0171E+00	2.182E+01%	6.52E+00
SB-125	#A	2.1314E+00	2.1314E+00	1.101E+02%	5.33E+00
I-131	#A	6.7973E-02	6.7977E-02	1.075E+03%	1.83E+00
Gd-153	#A	-1.7433E+00	-1.7433E+00	1.476E+02%	8.56E+00
Ga-68	#A	7.2593E+00	7.3239E+00	3.564E+02%	5.88E+01
Tc-99m	#A	0.0000E+00	0.0000E+00	1.000E+03%	3.02E+00
BA-133	#A	-1.1221E+00	-1.1221E+00	2.066E+02%	7.72E+00
CS-134	#A	1.5694E+00	1.5694E+00	7.206E+01%	2.65E+00
CS-137	#A	-1.1817E+00	-1.1817E+00	8.022E+01%	3.16E+00
CE-139	#A	-2.1306E-03	-2.1306E-03	3.073E+04%	2.21E+00
Ba-140	#A	-3.6210E+00	-3.6212E+00	9.370E+01%	7.97E+00
La-140	#A	-2.0858E+00	-2.0859E+00	7.766E+01%	3.25E+00
CE-141	#A	1.0578E+00	1.0578E+00	1.467E+02%	5.16E+00
CE-144	#A	-4.6543E+00	-4.6543E+00	1.482E+02%	2.29E+01
PM-144	#A	-6.5286E-01	-6.5286E-01	1.344E+02%	2.01E+00
EU-152	#A	2.3881E+00	2.3881E+00	1.279E+02%	5.61E+00
EU-154	#A	3.8861E-01	3.8861E-01	2.667E+02%	3.67E+00
EU-155	#A	2.2926E+00	2.2927E+00	1.430E+02%	1.09E+01

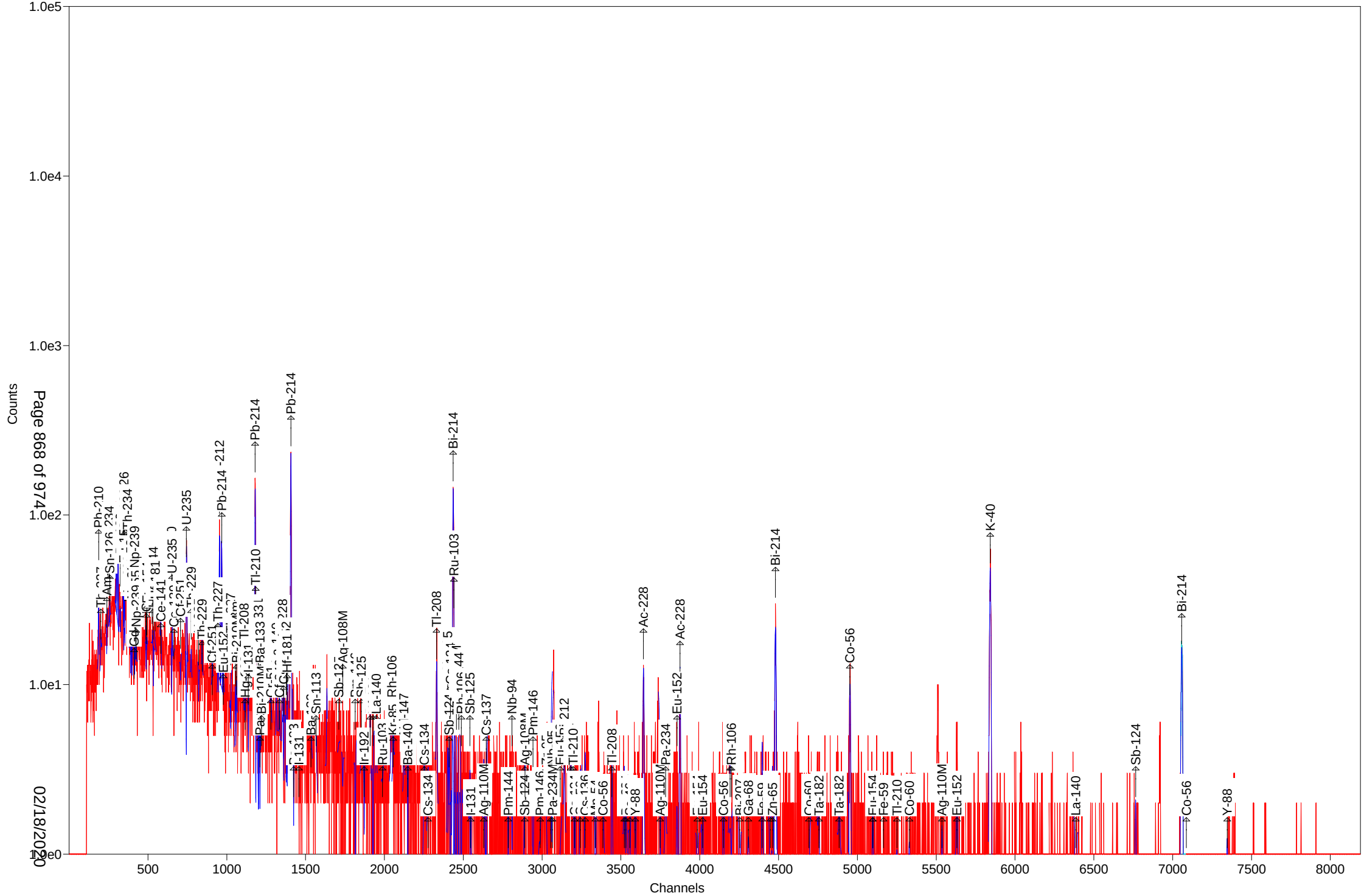
HF-181 #A	-9.5243E-01	-9.5244E-01	1.038E+02%	3.30E+00
Ta-182 #A	1.4108E+00	1.4108E+00	1.463E+02%	1.42E+01
Hg-203 #A	-3.4808E-01	-3.4808E-01	1.886E+02%	2.21E+00
TL-208	3.0612E+00	3.0612E+00	2.953E+01%	2.00E+00
PM-146 #A	-9.5967E-01	-9.5967E-01	1.035E+02%	2.44E+00
Y-88 #	1.2411E+00	1.2411E+00	2.774E+01%	7.04E-01
Cd-113m#A	7.5078E+03	7.5078E+03	9.055E+01%	2.27E+04
Cd-109 #A	0.0000E+00	0.0000E+00	1.000E+03%	7.36E+01
Cf-251 #A	-1.5173E+00	-1.5173E+00	2.182E+02%	8.46E+00
Cf-249 #A	6.9018E-01	6.9018E-01	1.016E+02%	3.58E+00
Sn-126 A	6.2635E+00	6.2635E+00	1.329E+02%	2.77E+01
PB-210	7.5987E+01	7.5987E+01	2.715E+01%	5.25E+01
PB-212	1.3938E+01	1.3938E+01	8.222E+00%	2.81E+00
PB-214	8.0661E+01	8.0661E+01	3.133E+00%	3.33E+00
BI-207 #A	-1.5629E+00	-1.5629E+00	8.602E+01%	2.88E+00
BI-212 #A	0.0000E+00	0.0000E+00	1.000E+03%	2.91E+01
U-235 #A	3.1942E+00	3.1942E+00	9.444E+01%	2.40E+01
BI-214	7.9388E+01	7.9388E+01	3.789E+00%	3.03E+00
BI-210M A	1.0600E+00	1.0600E+00	6.304E+01%	2.93E+00
AC-228	1.6224E+01	1.6225E+01	1.451E+01%	5.00E+00
TH-227 #A	2.5384E+00	2.5384E+00	9.141E+01%	2.17E+01
TH-229 #A	1.2464E+01	1.2464E+01	9.114E+01%	3.09E+01
TH-234 #A	3.8877E+00	3.8877E+00	3.167E+02%	4.82E+01
PA-231 #A	-2.1146E+01	-2.1146E+01	2.172E+02%	1.53E+02
PA-233 #A	0.0000E+00	0.0000E+00	1.000E+03%	1.24E+01
PA-234 #A	2.3470E+00	2.3470E+00	1.220E+02%	1.14E+01
PA-234M#A	7.2929E+01	7.2929E+01	9.819E+01%	3.38E+02
AM-241 #A	-2.0209E+00	-2.0209E+00	1.157E+02%	7.77E+00
Np-237 #A	0.0000E+00	0.0000E+00	1.000E+03%	2.26E+01
Ir-192 #A	0.0000E+00	0.0000E+00	7.071E+02%	5.17E+00
Cs-136 #A	1.0089E+00	1.0089E+00	5.621E+01%	2.46E+00
Np-239 A	1.5158E+00	1.5161E+00	8.539E+01%	4.32E+00
Nd-147 #A	3.5995E+00	3.5996E+00	1.371E+02%	1.18E+01
TL-210 #A	4.3475E-01	4.3475E-01	1.692E+02%	2.51E+00
Kr-85 #A	1.7138E+02	1.7138E+02	9.588E+01%	5.50E+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) 5.943E+02 Bq/Sample
Total Decayed Activity (25.1 to 1999.1 keV) 5.9430310E+02 Bq/Sample

453329_Gamma_160-36593-A-18-B. 12_Gamma_20193740.spc.



