YAEC Chemistry Lab Spectrum name: 101F_12SEPT2006_1807.An1

Sample description
FSS-SSS-01-01-015-F-S

Spectrum Filename: C:\GammaVision\Spectra\101F_12SEPT2006_1807.An1

Acquisition information
Start time: 12-Sep-2006 18:07:44
Live time: 2000
Real time: 2002
Dead time: 0.08 %
Detector ID: 1

Detector system
Det 101- DSPE-633

Calibration
Filename: D1_1LSa.Clb
Detector 101 1.0 Liter Marinelli Sand

Energy Calibration
Created: 03-Sep-2004 08:50:48
Zero offset: 0.244 keV
Gain: 0.500 keV/channel
Quadratic: -2.493E-08 keV/channel^2

Efficiency Calibration
Created: 03-Sep-2004 08:52:26
Type: Polynomial
Uncertainty: 0.626 %
Coefficients: -0.321775 -5.816463 0.734234
-0.099357 0.006049 -0.000149

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.23keV)
Stop channel: 4000 (1999.11keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 2.0010E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 2.0010E+03) =
4.9975E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five 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	08-Sep-2006 16:30:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	101_150K_28APR05.Pbc 01-May-2005 05:24:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 18 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.2898

***** 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. pCi/gm	Nuc
63.69	93.	40.87	1.20	1.145E-02	63.29	3.900	PBC<MDA	TH234
74.42	169.	20.33	1.00	1.651E-02				
74.42	169.	20.33	1.00	1.651E-02	74.81	9.600	6.956E-01	PB212
77.42	318.	10.89	1.01	1.736E-02	77.11	17.500	7.138E-01	PB212
					77.11	10.700	1.154E+00	PB214
87.11	116.	25.45	1.01	1.923E-02	86.45	32.740	1.257E-01	EU155
89.67	98.	28.79	1.02	1.957E-02	88.04	3.790	PBC<MDA	CD109
93.35	125.	22.53	1.02	1.997E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.08	121.	24.05	1.44	1.858E-02	185.99	3.280	1.341E+00	RA226
209.34	84.	35.58	1.47	1.721E-02				
238.93	791.	4.23	1.12	1.557E-02	238.63	43.100	7.897E-01	PB212
241.82	132.	18.77	1.12	1.542E-02	241.00	3.900	1.472E+00	RA224
270.64	70.	33.73	1.12	1.398E-02				
295.23	186.	14.10	1.19	1.292E-02	295.22	19.200	5.007E-01	PB214
300.74	55.	32.47	0.99	1.270E-02				
328.38	37.	40.72	0.98	1.168E-02				
338.86	202.	13.38	0.92	1.133E-02	338.40	12.010	9.900E-01	AC228
352.18	286.	9.66	1.32	1.092E-02	351.99	37.100	4.727E-01	PB214
463.49	66.	24.14	1.37	8.342E-03				
463.49	66.	24.14	1.37	8.342E-03	463.51	10.000	5.281E-01	SB125
511.40	130.	15.60	1.70	7.581E-03	510.72	22.500	4.495E-01	TL208
583.61	228.	8.07	1.37	6.679E-03	583.14	86.000	2.649E-01	TL208
609.57	239.	9.25	1.36	6.410E-03	609.32	46.090	5.438E-01	BI214
661.88	58.	22.83	1.29	5.935E-03	661.62	84.620	7.612E-02	CS137
727.73	75.	20.76	2.07	5.439E-03	727.17	11.800	7.836E-01	BI212
911.69	164.	10.51	1.71	4.444E-03	911.07	29.000	8.502E-01	AC228

969.16	91.	17.66	1.63	4.211E-03	968.90	17.460	8.327E-01	AC228
1120.98	77.	21.11	1.91	3.711E-03	1120.28	15.040	9.271E-01	BI214
1461.43	574.	4.28	1.58	2.941E-03	1460.75	10.700	1.226E+01	K40
1765.22	45.	16.65	2.23	2.481E-03	1764.51	15.920	7.635E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide
126.93	63.69	589.	93.	0.047	122.60	1.196	PA-234 l
148.42	74.72	504.	169.	0.084	60.98	1.005	BI-207 D
154.42	77.72	442.	318.	0.159	32.68	1.007	PB-214 D
173.79	87.36	379.	116.	0.058	76.35	1.014	PB-214 lD
178.91	89.92	350.	98.	0.049	86.38	1.015	PB-214 lD
418.36	209.34	339.	84.	0.042	106.73	1.467	AC-228 s
477.57	238.75	165.	789.	0.395	12.72	1.122	PB-212 D
541.00	270.64	195.	70.	0.035	101.19	1.123	AC-228
601.22	300.74	120.	55.	0.027	97.42	0.989	PB-212
656.53	328.38	95.	37.	0.019	122.16	0.984	RH-106M
1455.61	727.73	86.	36.	0.018	119.81	2.073	J-132 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: FSS_Rev_1.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 3 Sigma %	FWHM keV
HG-203	146.50	73.47	1038.	-132.	-0.066	107.06	1.499s
PB-212	149.57	75.00	1093.	206.	0.103	69.36	1.499
PB-212	153.79	77.11	962.	302.	0.151	46.79	1.499D
PB-214	153.79	77.11	965.	299.	0.149	46.79	1.499D
TH-234	185.74	93.08	873.	133.	0.066	93.34	1.499s
RA-226	371.98	186.16	465.	125.	0.063	77.95	1.499s
PB-212	477.53	238.92	420.	642.	0.321	17.78	1.499
RA-224	481.70	241.00	575.	111.	0.056	95.17	1.123D
PB-214	590.76	295.51	177.	180.	0.090	38.01	1.499s
AC-228	677.50	338.86	167.	200.	0.100	40.13	0.920s
PB-214	704.40	352.30	126.	258.	0.129	26.00	1.499s
SB-125	926.87	463.49	78.	60.	0.030	70.94	1.499
TL-208	1022.75	511.40	106.	114.	0.057	46.81	1.695s
TL-208	1167.23	583.61	50.	226.	0.113	24.22	1.375
BI-214	1219.18	609.57	77.	238.	0.119	27.76	1.355
CS-137	1323.84	661.88	43.	57.	0.028	68.48	1.290
BI-212	1455.61	727.73	54.	38.	0.019	92.91	1.499s
AC-228	1823.74	911.69	44.	162.	0.081	31.54	1.706
AC-228	1938.73	969.16	55.	91.	0.045	52.99	1.634

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-214	2242.56	1120.98	52.	77.	0.038	63.33	1.910
K-40	2923.88	1461.43	10.	572.	0.286	12.85	1.585
BI-214	3531.88	1765.22	3.	45.	0.022	49.96	2.229s

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 pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Code	MDA Value pCi/gm	COMMENTS
BE-7		5.8603E-02					
			477.56	5.860E-02	%(	3.666E-01 1.07E-01	G
K-40		1.2261E+01					
			1460.75	1.226E+01	(P	3.802E-01 5.27E-01	G
MN-54		1.6398E-02					
			834.81	1.640E-02	&(P	3.316E-02 1.01E-02	G
CO-57		-5.5155E-03					
			122.07	-5.516E-03	%(	4.838E-02 1.44E-02	G K
			136.43	-5.732E-02	%	4.108E-01 1.23E-01	G
CO-60		2.3442E-02					
			1332.51	2.344E-02	%(P	4.679E-02 1.43E-02	G K
			1173.23	2.006E-02	& P	6.633E-02 1.96E-02	G K
Sr-85		-1.4776E-02					
			514.00	-1.478E-02	%(	5.967E-02 1.77E-02	G
Kr-85		-3.5100E+02					
			513.99	-3.510E+02	%(P	1.323E+03 3.92E+02	G
Y-88		-5.2648E-04					
			1836.01	-5.265E-04	&(	4.819E-02 1.23E-02	G K
			898.02	-1.029E-03	% P	4.772E-02 1.31E-02	G
NB-94		-1.0022E-02					
			871.10	-1.002E-02	&(P	5.176E-02 1.50E-02	G K
			702.50	-4.437E-03	& P	5.210E-02 1.50E-02	G K
Ag-108M		-1.1355E-02					
			722.95	-1.136E-02	%(	5.328E-02 1.56E-02	G K
			614.37	-4.739E-02	% P	7.004E-02 2.16E-02	G
			433.93	1.030E-02	%	4.002E-02 1.18E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CD-109	2.7850E-01						
		88.04	2.785E-01	%(P	1.380E+00	4.14E-01	G
SN-113	-1.5920E-02						
		391.71	-1.592E-02	&(	6.596E-02	1.96E-02	G K
		255.04	-4.793E-03	% P	1.538E+00	4.48E-01	G
SB-125	1.3860E-01						
		427.95	1.960E-02	&(P	1.034E-01	3.01E-02	G K
		600.77	4.742E-03	& P	2.781E-01	7.98E-02	G
		636.15	1.614E-01	& P	3.133E-01	9.55E-02	G
		463.51	4.908E-01	(P	3.553E-01	1.19E-01	G
		176.29	-2.400E-02	& P	5.888E-01	1.74E-01	G
I-131	-7.1055E-03						
		364.48	-7.106E-03	%(	7.100E-02	2.08E-02	G K
		636.97	5.860E-02	&	6.155E-01	1.73E-01	G
		284.29	8.992E-02	%	8.628E-01	2.54E-01	G
CS-134	7.8760E-03						
		604.66	7.876E-03	%(P	5.186E-02	1.51E-02	G K
		795.76	2.715E-03	% P	5.310E-02	1.49E-02	G
		569.29	9.879E-02	% P	2.505E-01	7.50E-02	G
		801.84	8.327E-02	&	5.221E-01	1.50E-01	G
CS-137	7.6120E-02						
		661.62	7.612E-02	(P	4.491E-02	1.77E-02	G
CE-139	1.0736E-02						
		165.85	1.074E-02	&(P	4.722E-02	1.41E-02	G
EU-152	-2.7411E-03						
		121.78	-2.741E-03	%(P	1.244E-01	3.68E-02	G K
		344.30	-3.043E-02	% P	1.469E-01	4.34E-02	G
		1408.08	5.500E-02	% P	2.011E-01	5.75E-02	G
		964.00	-1.043E-02	% P	4.827E-01	1.37E-01	G
		1112.07	2.572E-02	& P	4.519E-01	1.27E-01	G
		778.90	-7.311E-03	% P	3.261E-01	9.08E-02	G
EU-154	-8.8655E-03						
		123.10	-8.865E-03	&(P	9.771E-02	2.91E-02	G K
		1274.80	-1.276E-04	% P	1.800E-01	4.99E-02	G
		723.30	-6.124E-02	% P	2.568E-01	7.51E-02	G
		1004.80	8.003E-02	% P	2.667E-01	7.82E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	-2.3033E-03						
		86.45	-2.303E-03	%(	1.734E-01	5.18E-02	G K
		105.31	0.000E+00	%	2.009E-01	5.97E-02	G
HG-203	-1.2208E-03						
		279.17	-1.221E-03	&(	4.631E-02	1.36E-02	G K
		72.87	-3.439E-02	& P	1.408E+00	4.21E-01	G
		70.83	-1.775E+00	+	2.060E+00	6.33E-01	G
		82.50	1.850E-02	%	2.768E+00	8.26E-01	G
TL-208	2.6494E-01						
		583.14	2.649E-01	(P	4.208E-02	2.16E-02	G
		510.72	4.495E-01	+ P	2.007E-01	8.01E-02	G
PB-212	6.5544E-01						
		238.63	6.461E-01	(P	9.880E-02	3.87E-02	G K
							Energy duplication
		77.11	6.785E-01	*(	3.302E-01	1.06E-01	G
		74.81	8.765E-01	& P	6.668E-01	2.08E-01	G
PB-214	4.5071E-01						
		351.99	4.300E-01	@(P	9.161E-02	3.75E-02	G K
		295.22	4.908E-01	*(P	1.760E-01	6.28E-02	G
							Energy duplication
		77.11	1.096E+00	+ P	5.411E-01	1.73E-01	G
		241.92	1.664E-01	% P	6.192E-01	1.86E-01	G
BI-212	4.0398E-01						
		727.17	4.040E-01	*(P	3.900E-01	1.27E-01	G K
		1620.56	-3.525E-01	%	1.595E+00	4.47E-01	G
		785.42	-3.858E-01	& P	2.594E+00	7.48E-01	G
BI-214	5.4380E-01						
		609.32	5.438E-01	(P	9.963E-02	5.06E-02	G K
		1764.51	7.635E-01	+ P	1.919E-01	1.28E-01	G
		1120.28	9.271E-01	+ P	4.409E-01	1.97E-01	G
RA-224	1.2463E+00						
		241.00	1.246E+00	(P	1.283E+00	3.98E-01	G
RA-226	1.3851E+00						
		185.99	1.385E+00	(	1.143E+00	3.60E-01	G
AC-228	8.7368E-01						
		911.07	8.502E-01	(P	1.755E-01	9.05E-02	G K
		968.90	8.327E-01	(P	3.432E-01	1.48E-01	G
		338.40	9.900E-01	*(P	3.120E-01	1.34E-01	G

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

TH-227      -1.3602E-01
                          236.00-1.360E-01 %(P 4.320E-01 1.30E-01 G K
                          256.25 2.076E-02 % P 4.270E-01 1.24E-01 G

PA-234       1.4045E-03
                           98.44 1.405E-03 %(  1.846E-01 5.50E-02 G K
                          946.00-4.784E-02 &   2.810E-01 8.12E-02 G
                          131.28-2.561E-02 &   2.180E-01 6.52E-02 G
                           94.67-1.219E-01 %   3.197E-01 9.66E-02 G
                          883.24 0.000E+00 &   4.927E-01 1.39E-01 G
                          926.70 0.000E+00 %   4.167E-01 1.15E-01 G
                          569.26 1.466E-01 %   3.697E-01 1.11E-01 G

TH-234       1.2281E+00
                           63.29 1.016E+00 %(P 2.148E+00 6.50E-01 G K
                           92.80 1.503E+00  (P 1.588E+00 4.90E-01 G
                           92.38-4.115E-01 & P 1.960E+00 5.84E-01 G

AM-241      -8.8860E-03
                           59.54-8.886E-03 %(P 3.154E-01 9.40E-02 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

- -

***** 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 pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	5.5589E-02	5.8603E-02	3.1987E-01	3.1989E-01	3.478E-01
K-40		1.2261E+01	1.2261E+01	1.5813E+00	1.7264E+00	
MN-54	#A	1.6251E-02	1.6398E-02	3.0236E-02	3.0250E-02	3.286E-02
CO-57	#B	-5.4582E-03	-5.5155E-03	4.3331E-02	4.3332E-02	4.787E-02
CO-60	#B	2.3408E-02	2.3442E-02	4.2895E-02	4.2916E-02	4.672E-02
Sr-85	#A	-1.4147E-02	-1.4776E-02	5.3190E-02	5.3197E-02	5.713E-02
Kr-85	#A	-3.5099E+02	-3.5100E+02	1.3521E+03	1.3522E+03	1.323E+03
Y-88	#B	-5.1274E-04	-5.2648E-04	3.6863E-02	3.6863E-02	4.693E-02
NB-94	#B	-1.0022E-02	-1.0022E-02	4.6706E-02	4.6709E-02	5.176E-02
Ag-108M	#B	-1.1354E-02	-1.1355E-02	4.6665E-02	4.6670E-02	5.328E-02
CD-109	#A	2.7677E-01	2.7850E-01	1.2432E+00	1.2433E+00	1.372E+00
SN-113	#B	-1.5535E-02	-1.5920E-02	5.8700E-02	5.8707E-02	6.436E-02
SB-125	#F	1.3822E-01	1.3860E-01	1.0068E-01	1.0098E-01	1.031E-01
I-131	#B	-5.0037E-03	-7.1055E-03	6.2459E-02	6.2460E-02	5.000E-02
CS-134	#B	7.8465E-03	7.8760E-03	4.5339E-02	4.5341E-02	5.167E-02
CS-137		7.6100E-02	7.6120E-02	5.2937E-02	5.3111E-02	
CE-139	#A	1.0518E-02	1.0736E-02	4.2411E-02	4.2415E-02	4.627E-02
EU-152	#B	-2.7394E-03	-2.7411E-03	2.1109E-01	2.1109E-01	1.243E-01
EU-154	#B	-8.8574E-03	-8.8655E-03	1.0274E-01	1.0274E-01	9.762E-02
EU-155	#B	-2.2997E-03	-2.3033E-03	1.5529E-01	1.5529E-01	1.732E-01
HG-203	#B	-1.1491E-03	-1.2208E-03	4.0652E-02	4.0652E-02	4.359E-02
TL-208		2.6494E-01	2.6494E-01	6.4845E-02	6.6550E-02	
PB-212	#	6.5544E-01	6.5544E-01	1.1763E-01	1.2333E-01	9.880E-02
PB-214	#	4.5071E-01	4.5071E-01	1.0473E-01	1.0778E-01	9.161E-02
BI-212	#	4.0398E-01	4.0398E-01	3.8196E-01	3.8264E-01	3.900E-01
BI-214		5.4380E-01	5.4380E-01	1.5167E-01	1.5475E-01	
RA-224	A	1.2463E+00	1.2463E+00	1.1937E+00	1.1957E+00	
RA-226	#	1.3851E+00	1.3851E+00	1.0797E+00	1.0825E+00	1.143E+00
AC-228		8.7368E-01	8.7368E-01	2.1629E-01	2.2185E-01	
TH-227	#B	-1.3602E-01	-1.3602E-01	3.9938E-01	3.9946E-01	4.320E-01
PA-234	#B	1.4045E-03	1.4045E-03	1.6486E-01	1.6486E-01	1.846E-01
TH-234	#B	1.2281E+00	1.2281E+00	1.1997E+00	1.2016E+00	2.148E+00
AM-241	#A	-8.8859E-03	-8.8860E-03	4.3865E-01	4.3865E-01	3.154E-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 (270.6 to 1999.1 keV) 1.5266020E+01 pCi/gm
Total Decayed Activity (270.6 to 1999.1 keV) 1.5266039E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JJM

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 101F_15SEPT2006_0847.An1

Sample description
FSS-SSS-01-01-026-F-B

Spectrum Filename: C:\GammaVision\Spectra\101F_15SEPT2006_0847.An1

Acquisition information
Start time: 15-Sep-2006 08:47:03
Live time: 2000
Real time: 2002
Dead time: 0.10 %
Detector ID: 1

Detector system
Det 101- DSPE-633

Calibration
Filename: D1_1LSa.Clb
Detector 101 1.0 Liter Marinelli Sand

Energy Calibration
Created: 03-Sep-2004 08:50:48
Zero offset: 0.244 keV
Gain: 0.500 keV/channel
Quadratic: -2.493E-08 keV/channel^2

Efficiency Calibration
Created: 03-Sep-2004 08:52:26
Type: Polynomial
Uncertainty: 0.626 %
Coefficients: -0.321775 -5.816463 0.734234
-0.099357 0.006049 -0.000149

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.23keV)
Stop channel: 4000 (1999.11keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.6100E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.6100E+03) =
6.2112E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five 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	09-Sep-2006 09:50:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	101_150K_28APR05.Pbc 01-May-2005 05:24:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 14 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.0540

***** 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. pCi/gm	Nuc
62.76	131.	28.81	0.73	1.085E-02				
62.76	131.	28.81	0.73	1.085E-02	63.29	3.900	PBC<MDA	TH234
74.84	177.	26.07	1.50	1.654E-02				
74.84	177.	26.07	1.50	1.654E-02	74.81	9.600	9.330E-01	PB212
77.05	315.	14.41	1.50	1.720E-02	77.11	17.500	8.781E-01	PB212
					77.11	10.700	1.419E+00	PB214
77.05	311.	14.41	1.50	1.720E-02	77.11	17.500	8.677E-01	PB212
					77.11	10.700	1.419E+00	PB214
87.30	111.	37.74	1.50	1.910E-02	86.45	32.740	PBC<MDA	EU155
					88.04	3.790	PBC<MDA	CD109
93.04	107.	36.81	1.50	1.989E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.23	136.	24.13	1.07	1.857E-02	185.99	3.280	1.866E+00	RA226
209.37	86.	24.06	1.01	1.721E-02				
238.75	744.	4.29	1.12	1.557E-02	238.63	43.100	9.232E-01	PB212
241.60	133.	17.74	1.12	1.542E-02	241.00	3.900	1.846E+00	RA224
					241.92	7.470	9.669E-01	PB214
269.82	77.	30.65	1.02	1.402E-02				
295.16	161.	14.61	1.18	1.292E-02				
295.16	161.	14.61	1.18	1.292E-02	295.22	19.200	5.394E-01	PB214
338.23	129.	17.42	1.12	1.136E-02	338.40	12.010	7.833E-01	AC228
352.02	284.	9.67	1.20	1.092E-02	351.99	37.100	5.836E-01	PB214
409.48	56.	37.27	1.14	9.420E-03				
463.22	51.	24.65	1.60	8.347E-03				
463.22	51.	24.65	1.60	8.347E-03	463.51	10.000	5.037E-01	SB125
510.61	113.	17.78	1.38	7.592E-03	510.72	22.500	4.746E-01	TL208
583.22	243.	10.18	1.30	6.684E-03	583.14	86.000	3.515E-01	TL208

609.24	191.	10.87	1.48	6.414E-03	609.32	46.090	5.393E-01	BI214
726.68	52.	28.52	1.91	5.446E-03				
726.68	52.	28.52	1.91	5.446E-03	727.17	11.800	6.707E-01	BI212
911.14	148.	10.63	1.68	4.446E-03	911.07	29.000	9.499E-01	AC228
968.13	112.	14.17	1.33	4.215E-03	968.90	17.460	1.265E+00	AC228
1120.17	67.	25.75	1.10	3.711E-03	1120.28	15.040	1.000E+00	BI214
1460.76	642.	4.02	1.96	2.942E-03	1460.75	10.700	1.707E+01	K40

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1620.28	13.	32.90	2.02	2.682E-03	1620.56	2.750	1.516E+00	BI212
1764.52	30.	18.26	0.73	2.481E-03	1764.51	15.920	6.281E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
125.08	62.76	539.	131.	0.065	86.44	0.732	PA-234	l
418.42	209.37	180.	86.	0.043	72.17	1.011	AC-228	
477.20	238.76	137.	744.	0.372	12.87	1.122	PB-212	D
539.37	269.82	192.	77.	0.038	91.95	1.016	AC-228	s
818.80	409.48	115.	56.	0.028	111.80	1.138	AC-228	

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

This section based on library: FSS_Rev_1.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 3 Sigma %	FWHM keV
PB-212	149.25	74.84	1037.	177.	0.088	78.21	1.499
PB-212	153.79	77.11	873.	315.	0.157	43.24	1.499D
PB-214	153.79	77.11	877.	311.	0.156	43.24	1.499D
EU-155	174.17	87.30	823.	111.	0.056	113.21	1.499
TH-234	185.66	93.04	818.	107.	0.054	110.44	1.499s
RA-226	371.84	186.09	404.	136.	0.068	67.92	1.499s
PB-212	477.17	238.74	406.	548.	0.274	19.92	1.499
RA-224	481.70	241.00	439.	114.	0.057	82.60	1.123D
PB-214	590.48	295.37	213.	145.	0.072	48.82	1.499s
AC-228	676.25	338.23	148.	127.	0.064	52.25	1.121
PB-214	704.04	352.12	137.	245.	0.122	27.66	1.499
SB-125	926.37	463.24	65.	52.	0.026	75.06	1.499s
TL-208	1021.16	510.61	103.	97.	0.048	53.35	1.377s
TL-208	1166.44	583.22	102.	241.	0.120	30.55	1.297
BI-214	1218.51	609.24	81.	190.	0.095	32.61	1.477
BI-212	1454.70	727.27	54.	39.	0.019	92.14	1.499s
AC-228	1822.64	911.14	36.	146.	0.073	31.90	1.680
AC-228	1936.67	968.13	37.	111.	0.055	42.50	1.326s
BI-214	2240.93	1120.17	62.	67.	0.033	77.24	1.098s
K-40	2922.54	1460.76	10.	640.	0.320	12.07	1.963
BI-212	3241.79	1620.28	3.	13.	0.007	98.69	2.021
BI-214	3530.47	1764.52	0.	30.	0.015	54.77	0.729s

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 pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm		COMMENTS
BE-7		6.6360E-02						
			477.56	6.636E-02	%(	4.538E-01	1.32E-01	G
K-40		1.7068E+01						
			1460.75	1.707E+01	(P	4.608E-01	6.89E-01	G
MN-54		1.8025E-02						
			834.81	1.803E-02	%(P	5.396E-02	1.59E-02	G
CO-57		-4.0134E-03						
			122.07	-4.013E-03	%(	5.433E-02	1.62E-02	G K
			136.43	-7.255E-02	%	4.425E-01	1.32E-01	G
CO-60		9.5055E-03						
			1332.51	9.506E-03	%(P	5.271E-02	1.47E-02	G K
			1173.23	1.714E-02	% P	7.859E-02	2.28E-02	G K
Sr-85		-1.8191E-02						
			514.00	-1.819E-02	%(	6.125E-02	1.82E-02	G
Kr-85		-5.2512E+02						
			513.99	-5.251E+02	%(P	1.385E+03	4.13E+02	G
Y-88		0.0000E+00						
			1836.01	0.000E+00	%(	8.195E-02	2.19E-02	G K
			898.02	-9.092E-03	& P	6.783E-02	1.93E-02	G
NB-94		-7.1462E-03						
			871.10	-7.146E-03	%(P	5.530E-02	1.57E-02	G K
			702.50	5.671E-03	% P	5.520E-02	1.58E-02	G K
Ag-108M		-1.2973E-02						
			722.95	-1.297E-02	%(	6.835E-02	1.99E-02	G K
			614.37	-9.167E-03	% P	6.481E-02	1.88E-02	G
			433.93	6.061E-03	%	4.533E-02	1.31E-02	G
CD-109		-1.9009E-01						
			88.04	-1.901E-01	&(P	1.702E+00	5.09E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SN-113	-1.8394E-02						
		391.71	-1.839E-02	%(	7.558E-02	2.24E-02	G K
		255.04	-6.901E-01	% P	2.172E+00	6.51E-01	G
SB-125	1.5598E-01						
		427.95	2.970E-02	%(P	1.518E-01	4.45E-02	G K
		600.77	8.255E-02	& P	2.375E-01	7.05E-02	G
		636.15	-4.019E-02	& P	3.968E-01	1.12E-01	G
		463.51	5.297E-01	*(P	4.080E-01	1.36E-01	G
		176.29	-2.291E-02	% P	7.518E-01	2.22E-01	G
I-131	-4.0674E-04						
		364.48	-4.067E-04	&(	9.257E-02	2.68E-02	G K
		636.97	1.192E-01	&	9.770E-01	2.78E-01	G
		284.29	8.029E-02	&	1.117E+00	3.27E-01	G
CS-134	-1.3079E-02						
		604.66	-1.308E-02	%(P	7.224E-02	2.12E-02	G K
		795.76	3.474E-02	% P	5.680E-02	1.76E-02	G
		569.29	1.104E-02	& P	3.379E-01	9.63E-02	G
		801.84	1.809E-01	%	5.768E-01	1.70E-01	G
CS-137	2.1698E-02						
		661.62	2.170E-02	%(P	5.987E-02	1.78E-02	G
CE-139	9.8803E-04						
		165.85	9.880E-04	%(P	5.544E-02	1.64E-02	G
EU-152	-1.9406E-02						
		121.78	-1.941E-02	%(P	1.621E-01	4.83E-02	G K
		344.30	-1.376E-03	% P	1.597E-01	4.61E-02	G
		1408.08	-2.370E-03	& P	3.276E-01	8.84E-02	G
		964.00	-1.607E-02	% P	6.373E-01	1.82E-01	G
		1112.07	2.989E-02	% P	4.707E-01	1.31E-01	G
		778.90	1.340E-01	% P	3.397E-01	1.01E-01	G
EU-154	6.2219E-03						
		123.10	6.222E-03	%(P	1.158E-01	3.44E-02	G K
		1274.80	4.949E-03	% P	1.903E-01	5.22E-02	G
		723.30	-2.836E-03	& P	4.929E-01	1.43E-01	G
		1004.80	-6.746E-02	% P	3.607E-01	1.04E-01	G
EU-155	1.4943E-01						
		86.45	1.494E-01	(	1.835E-01	5.64E-02	G K
		105.31	5.565E-02	%	2.321E-01	6.97E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
HG-203	-5.9345E-03						
		279.17	-5.935E-03	%(	5.817E-02	1.71E-02	G K
		72.87	-1.084E+00	& P	1.594E+00	4.86E-01	G
		70.83	-1.933E-01	&	2.546E+00	7.61E-01	G
		82.50	-6.328E-02	%	2.830E+00	8.41E-01	G
TL-208	3.5148E-01						
		583.14	3.515E-01	(P	7.277E-02	3.61E-02	G
		510.72	4.746E-01	+ P	2.462E-01	9.84E-02	G
PB-212	6.8520E-01						
		238.63	6.852E-01	(P	1.208E-01	4.60E-02	G K
							Energy duplication
		77.11	8.781E-01	+	3.915E-01	1.27E-01	G
		74.81	9.330E-01	& P	8.075E-01	2.50E-01	G
PB-214	5.0104E-01						
		351.99	5.068E-01	(P	1.187E-01	4.71E-02	G K
		295.22	4.900E-01	@(P	2.393E-01	8.07E-02	G
							Energy duplication
		77.11	1.419E+00	+ P	6.416E-01	2.07E-01	G
		241.92	5.701E-01	% P	7.950E-01	2.44E-01	G
BI-212	5.0546E-01						
		727.17	5.055E-01	*(P	4.831E-01	1.58E-01	G K
		1620.56	1.516E+00	+	1.218E+00	4.99E-01	G
		785.42	6.664E-01	& P	2.622E+00	7.64E-01	G
BI-214	5.6208E-01						
		609.32	5.393E-01	(P	1.269E-01	5.89E-02	G K
		1764.51	6.281E-01	(P	1.566E-01	1.16E-01	G
		1120.28	1.000E+00	+ P	5.947E-01	2.59E-01	G
RA-224	1.5834E+00						
		241.00	1.583E+00	(P	1.398E+00	4.39E-01	G
RA-226	1.8688E+00						
		185.99	1.869E+00	@(	1.327E+00	4.23E-01	G
AC-228	9.0112E-01						
		911.07	9.499E-01	(P	1.998E-01	1.02E-01	G K
		968.90	1.265E+00	+ P	3.549E-01	1.80E-01	G
		338.40	7.833E-01	(P	3.655E-01	1.39E-01	G
TH-227	-1.6976E-01						
		236.00	-1.698E-01	%(P	5.303E-01	1.59E-01	G K
		256.25	8.934E-02	% P	6.106E-01	1.80E-01	G

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

PA-234      -8.9739E-03
                           98.44-8.974E-03 &(  2.127E-01 6.33E-02 G K
                          946.00-1.171E-03 &   3.287E-01 9.18E-02 G
                          131.28 1.251E-02 &   2.226E-01 6.61E-02 G
                           94.67-1.382E-01 %   3.789E-01 1.14E-01 G
                          883.24-4.659E-02 &   5.796E-01 1.65E-01 G
                          926.70-9.259E-02 %   5.975E-01 1.72E-01 G
                          569.26 1.972E-02 &   4.975E-01 1.42E-01 G

TH-234       1.4620E+00
                           63.29 1.429E+00 %(P 2.492E+00 7.57E-01 G K
                           92.80 1.505E+00 *(P 1.913E+00 5.86E-01 G
                           92.38 3.155E-02 % P 2.277E+00 6.76E-01 G

AM-241      -5.2833E-03
                           59.54-5.283E-03 %(P 3.740E-01 1.11E-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

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

***** 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 pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	6.1422E-02	6.6360E-02	3.9467E-01	3.9469E-01	4.201E-01
K-40		1.7068E+01	1.7068E+01	2.0682E+00	2.2820E+00	
MN-54	#A	1.7789E-02	1.8025E-02	4.7739E-02	4.7750E-02	5.325E-02
CO-57	#B	-3.9525E-03	-4.0134E-03	4.8481E-02	4.8482E-02	5.351E-02
CO-60	#B	9.4852E-03	9.5055E-03	4.4054E-02	4.4058E-02	5.259E-02
Sr-85	#A	-1.7069E-02	-1.8191E-02	5.4639E-02	5.4648E-02	5.747E-02
Kr-85	#A	-5.2510E+02	-5.2512E+02	1.3909E+03	1.3912E+03	1.385E+03
Y-88	#B	0.0000E+00	0.0000E+00	6.5554E-02	6.5554E-02	7.884E-02
NB-94	#B	-7.1462E-03	-7.1462E-03	5.0292E-02	5.0293E-02	5.530E-02
Ag-108M	#B	-1.2972E-02	-1.2973E-02	5.9726E-02	5.9731E-02	6.834E-02
CD-109	#A	-1.8837E-01	-1.9009E-01	1.6169E+00	1.6169E+00	1.687E+00
SN-113	#B	-1.7746E-02	-1.8394E-02	6.7134E-02	6.7142E-02	7.292E-02
SB-125	#F	1.5534E-01	1.5598E-01	1.2030E-01	1.2062E-01	1.512E-01
I-131	#B	-2.4339E-04	-4.0674E-04	8.0282E-02	8.0282E-02	5.539E-02
CS-134	#B	-1.3007E-02	-1.3079E-02	7.2057E-02	7.2061E-02	7.184E-02
CS-137	#A	2.1689E-02	2.1698E-02	5.3316E-02	5.3330E-02	5.985E-02
CE-139	#A	9.5881E-04	9.8803E-04	4.9165E-02	4.9165E-02	5.380E-02
EU-152	#B	-1.9389E-02	-1.9406E-02	1.6172E-01	1.6173E-01	1.619E-01
EU-154	#B	6.2136E-03	6.2219E-03	1.0326E-01	1.0326E-01	1.157E-01
EU-155	#A	1.4909E-01	1.4943E-01	1.6917E-01	1.6937E-01	1.831E-01
HG-203	#B	-5.4313E-03	-5.9345E-03	5.1348E-02	5.1349E-02	5.323E-02
TL-208		3.5148E-01	3.5148E-01	1.0843E-01	1.1023E-01	
PB-212	#	6.8520E-01	6.8520E-01	1.3804E-01	1.4337E-01	1.208E-01
PB-214	#	5.0104E-01	5.0104E-01	1.3971E-01	1.4255E-01	1.187E-01
BI-212	#	5.0546E-01	5.0546E-01	4.7388E-01	4.7474E-01	4.831E-01
BI-214		5.6208E-01	5.6208E-01	1.8138E-01	1.8414E-01	
RA-224		1.5834E+00	1.5834E+00	1.3160E+00	1.3191E+00	
RA-226	#	1.8688E+00	1.8688E+00	1.2694E+00	1.2738E+00	1.327E+00
AC-228		9.0112E-01	9.0112E-01	2.8024E-01	2.8483E-01	
TH-227	#B	-1.6976E-01	-1.6976E-01	4.9028E-01	4.9038E-01	5.303E-01
PA-234	#B	-8.9739E-03	-8.9739E-03	1.8992E-01	1.8992E-01	2.127E-01
TH-234	#B	1.4620E+00	1.4620E+00	1.4416E+00	1.4439E+00	2.492E+00
AM-241	#A	-5.2831E-03	-5.2833E-03	8.9068E-01	8.9068E-01	3.740E-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 (269.6 to 1999.1 keV) 2.0465843E+01 pCi/gm
Total Decayed Activity (269.6 to 1999.1 keV) 2.0465843E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 101f_15SEPT2006_1007.An1

Sample description
FSS-SSS-01-01-029-F-B

Spectrum Filename: C:\GammaVision\Spectra\101f_15SEPT2006_1007.An1

Acquisition information
Start time: 15-Sep-2006 10:07:37
Live time: 2000
Real time: 2002
Dead time: 0.11 %
Detector ID: 1

Detector system
Det 101- DSPE-633

Calibration
Filename: D1_1LSa.Clb
Detector 101 1.0 Liter Marinelli Sand

Energy Calibration
Created: 03-Sep-2004 08:50:48
Zero offset: 0.244 keV
Gain: 0.500 keV/channel
Quadratic: -2.493E-08 keV/channel^2

Efficiency Calibration
Created: 03-Sep-2004 08:52:26
Type: Polynomial
Uncertainty: 0.626 %
Coefficients: -0.321775 -5.816463 0.734234
-0.099357 0.006049 -0.000149

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.23keV)
Stop channel: 4000 (1999.11keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.8240E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.8240E+03) =
5.4825E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five 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	09-Sep-2006 11:44:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	101_150K_28APR05.Pbc 01-May-2005 05:24:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 15 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.0983

***** 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. pCi/gm	Nuc
74.76	212.	23.07	1.50	1.654E-02				
74.76	212.	23.07	1.50	1.654E-02	74.81	9.600	9.880E-01	PB212
77.06	299.	16.09	1.50	1.720E-02	77.11	10.700	1.202E+00	PB214
					77.11	17.500	7.352E-01	PB212
77.06	302.	16.09	1.50	1.720E-02	77.11	10.700	1.202E+00	PB214
					77.11	17.500	7.443E-01	PB212
86.66	86.	34.18	1.01	1.911E-02	86.45	32.740	1.027E-01	EU155
89.68	87.	32.67	1.02	1.953E-02				
93.29	140.	21.71	1.02	1.993E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.00	83.	29.85	1.13	1.858E-02	185.99	3.280	1.011E+00	RA226
209.75	90.	34.74	0.98	1.719E-02				
238.78	789.	4.22	1.12	1.557E-02	238.63	43.100	8.636E-01	PB212
241.77	132.	17.71	1.12	1.541E-02	241.00	3.900	1.617E+00	RA224
					241.92	7.470	8.468E-01	PB214
270.10	100.	23.98	1.59	1.401E-02				
295.23	191.	11.87	1.25	1.292E-02	295.22	19.200	5.663E-01	PB214
300.30	93.	22.10	0.79	1.272E-02				
338.55	188.	13.99	1.13	1.134E-02	338.40	12.010	1.010E+00	AC228
352.08	300.	9.63	0.89	1.092E-02	351.99	37.100	5.444E-01	PB214
462.96	55.	25.78	0.97	8.351E-03				
462.96	55.	25.78	0.97	8.351E-03	463.51	10.000	4.740E-01	SB125
510.97	110.	19.13	1.11	7.587E-03	510.72	22.500	4.072E-01	TL208
583.35	234.	9.42	1.28	6.682E-03	583.14	86.000	2.985E-01	TL208
609.30	190.	9.98	1.65	6.413E-03	609.32	46.090	4.737E-01	BI214
727.05	77.	22.20	1.52	5.444E-03	727.17	11.800	8.758E-01	BI212
795.09	36.	27.63	1.50	5.016E-03	795.76	85.400	6.304E-02	CS134

860.90	31.	31.77	1.17	4.675E-03				
911.25	156.	12.88	1.40	4.446E-03	911.07	29.000	8.884E-01	AC228
964.55	36.	24.21	1.61	4.228E-03				
968.99	74.	14.95	1.62	4.211E-03	968.90	17.460	7.386E-01	AC228
1120.12	69.	21.54	1.83	3.711E-03	1120.28	15.040	9.109E-01	BI214
1460.82	751.	3.69	1.89	2.942E-03	1460.75	10.700	1.761E+01	K40
1764.41	38.	16.22	2.25	2.481E-03	1764.51	15.920	7.045E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
172.90	86.57	394.	86.	0.043	102.54	1.013	BI-207	lD
178.94	89.59	362.	87.	0.044	98.00	1.016	PB-214	lD
419.18	209.75	368.	90.	0.045	104.23	0.976	NP-239	
477.27	238.68	159.	789.	0.394	12.66	1.122	PB-212	D
483.24	241.67	208.	132.	0.066	53.12	1.124	PB-214	D
539.92	270.10	199.	100.	0.050	71.94	1.586	AC-228	s
600.35	300.30	139.	93.	0.047	66.30	0.793	PB-212	s
1722.10	860.90	30.	31.	0.015	95.31	1.172	TL-208	
1929.84	964.67	20.	37.	0.018	71.35	1.613	AC-228	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: FSS_Rev_1.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 3 Sigma %	FWHM keV
PB-212	149.09	74.76	1149.	212.	0.106	69.20	1.499s
PB-214	153.79	77.11	1037.	299.	0.149	48.27	1.499D
PB-212	153.79	77.11	1033.	302.	0.151	48.27	1.499D
TH-234	185.53	92.97	909.	148.	0.074	83.26	1.499s
TH-234	185.51	92.96	870.	155.	0.078	80.78	1.499s
RA-226	371.63	185.99	517.	95.	0.048	105.98	1.499
PB-212	477.32	238.81	412.	621.	0.311	18.14	1.499
RA-224	482.50	241.40	511.	96.	0.048	104.20	1.499
PB-214	590.36	295.31	212.	167.	0.083	43.22	1.499
AC-228	676.89	338.55	170.	186.	0.093	41.98	1.131s
PB-214	703.88	352.04	128.	272.	0.136	25.08	1.499
SB-125	926.68	463.39	68.	50.	0.025	79.60	1.499s
TL-208	1021.89	510.97	123.	94.	0.047	57.38	1.114s
TL-208	1166.71	583.35	86.	232.	0.116	28.26	1.281
BI-214	1218.63	609.30	64.	189.	0.094	29.94	1.645s
BI-212	1454.26	727.05	65.	76.	0.038	66.59	1.519s
CS-134	1590.41	795.09	33.	36.	0.018	82.89	1.502s
AC-228	1822.85	911.25	69.	155.	0.077	38.64	1.403s
AC-228	1938.21	968.90	25.	73.	0.037	44.79	1.616D
BI-214	2240.83	1120.12	46.	69.	0.034	64.61	1.828s
K-40	2922.66	1460.82	6.	748.	0.374	11.06	1.891

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-214	3530.26	1764.41	0.	38.	0.019	48.67	2.248s

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 pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	Peak COMMENTS
BE-7		8.3527E-02					
			477.56	8.353E-02	%(	4.546E-01 1.33E-01	G
K-40		1.7609E+01					
			1460.75	1.761E+01	(P	3.251E-01 6.51E-01	G
MN-54		-2.3482E-03					
			834.81	-2.348E-03	&(P	6.088E-02 1.72E-02	G
CO-57		4.6586E-03					
			122.07	4.659E-03	%(	5.339E-02 1.59E-02	G K
			136.43	3.528E-02	&	4.375E-01 1.30E-01	G
CO-60		-8.6897E-03					
			1332.51	-8.690E-03	%(P	6.018E-02 1.69E-02	G K
			1173.23	1.448E-02	% P	7.301E-02 2.12E-02	G K
Sr-85		-2.2381E-02					
			514.00	-2.238E-02	%(	6.405E-02 1.92E-02	G
Kr-85		-5.1186E+02					
			513.99	-5.119E+02	%(P	1.393E+03 4.16E+02	G
Y-88		0.0000E+00					
			1836.01	0.000E+00	%(	5.372E-02 1.36E-02	G K
			898.02	-1.117E-02	% P	6.689E-02 1.93E-02	G
NB-94		-6.5542E-03					
			871.10	-6.554E-03	&(P	5.302E-02 1.51E-02	G K
			702.50	1.752E-02	& P	4.060E-02 1.22E-02	G K
Ag-108M		-8.3694E-03					
			722.95	-8.369E-03	%(	6.040E-02 1.75E-02	G K
			614.37	6.524E-03	& P	4.647E-02 1.34E-02	G
			433.93	-1.057E-02	%	4.985E-02 1.47E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CD-109	2.7814E-02						
		88.04	2.781E-02	&(P	1.620E+00	4.83E-01	G
SN-113	-7.8519E-03						
		391.71	-7.852E-03	&(	7.340E-02	2.15E-02	G K
		255.04	-6.850E-02	& P	2.031E+00	5.97E-01	G
SB-125	7.7032E-02						
		427.95	-4.660E-02	%(P	1.665E-01	4.95E-02	G K
		600.77	2.308E-02	& P	2.841E-01	8.19E-02	G
		636.15	-4.513E-02	& P	4.355E-01	1.25E-01	G
		463.51	4.430E-01	*(P	3.665E-01	1.21E-01	G
		176.29	-1.029E-01	& P	6.797E-01	2.02E-01	G
I-131	0.0000E+00						
		364.48	0.000E+00	%(	8.496E-02	2.46E-02	G K
		636.97	-4.440E-02	&	9.809E-01	2.77E-01	G
		284.29	-5.340E-03	&	9.001E-01	2.61E-01	G
CS-134	1.6964E-02						
		604.66	-2.336E-02	%(P	6.638E-02	1.98E-02	G K
		795.76	6.304E-02	@(P	5.156E-02	1.76E-02	G
		569.29	4.983E-02	& P	3.148E-01	9.15E-02	G
		801.84	2.758E-02	%	4.614E-01	1.28E-01	G
CS-137	9.4296E-03						
		661.62	9.430E-03	&(P	6.368E-02	1.84E-02	G
CE-139	2.9437E-03						
		165.85	2.944E-03	%(P	5.331E-02	1.58E-02	G
EU-152	1.5930E-02						
		121.78	1.593E-02	%(P	1.572E-01	4.69E-02	G K
		344.30	-4.163E-03	% P	1.510E-01	4.38E-02	G
		1408.08	8.740E-02	% P	1.950E-01	5.88E-02	G
		964.00	7.194E-02	% P	4.667E-01	1.35E-01	G
		1112.07	1.635E-01	% P	4.166E-01	1.24E-01	G
		778.90	-1.019E-01	% P	4.269E-01	1.25E-01	G
EU-154	-3.0284E-03						
		123.10	-3.028E-03	%(P	1.130E-01	3.36E-02	G K
		1274.80	-2.009E-02	& P	2.142E-01	6.09E-02	G
		723.30	-5.668E-02	% P	3.310E-01	9.65E-02	G
		1004.80	6.221E-02	& P	3.270E-01	9.42E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	1.2860E-01						
		86.45	1.286E-01	%(	1.782E-01	5.45E-02	G K
		105.31	9.704E-02	%	2.175E-01	6.59E-02	G
HG-203	2.6752E-02						
		279.17	2.675E-02	&(	4.759E-02	1.45E-02	G K
		72.87	-6.367E-01	& P	1.454E+00	4.40E-01	G
		70.83	-9.347E-02	%	2.482E+00	7.42E-01	G
		82.50	4.930E-02	%	2.764E+00	8.23E-01	G
TL-208	2.9851E-01						
		583.14	2.985E-01	(P	5.931E-02	2.84E-02	G
		510.72	4.072E-01	+ P	2.361E-01	9.12E-02	G
PB-212	7.0274E-01						
		238.63	6.859E-01	(P	1.074E-01	4.19E-02	G K
							Energy duplication
		77.11	7.443E-01	@(	3.752E-01	1.20E-01	G
		74.81	9.880E-01	& P	7.498E-01	2.34E-01	G
PB-214	4.9796E-01						
		351.99	4.979E-01	(P	1.013E-01	4.19E-02	G K
		295.22	4.981E-01	(P	2.109E-01	7.25E-02	G
							Energy duplication
		77.11	1.202E+00	+ P	6.147E-01	1.96E-01	G
		241.92	4.303E-01	% P	6.994E-01	2.13E-01	G
BI-212	8.7578E-01						
		727.17	8.758E-01	*(P	4.649E-01	1.96E-01	G K
		1620.56	3.602E-01	%	1.682E+00	4.68E-01	G
		785.42	6.071E-01	% P	2.803E+00	8.17E-01	G
BI-214	4.7374E-01						
		609.32	4.737E-01	@(P	1.002E-01	4.76E-02	G K
		1764.51	7.045E-01	+ P	1.382E-01	1.16E-01	G
		1120.28	9.109E-01	+ P	4.573E-01	1.97E-01	G
RA-224	1.1746E+00						
		241.00	1.175E+00	(P	1.329E+00	4.11E-01	G
RA-226	1.1565E+00						
		185.99	1.156E+00	(	1.321E+00	4.09E-01	G
AC-228	8.6902E-01						
		911.07	8.884E-01	@(P	2.386E-01	1.16E-01	G K
		968.90	7.398E-01	(P	2.616E-01	1.12E-01	G
		338.40	1.010E+00	@(P	3.451E-01	1.43E-01	G