Daily Checks

Test America
St. Louis
Quality Control Check

Spectrum: 5_20191227001_QCAsLeft
Description: Quality control Check (QC Source 'A') Post Stabilization
Acquired: 12/27/2019 5:36:33 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	59.59	59.79	60.04	PASS
FWHM	0.74	0.00	0.00	0.72	1.84	1.94	PASS
ActivityDiff	636.60	-5.00	-4.00	0.32	4.00	5.00	PASS
QA-662							
FWHM	1.36	0.00	0.00	1.37	3.06	3.16	PASS
ActivityDiff	596.80	-5.00	-4.00	-0.05	4.00	5.00	PASS
QA-1332							
Channel	5330.00	5327.00	5328.00	5329.00	5332.00	5333.00	PASS
Energy	1332.51	1331.76	1332.01	1332.30	1333.01	1333.26	PASS
FWHM	1.90	0.00	0.00	1.98	4.10	4.20	PASS
ActivityDiff	1164.20	-5.00	-4.00	-1.56	4.00	5.00	PASS

Analyst: kody Saulters Reviewer: kody Saulters

Test America
St. Louis
Background Check

Spectrum: 5_20191227002_BG
Description: Background Contamination Check
Acquired: 12/27/2019 5:59:00 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	1.46	1.55	1.60	PASS

Analyst: Caleb Quinn Reviewer: kody Saulters

Test America
St. Louis
Quality Control Check

Spectrum: 8_20191227001_QCAsLeft
Description: Quality control Check (QC Source 'D') Post Stabilization
Acquired: 12/27/2019 5:37:51 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	238.00	239.00	240.00	PASS
Energy	59.54	59.04	59.29	59.56	59.79	60.04	PASS
FWHM	1.10	0.00	0.00	1.29	2.20	2.30	PASS
ActivityDiff	650.60	-5.00	-4.00	0.35	4.00	5.00	PASS
QA-662							
FWHM	1.53	0.00	0.00	1.67	3.23	3.33	PASS
ActivityDiff	609.90	-5.00	-4.00	3.44	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	1332.64	1333.01	1333.26	PASS
FWHM	1.90	0.00	0.00	1.84	4.10	4.20	PASS
ActivityDiff	1189.70	-5.00	-4.00	2.65	4.00	5.00	PASS

Analyst: kody Saulters Reviewer: kody Saulters

Test America
St. Louis
Background Check

Spectrum: 8_20191227002_BG
Description: Background Contamination Check
Acquired: 12/27/2019 5:56:22 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	1.57	1.68	1.74	PASS

Analyst: Caleb Quinn Reviewer: kody Saulters

Test America
St. Louis
Background Check

Spectrum: 9_20191227001_BG
Description: Background Contamination Check
Acquired: 12/27/2019 5:04:11 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	1.82	2.14	2.26	PASS

Analyst: kody Saulters Reviewer: kody Saulters

Test America
St. Louis
Quality Control Check

Spectrum: 9_20191227002_QCAsLeft
Description: Quality control Check (QC Source 'E') Post Stabilization
Acquired: 12/27/2019 6:10:52 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	0.93	2.18	2.28	PASS
ActivityDiff	649.44	-5.00	-4.00	0.05	4.00	5.00	PASS
QA-662							
FWHM	1.62	0.00	0.00	1.49	3.32	3.42	PASS
ActivityDiff	607.56	-5.00	-4.00	-0.82	4.00	5.00	PASS
QA-1332							
Channel	5330.00	5327.00	5328.00	5329.60	5332.00	5333.00	PASS
Energy	1332.51	1331.76	1332.01	1332.31	1333.01	1333.26	PASS
FWHM	2.12	0.00	0.00	1.95	4.32	4.42	PASS
ActivityDiff	1191.31	-5.00	-4.00	-2.09	4.00	5.00	PASS

Analyst: Caleb Quinn Reviewer: kody Saulters

Test America
St. Louis
Background Check

Spectrum: 12_20191227001_BG
Description: Background Contamination Check
Acquired: 12/27/2019 5:05:29 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	2.00	2.07	2.10	PASS

Analyst: kody Saulters Reviewer: kody Saulters

Test America
St. Louis
Quality Control Check

Spectrum: 12_20191227002_QCAsLeft
Description: Quality control Check (QC Source 'H') Post Stabilization
Acquired: 12/27/2019 6:48:07 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	237.90	239.00	240.00	PASS
Energy	59.54	59.04	59.29	59.58	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	-1.16	4.00	5.00	PASS
QA-662							
FWHM	1.48	0.00	0.00	1.46	3.18	3.28	PASS
ActivityDiff	659.00	-5.00	-4.00	0.36	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	2.00	0.00	0.00	1.97	4.20	4.30	PASS
ActivityDiff	1274.00	-5.00	-4.00	-0.51	4.00	5.00	PASS

Analyst: Caleb Quinn 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

(Page 1 of 8)

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 Centroid Channel	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

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

```
     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
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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	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
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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	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

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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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TestAmerica Spectrum name: 8_TunaCan2nd_20120697.An1

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

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

Total Activity (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

```
     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
                                      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	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	-

ORTEC g v - i (3263) Env32 G53W4.25 6/14/2012 1:20:45 PM Page 3

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.

ORTEC g v - i (3263) Env32 G53W4.25 6/14/2012 1:20:45 PM Page 4

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   1.3971E+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

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Monthly Backgrounds

Test America
St. Louis
Background Check

Spectrum: 5_20191206006_BGLong
Description: Background Long PBC Count
Acquired: 12/6/2019 6:41:26 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	1.48	1.55	1.60	PASS

Analyst: Shiloh Smith Reviewer: Shiloh Smith

(Page 1 of 8)

Sample description
Background Long PBC Count

Spectrum Filename: C:\User\SPC\Det5\5_20191206006_BGLong.An1

Acquisition information
Start time: 12/6/2019 6:41:26 PM
Live time: 72000
Real time: 72388
Dead time: 0.54 %
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

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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: 0.1147

***** 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	506.	11.54	0.73	5.683E-02	46.54	4.250	2.914E+00	PB210
59.65	204.	22.12	0.74	7.435E-02	59.54	35.900	1.062E-01	AM241
63.29	650.	7.95	0.78	7.923E-02	63.29	3.810	2.993E+00	TH234
74.89	237.	16.62	0.81	9.478E-02				
77.10	347.	10.66	0.81	9.774E-02				
92.53	766.	7.13	1.02	1.129E-01	92.59	5.584	1.687E+00	TH234
					93.35	5.561	1.693E+00	AC228
185.79	406.	11.97	0.92	9.606E-02	185.72	54.000	1.086E-01	U235
					185.99	3.280	1.788E+00	Ra226
238.61	187.	16.74	0.98	8.325E-02	238.63	43.300	7.204E-02	PB212
241.95	162.	19.09	0.98	8.244E-02	240.99	4.100	6.645E-01	RA224
					242.00	7.430	3.678E-01	PB214
295.27	319.	12.80	1.10	6.949E-02	295.09	19.300	3.302E-01	PB214
351.87	448.	11.72	0.92	5.575E-02	351.93	37.600	2.969E-01	PB214
609.36	460.	8.56	1.40	3.199E-02	609.31	46.090	4.328E-01	BI214
					610.30	5.750	3.476E+00	RU103
661.71	181.	14.74	1.19	2.860E-02	661.66	85.210	1.032E-01	CS137
898.56	82.	25.67	1.60	2.045E-02	898.04	93.700	5.909E-02	y88
1120.30	111.	19.82	0.72	1.646E-02	1120.29	15.100	6.220E-01	BI214
					1120.55	99.987	9.396E-02	Sc46
1460.76	113.	17.54	1.82	1.300E-02	1460.83	10.670	1.132E+00	K40
1764.75	129.	18.85	1.72	1.105E-02	1764.49	15.400	1.055E+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	
299.19	74.87	659.	237.	2.503E+03	16.62	0.813	-	D
308.03	77.08	512.	347.	3.554E+03	10.66	0.815	-	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: 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	185.91	46.60	792.	506.	0.007	11.54	0.733
AM-241	238.18	59.65	576.	204.	0.003	22.12	0.737
TH-234	252.74	63.29	578.	650.	0.009	7.95	0.779s
TH-234	369.81	92.53	665.	766.	0.011	7.13	1.019s
Ra-226	743.11	185.79	558.	406.	0.006	11.97	0.920
PB-212	954.64	238.63	396.	187.	0.003	16.76	0.978D
PB-214	968.10	242.00	398.	162.	0.002	19.16	0.981D
PB-214	1181.31	295.27	385.	319.	0.004	12.80	1.098
PB-214	1407.83	351.87	495.	448.	0.006	11.72	0.920
BI-214	2438.12	609.36	242.	460.	0.006	8.56	1.401
CS-137	2647.57	661.71	139.	181.	0.003	14.74	1.194
y-88	3594.92	898.56	86.	82.	0.001	25.67	1.603
BI-214	4481.57	1120.30	87.	111.	0.002	19.82	0.721s
K-40	5842.48	1460.76	56.	113.	0.002	17.54	1.818
BI-214	7057.09	1764.75	54.	129.	0.002	18.85	1.722s