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

TH-227      -1.0390E-01
                          236.00-1.039E-01 %(P 4.698E-01 1.41E-01 G K
                          256.25-1.585E-02 % P 6.239E-01 1.83E-01 G

PA-234      -5.8988E-02
                           98.44-5.899E-02 %(  1.818E-01 5.48E-02 G K
                          946.00 5.182E-02 &   2.791E-01 8.04E-02 G
                          131.28-5.051E-02 %   2.287E-01 6.86E-02 G
                           94.67-7.079E-02 %   3.455E-01 1.04E-01 G
                          883.24 0.000E+00 &   4.369E-01 1.21E-01 G
                          926.70 1.743E-01 %   4.080E-01 1.23E-01 G
                          569.26 7.737E-02 &   4.635E-01 1.35E-01 G

TH-234       1.5147E+00
                           63.29 7.746E-01 %(P 2.405E+00 7.23E-01 G K
                           92.80 1.927E+00  (P 1.740E+00 5.40E-01 G
                           92.38 2.156E+00  (P 2.080E+00 6.42E-01 G

AM-241      -2.1209E-03
                           59.54-2.121E-03 &(P 3.318E-01 9.87E-02 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

- -

***** 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 pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	7.7336E-02	8.3527E-02	3.9940E-01	3.9942E-01	4.209E-01
K-40		1.7609E+01	1.7609E+01	1.9533E+00	2.1921E+00	
MN-54	#A	-2.3175E-03	-2.3482E-03	9.1382E-02	9.1382E-02	6.008E-02
CO-57	#B	4.5881E-03	4.6586E-03	4.7765E-02	4.7766E-02	5.258E-02
CO-60	#B	-8.6712E-03	-8.6897E-03	5.3157E-02	5.3160E-02	6.005E-02
Sr-85	#A	-2.1005E-02	-2.2381E-02	5.7591E-02	5.7604E-02	6.012E-02
Kr-85	#A	-5.1183E+02	-5.1186E+02	1.3862E+03	1.3865E+03	1.393E+03
Y-88	#B	0.0000E+00	0.0000E+00	4.0909E-02	4.0909E-02	5.168E-02
NB-94	#B	-6.5542E-03	-6.5542E-03	4.8325E-02	4.8326E-02	5.302E-02
Ag-108M	#B	-8.3687E-03	-8.3694E-03	5.2388E-02	5.2391E-02	6.040E-02
CD-109	#A	2.7562E-02	2.7814E-02	1.4503E+00	1.4503E+00	1.605E+00
SN-113	#B	-7.5763E-03	-7.8519E-03	6.4499E-02	6.4501E-02	7.083E-02
SB-125	#B	7.6719E-02	7.7032E-02	6.3104E-02	6.3254E-02	1.658E-01
I-131	#B	0.0000E+00	0.0000E+00	7.3795E-02	7.3795E-02	5.094E-02
CS-134	#B	1.6871E-02	1.6964E-02	1.4224E-02	1.4256E-02	6.602E-02
CS-137	#A	9.4261E-03	9.4296E-03	5.5318E-02	5.5321E-02	6.365E-02
CE-139	#A	2.8570E-03	2.9437E-03	4.7466E-02	4.7466E-02	5.174E-02
EU-152	#B	1.5916E-02	1.5930E-02	1.4077E-01	1.4077E-01	1.571E-01
EU-154	#B	-3.0244E-03	-3.0284E-03	1.7209E-01	1.7209E-01	1.129E-01
EU-155	#B	1.2831E-01	1.2860E-01	1.6354E-01	1.6370E-01	1.778E-01
HG-203	#B	2.4492E-02	2.6752E-02	4.3595E-02	4.3621E-02	4.357E-02
TL-208		2.9851E-01	2.9851E-01	8.5235E-02	8.6888E-02	
PB-212	#	7.0274E-01	7.0274E-01	1.2874E-01	1.3472E-01	1.074E-01
PB-214	#	4.9796E-01	4.9796E-01	1.2564E-01	1.2876E-01	1.013E-01
BI-212	#	8.7578E-01	8.7578E-01	5.8842E-01	5.9050E-01	
BI-214	#	4.7374E-01	4.7374E-01	1.4267E-01	1.4516E-01	
RA-224	#A	1.1746E+00	1.1746E+00	1.2331E+00	1.2349E+00	1.329E+00
RA-226	#A	1.1564E+00	1.1565E+00	1.2257E+00	1.2274E+00	1.321E+00
AC-228		8.6902E-01	8.6902E-01	2.1243E-01	2.1803E-01	
TH-227	#B	-1.0390E-01	-1.0390E-01	4.3700E-01	4.3704E-01	4.698E-01
PA-234	#B	-5.8988E-02	-5.8988E-02	1.6427E-01	1.6430E-01	1.818E-01
TH-234	#B	1.5147E+00	1.5147E+00	1.2723E+00	1.2751E+00	2.405E+00
AM-241	#A	-2.1208E-03	-2.1209E-03	5.2567E-01	5.2567E-01	3.318E-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

YAEC Chemistry Lab Spectrum name: 101f_15SEPT2006_1007.An1

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

Total Activity (1120.2 to 1999.1 keV) 2.0126118E+01 pCi/gm
Total Decayed Activity (1120.2 to 1999.1 keV) 2.0126118E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 101F_15SEPT2006_1132.An1

Sample description
FSS-SSS-01-01-035-F-B

Spectrum Filename: C:\GammaVision\Spectra\101F_15SEPT2006_1132.An1

Acquisition information
Start time: 15-Sep-2006 11:32:19
Live time: 2000
Real time: 2002
Dead time: 0.09 %
Detector ID: 1

Detector system
Det 101- DSPE-633

Calibration
Filename: D1_1LSa.Clb
Detector 101 1.0 Liter Marinelli Sand

Energy Calibration
Created: 03-Sep-2004 08:50:48
Zero offset: 0.244 keV
Gain: 0.500 keV/channel
Quadratic: -2.493E-08 keV/channel^2

Efficiency Calibration
Created: 03-Sep-2004 08:52:26
Type: Polynomial
Uncertainty: 0.626 %
Coefficients: -0.321775 -5.816463 0.734234
-0.099357 0.006049 -0.000149

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.23keV)
Stop channel: 4000 (1999.11keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.6970E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.6970E+03) =
5.8928E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five 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	11-Sep-2006 11:50:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	101_150K_28APR05.Pbc 01-May-2005 05:24:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 11 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1823

***** 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. pCi/gm	Nuc
67.74	92.	38.94	1.06	1.373E-02				
74.86	176.	24.64	1.50	1.654E-02	74.81	9.600	8.813E-01	PB212
77.06	279.	15.42	1.50	1.720E-02	77.11	10.700	1.205E+00	PB214
					77.11	17.500	7.370E-01	PB212
77.06	282.	15.42	1.50	1.720E-02	77.11	10.700	1.205E+00	PB214
					77.11	17.500	7.468E-01	PB212
83.97	77.	31.87	1.01	1.870E-02				
86.55	82.	33.12	1.01	1.912E-02	86.45	32.740	1.052E-01	EU155
89.66	98.	28.40	1.02	1.954E-02	88.04	3.790	PBC<MDA	CD109
93.58	124.	22.06	1.02	1.998E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
129.23	65.	39.45	1.36	2.109E-02				
186.29	117.	25.44	1.57	1.857E-02	185.99	3.280	1.526E+00	RA226
209.54	60.	41.32	1.16	1.720E-02				
238.83	683.	4.41	1.12	1.556E-02	238.63	43.100	8.030E-01	PB212
241.60	121.	18.94	1.12	1.542E-02	241.00	3.900	1.589E+00	RA224
270.34	73.	30.42	1.62	1.400E-02				
295.36	138.	13.40	1.29	1.291E-02	295.22	19.200	4.373E-01	PB214
338.62	180.	15.64	1.21	1.134E-02	338.40	12.010	1.039E+00	AC228
352.11	265.	10.28	1.30	1.092E-02	351.99	37.100	5.176E-01	PB214
463.21	59.	22.90	1.29	8.347E-03				
463.21	59.	22.90	1.29	8.347E-03	463.51	10.000	5.548E-01	SB125
510.62	106.	21.91	1.94	7.592E-03				
510.62	106.	21.91	1.94	7.592E-03	510.72	22.500	4.172E-01	TL208
583.33	200.	13.80	1.44	6.682E-03	583.14	86.000	2.732E-01	TL208
609.36	214.	8.68	1.20	6.412E-03	609.32	46.090	5.747E-01	BI214
727.63	50.	26.82	1.34	5.440E-03	727.17	11.800	6.140E-01	BI212

785.60	28.	35.09	1.50	5.075E-03	785.42	2.000	PBC<MDA	BI212
794.98	31.	29.30	1.50	5.016E-03	795.76	85.400	5.794E-02	CS134
911.37	169.	9.94	1.64	4.445E-03	911.07	29.000	1.035E+00	AC228
968.43	115.	13.86	1.95	4.214E-03	968.90	17.460	1.240E+00	AC228
1119.93	47.	33.08	0.86	3.711E-03	1120.28	15.040	6.766E-01	BI214
1460.82	583.	4.25	2.00	2.942E-03	1460.75	10.700	1.468E+01	K40

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1764.57	29.	20.22	2.09	2.481E-03	1764.51	15.920	5.778E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
135.03	67.74	527.	88.	0.044	115.54	1.057	TA-182	
172.68	86.61	332.	82.	0.041	99.37	1.013	BI-207	lD
178.89	89.71	342.	98.	0.049	85.20	1.015	PB-214	lD
418.76	209.54	256.	60.	0.030	123.95	1.165	AC-228	
477.36	238.88	113.	683.	0.342	13.24	1.122	PB-212	D
482.89	241.64	202.	121.	0.060	56.83	1.124	PB-214	D
540.41	270.34	175.	73.	0.036	91.25	1.622	AC-228	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: FSS_Rev_1.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 3 Sigma %	FWHM keV
PB-212	149.28	74.86	909.	176.	0.088	73.93	1.499
PB-214	153.79	77.11	811.	279.	0.139	46.27	1.499D
PB-212	153.79	77.11	807.	282.	0.141	46.27	1.499D
TH-234	185.75	93.08	777.	143.	0.072	80.04	1.499s
TH-234	185.74	93.08	749.	147.	0.074	79.12	1.499s
RA-226	371.92	186.13	378.	116.	0.058	76.26	1.499s
PB-212	477.27	238.79	399.	541.	0.271	20.00	1.499
RA-224	483.36	241.83	456.	105.	0.052	90.77	1.499
PB-214	590.48	295.37	171.	137.	0.069	47.17	1.499
AC-228	677.02	338.62	177.	178.	0.089	46.92	1.206s
PB-214	704.01	352.11	118.	245.	0.123	26.55	1.499
SB-125	926.42	463.26	69.	53.	0.027	75.81	1.499s
TL-208	1021.27	510.67	129.	50.	0.025	77.87	1.499s
TL-208	1166.67	583.33	82.	176.	0.088	30.86	1.499s
BI-214	1218.76	609.36	47.	213.	0.107	26.05	1.204
BI-212	1455.42	727.63	47.	50.	0.025	80.45	1.338
BI-212	1571.41	785.60	34.	28.	0.014	105.27	1.499
CS-134	1590.18	794.98	27.	31.	0.016	87.89	1.502s
AC-228	1823.09	911.37	35.	168.	0.084	29.83	1.643s
AC-228	1937.27	968.43	39.	114.	0.057	41.59	1.946s
BI-214	2240.45	1119.93	54.	47.	0.024	99.23	0.860s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
K-40	2922.65	1460.82	11.	580.	0.290	12.76	2.005
BI-214	3530.57	1764.57	2.	29.	0.014	60.65	2.092

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 pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		-1.0697E-02					
			477.56	-1.070E-02	&(	4.418E-01 1.26E-01	G
K-40		1.4678E+01					
			1460.75	1.468E+01	(P	4.537E-01 6.27E-01	G
MN-54		2.8799E-02					
			834.81	2.880E-02	%(P	6.011E-02 1.82E-02	G
CO-57		-4.7302E-04					
			122.07	-4.730E-04	%(	5.077E-02 1.50E-02	G K
			136.43	1.146E-01	%	3.909E-01 1.17E-01	G
CO-60		-1.2668E-02					
			1332.51	-1.267E-02	%(P	6.232E-02 1.77E-02	G K
			1173.23	-7.118E-04	& P	7.908E-02 2.21E-02	G K
Sr-85		-2.3000E-02					
			514.00	-2.300E-02	&(	6.881E-02 2.06E-02	G
Kr-85		-5.3720E+02					
			513.99	-5.372E+02	&(P	1.527E+03 4.56E+02	G
Y-88		0.0000E+00					
			1836.01	0.000E+00	&(	2.535E-02 3.44E-03	G K
			898.02	-3.432E-04	% P	7.145E-02 2.01E-02	G
NB-94		6.0260E-03					
			871.10	6.026E-03	&(P	5.069E-02 1.43E-02	G K
			702.50	-7.577E-03	% P	4.966E-02 1.43E-02	G K
Ag-108M		3.4236E-03					
			722.95	3.424E-03	&(	1.019E-01 2.97E-02	G K
			614.37	-2.575E-02	% P	6.299E-02 1.89E-02	G
			433.93	-4.176E-03	&	5.029E-02 1.46E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CD-109	9.1627E-02						
		88.04	9.163E-02	%(P	1.631E+00	4.87E-01	G
SN-113	-6.5513E-03						
		391.71	-6.551E-03	&(	5.985E-02	1.73E-02	G K
		255.04	-2.143E-01	% P	1.956E+00	5.76E-01	G
SB-125	1.3117E-01						
		427.95	3.728E-03	%(P	1.074E-01	3.03E-02	G K
		600.77	3.542E-02	% P	1.861E-01	5.32E-02	G
		636.15	-3.290E-03	% P	4.000E-01	1.12E-01	G
		463.51	5.084E-01	(P	3.971E-01	1.32E-01	G
		176.29	-3.311E-02	% P	6.919E-01	2.04E-01	G
I-131	2.4281E-03						
		364.48	2.428E-03	&(	6.731E-02	1.94E-02	G K
		636.97	2.470E-01	%	7.830E-01	2.31E-01	G
		284.29	-9.713E-02	&	9.624E-01	2.83E-01	G
CS-134	1.9010E-02						
		604.66	-1.505E-02	%(P	5.236E-02	1.54E-02	G K
		795.76	5.794E-02	*(P	5.038E-02	1.72E-02	G
		569.29	-8.182E-02	% P	3.302E-01	9.68E-02	G
		801.84	1.617E-01	%	5.186E-01	1.52E-01	G
CS-137	1.8434E-02						
		661.62	1.843E-02	%(P	5.389E-02	1.59E-02	G
CE-139	3.6002E-03						
		165.85	3.600E-03	&(P	5.554E-02	1.65E-02	G
EU-152	2.2268E-02						
		121.78	2.227E-02	%(P	1.400E-01	4.18E-02	G K
		344.30	-3.369E-02	% P	1.527E-01	4.50E-02	G
		1408.08	5.940E-02	% P	2.230E-01	6.34E-02	G
		964.00	1.815E-01	% P	5.064E-01	1.51E-01	G
		1112.07	1.380E-01	& P	3.854E-01	1.14E-01	G
		778.90	-1.173E-03	& P	4.277E-01	1.20E-01	G
EU-154	2.5161E-02						
		123.10	2.516E-02	&(P	8.749E-02	2.62E-02	G K
		1274.80	1.876E-02	% P	2.064E-01	5.82E-02	G
		723.30	-1.428E-01	& P	3.808E-01	1.14E-01	G
		1004.80	3.434E-02	% P	3.572E-01	1.01E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	7.7242E-02						
		86.45	7.724E-02	%(	1.817E-01	5.50E-02	G K
		105.31	9.710E-02	%	2.124E-01	6.44E-02	G
HG-203	-9.3202E-03						
		279.17	-9.320E-03	%(	5.540E-02	1.64E-02	G K
		72.87	-7.403E-01	% P	1.371E+00	4.16E-01	G
		70.83	8.449E-02	%	2.802E+00	8.38E-01	G
		82.50	-9.604E-01	%	2.810E+00	8.48E-01	G
TL-208	2.4140E-01						
		583.14	2.440E-01	@(P	6.209E-02	2.54E-02	G
		510.72	2.315E-01	(P	2.590E-01	7.95E-02	G
PB-212	6.7244E-01						
		238.63	6.423E-01	(P	1.136E-01	4.33E-02	G K
							Energy duplication
		77.11	7.468E-01	@(	3.573E-01	1.15E-01	G
		74.81	8.813E-01	& P	7.183E-01	2.24E-01	G
PB-214	4.6761E-01						
		351.99	4.818E-01	(P	1.046E-01	4.30E-02	G K
		295.22	4.402E-01	(P	2.042E-01	7.01E-02	G
							Energy duplication
		77.11	1.205E+00	+ P	5.857E-01	1.88E-01	G
		241.92	-4.217E-01	% P	7.971E-01	2.42E-01	G
BI-212	6.1400E-01						
		727.17	6.140E-01	(P	4.317E-01	1.67E-01	G K
		1620.56	-6.316E-02	%	1.888E+00	4.91E-01	G
		785.42	2.177E+00	+ P	2.359E+00	7.71E-01	G
BI-214	5.9520E-01						
		609.32	5.747E-01	(P	9.311E-02	5.02E-02	G K
		1764.51	5.778E-01	(P	1.983E-01	1.19E-01	G
		1120.28	6.766E-01	(P	5.254E-01	2.26E-01	G
RA-224	1.3834E+00						
		241.00	1.383E+00	(P	1.352E+00	4.21E-01	G
RA-226	1.5179E+00						
		185.99	1.518E+00	(	1.219E+00	3.86E-01	G
AC-228	1.0967E+00						
		911.07	1.035E+00	@(P	1.881E-01	1.04E-01	G K
		968.90	1.240E+00	(P	3.425E-01	1.73E-01	G
		338.40	1.039E+00	@(P	3.782E-01	1.65E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-227	-2.6642E-01						
		236.00	-2.664E-01	%(P	5.191E-01	1.58E-01	G K
		256.25	-1.021E-01	% P	5.670E-01	1.67E-01	G
PA-234	7.9037E-02						
		98.44	7.904E-02	%(	1.686E-01	5.11E-02	G K
		946.00	1.387E-04	&	1.990E-01	5.28E-02	G
		131.28	-2.266E-02	&	2.252E-01	6.71E-02	G
		94.67	2.320E-03	%	2.815E-01	8.34E-02	G
		883.24	1.634E-01	%	3.775E-01	1.14E-01	G
		926.70	-7.109E-02	%	5.196E-01	1.48E-01	G
		569.26	-1.178E-01	%	4.870E-01	1.43E-01	G
TH-234	1.5374E+00						
		63.29	7.486E-01	%(P	2.321E+00	6.97E-01	G K
		92.80	1.967E+00	(P	1.738E+00	5.40E-01	G
		92.38	2.233E+00	&(P	2.070E+00	6.41E-01	G
AM-241	2.4118E-02						
		59.54	2.412E-02	%(P	3.255E-01	9.70E-02	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

- -

***** 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 pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	-1.0158E-02	-1.0697E-02	3.7867E-01	3.7868E-01	4.195E-01
K-40		1.4678E+01	1.4678E+01	1.8810E+00	2.0557E+00	
MN-54	#A	2.8546E-02	2.8799E-02	5.4622E-02	5.4646E-02	5.958E-02
CO-57	#B	-4.6821E-04	-4.7302E-04	4.5146E-02	4.5146E-02	5.025E-02
CO-60	#B	-1.2649E-02	-1.2668E-02	5.5025E-02	5.5030E-02	6.223E-02
Sr-85	#A	-2.2040E-02	-2.3000E-02	6.1797E-02	6.1811E-02	6.594E-02
Kr-85	#A	-5.3719E+02	-5.3720E+02	1.5223E+03	1.5226E+03	1.527E+03
Y-88	#B	0.0000E+00	0.0000E+00	1.0318E-02	1.0320E-02	2.470E-02
NB-94	#B	6.0260E-03	6.0260E-03	4.2963E-02	4.2965E-02	5.069E-02
Ag-108M	#B	3.4234E-03	3.4236E-03	8.9069E-02	8.9069E-02	1.019E-01
CD-109	#A	9.1070E-02	9.1627E-02	1.4604E+00	1.4604E+00	1.621E+00
SN-113	#B	-6.3959E-03	-6.5513E-03	5.2039E-02	5.2040E-02	5.843E-02
SB-125	#F	1.3081E-01	1.3117E-01	1.0216E-01	1.0242E-01	1.071E-01
I-131	#B	1.7217E-03	2.4281E-03	5.8299E-02	5.8299E-02	4.773E-02
CS-134	#B	1.8941E-02	1.9010E-02	1.6932E-02	1.6966E-02	5.217E-02
CS-137	#A	1.8429E-02	1.8434E-02	4.7766E-02	4.7778E-02	5.388E-02
CE-139	#A	3.5286E-03	3.6002E-03	4.9459E-02	4.9460E-02	5.444E-02
EU-152	#B	2.2255E-02	2.2268E-02	1.2526E-01	1.2527E-01	1.399E-01
EU-154	#B	2.5139E-02	2.5161E-02	7.8663E-02	7.8676E-02	8.741E-02
EU-155	#B	7.7124E-02	7.7242E-02	1.6499E-01	1.6505E-01	1.814E-01
HG-203	#B	-8.7833E-03	-9.3202E-03	4.9216E-02	4.9219E-02	5.221E-02
TL-208	#	2.4140E-01	2.4140E-01	7.5493E-02	7.6715E-02	6.209E-02
PB-212	#	6.7244E-01	6.7244E-01	1.3601E-01	1.4121E-01	1.136E-01
PB-214	#	4.6761E-01	4.6761E-01	1.2514E-01	1.2790E-01	1.046E-01
BI-212		6.1400E-01	6.1400E-01	5.0075E-01	5.0195E-01	
BI-214		5.9520E-01	5.9520E-01	1.5587E-01	1.5945E-01	
RA-224	#	1.3834E+00	1.3834E+00	1.2643E+00	1.2667E+00	1.352E+00
RA-226	#	1.5179E+00	1.5179E+00	1.1575E+00	1.1607E+00	1.219E+00
AC-228		1.0967E+00	1.0967E+00	2.5633E-01	2.6371E-01	
TH-227	#B	-2.6642E-01	-2.6642E-01	4.7988E-01	4.8012E-01	5.191E-01
PA-234	#B	7.9037E-02	7.9037E-02	1.5327E-01	1.5334E-01	1.686E-01
TH-234	#B	1.5374E+00	1.5374E+00	1.2673E+00	1.2702E+00	2.321E+00
AM-241	#A	2.4118E-02	2.4118E-02	2.9092E-01	2.9093E-01	3.255E-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 (270.1 to 1999.1 keV) 1.6983624E+01 pCi/gm
Total Decayed Activity (270.1 to 1999.1 keV) 1.6983624E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 101F_15SEPT2006_1307.An1

Sample description
FSS-SSS-01-01-024-F

Spectrum Filename: C:\GammaVision\Spectra\101F_15SEPT2006_1307.An1

Acquisition information

Start time:	15-Sep-2006 13:08:33
Live time:	2000
Real time:	2002
Dead time:	0.09 %
Detector ID:	1

Detector system
Det 101- DSPE-633

Calibration

Filename:	D1_1LSa.Clb

Detector 101 1.0 Liter Marinelli Sand

Energy Calibration

Created:	03-Sep-2004 08:50:48
Zero offset:	0.244 keV
Gain:	0.500 keV/channel
Quadratic:	-2.493E-08 keV/channel^2

Efficiency Calibration

Created:	03-Sep-2004 08:52:26
Type:	Polynomial
Uncertainty:	0.626 %
Coefficients:	-0.321775 -5.816463 0.734234
	-0.099357 0.006049 -0.000149

Library Files

Main analysis library:	FSS_Rev_1.Lib
Library Match Width:	1.000
Peak stripping:	Library based

Analysis parameters

Analysis engine:	Env32 G53W4.20
Start channel:	100 (50.23keV)
Stop channel:	4000 (1999.11keV)
Peak rejection level:	41.667%
Peak search sensitivity:	3
Sample Size:	1.8120E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.8120E+03) = 5.5188E+02
Detection limit method:	Nureg 4.16
Random error:	1.0000000E+00
Systematic error:	1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five 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	08-Sep-2006 10:28:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	101_150K_28APR05.Pbc 01-May-2005 05:24:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 15 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1292

***** 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. pCi/gm	Nuc
74.94	150.	29.70	1.50	1.654E-02	72.87	6.400	PBC<MDA	HG203
					74.81	9.600	7.035E-01	PB212
76.97	301.	15.01	1.50	1.720E-02	77.11	10.700	1.218E+00	PB214
					77.11	17.500	7.450E-01	PB212
76.97	304.	15.01	1.50	1.720E-02	77.11	10.700	1.218E+00	PB214
					77.11	17.500	7.542E-01	PB212
87.05	111.	38.83	1.50	1.910E-02	86.45	32.740	PBC<MDA	EU155
92.72	138.	31.67	1.54	1.989E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
129.46	103.	36.72	1.09	2.109E-02				
186.07	90.	29.60	0.94	1.858E-02	185.99	3.280	1.102E+00	RA226
209.63	111.	26.32	1.42	1.720E-02				
238.84	678.	4.45	1.12	1.556E-02	238.63	43.100	7.467E-01	PB212
					241.92	7.470	4.392E+00	PB214
241.89	105.	19.04	1.12	1.540E-02				
270.24	64.	30.37	1.18	1.400E-02				
295.25	157.	15.40	1.14	1.292E-02	295.22	19.200	4.663E-01	PB214
300.68	74.	27.61	0.95	1.270E-02				
308.35	74.	28.62	0.59	1.240E-02				
338.71	176.	15.15	1.42	1.134E-02	338.40	12.010	9.499E-01	AC228
352.18	269.	11.25	1.01	1.092E-02	351.99	37.100	4.913E-01	PB214
463.07	67.	21.18	1.85	8.349E-03				
463.07	67.	21.18	1.85	8.349E-03	463.51	10.000	5.889E-01	SB125
510.65	126.	15.18	1.59	7.591E-03	510.72	22.500	4.802E-01	TL208
583.42	234.	9.09	1.41	6.681E-03	583.14	86.000	3.002E-01	TL208
609.58	188.	10.87	1.19	6.410E-03	609.32	46.090	4.703E-01	BI214
661.90	38.	39.91	1.32	5.935E-03	661.62	84.620	5.512E-02	CS137

727.26	48.	27.78	1.53	5.442E-03	727.17	11.800	5.518E-01	BI212
794.83	29.	34.78	0.73	5.021E-03				
794.83	29.	34.78	0.73	5.021E-03	795.76	85.400	5.044E-02	CS134
911.28	147.	12.27	1.67	4.446E-03	911.07	29.000	8.417E-01	AC228
968.49	134.	12.93	1.87	4.214E-03	968.90	17.460	1.349E+00	AC228
1120.24	39.	29.64	1.20	3.711E-03	1120.28	15.040	5.200E-01	BI214
1461.02	625.	4.00	1.81	2.942E-03	1460.75	10.700	1.475E+01	K40

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1764.62	36.	18.58	1.86	2.481E-03	1764.51	15.920	6.789E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
258.52	129.46	531.	103.	0.052	110.16	1.087	AC-228	l
418.94	209.63	297.	111.	0.056	78.96	1.418	NP-239	s
477.38	238.88	117.	678.	0.339	13.36	1.122	PB-212	D
483.48	241.93	147.	105.	0.052	57.11	1.124	PB-214	D
540.21	270.24	147.	64.	0.032	91.12	1.180	AC-228	s
601.12	300.68	141.	74.	0.037	82.83	0.953	PB-212	s
616.45	308.35	142.	74.	0.037	85.87	0.585	-	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: FSS_Rev_1.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 3 Sigma %	FWHM keV
PB-212	149.46	74.94	988.	150.	0.075	89.10	1.499
PB-214	153.79	77.11	896.	301.	0.150	45.04	1.499D
PB-212	153.79	77.11	893.	304.	0.152	45.04	1.499D
EU-155	173.68	87.05	867.	111.	0.055	116.48	1.499
TH-234	185.64	93.03	850.	111.	0.055	104.60	1.499s
TH-234	185.61	93.02	808.	121.	0.061	98.14	1.499s
RA-226	371.64	185.99	444.	101.	0.051	93.22	1.499s
PB-212	477.41	238.85	378.	545.	0.273	19.58	1.499
RA-224	483.13	241.71	433.	92.	0.046	99.67	1.499s
PB-214	590.51	295.38	153.	144.	0.072	43.47	1.499s
AC-228	677.21	338.71	174.	174.	0.087	45.46	1.418s
PB-214	704.06	352.13	129.	234.	0.117	28.10	1.499
SB-125	926.13	463.12	61.	58.	0.029	67.66	1.499s
TL-208	1021.24	510.65	96.	110.	0.055	45.55	1.587s
TL-208	1166.84	583.42	71.	231.	0.116	27.28	1.408s
BI-214	1219.20	609.58	75.	186.	0.093	32.61	1.186
CS-137	1323.63	661.77	39.	36.	0.018	87.02	1.499
BI-212	1454.23	727.04	38.	43.	0.021	74.68	1.499s
CS-134	1590.60	795.19	31.	25.	0.013	108.91	1.502s
AC-228	1822.91	911.28	50.	146.	0.073	36.82	1.668
AC-228	1937.39	968.49	41.	133.	0.066	38.79	1.865s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-214	2241.06	1120.24	36.	39.	0.019	88.92	1.200s
K-40	2923.06	1461.02	2.	623.	0.311	12.00	1.813
BI-214	3530.67	1764.62	3.	36.	0.018	55.75	1.857

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 pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Code	MDA Value pCi/gm	COMMENTS
BE-7		2.3472E-01					
			477.56	2.347E-01	%(	3.833E-01 1.18E-01 G	
K-40		1.4751E+01					
			1460.75	1.475E+01	(P	2.309E-01 5.92E-01 G	
MN-54		3.6058E-03					
			834.81	3.606E-03	&(P	5.475E-02 1.55E-02 G	
CO-57		-7.7949E-03					
			122.07	-7.795E-03	%(	5.230E-02 1.56E-02 G K	
			136.43	-6.361E-03	&	3.950E-01 1.17E-01 G	
CO-60		-2.0316E-04					
			1332.51	-2.032E-04	%(P	7.462E-02 2.07E-02 G K	
			1173.23	-1.147E-03	% P	8.675E-02 2.46E-02 G K	
Sr-85		-2.0484E-02					
			514.00	-2.048E-02	%(	6.165E-02 1.84E-02 G	
Kr-85		-4.6534E+02					
			513.99	-4.653E+02	%(P	1.325E+03 3.94E+02 G	
Y-88		-4.8710E-04					
			1836.01	-4.871E-04	%(	4.435E-02 1.08E-02 G K	
			898.02	-5.617E-03	& P	5.109E-02 1.43E-02 G	
NB-94		-2.1492E-04					
			871.10	-2.149E-04	%(P	4.912E-02 1.36E-02 G K	
			702.50	-6.412E-04	% P	3.990E-02 1.10E-02 G K	
Ag-108M		-2.5573E-02					
			722.95	-2.557E-02	%(	6.800E-02 2.04E-02 G K	
			614.37	-5.195E-03	% P	5.456E-02 1.57E-02 G	
			433.93	-8.354E-04	&	3.888E-02 1.11E-02 G	

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CD-109	1.2554E-01						
		88.04	1.255E-01	%(P	1.480E+00	4.42E-01	G
SN-113	5.7151E-04						
		391.71	5.715E-04	&(	6.757E-02	1.95E-02	G K
		255.04	4.041E-01	% P	1.697E+00	5.04E-01	G
SB-125	1.1549E-01						
		427.95	-2.134E-02	%(P	1.482E-01	4.33E-02	G K
		600.77	5.248E-03	& P	2.480E-01	7.03E-02	G
		636.15	9.848E-02	% P	3.713E-01	1.09E-01	G
		463.51	5.205E-01	*(P	3.525E-01	1.20E-01	G
		176.29	-1.085E-01	% P	5.898E-01	1.75E-01	G
I-131	9.4946E-03						
		364.48	9.495E-03	%(	9.022E-02	2.64E-02	G K
		636.97	2.848E-01	%	1.017E+00	2.98E-01	G
		284.29	1.772E-01	%	1.155E+00	3.41E-01	G
CS-134	2.1590E-02						
		604.66	1.799E-03	&(P	8.520E-02	2.49E-02	G K
		795.76	4.421E-02	(P	5.016E-02	1.63E-02	G
		569.29	-1.782E-03	% P	2.721E-01	7.65E-02	G
		801.84	2.067E-01	&	5.123E-01	1.53E-01	G
CS-137	5.3013E-02						
		661.62	5.301E-02	(P	4.718E-02	1.58E-02	G
CE-139	-7.0463E-03						
		165.85	-7.046E-03	%(P	5.594E-02	1.67E-02	G
EU-152	-4.1702E-04						
		121.78	-4.170E-04	%(P	1.357E-01	4.02E-02	G K
		344.30	-1.487E-02	% P	1.539E-01	4.49E-02	G
		1408.08	-3.419E-04	& P	2.344E-01	6.14E-02	G
		964.00	-4.092E-02	% P	4.896E-01	1.40E-01	G
		1112.07	-3.315E-02	% P	4.475E-01	1.25E-01	G
		778.90	1.086E-02	% P	4.770E-01	1.36E-01	G
EU-154	-2.1730E-02						
		123.10	-2.173E-02	%(P	1.043E-01	3.12E-02	G K
		1274.80	-3.092E-02	% P	2.050E-01	5.87E-02	G
		723.30	5.354E-04	% P	2.494E-01	6.99E-02	G
		1004.80	-4.671E-03	% P	2.737E-01	7.47E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	1.3235E-01						
		86.45	1.323E-01	(	1.674E-01	5.14E-02	G K
		105.31	4.345E-02	&	1.760E-01	5.27E-02	G
HG-203	3.3182E-02						
		279.17	3.318E-02	%(	5.141E-02	1.58E-02	G K
		72.87	-2.657E-01	& P	1.370E+00	4.11E-01	G
		70.83	3.828E-02	%	2.309E+00	6.88E-01	G
		82.50	-1.114E+00	%	2.899E+00	8.76E-01	G
TL-208	3.0023E-01						
		583.14	3.002E-01	@(P	5.430E-02	2.76E-02	G
		510.72	4.802E-01	+ P	2.112E-01	8.35E-02	G
PB-212	6.2365E-01						
		238.63	6.059E-01	(P	1.037E-01	4.00E-02	G K
							Energy duplication
		77.11	7.542E-01	+	3.516E-01	1.13E-01	G
		74.81	7.035E-01	&(P	7.006E-01	2.16E-01	G
PB-214	4.3219E-01						
		351.99	4.311E-01	(P	1.022E-01	4.07E-02	G K
		295.22	4.343E-01	*(P	1.815E-01	6.37E-02	G
							Energy duplication
		77.11	1.218E+00	+ P	5.762E-01	1.85E-01	G
							Energy duplication
		241.92	2.787E-01	% P	6.890E-01	2.08E-01	G
BI-212	4.9837E-01						
		727.17	4.984E-01	(P	3.640E-01	1.26E-01	G K
		1620.56	3.585E-01	&	1.666E+00	4.63E-01	G
		785.42	1.022E+00	% P	2.403E+00	7.22E-01	G
BI-214	4.8255E-01						
		609.32	4.703E-01	(P	1.084E-01	5.14E-02	G K
		1764.51	6.789E-01	+ P	2.045E-01	1.28E-01	G
		1120.28	5.200E-01	@(P	4.103E-01	1.56E-01	G
RA-224	1.1446E+00						
		241.00	1.145E+00	&(P	1.234E+00	3.83E-01	G
RA-226	1.2391E+00						
		185.99	1.239E+00	(	1.235E+00	3.85E-01	G
AC-228	8.7338E-01						
		911.07	8.417E-01	(P	2.071E-01	1.05E-01	G K
		968.90	1.349E+00	+ P	3.301E-01	1.75E-01	G
		338.40	9.499E-01	@(P	3.515E-01	1.46E-01	G

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

TH-227      -7.1964E-02
                          236.00-7.196E-02 %(P 4.357E-01 1.30E-01 G K
                          256.25-1.227E-01 % P 6.071E-01 1.80E-01 G

PA-234      -5.5101E-02
                           98.44-5.510E-02 &(  1.834E-01 5.52E-02 G K
                          946.00 0.000E+00 &   3.607E-01 1.02E-01 G
                          131.28 4.085E-02 %   2.209E-01 6.61E-02 G
                           94.67-4.310E-02 %   3.360E-01 1.01E-01 G
                          883.24-9.241E-03 %   3.812E-01 1.05E-01 G
                          926.70 1.546E-02 %   4.337E-01 1.20E-01 G
                          569.26 2.025E-01 %   3.191E-01 9.95E-02 G

TH-234       9.6929E-01
                           63.29 1.229E-01 %(P 2.269E+00 6.74E-01 G K
                           92.80 1.512E+00 *(P 1.690E+00 5.20E-01 G
                           92.38 1.620E+00 *(P 2.025E+00 6.20E-01 G

AM-241      -6.0881E-03
                           59.54-6.088E-03 %(P 3.132E-01 9.31E-02 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

- -

***** 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 pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	2.1403E-01	2.3472E-01	3.5526E-01	3.5551E-01	3.495E-01
K-40		1.4751E+01	1.4751E+01	1.7765E+00	1.9623E+00	
MN-54	#A	3.5493E-03	3.6058E-03	4.6408E-02	4.6408E-02	5.389E-02
CO-57	#B	-7.6539E-03	-7.7949E-03	4.6899E-02	4.6901E-02	5.136E-02
CO-60	#B	-2.0264E-04	-2.0316E-04	1.0761E-02	1.0761E-02	7.442E-02
Sr-85	#A	-1.8984E-02	-2.0484E-02	5.5302E-02	5.5314E-02	5.714E-02
Kr-85	#A	-4.6532E+02	-4.6534E+02	1.3293E+03	1.3296E+03	1.324E+03
Y-88	#B	-4.6509E-04	-4.8710E-04	3.2493E-02	3.2493E-02	4.235E-02
NB-94	#B	-2.1492E-04	-2.1492E-04	1.0845E-02	1.0845E-02	4.912E-02
Ag-108M	#B	-2.5571E-02	-2.5573E-02	6.1098E-02	6.1115E-02	6.799E-02
CD-109	#A	1.2418E-01	1.2554E-01	1.3263E+00	1.3264E+00	1.464E+00
SN-113	#B	5.4755E-04	5.7151E-04	5.8535E-02	5.8535E-02	6.474E-02
SB-125	#B	1.1493E-01	1.1549E-01	8.0085E-02	8.0350E-02	1.475E-01
I-131	#B	5.1430E-03	9.4946E-03	7.9055E-02	7.9056E-02	4.887E-02
CS-134	#B	2.1449E-02	2.1590E-02	2.3902E-02	2.3933E-02	8.464E-02
CS-137	#	5.2989E-02	5.3013E-02	4.7272E-02	4.7367E-02	4.716E-02
CE-139	#A	-6.7982E-03	-7.0463E-03	5.2338E-02	5.2339E-02	5.397E-02
EU-152	#B	-4.1658E-04	-4.1702E-04	3.1034E-01	3.1034E-01	1.356E-01
EU-154	#B	-2.1695E-02	-2.1730E-02	1.0076E-01	1.0077E-01	1.041E-01
EU-155	#A	1.3199E-01	1.3235E-01	1.5416E-01	1.5433E-01	1.670E-01
HG-203	#B	2.9850E-02	3.3182E-02	4.7380E-02	4.7417E-02	4.625E-02
TL-208	#	3.0023E-01	3.0023E-01	8.2747E-02	8.4468E-02	
PB-212	#	6.2365E-01	6.2365E-01	1.2350E-01	1.2843E-01	1.037E-01
PB-214	#	4.3219E-01	4.3219E-01	1.1310E-01	1.1571E-01	1.022E-01
BI-212	#	4.9837E-01	4.9837E-01	3.7804E-01	3.7909E-01	3.640E-01
BI-214		4.8255E-01	4.8255E-01	1.5829E-01	1.6062E-01	
RA-224	#A	1.1446E+00	1.1446E+00	1.1496E+00	1.1515E+00	1.234E+00
RA-226	#	1.2391E+00	1.2391E+00	1.1550E+00	1.1572E+00	1.235E+00
AC-228		8.7338E-01	8.7338E-01	2.5869E-01	2.6336E-01	
TH-227	#B	-7.1964E-02	-7.1964E-02	4.1005E-01	4.1007E-01	4.357E-01
PA-234	#B	-5.5101E-02	-5.5101E-02	1.6561E-01	1.6564E-01	1.834E-01
TH-234	#B	9.6929E-01	9.6929E-01	9.9985E-01	1.0013E+00	2.269E+00
AM-241	#A	-6.0879E-03	-6.0881E-03	5.8071E-01	5.8071E-01	3.132E-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

YAEC Chemistry Lab Spectrum name: 101F_15SEPT2006_1307.An1

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

Total Activity (270.1 to 1999.1 keV) 1.6406713E+01 pCi/gm
Total Decayed Activity (270.1 to 1999.1 keV) 1.6406713E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 101F_15SEPT2006_1349.An1

Sample description
FSS-SSS-01-01-010-F

Spectrum Filename: C:\GammaVision\Spectra\101F_15SEPT2006_1349.An1

Acquisition information

Start time:	15-Sep-2006 13:49:01
Live time:	2000
Real time:	2002
Dead time:	0.11 %
Detector ID:	1

Detector system
Det 101- DSPE-633

Calibration

Filename:	D1_1LSa.Clb

Detector 101 1.0 Liter Marinelli Sand

Energy Calibration

Created:	03-Sep-2004 08:50:48
Zero offset:	0.244 keV
Gain:	0.500 keV/channel
Quadratic:	-2.493E-08 keV/channel^2

Efficiency Calibration

Created:	03-Sep-2004 08:52:26
Type:	Polynomial
Uncertainty:	0.626 %
Coefficients:	-0.321775 -5.816463 0.734234
	-0.099357 0.006049 -0.000149

Library Files

Main analysis library:	FSS_Rev_1.Lib
Library Match Width:	1.000
Peak stripping:	Library based

Analysis parameters

Analysis engine:	Env32 G53W4.20
Start channel:	100 (50.23keV)
Stop channel:	4000 (1999.11keV)
Peak rejection level:	41.667%
Peak search sensitivity:	3
Sample Size:	1.9040E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.9040E+03) = 5.2521E+02
Detection limit method:	Nureg 4.16
Random error:	1.0000000E+00
Systematic error:	1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five 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	09-Sep-2006 07:30:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	101_150K_28APR05.Pbc 01-May-2005 05:24:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 13 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1320

***** 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. pCi/gm	Nuc
74.63	250.	15.04	1.00	1.651E-02				
74.63	250.	15.04	1.00	1.651E-02	74.81	9.600	1.096E+00	PB212
77.98	129.	29.97	1.01	1.745E-02	77.11	10.700	PBC<MDA	PB214
					77.11	17.500	3.050E-01	PB212
87.31	115.	28.05	1.01	1.923E-02	86.45	32.740	1.313E-01	EU155
					88.04	3.790	PBC<MDA	CD109
89.62	114.	30.56	1.02	1.954E-02				
93.29	153.	20.48	1.02	1.995E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
185.99	164.	24.61	1.12	1.858E-02				
185.99	164.	24.61	1.12	1.858E-02	185.99	3.280	1.912E+00	RA226
238.84	868.	4.10	1.12	1.556E-02	238.63	43.100	9.114E-01	PB212
241.86	137.	16.58	1.12	1.540E-02	241.00	3.900	1.610E+00	RA224
270.44	56.	35.71	1.51	1.399E-02				
295.51	179.	11.31	1.16	1.291E-02	295.22	19.200	5.073E-01	PB214
300.01	46.	37.61	1.16	1.273E-02				
338.52	196.	12.43	1.06	1.135E-02	338.40	12.010	1.011E+00	AC228
352.16	341.	9.12	1.43	1.092E-02	351.99	37.100	5.944E-01	PB214
409.05	71.	35.42	1.07	9.430E-03				
463.19	45.	36.18	1.50	8.342E-03	463.51	10.000	PBC<MDA	SB125
510.95	163.	14.46	1.58	7.587E-03	510.72	22.500	6.124E-01	TL208
583.38	286.	8.65	1.38	6.682E-03	583.14	86.000	3.503E-01	TL208
600.71	24.	34.49	1.50	6.459E-03	604.66	97.600	PBC<MDA	CS134
609.38	262.	9.84	1.63	6.412E-03	609.32	46.090	6.265E-01	BI214
727.28	90.	20.33	1.40	5.442E-03	727.17	11.800	9.871E-01	BI212
795.18	38.	29.53	1.50	5.016E-03	795.76	85.400	6.252E-02	CS134
911.44	158.	11.35	1.30	4.445E-03	911.07	29.000	8.572E-01	AC228

968.95	134.	13.57	1.93	4.212E-03	968.90	17.460	1.288E+00	AC228
1120.04	65.	22.29	2.04	3.711E-03	1120.28	15.040	8.306E-01	BI214
1460.97	983.	3.29	2.09	2.942E-03	1460.75	10.700	2.211E+01	K40
1764.60	47.	14.59	1.60	2.481E-03	1764.51	15.920	8.366E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide
174.19	87.40	466.	115.	0.058	84.14	1.014	PB-214 lD
178.81	89.71	551.	114.	0.057	91.69	1.015	PB-214 lD
477.38	238.82	201.	868.	0.434	12.31	1.122	PB-212 D
483.42	241.84	191.	137.	0.069	49.73	1.124	PB-214 D
540.60	270.44	184.	56.	0.028	107.13	1.514	AC-228 s
599.76	299.85	129.	46.	0.023	112.83	1.165	TH-227 lD
817.95	409.05	183.	71.	0.036	106.25	1.070	CS-138 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: FSS_Rev_1.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 3 Sigma %	FWHM keV
PB-212	149.20	74.82	1422.	218.	0.109	74.33	1.499
PB-214	153.79	77.11	1278.	298.	0.149	53.03	1.499D
PB-212	153.79	77.11	1274.	302.	0.151	53.03	1.499D
TH-234	185.74	93.08	1154.	154.	0.077	92.65	1.499s
RA-226	371.64	185.99	608.	142.	0.071	77.81	1.499D
PB-212	477.33	238.82	547.	773.	0.386	16.62	1.499
RA-224	483.77	242.03	658.	96.	0.048	115.93	1.499s
PB-214	590.68	295.46	261.	160.	0.080	48.26	1.499s
AC-228	676.82	338.52	169.	194.	0.097	37.30	1.061s
PB-214	704.19	352.20	188.	318.	0.159	24.69	1.499
SB-125	926.27	463.19	122.	45.	0.023	108.55	1.499s
TL-208	1021.83	510.95	136.	147.	0.074	43.37	1.582s
TL-208	1166.78	583.38	101.	284.	0.142	25.95	1.384s
CS-134	1201.45	600.71	25.	24.	0.012	103.46	1.499s
BI-214	1218.80	609.38	116.	261.	0.130	29.52	1.630
BI-212	1454.72	727.28	73.	89.	0.045	60.99	1.399s
CS-134	1590.59	795.18	44.	38.	0.019	88.59	1.502s
AC-228	1823.22	911.44	64.	156.	0.078	34.04	1.301
AC-228	1938.31	968.95	61.	133.	0.067	40.70	1.931s
BI-214	2240.68	1120.04	52.	65.	0.033	66.87	2.038
K-40	2922.95	1460.97	16.	981.	0.490	9.87	2.090
BI-214	3530.64	1764.60	0.	47.	0.023	43.76	1.599s

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 pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		-3.6089E-02					
			477.56	-3.609E-02	&(	5.013E-01 1.46E-01	G
K-40		2.2108E+01					
			1460.75	2.211E+01	(P	4.849E-01 7.29E-01	G
MN-54		-1.1223E-04					
			834.81	-1.122E-04	%(P	5.786E-02 1.63E-02	G
CO-57		5.5461E-03					
			122.07	5.546E-03	%(	3.894E-02 1.16E-02	G K
			136.43	7.438E-04	%	4.752E-01 1.42E-01	G
CO-60		4.9664E-03					
			1332.51	4.966E-03	%(P	5.991E-02 1.67E-02	G K
			1173.23	1.655E-02	% P	8.528E-02 2.49E-02	G K
Sr-85		-3.4374E-02					
			514.00	-3.437E-02	%(	6.944E-02 2.11E-02	G
Kr-85		-7.6806E+02					
			513.99	-7.681E+02	%(P	1.504E+03 4.55E+02	G
Y-88		-2.1692E-03					
			1836.01	-2.169E-03	%(	5.188E-02 1.34E-02	G K
			898.02	7.828E-03	% P	5.947E-02 1.70E-02	G
NB-94		7.5528E-03					
			871.10	7.553E-03	%(P	5.952E-02 1.71E-02	G K
			702.50	1.833E-02	% P	4.850E-02 1.45E-02	G K
Ag-108M		3.4145E-03					
			722.95	3.415E-03	%(	6.244E-02 1.79E-02	G K
			614.37	-1.406E-03	% P	6.171E-02 1.78E-02	G
			433.93	9.447E-04	%	5.973E-02 1.74E-02	G
CD-109		6.5887E-01					
			88.04	6.589E-01	%(P	1.601E+00 4.85E-01	G
SN-113		2.3276E-02					
			391.71	2.328E-02	&(	6.741E-02 2.02E-02	G K
			255.04	1.389E-01	& P	2.113E+00 6.24E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	9.7311E-02						
		427.95	-8.650E-04	&(P	1.684E-01	4.88E-02	G K
		600.77	-7.995E-03	% P	2.328E-01	6.59E-02	G
		636.15	1.326E-01	% P	4.519E-01	1.34E-01	G
		463.51	3.879E-01	*(P	4.624E-01	1.45E-01	G
		176.29	1.195E-02	% P	6.209E-01	1.84E-01	G
I-131	-3.3179E-02						
		364.48	-3.318E-02	%(	1.030E-01	3.09E-02	G K
		636.97	-3.892E-03	%	1.050E+00	2.96E-01	G
		284.29	-2.702E-01	%	1.277E+00	3.81E-01	G
CS-134	4.3826E-02						
		604.66	2.747E-02	?(P	2.944E-02	9.71E-03	G K
		795.76	6.252E-02	(P	5.614E-02	1.87E-02	G
		569.29	5.683E-03	% P	3.260E-01	9.35E-02	G
		801.84	-4.022E-03	%	5.909E-01	1.66E-01	G
CS-137	1.6507E-02						
		661.62	1.651E-02	%(P	6.492E-02	1.91E-02	G
CE-139	-1.1532E-02						
		165.85	-1.153E-02	&(P	5.857E-02	1.75E-02	G
EU-152	-2.2801E-02						
		121.78	-2.280E-02	%(P	1.556E-01	4.65E-02	G K
		344.30	9.821E-03	% P	1.772E-01	5.20E-02	G
		1408.08	2.066E-02	% P	2.518E-01	6.89E-02	G
		964.00	3.096E-01	% P	4.763E-01	1.47E-01	G
		1112.07	1.182E-01	% P	5.112E-01	1.49E-01	G
		778.90	1.208E-01	% P	4.648E-01	1.37E-01	G
EU-154	-6.5219E-03						
		123.10	-6.522E-03	&(P	1.035E-01	3.08E-02	G K
		1274.80	-1.203E-02	% P	2.053E-01	5.79E-02	G
		723.30	-3.218E-03	% P	2.758E-01	7.81E-02	G
		1004.80	1.602E-01	& P	2.832E-01	8.74E-02	G
EU-155	3.6340E-03						
		86.45	3.634E-03	&(	2.035E-01	6.08E-02	G K
		105.31	7.827E-02	%	2.304E-01	6.95E-02	G
HG-203	1.2507E-02						
		279.17	1.251E-02	%(	5.677E-02	1.69E-02	G K
		72.87	-6.663E-01	% P	1.502E+00	4.55E-01	G
		70.83	3.116E-02	&	3.057E+00	9.16E-01	G
		82.50	-9.055E-01	%	3.110E+00	9.37E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	3.5029E-01						
		583.14	3.503E-01	@(P	6.125E-02	3.06E-02	G
		510.72	6.124E-01	+ P	2.368E-01	9.82E-02	G
PB-212	7.8657E-01						
		238.63	8.168E-01	(P	1.181E-01	4.56E-02	G K
							Energy duplication
		77.11	7.121E-01	(	3.985E-01	1.26E-01	G
		74.81	9.741E-01	& P	7.977E-01	2.47E-01	G
PB-214	5.5621E-01						
		351.99	5.562E-01	(P	1.167E-01	4.61E-02	G K
		295.22	4.585E-01	- P	2.230E-01	7.46E-02	G
							Energy duplication
		77.11	1.150E+00	+ P	6.527E-01	2.06E-01	G
		241.92	-1.285E-02	% P	8.424E-01	2.51E-01	G
BI-212	9.8706E-01						
		727.17	9.871E-01	*(P	4.690E-01	2.02E-01	G K
		1620.56	-3.134E-01	&	1.797E+00	4.97E-01	G
		785.42	8.236E-01	% P	2.795E+00	8.26E-01	G
BI-214	6.2649E-01						
		609.32	6.265E-01	(P	1.271E-01	6.19E-02	G K
		1764.51	8.366E-01	+ P	1.324E-01	1.23E-01	G
		1120.28	8.306E-01	+ P	4.605E-01	1.86E-01	G
RA-224	1.1366E+00						
		241.00	1.137E+00	&(P	1.440E+00	4.43E-01	G
RA-226	1.6551E+00						
							Energy duplication
		185.99	1.655E+00	*(	1.370E+00	4.29E-01	G
AC-228	9.0229E-01						
		911.07	8.572E-01	(P	2.205E-01	9.85E-02	G K
		968.90	1.288E+00	+ P	3.760E-01	1.76E-01	G
		338.40	1.011E+00	@(P	3.293E-01	1.27E-01	G
TH-227	-2.7481E-02						
		236.00	-2.748E-02	%(P	4.110E-01	1.22E-01	G K
		256.25	-1.643E-02	% P	6.349E-01	1.87E-01	G
PA-234	-3.7920E-04						
		98.44	-3.792E-04	%(	2.065E-01	6.15E-02	G K
		946.00	-8.101E-02	&	3.762E-01	1.10E-01	G
		131.28	1.794E-03	&	2.437E-01	7.26E-02	G
		94.67	-1.471E-01	%	3.849E-01	1.16E-01	G
		883.24	-8.392E-02	%	4.474E-01	1.29E-01	G
		926.70	-2.523E-02	%	5.788E-01	1.65E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 1.176E-02 %   4.801E-01 1.38E-01 G

TH-234       1.1132E+00
                           63.29 5.580E-01 %(P 2.216E+00 6.64E-01 G K
                           92.80 1.835E+00  (P 1.915E+00 5.89E-01 G
                           92.38 1.007E-01 % P 2.274E+00 6.78E-01 G

AM-241      -5.9490E-02
                           59.54-5.949E-02 &(P 3.274E-01 9.81E-02 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

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

***** 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 pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	-3.3271E-02	-3.6089E-02	4.3707E-01	4.3708E-01	4.621E-01
K-40		2.2108E+01	2.2108E+01	2.1872E+00	2.5188E+00	
MN-54	#A	-1.1068E-04	-1.1223E-04	7.0244E-02	7.0244E-02	5.706E-02
CO-57	#B	5.4576E-03	5.5461E-03	3.4758E-02	3.4759E-02	3.832E-02
CO-60	#B	4.9552E-03	4.9664E-03	5.0011E-02	5.0012E-02	5.978E-02

Sr-85	#A	-3.2148E-02	-3.4374E-02	6.3250E-02	6.3280E-02	6.494E-02
Kr-85	#A	-7.6802E+02	-7.6806E+02	1.4604E+03	1.4611E+03	1.504E+03
Y-88	#B	-2.0826E-03	-2.1692E-03	4.0320E-02	4.0320E-02	4.981E-02
NB-94	#B	7.5528E-03	7.5528E-03	5.1399E-02	5.1401E-02	5.952E-02
Ag-108M	#B	3.4142E-03	3.4145E-03	5.3719E-02	5.3719E-02	6.243E-02
CD-109	#A	6.5259E-01	6.5887E-01	1.4537E+00	1.4542E+00	1.586E+00
SN-113	#B	2.2414E-02	2.3276E-02	6.0544E-02	6.0558E-02	6.491E-02
SB-125	#B	9.6894E-02	9.7311E-02	1.0900E-01	1.0913E-01	1.676E-01
I-131	#B	-1.9336E-02	-3.3179E-02	9.2627E-02	9.2646E-02	6.005E-02
CS-134	#	4.3574E-02	4.3826E-02	3.0426E-02	3.0527E-02	2.927E-02
CS-137	#A	1.6500E-02	1.6507E-02	5.7338E-02	5.7346E-02	6.490E-02
CE-139	#A	-1.1174E-02	-1.1532E-02	5.4023E-02	5.4027E-02	5.675E-02
EU-152	#B	-2.2780E-02	-2.2801E-02	1.5107E-01	1.5108E-01	1.555E-01
EU-154	#B	-6.5128E-03	-6.5219E-03	1.1670E-01	1.1670E-01	1.034E-01
EU-155	#B	3.6253E-03	3.6340E-03	1.8254E-01	1.8254E-01	2.030E-01
HG-203	#B	1.1394E-02	1.2507E-02	5.0740E-02	5.0745E-02	5.172E-02
TL-208	#	3.5029E-01	3.5029E-01	9.1664E-02	9.3777E-02	
PB-212	#	7.8657E-01	7.8657E-01	1.3176E-01	1.3905E-01	1.181E-01
PB-214	#	5.5621E-01	5.5621E-01	1.3820E-01	1.4173E-01	1.167E-01
BI-212	#	9.8706E-01	9.8706E-01	6.0660E-01	6.0915E-01	
BI-214		6.2649E-01	6.2649E-01	1.8571E-01	1.8905E-01	
RA-224	#A	1.1366E+00	1.1366E+00	1.3275E+00	1.3291E+00	1.440E+00
RA-226	#	1.6551E+00	1.6551E+00	1.2879E+00	1.2913E+00	1.370E+00
AC-228		9.0229E-01	9.0229E-01	2.3046E-01	2.3603E-01	
TH-227	#B	-2.7481E-02	-2.7481E-02	4.1535E-01	4.1535E-01	4.110E-01
PA-234	#B	-3.7920E-04	-3.7920E-04	1.8458E-01	1.8458E-01	2.065E-01
TH-234	#B	1.1132E+00	1.1132E+00	1.0727E+00	1.0744E+00	2.216E+00
AM-241	#A	-5.9489E-02	-5.9490E-02	3.1516E-01	3.1518E-01	3.274E-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 (270.1 to 1999.1 keV) 2.4974262E+01 pCi/gm
Total Decayed Activity (270.1 to 1999.1 keV) 2.4974262E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 101F_15SEPT2006_1429.An1

Sample description
FSS-SSS-01-01-014-F

Spectrum Filename: C:\GammaVision\Spectra\101F_15SEPT2006_1429.An1

Acquisition information
Start time: 15-Sep-2006 14:29:12
Live time: 2000
Real time: 2002
Dead time: 0.10 %
Detector ID: 1

Detector system
Det 101- DSPE-633

Calibration
Filename: D1_1LSa.Clb
Detector 101 1.0 Liter Marinelli Sand

Energy Calibration
Created: 03-Sep-2004 08:50:48
Zero offset: 0.244 keV
Gain: 0.500 keV/channel
Quadratic: -2.493E-08 keV/channel^2

Efficiency Calibration
Created: 03-Sep-2004 08:52:26
Type: Polynomial
Uncertainty: 0.626 %
Coefficients: -0.321775 -5.816463 0.734234
-0.099357 0.006049 -0.000149

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.23keV)
Stop channel: 4000 (1999.11keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.8700E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.8700E+03) =
5.3476E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

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

YAEC Chemistry Lab Spectrum name: 101F_15SEPT2006_1429.An1

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

Corrections	Status	Comments
Decay correct to date:	YES	10-Sep-2006 10:45:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	101_150K_28APR05.Pbc 01-May-2005 05:24:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 17 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1649

***** 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. pCi/gm	Nuc
74.77	272.	12.83	1.00	1.651E-02	74.81	9.600	1.213E+00	PB212
83.84	72.	41.20	1.03	1.867E-02				
93.10	123.	34.26	1.50	1.989E-02	92.80	3.000	PBC<MDA	TH234
128.99	85.	39.54	1.10	2.110E-02				
185.84	121.	25.48	0.88	1.859E-02				
185.84	121.	25.48	0.88	1.859E-02	185.99	3.280	1.430E+00	RA226
209.24	113.	25.14	1.17	1.722E-02				
238.83	829.	4.13	1.12	1.557E-02	238.63	43.100	8.861E-01	PB212
241.74	117.	22.01	1.12	1.541E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	7.335E-01	PB214
270.16	77.	27.95	1.28	1.401E-02				
295.37	177.	12.92	1.07	1.291E-02	295.22	19.200	5.110E-01	PB214
328.16	69.	32.55	1.48	1.169E-02				
338.42	160.	14.37	1.12	1.135E-02	338.40	12.010	8.393E-01	AC228
352.05	334.	9.25	1.07	1.092E-02	351.99	37.100	5.927E-01	PB214
463.43	52.	26.14	1.23	8.343E-03				
463.43	52.	26.14	1.23	8.343E-03	463.51	10.000	4.378E-01	SB125
510.94	123.	14.70	1.33	7.587E-03	510.72	22.500	4.526E-01	TL208
562.89	50.	35.24	1.15	6.913E-03				
583.46	203.	10.23	1.33	6.681E-03	583.14	86.000	2.522E-01	TL208
609.65	238.	12.13	1.06	6.409E-03	609.32	46.090	5.799E-01	BI214
727.50	52.	27.30	1.31	5.441E-03	727.17	11.800	5.730E-01	BI212
782.30	41.	31.52	0.71	5.094E-03				
786.29	24.	40.93	1.50	5.075E-03	785.42	2.000	PBC<MDA	BI212
794.73	51.	31.68	1.18	5.022E-03				
794.73	51.	31.68	1.18	5.022E-03	795.76	85.400	8.574E-02	CS134
860.96	26.	30.79	0.65	4.675E-03				

911.21	166.	12.73	1.44	4.446E-03	911.07	29.000	9.187E-01	AC228
968.57	107.	17.82	1.67	4.213E-03	968.90	17.460	1.042E+00	AC228
1120.43	67.	21.93	1.43	3.710E-03	1120.28	15.040	8.600E-01	BI214
1461.12	797.	3.59	2.09	2.942E-03	1460.75	10.700	1.825E+01	K40
1764.82	43.	15.25	2.11	2.481E-03	1764.51	15.920	7.786E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
153.77	77.04	449.	377.	0.188	28.43	1.006	PB-214	lD
257.60	128.99	485.	96.	0.048	102.27	1.103	AC-228	s
418.16	209.24	317.	113.	0.057	75.43	1.167	AC-228	s
540.05	270.16	178.	77.	0.039	83.86	1.276	AC-228	s
656.10	328.16	170.	69.	0.035	97.66	1.481	AC-228	s
1125.76	562.89	84.	50.	0.025	88.59	1.147	AS-76	
1564.81	782.30	45.	41.	0.021	94.56	0.710	-	l
1722.21	860.96	19.	26.	0.013	92.37	0.649	TL-208	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: FSS_Rev_1.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 3 Sigma %	FWHM keV
PB-212	149.19	74.81	419.	267.	0.134	36.50	1.005D
PB-212	153.79	77.11	449.	371.	0.186	23.81	1.006A
TH-234	185.78	93.10	916.	123.	0.061	102.79	1.499
RA-226	371.84	186.09	511.	113.	0.056	89.61	1.499
PB-212	476.96	238.63	175.	826.	0.413	12.33	1.122D
RA-224	483.16	241.73	610.	91.	0.045	118.97	1.499s
PB-214	483.54	241.92	198.	112.	0.056	60.15	1.124D
PB-214	590.48	295.37	153.	175.	0.088	38.76	1.068s
AC-228	676.62	338.42	151.	158.	0.079	43.10	1.120
PB-214	703.90	352.05	191.	332.	0.166	27.75	1.068s
SB-125	926.38	463.24	74.	51.	0.025	80.93	1.499s
TL-208	1021.82	510.94	84.	107.	0.053	44.11	1.332s
TL-208	1166.93	583.46	78.	201.	0.100	30.68	1.328
BI-214	1219.34	609.65	147.	237.	0.119	36.39	1.064
BI-212	1455.15	727.50	55.	51.	0.025	81.91	1.315
BI-212	1572.79	786.29	36.	24.	0.012	122.78	1.499
CS-134	1590.81	795.29	38.	31.	0.016	97.59	1.502
AC-228	1822.78	911.21	70.	164.	0.082	38.19	1.440s
AC-228	1937.55	968.57	68.	106.	0.053	53.46	1.671s
BI-214	2241.46	1120.43	47.	66.	0.033	65.80	1.427
K-40	2923.25	1461.12	8.	795.	0.397	10.77	2.089
BI-214	3531.07	1764.82	0.	43.	0.021	45.75	2.106

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 pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		8.8090E-02					
			477.56	8.809E-02	%(	4.568E-01 1.34E-01	G
K-40		1.8245E+01					
			1460.75	1.825E+01	(P	3.662E-01 6.57E-01	G
MN-54		-6.3565E-04					
			834.81	-6.357E-04	%(P	6.277E-02 1.77E-02	G
CO-57		-1.2700E-02					
			122.07	-1.270E-02	%(	5.459E-02 1.64E-02	G K
			136.43	-1.536E-01	%	4.351E-01 1.31E-01	G
CO-60		8.9965E-03					
			1332.51	8.997E-03	&(P	6.309E-02 1.78E-02	G K
			1173.23	-2.003E-03	% P	8.139E-02 2.31E-02	G K
Sr-85		-2.1340E-02					
			514.00	-2.134E-02	%(	6.077E-02 1.82E-02	G
Kr-85		-4.9246E+02					
			513.99	-4.925E+02	%(P	1.333E+03 3.98E+02	G
Y-88		2.7055E-03					
			1836.01	2.705E-03	&(	4.699E-02 1.20E-02	G K
			898.02	3.114E-03	& P	5.751E-02 1.62E-02	G
NB-94		-4.0736E-03					
			871.10	-4.074E-03	%(P	3.915E-02 1.08E-02	G K
			702.50	-3.169E-05	% P	4.912E-02 1.38E-02	G K
Ag-108M		-1.8837E-02					
			722.95	-1.884E-02	%(	6.330E-02 1.88E-02	G K
			614.37	-1.865E-02	& P	6.606E-02 1.96E-02	G
			433.93	-2.004E-03	&	4.786E-02 1.38E-02	G
CD-109		-2.7071E-01					
			88.04	-2.707E-01	%(P	1.424E+00 4.27E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SN-113	6.1513E-03						
		391.71	6.151E-03	%(	6.877E-02	2.01E-02	G K
		255.04	3.439E-01	% P	1.908E+00	5.66E-01	G
SB-125	9.5826E-02						
		427.95	-2.050E-02	&(P	1.245E-01	3.62E-02	G K
		600.77	3.609E-02	& P	2.225E-01	6.42E-02	G
		636.15	-5.507E-02	% P	4.720E-01	1.36E-01	G
		463.51	4.402E-01	*(P	3.723E-01	1.22E-01	G
		176.29	-1.714E-01	% P	7.061E-01	2.11E-01	G
I-131	1.2533E-02						
		364.48	1.253E-02	%(	7.718E-02	2.27E-02	G K
		636.97	1.714E-02	&	1.094E+00	3.12E-01	G
		284.29	-6.935E-02	%	9.996E-01	2.94E-01	G
CS-134	1.3638E-02						
		604.66	-2.087E-02	%(P	6.136E-02	1.83E-02	G K
		795.76	5.308E-02	(P	5.317E-02	1.75E-02	G
		569.29	-3.059E-03	% P	3.216E-01	9.17E-02	G
		801.84	1.384E-01	%	5.043E-01	1.47E-01	G
CS-137	-4.2503E-03						
		661.62	-4.250E-03	&(P	4.617E-02	1.29E-02	G
CE-139	9.9434E-03						
		165.85	9.943E-03	&(P	5.521E-02	1.65E-02	G
EU-152	-2.7581E-02						
		121.78	-2.758E-02	%(P	1.568E-01	4.69E-02	G K
		344.30	8.806E-03	& P	1.433E-01	4.17E-02	G
		1408.08	3.821E-02	% P	2.222E-01	6.16E-02	G
		964.00	1.923E-01	% P	5.065E-01	1.51E-01	G
		1112.07	1.574E-02	% P	6.315E-01	1.80E-01	G
		778.90	1.731E-01	% P	3.010E-01	9.31E-02	G
EU-154	-2.5346E-02						
		123.10	-2.535E-02	%(P	1.077E-01	3.23E-02	G K
		1274.80	-3.241E-02	& P	2.073E-01	5.95E-02	G
		723.30	-9.589E-03	% P	4.568E-01	1.33E-01	G
		1004.80	-2.845E-02	% P	3.361E-01	9.51E-02	G
EU-155	1.1557E-01						
		86.45	1.156E-01	%(	1.761E-01	5.38E-02	G K
		105.31	7.783E-02	%	2.216E-01	6.69E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
HG-203	1.2040E-03						
		279.17	1.204E-03	%(	5.496E-02	1.61E-02	G K
		72.87	-7.814E-01	% P	1.317E+00	4.00E-01	G
		70.83	-1.092E-01	%	2.959E+00	8.87E-01	G
		82.50	-7.327E-01	&	2.863E+00	8.61E-01	G
TL-208	2.5220E-01						
		583.14	2.522E-01	(P	5.527E-02	2.61E-02	G
		510.72	4.526E-01	+ P	1.922E-01	7.65E-02	G
PB-212	8.9411E-01						
		238.63	8.897E-01	(P	6.935E-02	3.68E-02	G K
							Energy duplication
		77.11	8.915E-01	}	2.435E-01	7.07E-02	G
		74.81	1.217E+00	+ P	4.463E-01	1.51E-01	G
PB-214	5.8086E-01						
		351.99	5.927E-01	@(P	1.195E-01	5.52E-02	G K
		295.22	5.110E-01	@(P	1.756E-01	6.67E-02	G
							Energy duplication
		77.11	0.000E+00	} P	5.658E-01	0.00E+00	G
		241.92	7.016E-01	(P	4.292E-01	1.42E-01	G
BI-212	5.7295E-01						
		727.17	5.730E-01	(P	4.196E-01	1.59E-01	G K
		1620.56	1.431E-01	%	1.443E+00	3.76E-01	G
		785.42	1.686E+00	+ P	2.189E+00	6.97E-01	G
BI-214	6.3094E-01						
		609.32	5.799E-01	(P	1.447E-01	7.07E-02	G K
		1764.51	7.786E-01	(P	1.348E-01	1.20E-01	G
		1120.28	8.600E-01	+ P	4.469E-01	1.90E-01	G
RA-224	1.0862E+00						
		241.00	1.086E+00	(P	1.413E+00	4.34E-01	G
RA-226	1.3376E+00						
		185.99	1.338E+00	(	1.281E+00	4.00E-01	G
AC-228	9.3933E-01						
		911.07	9.187E-01	@(P	2.338E-01	1.18E-01	G K
		968.90	1.042E+00	*(P	4.040E-01	1.87E-01	G
		338.40	8.393E-01	(P	3.176E-01	1.22E-01	G
TH-227	-2.3185E-01						
		236.00	-2.318E-01	&(P	5.202E-01	1.57E-01	G K
		256.25	8.499E-02	% P	5.313E-01	1.57E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PA-234	-2.0037E-03						
		98.44	-2.004E-03	%(	2.016E-01	6.01E-02	G K
		946.00	9.548E-03	&	3.070E-01	8.67E-02	G
		131.28	-1.957E-02	%	2.270E-01	6.77E-02	G
		94.67	-1.090E-01	&	3.545E-01	1.07E-01	G
		883.24	1.664E-01	&	3.374E-01	1.03E-01	G
		926.70	-5.053E-02	%	4.359E-01	1.23E-01	G
		569.26	0.000E+00	%	4.737E-01	1.35E-01	G
TH-234	1.2680E+00						
		63.29	1.101E+00	%(P	2.418E+00	7.31E-01	G K
		92.80	1.486E+00	(P	1.741E+00	5.35E-01	G
		92.38	4.500E-01	% P	1.864E+00	5.58E-01	G
AM-241	-9.4314E-03						
		59.54	-9.431E-03	&(P	3.199E-01	9.52E-02	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	

- -

***** 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 pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	8.2387E-02	8.8090E-02	4.0227E-01	4.0230E-01	4.272E-01
K-40		1.8245E+01	1.8245E+01	1.9716E+00	2.2248E+00	
MN-54	#A	-6.2842E-04	-6.3565E-04	4.4478E-02	4.4478E-02	6.206E-02
CO-57	#B	-1.2533E-02	-1.2700E-02	4.9172E-02	4.9177E-02	5.387E-02
CO-60	#B	8.9798E-03	8.9965E-03	5.3542E-02	5.3545E-02	6.297E-02
Sr-85	#A	-2.0195E-02	-2.1340E-02	5.4631E-02	5.4644E-02	5.751E-02
Kr-85	#A	-4.9244E+02	-4.9246E+02	1.3278E+03	1.3281E+03	1.333E+03
Y-88	#B	2.6163E-03	2.7055E-03	3.6095E-02	3.6095E-02	4.544E-02
NB-94	#B	-4.0736E-03	-4.0736E-03	3.6052E-02	3.6053E-02	3.915E-02
Ag-108M	#B	-1.8835E-02	-1.8837E-02	5.6272E-02	5.6282E-02	6.329E-02
CD-109	#A	-2.6858E-01	-2.7071E-01	1.3258E+00	1.3259E+00	1.413E+00
SN-113	#B	5.9633E-03	6.1513E-03	6.0245E-02	6.0246E-02	6.667E-02
SB-125	#B	9.5488E-02	9.5826E-02	7.9770E-02	7.9954E-02	1.241E-01
I-131	#B	8.0357E-03	1.2533E-02	6.8124E-02	6.8127E-02	4.949E-02
CS-134	#B	1.3574E-02	1.3638E-02	1.3487E-02	1.3509E-02	6.107E-02
CS-137	#A	-4.2489E-03	-4.2503E-03	7.1493E-02	7.1494E-02	4.616E-02
CE-139	#A	9.6883E-03	9.9434E-03	4.9528E-02	4.9531E-02	5.380E-02
EU-152	#B	-2.7560E-02	-2.7581E-02	1.5048E-01	1.5049E-01	1.567E-01
EU-154	#B	-2.5317E-02	-2.5346E-02	1.0299E-01	1.0300E-01	1.076E-01
EU-155	#B	1.1534E-01	1.1557E-01	1.6126E-01	1.6139E-01	1.758E-01
HG-203	#B	1.1151E-03	1.2040E-03	4.8381E-02	4.8382E-02	5.090E-02
TL-208		2.5220E-01	2.5220E-01	7.8293E-02	7.9579E-02	
PB-212		8.9411E-01	8.9411E-01	1.1107E-01	1.2202E-01	
PB-214		5.8086E-01	5.8086E-01	1.4965E-01	1.5321E-01	
BI-212		5.7295E-01	5.7295E-01	4.7554E-01	4.7664E-01	
BI-214		6.3094E-01	6.3094E-01	1.8592E-01	1.8930E-01	
RA-224	#A	1.0862E+00	1.0862E+00	1.3024E+00	1.3039E+00	1.413E+00
RA-226	#	1.3376E+00	1.3376E+00	1.1986E+00	1.2009E+00	1.281E+00
AC-228		9.3933E-01	9.3933E-01	2.4847E-01	2.5408E-01	
TH-227	#B	-2.3185E-01	-2.3185E-01	4.7981E-01	4.7999E-01	5.202E-01
PA-234	#B	-2.0037E-03	-2.0037E-03	1.8016E-01	1.8016E-01	2.016E-01
TH-234	#B	1.2680E+00	1.2680E+00	1.3690E+00	1.3708E+00	2.418E+00
AM-241	#A	-9.4312E-03	-9.4314E-03	4.4619E-01	4.4619E-01	3.199E-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

YAEC Chemistry Lab Spectrum name: 101F_15SEPT2006_1429.An1

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

Total Activity (270.1 to 1999.1 keV) 2.2115885E+01 pCi/gm
Total Decayed Activity (270.1 to 1999.1 keV) 2.2115885E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 101F_15SEPT2006_1509.An1

Sample description
FSS-SSS-01-01-003-F

Spectrum Filename: C:\GammaVision\Spectra\101F_15SEPT2006_1509.An1

Acquisition information

Start time:	15-Sep-2006 15:09:53
Live time:	2000
Real time:	2002
Dead time:	0.09 %
Detector ID:	1

Detector system
Det 101- DSPE-633

Calibration

Filename:	D1_1LSa.Clb

Detector 101 1.0 Liter Marinelli Sand

Energy Calibration

Created:	03-Sep-2004 08:50:48
Zero offset:	0.244 keV
Gain:	0.500 keV/channel
Quadratic:	-2.493E-08 keV/channel^2

Efficiency Calibration

Created:	03-Sep-2004 08:52:26
Type:	Polynomial
Uncertainty:	0.626 %
Coefficients:	-0.321775 -5.816463 0.734234
	-0.099357 0.006049 -0.000149

Library Files

Main analysis library:	FSS_Rev_1.Lib
Library Match Width:	1.000
Peak stripping:	Library based

Analysis parameters

Analysis engine:	Env32 G53W4.20
Start channel:	100 (50.23keV)
Stop channel:	4000 (1999.11keV)
Peak rejection level:	41.667%
Peak search sensitivity:	3
Sample Size:	1.4240E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.4240E+03) = 7.0225E+02
Detection limit method:	Nureg 4.16
Random error:	1.0000000E+00
Systematic error:	1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five 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	11-Sep-2006 11:36:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	101_150K_28APR05.Pbc 01-May-2005 05:24:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 16 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.2284

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

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.33	156.	22.36	1.00	1.651E-02				
74.33	156.	22.36	1.00	1.651E-02	74.81	9.600	PBC<MDA	PB212
77.43	374.	8.86	1.01	1.739E-02	77.11	10.700	1.908E+00	PB214
					77.11	17.500	1.178E+00	PB212
86.96	149.	19.09	1.01	1.916E-02	86.45	32.740	2.270E-01	EU155
89.79	102.	29.08	1.02	1.954E-02	88.04	3.790	PBC<MDA	CD109
93.85	114.	25.57	1.02	1.999E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
129.31	84.	40.88	0.96	2.109E-02				
185.75	117.	31.13	1.15	1.860E-02				
185.75	117.	31.13	1.15	1.860E-02	185.99	3.280	1.820E+00	RA226
209.44	99.	25.56	1.34	1.721E-02				
238.90	736.	4.32	1.12	1.556E-02	238.63	43.100	1.032E+00	PB212
241.91	103.	20.13	1.12	1.540E-02				
270.24	89.	28.42	1.43	1.400E-02				
295.36	191.	13.75	1.16	1.291E-02	295.22	19.200	7.239E-01	PB214
300.73	42.	39.84	1.39	1.270E-02				
338.50	191.	14.63	1.20	1.135E-02	338.40	12.010	1.316E+00	AC228
352.15	297.	8.13	1.10	1.092E-02	351.99	37.100	6.908E-01	PB214
463.71	38.	40.44	1.50	8.342E-03	463.51	10.000	PBC<MDA	SB125
510.82	103.	17.40	0.96	7.589E-03	510.72	22.500	4.855E-01	TL208
583.45	200.	9.08	1.68	6.681E-03	583.14	86.000	3.269E-01	TL208
609.56	201.	11.26	1.56	6.410E-03	609.32	46.090	6.412E-01	BI214
727.59	67.	22.92	1.23	5.440E-03	727.17	11.800	9.740E-01	BI212
911.40	185.	10.43	1.24	4.445E-03	911.07	29.000	1.348E+00	AC228
969.46	75.	23.43	1.48	4.210E-03	968.90	17.460	9.637E-01	AC228
1120.17	44.	38.92	1.27	3.711E-03	1120.28	15.040	7.434E-01	BI214

1461.18	757.	3.70	1.85	2.942E-03	1460.75	10.700	2.275E+01	K40
1764.83	41.	15.62	1.02	2.481E-03	1764.51	15.920	9.744E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide
173.49	86.88	332.	149.	0.075	57.27	1.014	TB-160 lD
179.15	89.71	392.	102.	0.051	87.23	1.016	PB-214 lD
258.22	129.31	475.	89.	0.045	108.64	0.964	AC-228 M
418.56	209.44	246.	99.	0.049	76.67	1.340	AC-228 sM
477.49	238.86	138.	736.	0.368	12.97	1.122	PB-212 D
483.53	241.88	164.	103.	0.052	60.40	1.124	PB-214 D
540.20	270.24	213.	89.	0.045	85.25	1.427	AC-228 s
601.21	300.73	119.	42.	0.021	119.52	1.387	PB-212

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: FSS_Rev_1.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 3 Sigma %	FWHM keV
PB-212	149.45	74.94	1086.	209.	0.105	68.18	1.499s
PB-214	153.79	77.11	943.	357.	0.178	39.37	1.499D
PB-212	153.79	77.11	939.	361.	0.180	39.37	1.499D
TH-234	186.01	93.21	786.	163.	0.082	71.56	1.499s
TH-234	185.97	93.19	810.	168.	0.084	72.82	1.499s
RA-226	371.70	186.02	459.	86.	0.043	110.42	1.499s
PB-212	477.36	238.83	414.	604.	0.302	18.56	1.499
RA-224	474.03	237.17	62.	56.	0.028	71.20	1.499
PB-214	590.77	295.51	216.	157.	0.079	45.79	1.499
AC-228	676.78	338.50	187.	189.	0.095	43.89	1.198s
PB-214	704.05	352.13	138.	298.	0.149	23.89	1.499s
TL-208	1021.57	510.82	98.	87.	0.044	52.20	0.957s
TL-208	1166.91	583.45	57.	198.	0.099	27.25	1.680s
BI-214	1219.16	609.56	92.	200.	0.100	33.77	1.555s
BI-212	1455.32	727.59	60.	66.	0.033	68.75	1.229
AC-228	1823.16	911.40	54.	183.	0.092	31.29	1.236s
AC-228	1939.33	969.46	70.	75.	0.037	70.28	1.482
BI-214	2240.94	1120.17	76.	44.	0.022	116.76	1.274
K-40	2923.37	1461.18	10.	755.	0.377	11.10	1.854
BI-214	3531.10	1764.83	0.	41.	0.020	46.85	1.016s

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 pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Code	MDA Value pCi/gm	COMMENTS
BE-7		1.8902E-01					
			477.56	1.890E-01	%(	5.385E-01 1.61E-01	G
K-40		2.2754E+01					
			1460.75	2.275E+01	(P	5.276E-01 8.45E-01	G
MN-54		-8.3288E-04					
			834.81	-8.329E-04	%(P	7.312E-02 2.05E-02	G
CO-57		1.2763E-02					
			122.07	1.276E-02	%(	6.410E-02 1.92E-02	G K
			136.43	3.862E-02	%	5.286E-01 1.57E-01	G
CO-60		1.6865E-02					
			1332.51	1.686E-02	&(P	8.365E-02 2.40E-02	G K
			1173.23	1.723E-02	& P	8.712E-02 2.52E-02	G K
Sr-85		-2.8325E-02					
			514.00	-2.833E-02	%(	8.081E-02 2.42E-02	G
Kr-85		-6.6148E+02					
			513.99	-6.615E+02	%(P	1.791E+03 5.35E+02	G
Y-88		-3.1429E-03					
			1836.01	-3.143E-03	%(	6.738E-02 1.74E-02	G K
			898.02	1.879E-02	& P	6.653E-02 1.94E-02	G
NB-94		-1.6545E-02					
			871.10	-1.655E-02	&(P	7.716E-02 2.25E-02	G K
			702.50	-1.894E-04	% P	6.518E-02 1.84E-02	G K
Ag-108M		-1.1172E-02					
			722.95	-1.117E-02	%(	7.940E-02 2.30E-02	G K
			614.37	-3.629E-02	% P	7.892E-02 2.39E-02	G
			433.93	7.369E-03	%	6.042E-02 1.76E-02	G
CD-109		4.5579E-01					
			88.04	4.558E-01	%(P	1.883E+00 5.66E-01	G
SN-113		-5.8147E-03					
			391.71	-5.815E-03	%(	8.300E-02 2.41E-02	G K
			255.04	2.787E-01	% P	2.097E+00 6.17E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	-2.8117E-03						
		427.95	-2.812E-03	%(P	1.679E-01	4.80E-02	G K
		600.77	-4.265E-02	% P	3.604E-01	1.04E-01	G
		636.15	-1.430E-01	% P	5.529E-01	1.62E-01	G
		463.51	4.324E-01	% P	5.843E-01	1.82E-01	G
		176.29	4.586E-02	% P	8.228E-01	2.44E-01	G
I-131	5.6199E-03						
		364.48	5.620E-03	%(	8.371E-02	2.43E-02	G K
		636.97	-3.231E-02	&	1.331E+00	3.80E-01	G
		284.29	-2.347E-01	&	1.222E+00	3.63E-01	G
CS-134	-2.8265E-03						
		604.66	-2.826E-03	%(P	6.878E-02	1.96E-02	G K
		795.76	6.662E-03	% P	7.140E-02	2.02E-02	G
		569.29	9.023E-02	& P	3.290E-01	9.65E-02	G
		801.84	3.971E-03	&	6.700E-01	1.86E-01	G
CS-137	1.8689E-02						
		661.62	1.869E-02	%(P	8.301E-02	2.43E-02	G
CE-139	1.6330E-02						
		165.85	1.633E-02	&(P	6.013E-02	1.80E-02	G
EU-152	2.7725E-02						
		121.78	2.773E-02	%(P	1.903E-01	5.68E-02	G K
		344.30	1.118E-03	% P	1.928E-01	5.59E-02	G
		1408.08	-2.619E-03	% P	3.632E-01	9.77E-02	G
		964.00	2.876E-02	% P	5.833E-01	1.65E-01	G
		1112.07	2.694E-01	% P	5.592E-01	1.70E-01	G
		778.90	8.773E-03	& P	3.198E-01	8.59E-02	G
EU-154	3.4498E-02						
		123.10	3.450E-02	%(P	1.378E-01	4.14E-02	G K
		1274.80	5.296E-02	% P	2.582E-01	7.46E-02	G
		723.30	-3.205E-03	% P	6.299E-01	1.84E-01	G
		1004.80	9.585E-03	% P	4.800E-01	1.35E-01	G
EU-155	1.1329E-02						
		86.45	1.133E-02	%(	2.416E-01	7.22E-02	G K
		105.31	-6.694E-03	%	2.774E-01	8.26E-02	G
HG-203	1.0076E-02						
		279.17	1.008E-02	%(	6.822E-02	2.02E-02	G K
		72.87	-5.304E-01	% P	1.711E+00	5.15E-01	G
		70.83	-1.204E+00	%	3.026E+00	9.15E-01	G
		82.50	-9.226E-01	&	3.579E+00	1.08E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	3.2690E-01						
		583.14	3.269E-01	(P	6.254E-02	3.01E-02	G
		510.72	4.855E-01	+ P	2.709E-01	1.00E-01	G
PB-212	8.5375E-01						
		238.63	8.537E-01	(P	1.378E-01	5.34E-02	G K
							Energy duplication
		77.11	1.137E+00	+	4.587E-01	1.49E-01	G
		74.81	1.250E+00	+ P	9.339E-01	2.91E-01	G
PB-214	6.6489E-01						
		351.99	6.981E-01	@(P	1.343E-01	5.60E-02	G K
		295.22	6.007E-01	(P	2.725E-01	9.27E-02	G
							Energy duplication
		77.11	1.840E+00	+ P	7.517E-01	2.44E-01	G
		241.92	1.154E-01	% P	9.453E-01	2.82E-01	G
BI-212	9.7404E-01						
		727.17	9.740E-01	(P	5.737E-01	2.26E-01	G K
		1620.56	9.703E-01	%	1.511E+00	4.99E-01	G
		785.42	1.215E+00	% P	3.026E+00	9.05E-01	G
BI-214	6.6631E-01						
		609.32	6.412E-01	@(P	1.525E-01	7.26E-02	G K
		1764.51	9.744E-01	+ P	1.770E-01	1.54E-01	G
		1120.28	7.434E-01	(P	7.381E-01	2.92E-01	G
RA-224	8.7720E-01						
		241.00	8.772E-01	(P	6.212E-01	2.11E-01	G
RA-226	1.3399E+00						
		185.99	1.340E+00	*(	1.596E+00	4.93E-01	G
AC-228	1.3384E+00						
		911.07	1.348E+00	@(P	2.716E-01	1.42E-01	G K
		968.90	9.637E-01	- P	5.392E-01	2.28E-01	G
		338.40	1.316E+00	@(P	4.625E-01	1.95E-01	G
TH-227	2.4038E-02						
		236.00	2.404E-02	&(P	4.264E-01	1.25E-01	G K
		256.25	-1.073E-01	% P	7.856E-01	2.32E-01	G
PA-234	4.2951E-03						
		98.44	4.295E-03	%(	2.492E-01	7.42E-02	G K
		946.00	1.836E-03	&	3.844E-01	1.08E-01	G
		131.28	-5.659E-02	&	2.787E-01	8.35E-02	G
		94.67	-6.639E-02	%	3.227E-01	9.65E-02	G
		883.24	9.034E-03	&	4.698E-01	1.29E-01	G
		926.70	4.001E-03	%	5.524E-01	1.52E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 1.393E-01 &   4.844E-01 1.43E-01 G

TH-234       1.7272E+00
                           63.29 1.420E-01 %(P 2.969E+00 8.83E-01 G K
                           92.80 2.667E+00 @(P 2.152E+00 6.71E-01 G
                           92.38 3.036E+00 &(P 2.480E+00 7.72E-01 G

AM-241       2.9925E-02
                           59.54 2.992E-02 %(P 3.882E-01 1.16E-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

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

***** 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 pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	1.7911E-01	1.8902E-01	4.8234E-01	4.8246E-01	5.103E-01
K-40		2.2754E+01	2.2754E+01	2.5339E+00	2.8415E+00	
MN-54	#A	-8.2524E-04	-8.3288E-04	5.1312E-02	5.1312E-02	7.245E-02
CO-57	#B	1.2628E-02	1.2763E-02	5.7587E-02	5.7591E-02	6.343E-02
CO-60	#B	1.6840E-02	1.6865E-02	7.1972E-02	7.1978E-02	8.353E-02

Sr-85	#A	-2.7096E-02	-2.8325E-02	7.2667E-02	7.2685E-02	7.731E-02
Kr-85	#A	-6.6146E+02	-6.6148E+02	1.7815E+03	1.7819E+03	1.791E+03
Y-88	#B	-3.0593E-03	-3.1429E-03	5.2339E-02	5.2339E-02	6.558E-02
NB-94	#B	-1.6545E-02	-1.6545E-02	6.9642E-02	6.9648E-02	7.716E-02
Ag-108M	#B	-1.1171E-02	-1.1172E-02	6.8971E-02	6.8974E-02	7.939E-02
CD-109	#A	4.5291E-01	4.5579E-01	1.6975E+00	1.6977E+00	1.871E+00
SN-113	#B	-5.6712E-03	-5.8147E-03	7.2323E-02	7.2324E-02	8.095E-02
SB-125	#B	-2.8037E-03	-2.8117E-03	3.4682E-01	3.4682E-01	1.675E-01
I-131	#B	3.9301E-03	5.6199E-03	7.2860E-02	7.2861E-02	5.854E-02
CS-134	#B	-2.8157E-03	-2.8265E-03	1.1705E-01	1.1705E-01	6.851E-02
CS-137	#A	1.8684E-02	1.8689E-02	7.2926E-02	7.2934E-02	8.299E-02
CE-139	#A	1.5992E-02	1.6330E-02	5.4062E-02	5.4070E-02	5.889E-02
EU-152	#B	2.7708E-02	2.7725E-02	1.7055E-01	1.7055E-01	1.902E-01
EU-154	#B	3.4466E-02	3.4498E-02	1.2411E-01	1.2413E-01	1.377E-01
EU-155	#B	1.1311E-02	1.1329E-02	2.1656E-01	2.1656E-01	2.412E-01
HG-203	#B	9.4729E-03	1.0076E-02	6.0545E-02	6.0548E-02	6.413E-02
TL-208		3.2690E-01	3.2690E-01	9.0161E-02	9.2033E-02	
PB-212	#	8.5375E-01	8.5375E-01	1.6011E-01	1.6722E-01	1.378E-01
PB-214	#	6.6489E-01	6.6489E-01	1.5992E-01	1.6427E-01	1.343E-01
BI-212		9.7404E-01	9.7404E-01	6.7650E-01	6.7873E-01	
BI-214		6.6631E-01	6.6631E-01	2.2625E-01	2.2937E-01	
RA-224		8.7720E-01	8.7720E-01	6.3261E-01	6.3455E-01	6.212E-01
RA-226	#A	1.3399E+00	1.3399E+00	1.4796E+00	1.4815E+00	1.596E+00
AC-228		1.3384E+00	1.3384E+00	3.6472E-01	3.7248E-01	
TH-227	#B	2.4038E-02	2.4038E-02	3.7632E-01	3.7632E-01	4.264E-01
PA-234	#B	4.2951E-03	4.2951E-03	2.2246E-01	2.2246E-01	2.492E-01
TH-234	#B	1.7272E+00	1.7272E+00	1.3041E+00	1.3076E+00	2.969E+00
AM-241	#A	2.9924E-02	2.9925E-02	3.4700E-01	3.4700E-01	3.882E-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 (270.1 to 1999.1 keV) 2.6937233E+01 pCi/gm
Total Decayed Activity (270.1 to 1999.1 keV) 2.6937233E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 101F_16SEPT2006_0905.An1