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
K-40	N	1.1316E+00				4.66E+11	
			1460.83	1.132E+00	(	3.764E-01 1.75E+01 1.07E+01	G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

CS-137   I   1.0324E-01                                      1.10E+04
                          661.66 1.032E-01  (  3.283E-02 1.47E+01 8.52E+01 G

y-88     F   5.9087E-02                                      1.07E+02
                          898.04 5.909E-02  (  3.320E-02 2.57E+01 9.37E+01 G
                         1836.06 0.000E+00 %   2.860E-02 6.94E+01 9.92E+01 G

PB-210   N   2.9136E+00                                      8.14E+03
                           46.54 2.914E+00  (  7.707E-01 1.15E+01 4.25E+00 G

PB-212   N   7.1950E-02                                      6.98E+02
                          238.63 7.195E-02  (  3.680E-02 1.68E+01 4.33E+01 G
                          300.03 0.000E+00 %   3.461E-01 1.66E+02 3.28E+00 GA

PB-214   N   3.0820E-01                                      5.84E+05
                          351.93 2.969E-01  (  7.051E-02 1.17E+01 3.76E+01 G
                          295.09 3.302E-01  (  9.744E-02 1.28E+01 1.93E+01 G
                          242.00 3.665E-01     2.171E-01 1.92E+01 7.43E+00 GA

BI-214   N   4.3280E-01                                      5.84E+05
                          609.31 4.328E-01  (  7.076E-02 8.56E+00 4.61E+01 G
                         1120.29 6.220E-01 +   2.575E-01 1.98E+01 1.51E+01 G
                         1764.49 1.055E+00 +   3.007E-01 1.89E+01 1.54E+01 G

TH-234   N   2.9928E+00                                      1.63E+12
                           63.29 2.993E+00 *(  5.277E-01 7.95E+00 3.81E+00 G
                           92.59 1.687E+00 -   2.707E-01 7.13E+00 5.58E+00 G

Ra-226       1.7884E+00                                      5.84E+05
                          185.99 1.788E+00  (  4.972E-01 1.20E+01 3.28E+00 G

AM-241   T   1.0619E-01                                      1.58E+05
                           59.54 1.062E-01  (  5.974E-02 2.21E+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.
```

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& - 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	<	1.3279E-01		
NA-22	<	3.2700E-02		
K-40		1.1316E+00	1.7544E+01%	3.764E-01
Sc-46	<	2.4742E-02		
CR-51	<	1.2591E-01		
MN-54	<	2.5199E-02		
FE-59	<	4.9586E-02		
Co-56	<	2.4403E-02		
CO-57	<	1.5761E-02		
CO-58	<	2.2156E-02		
CO-60	<	3.3080E-02		
ZN-65	<	7.0081E-02		
NB-94	<	2.3387E-02		
ZR-95	<	4.2965E-02		
NB-95	<	2.9559E-02		
RU-103	<	1.6760E-02		
RH-106	<	3.6323E-01		
AG-108M	<	1.6759E-02		
AG-110M	<	4.1284E-02		
SN-113	<	2.4894E-02		
SB-124	<	2.3345E-02		
SB-125	<	5.1843E-02		

I-131	<	1.7685E-02		
BA-133	<	3.8297E-02		
CS-134	<	2.9939E-02		
CS-137		1.0324E-01	1.4743E+01%	3.283E-02
CE-139	<	1.7250E-02		
Ba-140	<	8.9143E-02		
La-140	<	3.2313E-02		
CE-141	<	2.4030E-02		
CE-144	<	8.0138E-02		
PM-144	<	2.4725E-02		
EU-152	<	7.1894E-02		
EU-154	<	2.7412E-01		
EU-155	<	4.1262E-02		
HF-181	<	2.0206E-02		
Ta-182	<	1.1154E-01		
Hg-203	<	2.8232E-02		
TL-208	<	2.3419E-02		
pm-146	<	6.5882E-02		
y-88		5.9087E-02	2.5672E+01%	3.320E-02
PB-210		2.9136E+00	1.1541E+01%	7.707E-01
PB-212		7.1950E-02	1.6762E+01%	3.680E-02
PB-214		3.0820E-01	8.6773E+00%	7.051E-02
BI-207	<	3.0426E-02		
BI-212	<	2.7482E-01		
BI-214		4.3280E-01	8.5576E+00%	7.076E-02
BI-210M	<	2.2571E-02		
RA-224	<	4.2528E-01		
AC-228	<	9.4073E-02		
TH-227	<	1.2880E-01		
TH-229	<	2.3853E-01		
TH-234	#	2.9928E+00	7.9460E+00%	5.277E-01
PA-231	<	2.8695E-01		
PA-233	<	3.1280E-02		
PA-234	<	4.6071E-02		
PA-234M	<	3.1862E+00		
Ra-226		1.7884E+00	1.1972E+01%	4.972E-01
U-235	<	8.0925E-02		
AM-241		1.0619E-01	2.2115E+01%	5.974E-02
Np-237	<	1.0691E-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  2000.8 keV)     9.908E+00  DPS
```

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Test America
St. Louis
Background Check

Spectrum: 8_20191206007_BGLong
Description: Background Long PBC Count
Acquired: 12/6/2019 6:49:15 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	1.57	1.68	1.74	PASS

Analyst: Shiloh Smith Reviewer: kody Saulters

(Page 1 of 7)

Sample description
Background Long PBC Count

Spectrum Filename: C:\User\SPC\Det8\8_20191206007_BGLong.An1

Acquisition information

Start time:	12/6/2019 6:49:15 PM
Live time:	72000
Real time:	73675
Dead time:	2.27 %
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

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: 0.0871

***** 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
59.48	382.	10.86	1.02	8.688E-02	59.54	35.900	1.699E-01	AM241
63.35	887.	5.44	1.03	9.259E-02	63.29	3.810	3.498E+00	TH234
92.69	2074.	4.57	1.43	1.295E-01	92.59	5.584	3.984E+00	TH234
					93.35	5.561	3.998E+00	AC228
143.89	228.	22.75	1.64	1.248E-01	143.79	10.960	2.312E-01	U235
185.86	1005.	6.28	1.34	1.107E-01	185.72	54.000	2.334E-01	U235
					185.99	3.280	3.845E+00	Ra226
205.31	138.	25.33	1.59	1.054E-01	205.33	5.010	3.615E-01	U235
238.73	306.	15.46	1.41	9.639E-02	238.63	43.300	1.017E-01	PB212
295.59	204.	18.76	2.03	8.103E-02	295.09	19.300	1.812E-01	PB214
352.20	264.	16.74	1.16	6.550E-02	351.93	37.600	1.487E-01	PB214
609.29	210.	18.26	1.46	3.750E-02	609.31	46.090	1.688E-01	BI214
					610.30	5.750	1.356E+00	RU103
661.38	268.	13.80	2.09	3.334E-02	661.66	85.210	1.310E-01	CS137
1000.70	84.	24.37	1.75	2.158E-02	1001.00	0.837	6.473E+00	PA234M
1172.95	116.	22.16	2.27	1.834E-02	1173.24	99.900	8.795E-02	CO60
1331.62	106.	26.45	2.83	1.637E-02	1332.50	99.980	8.979E-02	CO60
1460.73	174.	14.51	1.53	1.543E-02	1460.83	10.670	1.471E+00	K40
1764.08	87.	17.18	1.19	1.319E-02	1764.49	15.400	5.927E-01	BI214

No unknown peaks passed sensitivity test.