Sample description
FSS-SSS-01-01-036-F-B

Spectrum Filename: C:\GammaVision\Spectra\101F_16SEPT2006_0905.An1

Acquisition information

Start time:	16-Sep-2006 09:05:18
Live time:	2000
Real time:	2002
Dead time:	0.08 %
Detector ID:	1

Detector system
Det 101- DSPE-633

Calibration

Filename:	D1_1LSa.Clb

Detector 101 1.0 Liter Marinelli Sand

Energy Calibration

Created:	03-Sep-2004 08:50:48
Zero offset:	0.244 keV
Gain:	0.500 keV/channel
Quadratic:	-2.493E-08 keV/channel^2

Efficiency Calibration

Created:	03-Sep-2004 08:52:26
Type:	Polynomial
Uncertainty:	0.626 %
Coefficients:	-0.321775 -5.816463 0.734234
	-0.099357 0.006049 -0.000149

Library Files

Main analysis library:	FSS_Rev_1.Lib
Library Match Width:	1.000
Peak stripping:	Library based

Analysis parameters

Analysis engine:	Env32 G53W4.20
Start channel:	100 (50.23keV)
Stop channel:	4000 (1999.11keV)
Peak rejection level:	41.667%
Peak search sensitivity:	3
Sample Size:	1.2850E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.2850E+03) = 7.7821E+02
Detection limit method:	Nureg 4.16
Random error:	1.0000000E+00
Systematic error:	1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five 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	12-Sep-2006 13:30:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	101_150K_28APR05.Pbc 01-May-2005 05:24:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 14 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1516

***** 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. pCi/gm	Nuc
74.82	224.	12.16	1.00	1.654E-02	74.81	9.600	1.482E+00	PB212
75.73	128.	2.47	1.50	1.720E-02	74.81	9.600	PBC<MDA	PB212
					77.11	17.500	PBC<MDA	PB212
					77.11	10.700	PBC<MDA	PB214
93.10	107.	33.29	1.50	1.989E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
185.74	142.	20.05	1.24	1.860E-02				
185.74	142.	20.05	1.24	1.860E-02	185.99	3.280	2.441E+00	RA226
209.69	69.	38.11	1.11	1.719E-02				
238.79	602.	4.79	1.12	1.557E-02	238.63	43.100	9.343E-01	PB212
242.19	89.	20.93	1.12	1.539E-02	241.00	3.900	1.545E+00	RA224
					241.92	7.470	8.094E-01	PB214
269.77	70.	32.76	1.58	1.402E-02				
277.27	48.	39.49	1.60	1.368E-02				
295.48	140.	12.36	1.16	1.291E-02	295.22	19.200	5.878E-01	PB214
328.15	51.	29.56	0.89	1.169E-02				
338.75	144.	15.87	1.20	1.134E-02	338.40	12.010	1.094E+00	AC228
351.93	275.	9.03	0.88	1.093E-02	351.99	37.100	7.084E-01	PB214
511.07	101.	15.85	1.89	7.585E-03	510.72	22.500	5.245E-01	TL208
583.37	166.	11.45	1.39	6.682E-03	583.14	86.000	2.993E-01	TL208
609.22	213.	9.26	1.31	6.414E-03	609.32	46.090	7.539E-01	BI214
661.80	34.	39.58	0.78	5.936E-03	661.62	84.620	PBC<MDA	CS137
727.72	30.	37.98	1.50	5.443E-03	727.17	11.800	PBC<MDA	BI212
785.46	24.	35.54	1.50	5.075E-03	785.42	2.000	PBC<MDA	BI212
794.95	22.	35.99	1.50	5.016E-03	795.76	85.400	PBC<MDA	CS134
860.95	27.	27.47	0.87	4.675E-03				
911.54	111.	12.50	1.43	4.444E-03	911.07	29.000	8.933E-01	AC228

969.27	72.	22.90	1.46	4.211E-03	968.90	17.460	1.019E+00	AC228
1120.07	48.	20.09	2.23	3.711E-03	1120.28	15.040	8.973E-01	BI214
1460.86	564.	4.33	2.12	2.942E-03	1460.75	10.700	1.875E+01	K40
1765.06	32.	17.68	0.65	2.481E-03	1764.51	15.920	8.402E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
419.05	209.69	249.	69.	0.034	114.33	1.105	NP-239	s
539.26	269.77	164.	70.	0.035	98.28	1.575	AC-228	s
554.26	277.27	125.	50.	0.025	103.94	1.596	TL-208	s
656.08	328.15	82.	51.	0.026	88.69	0.889	AC-228	
1722.20	860.95	14.	27.	0.014	82.40	0.866	TL-208	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: FSS_Rev_1.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 3 Sigma %	FWHM keV
HG-203	146.49	73.46	856.	-124.	-0.062	104.03	1.499s
PB-212	149.19	74.81	279.	224.	0.112	36.48	1.005D
PB-212	153.79	77.11	323.	267.	0.134	29.77	1.006A
PB-214	153.79	77.11	453.	128.	0.064	7.41	1.499A
TH-234	185.77	93.10	658.	107.	0.053	99.86	1.499
RA-226	371.94	186.14	299.	113.	0.057	70.66	1.499s
PB-212	476.96	238.63	121.	596.	0.298	14.36	1.122D
PB-214	483.54	241.92	116.	92.	0.046	58.42	1.124D
PB-214	590.66	295.46	185.	137.	0.068	55.37	0.957
AC-228	677.29	338.75	128.	142.	0.071	47.60	1.201s
PB-214	703.66	351.93	116.	273.	0.137	27.10	0.883
TL-208	1022.08	511.07	72.	85.	0.043	47.56	1.886s
TL-208	1166.75	583.37	65.	164.	0.082	34.35	1.387
BI-214	1218.47	609.22	56.	212.	0.106	27.78	1.308
CS-137	1323.95	661.93	46.	27.	0.013	118.27	1.499s
BI-212	1455.59	727.72	53.	30.	0.015	113.94	1.499s
BI-212	1571.14	785.46	26.	24.	0.012	106.62	1.499
CS-134	1590.12	794.95	21.	22.	0.011	107.96	1.502s
AC-228	1823.43	911.54	32.	110.	0.055	37.51	1.428s
AC-228	1938.96	969.27	55.	71.	0.036	68.69	1.456
BI-214	2240.73	1120.07	18.	48.	0.024	60.27	2.226s
K-40	2922.74	1460.86	11.	561.	0.281	12.99	2.121
BI-214	3531.56	1765.06	0.	32.	0.016	53.03	0.649s

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 pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		-3.5106E-02					
			477.56	-3.511E-02	%(	5.384E-01 1.54E-01	G
K-40		1.8749E+01					
			1460.75	1.875E+01	(P	5.992E-01 8.15E-01	G
MN-54		3.1359E-02					
			834.81	3.136E-02	%(P	6.480E-02 1.96E-02	G
CO-57		-3.7786E-03					
			122.07	-3.779E-03	%(	5.935E-02 1.76E-02	G K
			136.43	0.000E+00	&	4.763E-01 1.41E-01	G
CO-60		2.8925E-02					
			1332.51	2.893E-02	%(P	6.941E-02 2.08E-02	G K
			1173.23	3.674E-02	% P	7.631E-02 2.32E-02	G K
Sr-85		-2.2909E-02					
			514.00	-2.291E-02	%(	7.771E-02 2.31E-02	G
Kr-85		-5.4587E+02					
			513.99	-5.459E+02	%(P	1.731E+03 5.12E+02	G
Y-88		-1.2904E-03					
			1836.01	-1.290E-03	%(	6.720E-02 1.68E-02	G K
			898.02	-2.802E-02	% P	9.719E-02 2.86E-02	G
NB-94		1.7919E-02					
			871.10	1.792E-02	%(P	5.935E-02 1.73E-02	G K
			702.50	1.103E-02	& P	6.297E-02 1.81E-02	G K
Ag-108M		7.0840E-04					
			722.95	7.084E-04	&(	5.121E-02 1.38E-02	G K
			614.37	-1.940E-02	% P	7.316E-02 2.15E-02	G
			433.93	-1.444E-03	%	6.287E-02 1.81E-02	G
CD-109		3.3442E-01					
			88.04	3.344E-01	%(P	1.872E+00 5.60E-01	G
SN-113		1.4884E-02					
			391.71	1.488E-02	%(	7.559E-02 2.21E-02	G K
			255.04	-6.078E-01	% P	2.623E+00 7.81E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	3.3328E-02						
		427.95	3.333E-02	%(P	1.718E-01	5.02E-02	G K
		600.77	6.635E-02	% P	3.093E-01	8.98E-02	G
		636.15	2.489E-02	& P	4.862E-01	1.36E-01	G
		463.51	2.366E-01	% P	4.829E-01	1.46E-01	G
		176.29	-1.205E-01	% P	8.580E-01	2.54E-01	G
I-131	3.9176E-04						
		364.48	3.918E-04	%(	6.933E-02	1.97E-02	G K
		636.97	1.185E-01	%	9.179E-01	2.59E-01	G
		284.29	3.329E-02	&	1.078E+00	3.13E-01	G
CS-134	1.5364E-02						
		604.66	-1.809E-02	&(P	7.577E-02	2.22E-02	G K
		795.76	5.359E-02	(P	5.949E-02	1.97E-02	G
		569.29	-2.797E-02	& P	4.159E-01	1.19E-01	G
		801.84	9.604E-02	%	7.071E-01	2.01E-01	G
CS-137	5.6043E-02						
		661.62	5.604E-02	(P	7.219E-02	2.28E-02	G
CE-139	1.8281E-03						
		165.85	1.828E-03	%(P	6.572E-02	1.94E-02	G
EU-152	-1.1646E-02						
		121.78	-1.165E-02	%(P	1.769E-01	5.24E-02	G K
		344.30	-3.290E-02	% P	1.915E-01	5.60E-02	G
		1408.08	6.362E-03	& P	3.122E-01	8.17E-02	G
		964.00	-7.871E-03	% P	1.047E+00	3.03E-01	G
		1112.07	3.786E-02	& P	5.520E-01	1.53E-01	G
		778.90	-4.494E-02	% P	4.172E-01	1.16E-01	G
EU-154	-1.9517E-03						
		123.10	-1.952E-03	%(P	1.084E-01	3.19E-02	G K
		1274.80	-5.076E-02	% P	2.692E-01	7.73E-02	G
		723.30	-8.351E-02	& P	4.230E-01	1.23E-01	G
		1004.80	8.461E-02	% P	4.129E-01	1.19E-01	G
EU-155	1.3647E-02						
		86.45	1.365E-02	%(	1.920E-01	5.71E-02	G K
		105.31	3.874E-02	%	2.590E-01	7.73E-02	G
HG-203	-1.3226E-02						
		279.17	-1.323E-02	&(	6.690E-02	1.98E-02	G K
		72.87	-8.465E-01	% P	1.710E+00	5.18E-01	G
		70.83	-2.583E+00	+	2.907E+00	8.96E-01	G
		82.50	1.270E-01	%	2.883E+00	8.55E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.9933E-01						
		583.14	2.993E-01	(P	7.389E-02	3.48E-02	G
		510.72	5.245E-01	+ P	2.599E-01	9.89E-02	G
PB-212	9.3428E-01						
		238.63	9.343E-01	(P	8.450E-02	4.52E-02	G K
							Energy duplication
		77.11	9.343E-01	}	3.022E-01	9.27E-02	G
		74.81	1.482E+00	+ P	5.332E-01	1.84E-01	G
PB-214	7.3015E-01						
		351.99	7.084E-01	(P	1.372E-01	6.44E-02	G K
		295.22	5.792E-01	- P	2.805E-01	1.08E-01	G
							Energy duplication
		77.11	7.301E-01	} P	5.823E-01	1.80E-02	G
		241.92	8.382E-01	(P	4.842E-01	1.64E-01	G
BI-212	4.8994E-01						
		727.17	4.899E-01	*(P	5.994E-01	1.90E-01	G K
		1620.56	1.866E-01	%	2.568E+00	6.82E-01	G
		785.42	2.528E+00	+ P	2.756E+00	9.07E-01	G
BI-214	7.9974E-01						
		609.32	7.539E-01	(P	1.338E-01	7.02E-02	G K
		1764.51	8.402E-01	(P	1.962E-01	1.51E-01	G
		1120.28	8.973E-01	@(P	4.275E-01	1.82E-01	G
RA-224	6.0197E-01						
		241.00	6.020E-01	&(P	1.544E+00	4.65E-01	G
RA-226	1.9547E+00						
		185.99	1.955E+00	@(	1.438E+00	4.60E-01	G
AC-228	9.7217E-01						
		911.07	8.933E-01	(P	2.386E-01	1.14E-01	G K
		968.90	1.019E+00	(P	5.317E-01	2.36E-01	G
		338.40	1.094E+00	@(P	4.280E-01	1.76E-01	G
TH-227	-8.9659E-03						
		236.00	-8.966E-03	%(P	5.994E-01	1.77E-01	G K
		256.25	-1.510E-01	& P	7.196E-01	2.13E-01	G
PA-234	-7.7481E-03						
		98.44	-7.748E-03	&(	2.336E-01	6.93E-02	G K
		946.00	1.892E-02	&	4.014E-01	1.13E-01	G
		131.28	1.219E-01	&	2.327E-01	7.08E-02	G
		94.67	-1.362E-01	%	4.304E-01	1.30E-01	G
		883.24	1.192E-01	%	4.589E-01	1.32E-01	G
		926.70	-2.970E-02	%	6.662E-01	1.86E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-3.476E-02 &   6.130E-01 1.75E-01 G

TH-234       9.6660E-01
                           63.29 2.607E-01 &(P 2.950E+00 8.76E-01 G K
                           92.80 1.884E+00  (P 2.155E+00 6.63E-01 G
                           92.38-3.116E-01 % P 2.605E+00 7.69E-01 G

AM-241       4.6754E-02
                           59.54 4.675E-02 &(P 3.384E-01 1.01E-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

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

***** 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 pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	-3.3409E-02	-3.5106E-02	4.6204E-01	4.6204E-01	5.124E-01
K-40		1.8749E+01	1.8749E+01	2.4453E+00	2.6650E+00	
MN-54	#A	3.1094E-02	3.1359E-02	5.8926E-02	5.8953E-02	6.425E-02
CO-57	#B	-3.7417E-03	-3.7786E-03	5.2780E-02	5.2781E-02	5.878E-02
CO-60	#B	2.8886E-02	2.8925E-02	6.2301E-02	6.2322E-02	6.932E-02

Sr-85	#A	-2.1993E-02	-2.2909E-02	6.9352E-02	6.9364E-02	7.460E-02
Kr-85	#A	-5.4586E+02	-5.4587E+02	1.7680E+03	1.7683E+03	1.730E+03
Y-88	#B	-1.2588E-03	-1.2904E-03	5.0511E-02	5.0511E-02	6.555E-02
NB-94	#B	1.7919E-02	1.7919E-02	5.2012E-02	5.2022E-02	5.935E-02
Ag-108M	#B	7.0836E-04	7.0840E-04	4.1549E-02	4.1549E-02	5.121E-02
CD-109	#A	3.3248E-01	3.3442E-01	1.6814E+00	1.6815E+00	1.861E+00
SN-113	#B	1.4546E-02	1.4884E-02	6.6358E-02	6.6364E-02	7.387E-02
SB-125	#B	3.3241E-02	3.3328E-02	1.5051E-01	1.5052E-01	1.714E-01
I-131	#B	2.8192E-04	3.9176E-04	5.8972E-02	5.8972E-02	4.990E-02
CS-134	#B	1.5310E-02	1.5364E-02	1.6905E-02	1.6927E-02	7.551E-02
CS-137	#A	5.6029E-02	5.6043E-02	6.8471E-02	6.8545E-02	7.217E-02
CE-139	#A	1.7933E-03	1.8281E-03	5.8240E-02	5.8240E-02	6.447E-02
EU-152	#B	-1.1639E-02	-1.1646E-02	1.9787E-01	1.9787E-01	1.768E-01
EU-154	#B	-1.9500E-03	-1.9517E-03	3.5441E-01	3.5441E-01	1.083E-01
EU-155	#B	1.3627E-02	1.3647E-02	1.7125E-01	1.7125E-01	1.917E-01
HG-203	#B	-1.2496E-02	-1.3226E-02	5.9447E-02	5.9451E-02	6.321E-02
TL-208		2.9933E-01	2.9933E-01	1.0432E-01	1.0568E-01	
PB-212		9.3428E-01	9.3428E-01	1.3556E-01	1.4548E-01	
PB-214		7.3015E-01	7.3015E-01	1.9929E-01	2.0351E-01	
BI-212	#A	4.8994E-01	4.8994E-01	5.7087E-01	5.7154E-01	5.994E-01
BI-214		7.9974E-01	7.9974E-01	2.2332E-01	2.2785E-01	
RA-224	#A	6.0197E-01	6.0197E-01	1.3960E+00	1.3964E+00	1.544E+00
RA-226	#	1.9547E+00	1.9547E+00	1.3812E+00	1.3856E+00	1.438E+00
AC-228		9.7217E-01	9.7217E-01	3.0062E-01	3.0559E-01	
TH-227	#B	-8.9659E-03	-8.9659E-03	9.6618E-01	9.6618E-01	5.994E-01
PA-234	#B	-7.7481E-03	-7.7481E-03	2.0794E-01	2.0794E-01	2.336E-01
TH-234	#B	9.6660E-01	9.6660E-01	1.0211E+00	1.0225E+00	2.950E+00
AM-241	#A	4.6753E-02	4.6754E-02	3.0193E-01	3.0194E-01	3.384E-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 (269.6 to 1999.1 keV) 2.2484791E+01 pCi/gm
Total Decayed Activity (269.6 to 1999.1 keV) 2.2484791E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JJM

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 101F_16SEPT2006_0943.An1

Sample description
FSS-SSS-01-01-013-F

Spectrum Filename: C:\GammaVision\Spectra\101F_16SEPT2006_0943.An1

Acquisition information
Start time: 16-Sep-2006 09:43:07
Live time: 2000
Real time: 2002
Dead time: 0.12 %
Detector ID: 1

Detector system
Det 101- DSPE-633

Calibration
Filename: D1_1LSa.Clb
Detector 101 1.0 Liter Marinelli Sand

Energy Calibration
Created: 03-Sep-2004 08:50:48
Zero offset: 0.244 keV
Gain: 0.500 keV/channel
Quadratic: -2.493E-08 keV/channel^2

Efficiency Calibration
Created: 03-Sep-2004 08:52:26
Type: Polynomial
Uncertainty: 0.626 %
Coefficients: -0.321775 -5.816463 0.734234
-0.099357 0.006049 -0.000149

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.23keV)
Stop channel: 4000 (1999.11keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.9530E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.9530E+03) =
5.1203E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five 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	09-Sep-2006 13:37:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	101_150K_28APR05.Pbc 01-May-2005 05:24:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 15 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.0941

***** 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. pCi/gm	Nuc
74.39	202.	19.27	1.00	1.651E-02	70.83	3.520	2.909E+00	HG203
					74.81	9.600	8.580E-01	PB212
77.39	378.	10.14	1.01	1.736E-02	77.11	17.500	8.681E-01	PB212
					77.11	10.700	1.406E+00	PB214
93.16	156.	30.97	1.50	1.989E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
					98.44	25.100	PBC<MDA	PA234
93.17	149.	31.82	1.50	1.985E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
					98.44	25.100	PBC<MDA	PA234
186.34	135.	29.23	1.01	1.856E-02	185.99	3.280	1.535E+00	RA226
209.39	103.	29.24	1.34	1.721E-02				
238.79	857.	4.10	1.12	1.557E-02	238.63	43.100	8.775E-01	PB212
241.55	155.	16.96	1.12	1.542E-02	241.00	3.900	1.772E+00	RA224
270.44	118.	28.09	1.39	1.399E-02				
295.44	240.	11.69	1.26	1.291E-02	295.22	19.200	6.645E-01	PB214
300.66	78.	31.87	1.31	1.270E-02				
338.49	179.	16.35	0.93	1.135E-02	338.40	12.010	8.975E-01	AC228
352.00	422.	7.84	1.29	1.092E-02	351.99	37.100	7.165E-01	PB214
463.07	37.	41.47	1.50	8.342E-03	463.51	10.000	PBC<MDA	SB125
510.99	112.	15.96	0.98	7.587E-03	510.72	22.500	3.896E-01	TL208
583.27	262.	8.61	1.37	6.683E-03	583.14	86.000	3.127E-01	TL208
609.29	294.	8.27	1.55	6.413E-03	609.32	46.090	6.848E-01	BI214
727.16	84.	23.25	1.39	5.443E-03	727.17	11.800	8.977E-01	BI212
795.10	32.	35.84	1.50	5.016E-03	795.76	85.400	PBC<MDA	CS134
911.24	171.	12.15	1.50	4.446E-03	911.07	29.000	9.086E-01	AC228
968.92	138.	15.64	2.11	4.212E-03	968.90	17.460	1.292E+00	AC228

1120.24	63.	24.17	0.95	3.711E-03	1120.28	15.040	7.714E-01	BI214
1460.96	973.	3.26	1.69	2.942E-03	1460.75	10.700	2.132E+01	K40

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1764.77	49.	14.29	2.02	2.481E-03	1764.51	15.920	8.506E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
148.34	74.72	658.	202.	0.101	57.82	1.005	BI-207	D
154.34	77.72	545.	378.	0.189	30.43	1.007	PB-214	D
418.46	209.39	362.	103.	0.051	87.71	1.336	AC-228	s
477.28	238.74	189.	857.	0.429	12.30	1.122	PB-212	D
482.79	241.49	268.	155.	0.077	50.88	1.124	PB-214	D
540.60	270.44	336.	118.	0.059	84.27	1.387	AC-228	s
601.08	300.66	216.	78.	0.039	95.61	1.309	PB-212	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: FSS_Rev_1.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 3 Sigma %	FWHM keV
HG-203	146.80	73.61	1392.	-149.	-0.075	108.94	1.499s
PB-212	149.27	74.85	1395.	242.	0.121	66.65	1.499
PB-212	153.79	77.11	1265.	352.	0.176	45.79	1.499D
PB-214	153.79	77.11	1269.	348.	0.174	45.79	1.499D
TH-234	185.92	93.17	1226.	149.	0.075	95.46	1.499s
TH-234	185.91	93.16	1189.	156.	0.078	92.91	1.499s
RA-226	372.24	186.29	634.	101.	0.050	110.18	1.499s
PB-212	477.18	238.74	552.	700.	0.350	18.03	1.499
RA-224	483.22	241.76	613.	133.	0.067	82.59	1.499
PB-214	590.63	295.44	252.	213.	0.106	37.36	1.499
AC-228	676.77	338.49	228.	177.	0.088	49.06	0.935
PB-214	703.97	352.09	159.	380.	0.190	20.73	1.499
TL-208	1021.91	510.99	103.	96.	0.048	47.87	0.976s
TL-208	1166.56	583.27	94.	260.	0.130	25.84	1.373
BI-214	1218.62	609.29	94.	292.	0.146	24.80	1.551s
BI-212	1454.48	727.16	86.	83.	0.042	69.76	1.389s
CS-134	1590.43	795.10	51.	32.	0.016	107.52	1.502s
AC-228	1822.82	911.24	79.	169.	0.085	36.44	1.501
AC-228	1938.26	968.92	92.	137.	0.069	46.91	2.110s
BI-214	2241.07	1120.24	60.	62.	0.031	72.51	0.954s
K-40	2922.94	1460.96	14.	970.	0.485	9.78	1.692

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-214	3530.98	1764.77	0.	49.	0.024	42.86	2.022

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 pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	Peak	COMMENTS
BE-7		-1.3399E-01						
			477.56	-1.340E-01	&(	4.976E-01	1.48E-01	G
K-40		2.1325E+01						
			1460.75	2.132E+01	(P	4.383E-01	6.97E-01	G
MN-54		5.3019E-03						
			834.81	5.302E-03	&(P	5.894E-02	1.69E-02	G
CO-57		5.1650E-03						
			122.07	5.165E-03	%(	5.446E-02	1.63E-02	G K
			136.43	-9.360E-02	%	4.652E-01	1.40E-01	G
CO-60		-1.8848E-04						
			1332.51	-1.885E-04	%(P	8.830E-02	2.50E-02	G K
			1173.23	1.737E-02	% P	8.471E-02	2.48E-02	G K
Sr-85		-2.5592E-02						
			514.00	-2.559E-02	%(	6.560E-02	1.97E-02	G
Kr-85		-5.7432E+02						
			513.99	-5.743E+02	%(P	1.412E+03	4.24E+02	G
Y-88		0.0000E+00						
			1836.01	0.000E+00	%(	2.244E-02	3.04E-03	G K
			898.02	-9.180E-03	% P	5.859E-02	1.68E-02	G
NB-94		-1.0742E-02						
			871.10	-1.074E-02	%(P	6.112E-02	1.78E-02	G K
			702.50	1.163E-02	% P	4.764E-02	1.40E-02	G K
Ag-108M		2.7755E-03						
			722.95	2.775E-03	%(	6.167E-02	1.77E-02	G K
			614.37	-7.263E-04	& P	6.372E-02	1.84E-02	G
			433.93	-1.222E-02	%	5.678E-02	1.68E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CD-109	-4.0804E-01						
		88.04	-4.080E-01	%(P	1.729E+00	5.21E-01	G
SN-113	-1.2155E-03						
		391.71	-1.216E-03	&(	8.036E-02	2.35E-02	G K
		255.04	-3.209E-01	% P	2.187E+00	6.50E-01	G
SB-125	-3.2294E-02						
		427.95	-3.229E-02	%(P	1.766E-01	5.22E-02	G K
		600.77	-5.539E-03	% P	2.671E-01	7.63E-02	G
		636.15	5.961E-02	& P	4.559E-01	1.32E-01	G
		463.51	3.089E-01	& P	4.294E-01	1.33E-01	G
		176.29	1.202E-01	& P	7.311E-01	2.19E-01	G
I-131	1.3007E-03						
		364.48	1.301E-03	%(	9.226E-02	2.68E-02	G K
		636.97	1.213E-01	&	1.143E+00	3.29E-01	G
		284.29	-1.454E-01	&	1.166E+00	3.44E-01	G
CS-134	2.1249E-02						
		604.66	-5.386E-03	%(P	1.118E-01	3.31E-02	G K
		795.76	5.169E-02	@(P	5.848E-02	1.88E-02	G
		569.29	7.149E-02	& P	2.857E-01	8.40E-02	G
		801.84	-1.367E-01	&	7.373E-01	2.16E-01	G
CS-137	2.4943E-02						
		661.62	2.494E-02	&(P	6.430E-02	1.93E-02	G
CE-139	-1.4865E-04						
		165.85	-1.487E-04	&(P	5.785E-02	1.72E-02	G
EU-152	1.0881E-02						
		121.78	1.088E-02	%(P	1.619E-01	4.83E-02	G K
		344.30	2.917E-02	% P	1.485E-01	4.39E-02	G
		1408.08	4.897E-02	% P	2.448E-01	6.92E-02	G
		964.00	2.806E-01	% P	4.841E-01	1.48E-01	G
		1112.07	1.412E-01	% P	5.250E-01	1.54E-01	G
		778.90	-3.859E-04	% P	4.410E-01	1.25E-01	G
EU-154	1.6269E-02						
		123.10	1.627E-02	&(P	1.147E-01	3.43E-02	G K
		1274.80	-2.290E-02	% P	2.135E-01	6.11E-02	G
		723.30	3.997E-02	% P	2.045E-01	5.89E-02	G
		1004.80	-1.010E-02	% P	3.363E-01	9.45E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	6.5042E-02						
		86.45	6.504E-02	%(	1.572E-01	4.76E-02	G K
		105.31	7.843E-02	&	2.027E-01	6.13E-02	G
HG-203	3.0904E-02						
		279.17	3.090E-02	%(	5.038E-02	1.54E-02	G K
		72.87	-5.877E-01	% P	1.494E+00	4.52E-01	G
		70.83	-2.146E+00	-	2.541E+00	7.79E-01	G
		82.50	-8.638E-01	%	2.966E+00	8.94E-01	G
TL-208	3.2869E-01						
		583.14	3.127E-01	(P	5.769E-02	2.72E-02	G
		510.72	3.896E-01	*(P	2.024E-01	7.26E-02	G
PB-212	7.4628E-01						
		238.63	7.211E-01	(P	1.157E-01	4.37E-02	G K
							Energy duplication
		77.11	8.084E-01	(	3.872E-01	1.23E-01	G
		74.81	1.056E+00	& P	7.702E-01	2.40E-01	G
PB-214	6.3005E-01						
		351.99	6.487E-01	(P	1.051E-01	4.51E-02	G K
		295.22	5.941E-01	(P	2.140E-01	7.46E-02	G
							Energy duplication
		77.11	1.308E+00	+ P	6.341E-01	2.02E-01	G
		241.92	-3.886E-01	% P	7.602E-01	2.31E-01	G
BI-212	8.9766E-01						
		727.17	8.977E-01	*(P	4.939E-01	2.10E-01	G K
		1620.56	3.410E-01	%	1.648E+00	4.59E-01	G
		785.42	1.361E+00	% P	2.976E+00	9.00E-01	G
BI-214	7.3593E-01						
		609.32	6.848E-01	*(P	1.118E-01	5.68E-02	G K
		1764.51	8.506E-01	(P	1.291E-01	1.23E-01	G
		1120.28	7.714E-01	(P	4.803E-01	1.88E-01	G
RA-224	1.5298E+00						
		241.00	1.530E+00	(P	1.357E+00	4.23E-01	G
RA-226	1.1431E+00						
		185.99	1.143E+00	*(	1.362E+00	4.20E-01	G
AC-228	9.0539E-01						
		911.07	9.086E-01	(P	2.363E-01	1.12E-01	G K
		968.90	1.292E+00	+ P	4.454E-01	2.03E-01	G
		338.40	8.975E-01	(P	3.711E-01	1.49E-01	G

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

TH-227      -2.7981E-01
                          236.00-2.798E-01 %(P 5.208E-01 1.58E-01 G K
                          256.25 8.486E-02 % P 5.626E-01 1.67E-01 G

PA-234       1.7065E-02
                           98.44 1.707E-02 %(  1.558E-01 4.64E-02 G K
                          946.00-6.778E-02 %   3.284E-01 9.59E-02 G
                          131.28-1.810E-03 %   2.044E-01 6.07E-02 G
                           94.67-1.413E-01 %   3.734E-01 1.13E-01 G
                          883.24-8.471E-02 %   4.650E-01 1.35E-01 G
                          926.70 5.438E-03 &   4.459E-01 1.24E-01 G
                          569.26 1.096E-01 &   4.201E-01 1.24E-01 G

TH-234       1.5689E+00
                           63.29 1.084E+00 %(P 2.354E+00 7.12E-01 G K
                           92.80 1.811E+00 *(P 1.894E+00 5.83E-01 G
                           92.38 2.022E+00 *(P 2.250E+00 6.90E-01 G

AM-241      -4.4092E-03
                           59.54-4.409E-03 %(P 2.909E-01 8.64E-02 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

- -

***** 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 pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	-1.2261E-01	-1.3399E-01	4.4321E-01	4.4328E-01	4.554E-01
K-40		2.1325E+01	2.1325E+01	2.0908E+00	2.4132E+00	
MN-54	#A	5.2221E-03	5.3019E-03	5.0670E-02	5.0671E-02	5.806E-02
CO-57	#B	5.0751E-03	5.1650E-03	4.8810E-02	4.8811E-02	5.351E-02
CO-60	#B	-1.8801E-04	-1.8848E-04	1.2996E-02	1.2996E-02	8.808E-02
Sr-85	#A	-2.3788E-02	-2.5592E-02	5.9239E-02	5.9256E-02	6.098E-02
Kr-85	#A	-5.7429E+02	-5.7432E+02	1.3874E+03	1.3878E+03	1.412E+03
Y-88	#B	0.0000E+00	0.0000E+00	9.1331E-03	9.1347E-03	2.146E-02
NB-94	#B	-1.0742E-02	-1.0742E-02	5.5267E-02	5.5270E-02	6.112E-02
Ag-108M	#B	2.7752E-03	2.7755E-03	5.3033E-02	5.3033E-02	6.167E-02
CD-109	#A	-4.0380E-01	-4.0804E-01	1.5961E+00	1.5963E+00	1.711E+00
SN-113	#B	-1.1665E-03	-1.2155E-03	7.0435E-02	7.0435E-02	7.712E-02
SB-125	#B	-3.2143E-02	-3.2294E-02	1.6503E-01	1.6504E-01	1.758E-01
I-131	#B	7.2141E-04	1.3007E-03	8.0517E-02	8.0517E-02	5.117E-02
CS-134	#B	2.1116E-02	2.1249E-02	2.3146E-02	2.3178E-02	1.111E-01
CS-137	#A	2.4932E-02	2.4943E-02	5.7752E-02	5.7769E-02	6.428E-02
CE-139	#A	-1.4362E-04	-1.4865E-04	3.3738E-02	3.3738E-02	5.589E-02
EU-152	#B	1.0870E-02	1.0881E-02	1.4495E-01	1.4495E-01	1.617E-01
EU-154	#B	1.6244E-02	1.6269E-02	1.0302E-01	1.0302E-01	1.146E-01
EU-155	#B	6.4872E-02	6.5042E-02	1.4265E-01	1.4270E-01	1.568E-01
HG-203	#B	2.7915E-02	3.0904E-02	4.6292E-02	4.6325E-02	4.551E-02
TL-208		3.2869E-01	3.2869E-01	8.5710E-02	8.7699E-02	
PB-212	#	7.4628E-01	7.4628E-01	1.3571E-01	1.4211E-01	1.157E-01
PB-214	#	6.3005E-01	6.3005E-01	1.3132E-01	1.3606E-01	1.051E-01
BI-212	#	8.9766E-01	8.9766E-01	6.3128E-01	6.3331E-01	
BI-214		7.3593E-01	7.3593E-01	1.8323E-01	1.8789E-01	
RA-224	#	1.5298E+00	1.5298E+00	1.2702E+00	1.2731E+00	1.357E+00
RA-226	#A	1.1431E+00	1.1431E+00	1.2595E+00	1.2612E+00	1.362E+00
AC-228		9.0539E-01	9.0539E-01	2.7994E-01	2.8458E-01	
TH-227	#B	-2.7981E-01	-2.7981E-01	4.8067E-01	4.8093E-01	5.208E-01
PA-234	#B	1.7065E-02	1.7065E-02	1.3922E-01	1.3922E-01	1.558E-01
TH-234	#B	1.5689E+00	1.5689E+00	1.2663E+00	1.2693E+00	2.354E+00
AM-241	#A	-4.4091E-03	-4.4092E-03	6.8216E-01	6.8216E-01	2.908E-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 (270.1 to 1999.1 keV) 2.4192537E+01 pCi/gm
Total Decayed Activity (270.1 to 1999.1 keV) 2.4192537E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JJM

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 102F_15SEPT2006_1023.An1

Sample description
FSS- SSS-01-01-019-F

Spectrum Filename: C:\GammaVision\Spectra\102F_15SEPT2006_1023.An1

Acquisition information
Start time: 15-Sep-2006 10:23:03
Live time: 2000
Real time: 2020
Dead time: 0.99 %
Detector ID: 3

Detector system
Det 102 - DSPP-468

Calibration
Filename: D2_1LSa.Clb
DET 102 1 Liter Sand Geometry

Energy Calibration
Created: 15-Jan-2005 03:09:29
Zero offset: 0.220 keV
Gain: 0.500 keV/channel
Quadratic: -6.435E-08 keV/channel^2

Efficiency Calibration
Created: 15-Jan-2005 06:48:10
Type: Polynomial
Uncertainty: 0.497 %
Coefficients: -0.294180 -5.980622 0.744607
-0.096737 0.005214 -0.000120

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.22keV)
Stop channel: 4000 (1999.02keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.7210E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.7210E+03) =
5.8106E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five 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	08-Sep-2006 15:18:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	102_150K_28APR05.Pbc 01-May-2005 05:27:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 13 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.6968

***** 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. pCi/gm	Nuc
77.38	211.	13.54	1.10	9.670E-03	77.11	10.700	1.625E+00	PB214
					77.11	17.500	9.937E-01	PB212
93.33	102.	41.60	1.50	1.333E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	2.011E+00	TH234
186.23	79.	33.48	1.23	1.626E-02	185.99	3.280	PBC<MDA	RA226
209.48	92.	32.36	0.92	1.518E-02				
239.08	699.	4.36	1.22	1.379E-02	238.63	43.100	9.228E-01	PB212
241.99	129.	20.49	1.22	1.365E-02	241.00	3.900	1.880E+00	RA224
					241.92	7.470	9.935E-01	PB214
276.94	55.	40.32	1.22	1.216E-02				
295.77	173.	14.03	1.15	1.145E-02	295.22	19.200	6.182E-01	PB214
338.88	110.	13.73	1.29	1.005E-02	338.40	12.010	7.132E-01	AC228
352.50	248.	10.77	1.47	9.665E-03	351.99	37.100	5.410E-01	PB214
432.50	28.	34.61	1.50	7.862E-03	433.93	89.881	PBC<MDA	Ag108M
463.74	68.	25.35	1.33	7.361E-03	463.51	10.000	7.161E-01	SB125
511.68	111.	16.37	1.66	6.683E-03	510.72	22.500	5.776E-01	TL208
584.07	174.	9.93	1.40	5.881E-03	583.14	86.000	2.691E-01	TL208
610.30	216.	9.94	1.34	5.641E-03	609.32	46.090	6.514E-01	BI214
728.85	55.	29.18	1.13	4.784E-03	727.17	11.800	7.662E-01	BI212
912.50	126.	10.17	1.50	3.917E-03	911.07	29.000	8.655E-01	AC228
970.24	114.	15.03	1.67	3.713E-03	968.90	17.460	1.374E+00	AC228
1121.91	75.	17.63	1.16	3.279E-03	1120.28	15.040	1.193E+00	BI214
1463.14	519.	4.45	2.12	2.617E-03	1460.75	10.700	1.452E+01	K40

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
154.33	77.55	304.	211.	0.106	40.62	1.100	PB-214	D
372.07	186.23	282.	79.	0.040	100.43	1.231	PA-234	l
418.58	209.48	298.	92.	0.046	97.07	0.919	AC-228	sM
477.79	239.03	115.	699.	0.350	13.08	1.215	PB-212	D
483.62	241.94	285.	129.	0.065	61.46	1.217	PB-214	D
553.52	276.94	165.	58.	0.029	101.54	1.220	TL-208	M
677.43	338.59	59.	110.	0.055	41.18	1.285	AC-228	D
1940.69	970.24	102.	55.	0.027	87.96	1.667	AC-228	M

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

This section based on library: FSS_Rev_1.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 3 Sigma %	FWHM keV
PB-214	153.80	77.11	851.	198.	0.099	66.13	1.500D
PB-212	153.80	77.11	851.	198.	0.099	66.13	1.500D
TH-234	186.23	93.33	857.	102.	0.051	124.80	1.500
PB-212	477.75	239.06	407.	589.	0.294	19.08	1.500s
RA-224	483.76	242.07	464.	87.	0.044	108.35	1.500
PB-214	483.61	241.99	457.	82.	0.041	115.13	1.500
PB-214	591.37	295.86	162.	161.	0.080	41.13	1.500s
AC-228	677.32	338.82	98.	116.	0.058	45.79	1.500
PB-214	704.70	352.51	114.	234.	0.117	27.46	1.500
Ag-108M	864.73	432.50	33.	28.	0.014	103.83	1.500s
SB-125	927.49	463.87	62.	51.	0.025	75.42	1.500
TL-208	1023.15	511.68	68.	111.	0.055	49.11	1.660s
TL-208	1167.98	584.07	48.	174.	0.087	29.80	1.399
BI-214	1220.45	610.30	72.	216.	0.108	29.81	1.345
BI-212	1457.07	728.56	51.	29.	0.015	117.04	1.554
AC-228	1825.53	912.69	13.	116.	0.058	30.80	1.679
AC-228	1941.35	970.57	41.	59.	0.029	60.57	1.718
BI-214	2244.22	1121.91	27.	75.	0.038	52.90	1.158s
K-40	2927.27	1463.18	11.	488.	0.244	13.89	2.042

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 pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		0.0000E+00					
			477.56	0.000E+00	&(	5.054E-01 1.44E-01	G
K-40		1.3661E+01					
			1460.75	1.366E+01	(P	5.138E-01 6.33E-01	G
MN-54		-4.0164E-04					
			834.81	-4.016E-04	&(P	7.005E-02 1.97E-02	G
CO-57		-5.6359E-03					
			122.07	-5.636E-03	&(	4.335E-02 1.28E-02	G K
			136.43	-1.016E-01	%	4.923E-01 1.47E-01	G
CO-60		3.7250E-03					
			1332.51	3.725E-03	%(P	6.461E-02 1.76E-02	G K
			1173.23	-3.602E-04	%	7.434E-02 2.05E-02	G K
Sr-85		-1.2147E-02					
			514.00	-1.215E-02	&(	6.520E-02 1.91E-02	G
Kr-85		-2.6078E+02					
			513.99	-2.608E+02	&(	1.400E+03 4.11E+02	G
Y-88		-1.0330E-02					
			1836.01	-1.033E-02	%(P	7.192E-02 1.97E-02	G K
			898.02	-1.334E-03	% P	7.492E-02 2.08E-02	G
NB-94		1.2385E-02					
			871.10	1.239E-02	%(	5.081E-02 1.47E-02	G K
			702.50	-3.434E-03	%	4.115E-02 1.14E-02	G K
Ag-108M		1.4430E-02					
			722.95	-2.106E-03	&(	6.042E-02 1.70E-02	G K
			614.37	-5.178E-02	% P	8.661E-02 2.65E-02	G
			433.93	3.108E-02	&(	3.270E-02 1.08E-02	G
CD-109		6.0414E-01					
			88.04	6.041E-01	%(P	2.299E+00 6.91E-01	G
SN-113		-1.5587E-03					
			391.71	-1.559E-03	%(	8.607E-02 2.50E-02	G K
			255.04	-5.683E-01	%	2.471E+00 7.37E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	1.3542E-01						
		427.95	-2.789E-03	%(P	1.450E-01	4.10E-02	G K
		600.77	4.795E-04	% P	2.325E-01	6.44E-02	G
		636.15	-8.885E-04	& P	5.488E-01	1.56E-01	G
		463.51	5.445E-01	(P	4.223E-01	1.41E-01	G
		176.29	-1.025E-01	% P	7.408E-01	2.19E-01	G
I-131	-1.5536E-02						
		364.48	-1.554E-02	%(	8.910E-02	2.61E-02	G K
		636.97	6.369E-02	%	1.165E+00	3.28E-01	G
		284.29	-2.088E-02	%	1.295E+00	3.77E-01	G
CS-134	2.5585E-02						
		604.66	2.559E-02	%(	4.449E-02	1.37E-02	G K
		795.76	4.858E-03	&	6.244E-02	1.75E-02	G
		569.29	1.079E-01	%	2.404E-01	7.26E-02	G
		801.84	-2.000E-01	% P	8.171E-01	2.40E-01	G
CS-137	3.2444E-02						
		661.62	3.244E-02	%(	6.090E-02	1.86E-02	G
CE-139	-7.9549E-03						
		165.85	-7.955E-03	&(P	6.156E-02	1.83E-02	G
EU-152	4.9413E-03						
		121.78	4.941E-03	&(P	1.356E-01	3.99E-02	G K
		344.30	4.913E-02	%	1.454E-01	4.34E-02	G
		1408.08	0.000E+00	&	3.652E-01	9.96E-02	G
		964.00	-1.002E-01	% P	5.282E-01	1.53E-01	G
		1112.07	-2.550E-02	%	4.888E-01	1.36E-01	G
		778.90	7.434E-02	% P	2.767E-01	7.94E-02	G
EU-154	-5.0907E-02						
		123.10	-5.091E-02	%(P	1.320E-01	3.99E-02	G K
		1274.80	-6.389E-03	%	2.160E-01	5.98E-02	G
		723.30	-3.081E-02	& P	2.948E-01	8.39E-02	G
		1004.80	-9.600E-02	%	4.145E-01	1.21E-01	G
EU-155	5.2231E-02						
		86.45	5.223E-02	&(P	2.976E-01	8.92E-02	G K
		105.31	6.459E-02	%	2.773E-01	8.31E-02	G
HG-203	-2.9019E-03						
		279.17	-2.902E-03	&(P	6.650E-02	1.95E-02	G K
		72.87	1.108E-02	%	2.335E+00	6.95E-01	G
		70.83	-6.817E-01	&	4.582E+00	1.37E+00	G
		82.50	-7.640E-01	%	4.593E+00	1.37E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.6910E-01						
		583.14	2.691E-01	(P	5.446E-02	2.68E-02	G
		510.72	5.776E-01	+	2.147E-01	9.47E-02	G
PB-212	7.7714E-01						
		238.63	7.771E-01	@(	1.276E-01	4.94E-02	G K
							Energy duplication
		77.11	9.300E-01	+	6.522E-01	2.05E-01	G
		74.81	5.093E-01	& P	1.354E+00	4.09E-01	G
PB-214	5.4508E-01						
		351.99	5.127E-01	(P	1.148E-01	4.70E-02	G K
		295.22	5.732E-01	@(	2.215E-01	7.86E-02	G
							Energy duplication
		77.11	1.521E+00	+	1.067E+00	3.35E-01	G
		241.92	6.335E-01	?(	7.882E-01	2.43E-01	G
BI-212	4.0906E-01						
		727.17	4.091E-01	(	5.012E-01	1.60E-01	G K
		1620.56	-2.536E-01	% P	1.976E+00	5.17E-01	G
		785.42	1.004E+00	% P	2.588E+00	7.72E-01	G
BI-214	6.5139E-01						
		609.32	6.514E-01	(	1.274E-01	6.48E-02	G K
		1764.51	-6.278E-02	& P	3.602E-01	9.78E-02	G
		1120.28	1.193E+00	+	4.282E-01	2.11E-01	G
RA-224	1.2796E+00						
		241.00	1.280E+00	&(P	1.516E+00	4.68E-01	G
RA-226	9.8722E-01						
		185.99	9.872E-01	%(P	1.471E+00	4.50E-01	G
AC-228	7.6392E-01						
		911.07	8.021E-01	(P	1.366E-01	8.25E-02	G K
		968.90	7.096E-01	(P	3.934E-01	1.43E-01	G
		338.40	7.507E-01	(	3.169E-01	1.15E-01	G
TH-227	-1.9855E-01						
		236.00	-1.985E-01	%(P	5.281E-01	1.59E-01	G K
		256.25	-2.379E-01	%	7.153E-01	2.15E-01	G
PA-234	-2.7747E-02						
		98.44	-2.775E-02	&(	2.679E-01	7.99E-02	G K
		946.00	-1.401E-02	%	2.914E-01	8.08E-02	G
		131.28	1.869E-02	&	2.674E-01	7.95E-02	G
		94.67	-2.153E-01	%	5.341E-01	1.62E-01	G
		883.24	1.742E-03	%	4.435E-01	1.21E-01	G
		926.70	-4.790E-02	%	4.289E-01	1.19E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 1.590E-01 %   3.545E-01 1.07E-01 G

TH-234       9.1187E-02
                           63.29-1.386E+00 %(P 4.913E+00 1.48E+00 G K
                           92.80 2.011E+00  (  2.731E+00 8.37E-01 G
                           92.38 2.024E-01 % P 3.367E+00 1.00E+00 G

AM-241       1.8759E-01
                           59.54 1.876E-01 %(  7.181E-01 2.16E-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

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

***** 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 pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	0.0000E+00	0.0000E+00	4.3138E-01	4.3138E-01	4.627E-01
K-40		1.3661E+01	1.3661E+01	1.8975E+00	2.0465E+00	5.138E-01
MN-54	#A	-3.9562E-04	-4.0164E-04	2.5180E-02	2.5180E-02	6.900E-02
CO-57	#B	-5.5385E-03	-5.6359E-03	3.8464E-02	3.8466E-02	4.260E-02
CO-60	#B	3.7159E-03	3.7250E-03	5.2802E-02	5.2803E-02	6.445E-02

Sr-85	#A	-1.1296E-02	-1.2147E-02	5.7438E-02	5.7442E-02	6.063E-02
Kr-85	#A	-2.6077E+02	-2.6078E+02	1.2332E+03	1.2332E+03	1.400E+03
Y-88	#B	-9.8838E-03	-1.0330E-02	5.9369E-02	5.9372E-02	6.882E-02
NB-94	#B	1.2385E-02	1.2385E-02	4.4015E-02	4.4021E-02	5.081E-02
Ag-108M	#B	1.4429E-02	1.4430E-02	1.4983E-02	1.5005E-02	6.042E-02
CD-109	#A	5.9789E-01	6.0414E-01	2.0729E+00	2.0731E+00	2.275E+00
SN-113	#B	-1.4962E-03	-1.5587E-03	7.4883E-02	7.4883E-02	8.262E-02
SB-125	#B	1.3479E-01	1.3542E-01	1.0524E-01	1.0551E-01	1.443E-01
I-131	#B	-8.6481E-03	-1.5536E-02	7.8212E-02	7.8217E-02	4.959E-02
CS-134	#B	2.5426E-02	2.5585E-02	4.1187E-02	4.1212E-02	4.421E-02
CS-137	#A	3.2430E-02	3.2444E-02	5.5909E-02	5.5939E-02	6.087E-02
CE-139	#A	-7.6870E-03	-7.9549E-03	5.8648E-02	5.8650E-02	5.948E-02
EU-152	#B	4.9363E-03	4.9413E-03	1.1976E-01	1.1976E-01	1.355E-01
EU-154	#B	-5.0830E-02	-5.0907E-02	1.2068E-01	1.2071E-01	1.318E-01
EU-155	#B	5.2095E-02	5.2231E-02	2.6750E-01	2.6751E-01	2.968E-01
HG-203	#B	-2.6228E-03	-2.9019E-03	6.1940E-02	6.1941E-02	6.010E-02
TL-208		2.6910E-01	2.6910E-01	8.0387E-02	8.1793E-02	
PB-212	#	7.7714E-01	7.7714E-01	1.4826E-01	1.5454E-01	1.276E-01
PB-214	#	5.4508E-01	5.4508E-01	1.4994E-01	1.5303E-01	1.148E-01
BI-212	A	4.0906E-01	4.0906E-01	4.7875E-01	4.7930E-01	5.012E-01
BI-214		6.5139E-01	6.5139E-01	1.9421E-01	1.9762E-01	
RA-224	#A	1.2796E+00	1.2796E+00	1.4049E+00	1.4067E+00	1.516E+00
RA-226	#A	9.8722E-01	9.8722E-01	1.3490E+00	1.3501E+00	1.471E+00
AC-228		7.6392E-01	7.6392E-01	2.0878E-01	2.1313E-01	1.366E-01
TH-227	#B	-1.9855E-01	-1.9855E-01	4.8467E-01	4.8480E-01	5.281E-01
PA-234	#B	-2.7747E-02	-2.7747E-02	2.3967E-01	2.3968E-01	2.679E-01
TH-234	#B	9.1187E-02	9.1187E-02	1.1380E-01	1.1392E-01	4.913E+00
AM-241	#A	1.8759E-01	1.8759E-01	6.4662E-01	6.4670E-01	7.181E-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 (352.2 to 1999.0 keV) 1.5754241E+01 pCi/gm
Total Decayed Activity (352.2 to 1999.0 keV) 1.5754241E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 102F_15SEPT2006_1136.An1

Sample description
FSS- SSS-01-01-011-F

Spectrum Filename: C:\GammaVision\Spectra\102F_15SEPT2006_1136.An1

Acquisition information
Start time: 15-Sep-2006 11:36:35
Live time: 2000
Real time: 2024
Dead time: 1.18 %
Detector ID: 3

Detector system
Det 102 - DSPP-468

Calibration
Filename: D2_1LSa.Clb
DET 102 1 Liter Sand Geometry

Energy Calibration
Created: 15-Jan-2005 03:09:29
Zero offset: 0.220 keV
Gain: 0.500 keV/channel
Quadratic: -6.435E-08 keV/channel^2

Efficiency Calibration
Created: 15-Jan-2005 06:48:10
Type: Polynomial
Uncertainty: 0.497 %
Coefficients: -0.294180 -5.980622 0.744607
-0.096737 0.005214 -0.000120

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.22keV)
Stop channel: 4000 (1999.02keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.7380E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.7380E+03) =
5.7537E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five 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	10-Sep-2006 14:00:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	102_150K_28APR05.Pbc 01-May-2005 05:27:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 16 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.8945

***** 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. pCi/gm	Nuc
77.13	205.	22.19	1.50	9.541E-03	77.11	10.700	1.564E+00	PB214
					77.11	17.500	9.562E-01	PB212
77.13	205.	22.19	1.50	9.541E-03	77.11	10.700	1.564E+00	PB214
					77.11	17.500	9.562E-01	PB212
93.59	104.	40.61	1.58	1.348E-02	92.80	3.000	2.022E+00	TH234
185.88	133.	30.15	1.42	1.627E-02				
185.88	133.	30.15	1.42	1.627E-02	185.99	3.280	1.867E+00	RA226
239.12	680.	4.66	1.22	1.378E-02	238.63	43.100	8.887E-01	PB212
241.89	89.	31.54	1.22	1.366E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	6.789E-01	PB214
271.19	88.	28.35	1.52	1.239E-02				
295.74	172.	11.20	1.26	1.145E-02	295.22	19.200	6.066E-01	PB214
300.53	59.	27.53	1.26	1.128E-02				
338.85	131.	15.03	1.07	1.005E-02	338.40	12.010	8.456E-01	AC228
352.64	282.	7.85	1.20	9.661E-03	351.99	37.100	6.102E-01	PB214
463.37	37.	41.36	1.00	7.367E-03				
463.37	37.	41.36	1.00	7.367E-03	463.51	10.000	PBC<MDA	SB125
512.12	131.	17.71	1.63	6.677E-03	510.72	22.500	6.777E-01	TL208
584.07	220.	10.27	1.59	5.881E-03	583.14	86.000	3.363E-01	TL208
610.34	209.	10.74	1.41	5.640E-03	609.32	46.090	6.229E-01	BI214
662.93	89.	23.19	1.81	5.220E-03	661.62	84.620	1.571E-01	CS137
728.71	38.	32.25	1.51	4.785E-03	727.17	11.800	5.154E-01	BI212
913.01	94.	17.74	1.13	3.915E-03				
966.28	25.	34.43	1.71	3.734E-03	964.00	14.580	PBC<MDA	EU152
970.57	78.	20.92	1.61	3.712E-03				
1121.59	50.	30.07	1.54	3.280E-03	1120.28	15.040	7.873E-01	BI214
1175.33	60.	29.20	1.25	3.152E-03				

1334.42	47.	25.03	1.27	2.830E-03				
1463.21	737.	3.86	1.97	2.617E-03	1460.75	10.700	2.043E+01	K40

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
186.76	93.59	700.	104.	0.052	121.84	1.584	U-235	l
477.87	239.10	162.	680.	0.340	13.98	1.215	PB-212	D
483.40	241.86	350.	89.	0.045	94.62	1.217	PB-214	D
542.02	271.19	196.	87.	0.044	75.20	1.518	AC-228	sM
600.49	300.42	132.	48.	0.024	112.71	0.696	PB-212	sM
926.49	463.37	81.	37.	0.018	124.08	0.998	SB-125	l
1826.16	913.01	51.	100.	0.050	42.52	1.131	AC-228	sM
1941.34	970.57	48.	91.	0.046	44.82	1.612	AC-228	M
2244.53	1121.59	39.	38.	0.019	83.79	1.820	TA-182	D
2351.13	1175.33	59.	65.	0.033	62.36	1.245	KR-87	sM
2669.54	1334.42	32.	39.	0.020	77.29	1.265	CO-60	sM

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

This section based on library: FSS_Rev_1.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 3 Sigma %	FWHM keV
PB-214	153.80	77.11	935.	205.	0.103	66.56	1.500D
PB-212	153.80	77.11	935.	205.	0.103	66.56	1.500D
RA-226	372.49	186.44	511.	87.	0.043	109.59	1.500s
PB-212	477.72	239.05	469.	538.	0.269	21.42	1.500
PB-214	591.14	295.74	230.	159.	0.080	46.87	1.500
AC-228	677.33	338.83	164.	131.	0.066	48.95	1.500
PB-214	704.94	352.63	127.	275.	0.138	25.04	1.500
TL-208	1023.96	512.09	109.	130.	0.065	52.85	1.631s
TL-208	1167.98	584.07	83.	219.	0.110	30.81	1.585s
BI-214	1220.54	610.34	86.	209.	0.104	32.23	1.411s
CS-137	1325.77	662.93	90.	89.	0.045	69.58	1.813s
BI-212	1457.56	728.80	46.	34.	0.017	99.91	1.554
EU-152	1932.76	966.28	24.	25.	0.012	103.30	1.714
BI-214	2240.95	1120.28	52.	36.	0.018	99.46	1.819D
K-40	2927.35	1463.22	3.	702.	0.351	11.36	2.042

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 pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		-1.3321E-01					
			477.56	-1.332E-01	&(	6.823E-01 2.02E-01	G
K-40		1.9475E+01					
			1460.75	1.948E+01	(P	2.979E-01 7.38E-01	G
MN-54		2.5340E-03					
			834.81	2.534E-03	&(P	6.624E-02 1.87E-02	G
CO-57		-9.3240E-03					
			122.07	-9.324E-03	&(	6.608E-02 1.97E-02	G K
			136.43	5.578E-02	%	5.182E-01 1.55E-01	G
CO-60		2.0047E-02					
			1332.51	2.005E-02	%(P	7.278E-02 2.12E-02	G K
			1173.23	-1.203E-02	%	9.027E-02 2.59E-02	G K
Sr-85		-1.9440E-02					
			514.00	-1.944E-02	&(	8.121E-02 2.41E-02	G
Kr-85		-4.2590E+02					
			513.99	-4.259E+02	&(	1.779E+03 5.29E+02	G
Y-88		-2.4680E-05					
			1836.01	-2.468E-05	%(P	6.328E-02 1.61E-02	G K
			898.02	-3.087E-03	& P	7.051E-02 1.96E-02	G
NB-94		1.4737E-02					
			871.10	1.474E-02	&(	5.735E-02 1.67E-02	G K
			702.50	-8.981E-04	%	5.368E-02 1.50E-02	G K
Ag-108M		-1.4071E-03					
			722.95	-1.407E-03	&(	6.811E-02 1.93E-02	G K
			614.37	7.497E-04	% P	5.442E-02 1.53E-02	G
			433.93	1.509E-02	%	5.624E-02 1.67E-02	G
CD-109		4.7322E-01					
			88.04	4.732E-01	%(P	2.529E+00 7.59E-01	G
SN-113		1.9295E-02					
			391.71	1.930E-02	%(	7.154E-02 2.12E-02	G K
			255.04	-2.375E-01	&	2.530E+00 7.48E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	-3.0631E-03						
		427.95	-3.063E-03	%(P	1.708E-01	4.89E-02	G K
		600.77	6.892E-02	& P	2.864E-01	8.39E-02	G
		636.15	-1.342E-01	% P	5.012E-01	1.47E-01	G
		463.51	3.312E-01	% P	5.058E-01	1.56E-01	G
		176.29	-2.604E-02	& P	7.373E-01	2.17E-01	G
I-131	-2.7369E-03						
		364.48	-2.737E-03	&(	9.137E-02	2.65E-02	G K
		636.97	-2.819E-01	%	1.169E+00	3.42E-01	G
		284.29	-2.366E-03	%	1.038E+00	3.01E-01	G
CS-134	-1.4612E-04						
		604.66	-1.461E-04	%(	6.165E-02	1.76E-02	G K
		795.76	3.159E-02	%	7.431E-02	2.24E-02	G
		569.29	-8.940E-03	%	3.757E-01	1.07E-01	G
		801.84	-1.140E-01	% P	7.435E-01	2.14E-01	G
CS-137	1.5713E-01						
		661.62	1.571E-01	@(	8.229E-02	3.65E-02	G
CE-139	-1.8075E-02						
		165.85	-1.807E-02	%(P	6.828E-02	2.05E-02	G
EU-152	9.4355E-02						
		121.78	-3.358E-02	&(P	1.967E-01	5.88E-02	G K
		344.30	-3.101E-03	%	2.029E-01	5.93E-02	G
		1408.08	-9.461E-03	%	2.985E-01	8.02E-02	G
		964.00	3.509E-01	(P	3.667E-01	1.22E-01	G
		1112.07	9.741E-02	%	5.869E-01	1.69E-01	G
		778.90	-6.310E-03	& P	4.756E-01	1.34E-01	G
EU-154	6.8971E-03						
		123.10	6.897E-03	%(P	1.432E-01	4.26E-02	G K
		1274.80	0.000E+00	%	3.237E-01	9.21E-02	G
		723.30	-7.210E-02	& P	3.376E-01	9.85E-02	G
		1004.80	1.615E-01	%	3.364E-01	1.02E-01	G
EU-155	1.1780E-02						
		86.45	1.178E-02	&(P	2.606E-01	7.75E-02	G K
		105.31	9.908E-02	%	2.970E-01	8.95E-02	G
HG-203	2.5536E-02						
		279.17	2.554E-02	%(P	5.592E-02	1.69E-02	G K
		72.87	-9.858E-01	%	2.587E+00	7.82E-01	G
		70.83	-1.355E+00	&	4.394E+00	1.32E+00	G
		82.50	-9.005E-01	%	4.997E+00	1.50E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	3.3631E-01						
		583.14	3.363E-01	@(P	6.929E-02	3.47E-02	G
		510.72	6.700E-01	+	2.653E-01	1.18E-01	G
PB-212	7.0296E-01						
		238.63	7.030E-01	(	1.354E-01	5.02E-02	G K
							Energy duplication
		77.11	9.562E-01	+	6.762E-01	2.12E-01	G
		74.81	7.871E-01	& P	1.411E+00	4.29E-01	G
PB-214	5.8428E-01						
		351.99	5.955E-01	(P	1.196E-01	4.98E-02	G K
		295.22	5.626E-01	(	2.592E-01	8.79E-02	G
							Energy duplication
		77.11	1.564E+00	+	1.106E+00	3.47E-01	G
		241.92	4.657E-01	%	8.485E-01	2.58E-01	G
BI-212	4.6320E-01						
		727.17	4.632E-01	(	4.723E-01	1.54E-01	G K
		1620.56	-2.314E-01	% P	1.870E+00	4.84E-01	G
		785.42	-4.449E-01	% P	3.348E+00	9.65E-01	G
BI-214	6.0744E-01						
		609.32	6.229E-01	@(	1.374E-01	6.70E-02	G K
		1764.51	-8.027E-02	% P	5.435E-01	1.52E-01	G
		1120.28	5.600E-01	(	5.704E-01	1.86E-01	G
RA-224	9.9403E-01						
		241.00	9.940E-01	&(P	1.509E+00	4.62E-01	G
RA-226	1.2610E+00						
		185.99	1.261E+00	*(P	1.575E+00	4.84E-01	G
AC-228	1.8345E-01						
		911.07	-9.086E-02	%(P	3.438E-01	1.02E-01	G K
		968.90	-1.935E-01	% P	5.501E-01	1.64E-01	G
		338.40	8.458E-01	(	4.018E-01	1.38E-01	G
TH-227	-1.2035E-02						
		236.00	-1.204E-02	%(P	6.672E-01	1.98E-01	G K
		256.25	1.812E-01	%	7.180E-01	2.14E-01	G
PA-234	-4.8262E-02						
		98.44	-4.826E-02	&(	3.014E-01	9.03E-02	G K
		946.00	-7.996E-02	%	3.553E-01	1.03E-01	G
		131.28	-9.612E-03	%	2.891E-01	8.60E-02	G
		94.67	-1.788E-01	%	5.393E-01	1.63E-01	G
		883.24	3.006E-02	&	5.003E-01	1.40E-01	G
		926.70	-6.902E-03	&	5.215E-01	1.44E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-1.320E-02 %   5.548E-01 1.59E-01 G

TH-234       1.9417E+00
                           63.29 1.942E+00 &(P 5.200E+00 1.57E+00 G K
                           92.80 1.980E+00 %   2.868E+00 8.77E-01 G
                           92.38 6.557E-01 & P 3.018E+00 9.05E-01 G

AM-241      -1.2343E-01
                           59.54-1.234E-01 %(  8.059E-01 2.41E-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

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

***** 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 pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	-1.2500E-01	-1.3321E-01	6.0465E-01	6.0470E-01	6.402E-01
K-40		1.9475E+01	1.9475E+01	2.2136E+00	2.4687E+00	2.979E-01
MN-54	#A	2.5066E-03	2.5340E-03	5.6048E-02	5.6048E-02	6.552E-02
CO-57	#B	-9.2074E-03	-9.3240E-03	5.9205E-02	5.9207E-02	6.526E-02
CO-60	B	2.0012E-02	2.0047E-02	6.3472E-02	6.3482E-02	7.265E-02

Sr-85	#A	-1.8448E-02	-1.9440E-02	7.2387E-02	7.2395E-02	7.706E-02
Kr-85	#A	-4.2588E+02	-4.2590E+02	1.5859E+03	1.5860E+03	1.779E+03
Y-88	#B	-2.3906E-05	-2.4680E-05	6.3424E-04	6.3424E-04	6.130E-02
NB-94	#B	1.4737E-02	1.4737E-02	5.0105E-02	5.0111E-02	5.735E-02
Ag-108M	#B	-1.4070E-03	-1.4071E-03	5.7808E-02	5.7808E-02	6.811E-02
CD-109	#A	4.6968E-01	4.7322E-01	2.2765E+00	2.2767E+00	2.511E+00
SN-113	#B	1.8734E-02	1.9295E-02	6.3585E-02	6.3594E-02	6.946E-02
SB-125	#B	-3.0528E-03	-3.0631E-03	3.8428E+00	3.8428E+00	1.702E-01
I-131	#B	-1.7938E-03	-2.7369E-03	7.9579E-02	7.9579E-02	5.989E-02
CS-134	#B	-1.4546E-04	-1.4612E-04	5.2679E-02	5.2679E-02	6.138E-02
CS-137	#	1.5708E-01	1.5713E-01	1.0932E-01	1.0968E-01	
CE-139	#A	-1.7634E-02	-1.8075E-02	6.3229E-02	6.3237E-02	6.661E-02
EU-152	#B	9.4286E-02	9.4355E-02	9.8384E-02	9.8523E-02	1.966E-01
EU-154	#B	6.8895E-03	6.8971E-03	1.2780E-01	1.2780E-01	1.430E-01
EU-155	#B	1.1758E-02	1.1780E-02	2.3252E-01	2.3252E-01	2.601E-01
HG-203	#B	2.3741E-02	2.5536E-02	5.0769E-02	5.0789E-02	5.199E-02
TL-208	#	3.3631E-01	3.3631E-01	1.0382E-01	1.0552E-01	
PB-212	#	7.0296E-01	7.0296E-01	1.5057E-01	1.5565E-01	1.354E-01
PB-214	#	5.8428E-01	5.8428E-01	1.4653E-01	1.5016E-01	1.196E-01
BI-212	A	4.6320E-01	4.6320E-01	4.6278E-01	4.6351E-01	4.723E-01
BI-214		6.0744E-01	6.0744E-01	1.9580E-01	1.9875E-01	
RA-224	#A	9.9403E-01	9.9403E-01	1.3847E+00	1.3858E+00	1.509E+00
RA-226	#A	1.2610E+00	1.2610E+00	1.4532E+00	1.4549E+00	1.575E+00
AC-228	B	1.8345E-01	1.8345E-01	8.9797E-02	9.0385E-02	3.438E-01
TH-227	#B	-1.2035E-02	-1.2035E-02	7.5507E-01	7.5507E-01	6.672E-01
PA-234	#B	-4.8262E-02	-4.8262E-02	2.7078E-01	2.7079E-01	3.014E-01
TH-234	#B	1.9417E+00	1.9417E+00	4.7093E+00	4.7105E+00	5.200E+00
AM-241	#A	-1.2343E-01	-1.2343E-01	7.2321E-01	7.2324E-01	8.058E-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 (1172.8 to 1999.0 keV) 2.1222565E+01 pCi/gm
Total Decayed Activity (1172.8 to 1999.0 keV) 2.1222612E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 102F_15SEPT2006_1313.An1

Sample description
FSS- SSS-01-01-022-F

Spectrum Filename: C:\GammaVision\Spectra\102F_15SEPT2006_1313.An1

Acquisition information
Start time: 15-Sep-2006 13:13:08
Live time: 2000
Real time: 2023
Dead time: 1.13 %
Detector ID: 3

Detector system
Det 102 - DSPP-468

Calibration
Filename: D2_1LSa.Clb
DET 102 1 Liter Sand Geometry

Energy Calibration
Created: 15-Jan-2005 03:09:29
Zero offset: 0.220 keV
Gain: 0.500 keV/channel
Quadratic: -6.435E-08 keV/channel^2

Efficiency Calibration
Created: 15-Jan-2005 06:48:10
Type: Polynomial
Uncertainty: 0.497 %
Coefficients: -0.294180 -5.980622 0.744607
-0.096737 0.005214 -0.000120

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.22keV)
Stop channel: 4000 (1999.02keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.7910E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.7910E+03) =
5.5835E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five 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	09-Sep-2006 15:50:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	102_150K_28APR05.Pbc 01-May-2005 05:27:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 12 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.7003

***** 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. pCi/gm	Nuc
74.67	131.	22.13	1.10	8.908E-03	74.81	9.600	PBC<MDA	PB212
77.39	238.	13.21	1.10	9.719E-03	77.11	10.700	1.762E+00	PB214
					77.11	17.500	1.077E+00	PB212
93.18	125.	33.82	1.50	1.325E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
93.19	125.	33.89	1.50	1.333E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	2.358E+00	TH234
239.14	665.	4.67	1.22	1.379E-02	238.63	43.100	8.432E-01	PB212
					241.92	7.470	4.919E+00	PB214
242.42	90.	23.26	1.22	1.363E-02				
270.47	81.	34.13	1.28	1.242E-02				
295.92	154.	11.93	1.26	1.144E-02	295.22	19.200	5.268E-01	PB214
338.97	122.	18.00	1.08	1.004E-02	338.40	12.010	7.650E-01	AC228
352.54	300.	8.68	1.18	9.664E-03	351.99	37.100	6.296E-01	PB214
463.86	61.	34.02	1.23	7.359E-03	463.51	10.000	6.075E-01	SB125
511.53	129.	16.30	1.73	6.685E-03	510.72	22.500	6.447E-01	TL208
584.07	186.	12.24	1.62	5.881E-03	583.14	86.000	2.759E-01	TL208
610.51	203.	9.72	1.64	5.639E-03	609.32	46.090	5.894E-01	BI214
728.62	58.	28.61	1.28	4.785E-03	727.17	11.800	7.696E-01	BI212
912.83	133.	12.27	1.59	3.915E-03	911.07	29.000	8.821E-01	AC228
969.98	102.	16.12	1.52	3.714E-03	968.90	17.460	1.179E+00	AC228
1463.31	661.	4.04	2.11	2.617E-03				

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide

148.92	75.01	353.	131.	0.065	66.38	1.098	PB-214	D

Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	Suspected	
154.35	77.72	377.	238.	0.119	39.63	1.100	PB-214	D
477.91	239.06	150.	665.	0.332	14.02	1.215	PB-212	D
484.48	242.34	175.	90.	0.045	69.77	1.217	XE-138	D
540.59	270.47	247.	81.	0.041	102.39	1.285	AC-228	M
1940.16	969.98	41.	108.	0.054	38.30	1.520	AC-228	M
2927.52	1463.31	14.	661.	0.331	11.91	2.111	K-40	M

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

This section based on library: FSS_Rev_1.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 3 Sigma %	FWHM keV
PB-212	149.62	75.02	973.	129.	0.065	103.40	1.500s
PB-214	153.80	77.11	833.	240.	0.120	54.54	1.500D
PB-212	153.80	77.11	833.	240.	0.120	54.54	1.500D
TH-234	185.95	93.18	852.	125.	0.063	101.47	1.500
TH-234	185.95	93.19	835.	125.	0.062	101.66	1.500
PB-212	477.79	239.08	429.	595.	0.297	19.23	1.500
PB-214	591.44	295.89	179.	156.	0.078	43.54	1.500s
AC-228	677.67	338.99	179.	118.	0.059	55.50	1.500
PB-214	704.74	352.53	134.	291.	0.145	24.37	1.500
SB-125	927.50	463.87	83.	36.	0.018	113.19	1.500
TL-208	1022.83	511.53	94.	129.	0.064	48.89	1.730s
TL-208	1167.98	584.07	104.	185.	0.093	36.73	1.621s
BI-214	1220.87	610.51	65.	203.	0.102	29.16	1.644
BI-212	1457.19	728.62	69.	58.	0.029	85.83	1.283
AC-228	1825.92	912.89	33.	114.	0.057	35.06	1.679

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

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

Nuclide Name	Nuclide Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		1.1763E-01					
			477.56	1.176E-01	%(	4.199E-01 1.24E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
K-40	-4.0659E-03						
		1460.75	-4.066E-03	%(P	7.760E-01	2.13E-01	G
MN-54	1.3991E-02						
		834.81	1.399E-02	&(P	5.368E-02	1.56E-02	G
CO-57	5.3296E-04						
		122.07	5.330E-04	%(	6.059E-02	1.80E-02	G K
		136.43	3.370E-02	&	4.971E-01	1.48E-01	G
CO-60	-4.8748E-03						
		1332.51	-4.875E-03	%(P	6.486E-02	1.78E-02	G K
		1173.23	-1.516E-02	&	8.870E-02	2.57E-02	G K
Sr-85	9.9705E-03						
		514.00	9.970E-03	&(	4.513E-02	1.32E-02	G
Kr-85	-1.0638E+01						
		513.99	-1.064E+01	&(	1.395E+03	4.02E+02	G
Y-88	-2.4104E-05						
		1836.01	-2.410E-05	%(P	9.974E-02	2.72E-02	G K
		898.02	3.266E-03	& P	7.037E-02	1.97E-02	G
NB-94	9.5019E-05						
		871.10	9.502E-05	%(	6.072E-02	1.69E-02	G K
		702.50	2.575E-02	&	5.069E-02	1.55E-02	G K
Ag-108M	5.7577E-04						
		722.95	5.758E-04	%(	5.836E-02	1.63E-02	G K
		614.37	-5.922E-02	% P	9.086E-02	2.80E-02	G
		433.93	-1.200E-02	%	5.358E-02	1.58E-02	G
CD-109	1.0229E+00						
		88.04	1.023E+00	%(P	2.171E+00	6.58E-01	G
SN-113	3.8872E-03						
		391.71	3.887E-03	%(	6.754E-02	1.95E-02	G K
		255.04	-4.845E-01	%	2.410E+00	7.17E-01	G
SB-125	1.0689E-01						
		427.95	1.797E-02	%(P	1.495E-01	4.33E-02	G K
		600.77	1.103E-01	& P	2.422E-01	7.32E-02	G
		636.15	1.376E-02	% P	4.987E-01	1.42E-01	G
		463.51	3.701E-01	(P	4.646E-01	1.46E-01	G
		176.29	-3.141E-02	% P	7.680E-01	2.27E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
I-131	-1.1717E-02						
		364.48	-1.172E-02	&(	9.992E-02	2.93E-02	G K
		636.97	3.820E-03	%	1.321E+00	3.75E-01	G
		284.29	-1.221E-01	%	1.066E+00	3.13E-01	G
CS-134	-4.2215E-03						
		604.66	-4.221E-03	%(	5.283E-02	1.51E-02	G K
		795.76	3.111E-02	%	7.564E-02	2.27E-02	G
		569.29	-4.452E-02	%	3.610E-01	1.05E-01	G
		801.84	2.618E-02	& P	6.767E-01	1.90E-01	G
CS-137	1.8805E-02						
		661.62	1.880E-02	&(	5.872E-02	1.74E-02	G
CE-139	-5.7434E-03						
		165.85	-5.743E-03	%(P	5.655E-02	1.68E-02	G
EU-152	4.8917E-03						
		121.78	4.892E-03	%(P	1.483E-01	4.38E-02	G K
		344.30	-4.632E-02	%	1.758E-01	5.23E-02	G
		1408.08	2.438E-02	%	2.889E-01	7.89E-02	G
		964.00	1.335E-01	& P	5.117E-01	1.50E-01	G
		1112.07	1.649E-01	&	5.777E-01	1.70E-01	G
		778.90	-4.102E-03	% P	4.662E-01	1.31E-01	G
EU-154	-4.9922E-04						
		123.10	-4.992E-04	&(P	1.296E-01	3.84E-02	G K
		1274.80	-1.290E-02	%	2.286E-01	6.41E-02	G
		723.30	7.225E-02	& P	2.211E-01	6.50E-02	G
		1004.80	-6.587E-02	&	3.884E-01	1.12E-01	G
EU-155	-7.1750E-02						
		86.45	-7.175E-02	%(P	2.990E-01	8.97E-02	G K
		105.31	8.798E-03	&	2.563E-01	7.61E-02	G
HG-203	-7.7573E-05						
		279.17	-7.757E-05	%(P	6.075E-02	1.77E-02	G K
		72.87	-7.725E-01	&	2.537E+00	7.65E-01	G
		70.83	-1.950E-01	&	4.241E+00	1.26E+00	G
		82.50	2.558E+00	%	4.681E+00	1.42E+00	G
TL-208	2.7586E-01						
		583.14	2.759E-01	*(P	7.476E-02	3.39E-02	G
		510.72	6.447E-01	+	2.402E-01	1.05E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PB-212	7.5407E-01						
		238.63	7.541E-01	(	1.259E-01	4.83E-02	G K
							Energy duplication
		77.11	1.086E+00	+	6.202E-01	1.97E-01	G
		74.81	1.146E+00	& P	1.315E+00	4.04E-01	G
PB-214	5.8497E-01						
		351.99	6.106E-01	(P	1.192E-01	4.97E-02	G K
		295.22	5.355E-01	(	2.229E-01	7.77E-02	G
							Energy duplication
		77.11	1.775E+00	+	1.014E+00	3.23E-01	G
		241.92	1.756E-01	%	7.060E-01	2.11E-01	G
BI-212	7.6960E-01						
		727.17	7.696E-01	(	5.536E-01	2.21E-01	G K
		1620.56	-1.937E-01	% P	2.124E+00	5.58E-01	G
		785.42	8.108E-02	% P	2.606E+00	7.26E-01	G
BI-214	5.8942E-01						
		609.32	5.894E-01	(	1.164E-01	5.74E-02	G K
		1764.51	-8.806E-02	& P	5.755E-01	1.63E-01	G
		1120.28	-4.593E-02	&	6.074E-01	1.74E-01	G
RA-224	7.0581E-02						
		241.00	7.058E-02	&(P	1.217E+00	3.59E-01	G
RA-226	8.5538E-01						
		185.99	8.554E-01	%(P	1.484E+00	4.51E-01	G
AC-228	7.5251E-01						
		911.07	7.591E-01	(P	1.947E-01	8.89E-02	G K
		968.90	-7.573E-02	% P	5.074E-01	1.47E-01	G
		338.40	7.367E-01	(	4.065E-01	1.36E-01	G
TH-227	-1.5047E-01						
		236.00	-1.505E-01	%(P	5.139E-01	1.54E-01	G K
		256.25	1.815E-02	%	7.483E-01	2.20E-01	G
PA-234	-6.2902E-02						
		98.44	-6.290E-02	%(	2.762E-01	8.29E-02	G K
		946.00	-1.143E-02	%	3.170E-01	8.87E-02	G
		131.28	4.069E-02	&	2.529E-01	7.55E-02	G
		94.67	-1.468E-01	&	5.116E-01	1.54E-01	G
		883.24	9.522E-02	&	4.303E-01	1.24E-01	G
		926.70	1.332E-01	%	5.602E-01	1.63E-01	G
		569.26	-6.569E-02	%	5.327E-01	1.54E-01	G

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

TH-234       2.1837E+00
                           63.29 1.660E+00 %(P 5.094E+00 1.53E+00 G K
                           92.80 2.358E+00  (  2.591E+00 7.99E-01 G
                           92.38 2.774E+00  (P 3.073E+00 9.47E-01 G

AM-241       1.2660E-01
                           59.54 1.266E-01 %(  7.119E-01 2.13E-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

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

***** 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 pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	1.0897E-01	1.1763E-01	3.7109E-01	3.7115E-01	3.889E-01
K-40	#A	-4.0659E-03	-4.0659E-03	1.9298E-01	1.9298E-01	7.760E-01
MN-54	#A	1.3809E-02	1.3991E-02	4.6843E-02	4.6849E-02	5.299E-02
CO-57	#B	5.2496E-04	5.3296E-04	5.3878E-02	5.3878E-02	5.968E-02
CO-60	#B	-4.8645E-03	-4.8748E-03	5.8187E-02	5.8188E-02	6.473E-02
Sr-85	#A	9.3620E-03	9.9705E-03	3.9491E-02	3.9495E-02	4.237E-02

Kr-85	#A	-1.0637E+01	-1.0638E+01	1.2060E+03	1.2060E+03	1.395E+03
Y-88	#B	-2.3198E-05	-2.4104E-05	1.0729E-03	1.0729E-03	9.600E-02
NB-94	#B	9.5019E-05	9.5019E-05	5.0730E-02	5.0730E-02	6.072E-02
Ag-108M	#B	5.7572E-04	5.7577E-04	4.8961E-02	4.8961E-02	5.836E-02
CD-109	#A	1.0137E+00	1.0229E+00	1.9737E+00	1.9745E+00	2.151E+00
SN-113	#B	3.7517E-03	3.8872E-03	5.8462E-02	5.8462E-02	6.519E-02
SB-125	#B	1.0646E-01	1.0689E-01	1.2620E-01	1.2634E-01	1.489E-01
I-131	#B	-7.0511E-03	-1.1717E-02	8.7892E-02	8.7894E-02	6.013E-02
CS-134	#B	-4.1986E-03	-4.2215E-03	4.5308E-02	4.5309E-02	5.255E-02
CS-137	#A	1.8798E-02	1.8805E-02	5.2097E-02	5.2108E-02	5.869E-02
CE-139	#A	-5.5754E-03	-5.7434E-03	5.4900E-02	5.4901E-02	5.489E-02
EU-152	#B	4.8874E-03	4.8917E-03	1.3142E-01	1.3142E-01	1.482E-01
EU-154	#B	-4.9856E-04	-4.9922E-04	3.0786E-01	3.0786E-01	1.295E-01
EU-155	#B	-7.1588E-02	-7.1750E-02	3.3053E-01	3.3056E-01	2.983E-01
HG-203	#B	-7.1063E-05	-7.7573E-05	9.8647E-03	9.8647E-03	5.565E-02
TL-208	#	2.7586E-01	2.7586E-01	1.0156E-01	1.0273E-01	
PB-212	#	7.5407E-01	7.5407E-01	1.4501E-01	1.5106E-01	1.259E-01
PB-214	#	5.8497E-01	5.8497E-01	1.4276E-01	1.4649E-01	1.192E-01
BI-212		7.6960E-01	7.6960E-01	6.6057E-01	6.6198E-01	
BI-214		5.8942E-01	5.8942E-01	1.7185E-01	1.7500E-01	
RA-224	#A	7.0581E-02	7.0581E-02	1.0759E+00	1.0759E+00	1.217E+00
RA-226	#A	8.5538E-01	8.5538E-01	1.3539E+00	1.3547E+00	1.484E+00
AC-228		7.5251E-01	7.5251E-01	2.4715E-01	2.5073E-01	1.947E-01
TH-227	#B	-1.5047E-01	-1.5047E-01	4.7146E-01	4.7154E-01	5.139E-01
PA-234	#B	-6.2902E-02	-6.2902E-02	2.4869E-01	2.4871E-01	2.762E-01
TH-234	#B	2.1837E+00	2.1837E+00	2.2200E+00	2.2233E+00	5.094E+00
AM-241	#A	1.2660E-01	1.2660E-01	6.3873E-01	6.3876E-01	7.119E-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 (270.2 to 1999.0 keV) 2.3873878E+00 pCi/gm
Total Decayed Activity (270.2 to 1999.0 keV) 2.3873878E+00 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 102F_15SEPT2006_1354.An1

Sample description
FSS- SSS-01-01-015-F

Spectrum Filename: C:\GammaVision\Spectra\102F_15SEPT2006_1354.An1

Acquisition information
Start time: 15-Sep-2006 13:54:36
Live time: 2000
Real time: 2020
Dead time: 0.98 %
Detector ID: 3

Detector system
Det 102 - DSPP-468

Calibration
Filename: D2_1LSa.Clb
DET 102 1 Liter Sand Geometry

Energy Calibration
Created: 15-Jan-2005 03:09:29
Zero offset: 0.220 keV
Gain: 0.500 keV/channel
Quadratic: -6.435E-08 keV/channel^2

Efficiency Calibration
Created: 15-Jan-2005 06:48:10
Type: Polynomial
Uncertainty: 0.497 %
Coefficients: -0.294180 -5.980622 0.744607
-0.096737 0.005214 -0.000120

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.22keV)
Stop channel: 4000 (1999.02keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.7720E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.7720E+03) =
5.6433E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five 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	08-Sep-2006 16:30:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	102_150K_28APR05.Pbc 01-May-2005 05:27:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 13 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.6022

***** 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. pCi/gm	Nuc
76.39	306.	15.36	1.12	9.328E-03				
76.39	306.	15.36	1.12	9.328E-03	77.11	10.700	2.284E+00	PB214
					77.11	17.500	1.397E+00	PB212
186.93	112.	27.87	1.31	1.623E-02	185.99	3.280	1.537E+00	RA226
239.11	595.	4.94	1.22	1.378E-02	238.63	43.100	7.620E-01	PB212
242.08	89.	22.36	1.22	1.365E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	6.692E-01	PB214
282.33	48.	30.27	1.00	1.195E-02				
295.79	128.	16.23	1.20	1.144E-02	295.22	19.200	4.434E-01	PB214
329.11	68.	28.66	1.22	1.034E-02				
338.85	141.	18.58	1.21	1.005E-02	338.40	12.010	8.875E-01	AC228
352.53	244.	9.01	1.19	9.664E-03	351.99	37.100	5.165E-01	PB214
463.74	48.	36.19	0.91	7.361E-03	463.51	10.000	4.781E-01	SB125
511.87	83.	23.01	1.74	6.680E-03	510.72	22.500	4.197E-01	TL208
					513.99	0.004	2.210E+03	Kr85
					514.00	99.270	1.030E-01	Sr85
584.40	160.	9.67	1.26	5.878E-03	583.14	86.000	2.403E-01	TL208
610.20	183.	13.27	1.35	5.642E-03	609.32	46.090	5.348E-01	BI214
662.63	71.	22.93	1.50	5.222E-03	661.62	84.620	1.231E-01	CS137
727.83	45.	33.04	1.16	4.790E-03	727.17	11.800	6.066E-01	BI212
912.47	143.	12.74	1.55	3.917E-03	911.07	29.000	9.573E-01	AC228
969.86	126.	14.94	1.84	3.715E-03				
1121.97	59.	23.91	2.54	3.283E-03	1120.28	15.040	9.112E-01	BI214
1463.34	500.	4.55	2.13	2.617E-03				

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

Peak Centroid Channel	Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
477.86	239.14	135.	595.	0.297	14.83	1.215	PB-212	D

Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	Suspected	
483.78	242.10	156.	89.	0.045	67.08	1.217	PB-214	D
657.89	329.11	118.	68.	0.034	85.99	1.215	LA-140	sM
1825.09	912.47	139.	46.	0.023	116.65	1.552	AC-228	sM
1939.93	969.86	44.	129.	0.065	34.09	1.841	AC-228	sM
2927.59	1463.34	6.	500.	0.250	13.58	2.127	K-40	M

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

This section based on library: FSS_Rev_1.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 3 Sigma %	FWHM keV
PB-214	153.80	77.11	821.	213.	0.106	60.68	1.500D
PB-212	153.80	77.11	821.	213.	0.106	60.68	1.500D
RA-226	372.48	186.43	433.	110.	0.055	81.86	1.500s
PB-212	477.79	239.08	388.	542.	0.271	20.09	1.500
PB-214	591.35	295.85	195.	132.	0.066	51.84	1.500
AC-228	677.47	338.90	136.	113.	0.056	52.25	1.500
PB-214	704.87	352.59	112.	248.	0.124	26.24	1.500
SB-125	927.68	463.97	82.	43.	0.021	97.21	1.500
TL-208	1023.53	511.87	85.	83.	0.041	69.02	1.745s
TL-208	1168.63	584.40	36.	160.	0.080	29.00	1.259
BI-214	1220.25	610.20	106.	183.	0.091	39.80	1.350
CS-137	1325.16	662.63	55.	71.	0.036	68.78	1.496s
BI-212	1455.62	727.83	55.	45.	0.023	99.11	1.159s
AC-228	1825.68	912.77	34.	97.	0.048	39.76	1.679
BI-214	2244.33	1121.97	40.	59.	0.030	71.73	2.541s

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 pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		9.2957E-02					
			477.56	9.296E-02	&(	4.706E-01 1.37E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
K-40	-4.1095E-03						
		1460.75	-4.110E-03	%(P	6.965E-01	1.88E-01	G
MN-54	9.7787E-04						
		834.81	9.779E-04	&(P	5.437E-02	1.50E-02	G
CO-57	5.3485E-03						
		122.07	5.348E-03	&(	5.562E-02	1.65E-02	G K
		136.43	5.798E-02	&	4.767E-01	1.42E-01	G
CO-60	6.7407E-04						
		1332.51	6.741E-04	&(P	6.866E-02	1.87E-02	G K
		1173.23	9.701E-03	%	8.602E-02	2.46E-02	G K
Sr-85	-6.8917E-03						
		514.00	-6.892E-03	&(	5.095E-02	1.47E-02	G
Kr-85	-1.4792E+02						
		513.99	-1.479E+02	&(	1.093E+03	3.16E+02	G
Y-88	-3.4177E-03						
		1836.01	-3.418E-03	%(P	6.416E-02	1.68E-02	G K
		898.02	-3.185E-03	% P	6.654E-02	1.84E-02	G
NB-94	-1.4141E-04						
		871.10	-1.414E-04	&(	6.336E-02	1.77E-02	G K
		702.50	8.897E-03	%	5.905E-02	1.71E-02	G K
Ag-108M	-3.7106E-03						
		722.95	-3.711E-03	%(	5.607E-02	1.58E-02	G K
		614.37	-4.042E-02	% P	7.869E-02	2.39E-02	G
		433.93	6.628E-03	%	4.741E-02	1.38E-02	G
CD-109	-1.4717E-01						
		88.04	-1.472E-01	%(P	2.328E+00	6.94E-01	G
SN-113	-1.4636E-02						
		391.71	-1.464E-02	%(	7.292E-02	2.15E-02	G K
		255.04	7.174E-01	%	2.000E+00	6.01E-01	G
SB-125	1.4205E-01						
		427.95	3.982E-02	%(P	1.356E-01	4.00E-02	G K
		600.77	2.967E-02	& P	2.884E-01	8.28E-02	G
		636.15	-4.862E-02	& P	4.607E-01	1.32E-01	G
		463.51	4.447E-01	(P	4.682E-01	1.49E-01	G
		176.29	-2.031E-01	% P	7.838E-01	2.34E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
I-131	-1.6066E-02						
		364.48	-1.607E-02	%(	9.878E-02	2.90E-02	G K
		636.97	3.734E-02	&	1.195E+00	3.36E-01	G
		284.29	-1.796E-01	&	1.386E+00	4.09E-01	G
CS-134	-3.8368E-03						
		604.66	-3.837E-03	&(	6.671E-02	1.92E-02	G K
		795.76	3.115E-02	%	7.284E-02	2.19E-02	G
		569.29	2.246E-02	&	2.928E-01	8.32E-02	G
		801.84	-1.443E-01	& P	8.452E-01	2.46E-01	G
CS-137	1.2310E-01						
		661.62	1.231E-01	*(	6.404E-02	2.83E-02	G
CE-139	-2.9628E-03						
		165.85	-2.963E-03	%(P	5.800E-02	1.72E-02	G
EU-152	3.6054E-02						
		121.78	3.605E-02	&(P	1.559E-01	4.66E-02	G K
		344.30	-1.690E-02	%	1.724E-01	5.04E-02	G
		1408.08	5.741E-02	%	2.685E-01	7.58E-02	G
		964.00	-3.124E-04	& P	4.132E-01	1.14E-01	G
		1112.07	-1.458E-02	%	4.731E-01	1.31E-01	G
		778.90	5.745E-02	% P	4.197E-01	1.20E-01	G
EU-154	-2.9134E-02						
		123.10	-2.913E-02	%(P	1.280E-01	3.83E-02	G K
		1274.80	-3.273E-02	&	2.127E-01	6.05E-02	G
		723.30	-5.877E-02	% P	3.229E-01	9.37E-02	G
		1004.80	7.321E-02	%	3.263E-01	9.39E-02	G
EU-155	-1.2140E-03						
		86.45	-1.214E-03	%(P	2.815E-01	8.37E-02	G K
		105.31	-2.359E-03	&	2.776E-01	8.24E-02	G
HG-203	-2.0897E-02						
		279.17	-2.090E-02	&(P	6.883E-02	2.06E-02	G K
		72.87	-1.298E-01	%	2.141E+00	6.38E-01	G
		70.83	-1.372E+00	%	4.606E+00	1.39E+00	G
		82.50	-1.684E-01	&	4.645E+00	1.38E+00	G
TL-208	2.4027E-01						
		583.14	2.403E-01	(P	4.641E-02	2.33E-02	G
		510.72	4.197E-01	+	2.314E-01	9.68E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PB-212	6.9492E-01						
		238.63	6.949E-01	(	1.211E-01	4.65E-02	G K
							Energy duplication
		77.11	9.726E-01	+	6.223E-01	1.97E-01	G
		74.81	6.002E-01	& P	1.289E+00	3.90E-01	G
PB-214	5.0290E-01						
		351.99	5.262E-01	(P	1.104E-01	4.61E-02	G K
		295.22	4.579E-01	(	2.347E-01	7.91E-02	G
							Energy duplication
		77.11	1.591E+00	+	1.018E+00	3.22E-01	G
		241.92	4.841E-01	%	7.154E-01	2.19E-01	G
BI-212	6.0664E-01						
		727.17	6.066E-01	*(	5.024E-01	2.01E-01	G K
		1620.56	-5.289E-01	& P	2.525E+00	7.06E-01	G
		785.42	1.006E+00	& P	2.501E+00	7.48E-01	G
BI-214	5.3482E-01						
		609.32	5.348E-01	(	1.487E-01	7.11E-02	G K
		1764.51	-6.987E-02	% P	4.880E-01	1.36E-01	G
		1120.28	9.112E-01	+	4.970E-01	2.18E-01	G
RA-224	9.8055E-01						
		241.00	9.805E-01	&(P	1.385E+00	4.25E-01	G
RA-226	1.5685E+00						
		185.99	1.569E+00	@(P	1.424E+00	4.45E-01	G
AC-228	6.6585E-01						
		911.07	6.470E-01	(P	2.005E-01	8.60E-02	G K
		968.90	-4.225E-02	% P	4.037E-01	1.15E-01	G
		338.40	7.112E-01	(	3.604E-01	1.24E-01	G
TH-227	1.4219E-02						
		236.00	1.422E-02	%(P	6.362E-01	1.89E-01	G K
		256.25	-1.780E-01	&	6.704E-01	2.00E-01	G
PA-234	-5.0313E-02						
		98.44	-5.031E-02	&(	2.655E-01	7.95E-02	G K
		946.00	5.056E-02	%	2.320E-01	6.61E-02	G
		131.28	-2.357E-03	&	2.399E-01	7.10E-02	G
		94.67	1.732E-02	%	3.803E-01	1.13E-01	G
		883.24	7.527E-03	%	4.602E-01	1.27E-01	G
		926.70	0.000E+00	%	5.225E-01	1.44E-01	G
		569.26	1.018E-01	&	3.832E-01	1.12E-01	G