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	671.	378.	0.005	10.96	1.022D
TH-234	252.96	63.29	767.	887.	0.012	5.55	1.025D
TH-234	370.57	92.69	1338.	2074.	0.029	4.57	1.431s
U-235	575.38	143.89	669.	228.	0.003	22.75	1.643s
U-235	742.71	185.72	1099.	888.	0.012	5.23	1.119D
U-235	821.08	205.31	380.	138.	0.002	25.33	1.593s
PB-212	954.77	238.73	525.	306.	0.004	15.46	1.411s
PB-214	1182.23	295.59	360.	204.	0.003	18.76	2.034s
PB-214	1408.68	352.20	390.	264.	0.004	16.74	1.156s
BI-214	2437.09	609.29	280.	210.	0.003	18.26	1.459
CS-137	2645.45	661.38	220.	268.	0.004	13.80	2.092s
PA-234M	4002.79	1000.70	88.	84.	0.001	24.37	1.752
CO-60	4691.84	1172.95	99.	116.	0.002	22.16	2.275s
CO-60	5326.51	1331.62	99.	106.	0.001	26.45	2.828s
K-40	5842.99	1460.73	54.	174.	0.002	14.51	1.525s
BI-214	7056.41	1764.08	21.	87.	0.001	17.18	1.191s

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	MDA Value DPS	COMMENTS
K-40	N	1.4710E+00				4.66E+11	
			1460.83	1.471E+00	*(	3.109E-01 1.45E+01 1.07E+01	G
CO-60	F	8.8872E-02				1.93E+03	
			1332.50	8.979E-02	(	4.167E-02 2.64E+01 1.00E+02	G
			1173.24	8.795E-02	(	3.721E-02 2.22E+01 9.99E+01	G
CS-137	I	1.3102E-01				1.10E+04	
			661.66	1.310E-01	*(	3.511E-02 1.38E+01 8.52E+01	G
PB-212	N	1.0172E-01				6.98E+02	
			238.63	1.017E-01	*(	3.645E-02 1.55E+01 4.33E+01	G
			300.03	0.000E+00	&	4.607E-01 0.00E+00 3.28E+00	GA
PB-214	N	1.5971E-01				5.84E+05	
			351.93	1.487E-01	*(	5.336E-02 1.67E+01 3.76E+01	G
			295.09	1.812E-01	(	8.093E-02 1.88E+01 1.93E+01	G
			242.00	0.000E+00		2.016E-01 0.00E+00 7.43E+00	GA

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
BI-214	N 1.6877E-01					5.84E+05	
		609.31	1.688E-01	(	6.484E-02	1.83E+01	4.61E+01 G
		1120.29	0.000E+00	%	1.868E-01	9.80E+01	1.51E+01 G
		1764.49	5.927E-01	+	1.657E-01	1.72E+01	1.54E+01 G
TH-234	N 3.4976E+00					1.63E+12	
		63.29	3.498E+00	(	5.196E-01	5.55E+00	3.81E+00 G
		92.59	3.984E+00	+	3.325E-01	4.57E+00	5.58E+00 G
PA-234M	N 6.4727E+00					1.63E+12	
		1001.00	6.473E+00	?(	3.567E+00	2.44E+01	8.37E-01 G
		766.41	0.000E+00	%	7.305E+00	1.00E+03	2.94E-01 G
U-235	N 2.7210E-01					2.57E+11	
		185.72	2.061E-01	}	3.650E-02	5.23E+00	5.40E+01 GA
		143.79	2.312E-01	@(	1.252E-01	2.27E+01	1.10E+01 G
		205.33	3.615E-01	(	2.458E-01	2.53E+01	5.01E+00 G
		163.38	0.000E+00	%	1.655E-01	3.47E+01	5.08E+00 G
AM-241	T 1.6847E-01					1.58E+05	
		59.54	1.685E-01	(	5.492E-02	1.10E+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
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	<	2.1633E-01		
NA-22	<	1.5332E-02		
K-40	#	1.4710E+00	1.4505E+01%	3.109E-01
Sc-46	<	2.3094E-02		
CR-51	<	1.0542E-01		
MN-54	<	2.2502E-02		
FE-59	<	4.1672E-02		
Co-56	<	2.3119E-02		
CO-57	<	1.3309E-02		
CO-58	<	2.9559E-02		
CO-60		8.8872E-02	1.7251E+01%	4.167E-02
ZN-65	<	2.3587E-02		
NB-94	<	2.1148E-02		
ZR-95	<	3.3848E-02		
NB-95	<	3.3386E-02		
RU-103	<	1.7793E-02		
RH-106	<	3.0493E-01		
AG-108M	<	1.6060E-02		
AG-110M	<	2.9839E-02		
SN-113	<	2.3814E-02		
SB-124	<	2.1336E-02		
SB-125	<	5.2923E-02		
I-131	<	1.6435E-02		
BA-133	<	1.8884E-02		
CS-134	<	2.4447E-02		
CS-137	#	1.3102E-01	1.3801E+01%	3.511E-02
CE-139	<	1.6381E-02		
Ba-140	<	7.0557E-02		
La-140	<	3.0353E-02		
CE-141	<	1.3338E-02		
CE-144	<	9.8788E-02		
PM-144	<	2.2774E-02		
EU-152	<	6.4624E-02		
EU-154	<	2.2883E-01		

EU-155	<	3.7864E-02		
HF-181	<	3.3604E-02		
Ta-182	<	1.3863E-01		
Hg-203	<	1.5111E-02		
TL-208	<	2.3245E-02		
pm-146	<	5.5831E-02		
y-88	<	2.5873E-02		
PB-210	<	4.0297E-01		
PB-212	#	1.0172E-01	1.5456E+01%	3.645E-02
PB-214	#	1.5971E-01	1.2571E+01%	5.336E-02
BI-207	<	2.7422E-02		
BI-212	<	4.1520E-01		
BI-214		1.6877E-01	1.8257E+01%	6.484E-02
BI-210M	<	1.8858E-02		
RA-224	<	3.7677E-01		
AC-228	<	1.0709E-01		
TH-227	<	9.8708E-02		
TH-229	<	2.0560E-01		
TH-234	#	3.4976E+00	5.5477E+00%	5.196E-01
PA-231	<	4.0252E-01		
PA-233	<	2.9282E-02		
PA-234	<	5.7504E-02		
PA-234M	#	6.4727E+00	2.4374E+01%	3.567E+00
U-235		2.7210E-01	1.7021E+01%	1.252E-01
AM-241	#	1.6847E-01	1.0957E+01%	5.492E-02
Np-237	<	9.6457E-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) 1.253E+01 DPS

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Test America
St. Louis
Background Check

Spectrum: 9_20191206007_BGLong
Description: Background Long PBC Count
Acquired: 12/6/2019 6:43:28 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	1.77	2.14	2.26	PASS

Analyst: Shiloh Smith Reviewer: Shiloh Smith

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Sample description
Background Long PBC Count

Spectrum Filename: C:\User\SPC\Det9\9_20191206007_BGLong.An1

Acquisition information
Start time: 12/6/2019 6:43:28 PM
Live time: 72000
Real time: 72056
Dead time: 0.08 %
Detector ID: 9

Detector system
Ge9 S/N09363993

Calibration
Filename: 9_QC.Clb
9_QC-E_79670-334_060211

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: 6/3/2011 12:03:10 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 (37.59keV)
Stop channel: 8000 (1999.34keV)
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. 12 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 0.1621

***** 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
238.67	186.	26.00	1.24	1.228E-01	238.63	43.300	4.856E-02	PB212
295.12	154.	22.60	1.23	1.047E-01	295.09	19.300	1.057E-01	PB214
338.25	187.	28.54	1.82	9.078E-02	338.32	12.010	2.378E-01	AC228
351.63	294.	16.94	1.37	8.650E-02	351.93	37.600	1.255E-01	PB214
510.96	2215.	4.93	2.60	6.208E-02	511.86	20.000	2.481E+00	RH106
582.41	182.	20.02	1.41	5.512E-02	583.02	84.500	5.417E-02	TL208
609.15	372.	14.51	1.75	5.260E-02	609.31	46.090	2.135E-01	BI214
					610.30	5.750	1.714E+00	RU103
911.11	78.	29.03	0.77	3.085E-02	911.16	29.000	1.203E-01	AC228
1120.11	118.	23.33	1.13	2.761E-02	1120.29	15.100	3.931E-01	BI214
					1120.55	99.987	5.937E-02	Sc46
					1121.30	34.900	1.702E-01	Ta182
1460.88	313.	8.81	1.91	2.339E-02	1460.83	10.670	1.740E+00	K40
1764.70	146.	16.38	2.15	2.159E-02	1764.49	15.400	6.111E-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
2043.20	510.96	953.	2215.	3.567E+04	4.93	2.599	-

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

(Page 3 of 7)

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-212	954.13	238.67	615.	186.	0.003	26.00	1.236s
PB-214	1179.87	295.12	372.	154.	0.002	22.60	1.226
AC-228	1352.39	338.25	568.	187.	0.003	28.54	1.822s
PB-214	1405.92	351.63	522.	294.	0.004	16.94	1.373
TL-208	2329.01	582.41	263.	182.	0.003	20.02	1.412
BI-214	2435.95	609.15	464.	372.	0.005	14.51	1.755s
AC-228	3644.06	911.11	122.	78.	0.001	29.03	0.771s
BI-214	4480.37	1120.11	128.	118.	0.002	23.33	1.132s
K-40	5844.23	1460.88	72.	313.	0.004	8.81	1.912
BI-214	7060.48	1764.70	55.	146.	0.002	16.38	2.152

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	1.7398E+00					4.66E+11
			1460.83	1.740E+00	(	2.356E-01 8.81E+00 1.07E+01	G
TL-208	N	5.4171E-02					6.98E+02
			583.02	5.417E-02	(	2.336E-02 2.00E+01 8.45E+01	G
			277.28	0.000E+00	&	1.351E-01 2.96E+02 6.31E+00	G
			860.56	0.000E+00	%	1.607E-01 4.20E+01 1.24E+01	G
PB-212	N	4.8565E-02					6.98E+02
			238.63	4.856E-02	(	3.088E-02 2.60E+01 4.33E+01	G
			300.03	0.000E+00	%	4.563E-01 0.00E+00 3.28E+00	GA
PB-214	N	1.1879E-01					5.84E+05
			351.93	1.255E-01	(	4.670E-02 1.69E+01 3.76E+01	G
			295.09	1.057E-01	?(	6.366E-02 2.26E+01 1.93E+01	G
			242.00	0.000E+00	?	1.858E-01 0.00E+00 7.43E+00	GA
BI-214	N	2.1348E-01					5.84E+05
			609.31	2.135E-01	*(	5.905E-02 1.45E+01 4.61E+01	G
			1120.29	3.931E-01	+	1.846E-01 2.33E+01 1.51E+01	G
			1764.49	6.111E-01	+	1.552E-01 1.64E+01 1.54E+01	G

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

AC-228   N   1.5473E-01                                        2.10E+03
                           911.16 1.203E-01 ?(  8.428E-02 2.90E+01 2.90E+01 G
                           968.97 0.000E+00 %   1.265E-01 4.41E+02 1.75E+01 G
                           338.32 2.378E-01  (  1.450E-01 2.85E+01 1.20E+01 G
                            93.35 0.000E+00 %   1.242E-01 7.13E+01 5.56E+00 XA
   ( - 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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***** 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	<	1.2194E-01		
NA-22	<	2.5827E-02		
K-40		1.7398E+00	8.8097E+00%	2.356E-01
Sc-46	<	2.1839E-02		
CR-51	<	9.9356E-02		
MN-54	<	1.9503E-02		
FE-59	<	3.4538E-02		
Co-56	<	2.0528E-02		
CO-57	<	1.3635E-02		
CO-58	<	1.8457E-02		
CO-60	<	1.4273E-02		
ZN-65	<	5.3505E-02		
NB-94	<	1.5943E-02		
ZR-95	<	2.4968E-02		
NB-95	<	1.7125E-02		
RU-103	<	1.3599E-02		
RH-106	<	8.8635E-02		
AG-108M	<	1.3366E-02		
AG-110M	<	2.9535E-02		
SN-113	<	2.0090E-02		
SB-124	<	2.0844E-02		
SB-125	<	4.1096E-02		
I-131	<	1.4381E-02		
BA-133	<	2.5290E-02		
CS-134	<	1.2914E-02		
CS-137	<	1.7217E-02		
CE-139	<	8.8272E-03		
Ba-140	<	4.9263E-02		
La-140	<	1.8998E-02		
CE-141	<	1.8044E-02		
CE-144	<	8.5214E-02		
PM-144	<	1.5946E-02		
EU-152	<	5.1452E-02		
EU-154	<	1.6580E-01		
EU-155	<	3.2512E-02		
HF-181	<	1.5744E-02		
Ta-182	<	6.8827E-02		
Hg-203	<	1.8526E-02		
TL-208		5.4171E-02	2.0020E+01%	2.336E-02
pm-146	<	4.2547E-02		
y-88	<	2.3761E-02		
PB-210	<	3.3480E-01		
PB-212	#	4.8565E-02	2.5999E+01%	3.088E-02

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PB-214		1.1879E-01	1.4119E+01%	4.670E-02
BI-207	<	2.3657E-02		
BI-212	<	3.2903E-01		
BI-214		2.1348E-01	1.4511E+01%	5.905E-02
BI-210M	<	1.5488E-02		
RA-224	<	2.9344E-01		
AC-228		1.5473E-01	2.0357E+01%	8.428E-02
TH-227	<	7.7246E-02		
TH-229	<	1.8110E-01		
TH-234	<	4.7720E-01		
PA-231	<	3.4463E-01		
PA-233	<	2.4499E-02		
PA-234	<	2.9942E-02		
PA-234M	<	2.4031E+00		
Ra-226	<	3.4047E-01		
U-235	<	4.7317E-02		
AM-241	<	5.0235E-02		
Np-237	<	8.0237E-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 1999.3 keV) 2.330E+00 DPS

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Test America
St. Louis
Background Check

Spectrum: 12_20191206008_BGLong
Description: Background Long PBC Count
Acquired: 12/6/2019 6:42:59 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	1.94	2.07	2.10	PASS

Analyst: Shiloh Smith Reviewer: Shiloh Smith

(Page 1 of 5)

TestAmerica Inc Spectrum name: 12_20191206008_BGLong.An1

Sample description
Background Long PBC Count

Spectrum Filename: C:\User\SPC\Det12\12_20191206008_BGLong.An1

Acquisition information
Start time: 12/6/2019 6:42:59 PM
Live time: 72000
Real time: 72037
Dead time: 0.05 %
Detector ID: 12

Detector system
Ge12 S/N10034336

Calibration
Filename: 12_QC.Clb
12_SourceCheck_H_2018

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: 4/24/2018 2:08:25 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: Null.lib
Library Match Width: 0.500
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G800W064
Start channel: 150 (37.59keV)
Stop channel: 8000 (1999.13keV)
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	

***** 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	1310.	5.51	0.84	5.835E-02				
63.29	967.	7.99	0.94	7.854E-02				
74.95	197.	23.77	0.88	9.254E-02				
77.13	198.	23.63	0.88	9.518E-02				
84.18	424.	15.64	2.59	1.038E-01				
92.60	1167.	5.20	1.09	1.066E-01				
185.76	725.	8.78	0.90	8.763E-02				
198.31	216.	24.12	1.32	8.618E-02				
238.40	404.	11.64	0.98	8.153E-02				
294.98	260.	17.25	1.02	7.497E-02				
351.69	390.	14.18	0.94	6.840E-02				
510.82	2198.	4.80	2.48	4.995E-02				
609.19	321.	16.55	1.31	3.855E-02				

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide	
185.91	46.57	1112.	1310.	2.244E+04	5.51	0.837	-	
252.73	63.29	1251.	967.	1.231E+04	7.99	0.937	-	s
299.34	74.88	993.	197.	2.124E+03	23.77	0.880	-	D
308.08	77.06	997.	198.	2.082E+03	23.63	0.883	-	D
336.25	84.18	1037.	424.	4.086E+03	15.64	2.594	-	s
369.91	92.60	793.	1167.	1.095E+04	5.20	1.090	-	s
742.35	185.76	867.	725.	8.273E+03	8.78	0.902	-	
792.50	198.31	718.	216.	2.512E+03	24.12	1.324	-	s

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TestAmerica Inc Spectrum name: 12_20191206008_BGLong.An1

Channel	Energy	Background	Net area	Eff*Area	Uncert	FWHM	Suspected	
952.81	238.40	544.	404.	4.959E+03	11.64	0.976	-	s
1179.02	294.98	502.	260.	3.475E+03	17.25	1.019	-	
1405.79	351.69	592.	390.	5.695E+03	14.18	0.941	-	s
2042.19	510.82	880.	2198.	4.401E+04	4.80	2.475	-	
2435.61	609.19	483.	321.	8.319E+03	16.55	1.312	-	

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

This section based on library: Null.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

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

(- 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

Peak Codes:
G - Gamma Ray

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```
  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
_____________________________________________________________________________
DUMMY    No in-range peaks
  < - 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  1999.1 keV)     0.000E+00  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
12/06/19 18:41		ICB 160-453835/1		453835			JLW
12/27/19 05:15		CCV 160-455402/1		455402			
12/27/19 05:36		CCV 160-455402/2		455402			KLS
12/27/19 05:59		CCB 160-455402/3		455402			KLS
12/27/19 06:33	60	ZZZZZ		455402			
12/27/19 07:41	30	ZZZZZ		455402			
12/27/19 08:18	30	160-36593-1 DU	STSB32_0-0.5 DU	455402	453329	901.1	KLS
12/27/19 09:03	30	160-36593-6	STSB34_0.5-3	455402	453329	901.1	KLS
12/27/19 09:35	30	160-36593-9	STSB34-FD_3-6	455402	453329	901.1	KLS
12/27/19 10:14	30	160-36593-13	STSB33_3-6	455402	453329	901.1	KLS
12/27/19 10:51	30	ZZZZZ		455402			

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
12/06/19 00:17		CCV 160-453212/1		453212			
12/06/19 00:38		CCV 160-453212/2		453212			
12/06/19 01:16		CCB 160-453212/3		453212			
12/06/19 03:12	30	ZZZZZ		453212			
12/06/19 06:16	30	ZZZZZ		453212			
12/06/19 07:14	30	ZZZZZ		453212			
12/06/19 07:52	30	ZZZZZ		453212			
12/06/19 18:49		ICB 160-453212/8		453212			KLS
12/27/19 05:16		CCV 160-455403/1		455403			
12/27/19 05:37		CCV 160-455403/2		455403			KLS
12/27/19 05:56		CCB 160-455403/3		455403			KLS
12/27/19 06:30	30	ZZZZZ		455403			
12/27/19 07:09	30	ZZZZZ		455403			
12/27/19 07:44	30	160-36593-1	STSB32_0-0.5	455403	453329	901.1	KLS
12/27/19 08:19	30	160-36593-4	STSB32_6-15	455403	453329	901.1	KLS
12/27/19 08:58	30	160-36593-5	STSB34_0-0.5	455403	453329	901.1	KLS
12/27/19 09:34	30	160-36593-10	STSB33_0-0.5	455403	453329	901.1	KLS
12/27/19 10:15	30	160-36593-14	STSB33_6-15	455403	453329	901.1	KLS
12/27/19 10:54	30	160-36593-16	STSB35_0-0.5	455403	453329	901.1	KLS