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

TH-234       6.1571E-01
                           63.29 6.157E-01 &(P 5.079E+00 1.52E+00 G K
                           92.80 1.704E+00 %   2.535E+00 7.75E-01 G
                           92.38 1.993E+00 % P 2.914E+00 8.91E-01 G

AM-241       1.8810E-01
                           59.54 1.881E-01 %(  7.086E-01 2.13E-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

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

***** 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 pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	8.5002E-02	9.2957E-02	4.1213E-01	4.1216E-01	4.303E-01
K-40	#A	-4.1095E-03	-4.1095E-03	1.7083E-01	1.7083E-01	6.965E-01
MN-54	#A	9.6302E-04	9.7787E-04	4.5094E-02	4.5094E-02	5.354E-02
CO-57	#B	5.2547E-03	5.3485E-03	4.9574E-02	4.9574E-02	5.465E-02
CO-60	#B	6.7240E-04	6.7407E-04	5.5950E-02	5.5950E-02	6.849E-02
Sr-85	#A	-6.4022E-03	-6.8917E-03	4.4204E-02	4.4206E-02	4.733E-02

Kr-85	#A	-1.4791E+02	-1.4792E+02	9.4807E+02	9.4811E+02	1.093E+03
Y-88	#B	-3.2679E-03	-3.4177E-03	5.1055E-02	5.1055E-02	6.135E-02
NB-94	#B	-1.4141E-04	-1.4141E-04	5.3096E-02	5.3096E-02	6.336E-02
Ag-108M	#B	-3.7102E-03	-3.7106E-03	4.7352E-02	4.7353E-02	5.606E-02
CD-109	#A	-1.4563E-01	-1.4717E-01	2.9115E+00	2.9115E+00	2.304E+00
SN-113	#B	-1.4041E-02	-1.4636E-02	6.4354E-02	6.4359E-02	6.996E-02
SB-125	#F	1.4138E-01	1.4205E-01	1.4309E-01	1.4331E-01	1.349E-01
I-131	#B	-8.8687E-03	-1.6066E-02	8.6970E-02	8.6975E-02	5.453E-02
CS-134	#B	-3.8125E-03	-3.8368E-03	5.7741E-02	5.7742E-02	6.629E-02
CS-137	#	1.2305E-01	1.2310E-01	8.4668E-02	8.4949E-02	
CE-139	#A	-2.8616E-03	-2.9628E-03	6.1120E-02	6.1121E-02	5.602E-02
EU-152	#B	3.6017E-02	3.6054E-02	1.3988E-01	1.3990E-01	1.558E-01
EU-154	#B	-2.9089E-02	-2.9134E-02	1.1685E-01	1.1686E-01	1.278E-01
EU-155	#B	-1.2108E-03	-1.2140E-03	3.4922E-01	3.4922E-01	2.808E-01
HG-203	#B	-1.8860E-02	-2.0897E-02	6.2328E-02	6.2339E-02	6.213E-02
TL-208		2.4027E-01	2.4027E-01	6.9855E-02	7.1144E-02	
PB-212	#	6.9492E-01	6.9492E-01	1.3958E-01	1.4492E-01	1.211E-01
PB-214	#	5.0290E-01	5.0290E-01	1.3218E-01	1.3516E-01	1.104E-01
BI-212	#	6.0664E-01	6.0664E-01	6.0122E-01	6.0219E-01	
BI-214		5.3482E-01	5.3482E-01	2.1287E-01	2.1498E-01	
RA-224	#A	9.8055E-01	9.8055E-01	1.2750E+00	1.2762E+00	1.385E+00
RA-226	#	1.5685E+00	1.5685E+00	1.3361E+00	1.3390E+00	1.424E+00
AC-228		6.6585E-01	6.6585E-01	2.1877E-01	2.2194E-01	2.005E-01
TH-227	#B	1.4219E-02	1.4219E-02	5.6766E-01	5.6766E-01	6.362E-01
PA-234	#B	-5.0313E-02	-5.0313E-02	2.3852E-01	2.3854E-01	2.655E-01
TH-234	#B	6.1571E-01	6.1571E-01	4.5491E+00	4.5492E+00	5.079E+00
AM-241	#A	1.8809E-01	1.8810E-01	6.3827E-01	6.3835E-01	7.086E-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 (282.2 to 1999.0 keV) 2.1706271E+00 pCi/gm
Total Decayed Activity (282.2 to 1999.0 keV) 2.1706808E+00 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 102F_15SEPT2006_1434.An1

Sample description
FSS- SSS-01-01-031-F-B

Spectrum Filename: C:\GammaVision\Spectra\102F_15SEPT2006_1434.An1

Acquisition information
Start time: 15-Sep-2006 14:34:13
Live time: 2000
Real time: 2021
Dead time: 1.02 %
Detector ID: 3

Detector system
Det 102 - DSPP-468

Calibration
Filename: D2_1LSa.Clb
DET 102 1 Liter Sand Geometry

Energy Calibration
Created: 15-Jan-2005 03:09:29
Zero offset: 0.220 keV
Gain: 0.500 keV/channel
Quadratic: -6.435E-08 keV/channel^2

Efficiency Calibration
Created: 15-Jan-2005 06:48:10
Type: Polynomial
Uncertainty: 0.497 %
Coefficients: -0.294180 -5.980622 0.744607
-0.096737 0.005214 -0.000120

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.22keV)
Stop channel: 4000 (1999.02keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.7040E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.7040E+03) =
5.8685E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five 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	09-Sep-2006 14:00:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	102_150K_28APR05.Pbc 01-May-2005 05:27:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 17 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.7338

***** 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. pCi/gm	Nuc
77.30	172.	26.27	1.50	9.541E-03	77.11	10.700	1.335E+00	PB214
					77.11	17.500	8.162E-01	PB212
77.30	172.	26.27	1.50	9.541E-03	77.11	10.700	1.335E+00	PB214
					77.11	17.500	8.162E-01	PB212
186.53	146.	23.77	1.13	1.624E-02	185.99	3.280	2.104E+00	RA226
239.25	702.	6.00	1.19	1.378E-02	238.63	43.100	9.352E-01	PB212
270.96	45.	37.38	1.40	1.240E-02				
295.70	119.	15.03	1.25	1.144E-02	295.22	19.200	4.272E-01	PB214
300.88	38.	38.68	1.26	1.126E-02				
329.09	53.	41.26	1.35	1.034E-02				
338.96	137.	15.26	1.43	1.004E-02	338.40	12.010	8.993E-01	AC228
352.62	268.	10.34	1.49	9.662E-03	351.99	37.100	5.902E-01	PB214
464.17	32.	36.98	1.37	7.354E-03	463.51	10.000	PBC<MDA	SB125
511.98	68.	20.10	1.64	6.679E-03	510.72	22.500	3.580E-01	TL208
584.42	187.	9.97	1.41	5.878E-03	583.14	86.000	2.928E-01	TL208
610.41	180.	9.55	1.36	5.640E-03	609.32	46.090	5.485E-01	BI214
662.95	64.	23.74	1.69	5.220E-03	661.62	84.620	1.155E-01	CS137
728.35	85.	19.07	2.17	4.794E-03	727.17	11.800	1.197E+00	BI212
796.58	29.	31.97	1.60	4.420E-03	795.76	85.400	6.142E-02	CS134
913.13	130.	13.09	1.27	3.914E-03				
970.72	84.	17.51	1.75	3.712E-03				
1463.45	630.	4.09	1.97	2.617E-03	1460.75	10.700	1.780E+01	K40

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide

478.13	239.25	909.	137.	0.068	97.09	1.185	PB-212	M
541.56	270.96	119.	45.	0.023	112.15	1.402	AC-228	M
601.42	301.00	91.	38.	0.019	116.03	1.259	PB-212	lD

Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	Suspected	
657.85	329.09	149.	53.	0.026	123.77	1.346	LA-140	sM
1826.40	913.13	42.	130.	0.065	33.93	1.267	AC-228	sM
1941.66	970.72	38.	84.	0.042	45.45	1.750	AC-228	M

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

This section based on library: FSS_Rev_1.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 3 Sigma %	FWHM keV
PB-214	153.80	77.11	933.	172.	0.086	78.80	1.500D
PB-212	153.80	77.11	933.	172.	0.086	78.80	1.500D
RA-226	372.51	186.45	406.	88.	0.044	97.08	1.500s
PB-212	477.77	239.07	386.	525.	0.263	20.57	1.500
PB-214	591.04	295.69	177.	119.	0.060	54.61	1.500s
AC-228	677.59	338.96	137.	140.	0.070	43.68	1.500
PB-214	705.16	352.74	118.	232.	0.116	27.92	1.500s
SB-125	927.78	464.02	86.	43.	0.022	97.54	1.500
TL-208	1023.74	511.98	54.	68.	0.034	60.30	1.638s
TL-208	1168.67	584.42	51.	187.	0.093	29.92	1.406
BI-214	1220.68	610.41	40.	180.	0.090	28.65	1.360
Ag-108M	1224.66	612.40	145.	-51.	-0.026	107.88	1.499s
CS-137	1325.79	662.95	55.	64.	0.032	71.21	1.693
BI-212	1456.66	728.35	49.	85.	0.043	57.21	2.168s
CS-134	1593.19	796.58	29.	29.	0.015	95.90	1.601s
K-40	2927.87	1463.48	4.	599.	0.300	12.33	2.042

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 pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		7.6246E-02					
			477.56	7.625E-02	%(	4.415E-01 1.28E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
K-40	1.6942E+01						
		1460.75	1.694E+01	(P	3.385E-01	6.97E-01	G
MN-54	-9.2961E-03						
		834.81	-9.296E-03	%(P	7.033E-02	2.02E-02	G
CO-57	-1.7006E-03						
		122.07	-1.701E-03	&(	6.289E-02	1.87E-02	G K
		136.43	1.600E-02	&	4.482E-01	1.33E-01	G
CO-60	-1.0256E-02						
		1332.51	-1.026E-02	%(P	7.675E-02	2.16E-02	G K
		1173.23	-1.169E-02	&	9.940E-02	2.86E-02	G K
Sr-85	2.5845E-03						
		514.00	2.584E-03	%(	4.984E-02	1.42E-02	G
Kr-85	5.4926E+01						
		513.99	5.493E+01	%(	1.079E+03	3.07E+02	G
Y-88	1.2783E-04						
		1836.01	1.278E-04	%(P	5.367E-02	1.31E-02	G K
		898.02	1.959E-02	% P	7.130E-02	2.08E-02	G
NB-94	9.3267E-03						
		871.10	9.327E-03	&(	4.403E-02	1.25E-02	G K
		702.50	1.805E-02	%	4.895E-02	1.46E-02	G K
Ag-108M	1.3361E-02						
		722.95	1.336E-02	%(	3.914E-02	1.15E-02	G K
		614.37	-8.057E-02	+ P	9.194E-02	2.89E-02	G
		433.93	7.802E-03	%	4.837E-02	1.41E-02	G
CD-109	2.9961E-01						
		88.04	2.996E-01	%(P	2.359E+00	7.05E-01	G
SN-113	-1.4198E-02						
		391.71	-1.420E-02	%(	7.317E-02	2.15E-02	G K
		255.04	5.746E-01	&	2.080E+00	6.20E-01	G
SB-125	1.4453E-01						
		427.95	3.456E-02	%(P	1.328E-01	3.89E-02	G K
		600.77	-7.765E-03	% P	2.883E-01	8.15E-02	G
		636.15	1.441E-01	% P	3.575E-01	1.07E-01	G
		463.51	4.700E-01	(P	4.970E-01	1.58E-01	G
		176.29	-7.795E-02	& P	7.612E-01	2.25E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
I-131	-1.0097E-04						
		364.48	-1.010E-04	&(	9.007E-02	2.59E-02	G K
		636.97	-3.378E-01	%	1.348E+00	3.96E-01	G
		284.29	6.235E-03	%	1.242E+00	3.62E-01	G
CS-134	2.5214E-02						
		604.66	-6.469E-03	%(	4.980E-02	1.43E-02	G K
		795.76	6.142E-02	(	5.842E-02	1.96E-02	G
		569.29	-2.799E-02	%	3.399E-01	9.73E-02	G
		801.84	1.678E-01	% P	5.932E-01	1.73E-01	G
CS-137	1.1546E-01						
		661.62	1.155E-01	(	6.659E-02	2.75E-02	G
CE-139	-6.1596E-03						
		165.85	-6.160E-03	%(P	6.192E-02	1.84E-02	G
EU-152	1.5984E-02						
		121.78	1.598E-02	%(P	1.725E-01	5.12E-02	G K
		344.30	-1.734E-03	&	1.666E-01	4.82E-02	G
		1408.08	-4.978E-02	&	3.140E-01	8.79E-02	G
		964.00	-5.012E-02	& P	5.075E-01	1.44E-01	G
		1112.07	1.590E-01	%	5.510E-01	1.62E-01	G
		778.90	-1.023E-03	& P	5.143E-01	1.45E-01	G
EU-154	-5.9675E-03						
		123.10	-5.968E-03	&(P	1.320E-01	3.92E-02	G K
		1274.80	3.719E-02	%	2.207E-01	6.30E-02	G
		723.30	7.000E-02	% P	3.045E-01	8.88E-02	G
		1004.80	-3.808E-02	%	3.802E-01	1.07E-01	G
EU-155	3.7671E-02						
		86.45	3.767E-02	&(P	2.929E-01	8.76E-02	G K
		105.31	7.921E-02	%	2.648E-01	7.96E-02	G
HG-203	-6.9942E-03						
		279.17	-6.994E-03	&(P	6.160E-02	1.81E-02	G K
		72.87	-3.590E-01	%	2.559E+00	7.67E-01	G
		70.83	-3.470E-02	%	5.236E+00	1.56E+00	G
		82.50	-7.020E-01	%	5.029E+00	1.51E+00	G
TL-208	3.0629E-01						
		583.14	2.928E-01	(P	5.635E-02	2.93E-02	G
		510.72	3.580E-01	(	1.946E-01	7.21E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PB-212	7.3385E-01						
		238.63	7.004E-01	(	1.257E-01	4.80E-02	G K
							Energy duplication
		77.11	8.162E-01	(	6.889E-01	2.14E-01	G
		74.81	6.420E-01	& P	1.429E+00	4.33E-01	G
PB-214	4.8441E-01						
		351.99	5.124E-01	@(P	1.178E-01	4.78E-02	G K
		295.22	4.304E-01	@(	2.330E-01	7.83E-02	G
							Energy duplication
		77.11	1.335E+00	+	1.127E+00	3.51E-01	G
		241.92	2.409E-01	%	8.370E-01	2.51E-01	G
BI-212	1.1972E+00						
		727.17	1.197E+00	@(	4.934E-01	2.29E-01	G K
		1620.56	-2.187E-02	% P	2.138E+00	5.43E-01	G
		785.42	-3.458E-01	& P	2.766E+00	7.86E-01	G
BI-214	5.4854E-01						
		609.32	5.485E-01	(	9.791E-02	5.25E-02	G K
		1764.51	-6.108E-02	% P	4.392E-01	1.20E-01	G
		1120.28	-1.680E-01	&	5.754E-01	1.70E-01	G
RA-224	5.6909E-01						
		241.00	5.691E-01	&(P	1.566E+00	4.72E-01	G
RA-226	1.3084E+00						
		185.99	1.308E+00	*(P	1.436E+00	4.45E-01	G
AC-228	2.7933E-01						
		911.07	1.519E-02	%(P	2.274E-01	6.40E-02	G K
		968.90	-4.237E-04	% P	4.351E-01	1.22E-01	G
		338.40	9.171E-01	(	3.759E-01	1.34E-01	G
TH-227	-3.4519E-01						
		236.00	-3.452E-01	%(P	5.925E-01	1.80E-01	G K
		256.25	-1.634E-01	%	6.967E-01	2.08E-01	G
PA-234	-2.1953E-02						
		98.44	-2.195E-02	&(	2.734E-01	8.14E-02	G K
		946.00	-8.613E-02	%	3.900E-01	1.14E-01	G
		131.28	-5.921E-02	&	2.598E-01	7.78E-02	G
		94.67	-1.809E-02	%	5.136E-01	1.53E-01	G
		883.24	2.825E-04	&	3.451E-01	9.13E-02	G
		926.70	-5.632E-04	&	5.535E-01	1.53E-01	G
		569.26	-4.080E-02	%	4.900E-01	1.40E-01	G

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

TH-234       1.3324E+00
                           63.29 1.332E+00 %(P 5.113E+00 1.54E+00 G K
                           92.80 1.162E+00 &   2.698E+00 8.17E-01 G
                           92.38-1.937E-02 & P 2.996E+00 8.89E-01 G

AM-241      -2.2392E-01
                           59.54-2.239E-01 &(  7.955E-01 2.39E-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

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

***** 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 pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	7.0512E-02	7.6246E-02	3.8375E-01	3.8378E-01	4.083E-01
K-40		1.6942E+01	1.6942E+01	2.0900E+00	2.2961E+00	3.385E-01
MN-54	#A	-9.1726E-03	-9.2961E-03	6.6014E-02	6.6017E-02	6.940E-02
CO-57	#B	-1.6745E-03	-1.7006E-03	5.5953E-02	5.5953E-02	6.192E-02
CO-60	#B	-1.0233E-02	-1.0256E-02	6.7675E-02	6.7678E-02	7.659E-02
Sr-85	A	2.4233E-03	2.5845E-03	4.2566E-02	4.2567E-02	4.673E-02

Kr-85	A	5.4924E+01	5.4926E+01	9.2148E+02	9.2149E+02	1.079E+03
Y-88	#B	1.2292E-04	1.2783E-04	3.9374E-02	3.9374E-02	5.161E-02
NB-94	#B	9.3267E-03	9.3267E-03	3.7531E-02	3.7534E-02	4.403E-02
Ag-108M	#B	1.3360E-02	1.3361E-02	3.4479E-02	3.4487E-02	3.914E-02
CD-109	#A	2.9687E-01	2.9961E-01	2.1151E+00	2.1152E+00	2.337E+00
SN-113	#B	-1.3693E-02	-1.4198E-02	6.4457E-02	6.4462E-02	7.056E-02
SB-125	#F	1.4394E-01	1.4453E-01	1.4599E-01	1.4622E-01	1.323E-01
I-131	#B	-6.0067E-05	-1.0097E-04	7.7683E-02	7.7683E-02	5.358E-02
CS-134	#B	2.5075E-02	2.5214E-02	2.4181E-02	2.4222E-02	4.953E-02
CS-137		1.1541E-01	1.1546E-01	8.2214E-02	8.2469E-02	
CE-139	#A	-5.9754E-03	-6.1596E-03	6.0064E-02	6.0065E-02	6.007E-02
EU-152	#B	1.5969E-02	1.5984E-02	1.5373E-01	1.5374E-01	1.723E-01
EU-154	#B	-5.9595E-03	-5.9675E-03	1.2738E-01	1.2738E-01	1.319E-01
EU-155	#B	3.7585E-02	3.7671E-02	2.6271E-01	2.6272E-01	2.922E-01
HG-203	#B	-6.3946E-03	-6.9942E-03	5.5684E-02	5.5686E-02	5.632E-02
TL-208		3.0629E-01	3.0629E-01	9.1842E-02	9.3436E-02	
PB-212	#	7.3385E-01	7.3385E-01	1.5094E-01	1.5646E-01	1.257E-01
PB-214	#	4.8441E-01	4.8441E-01	1.3545E-01	1.3815E-01	1.178E-01
BI-212	#	1.1972E+00	1.1972E+00	6.8492E-01	6.8820E-01	
BI-214		5.4854E-01	5.4854E-01	1.5715E-01	1.6014E-01	
RA-224	#A	5.6909E-01	5.6909E-01	1.4154E+00	1.4157E+00	1.566E+00
RA-226	#A	1.3084E+00	1.3084E+00	1.3345E+00	1.3366E+00	1.436E+00
AC-228	F	2.7933E-01	2.7933E-01	1.2200E-01	1.2300E-01	2.274E-01
TH-227	#B	-3.4519E-01	-3.4519E-01	5.4603E-01	5.4637E-01	5.925E-01
PA-234	#B	-2.1953E-02	-2.1953E-02	2.4433E-01	2.4434E-01	2.734E-01
TH-234	#B	1.3324E+00	1.3324E+00	4.6058E+00	4.6064E+00	5.113E+00
AM-241	#A	-2.2391E-01	-2.2392E-01	7.1762E-01	7.1773E-01	7.955E-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 (50.2 to 1999.0 keV) 1.9389145E+01 pCi/gm
Total Decayed Activity (50.2 to 1999.0 keV) 1.9389189E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

Sample description
FSS-SSS-01-01-012-F

Spectrum Filename: C:\GammaVision\Spectra\102F_16SEPT2006_0813.An1

Acquisition information
Start time: 16-Sep-2006 08:13:20
Live time: 2000
Real time: 2025
Dead time: 1.22 %
Detector ID: 3

Detector system
Det 102 - DSPP-468

Calibration
Filename: D2_1LSa.Clb
DET 102 1 Liter Sand Geometry

Energy Calibration
Created: 15-Jan-2005 03:09:29
Zero offset: 0.220 keV
Gain: 0.500 keV/channel
Quadratic: -6.435E-08 keV/channel^2

Efficiency Calibration
Created: 15-Jan-2005 06:48:10
Type: Polynomial
Uncertainty: 0.497 %
Coefficients: -0.294180 -5.980622 0.744607
-0.096737 0.005214 -0.000120

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.22keV)
Stop channel: 4000 (1999.02keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 2.0500E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 2.0500E+03) =
4.8780E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five 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	10-Sep-2006 13:30:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	102_150K_28APR05.Pbc 01-May-2005 05:27:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 17 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.7177

***** 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. pCi/gm	Nuc
74.92	166.	19.79	1.10	9.037E-03	74.81	9.600	PBC<MDA	PB212
77.21	253.	13.62	1.10	9.717E-03	77.11	10.700	1.631E+00	PB214
					77.11	17.500	9.974E-01	PB212
92.93	136.	35.10	1.50	1.333E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	2.234E+00	TH234
92.97	131.	36.72	1.50	1.325E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.49	122.	26.82	1.15	1.624E-02	185.99	3.280	1.456E+00	RA226
209.31	114.	28.22	1.10	1.519E-02				
239.15	768.	4.45	1.22	1.378E-02	238.63	43.100	8.507E-01	PB212
242.34	122.	19.78	1.22	1.364E-02	241.00	3.900	1.488E+00	RA224
					241.92	7.470	7.869E-01	PB214
271.47	78.	33.82	1.12	1.238E-02				
278.28	57.	35.76	1.37	1.211E-02				
278.28	57.	35.76	1.37	1.211E-02	279.17	81.500	PBC<MDA	HG203
295.88	183.	10.90	1.26	1.145E-02	295.22	19.200	5.486E-01	PB214
300.88	53.	30.64	1.26	1.127E-02				
339.07	172.	17.72	0.97	1.004E-02	338.40	12.010	9.363E-01	AC228
352.63	360.	9.36	1.42	9.661E-03	351.99	37.100	6.602E-01	PB214
434.54	60.	30.96	1.14	7.851E-03	433.93	89.881	5.597E-02	Ag108M
463.78	41.	39.61	1.50	7.365E-03	463.51	10.000	PBC<MDA	SB125
511.90	101.	15.27	1.14	6.680E-03	510.72	22.500	4.429E-01	TL208
584.35	261.	10.72	1.24	5.878E-03	583.14	86.000	3.386E-01	TL208
610.52	214.	7.96	1.47	5.639E-03	609.32	46.090	5.428E-01	BI214
615.65	49.	23.20	1.48	5.595E-03				
662.81	187.	8.99	1.32	5.221E-03	661.62	84.620	2.784E-01	CS137
724.36	36.	34.36	1.55	4.817E-03	722.95	90.499	PBC<MDA	Ag108M

					723.30	19.700	PBC<MDA	EU154
724.37	37.	31.91	1.55	4.820E-03	722.95	90.499	5.666E-02	Ag108M
					723.30	19.700	PBC<MDA	EU154
728.88	44.	27.80	1.69	4.784E-03				
913.07	181.	10.53	1.80	3.914E-03	911.07	29.000	1.045E+00	AC228
970.63	102.	21.04	1.21	3.712E-03				
1122.00	77.	23.12	1.85	3.279E-03				

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1175.39	33.	41.15	1.85	3.157E-03	1173.23	99.860	PBC<MDA	CO60
1463.43	701.	3.88	2.27	2.617E-03				

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
149.42	75.43	455.	166.	0.083	59.38	1.098	PB-214	D
153.99	77.71	465.	253.	0.126	40.85	1.100	PB-214	D
418.24	209.31	382.	114.	0.057	84.65	1.101	AC-228	sM
477.92	239.09	199.	768.	0.384	13.35	1.215	PB-212	D
484.30	242.28	229.	122.	0.061	59.35	1.217	XE-138	D
542.59	271.47	250.	78.	0.039	101.45	1.120	PA-234	M
601.19	300.77	132.	43.	0.022	122.24	1.823	PB-212	sM
1231.12	615.63	35.	57.	0.028	59.74	1.225	RH-106M	M
1457.71	728.88	38.	54.	0.027	63.40	1.692	J-132	M
1941.48	970.63	77.	107.	0.053	45.43	1.210	AC-228	M
2245.13	1122.00	27.	48.	0.024	63.35	1.820	TA-182	D
2927.78	1463.43	9.	700.	0.350	11.49	2.269	K-40	M

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

This section based on library: FSS_Rev_1.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 3 Sigma %	FWHM keV
PB-214	153.80	77.11	1105.	214.	0.107	69.05	1.500D
PB-212	153.80	77.11	1105.	214.	0.107	69.05	1.500D
TH-234	185.53	92.97	1105.	131.	0.065	110.15	1.500s
TH-234	185.45	92.93	1064.	136.	0.068	105.30	1.500s
RA-226	372.28	186.34	559.	126.	0.063	80.75	1.500s
PB-212	477.82	239.09	558.	639.	0.320	19.66	1.500
RA-224	483.93	242.15	625.	90.	0.045	120.20	1.500
HG-203	556.12	278.24	250.	57.	0.029	123.20	1.500
PB-214	591.35	295.85	274.	170.	0.085	47.29	1.500
AC-228	677.92	339.12	225.	120.	0.060	59.58	1.500
PB-214	705.08	352.70	192.	310.	0.155	25.49	1.500
Ag-108M	869.28	434.78	127.	60.	0.030	88.93	1.500
SB-125	927.31	463.78	121.	41.	0.020	118.83	1.500s
TL-208	1023.58	511.90	60.	101.	0.051	45.80	1.138s
TL-208	1168.53	584.35	134.	260.	0.130	32.17	1.242

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-214	1220.89	610.52	101.	262.	0.131	28.71	1.248
Ag-108M	1225.61	612.88	198.	-54.	-0.027	118.89	1.499
CS-137	1325.52	662.81	43.	187.	0.093	26.96	1.319
Ag-108M	1448.70	724.37	53.	37.	0.019	95.72	1.551
EU-154	1448.68	724.36	59.	36.	0.018	103.08	1.551s
AC-228	1825.90	912.88	37.	147.	0.074	30.23	1.679
CO-60	2351.24	1175.39	75.	33.	0.016	123.44	1.854s

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 pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		-1.6049E-01					
			477.56	-1.605E-01	&(	5.501E-01 1.64E-01	G
K-40		3.0542E-02					
			1460.75	3.054E-02	%(P	1.097E+00 3.15E-01	G
MN-54		-1.1001E-02					
			834.81	-1.100E-02	%(P	5.532E-02 1.60E-02	G
CO-57		4.7267E-03					
			122.07	4.727E-03	%(	6.417E-02 1.91E-02	G K
			136.43	6.486E-02	&	4.549E-01 1.36E-01	G
CO-60		2.5967E-02					
			1332.51	-1.677E-02	%(P	7.335E-02 2.13E-02	G K
			1173.23	6.875E-02	&(	9.008E-02 2.83E-02	G K
Sr-85		-1.7584E-02					
			514.00	-1.758E-02	%(	6.142E-02 1.83E-02	G
Kr-85		-3.8163E+02					
			513.99	-3.816E+02	%(	1.333E+03 3.97E+02	G
Y-88		-2.1044E-05					
			1836.01	-2.104E-05	%(P	5.396E-02 1.37E-02	G K
			898.02	-1.347E-02	& P	7.846E-02 2.27E-02	G
NB-94		0.0000E+00					
			871.10	0.000E+00	%(	6.834E-02 1.94E-02	G K
			702.50	-7.789E-03	&	5.487E-02 1.59E-02	G K

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Ag-108M	5.6235E-02						
		722.95	5.666E-02	(	5.526E-02	1.81E-02	G K
		614.37	-6.976E-02	- P	8.875E-02	2.75E-02	G
		433.93	5.581E-02	(	5.158E-02	1.65E-02	G
CD-109	-3.3091E-02						
		88.04	-3.309E-02	%(P	2.295E+00	6.85E-01	G
SN-113	-2.3137E-02						
		391.71	-2.314E-02	%(	8.171E-02	2.44E-02	G K
		255.04	-3.270E-01	&	2.011E+00	5.96E-01	G
SB-125	9.0203E-02						
		427.95	-3.215E-03	&(P	1.684E-01	4.86E-02	G K
		600.77	8.098E-03	& P	2.915E-01	8.36E-02	G
		636.15	-2.784E-02	% P	4.966E-01	1.43E-01	G
		463.51	3.667E-01	*(P	4.852E-01	1.51E-01	G
		176.29	5.428E-02	& P	7.546E-01	2.24E-01	G
I-131	-1.6099E-02						
		364.48	-1.610E-02	&(	9.560E-02	2.82E-02	G K
		636.97	-9.015E-02	%	1.216E+00	3.50E-01	G
		284.29	-2.079E-01	&	1.007E+00	2.99E-01	G
CS-134	-6.4557E-03						
		604.66	-6.456E-03	&(	5.215E-02	1.51E-02	G K
		795.76	1.802E-02	%	6.670E-02	1.96E-02	G
		569.29	1.129E-02	%	3.406E-01	9.79E-02	G
		801.84	-3.489E-02	% P	6.257E-01	1.77E-01	G
CS-137	2.7837E-01						
		661.62	2.784E-01	(	4.968E-02	2.51E-02	G
CE-139	-5.0099E-03						
		165.85	-5.010E-03	%(P	5.514E-02	1.64E-02	G
EU-152	2.0605E-02						
		121.78	2.060E-02	%(P	1.841E-01	5.50E-02	G K
		344.30	-4.134E-02	&	1.835E-01	5.46E-02	G
		1408.08	5.519E-03	&	2.633E-01	7.09E-02	G
		964.00	-1.175E-01	& P	4.963E-01	1.45E-01	G
		1112.07	-1.450E-01	%	6.184E-01	1.82E-01	G
		778.90	-5.972E-03	% P	3.509E-01	9.74E-02	G
EU-154	8.5514E-02						
		123.10	5.428E-03	%(P	1.326E-01	3.95E-02	G K
		1274.80	5.741E-04	&	1.980E-01	5.49E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		723.30	2.500E-01	(P	2.686E-01	8.64E-02	G
		1004.80	1.571E-02	%	2.616E-01	7.20E-02	G
EU-155	1.7734E-01						
		86.45	1.773E-01	%(P	2.629E-01	8.02E-02	G K
		105.31	4.501E-02	%	1.984E-01	5.93E-02	G
HG-203	4.1908E-02						
		279.17	4.191E-02	(P	5.578E-02	1.72E-02	G K
		72.87	-5.636E-01	%	2.262E+00	6.81E-01	G
		70.83	0.000E+00	%	4.886E+00	1.46E+00	G
		82.50	-1.787E+00	%	4.669E+00	1.41E+00	G
TL-208	3.6023E-01						
		583.14	3.386E-01	(P	7.368E-02	3.64E-02	G
		510.72	4.429E-01	*(	1.696E-01	6.78E-02	G
PB-212	7.4778E-01						
		238.63	7.084E-01	(	1.250E-01	4.64E-02	G K
							Energy duplication
		77.11	8.447E-01	@(	6.224E-01	1.94E-01	G
		74.81	9.083E-01	& P	1.281E+00	3.91E-01	G
PB-214	5.4819E-01						
		351.99	5.683E-01	(P	1.236E-01	4.84E-02	G K
		295.22	5.092E-01	(	2.392E-01	8.03E-02	G
							Energy duplication
		77.11	1.381E+00	+	1.018E+00	3.18E-01	G
		241.92	4.842E-01	%	7.913E-01	2.41E-01	G
BI-212	-1.5387E-01						
		727.17	-1.539E-01	%(	5.752E-01	1.70E-01	G K
		1620.56	-1.949E-01	% P	1.584E+00	4.10E-01	G
		785.42	5.424E-01	% P	2.400E+00	6.97E-01	G
BI-214	6.6230E-01						
		609.32	6.623E-01	(	1.257E-01	6.35E-02	G K
		1764.51	-1.070E-01	% P	4.711E-01	1.35E-01	G
		1120.28	-1.461E-01	%	6.204E-01	1.83E-01	G
RA-224	1.1129E+00						
		241.00	1.113E+00	(P	1.471E+00	4.52E-01	G
RA-226	1.5614E+00						
		185.99	1.561E+00	(P	1.395E+00	4.35E-01	G
AC-228	8.5399E-01						
		911.07	8.540E-01	(P	1.799E-01	8.62E-02	G K
		968.90	-5.351E-02	% P	4.950E-01	1.44E-01	G
		338.40	6.560E-01	-	3.961E-01	1.30E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-227	-3.7924E-01						
		236.00	-3.792E-01	&(P	5.752E-01	1.76E-01	G K
		256.25	-2.539E-02	%	6.651E-01	1.96E-01	G
PA-234	7.5760E-02						
		98.44	7.576E-02	%(	2.700E-01	8.13E-02	G K
		946.00	5.613E-02	%	2.902E-01	8.39E-02	G
		131.28	-7.827E-03	&	2.488E-01	7.40E-02	G
		94.67	-1.959E-01	%	5.145E-01	1.56E-01	G
		883.24	-4.349E-04	&	4.715E-01	1.32E-01	G
		926.70	1.592E-01	%	3.623E-01	1.09E-01	G
		569.26	1.669E-02	%	5.026E-01	1.44E-01	G
TH-234	1.6477E+00						
		63.29	6.174E-01	%(P	4.827E+00	1.44E+00	G K
		92.80	2.234E+00	(	2.550E+00	7.84E-01	G
		92.38	2.527E+00	(P	3.051E+00	9.36E-01	G
AM-241	-1.2812E-02						
		59.54	-1.281E-02	&(	6.973E-01	2.07E-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

- -

***** 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 pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	-1.4889E-01	-1.6049E-01	4.9138E-01	4.9146E-01	5.103E-01
K-40	A	3.0542E-02	3.0542E-02	9.4406E-01	9.4406E-01	1.097E+00
MN-54	#A	-1.0861E-02	-1.1001E-02	5.1004E-02	5.1008E-02	5.462E-02
CO-57	#B	4.6571E-03	4.7267E-03	5.7450E-02	5.7451E-02	6.323E-02
CO-60	#B	2.5913E-02	2.5967E-02	3.2053E-02	3.2086E-02	7.320E-02
Sr-85	#A	-1.6531E-02	-1.7584E-02	5.4851E-02	5.4860E-02	5.774E-02
Kr-85	#A	-3.8162E+02	-3.8163E+02	1.1904E+03	1.1906E+03	1.333E+03
Y-88	#B	-2.0268E-05	-2.1044E-05	5.4080E-04	5.4080E-04	5.197E-02
NB-94	#B	0.0000E+00	0.0000E+00	5.8235E-02	5.8236E-02	6.834E-02
Ag-108M		5.6230E-02	5.6235E-02	3.6736E-02	3.6871E-02	5.526E-02
CD-109	#A	-3.2799E-02	-3.3091E-02	9.2843E+00	9.2843E+00	2.275E+00
SN-113	#B	-2.2345E-02	-2.3137E-02	7.3134E-02	7.3145E-02	7.891E-02
SB-125	#B	8.9847E-02	9.0203E-02	1.1126E-01	1.1137E-01	1.677E-01
I-131	#B	-9.7812E-03	-1.6099E-02	8.4742E-02	8.4747E-02	5.808E-02
CS-134	#B	-6.4214E-03	-6.4557E-03	4.5303E-02	4.5304E-02	5.187E-02
CS-137		2.7827E-01	2.7837E-01	7.5052E-02	7.6661E-02	
CE-139	#A	-4.8660E-03	-5.0099E-03	5.3645E-02	5.3645E-02	5.356E-02
EU-152	#B	2.0587E-02	2.0605E-02	1.6502E-01	1.6502E-01	1.839E-01
EU-154	#B	8.5404E-02	8.5514E-02	8.8696E-02	8.8822E-02	1.325E-01
EU-155	#B	1.7695E-01	1.7734E-01	2.4067E-01	2.4087E-01	2.624E-01
HG-203	#A	3.8455E-02	4.1908E-02	5.1716E-02	5.1769E-02	5.119E-02
TL-208		3.6023E-01	3.6023E-01	1.0087E-01	1.0287E-01	
PB-212	#	7.4778E-01	7.4778E-01	1.4702E-01	1.5289E-01	1.250E-01
PB-214	#	5.4819E-01	5.4819E-01	1.3993E-01	1.4327E-01	1.236E-01
BI-212	#B	-1.5387E-01	-1.5387E-01	5.1099E-01	5.1106E-01	5.752E-01
BI-214		6.6230E-01	6.6230E-01	1.9013E-01	1.9373E-01	
RA-224	#A	1.1129E+00	1.1129E+00	1.3549E+00	1.3564E+00	1.471E+00
RA-226	#	1.5613E+00	1.5614E+00	1.3054E+00	1.3083E+00	1.395E+00
AC-228		8.5399E-01	8.5399E-01	2.5852E-01	2.6293E-01	1.799E-01
TH-227	#B	-3.7924E-01	-3.7924E-01	5.3034E-01	5.3077E-01	5.752E-01
PA-234	#B	7.5760E-02	7.5760E-02	2.4386E-01	2.4390E-01	2.700E-01
TH-234	#B	1.6477E+00	1.6477E+00	1.7350E+00	1.7375E+00	4.827E+00
AM-241	#A	-1.2811E-02	-1.2812E-02	6.2242E-01	6.2242E-01	6.973E-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 (1460.5 to 1999.0 keV) 2.2110145E+00 pCi/gm
Total Decayed Activity (1460.5 to 1999.0 keV) 2.2111208E+00 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JJM

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 102F_16SEPT2006_0908.An1

Sample description
FSS-SSS-01-01-007-F

Spectrum Filename: C:\GammaVision\Spectra\102F_16SEPT2006_0908.An1

Acquisition information
Start time: 16-Sep-2006 09:08:24
Live time: 2000
Real time: 2022
Dead time: 1.09 %
Detector ID: 3

Detector system
Det 102 - DSPP-468

Calibration
Filename: D2_1LSa.Clb
DET 102 1 Liter Sand Geometry

Energy Calibration
Created: 15-Jan-2005 03:09:29
Zero offset: 0.220 keV
Gain: 0.500 keV/channel
Quadratic: -6.435E-08 keV/channel^2

Efficiency Calibration
Created: 15-Jan-2005 06:48:10
Type: Polynomial
Uncertainty: 0.497 %
Coefficients: -0.294180 -5.980622 0.744607
-0.096737 0.005214 -0.000120

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.22keV)
Stop channel: 4000 (1999.02keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.8300E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.8300E+03) =
5.4645E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five 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	09-Sep-2006 11:00:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	102_150K_28APR05.Pbc 01-May-2005 05:27:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 11 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.6873

***** 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. pCi/gm	Nuc
74.98	140.	32.80	1.50	8.847E-03	72.87	6.400	2.179E+00	HG203
					74.81	9.600	PBC<MDA	PB212
77.14	207.	21.75	1.50	9.541E-03	77.11	10.700	1.496E+00	PB214
					77.11	17.500	9.144E-01	PB212
77.14	207.	21.75	1.50	9.541E-03	77.11	10.700	1.496E+00	PB214
					77.11	17.500	9.144E-01	PB212
128.85	107.	38.36	1.32	1.714E-02				
186.88	126.	25.19	1.44	1.623E-02	185.99	3.280	1.675E+00	RA226
209.36	97.	37.38	1.13	1.519E-02				
239.13	688.	4.55	1.22	1.378E-02	238.63	43.100	8.536E-01	PB212
242.33	111.	20.46	1.22	1.364E-02	241.00	3.900	1.515E+00	RA224
					241.92	7.470	8.018E-01	PB214
271.11	72.	29.88	1.06	1.239E-02				
295.75	169.	11.28	1.26	1.144E-02	295.22	19.200	5.667E-01	PB214
300.69	54.	28.52	1.26	1.127E-02				
328.15	63.	32.78	1.22	1.037E-02				
339.25	133.	19.59	1.73	1.004E-02	338.40	12.010	8.129E-01	AC228
352.51	296.	8.35	1.24	9.665E-03	351.99	37.100	6.088E-01	PB214
463.05	47.	36.79	0.92	7.372E-03				
463.05	47.	36.79	0.92	7.372E-03	463.51	10.000	PBC<MDA	SB125
511.04	103.	19.49	1.31	6.691E-03	510.72	22.500	5.069E-01	TL208
584.09	219.	8.79	1.39	5.881E-03	583.14	86.000	3.187E-01	TL208
610.43	230.	10.50	1.39	5.640E-03	609.32	46.090	6.512E-01	BI214
728.55	32.	34.52	1.55	4.794E-03	727.17	11.800	PBC<MDA	BI212
913.32	147.	12.29	1.60	3.913E-03				
969.97	120.	13.59	1.58	3.714E-03	968.90	17.460	1.368E+00	AC228
1121.08	68.	22.22	1.53	3.283E-03	1120.28	15.040	1.014E+00	BI214

1463.51	632.	4.08	2.05	2.617E-03	1460.75	10.700	1.665E+01	K40

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
257.28	128.85	565.	125.	0.062	85.37	1.323	AC-228	M
418.35	209.36	422.	97.	0.049	112.15	1.131	AC-228	sM
477.89	239.08	146.	688.	0.344	13.66	1.215	PB-212	D
484.30	242.29	201.	111.	0.055	61.37	1.217	XE-138	D
541.86	271.11	179.	72.	0.036	89.65	1.061	AC-228	M
601.22	300.78	160.	70.	0.035	93.66	1.911	PB-212	sM
655.98	328.15	141.	63.	0.032	98.35	1.216	AC-228	sM
925.86	463.05	90.	47.	0.023	110.37	0.923	AC-228	l
1826.78	913.32	46.	149.	0.074	31.37	1.597	AC-228	sM
1940.15	969.97	99.	59.	0.029	82.05	1.585	AC-228	M

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

This section based on library: FSS_Rev_1.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 3 Sigma %	FWHM keV
PB-212	149.54	74.98	1036.	140.	0.070	98.41	1.500s
PB-214	153.80	77.11	908.	207.	0.103	65.26	1.500D
PB-212	153.80	77.11	908.	207.	0.103	65.26	1.500D
RA-226	372.57	186.48	453.	98.	0.049	92.87	1.500s
PB-212	477.89	239.13	437.	604.	0.302	19.11	1.500
RA-224	483.15	241.76	521.	87.	0.044	114.03	1.500s
PB-214	591.19	295.77	177.	168.	0.084	40.74	1.500
AC-228	677.80	339.06	176.	110.	0.055	58.46	1.500
PB-214	704.90	352.61	142.	266.	0.133	26.40	1.500
TL-208	1021.85	511.04	95.	103.	0.052	58.47	1.314s
TL-208	1168.01	584.09	54.	219.	0.109	26.36	1.387s
BI-214	1220.71	610.43	92.	230.	0.115	31.49	1.387
BI-212	1457.05	728.55	46.	32.	0.016	103.57	1.554s
AC-228	1941.38	970.59	40.	62.	0.031	57.79	1.718
BI-214	2242.56	1121.08	44.	68.	0.034	66.65	1.526s
K-40	2927.95	1463.52	7.	619.	0.309	12.19	2.042