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
12/06/19 18:43		ICB 160-453837/1		453837			JLW
12/27/19 05:04		CCB 160-455404/1		455404			KLS
12/27/19 05:50		CCV 160-455404/2		455404			
12/27/19 06:10		CCV 160-455404/3		455404			KLS
12/27/19 06:31	30	ZZZZZ		455404			
12/27/19 07:06	30	ZZZZZ		455404			
12/27/19 07:39	30	MB 160-453329/1-A		455404	453329	901.1	KLS
12/27/19 08:16	30	160-36593-2	STSB32_0.5-3	455404	453329	901.1	KLS

Gamma Spectroscopy Run Log

Detector: GV9 (Continued)

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
12/27/19 08:53	30	ZZZZZ		455404			
12/27/19 09:30	30	160-36593-7	STSB34_3-6	455404	453329	901.1	KLS
12/27/19 10:11	30	160-36593-11	STSB33_0.5-3	455404	453329	901.1	KLS
12/27/19 10:53	30	160-36593-15	STSB35_0.5-3	455404	453329	901.1	KLS
12/27/19 11:37	30	160-36593-17	STSB35_3-6	455404	453329	901.1	KLS

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
12/06/19 18:42		ICB 160-453836/1		453836			JLW
12/27/19 05:05		CCB 160-455401/1		455401			KLS
12/27/19 06:27		CCV 160-455401/2		455401			
12/27/19 06:48		CCV 160-455401/3		455401			KLS
12/27/19 07:07	30	ZZZZZ		455401			
12/27/19 07:38	30	LCS 160-453329/2-A		455401	453329	901.1	KLS
12/27/19 08:17	30	160-36593-3	STSB32_3-6	455401	453329	901.1	KLS
12/27/19 08:54	30	ZZZZZ		455401			
12/27/19 09:31	30	160-36593-8	STSB34_6-15	455401	453329	901.1	KLS
12/27/19 10:12	30	160-36593-12	STSB33-FD_0.5-3	455401	453329	901.1	KLS
12/27/19 10:50	30	ZZZZZ		455401			
12/27/19 11:37	30	160-36593-18	STSB35_6-15	455401	453329	901.1	KLS

Shipping and Receiving Documents

Atlantic Richfield Company
A BP affiliated company

Laboratory Management Program LaMP Chain of Custody Record

BP/ARC Site Node Path: NV_YERINGTON
BP/ARC Facility Name: Anaconda Copper Mine Site
Req Due Date (mm/dd/yy): STD TAT
Rush TAT: Yes ___ No X
Lab Work Order Number:

Lab Name:	TestAmerica, Inc.	BP/ARC Facility Address:	1 Austin Circle	Consultant/Contractor:	Wood - E&I Solutions, Inc.
Lab Address:	13715 Rider Trail N., Earth City, MO 63045	City, State, ZIP Code:	Yerington, Nevada 89447	Consultant/Contractor Project No:	SA18170340.005.055B
Lab PM:	Jayna Awalt	Lead Regulatory Agency:	NDEP Abandoned Mine Lands Program	Address:	10940 White Rock Rd, Ste 190 Rancho Cordova, CA 95670
Lab Phone:	314-298-8566	California Global ID No.:		Consultant/Contractor PM:	Kent Parrish
Lab Shipping Accnt:	1955-3772-0 (TAL Acct #)	Enfos Proposal No: D019Q-0047	Work Release No: WR331232	Phone: 916-636-3200	Email: Kent.Parrish@woodplc.com
Lab Bottle Order No:	NA	Accounting Mode:	Provision X OOC-BU ___ OOC-RM ___	Email Report/EDD To:	lynda.lombardi@woodplc.com
Other Info:	OU-4b_OU-5_Soil	Stage: Appraise	Activity: Field Work/Remedial Investigation	Invoice To:	BP/ARC X Contractor ___
BP/ARC EBM:	Chuck Stilwell				
EBM Phone:	713-998-2443				
EBM Email:	Chuck.Stilwell@bp.com				

Report Type & QC Level: Standard ___ Full Data Package X

Lab No	Sample Description	Date	Time	Matrix: Soil / Solid	Water / Liquid	Air / Vapor		No. Containers / Preservative: Total Number of Containers	Unpreserved	H_2SO_4	HNO_3				Requested Analyses: Thorium, Uranium (SW6020A)	Radium-226 (HASL 300)	Radium-228 (HASL 300)							MS/MSD or LD	Comments
	STSB32_0-0.5	11/25/19	1325	X				4	4						X	X	X							X	Report soil on dry weight basis.
	STSB32_0.5-3	11/25/19	1340	X				2	2						X	X	X								
	STSB32_3-6	11/25/19	1349	X				2	2						X	X	X								
	STSB32_6-15	11/25/19	1406	X				2	2						X	X	X								
	STSB34_0-0.5	11/25/19	1500	X				2	2						X	X	X								
	STSB34_0.5-3	11/25/19	1505	X				2	2						X	X	X								
	STSB34_3-6	11/25/19	1512	X				2	2						X	X	X								
	STSB34_6-15	11/25/19	1528	X				2	2						X	X	X								
	STSB34-FD_3-6	11/25/19	1513	X				2	2						X	X	X								
	STSB33_0-0.5	12/03/19	1231	X				2	2						X	X	X								

160-36593 Chain of Custody

Comments: Note: If sample not collected, indicate "No Sample" in comments and single-strike out and initial any preprinted sample description.

Sampler's Name: Bryce Johnson
Sampler's Company: Wood
Shipment Method: Fed Ex Ship Date: 12/4/19
Shipment Tracking No: 7771 5034 9430/7771 5039 2441

Relinquished By / Affiliation	Date	Time	Accepted By / Affiliation	Date	Time
[illegible] / Wood	12/4/19	1200	[illegible] / TASTL	12-5-19	0930

Special Instructions:

THIS LINE - LAB USE ONLY: Custody Seals In Place: Yes / No | Temp Blank: Yes / No | Cooler Temp on Receipt: ____ °F/C | Trip Blank: Yes / No | MS/MSD Sample Submitted: Yes / No

BP/ARC LaMP COC Rev. 7, Jul 29, 2010

Atlantic Richfield Company
A BP affiliated company

Laboratory Management Program LaMP Chain of Custody Record

BP/ARC Site Node Path: NV_YERINGTON
BP/ARC Facility Name: Anaconda Copper Mine Site
Req Due Date (mm/dd/yy): STD TAT
Rush TAT: Yes ___ No X
Lab Work Order Number:

Lab Name:	TestAmerica, Inc.	BP/ARC Facility Address:	1 Austin Circle	Consultant/Contractor:	Wood - E&I Solutions, Inc.
Lab Address:	13715 Rider Trail N., Earth City, MO 63045	City, State, ZIP Code:	Yerington, Nevada 89447	Consultant/Contractor Project No:	SA18170340.005.055B
Lab PM:	Jayna Awalt	Lead Regulatory Agency:	NDEP Abandoned Mine Lands Program	Address:	10940 White Rock Rd, Ste 190 Rancho Cordova, CA 95670
Lab Phone:	314-298-8566	California Global ID No.:		Consultant/Contractor PM:	Kent Parrish
Lab Shipping Accnt:	1955-3772-0 (TAL Acct #)	Enfos Proposal No: D019Q-0047	Work Release No: WR331232	Phone: 916-636-3200	Email: Kent.Parrish@woodplc.com
Lab Bottle Order No:	NA	Accounting Mode:	Provision X OOC-BU ___ OOC-RM ___	Email Report/EDD To:	lynda.lombardi@woodplc.com
Other Info:	OU-4b_OU-5_Soil	Stage: Appraise	Activity: Field Work/Remedial Investigation	Invoice To:	BP/ARC X Contractor ___
BP/ARC EBM:	Chuck Stilwell				
EBM Phone:	713-998-2443				
EBM Email:	Chuck.Stilwell@bp.com				

Report Type & QC Level: Standard ___ Full Data Package X

Lab No	Sample Description	Date	Time	Matrix: Soil / Solid	Water / Liquid	Air / Vapor		No. Containers / Preservative: Total Number of Containers	Unpreserved	H_2SO_4	HNO_3				Requested Analyses: Thorium, Uranium (SW6020A)	Radium-226 (HASL 300)	Radium-228 (HASL 300)							MS/MSD or LD	Comments
	STSB33_0.5-3	12/03/19	1240	X				2	2						X	X	X								Report soil on dry weight basis.
	STSB33-FD_0.5-3	12/03/19	1248	X				2	2						X	X	X								
	STSB33_3-6	12/03/19	1251	X				2	2						X	X	X								
	STSB33_6-15	12/03/19	1305	X				2	2						X	X	X								
	STSB35_0.5-3	12/03/19	1441	X				2	2						X	X	X								
	STSB35_0-0.5	12/03/19	1435	X				2	2						X	X	X								
	STSB35_3-6	12/03/19	1454	X				2	2						X	X	X								
	STSB35_6-15	12/03/19	1500	X				2	2						X	X	X								