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 pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		-1.3928E-02					
			477.56	-1.393E-02	%(	4.838E-01 1.38E-01	G
K-40		1.6290E+01					
			1460.75	1.629E+01	(P	3.960E-01 6.62E-01	G
MN-54		-1.3021E-02					
			834.81	-1.302E-02	%(P	6.217E-02 1.80E-02	G
CO-57		8.9517E-03					
			122.07	8.952E-03	%(	6.396E-02 1.91E-02	G K
			136.43	2.364E-03	%	4.770E-01 1.41E-01	G
CO-60		-1.5058E-03					
			1332.51	-1.506E-03	%(P	6.242E-02 1.69E-02	G K
			1173.23	1.995E-02	%	9.209E-02 2.69E-02	G K
Sr-85		-1.7791E-02					
			514.00	-1.779E-02	%(	7.120E-02 2.11E-02	G
Kr-85		-3.8145E+02					
			513.99	-3.814E+02	%(	1.526E+03 4.53E+02	G
Y-88		7.9949E-03					
			1836.01	7.995E-03	&(P	5.548E-02 1.49E-02	G K
			898.02	-1.400E-02	% P	7.184E-02 2.06E-02	G
NB-94		1.5241E-02					
			871.10	1.524E-02	%(	5.159E-02 1.51E-02	G K
			702.50	3.296E-03	&	4.707E-02 1.32E-02	G K
Ag-108M		-1.4130E-02					
			722.95	-1.413E-02	&(	6.806E-02 1.99E-02	G K
			614.37	-4.497E-02	& P	8.327E-02 2.54E-02	G
			433.93	-6.767E-03	%	5.398E-02 1.57E-02	G
CD-109		-1.0856E-01					
			88.04	-1.086E-01	%(P	2.537E+00 7.57E-01	G
SN-113		1.0660E-03					
			391.71	1.066E-03	%(	7.592E-02 2.19E-02	G K
			255.04	-5.835E-01	%	2.063E+00 6.16E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	-3.8411E-03						
		427.95	-3.841E-03	%(P	1.506E-01	4.29E-02	G K
		600.77	-8.481E-03	& P	3.304E-01	9.47E-02	G
		636.15	-4.426E-03	& P	3.799E-01	1.05E-01	G
		463.51	3.244E-01	% P	4.673E-01	1.45E-01	G
		176.29	-2.571E-02	& P	7.158E-01	2.11E-01	G
I-131	-9.7306E-03						
		364.48	-9.731E-03	%(	9.871E-02	2.88E-02	G K
		636.97	1.495E-01	%	1.155E+00	3.30E-01	G
		284.29	7.241E-02	%	1.283E+00	3.76E-01	G
CS-134	1.0697E-02						
		604.66	1.070E-02	%(	4.645E-02	1.35E-02	G K
		795.76	4.882E-02	%	6.444E-02	2.04E-02	G
		569.29	1.099E-01	&	2.095E-01	6.42E-02	G
		801.84	-7.265E-02	% P	6.386E-01	1.82E-01	G
CS-137	2.9171E-04						
		661.62	2.917E-04	%(	6.429E-02	1.82E-02	G
CE-139	9.0387E-03						
		165.85	9.039E-03	&(P	6.094E-02	1.82E-02	G
EU-152	2.4333E-03						
		121.78	2.433E-03	%(P	1.644E-01	4.87E-02	G K
		344.30	-1.267E-02	%	1.763E-01	5.16E-02	G
		1408.08	-3.509E-02	&	3.232E-01	9.00E-02	G
		964.00	-1.315E-01	% P	5.055E-01	1.48E-01	G
		1112.07	2.041E-01	&	4.504E-01	1.36E-01	G
		778.90	-1.528E-02	% P	3.365E-01	9.26E-02	G
EU-154	-1.5226E-03						
		123.10	-1.523E-03	%(P	1.232E-01	3.65E-02	G K
		1274.80	-4.395E-02	&	2.600E-01	7.52E-02	G
		723.30	-1.033E-02	& P	3.638E-01	1.04E-01	G
		1004.80	9.860E-02	&	3.364E-01	9.85E-02	G
EU-155	1.7009E-01						
		86.45	1.701E-01	%(P	2.783E-01	8.47E-02	G K
		105.31	1.900E-03	%	2.234E-01	6.60E-02	G
HG-203	3.1148E-02						
		279.17	3.115E-02	&(P	5.784E-02	1.76E-02	G K
		72.87	8.473E-01	&	2.343E+00	7.08E-01	G
		70.83	3.260E-02	%	4.331E+00	1.29E+00	G
		82.50	-7.057E-02	&	5.113E+00	1.53E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	3.1867E-01						
		583.14	3.187E-01	@(P	5.406E-02	2.81E-02	G
		510.72	5.069E-01	+	2.355E-01	9.89E-02	G
PB-212	7.4937E-01						
		238.63	7.494E-01	(	1.243E-01	4.77E-02	G K
							Energy duplication
		77.11	9.144E-01	+	6.330E-01	1.99E-01	G
		74.81	1.219E+00	+ P	1.328E+00	4.09E-01	G
PB-214	5.5325E-01						
		351.99	5.477E-01	(P	1.200E-01	4.83E-02	G K
		295.22	5.640E-01	(	2.168E-01	7.66E-02	G
							Energy duplication
		77.11	1.496E+00	+	1.035E+00	3.25E-01	G
		241.92	5.653E-01	%	8.026E-01	2.46E-01	G
BI-212	4.2179E-01						
		727.17	4.218E-01	@(	4.482E-01	1.46E-01	G K
		1620.56	-1.712E-01	& P	2.094E+00	5.49E-01	G
		785.42	-9.362E-03	& P	2.930E+00	8.21E-01	G
BI-214	6.5116E-01						
		609.32	6.512E-01	(	1.347E-01	6.85E-02	G K
		1764.51	-1.806E-03	% P	3.495E-01	8.85E-02	G
		1120.28	1.014E+00	+	5.039E-01	2.25E-01	G
RA-224	1.2057E+00						
		241.00	1.206E+00	&(P	1.508E+00	4.64E-01	G
RA-226	1.3513E+00						
		185.99	1.351E+00	*(P	1.410E+00	4.37E-01	G
AC-228	3.4330E-01						
		911.07	-9.226E-03	%(P	2.820E-01	8.04E-02	G K
		968.90	7.008E-01	(P	3.649E-01	1.35E-01	G
		338.40	6.748E-01	(	3.946E-01	1.31E-01	G
TH-227	-1.5165E-01						
		236.00	-1.516E-01	%(P	5.102E-01	1.53E-01	G K
		256.25	-6.539E-02	%	6.539E-01	1.93E-01	G
PA-234	-1.8838E-02						
		98.44	-1.884E-02	&(	2.780E-01	8.29E-02	G K
		946.00	-6.975E-02	%	3.008E-01	8.73E-02	G
		131.28	-3.777E-02	%	2.559E-01	7.64E-02	G
		94.67	-1.857E-01	%	5.102E-01	1.54E-01	G
		883.24	1.044E-01	&	4.614E-01	1.34E-01	G
		926.70	-7.804E-02	&	5.537E-01	1.58E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 9.361E-02 &   3.565E-01 1.04E-01 G

TH-234       6.9324E-01
                           63.29 6.932E-01 %(P 5.046E+00 1.51E+00 G K
                           92.80 1.510E+00 %   2.725E+00 8.29E-01 G
                           92.38-1.178E-01 % P 3.307E+00 9.86E-01 G

AM-241      -1.1063E-01
                           59.54-1.106E-01 %(  7.310E-01 2.19E-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

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

***** 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 pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	-1.2731E-02	-1.3928E-02	4.1504E-01	4.1504E-01	4.422E-01
K-40		1.6290E+01	1.6290E+01	1.9867E+00	2.1870E+00	3.960E-01
MN-54	#A	-1.2822E-02	-1.3021E-02	5.7240E-02	5.7245E-02	6.122E-02
CO-57	#B	8.7940E-03	8.9517E-03	5.7315E-02	5.7317E-02	6.284E-02
CO-60	#B	-1.5021E-03	-1.5058E-03	6.6375E-02	6.6375E-02	6.226E-02

Sr-85	#A	-1.6522E-02	-1.7791E-02	6.3391E-02	6.3399E-02	6.612E-02
Kr-85	#A	-3.8143E+02	-3.8145E+02	1.3591E+03	1.3593E+03	1.526E+03
Y-88	#B	7.6430E-03	7.9949E-03	4.4592E-02	4.4594E-02	5.303E-02
NB-94	#B	1.5241E-02	1.5241E-02	4.5331E-02	4.5339E-02	5.159E-02
Ag-108M	#B	-1.4128E-02	-1.4130E-02	5.9618E-02	5.9623E-02	6.805E-02
CD-109	#A	-1.0742E-01	-1.0856E-01	3.5395E+00	3.5395E+00	2.510E+00
SN-113	#B	1.0225E-03	1.0660E-03	6.5822E-02	6.5822E-02	7.282E-02
SB-125	#B	-3.8229E-03	-3.8411E-03	1.2908E+00	1.2908E+00	1.499E-01
I-131	#B	-5.3573E-03	-9.7306E-03	8.6409E-02	8.6411E-02	5.434E-02
CS-134	#B	1.0629E-02	1.0697E-02	4.0605E-02	4.0610E-02	4.615E-02
CS-137	#A	2.9159E-04	2.9171E-04	5.4457E-02	5.4457E-02	6.427E-02
CE-139	#A	8.7287E-03	9.0387E-03	5.4504E-02	5.4506E-02	5.885E-02
EU-152	#B	2.4308E-03	2.4333E-03	1.4601E-01	1.4601E-01	1.642E-01
EU-154	#B	-1.5202E-03	-1.5226E-03	1.4696E-01	1.4696E-01	1.230E-01
EU-155	#B	1.6964E-01	1.7009E-01	2.5419E-01	2.5436E-01	2.775E-01
HG-203	#B	2.8099E-02	3.1148E-02	5.2854E-02	5.2883E-02	5.218E-02
TL-208	#	3.1867E-01	3.1867E-01	8.4148E-02	8.6027E-02	
PB-212	#	7.4937E-01	7.4937E-01	1.4317E-01	1.4922E-01	1.243E-01
PB-214	#	5.5325E-01	5.5325E-01	1.3434E-01	1.3788E-01	1.200E-01
BI-212	#A	4.2179E-01	4.2179E-01	4.3684E-01	4.3749E-01	4.482E-01
BI-214		6.5116E-01	6.5116E-01	2.0503E-01	2.0826E-01	
RA-224	#A	1.2057E+00	1.2057E+00	1.3932E+00	1.3948E+00	1.508E+00
RA-226	#A	1.3513E+00	1.3513E+00	1.3123E+00	1.3145E+00	1.410E+00
AC-228	F	3.4330E-01	3.4330E-01	1.9850E-01	1.9943E-01	2.820E-01
TH-227	#B	-1.5165E-01	-1.5165E-01	4.6799E-01	4.6807E-01	5.102E-01
PA-234	#B	-1.8838E-02	-1.8838E-02	2.4878E-01	2.4878E-01	2.780E-01
TH-234	#B	6.9324E-01	6.9324E-01	4.5243E+00	4.5245E+00	5.046E+00
AM-241	#A	-1.1063E-01	-1.1063E-01	6.5557E-01	6.5560E-01	7.310E-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 (270.7 to 1999.0 keV) 1.7603083E+01 pCi/gm
Total Decayed Activity (270.7 to 1999.0 keV) 1.7603083E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JJM

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 102F_16SEPT2006_0947.An1

Sample description
FSS-SSS-01-01-017-F

Spectrum Filename: C:\GammaVision\Spectra\102F_16SEPT2006_0947.An1

Acquisition information
Start time: 16-Sep-2006 09:47:28
Live time: 2000
Real time: 2022
Dead time: 1.11 %
Detector ID: 3

Detector system
Det 102 - DSPP-468

Calibration
Filename: D2_1LSa.Clb
DET 102 1 Liter Sand Geometry

Energy Calibration
Created: 15-Jan-2005 03:09:29
Zero offset: 0.220 keV
Gain: 0.500 keV/channel
Quadratic: -6.435E-08 keV/channel^2

Efficiency Calibration
Created: 15-Jan-2005 06:48:10
Type: Polynomial
Uncertainty: 0.497 %
Coefficients: -0.294180 -5.980622 0.744607
-0.096737 0.005214 -0.000120

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.22keV)
Stop channel: 4000 (1999.02keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.7690E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.7690E+03) =
5.6529E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five 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	09-Sep-2006 12:40:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	102_150K_28APR05.Pbc 01-May-2005 05:27:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 10 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.7152

***** 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. pCi/gm	Nuc
75.05	127.	26.37	1.10	8.965E-03	74.81	9.600	PBC<MDA	PB212
77.22	281.	11.11	1.10	9.615E-03	77.11	17.500	1.284E+00	PB212
					77.11	10.700	2.100E+00	PB214
129.34	89.	38.78	0.82	1.716E-02				
186.20	102.	33.43	0.88	1.626E-02	185.99	3.280	PBC<MDA	RA226
209.19	92.	29.16	1.05	1.520E-02				
239.08	698.	4.48	1.22	1.379E-02	238.63	43.100	8.960E-01	PB212
242.36	95.	22.77	1.22	1.364E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	7.095E-01	PB214
270.68	92.	28.74	1.81	1.241E-02				
295.88	167.	11.60	1.26	1.144E-02	295.22	19.200	5.781E-01	PB214
300.70	59.	25.42	1.26	1.127E-02				
339.15	140.	21.03	1.32	1.004E-02	338.40	12.010	8.820E-01	AC228
352.72	307.	10.45	1.27	9.659E-03	351.99	37.100	6.519E-01	PB214
463.83	44.	30.94	1.15	7.360E-03	463.51	10.000	4.414E-01	SB125
511.93	96.	21.69	2.11	6.679E-03	510.72	22.500	4.894E-01	TL208
					513.99	0.004	2.577E+03	Kr85
					514.00	99.270	1.201E-01	Sr85
584.29	230.	8.49	1.25	5.879E-03	583.14	86.000	3.461E-01	TL208
610.45	212.	12.19	1.49	5.639E-03	609.32	46.090	6.220E-01	BI214
728.41	61.	19.26	2.21	4.794E-03	727.17	11.800	8.264E-01	BI212
796.55	36.	30.20	1.60	4.420E-03	795.76	85.400	7.306E-02	CS134
912.95	170.	12.53	1.65	3.915E-03				
970.26	103.	15.84	1.70	3.713E-03	968.90	17.460	1.212E+00	AC228
1463.51	670.	3.98	1.83	2.617E-03				

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
149.67	75.19	495.	127.	0.063	79.10	1.099	PB-214	D

Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	Suspected	
154.02	77.36	346.	281.	0.140	33.33	1.100	PB-214	D
418.00	209.19	273.	92.	0.046	87.49	1.055	AC-228	M
477.78	239.03	139.	698.	0.349	13.43	1.215	PB-212	D
484.36	242.31	185.	95.	0.047	68.31	1.217	XE-138	D
541.00	270.68	218.	92.	0.046	86.21	1.807	AC-228	sM
601.18	300.76	136.	50.	0.025	113.41	1.236	PB-212	sM
1826.05	912.95	63.	170.	0.085	30.32	1.649	AC-228	M
1940.72	970.26	47.	104.	0.052	40.68	1.695	AC-228	M
2927.92	1463.51	10.	670.	0.335	11.76	1.833	K-40	M

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

This section based on library: FSS_Rev_1.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 3 Sigma %	FWHM keV
PB-212	149.36	74.89	1062.	115.	0.058	120.08	1.500
PB-212	153.80	77.11	977.	240.	0.120	58.63	1.500D
PB-214	153.80	77.11	977.	240.	0.120	58.63	1.500D
RA-226	372.16	186.28	466.	80.	0.040	112.92	1.500
PB-212	477.79	239.08	416.	627.	0.314	18.27	1.500
PB-214	591.47	295.91	179.	177.	0.088	39.22	1.500
AC-228	677.81	339.06	164.	127.	0.064	50.32	1.500
PB-214	705.14	352.73	150.	262.	0.131	27.11	1.500
SB-125	927.74	464.00	72.	34.	0.017	112.46	1.500
TL-208	1023.27	511.74	101.	54.	0.027	88.63	1.499s
Kr-85	1023.53	511.88	99.	41.	0.020	114.10	1.500s
Sr-85	1023.52	511.87	95.	43.	0.021	106.76	1.500s
TL-208	1168.58	584.37	47.	223.	0.112	23.90	1.499
BI-214	1220.76	610.45	114.	212.	0.106	36.57	1.492
Ag-108M	1224.51	612.33	213.	-67.	-0.033	100.12	1.499s
BI-212	1456.77	728.41	34.	61.	0.031	57.78	2.210s
CS-134	1593.13	796.55	41.	36.	0.018	90.60	1.601s

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 pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		-1.2072E-02					
			477.56	-1.207E-02	%(	5.791E-01 1.67E-01	G
K-40		-4.1165E-03					
			1460.75	-4.116E-03	%(P	1.291E+00 3.69E-01	G
MN-54		-9.4840E-03					
			834.81	-9.484E-03	&(P	6.402E-02 1.83E-02	G
CO-57		-4.7079E-03					
			122.07	-4.708E-03	%(	6.463E-02 1.92E-02	G K
			136.43	-1.260E-01	%	5.396E-01 1.62E-01	G
CO-60		8.2658E-03					
			1332.51	8.266E-03	%(P	5.385E-02 1.49E-02	G K
			1173.23	2.938E-02	&	7.842E-02 2.34E-02	G K
Sr-85		5.3418E-02					
			514.00	5.342E-02	&(	5.996E-02 1.90E-02	G
Kr-85		1.0848E+03					
			513.99	1.085E+03	&(	1.311E+03 4.13E+02	G
Y-88		5.9802E-03					
			1836.01	5.980E-03	%(P	5.177E-02 1.35E-02	G K
			898.02	-2.235E-03	& P	6.502E-02 1.79E-02	G
NB-94		5.3607E-03					
			871.10	5.361E-03	%(	4.389E-02 1.22E-02	G K
			702.50	0.000E+00	%	7.077E-02 2.02E-02	G K
Ag-108M		1.4324E-02					
			722.95	1.432E-02	&(	6.750E-02 1.97E-02	G K
			614.37	-1.004E-01	+ P	1.065E-01 3.34E-02	G
			433.93	1.764E-02	%	4.890E-02 1.46E-02	G
CD-109		1.4176E+00					
			88.04	1.418E+00	%(P	2.405E+00 7.32E-01	G
SN-113		-1.2423E-02					
			391.71	-1.242E-02	%(	8.150E-02 2.39E-02	G K
			255.04	-5.682E-01	%	2.121E+00 6.33E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	1.3402E-01						
		427.95	6.026E-02	%(P	1.206E-01	3.66E-02	G K
		600.77	-3.972E-02	& P	2.965E-01	8.56E-02	G
		636.15	-5.079E-02	& P	4.921E-01	1.41E-01	G
		463.51	3.524E-01	(P	4.395E-01	1.38E-01	G
		176.29	-5.357E-02	% P	7.833E-01	2.32E-01	G
I-131	1.6093E-02						
		364.48	1.609E-02	%(	1.050E-01	3.09E-02	G K
		636.97	-1.141E-01	&	1.009E+00	2.84E-01	G
		284.29	1.499E-01	%	1.230E+00	3.62E-01	G
CS-134	3.7146E-02						
		604.66	5.719E-03	%(	5.497E-02	1.58E-02	G K
		795.76	7.306E-02	(	6.610E-02	2.21E-02	G
		569.29	0.000E+00	%	4.420E-01	1.27E-01	G
		801.84	-1.042E-01	% P	7.686E-01	2.21E-01	G
CS-137	1.1388E-02						
		661.62	1.139E-02	&(	6.579E-02	1.91E-02	G
CE-139	-4.8663E-03						
		165.85	-4.866E-03	%(P	6.683E-02	1.99E-02	G
EU-152	-2.1395E-02						
		121.78	-2.139E-02	%(P	1.751E-01	5.21E-02	G K
		344.30	-3.665E-02	%	1.953E-01	5.78E-02	G
		1408.08	-7.398E-02	%	3.673E-01	1.05E-01	G
		964.00	-6.691E-03	& P	5.212E-01	1.46E-01	G
		1112.07	7.048E-03	%	6.421E-01	1.81E-01	G
		778.90	-9.858E-04	% P	5.070E-01	1.43E-01	G
EU-154	-3.0735E-02						
		123.10	-3.073E-02	&(P	1.146E-01	3.44E-02	G K
		1274.80	4.642E-02	%	2.334E-01	6.74E-02	G
		723.30	7.072E-03	& P	4.836E-01	1.40E-01	G
		1004.80	-4.284E-02	%	4.225E-01	1.20E-01	G
EU-155	1.7479E-02						
		86.45	1.748E-02	%(P	3.099E-01	9.25E-02	G K
		105.31	4.419E-02	%	2.772E-01	8.29E-02	G
HG-203	3.3040E-02						
		279.17	3.304E-02	&(P	5.807E-02	1.77E-02	G K
		72.87	-5.571E-01	%	2.689E+00	8.08E-01	G
		70.83	-1.161E+00	%	4.809E+00	1.45E+00	G
		82.50	-6.821E-02	&	4.716E+00	1.40E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	3.3643E-01						
		583.14	3.364E-01	(P	5.234E-02	2.68E-02	G
		510.72	2.744E-01	-	2.509E-01	8.11E-02	G
PB-212	8.0545E-01						
		238.63	8.054E-01	(	1.256E-01	4.91E-02	G K
							Energy duplication
		77.11	1.096E+00	+	6.788E-01	2.14E-01	G
		74.81	1.035E+00	& P	1.390E+00	4.25E-01	G
PB-214	5.7653E-01						
		351.99	5.571E-01	(P	1.272E-01	5.04E-02	G K
		295.22	6.141E-01	(	2.259E-01	8.03E-02	G
							Energy duplication
		77.11	1.793E+00	+	1.110E+00	3.50E-01	G
		241.92	4.772E-01	%	7.870E-01	2.40E-01	G
BI-212	8.2643E-01						
		727.17	8.264E-01	(	4.024E-01	1.59E-01	G K
		1620.56	-4.435E-01	& P	2.007E+00	5.50E-01	G
		785.42	-2.001E-01	% P	2.930E+00	8.29E-01	G
BI-214	6.2198E-01						
		609.32	6.220E-01	(	1.539E-01	7.60E-02	G K
		1764.51	-1.869E-03	% P	3.616E-01	9.16E-02	G
		1120.28	1.331E-01	&	6.477E-01	1.89E-01	G
RA-224	8.0064E-01						
		241.00	8.006E-01	&(P	1.450E+00	4.41E-01	G
RA-226	1.1430E+00						
		185.99	1.143E+00	(P	1.479E+00	4.54E-01	G
AC-228	2.3325E-01						
		911.07	-2.828E-03	%(P	2.309E-01	6.45E-02	G K
		968.90	-1.011E-02	% P	4.586E-01	1.30E-01	G
		338.40	8.033E-01	(	3.939E-01	1.35E-01	G
TH-227	-3.5046E-01						
		236.00	-3.505E-01	%(P	5.797E-01	1.77E-01	G K
		256.25	1.195E-01	%	6.118E-01	1.81E-01	G
PA-234	-2.9959E-02						
		98.44	-2.996E-02	%(	2.645E-01	7.89E-02	G K
		946.00	1.233E-01	%	3.388E-01	1.01E-01	G
		131.28	-5.657E-02	&	2.703E-01	8.10E-02	G
		94.67	-8.663E-02	&	5.238E-01	1.57E-01	G
		883.24	-2.271E-02	&	5.566E-01	1.57E-01	G
		926.70	7.483E-03	%	4.961E-01	1.36E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 0.000E+00 %   6.516E-01 1.88E-01 G

TH-234       8.6978E-01
                           63.29 8.698E-01 %(P 5.499E+00 1.65E+00 G K
                           92.80 1.382E+00 &   2.808E+00 8.52E-01 G
                           92.38 1.598E-01 & P 2.852E+00 8.49E-01 G

AM-241       1.6548E-01
                           59.54 1.655E-01 &(  7.639E-01 2.29E-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

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

***** 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 pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	-1.1040E-02	-1.2072E-02	5.0048E-01	5.0048E-01	5.296E-01
K-40	#A	-4.1165E-03	-4.1165E-03	3.3453E-01	3.3453E-01	1.291E+00
MN-54	#A	-9.3402E-03	-9.4840E-03	5.9752E-02	5.9754E-02	6.305E-02
CO-57	#B	-4.6255E-03	-4.7079E-03	5.7709E-02	5.7710E-02	6.350E-02
CO-60	#B	8.2454E-03	8.2658E-03	4.4614E-02	4.4617E-02	5.372E-02

Sr-85	#A	4.9630E-02	5.3418E-02	5.7029E-02	5.7107E-02	5.570E-02
Kr-85	#A	1.0848E+03	1.0848E+03	1.2378E+03	1.2393E+03	1.311E+03
Y-88	#B	5.7186E-03	5.9802E-03	4.0460E-02	4.0461E-02	4.950E-02
NB-94	#B	5.3607E-03	5.3607E-03	3.6597E-02	3.6598E-02	4.389E-02
Ag-108M	#B	1.4322E-02	1.4324E-02	5.9073E-02	5.9079E-02	6.749E-02
CD-109	#A	1.4028E+00	1.4176E+00	2.1965E+00	2.1979E+00	2.380E+00
SN-113	#B	-1.1918E-02	-1.2423E-02	7.1806E-02	7.1809E-02	7.820E-02
SB-125	#F	1.3339E-01	1.3402E-01	1.4524E-01	1.4543E-01	1.201E-01
I-131	#B	8.8929E-03	1.6093E-02	9.2577E-02	9.2582E-02	5.804E-02
CS-134	#B	3.6911E-02	3.7146E-02	3.3653E-02	3.3718E-02	5.463E-02
CS-137	#A	1.1383E-02	1.1388E-02	5.7205E-02	5.7209E-02	6.576E-02
CE-139	#A	-4.7004E-03	-4.8663E-03	6.6155E-02	6.6155E-02	6.455E-02
EU-152	#B	-2.1373E-02	-2.1395E-02	1.7765E-01	1.7765E-01	1.749E-01
EU-154	#B	-3.0687E-02	-3.0735E-02	1.0461E-01	1.0462E-01	1.144E-01
EU-155	#B	1.7433E-02	1.7479E-02	2.7761E-01	2.7761E-01	3.090E-01
HG-203	#B	2.9826E-02	3.3040E-02	5.3204E-02	5.3236E-02	5.242E-02
TL-208	#	3.3643E-01	3.3643E-01	8.0549E-02	8.2731E-02	5.234E-02
PB-212	#	8.0545E-01	8.0545E-01	1.4717E-01	1.5396E-01	1.256E-01
PB-214	#	5.7653E-01	5.7653E-01	1.3751E-01	1.4127E-01	1.272E-01
BI-212		8.2643E-01	8.2643E-01	4.7752E-01	4.7977E-01	
BI-214		6.2198E-01	6.2198E-01	2.2748E-01	2.3015E-01	
RA-224	#A	8.0064E-01	8.0064E-01	1.3235E+00	1.3242E+00	1.450E+00
RA-226	#A	1.1430E+00	1.1430E+00	1.3628E+00	1.3643E+00	1.479E+00
AC-228	F	2.3325E-01	2.3325E-01	1.1737E-01	1.1809E-01	2.309E-01
TH-227	#B	-3.5046E-01	-3.5046E-01	5.3454E-01	5.3490E-01	5.797E-01
PA-234	#B	-2.9959E-02	-2.9959E-02	2.3678E-01	2.3678E-01	2.645E-01
TH-234	#B	8.6978E-01	8.6978E-01	4.9386E+00	4.9388E+00	5.499E+00
AM-241	#A	1.6548E-01	1.6548E-01	6.8712E-01	6.8718E-01	7.639E-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 (270.7 to 1999.0 keV) 1.6816635E+00 pCi/gm
Total Decayed Activity (270.7 to 1999.0 keV) 1.6816635E+00 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JJM

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 103F_15SEPT2006_0838.An1

Sample description
FSS-SSS-01-01-009-F

Spectrum Filename: C:\GammaVision\Spectra\103F_15SEPT2006_0838.An1

Acquisition information
Start time: 15-Sep-2006 08:38:08
Live time: 2000
Real time: 2002
Dead time: 0.12 %
Detector ID: 4

Detector system
Det 103 - DSPE-471

Calibration
Filename: D3_1LSa.Clb
Detector_103 1.0 Liter Sand Geometry

Energy Calibration
Created: 08-Aug-2005 11:09:41
Zero offset: 0.409 keV
Gain: 0.500 keV/channel
Quadratic: 1.092E-08 keV/channel^2

Efficiency Calibration
Created: 08-Aug-2005 11:11:25
Type: Polynomial
Uncertainty: 0.993 %
Coefficients: -0.264059 -5.138468 0.638383
-0.089199 0.005011 -0.000129

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.41keV)
Stop channel: 4000 (2000.67keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.9040E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.9040E+03) =
5.2521E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five 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	10-Sep-2006 10:09:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	103_150K_05AUG05.Pbc 08-Aug-2005 12:54:15
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 17 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1809

***** 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. pCi/gm	Nuc
46.64	144.	31.81	0.96	0.000E+00				
74.89	148.	20.68	0.99	9.052E-03	74.81	9.600	1.208E+00	PB212
77.19	210.	11.80	0.99	1.011E-02	77.11	10.700	1.442E+00	PB214
					77.11	17.500	8.817E-01	PB212
93.15	114.	36.21	1.50	1.631E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
93.17	117.	35.12	1.50	1.645E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
128.81	111.	40.89	0.89	2.434E-02				
186.47	128.	29.04	1.20	2.565E-02	185.99	3.280	PBC<MDA	RA226
209.69	154.	22.39	0.98	2.469E-02				
238.81	1178.	3.39	1.09	2.319E-02	238.63	43.100	8.280E-01	PB212
241.51	170.	20.11	1.09	2.305E-02	241.00	3.900	1.340E+00	RA224
					241.92	7.470	7.013E-01	PB214
270.23	130.	22.95	1.43	2.151E-02				
295.37	340.	8.54	1.07	2.024E-02	295.22	19.200	6.137E-01	PB214
300.46	86.	29.90	1.13	2.000E-02				
327.80	90.	30.82	1.83	1.875E-02				
338.52	286.	10.37	1.18	1.830E-02	338.40	12.010	9.206E-01	AC228
352.00	621.	5.91	1.10	1.775E-02	351.99	37.100	6.629E-01	PB214
409.74	61.	36.09	0.88	1.574E-02				
462.72	76.	27.01	1.23	1.427E-02				
462.72	76.	27.01	1.23	1.427E-02	463.51	10.000	3.755E-01	SB125
510.74	178.	16.27	1.29	1.317E-02	510.72	22.500	3.621E-01	TL208
583.42	406.	6.88	1.43	1.184E-02	583.14	86.000	2.797E-01	TL208
609.44	456.	6.92	1.49	1.144E-02	609.32	46.090	6.047E-01	BI214
727.13	131.	17.52	1.03	9.965E-03	727.17	11.800	7.865E-01	BI212

768.55	65.	38.02	1.19	9.551E-03				
786.96	88.	24.61	1.22	9.380E-03	785.42	2.000	3.305E+00	BI212
795.10	37.	35.69	1.50	9.301E-03	795.76	85.400	PBC<MDA	CS134
795.98	61.	28.17	0.88	9.299E-03				
860.98	48.	36.71	1.59	8.764E-03				
911.60	276.	7.49	1.66	8.398E-03	911.07	29.000	7.939E-01	AC228
965.15	56.	22.43	1.54	8.048E-03	964.00	14.580	3.356E-01	EU152
969.33	163.	9.85	1.54	8.022E-03	968.90	17.460	8.238E-01	AC228
1120.46	109.	16.91	1.57	7.211E-03	1120.28	15.040	7.022E-01	BI214
1461.32	1574.	2.60	2.01	5.930E-03	1460.75	10.700	1.739E+01	K40

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1622.18	24.	27.74	0.59	5.488E-03	1620.56	2.750	1.113E+00	BI212
1765.35	92.	11.53	1.65	5.140E-03	1764.51	15.920	7.728E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide
92.47	46.64	788.	144.	0.072	95.44	0.956	EU-152
256.79	128.81	779.	144.	0.072	86.23	0.889	AC-228 s
418.54	209.69	469.	154.	0.077	67.18	0.982	NP-239 s
539.62	270.23	318.	130.	0.065	68.85	1.425	AC-228 s
600.06	300.46	248.	86.	0.043	89.71	1.132	PB-212
654.75	327.80	268.	90.	0.045	92.45	1.832	AC-228 s
818.61	409.74	178.	61.	0.031	108.28	0.884	AC-228 s
1536.15	768.55	158.	65.	0.032	114.05	1.187	BI-214 M
1572.98	786.96	146.	49.	0.025	112.55	1.215	PA-234 sM
1591.02	795.98	82.	61.	0.031	84.52	0.877	PA-234 l
1721.00	860.98	89.	48.	0.024	94.61	1.594	TL-208
1930.39	965.31	60.	47.	0.023	83.37	1.539	AC-228 D

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: FSS_Rev_1.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 3 Sigma %	FWHM keV
PB-212	148.79	74.81	415.	148.	0.074	62.05	0.993D
PB-212	153.39	77.11	421.	210.	0.105	35.41	0.995A
TH-234	185.50	93.17	1066.	117.	0.058	105.37	1.500
RA-226	371.80	186.32	862.	124.	0.062	93.94	1.500s
PB-212	476.78	238.81	767.	1163.	0.582	14.47	1.022
RA-224	482.72	241.78	908.	130.	0.065	102.00	1.500
PB-214	589.88	295.37	244.	336.	0.168	25.62	1.067
AC-228	676.19	338.52	230.	285.	0.143	31.11	1.182
PB-214	703.13	352.00	265.	615.	0.308	17.73	1.097
SB-125	925.39	463.13	143.	68.	0.034	81.05	1.500
TL-208	1020.58	510.74	227.	151.	0.076	48.82	1.290s
TL-208	1165.93	583.42	134.	401.	0.201	20.65	1.430s
BI-214	1217.97	609.44	170.	449.	0.225	20.76	1.490
Ag-108M	1222.90	611.90	220.	-64.	-0.032	104.86	1.500s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-212	1453.34	727.13	124.	130.	0.065	52.55	1.035s
CS-134	1589.26	795.10	70.	37.	0.019	107.06	1.500s
AC-228	1822.23	911.60	59.	273.	0.136	22.48	1.664
AC-228	1936.81	968.90	49.	162.	0.081	29.75	1.541D
BI-214	2239.89	1120.46	85.	107.	0.054	50.73	1.572s
K-40	2921.51	1461.32	44.	1555.	0.778	7.80	2.009
BI-212	3243.17	1622.18	6.	24.	0.012	83.23	0.593s
BI-214	3529.45	1765.35	10.	89.	0.045	34.59	1.651

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 pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Code	MDA Value pCi/gm	COMMENTS
BE-7		-6.9431E-02					
			477.56	-6.943E-02	%(	3.452E-01 1.02E-01	G
K-40		1.7393E+01					
			1460.75	1.739E+01	(P	3.741E-01 4.58E-01	G
MN-54		4.6885E-03					
			834.81	4.689E-03	%(P	3.594E-02 1.04E-02	G
CO-57		2.9804E-04					
			122.07	2.980E-04	&(P	5.183E-02 1.54E-02	G K
			136.43	-7.255E-02	%	4.255E-01 1.28E-01	G
CO-60		-4.3860E-03					
			1332.51	-4.386E-03	&(P	3.989E-02 1.10E-02	G K
			1173.23	1.377E-03	% P	5.733E-02 1.65E-02	G K
Sr-85		-1.2976E-02					
			514.00	-1.298E-02	&(	4.357E-02 1.30E-02	G
Kr-85		-2.8460E+02					
			513.99	-2.846E+02	&(	9.542E+02 2.86E+02	G
Y-88		-3.8850E-03					
			1836.01	-3.885E-03	%(P	2.894E-02 7.91E-03	G K
			898.02	3.974E-04	& P	4.956E-02 1.43E-02	G
NB-94		-4.7971E-03					
			871.10	-4.797E-03	%(	3.411E-02 9.88E-03	G K
			702.50	1.847E-02	&	2.504E-02 7.89E-03	G K

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Ag-108M	-8.7287E-03						
		722.95	-8.729E-03	&(	5.049E-02	1.49E-02	G K
		614.37	-4.444E-02	& P	4.961E-02	1.55E-02	G
		433.93	6.345E-03	%	3.404E-02	1.01E-02	G
CD-109	6.7447E-01						
		88.04	6.745E-01	%(	1.622E+00	4.91E-01	G
SN-113	5.0679E-03						
		391.71	5.068E-03	%(	5.315E-02	1.57E-02	G K
		255.04	6.443E-02	&	1.569E+00	4.64E-01	G
SB-125	8.3992E-02						
		427.95	-2.750E-03	%(P	1.003E-01	2.92E-02	G K
		600.77	-5.181E-02	% P	1.724E-01	5.13E-02	G
		636.15	1.017E-02	& P	2.837E-01	8.16E-02	G
		463.51	3.407E-01	(P	2.917E-01	9.38E-02	G
		176.29	9.284E-03	&	5.767E-01	1.72E-01	G
I-131	-6.9624E-03						
		364.48	-6.962E-03	&(P	5.456E-02	1.61E-02	G K
		636.97	-1.440E-02	%	7.943E-01	2.30E-01	G
		284.29	-1.392E-01	% P	8.550E-01	2.55E-01	G
CS-134	1.4838E-02						
		604.66	-1.351E-03	%(	7.176E-02	2.13E-02	G K
		795.76	3.334E-02	@(P	3.736E-02	1.19E-02	G
		569.29	-2.376E-02	% P	2.136E-01	6.18E-02	G
		801.84	-1.602E-01	% P	4.804E-01	1.42E-01	G
CS-137	9.5102E-03						
		661.62	9.510E-03	%(P	4.083E-02	1.20E-02	G
CE-139	-1.1422E-02						
		165.85	-1.142E-02	%(	4.709E-02	1.41E-02	G
EU-152	-2.6140E-03						
		121.78	-2.614E-03	&(P	1.501E-01	4.47E-02	G K
		344.30	-1.898E-02	% P	1.186E-01	3.52E-02	G
		1408.08	1.015E-01	%	1.533E-01	4.82E-02	G
		964.00	2.271E-01	% P	3.268E-01	1.01E-01	G
		1112.07	5.837E-02	%	3.052E-01	8.91E-02	G
		778.90	-7.714E-03	%	2.653E-01	7.60E-02	G
EU-154	2.9211E-04						
		123.10	2.921E-04	&(	1.058E-01	3.15E-02	G K
		1274.80	2.579E-02	%	9.612E-02	2.81E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		723.30	3.837E-03	&	3.300E-01	9.73E-02	G
		1004.80	6.157E-02	%	1.863E-01	5.52E-02	G
EU-155	1.3976E-01						
		86.45	1.398E-01	%(	2.483E-01	7.55E-02	G K
		105.31	-3.338E-02	&	2.491E-01	7.46E-02	G
HG-203	2.2420E-02						
		279.17	2.242E-02	&(P	4.131E-02	1.26E-02	G K
		72.87	-3.282E-01	% P	2.516E+00	7.54E-01	G
		70.83	-4.447E-01	&	4.797E+00	1.44E+00	G
		82.50	-3.005E-01	&	4.245E+00	1.27E+00	G
TL-208	2.7974E-01						
		583.14	2.797E-01	@(P	3.940E-02	1.95E-02	G
		510.72	3.621E-01	+ P	1.745E-01	6.93E-02	G
PB-212	8.4189E-01						
		238.63	8.257E-01	(P	9.352E-02	4.02E-02	G K
							Energy duplication
		77.11	8.419E-01	} P	3.943E-01	9.94E-02	G
		74.81	1.208E+00	+ P	7.976E-01	2.55E-01	G
PB-214	6.4611E-01						
		351.99	6.629E-01	(P	8.464E-02	3.95E-02	G K
		295.22	6.137E-01	(P	1.378E-01	5.30E-02	G
							Energy duplication
		77.11	0.000E+00	} P	9.575E-01	0.00E+00	G
		241.92	2.599E-01	%	6.103E-01	1.85E-01	G
BI-212	8.4815E-01						
		727.17	7.865E-01	*(P	3.292E-01	1.38E-01	G K
		1620.56	1.113E+00	*(P	6.795E-01	3.09E-01	G
		785.42	1.446E+00	%	1.946E+00	6.06E-01	G
BI-214	6.2870E-01						
		609.32	6.047E-01	(P	8.538E-02	4.25E-02	G K
		1764.51	7.728E-01	+ P	1.504E-01	9.24E-02	G
		1120.28	7.022E-01	@(P	2.984E-01	1.21E-01	G
RA-224	1.0234E+00						
		241.00	1.023E+00	(	1.129E+00	3.48E-01	G
RA-226	1.0442E+00						
		185.99	1.044E+00	(P	1.177E+00	3.61E-01	G
AC-228	8.2838E-01						
		911.07	7.939E-01	(P	1.126E-01	6.02E-02	G K
		968.90	8.222E-01	(P	1.784E-01	8.16E-02	G
		338.40	9.206E-01	(P	2.369E-01	9.59E-02	G

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

TH-227       0.0000E+00
                          236.00 0.000E+00 %(  4.710E-01 1.41E-01 G K
                          256.25 3.502E-02 % P 4.772E-01 1.42E-01 G

PA-234       3.4610E-02
                           98.44 3.461E-02 %(P 2.434E-01 7.29E-02 G K
                          946.00-2.195E-02 % P 2.253E-01 6.55E-02 G
                          131.28-5.147E-02 & P 2.275E-01 6.84E-02 G
                           94.67-1.526E-01 % P 4.296E-01 1.30E-01 G
                          883.24-6.220E-02 &   3.088E-01 9.04E-02 G
                          926.70-2.457E-02 &   3.419E-01 9.84E-02 G
                          569.26-4.069E-02 % P 3.066E-01 8.88E-02 G

TH-234       1.7849E+00
                           63.29 1.866E+00 %(P 6.845E+00 2.06E+00 G K
                           92.80 1.680E+00  (P 2.227E+00 6.79E-01 G
                           92.38 1.934E+00 & P 2.652E+00 8.08E-01 G

AM-241       5.3793E-02
                           59.54 5.379E-02 &(P 1.259E+00 3.76E-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

- -

***** 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 pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	-6.5121E-02	-6.9431E-02	3.0666E-01	3.0669E-01	3.238E-01
K-40		1.7393E+01	1.7393E+01	1.3733E+00	1.7046E+00	
MN-54	#A	4.6374E-03	4.6885E-03	3.1255E-02	3.1256E-02	3.554E-02
CO-57	#B	2.9429E-04	2.9804E-04	4.6312E-02	4.6312E-02	5.118E-02
CO-60	#B	-4.3782E-03	-4.3860E-03	1.6995E-01	1.6995E-01	3.982E-02
Sr-85	#A	-1.2309E-02	-1.2976E-02	3.9117E-02	3.9125E-02	4.133E-02
Kr-85	#A	-2.8459E+02	-2.8460E+02	8.5673E+02	8.5689E+02	9.542E+02
Y-88	#B	-3.7623E-03	-3.8850E-03	2.4896E-02	2.4897E-02	2.802E-02
NB-94	#B	-4.7971E-03	-4.7971E-03	2.9638E-02	2.9639E-02	3.411E-02
Ag-108M	#B	-8.7280E-03	-8.7287E-03	4.4730E-02	4.4733E-02	5.049E-02
CD-109	#A	6.6940E-01	6.7447E-01	1.4718E+00	1.4723E+00	1.610E+00
SN-113	#B	4.9194E-03	5.0679E-03	4.7005E-02	4.7006E-02	5.159E-02
SB-125	#B	8.3708E-02	8.3992E-02	6.9352E-02	6.9523E-02	9.998E-02
I-131	#B	-4.5490E-03	-6.9624E-03	5.6082E-02	5.6084E-02	3.565E-02
CS-134	#B	1.4771E-02	1.4838E-02	1.5923E-02	1.5946E-02	7.144E-02
CS-137	#A	9.5073E-03	9.5102E-03	3.6072E-02	3.6076E-02	4.081E-02
CE-139	#A	-1.1141E-02	-1.1422E-02	4.2438E-02	4.2443E-02	4.593E-02
EU-152	#B	-2.6121E-03	-2.6140E-03	2.9776E-01	2.9776E-01	1.500E-01
EU-154	#B	2.9179E-04	2.9211E-04	9.4467E-02	9.4467E-02	1.056E-01
EU-155	#B	1.3949E-01	1.3976E-01	2.2661E-01	2.2675E-01	2.479E-01
HG-203	#B	2.0833E-02	2.2420E-02	3.7719E-02	3.7742E-02	3.838E-02
TL-208	#	2.7974E-01	2.7974E-01	5.8396E-02	6.0612E-02	
PB-212		8.4189E-01	8.4189E-01	1.2308E-01	1.3243E-01	
PB-214		6.4611E-01	6.4611E-01	1.0177E-01	1.0846E-01	
BI-212	#	8.4815E-01	8.4815E-01	4.1844E-01	4.2133E-01	
BI-214		6.2870E-01	6.2870E-01	1.3241E-01	1.3735E-01	
RA-224	#A	1.0234E+00	1.0234E+00	1.0439E+00	1.0455E+00	1.129E+00
RA-226	#A	1.0442E+00	1.0442E+00	1.0836E+00	1.0853E+00	1.177E+00
AC-228		8.2838E-01	8.2838E-01	1.3471E-01	1.4303E-01	
TH-227	#B	0.0000E+00	0.0000E+00	4.2216E-01	4.2216E-01	4.710E-01
PA-234	#B	3.4610E-02	3.4610E-02	2.1883E-01	2.1884E-01	2.434E-01
TH-234	#B	1.7849E+00	1.7849E+00	2.1650E+00	2.1673E+00	6.845E+00
AM-241	#A	5.3792E-02	5.3793E-02	1.1269E+00	1.1269E+00	1.259E+00

- 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

YAEC Chemistry Lab Spectrum name: 103F_15SEPT2006_0838.An1

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

Total Activity (1120.0 to 2000.7 keV) 2.1466202E+01 pCi/gm
Total Decayed Activity (1120.0 to 2000.7 keV) 2.1466202E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 103F_15SEPT2006_0959.An1

Sample description
FSS-SSS-01-01-008-F

Spectrum Filename: C:\GammaVision\Spectra\103F_15SEPT2006_0959.An1

Acquisition information
Start time: 15-Sep-2006 09:59:10
Live time: 2000
Real time: 2002
Dead time: 0.12 %
Detector ID: 4

Detector system
Det 103 - DSPE-471

Calibration
Filename: D3_1LSa.Clb
Detector_103 1.0 Liter Sand Geometry

Energy Calibration
Created: 08-Aug-2005 11:09:41
Zero offset: 0.409 keV
Gain: 0.500 keV/channel
Quadratic: 1.092E-08 keV/channel^2

Efficiency Calibration
Created: 08-Aug-2005 11:11:25
Type: Polynomial
Uncertainty: 0.993 %
Coefficients: -0.264059 -5.138468 0.638383
-0.089199 0.005011 -0.000129

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.41keV)
Stop channel: 4000 (2000.67keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.8860E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.8860E+03) =
5.3022E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five 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	10-Sep-2006 08:20:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	103_150K_05AUG05.Pbc 08-Aug-2005 12:54:15
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 16 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.2351

***** 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. pCi/gm	Nuc
74.47	80.	39.33	0.99	9.023E-03	74.81	9.600	PBC<MDA	PB212
77.28	263.	12.29	0.99	1.032E-02	77.11	17.500	1.054E+00	PB212
					77.11	10.700	1.724E+00	PB214
87.40	104.	28.37	1.00	1.459E-02	86.45	32.740	1.620E-01	EU155
					88.04	3.790	1.349E+00	CD109
93.45	119.	26.33	1.00	1.678E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
129.04	104.	36.86	0.86	2.437E-02				
186.38	156.	20.45	1.05	2.565E-02	185.99	3.280	1.217E+00	RA226
209.25	151.	26.42	1.02	2.472E-02				
238.78	1172.	3.45	1.09	2.320E-02	238.63	43.100	8.315E-01	PB212
241.28	174.	18.89	1.09	2.306E-02	241.00	3.900	1.388E+00	RA224
					241.92	7.470	7.261E-01	PB214
270.08	123.	28.98	1.14	2.152E-02				
295.31	258.	12.14	0.97	2.024E-02	295.22	19.200	4.680E-01	PB214
300.21	111.	22.38	1.26	2.001E-02				
327.97	88.	30.84	1.64	1.874E-02				
338.56	248.	12.60	1.02	1.829E-02	338.40	12.010	8.049E-01	AC228
352.05	474.	8.14	1.30	1.775E-02	351.99	37.100	5.095E-01	PB214
409.88	51.	34.47	1.27	1.573E-02				
462.62	52.	39.49	1.06	1.427E-02				
462.62	52.	39.49	1.06	1.427E-02	463.51	10.000	PBC<MDA	SB125
510.57	170.	17.13	1.76	1.318E-02	510.72	22.500	3.460E-01	TL208
583.36	412.	6.53	1.23	1.184E-02	583.14	86.000	2.871E-01	TL208
609.45	427.	6.64	1.51	1.144E-02	609.32	46.090	5.715E-01	BI214
727.52	98.	15.05	1.39	9.959E-03	727.17	11.800	5.947E-01	BI212
768.91	82.	25.81	1.01	9.547E-03				