TC 12/4/19

Sampler's Name:	Bryce Johnson	Relinquished By / Affiliation	Date	Time	Accepted By / Affiliation	Date	Time
Sampler's Company:	Wood	[illegible] / Wood	12/4/19	1200	[illegible] / TASL	12-5-19	0930
Shipment Method:	Fed Ex Ship Date: 12/4/19						
Shipment Tracking No:	7771 5034 9430/7771 5039 2441						

Special Instructions:

THIS LINE - LAB USE ONLY: Custody Seals In Place: Yes / No | Temp Blank: Yes / No | Cooler Temp on Receipt: _____ °F/C | Trip Blank: Yes / No | MS/MSD Sample Submitted: Yes / No

BP/ARC LaMP COC Rev. 7, Jul 29, 2010

Login Sample Receipt Checklist

Client: Wood E&I Solutions Inc

Job Number: 160-36593-1

Login Number: 36593
List Number: 1
Creator: Press, Nicholas B

List Source: Eurofins TestAmerica, St. Louis

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.	N/A	
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.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Internal Chain of Custody Tracking

Login	Smp	Customer Sample ID	Matrix	Container ID	Lab Sample ID	Container Type	Location	Custody User	I/O	ICOC ID	ICOC Date
160-36593	1	STSB32_0-0.5	Solid	160-1846499	160-36593-A-1	Plastic Bag - 500g	Pre-Prep	Oetter, David R	I	160-187430	12/05/19 14:09
160-36593	1	STSB32_0-0.5	Solid	160-1846499	160-36593-A-1	Plastic Bag - 500g	DRY AND GRIND	Oetter, David R	I	160-187437	12/05/19 15:08
160-36593	1	STSB32_0-0.5	Solid	160-1846535	160-36593-A-1	Plastic Bag - 500g	Pre-Prep	Oetter, David R	I	160-187430	12/05/19 14:09
160-36593	1	STSB32_0-0.5	Solid	160-1846535	160-36593-A-1	Plastic Bag - 500g	DRY AND GRIND	Oetter, David R	I	160-187437	12/05/19 15:08
160-36593	1	STSB32_0-0.5	Solid	160-1846536	160-36593-A-1	Clear Glass 4oz Wide -	1-46	Mazariegos, Leonel	I	160-187802	12/11/19 09:24
160-36593	1	STSB32_0-0.5	Solid	160-1846536	160-36593-A-1	Clear Glass 4oz Wide -	METALS	Mazariegos, Leonel	I	160-187729	12/10/19 12:46
160-36593	1	STSB32_0-0.5	Solid	160-1846537	160-36593-A-1	No Container	1-46	Mazariegos, Leonel	I	160-187802	12/11/19 09:24
160-36593	1	STSB32_0-0.5	Solid	160-1846537	160-36593-A-1	No Container	METALS	Mazariegos, Leonel	I	160-187729	12/10/19 12:46
160-36593	1	STSB32_0-0.5	Solid	160-1846500	160-36593-B-1	Clear Glass 4oz Wide -	1-46	Mazariegos, Leonel	I	160-187802	12/11/19 09:24
160-36593	1	STSB32_0-0.5	Solid	160-1846500	160-36593-B-1	Clear Glass 4oz Wide -	METALS	Mazariegos, Leonel	I	160-187729	12/10/19 12:46
160-36593	2	STSB32_0.5-3	Solid	160-1846501	160-36593-A-2	Plastic Bag - 500g	Pre-Prep	Oetter, David R	I	160-187430	12/05/19 14:09
160-36593	2	STSB32_0.5-3	Solid	160-1846501	160-36593-A-2	Plastic Bag - 500g	DRY AND GRIND	Oetter, David R	I	160-187437	12/05/19 15:08
160-36593	2	STSB32_0.5-3	Solid	160-1846502	160-36593-B-2	Clear Glass 4oz Wide -	1-46	Mazariegos, Leonel	I	160-187802	12/11/19 09:24
160-36593	2	STSB32_0.5-3	Solid	160-1846502	160-36593-B-2	Clear Glass 4oz Wide -	METALS	Mazariegos, Leonel	I	160-187729	12/10/19 12:46
160-36593	3	STSB32_3-6	Solid	160-1846503	160-36593-A-3	Plastic Bag - 500g	Pre-Prep	Oetter, David R	I	160-187430	12/05/19 14:09
160-36593	3	STSB32_3-6	Solid	160-1846503	160-36593-A-3	Plastic Bag - 500g	DRY AND GRIND	Oetter, David R	I	160-187437	12/05/19 15:08
160-36593	3	STSB32_3-6	Solid	160-1846504	160-36593-B-3	Clear Glass 4oz Wide -	1-46	Mazariegos, Leonel	I	160-187802	12/11/19 09:24
160-36593	3	STSB32_3-6	Solid	160-1846504	160-36593-B-3	Clear Glass 4oz Wide -	METALS	Mazariegos, Leonel	I	160-187729	12/10/19 12:46
160-36593	4	STSB32_6-15	Solid	160-1846505	160-36593-A-4	Plastic Bag - 500g	Pre-Prep	Oetter, David R	I	160-187430	12/05/19 14:09
160-36593	4	STSB32_6-15	Solid	160-1846505	160-36593-A-4	Plastic Bag - 500g	DRY AND GRIND	Oetter, David R	I	160-187437	12/05/19 15:08
160-36593	4	STSB32_6-15	Solid	160-1846506	160-36593-B-4	Clear Glass 4oz Wide -	1-46	Mazariegos, Leonel	I	160-187802	12/11/19 09:24
160-36593	4	STSB32_6-15	Solid	160-1846506	160-36593-B-4	Clear Glass 4oz Wide -	METALS	Mazariegos, Leonel	I	160-187729	12/10/19 12:46
160-36593	5	STSB34_0-0.5	Solid	160-1846507	160-36593-A-5	Plastic Bag - 500g	Pre-Prep	Oetter, David R	I	160-187430	12/05/19 14:09
160-36593	5	STSB34_0-0.5	Solid	160-1846507	160-36593-A-5	Plastic Bag - 500g	DRY AND GRIND	Oetter, David R	I	160-187437	12/05/19 15:08
160-36593	5	STSB34_0-0.5	Solid	160-1846508	160-36593-B-5	Clear Glass 4oz Wide -	1-46	Mazariegos, Leonel	I	160-187802	12/11/19 09:24
160-36593	5	STSB34_0-0.5	Solid	160-1846508	160-36593-B-5	Clear Glass 4oz Wide -	METALS	Mazariegos, Leonel	I	160-187729	12/10/19 12:46
160-36593	6	STSB34_0.5-3	Solid	160-1846509	160-36593-A-6	Plastic Bag - 500g	Pre-Prep	Oetter, David R	I	160-187430	12/05/19 14:09
160-36593	6	STSB34_0.5-3	Solid	160-1846509	160-36593-A-6	Plastic Bag - 500g	DRY AND GRIND	Oetter, David R	I	160-187437	12/05/19 15:08
160-36593	6	STSB34_0.5-3	Solid	160-1846510	160-36593-B-6	Clear Glass 4oz Wide -	1-46	Mazariegos, Leonel	I	160-187802	12/11/19 09:24
160-36593	6	STSB34_0.5-3	Solid	160-1846510	160-36593-B-6	Clear Glass 4oz Wide -	METALS	Mazariegos, Leonel	I	160-187729	12/10/19 12:46
160-36593	7	STSB34_3-6	Solid	160-1846511	160-36593-A-7	Plastic Bag - 500g	Pre-Prep	Oetter, David R	I	160-187430	12/05/19 14:09
160-36593	7	STSB34_3-6	Solid	160-1846511	160-36593-A-7	Plastic Bag - 500g	DRY AND GRIND	Oetter, David R	I	160-187437	12/05/19 15:08
160-36593	7	STSB34_3-6	Solid	160-1846512	160-36593-B-7	Clear Glass 4oz Wide -	1-46	Mazariegos, Leonel	I	160-187802	12/11/19 09:24
160-36593	7	STSB34_3-6	Solid	160-1846512	160-36593-B-7	Clear Glass 4oz Wide -	METALS	Mazariegos, Leonel	I	160-187729	12/10/19 12:46
160-36593	8	STSB34_6-15	Solid	160-1846513	160-36593-A-8	Plastic Bag - 500g	Pre-Prep	Oetter, David R	I	160-187430	12/05/19 14:09
160-36593	8	STSB34_6-15	Solid	160-1846513	160-36593-A-8	Plastic Bag - 500g	DRY AND GRIND	Oetter, David R	I	160-187437	12/05/19 15:08
160-36593	8	STSB34_6-15	Solid	160-1846514	160-36593-B-8	Clear Glass 4oz Wide -	1-46	Mazariegos, Leonel	I	160-187802	12/11/19 09:24
160-36593	8	STSB34_6-15	Solid	160-1846514	160-36593-B-8	Clear Glass 4oz Wide -	METALS	Mazariegos, Leonel	I	160-187729	12/10/19 12:46
160-36593	9	STSB34-FD_3-6	Solid	160-1846515	160-36593-A-9	Plastic Bag - 500g	Pre-Prep	Oetter, David R	I	160-187430	12/05/19 14:09
160-36593	9	STSB34-FD_3-6	Solid	160-1846515	160-36593-A-9	Plastic Bag - 500g	DRY AND GRIND	Oetter, David R	I	160-187437	12/05/19 15:08

Internal Chain of Custody Tracking

Login	Smp	Customer Sample ID	Matrix	Container ID	Lab Sample ID	Container Type	Location	Custody User	I/O	ICOC ID	ICOC Date
160-36593	9	STSB34-FD_3-6	Solid	160-1846516	160-36593-B-9	Clear Glass 4oz Wide -	1-46	Mazariegos, Leonel	I	160-187802	12/11/19 09:24
160-36593	9	STSB34-FD_3-6	Solid	160-1846516	160-36593-B-9	Clear Glass 4oz Wide -	METALS	Mazariegos, Leonel	I	160-187729	12/10/19 12:46
160-36593	10	STSB33_0-0.5	Solid	160-1846517	160-36593-A-10	Plastic Bag - 500g	Pre-Prep	Oetter, David R	I	160-187430	12/05/19 14:09
160-36593	10	STSB33_0-0.5	Solid	160-1846517	160-36593-A-10	Plastic Bag - 500g	DRY AND GRIND	Oetter, David R	I	160-187437	12/05/19 15:08
160-36593	10	STSB33_0-0.5	Solid	160-1846518	160-36593-B-10	Clear Glass 4oz Wide -	1-46	Mazariegos, Leonel	I	160-187802	12/11/19 09:24
160-36593	10	STSB33_0-0.5	Solid	160-1846518	160-36593-B-10	Clear Glass 4oz Wide -	METALS	Mazariegos, Leonel	I	160-187729	12/10/19 12:46
160-36593	11	STSB33_0.5-3	Solid	160-1846519	160-36593-A-11	Plastic Bag - 500g	Pre-Prep	Oetter, David R	I	160-187430	12/05/19 14:09
160-36593	11	STSB33_0.5-3	Solid	160-1846519	160-36593-A-11	Plastic Bag - 500g	DRY AND GRIND	Oetter, David R	I	160-187437	12/05/19 15:08
160-36593	11	STSB33_0.5-3	Solid	160-1846520	160-36593-B-11	Clear Glass 4oz Wide -	1-46	Mazariegos, Leonel	I	160-187802	12/11/19 09:24
160-36593	11	STSB33_0.5-3	Solid	160-1846520	160-36593-B-11	Clear Glass 4oz Wide -	METALS	Mazariegos, Leonel	I	160-187729	12/10/19 12:46
160-36593	12	STSB33-FD_0.5-3	Solid	160-1846521	160-36593-A-12	Plastic Bag - 500g	Pre-Prep	Oetter, David R	I	160-187430	12/05/19 14:09
160-36593	12	STSB33-FD_0.5-3	Solid	160-1846521	160-36593-A-12	Plastic Bag - 500g	DRY AND GRIND	Oetter, David R	I	160-187437	12/05/19 15:08
160-36593	12	STSB33-FD_0.5-3	Solid	160-1846522	160-36593-B-12	Clear Glass 4oz Wide -	1-46	Mazariegos, Leonel	I	160-187802	12/11/19 09:24
160-36593	12	STSB33-FD_0.5-3	Solid	160-1846522	160-36593-B-12	Clear Glass 4oz Wide -	METALS	Mazariegos, Leonel	I	160-187729	12/10/19 12:46
160-36593	13	STSB33_3-6	Solid	160-1846523	160-36593-A-13	Plastic Bag - 500g	Pre-Prep	Oetter, David R	I	160-187430	12/05/19 14:09
160-36593	13	STSB33_3-6	Solid	160-1846523	160-36593-A-13	Plastic Bag - 500g	DRY AND GRIND	Oetter, David R	I	160-187437	12/05/19 15:08
160-36593	13	STSB33_3-6	Solid	160-1846524	160-36593-B-13	Clear Glass 4oz Wide -	1-46	Mazariegos, Leonel	I	160-187802	12/11/19 09:24
160-36593	13	STSB33_3-6	Solid	160-1846524	160-36593-B-13	Clear Glass 4oz Wide -	METALS	Mazariegos, Leonel	I	160-187729	12/10/19 12:46
160-36593	14	STSB33_6-15	Solid	160-1846525	160-36593-A-14	Plastic Bag - 500g	Pre-Prep	Oetter, David R	I	160-187430	12/05/19 14:09
160-36593	14	STSB33_6-15	Solid	160-1846525	160-36593-A-14	Plastic Bag - 500g	DRY AND GRIND	Oetter, David R	I	160-187437	12/05/19 15:08
160-36593	14	STSB33_6-15	Solid	160-1846526	160-36593-B-14	Clear Glass 4oz Wide -	1-46	Mazariegos, Leonel	I	160-187802	12/11/19 09:24
160-36593	14	STSB33_6-15	Solid	160-1846526	160-36593-B-14	Clear Glass 4oz Wide -	METALS	Mazariegos, Leonel	I	160-187729	12/10/19 12:46
160-36593	15	STSB35_0.5-3	Solid	160-1846527	160-36593-A-15	Plastic Bag - 500g	Pre-Prep	Oetter, David R	I	160-187430	12/05/19 14:09
160-36593	15	STSB35_0.5-3	Solid	160-1846527	160-36593-A-15	Plastic Bag - 500g	DRY AND GRIND	Oetter, David R	I	160-187437	12/05/19 15:08
160-36593	15	STSB35_0.5-3	Solid	160-1846528	160-36593-B-15	Clear Glass 4oz Wide -	1-46	Mazariegos, Leonel	I	160-187802	12/11/19 09:24
160-36593	15	STSB35_0.5-3	Solid	160-1846528	160-36593-B-15	Clear Glass 4oz Wide -	METALS	Mazariegos, Leonel	I	160-187729	12/10/19 12:46
160-36593	16	STSB35_0-0.5	Solid	160-1846529	160-36593-A-16	Plastic Bag - 500g	Pre-Prep	Oetter, David R	I	160-187430	12/05/19 14:09
160-36593	16	STSB35_0-0.5	Solid	160-1846529	160-36593-A-16	Plastic Bag - 500g	DRY AND GRIND	Oetter, David R	I	160-187437	12/05/19 15:08
160-36593	16	STSB35_0-0.5	Solid	160-1846530	160-36593-B-16	Clear Glass 4oz Wide -	1-46	Mazariegos, Leonel	I	160-187802	12/11/19 09:24
160-36593	16	STSB35_0-0.5	Solid	160-1846530	160-36593-B-16	Clear Glass 4oz Wide -	METALS	Mazariegos, Leonel	I	160-187729	12/10/19 12:46
160-36593	17	STSB35_3-6	Solid	160-1846531	160-36593-A-17	Plastic Bag - 500g	Pre-Prep	Oetter, David R	I	160-187430	12/05/19 14:09
160-36593	17	STSB35_3-6	Solid	160-1846531	160-36593-A-17	Plastic Bag - 500g	DRY AND GRIND	Oetter, David R	I	160-187437	12/05/19 15:08
160-36593	17	STSB35_3-6	Solid	160-1846532	160-36593-B-17	Clear Glass 4oz Wide -	1-46	Mazariegos, Leonel	I	160-187802	12/11/19 09:24
160-36593	17	STSB35_3-6	Solid	160-1846532	160-36593-B-17	Clear Glass 4oz Wide -	METALS	Mazariegos, Leonel	I	160-187729	12/10/19 12:46
160-36593	18	STSB35_6-15	Solid	160-1846533	160-36593-A-18	Plastic Bag - 500g	Pre-Prep	Oetter, David R	I	160-187430	12/05/19 14:09
160-36593	18	STSB35_6-15	Solid	160-1846533	160-36593-A-18	Plastic Bag - 500g	DRY AND GRIND	Oetter, David R	I	160-187437	12/05/19 15:08
160-36593	18	STSB35_6-15	Solid	160-1846534	160-36593-B-18	Clear Glass 4oz Wide -	1-46	Mazariegos, Leonel	I	160-187802	12/11/19 09:24
160-36593	18	STSB35_6-15	Solid	160-1846534	160-36593-B-18	Clear Glass 4oz Wide -	METALS	Mazariegos, Leonel	I	160-187729	12/10/19 12:46