794.98	67.	21.77	1.98	9.308E-03				
794.98	67.	21.77	1.98	9.308E-03	795.76	85.400	6.100E-02	CS134
860.89	65.	25.12	1.68	8.765E-03				
911.60	269.	8.18	1.91	8.398E-03	911.07	29.000	7.809E-01	AC228
964.69	42.	29.07	1.54	8.052E-03	964.00	14.580	PBC<MDA	EU152
969.55	157.	9.97	1.54	8.022E-03	968.90	17.460	7.998E-01	AC228
1120.85	80.	22.90	1.60	7.209E-03	1120.28	15.040	5.173E-01	BI214
1239.38	78.	33.24	1.38	6.697E-03				
1461.37	1932.	2.37	1.78	5.930E-03	1460.75	10.700	2.159E+01	K40
1621.71	24.	24.07	0.79	5.488E-03	1620.56	2.750	1.156E+00	BI212

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1765.03	60.	13.94	0.75	5.142E-03	1764.51	15.920	5.281E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
173.98	87.71	385.	104.	0.052	85.12	1.001	PB-214	lD
417.67	209.25	576.	151.	0.075	79.25	1.022	AC-228	s
539.31	270.08	425.	123.	0.062	86.94	1.144	AC-228	
599.57	300.21	229.	111.	0.055	67.15	1.260	PB-212	
655.08	327.97	262.	88.	0.044	92.51	1.640	AC-228	s
818.90	409.88	129.	51.	0.025	103.40	1.269	AC-228	
1536.89	768.91	122.	82.	0.041	66.06	1.013	BI-214	M
1720.83	860.89	72.	65.	0.032	75.36	1.675	TL-208	s
1929.50	964.64	50.	45.	0.023	79.71	1.538	AC-228	D
2477.71	1239.38	168.	78.	0.039	99.73	1.375	CO-56	

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: FSS_Rev_1.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 3 Sigma %	FWHM keV
PB-212	148.79	74.81	426.	112.	0.056	80.57	0.993D
PB-212	153.39	77.11	398.	191.	0.096	41.13	0.995A
TH-234	185.69	93.26	1054.	132.	0.066	94.70	1.500s
TH-234	185.67	93.25	1043.	131.	0.066	94.46	1.500s
RA-226	371.39	186.12	779.	144.	0.072	78.49	1.500s
PB-212	476.69	238.77	894.	1080.	0.540	16.20	1.025
RA-224	482.59	241.72	870.	166.	0.083	78.95	1.500
PB-214	482.12	241.48	907.	115.	0.057	114.93	1.500s
PB-214	589.76	295.31	305.	254.	0.127	36.41	0.971
AC-228	676.27	338.56	281.	247.	0.123	37.79	1.016
PB-214	703.24	352.05	344.	468.	0.234	24.41	1.297
SB-125	925.29	463.08	169.	59.	0.030	98.36	1.500
TL-208	1020.26	510.57	238.	143.	0.072	51.38	1.760s
TL-208	1165.82	583.36	116.	408.	0.204	19.59	1.227
BI-214	1217.99	609.45	132.	421.	0.210	19.93	1.515
BI-212	1453.41	727.17	53.	98.	0.049	43.66	1.392D
CS-134	1589.89	795.41	80.	55.	0.028	79.53	1.500s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
AC-228	1822.23	911.60	77.	266.	0.133	24.54	1.908s
AC-228	1936.81	968.90	48.	156.	0.078	30.37	1.541D
BI-214	2240.68	1120.85	94.	78.	0.039	68.69	1.595
K-40	2921.60	1461.37	52.	1913.	0.956	7.10	1.785
BI-212	3242.23	1621.71	4.	24.	0.012	72.20	0.792s
BI-214	3528.81	1765.03	7.	60.	0.030	41.81	0.751s

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 pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		6.6591E-02					
			477.56	6.659E-02	%(	3.314E-01 9.80E-02	G
K-40		2.1595E+01					
			1460.75	2.159E+01	(P	4.100E-01 5.16E-01	G
MN-54		1.6779E-02					
			834.81	1.678E-02	%(P	3.318E-02 1.01E-02	G
CO-57		3.0390E-03					
			122.07	3.039E-03	&(P	5.402E-02 1.61E-02	G K
			136.43	-2.707E-02	&	4.059E-01 1.21E-01	G
CO-60		4.4196E-03					
			1332.51	4.420E-03	%(P	3.847E-02 1.08E-02	G K
			1173.23	-1.026E-02	% P	5.774E-02 1.68E-02	G K
Sr-85		-1.8568E-02					
			514.00	-1.857E-02	%(	4.648E-02 1.40E-02	G
Kr-85		-4.0578E+02					
			513.99	-4.058E+02	%(	1.016E+03 3.07E+02	G
Y-88		-9.4142E-05					
			1836.01	-9.414E-05	%(P	4.478E-02 1.23E-02	G K
			898.02	-8.547E-03	& P	4.610E-02 1.35E-02	G
NB-94		0.0000E+00					
			871.10	0.000E+00	&(	4.463E-02 1.29E-02	G K
			702.50	5.733E-04	&	3.286E-02 9.42E-03	G K

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Ag-108M	-1.1569E-02						
		722.95	-1.157E-02	%(	4.562E-02	1.35E-02	G K
		614.37	-2.406E-02	& P	4.228E-02	1.29E-02	G
		433.93	5.479E-03	%	3.241E-02	9.55E-03	G
CD-109	-6.8880E-02						
		88.04	-6.888E-02	%(	2.148E+00	6.42E-01	G
SN-113	-2.0298E-03						
		391.71	-2.030E-03	%(	5.094E-02	1.49E-02	G K
		255.04	-1.702E-02	%	1.797E+00	5.33E-01	G
SB-125	7.6954E-02						
		427.95	1.642E-03	%(P	1.178E-01	3.45E-02	G K
		600.77	7.280E-02	& P	1.649E-01	4.98E-02	G
		636.15	1.284E-01	& P	2.304E-01	7.05E-02	G
		463.51	2.999E-01	(P	3.193E-01	1.00E-01	G
		176.29	1.144E-01	&	5.883E-01	1.76E-01	G
I-131	-1.0379E-02						
		364.48	-1.038E-02	%(P	6.308E-02	1.87E-02	G K
		636.97	-5.171E-02	&	7.256E-01	2.11E-01	G
		284.29	4.770E-01	& P	7.338E-01	2.25E-01	G
CS-134	2.2980E-02						
		604.66	-6.822E-04	%(	7.466E-02	2.21E-02	G K
		795.76	5.002E-02	@(P	4.019E-02	1.33E-02	G
		569.29	5.584E-03	% P	2.212E-01	6.39E-02	G
		801.84	3.144E-02	% P	3.803E-01	1.09E-01	G
CS-137	9.8104E-03						
		661.62	9.810E-03	%(P	4.211E-02	1.24E-02	G
CE-139	3.5308E-03						
		165.85	3.531E-03	%(	4.705E-02	1.40E-02	G
EU-152	8.2902E-03						
		121.78	8.290E-03	&(P	1.521E-01	4.54E-02	G K
		344.30	-4.623E-03	& P	1.130E-01	3.32E-02	G
		1408.08	7.359E-02	%	1.385E-01	4.26E-02	G
		964.00	-1.665E-02	% P	4.398E-01	1.29E-01	G
		1112.07	4.621E-02	%	3.958E-01	1.16E-01	G
		778.90	-9.051E-03	&	2.899E-01	8.35E-02	G
EU-154	5.6394E-05						
		123.10	5.639E-05	&(	1.107E-01	3.30E-02	G K
		1274.80	-1.104E-02	%	1.445E-01	4.17E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          723.30-4.960E-02 %   1.983E-01 5.88E-02 G
                         1004.80 9.782E-02 %   2.184E-01 6.60E-02 G

EU-155       1.3239E-02
                           86.45 1.324E-02 %(  2.524E-01 7.55E-02 G K
                          105.31 1.338E-02 %   2.508E-01 7.49E-02 G

HG-203       2.5381E-02
                          279.17 2.538E-02 &(P 3.891E-02 1.19E-02 G K
                           72.87-6.028E-01 % P 2.562E+00 7.71E-01 G
                           70.83-9.771E-02 %   5.079E+00 1.52E+00 G
                           82.50 8.795E-03 &   3.788E+00 1.13E+00 G

TL-208       2.8705E-01
                          583.14 2.871E-01  (P 3.720E-02 1.89E-02 G
                          510.72 3.460E-01 + P 1.803E-01 7.03E-02 G

PB-212       7.7375E-01
                          238.63 7.738E-01  (P 1.018E-01 4.22E-02 G K
                                                          Energy duplication
                           77.11 7.738E-01 } P 3.871E-01 1.06E-01 G
                           74.81 9.261E-01 + P 8.151E-01 2.56E-01 G

PB-214       4.9328E-01
                          351.99 5.095E-01  (P 9.693E-02 4.20E-02 G K
                          295.22 4.680E-01  (P 1.550E-01 5.77E-02 G
                                                          Energy duplication
                           77.11 0.000E+00 } P 9.688E-01 0.00E+00 G
                          241.92 4.775E-01  (  5.959E-01 1.83E-01 G

BI-212       5.9490E-01
                          727.17 5.949E-01  (P 2.240E-01 8.70E-02 G K
                         1620.56 1.156E+00 + P 5.511E-01 2.79E-01 G
                          785.42 5.162E-01 %   2.038E+00 6.04E-01 G

BI-214       5.5195E-01
                          609.32 5.715E-01  (P 7.657E-02 3.86E-02 G K
                         1764.51 5.281E-01  (P 1.291E-01 7.76E-02 G
                         1120.28 5.173E-01  (P 3.159E-01 1.21E-01 G

RA-224       1.3210E+00
                          241.00 1.321E+00  (  1.116E+00 3.48E-01 G

RA-226       1.2270E+00
                          185.99 1.227E+00 @(P 1.130E+00 3.50E-01 G

AC-228       7.9155E-01
                          911.07 7.809E-01  (P 1.286E-01 6.47E-02 G K
                          968.90 8.001E-01  (P 1.781E-01 8.11E-02 G
                          338.40 8.049E-01  (P 2.635E-01 1.02E-01 G
```

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

TH-227      -1.1014E-01
                          236.00-1.101E-01 %(  3.956E-01 1.19E-01 G K
                          256.25 1.375E-01 % P 4.471E-01 1.34E-01 G

PA-234       1.5905E-02
                           98.44 1.591E-02 %(P 2.366E-01 7.07E-02 G K
                          946.00 5.883E-03 % P 1.075E-01 2.94E-02 G
                          131.28-4.805E-02 % P 2.293E-01 6.89E-02 G
                           94.67 1.044E-03 % P 3.521E-01 1.05E-01 G
                          883.24-1.385E-02 &   3.153E-01 9.05E-02 G
                          926.70 1.054E-01 %   3.586E-01 1.06E-01 G
                          569.26 5.577E-03 % P 3.334E-01 9.64E-02 G

TH-234       1.4755E+00
                           63.29 6.331E-01 %(P 6.829E+00 2.04E+00 G K
                           92.80 1.906E+00 *(P 2.224E+00 6.81E-01 G
                           92.38 2.252E+00 *(P 2.633E+00 8.06E-01 G

AM-241       9.8562E-02
                           59.54 9.856E-02 %(P 1.180E+00 3.52E-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

- -

***** 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 pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	6.2351E-02	6.6591E-02	2.9401E-01	2.9403E-01	3.103E-01
K-40		2.1595E+01	2.1595E+01	1.5476E+00	1.9917E+00	
MN-54	#A	1.6591E-02	1.6779E-02	3.0262E-02	3.0277E-02	3.280E-02
CO-57	#B	2.9997E-03	3.0390E-03	4.8386E-02	4.8386E-02	5.332E-02
CO-60	#B	4.4115E-03	4.4196E-03	3.2460E-02	3.2461E-02	3.840E-02
Sr-85	#A	-1.7589E-02	-1.8568E-02	4.2057E-02	4.2071E-02	4.403E-02
Kr-85	#A	-4.0576E+02	-4.0578E+02	9.1965E+02	9.1995E+02	1.016E+03
Y-88	#B	-9.1089E-05	-9.4142E-05	4.6660E-03	4.6660E-03	4.333E-02
NB-94	#B	0.0000E+00	0.0000E+00	3.8597E-02	3.8597E-02	4.463E-02
Ag-108M	#B	-1.1568E-02	-1.1569E-02	4.0614E-02	4.0619E-02	4.562E-02
CD-109	#A	-6.8349E-02	-6.8880E-02	1.9262E+00	1.9262E+00	2.132E+00
SN-113	#B	-1.9688E-03	-2.0298E-03	4.4784E-02	4.4784E-02	4.941E-02
SB-125	#B	7.6687E-02	7.6954E-02	7.7314E-02	7.7443E-02	1.174E-01
I-131	#B	-6.7047E-03	-1.0379E-02	6.2200E-02	6.2202E-02	4.075E-02
CS-134	#B	2.2873E-02	2.2980E-02	1.8304E-02	1.8353E-02	7.431E-02
CS-137	#A	9.8073E-03	9.8104E-03	3.7233E-02	3.7237E-02	4.210E-02
CE-139	#A	3.4417E-03	3.5308E-03	4.2102E-02	4.2103E-02	4.587E-02
EU-152	#B	8.2839E-03	8.2902E-03	1.3614E-01	1.3614E-01	1.520E-01
EU-154	#B	5.6330E-05	5.6394E-05	9.8925E-02	9.8925E-02	1.106E-01
EU-155	#B	1.3213E-02	1.3239E-02	2.2639E-01	2.2639E-01	2.519E-01
HG-203	#B	2.3537E-02	2.5381E-02	3.5782E-02	3.5812E-02	3.608E-02
TL-208		2.8705E-01	2.8705E-01	5.6814E-02	5.9208E-02	
PB-212		7.7375E-01	7.7375E-01	1.2671E-01	1.3444E-01	
PB-214		4.9328E-01	4.9328E-01	1.2188E-01	1.2520E-01	
BI-212		5.9490E-01	5.9490E-01	2.6103E-01	2.6330E-01	
BI-214		5.5195E-01	5.5195E-01	1.1172E-01	1.1622E-01	
RA-224		1.3210E+00	1.3210E+00	1.0429E+00	1.0457E+00	1.116E+00
RA-226	#	1.2270E+00	1.2270E+00	1.0496E+00	1.0520E+00	1.130E+00
AC-228		7.9155E-01	7.9155E-01	1.4410E-01	1.5125E-01	
TH-227	#B	-1.1014E-01	-1.1014E-01	3.5724E-01	3.5730E-01	3.956E-01
PA-234	#B	1.5905E-02	1.5905E-02	2.1203E-01	2.1204E-01	2.366E-01
TH-234	#B	1.4755E+00	1.4755E+00	1.5811E+00	1.5832E+00	6.829E+00
AM-241	#A	9.8560E-02	9.8562E-02	1.0561E+00	1.0561E+00	1.180E+00

- 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 (1120.0 to 2000.7 keV) 2.6408432E+01 pCi/gm
Total Decayed Activity (1120.0 to 2000.7 keV) 2.6408432E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 103F_15SEPT2006_1123.An1

Sample description
FSS-SSS-01-01-016-F

Spectrum Filename: C:\GammaVision\Spectra\103F_15SEPT2006_1123.An1

Acquisition information
Start time: 15-Sep-2006 11:23:19
Live time: 2000
Real time: 2002
Dead time: 0.11 %
Detector ID: 4

Detector system
Det 103 - DSPE-471

Calibration
Filename: D3_1LSa.Clb
Detector_103 1.0 Liter Sand Geometry

Energy Calibration
Created: 08-Aug-2005 11:09:41
Zero offset: 0.409 keV
Gain: 0.500 keV/channel
Quadratic: 1.092E-08 keV/channel^2

Efficiency Calibration
Created: 08-Aug-2005 11:11:25
Type: Polynomial
Uncertainty: 0.993 %
Coefficients: -0.264059 -5.138468 0.638383
-0.089199 0.005011 -0.000129

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.41keV)
Stop channel: 4000 (2000.67keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.9230E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.9230E+03) =
5.2002E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five 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	10-Sep-2006 14:38:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	103_150K_05AUG05.Pbc 08-Aug-2005 12:54:15
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 21 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.2608

***** 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. pCi/gm	Nuc
74.98	148.	20.22	0.99	9.052E-03	74.81	9.600	1.193E+00	PB212
93.15	79.	40.06	1.44	1.657E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
128.20	132.	31.92	0.84	2.427E-02				
186.42	144.	19.47	1.06	2.565E-02	185.99	3.280	1.094E+00	RA226
210.07	98.	35.67	1.00	2.468E-02				
238.80	1151.	3.45	1.09	2.319E-02	238.63	43.100	8.003E-01	PB212
241.71	195.	13.86	1.09	2.304E-02	241.00	3.900	1.524E+00	RA224
					241.92	7.470	7.972E-01	PB214
270.78	101.	23.74	1.00	2.148E-02				
295.41	257.	13.09	0.99	2.024E-02	295.22	19.200	4.579E-01	PB214
300.29	74.	29.85	1.12	2.000E-02				
328.31	82.	31.65	1.30	1.873E-02				
338.43	240.	10.89	1.15	1.830E-02	338.40	12.010	7.625E-01	AC228
352.10	520.	7.11	1.10	1.775E-02	351.99	37.100	5.488E-01	PB214
409.32	51.	39.33	1.03	1.575E-02				
463.02	79.	21.62	1.69	1.426E-02				
463.02	79.	21.62	1.69	1.426E-02	463.51	10.000	3.866E-01	SB125
511.25	147.	18.03	1.24	1.316E-02	510.72	22.500	2.855E-01	TL208
583.48	382.	6.16	1.51	1.184E-02	583.14	86.000	2.606E-01	TL208
609.56	375.	7.29	1.35	1.144E-02	609.32	46.090	4.912E-01	BI214
662.05	121.	17.88	1.44	1.072E-02	661.62	84.620	9.244E-02	CS137
727.42	119.	17.72	1.19	9.962E-03	727.17	11.800	7.088E-01	BI212
794.99	59.	27.72	1.15	9.308E-03				
794.99	59.	27.72	1.15	9.308E-03	795.76	85.400	5.271E-02	CS134
860.68	83.	23.49	1.69	8.767E-03				
911.61	274.	7.61	1.25	8.398E-03	911.07	29.000	7.818E-01	AC228

965.19	54.	26.18	1.54	8.056E-03	964.00	14.580	3.214E-01	EU152
969.01	229.	11.64	1.17	8.025E-03	968.90	17.460	1.149E+00	AC228
1120.54	116.	19.60	1.64	7.211E-03	1120.28	15.040	7.406E-01	BI214
1174.41	82.	28.19	1.23	6.966E-03	1173.23	99.860	8.095E-02	CO60
1238.42	56.	27.87	1.00	6.700E-03				
1461.51	1472.	2.68	1.91	5.930E-03	1460.75	10.700	1.609E+01	K40
1621.52	20.	25.50	0.66	5.488E-03	1620.56	2.750	9.293E-01	BI212
1765.37	68.	12.95	1.73	5.140E-03	1764.51	15.920	5.583E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide
255.57	128.20	655.	157.	0.079	73.12	0.843	AC-228 s
419.30	210.07	506.	98.	0.049	107.00	1.003	NP-239 s
540.71	270.78	237.	101.	0.051	71.23	1.001	AC-228
599.73	300.29	207.	74.	0.037	89.56	1.119	PB-212
655.76	328.31	248.	82.	0.041	94.96	1.299	RH-106M s
817.76	409.32	152.	51.	0.025	117.99	1.030	AC-228
1720.40	860.68	86.	83.	0.041	70.46	1.690	TL-208 s
2475.78	1238.42	74.	56.	0.028	83.61	1.002	CO-56 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: FSS_Rev_1.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 3 Sigma %	FWHM keV
PB-212	148.79	74.81	391.	148.	0.074	60.66	0.993D
PB-212	153.39	77.11	393.	210.	0.105	34.79	0.995A
RA-226	372.06	186.45	752.	134.	0.067	82.45	1.500
PB-212	476.42	238.63	229.	1142.	0.571	10.36	1.093D
PB-214	483.00	241.92	363.	135.	0.067	51.58	1.095A
PB-214	589.97	295.41	342.	253.	0.127	39.27	0.989
AC-228	675.99	338.43	201.	239.	0.119	32.66	1.154s
PB-214	703.35	352.10	279.	514.	0.257	21.33	1.104
SB-125	925.34	463.11	114.	70.	0.035	71.96	1.500s
TL-208	1021.61	511.25	219.	120.	0.060	54.10	1.242s
TL-208	1166.06	583.48	82.	378.	0.189	18.48	1.508
BI-214	1218.23	609.56	130.	369.	0.184	21.87	1.347
CS-137	1323.19	662.05	113.	119.	0.060	53.64	1.443s
BI-212	1453.91	727.42	99.	119.	0.059	53.16	1.188s
CS-134	1590.10	795.52	59.	50.	0.025	78.14	1.500s
AC-228	1822.24	911.61	61.	271.	0.136	22.82	1.248
EU-152	1929.40	965.19	74.	54.	0.027	78.54	1.538
AC-228	1937.04	969.01	118.	229.	0.115	34.93	1.170
BI-214	2240.06	1120.54	114.	114.	0.057	58.80	1.644
CO-60	2346.80	1173.92	98.	41.	0.021	106.09	1.667
K-40	2921.88	1461.51	44.	1453.	0.727	8.05	1.909
BI-212	3241.86	1621.52	2.	20.	0.010	76.49	0.662s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-214	3529.50	1765.37	6.	65.	0.033	38.86	1.732

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 pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	Peak COMMENTS
BE-7		1.6762E-02					
			477.56	1.676E-02	&(	3.039E-01	8.84E-02 G
K-40		1.6090E+01					
			1460.75	1.609E+01	(P	3.711E-01	4.37E-01 G
MN-54		6.3878E-04					
			834.81	6.388E-04	%(P	3.225E-02	9.15E-03 G
CO-57		1.8852E-02					
			122.07	1.885E-02	%(P	5.121E-02	1.55E-02 G K
			136.43	9.139E-02	%	3.682E-01	1.11E-01 G
CO-60		3.0852E-02					
			1332.51	1.983E-02	%(P	3.888E-02	1.17E-02 G K
			1173.23	4.188E-02	(P	4.936E-02	1.55E-02 G K
Sr-85		-1.0020E-02					
			514.00	-1.002E-02	&(	4.533E-02	1.35E-02 G
Kr-85		-2.1960E+02					
			513.99	-2.196E+02	&(	9.935E+02	2.96E+02 G
Y-88		-8.4796E-04					
			1836.01	-8.480E-04	&(P	2.314E-02	5.89E-03 G K
			898.02	1.546E-02	% P	3.790E-02	1.14E-02 G
NB-94		9.7987E-03					
			871.10	9.799E-03	&(	3.096E-02	9.17E-03 G K
			702.50	3.035E-03	%	3.696E-02	1.07E-02 G K
Ag-108M		4.3545E-03					
			722.95	4.355E-03	%(	3.914E-02	1.14E-02 G K
			614.37	-2.495E-02	% P	4.421E-02	1.35E-02 G
			433.93	-8.666E-03	%	3.715E-02	1.11E-02 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CD-109	7.6328E-01						
		88.04	7.633E-01	%(	1.838E+00	5.56E-01	G
SN-113	-8.1557E-03						
		391.71	-8.156E-03	&(	5.203E-02	1.54E-02	G K
		255.04	-4.879E-02	&	1.607E+00	4.76E-01	G
SB-125	9.9261E-02						
		427.95	1.495E-02	&(P	1.018E-01	3.00E-02	G K
		600.77	7.005E-03	% P	1.904E-01	5.53E-02	G
		636.15	-4.378E-02	% P	2.903E-01	8.46E-02	G
		463.51	3.488E-01	(P	2.591E-01	8.52E-02	G
		176.29	1.500E-01	%	5.705E-01	1.71E-01	G
I-131	-7.2330E-04						
		364.48	-7.233E-04	%(P	5.413E-02	1.58E-02	G K
		636.97	-1.399E-01	%	6.339E-01	1.86E-01	G
		284.29	-9.621E-02	& P	7.883E-01	2.34E-01	G
CS-134	1.6404E-02						
		604.66	-7.932E-03	%(	3.816E-02	1.13E-02	G K
		795.76	4.422E-02	*(P	3.434E-02	1.15E-02	G
		569.29	4.566E-02	% P	1.847E-01	5.43E-02	G
		801.84	1.403E-01	% P	2.833E-01	8.55E-02	G
CS-137	9.2438E-02						
		661.62	9.244E-02	(P	4.043E-02	1.67E-02	G
CE-139	1.3452E-02						
		165.85	1.345E-02	%(	4.621E-02	1.39E-02	G
EU-152	1.4309E-01						
		121.78	5.417E-02	%(P	1.485E-01	4.48E-02	G K
		344.30	3.123E-02	% P	1.110E-01	3.32E-02	G
		1408.08	0.000E+00	%	1.586E-01	4.37E-02	G
		964.00	3.214E-01	(P	2.566E-01	8.50E-02	G
		1112.07	1.533E-01	&	2.862E-01	8.75E-02	G
		778.90	-7.853E-03	&	2.783E-01	8.00E-02	G
EU-154	3.6018E-02						
		123.10	3.602E-02	&(	1.012E-01	3.06E-02	G K
		1274.80	-1.215E-02	%	1.168E-01	3.35E-02	G
		723.30	1.797E-02	%	1.730E-01	5.02E-02	G
		1004.80	1.278E-02	&	1.982E-01	5.65E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	8.3947E-02						
		86.45	8.395E-02	&(	2.331E-01	7.04E-02	G K
		105.31	8.659E-02	%	2.302E-01	6.95E-02	G
HG-203	4.6307E-03						
		279.17	4.631E-03	&(P	4.510E-02	1.34E-02	G K
		72.87	-5.285E-01	% P	2.311E+00	6.95E-01	G
		70.83	-1.273E+00	%	4.594E+00	1.38E+00	G
		82.50	1.014E-01	&	3.777E+00	1.13E+00	G
TL-208	2.6574E-01						
		583.14	2.606E-01	(P	3.103E-02	1.62E-02	G
		510.72	2.855E-01	*(P	1.698E-01	6.29E-02	G
PB-212	8.3190E-01						
		238.63	8.027E-01	(P	5.151E-02	2.80E-02	G K
							Energy duplication
		77.11	8.319E-01	} P	3.777E-01	9.65E-02	G
		74.81	1.193E+00	+ P	7.676E-01	2.46E-01	G
PB-214	5.5082E-01						
		351.99	5.488E-01	(P	8.589E-02	3.94E-02	G K
		295.22	4.579E-01	- P	1.606E-01	6.09E-02	G
							Energy duplication
		77.11	0.000E+00	} P	8.706E-01	0.00E+00	G
		241.92	5.508E-01	}	3.737E-01	9.47E-02	G
BI-212	7.5050E-01						
		727.17	7.088E-01	@(P	2.939E-01	1.26E-01	G K
		1620.56	9.293E-01	(P	4.365E-01	2.38E-01	G
		785.42	0.000E+00	%	1.912E+00	5.49E-01	G
BI-214	5.0841E-01						
		609.32	4.912E-01	(P	7.456E-02	3.64E-02	G K
		1764.51	5.583E-01	(P	1.210E-01	7.60E-02	G
		1120.28	7.406E-01	+ P	3.395E-01	1.48E-01	G
RA-224	8.7375E-01						
							Derived Ave Activity
		241.00	8.737E-01	}(	1.190E+00	3.77E-01	G
RA-226	1.1158E+00						
		185.99	1.116E+00	(P	1.089E+00	3.36E-01	G
AC-228	7.7613E-01						
		911.07	7.818E-01	(P	1.128E-01	6.02E-02	G K
		968.90	1.149E+00	+ P	2.674E-01	1.34E-01	G
		338.40	7.625E-01	@(P	2.202E-01	8.34E-02	G

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

TH-227      -1.0787E-01
                          236.00-1.079E-01 &(  3.561E-01 1.07E-01 G K
                          256.25 1.158E-01 % P 4.772E-01 1.43E-01 G

PA-234      -3.1398E-03
                           98.44-3.140E-03 %(P 1.924E-01 5.71E-02 G K
                          946.00 3.383E-02 % P 1.489E-01 4.34E-02 G
                          131.28-4.212E-02 % P 2.126E-01 6.38E-02 G
                           94.67-1.857E-01 % P 4.112E-01 1.25E-01 G
                          883.24 1.015E-01 %   2.433E-01 7.31E-02 G
                          926.70-2.159E-03 &   3.362E-01 9.58E-02 G
                          569.26 6.744E-02 % P 2.728E-01 8.02E-02 G

TH-234       1.8477E+00
                           63.29 1.848E+00 &(P 6.138E+00 1.84E+00 G K
                           92.80 1.457E+00 % P 2.097E+00 6.38E-01 G
                           92.38 1.671E+00 % P 2.514E+00 7.64E-01 G

AM-241      -2.1480E-01
                           59.54-2.148E-01 %(P 1.132E+00 3.39E-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

- -

***** 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 pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	1.5737E-02	1.6762E-02	2.6529E-01	2.6529E-01	2.853E-01
K-40		1.6090E+01	1.6090E+01	1.3116E+00	1.6103E+00	
MN-54	#A	6.3192E-04	6.3878E-04	2.7456E-02	2.7456E-02	3.191E-02
CO-57	#B	1.8618E-02	1.8852E-02	4.6393E-02	4.6405E-02	5.057E-02
CO-60	#B	3.0798E-02	3.0852E-02	3.2264E-02	3.2314E-02	3.881E-02
Sr-85	#A	-9.5120E-03	-1.0020E-02	4.0506E-02	4.0510E-02	4.303E-02
Kr-85	#A	-2.1959E+02	-2.1960E+02	8.8776E+02	8.8785E+02	9.935E+02
Y-88	#B	-8.2156E-04	-8.4796E-04	2.1986E-02	2.1986E-02	2.242E-02
NB-94	#B	9.7987E-03	9.7987E-03	2.7517E-02	2.7523E-02	3.096E-02
Ag-108M	#B	4.3542E-03	4.3545E-03	3.4167E-02	3.4168E-02	3.914E-02
CD-109	#A	7.5762E-01	7.6328E-01	1.6685E+00	1.6691E+00	1.825E+00
SN-113	#B	-7.9202E-03	-8.1557E-03	4.6217E-02	4.6219E-02	5.053E-02
SB-125	#B	9.8931E-02	9.9261E-02	7.2718E-02	7.2946E-02	1.015E-01
I-131	#B	-4.7552E-04	-7.2330E-04	2.9135E-01	2.9135E-01	3.558E-02
CS-134	#B	1.6331E-02	1.6404E-02	1.2841E-02	1.2876E-02	3.799E-02
CS-137	#	9.2409E-02	9.2438E-02	5.0160E-02	5.0446E-02	
CE-139	#A	1.3126E-02	1.3452E-02	4.1727E-02	4.1734E-02	4.509E-02
EU-152	#B	1.4299E-01	1.4309E-01	1.1352E-01	1.1380E-01	1.484E-01
EU-154	#B	3.5978E-02	3.6018E-02	9.1668E-02	9.1690E-02	1.011E-01
EU-155	#B	8.3791E-02	8.3947E-02	2.1120E-01	2.1125E-01	2.327E-01
HG-203	#B	4.3074E-03	4.6307E-03	4.0198E-02	4.0199E-02	4.195E-02
TL-208		2.6574E-01	2.6574E-01	4.9663E-02	5.2004E-02	
PB-212		8.3190E-01	8.3190E-01	8.7104E-02	9.9599E-02	
PB-214		5.5082E-01	5.5082E-01	1.1875E-01	1.2298E-01	
BI-212		7.5050E-01	7.5050E-01	3.5054E-01	3.5323E-01	
BI-214		5.0841E-01	5.0841E-01	1.1312E-01	1.1690E-01	
RA-224	A	8.7375E-01	8.7375E-01	1.1054E+00	1.1065E+00	
RA-226	#	1.1158E+00	1.1158E+00	1.0091E+00	1.0112E+00	1.089E+00
AC-228		7.7613E-01	7.7613E-01	1.5573E-01	1.6212E-01	
TH-227	#B	-1.0787E-01	-1.0787E-01	3.2164E-01	3.2170E-01	3.561E-01
PA-234	#B	-3.1398E-03	-3.1398E-03	4.9171E-01	4.9171E-01	1.924E-01
TH-234	#B	1.8477E+00	1.8477E+00	5.5323E+00	5.5332E+00	6.138E+00
AM-241	#A	-2.1480E-01	-2.1480E-01	1.0338E+00	1.0338E+00	1.132E+00

- 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 (270.4 to 2000.7 keV) 2.0739532E+01 pCi/gm
Total Decayed Activity (270.4 to 2000.7 keV) 2.0739561E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 103F_15SEPT2006_1259.An1

Sample description
FSS-SSS-01-01-004-F

Spectrum Filename: C:\GammaVision\Spectra\103F_15SEPT2006_1259.An1

Acquisition information
Start time: 15-Sep-2006 12:59:09
Live time: 2000
Real time: 2003
Dead time: 0.13 %
Detector ID: 4

Detector system
Det 103 - DSPE-471

Calibration
Filename: D3_1LSa.Clb
Detector_103 1.0 Liter Sand Geometry

Energy Calibration
Created: 08-Aug-2005 11:09:41
Zero offset: 0.409 keV
Gain: 0.500 keV/channel
Quadratic: 1.092E-08 keV/channel^2

Efficiency Calibration
Created: 08-Aug-2005 11:11:25
Type: Polynomial
Uncertainty: 0.993 %
Coefficients: -0.264059 -5.138468 0.638383
-0.089199 0.005011 -0.000129

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.41keV)
Stop channel: 4000 (2000.67keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.9860E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.9860E+03) =
5.0352E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five 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	10-Sep-2006 09:46:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	103_150K_05AUG05.Pbc 08-Aug-2005 12:54:15
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 18 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.2731

***** 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. pCi/gm	Nuc
74.92	202.	15.48	0.99	9.052E-03	74.81	9.600	1.583E+00	PB212
77.22	213.	14.55	0.99	1.011E-02	77.11	17.500	9.899E-01	PB212
					77.11	10.700	1.619E+00	PB214
93.05	110.	37.81	1.50	1.631E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
93.05	108.	38.23	1.50	1.645E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.29	178.	24.00	1.02	2.566E-02	185.99	3.280	1.334E+00	RA226
209.60	141.	27.26	0.82	2.470E-02				
238.82	1285.	3.30	1.09	2.319E-02	238.63	43.100	8.666E-01	PB212
241.74	177.	16.46	1.09	2.303E-02	241.00	3.900	1.339E+00	RA224
					241.92	7.470	7.003E-01	PB214
270.34	93.	32.84	1.06	2.151E-02				
277.33	117.	29.48	0.76	2.114E-02				
277.33	117.	29.48	0.76	2.114E-02	279.17	81.500	4.990E-02	HG203
295.36	279.	12.07	0.94	2.024E-02	295.22	19.200	4.819E-01	PB214
300.33	89.	27.13	1.35	2.000E-02				
327.93	69.	34.23	0.95	1.874E-02				
338.59	293.	11.48	1.18	1.829E-02	338.40	12.010	9.024E-01	AC228
352.05	482.	8.37	1.23	1.775E-02	351.99	37.100	4.925E-01	PB214
409.79	55.	34.27	1.20	1.574E-02				
462.96	97.	22.86	1.40	1.426E-02				
462.96	97.	22.86	1.40	1.426E-02	463.51	10.000	4.569E-01	SB125
511.38	234.	11.96	1.46	1.316E-02	510.72	22.500	4.751E-01	TL208
583.37	471.	6.46	1.51	1.184E-02	583.14	86.000	3.117E-01	TL208
609.67	407.	8.39	1.36	1.143E-02	609.32	46.090	5.167E-01	BI214
728.03	115.	20.23	1.13	9.956E-03	727.17	11.800	6.649E-01	BI212

795.24	87.	25.26	1.55	9.306E-03				
795.24	87.	25.26	1.55	9.306E-03	795.76	85.400	7.515E-02	CS134
860.67	65.	31.06	1.65	8.767E-03				
911.65	302.	9.00	1.53	8.397E-03	911.07	29.000	8.340E-01	AC228
969.28	212.	11.12	1.63	8.023E-03	968.90	17.460	1.030E+00	AC228
1120.28	104.	22.01	1.70	7.212E-03	1120.28	15.040	6.380E-01	BI214
1461.62	1788.	2.40	1.80	5.929E-03	1460.75	10.700	1.897E+01	K40
1765.29	72.	14.41	1.73	5.140E-03	1764.51	15.920	5.746E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
418.37	209.60	584.	141.	0.071	81.78	0.817	NP-239	s
539.84	270.34	350.	93.	0.047	98.53	1.064	AC-228	s
553.81	277.33	394.	117.	0.058	88.44	0.758	TL-208	l
599.80	300.33	238.	89.	0.045	81.40	1.345	PB-212	s
655.00	327.93	232.	69.	0.034	102.70	0.953	AC-228	
818.72	409.79	143.	55.	0.027	102.81	1.202	AC-228	
1720.38	860.67	108.	65.	0.033	93.19	1.649	TL-208	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: FSS_Rev_1.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 3 Sigma %	FWHM keV
PB-212	148.79	74.81	405.	202.	0.101	46.44	0.993D
PB-212	153.39	77.11	413.	213.	0.107	43.65	0.995A
RA-226	371.98	186.41	877.	170.	0.085	71.83	1.500
PB-212	476.42	238.63	280.	1273.	0.637	9.96	1.093D
RA-224	481.16	241.00	1168.	127.	0.064	118.01	1.095D
PB-214	483.00	241.92	433.	122.	0.061	57.68	1.095A
PB-214	589.87	295.36	334.	275.	0.138	36.20	0.943
AC-228	676.32	338.59	310.	292.	0.146	34.43	1.182s
PB-214	703.25	352.05	364.	477.	0.238	25.11	1.231
SB-125	925.41	463.14	167.	86.	0.043	69.98	1.500s
TL-208	1021.88	511.38	203.	207.	0.103	35.88	1.464s
TL-208	1165.84	583.37	156.	467.	0.233	19.39	1.509s
BI-214	1218.44	609.67	212.	400.	0.200	25.18	1.359
Ag-108M	1222.27	611.59	280.	-111.	-0.055	70.15	1.500s
BI-212	1455.14	728.03	139.	115.	0.057	60.69	1.126s
CS-134	1589.93	795.44	88.	58.	0.029	78.69	1.500s
AC-228	1822.32	911.65	128.	299.	0.149	27.01	1.534
AC-228	1937.58	969.28	108.	212.	0.106	33.37	1.627
BI-214	2239.53	1120.28	124.	102.	0.051	66.02	1.699s
K-40	2922.11	1461.62	39.	1769.	0.885	7.21	1.795
BI-214	3529.33	1765.29	11.	69.	0.035	43.24	1.732

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 pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		-7.9518E-02					
			477.56	-7.952E-02	%(	3.462E-01 1.03E-01	G
K-40		1.8967E+01					
			1460.75	1.897E+01	(P	3.399E-01 4.61E-01	G
MN-54		1.1317E-02					
			834.81	1.132E-02	%(P	3.564E-02 1.06E-02	G
CO-57		-7.0293E-03					
			122.07	-7.029E-03	%(P	5.211E-02 1.56E-02	G K
			136.43	-4.021E-02	%	4.149E-01 1.24E-01	G
CO-60		-3.1872E-03					
			1332.51	-3.187E-03	&(P	3.692E-02 1.00E-02	G K
			1173.23	-3.557E-03	& P	4.706E-02 1.34E-02	G K
Sr-85		-8.2376E-03					
			514.00	-8.238E-03	%(	4.426E-02 1.32E-02	G
Kr-85		-1.7992E+02					
			513.99	-1.799E+02	%(	9.673E+02 2.87E+02	G
Y-88		1.3423E-02					
			1836.01	1.342E-02	%(P	1.851E-02 6.22E-03	G K
			898.02	1.146E-02	% P	3.115E-02 9.26E-03	G
NB-94		4.9463E-05					
			871.10	4.946E-05	&(	3.179E-02 9.01E-03	G K
			702.50	2.417E-03	%	3.660E-02 1.06E-02	G K
Ag-108M		1.5993E-03					
			722.95	1.599E-03	%(	6.228E-02 1.83E-02	G K
			614.37	-7.341E-02	+ P	5.344E-02 1.71E-02	G
			433.93	-1.073E-03	%	3.728E-02 1.09E-02	G
CD-109		-1.1775E-01					
			88.04	-1.178E-01	%(	2.102E+00 6.29E-01	G
SN-113		-7.1351E-04					
			391.71	-7.135E-04	&(	5.079E-02 1.49E-02	G K
			255.04	-1.174E-01	%	1.574E+00 4.67E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	1.0912E-01						
		427.95	6.042E-03	&(P	1.027E-01	3.01E-02	G K
		600.77	2.501E-02	& P	1.861E-01	5.46E-02	G
		636.15	-3.188E-03	% P	2.755E-01	7.89E-02	G
		463.51	4.142E-01	*(P	3.013E-01	9.81E-02	G
		176.29	1.610E-01	%	5.921E-01	1.78E-01	G
I-131	8.4680E-03						
		364.48	8.468E-03	&(P	5.518E-02	1.63E-02	G K
		636.97	-1.416E-01	%	6.701E-01	1.97E-01	G
		284.29	-2.188E-01	% P	7.769E-01	2.33E-01	G
CS-134	1.9645E-02						
		604.66	-7.078E-03	%(	3.727E-02	1.10E-02	G K
		795.76	5.019E-02	*(P	4.000E-02	1.32E-02	G
		569.29	5.077E-02	& P	2.123E-01	6.27E-02	G
		801.84	-1.005E-01	% P	3.724E-01	1.08E-01	G
CS-137	9.9530E-03						
		661.62	9.953E-03	%(P	3.800E-02	1.12E-02	G
CE-139	-1.7833E-03						
		165.85	-1.783E-03	%(	4.944E-02	1.47E-02	G
EU-152	-2.1015E-02						
		121.78	-2.102E-02	%(P	1.510E-01	4.52E-02	G K
		344.30	-1.384E-02	% P	1.153E-01	3.41E-02	G
		1408.08	7.393E-02	%	1.231E-01	3.85E-02	G
		964.00	4.278E-02	% P	1.941E-01	5.62E-02	G
		1112.07	-6.149E-02	%	3.912E-01	1.15E-01	G
		778.90	-2.604E-02	%	2.797E-01	8.12E-02	G
EU-154	-1.5178E-03						
		123.10	-1.518E-03	%(	1.134E-01	3.38E-02	G K
		1274.80	3.766E-02	&	1.132E-01	3.36E-02	G
		723.30	-9.142E-02	%	2.380E-01	7.16E-02	G
		1004.80	-1.492E-02	%	2.093E-01	6.00E-02	G
EU-155	1.3772E-01						
		86.45	1.377E-01	%(	2.400E-01	7.30E-02	G K
		105.31	6.256E-02	%	2.205E-01	6.64E-02	G
HG-203	2.5574E-02						
		279.17	2.557E-02	&(P	3.944E-02	1.21E-02	G K
		72.87	4.880E-01	% P	1.633E+00	4.91E-01	G
		70.83	2.175E+00	&	3.561E+00	1.09E+00	G
		82.50	-1.306E+00	&	4.104E+00	1.24E+00	G

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

TL-208       3.1174E-01
                          583.14 3.117E-01 @(P 4.073E-02 2.03E-02 G
                          510.72 4.751E-01 + P 1.587E-01 6.42E-02 G

PB-212       8.6635E-01
                          238.63 8.663E-01  (P 5.488E-02 2.90E-02 G K
                                                          Energy duplication
                           77.11 8.191E-01 } P 3.747E-01 1.19E-01 G
                           74.81 1.583E+00 + P 7.555E-01 2.49E-01 G

PB-214       4.8103E-01
                          351.99 4.925E-01  (P 9.468E-02 4.17E-02 G K
                          295.22 4.819E-01  (P 1.537E-01 5.90E-02 G
                                                          Energy duplication
                           77.11 7.545E-02 } P 8.973E-01 2.44E-01 G
                          241.92 4.810E-01 }   3.946E-01 9.25E-02 G

BI-212       6.6494E-01
                          727.17 6.649E-01 @(P 3.337E-01 1.35E-01 G K
                         1620.56 1.553E-01 % P 8.800E-01 2.45E-01 G
                          785.42 9.624E-01 %   1.718E+00 5.26E-01 G

BI-214       5.5233E-01
                          609.32 5.167E-01  (P 9.100E-02 4.41E-02 G K
                         1764.51 5.746E-01  (P 1.503E-01 8.68E-02 G
                         1120.28 6.380E-01 @(P 3.429E-01 1.43E-01 G

RA-224       9.6394E-01
                                                          Derived Ave Activity
                          241.00 9.639E-01 }(  1.225E+00 3.88E-01 G

RA-226       1.3705E+00
                          185.99 1.370E+00  (P 1.137E+00 3.53E-01 G

AC-228       9.0651E-01
                          911.07 8.340E-01  (P 1.550E-01 7.60E-02 G K
                          968.90 1.030E+00  (P 2.483E-01 1.15E-01 G
                          338.40 9.024E-01 @(P 2.626E-01 1.04E-01 G

TH-227      -1.8143E-01
                          236.00-1.814E-01 %(  4.034E-01 1.22E-01 G K
                          256.25-9.065E-02 % P 4.356E-01 1.30E-01 G

PA-234       6.0982E-02
                           98.44 6.098E-02 %(P 2.202E-01 6.63E-02 G K
                          946.00 2.011E-02 & P 1.597E-01 4.60E-02 G
                          131.28 1.971E-03 % P 2.048E-01 6.10E-02 G
                           94.67-1.612E-01 % P 4.276E-01 1.29E-01 G
                          883.24-4.557E-02 %   2.895E-01 8.42E-02 G
```

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		926.70	5.325E-03	&	2.529E-01	7.09E-02	G
		569.26	7.617E-02	& P	3.132E-01	9.26E-02	G
TH-234	8.5617E-01						
		63.29	8.562E-01	%(P	6.295E+00	1.88E+00	G K
		92.80	1.494E+00	% P	2.184E+00	6.64E-01	G
		92.38	1.794E+00	% P	2.584E+00	7.87E-01	G
AM-241	1.7836E-01						
		59.54	1.784E-01	%(P	1.111E+00	3.32E-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	

- -

***** 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 pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	-7.4391E-02	-7.9518E-02	3.0861E-01	3.0864E-01	3.239E-01
K-40		1.8967E+01	1.8967E+01	1.3825E+00	1.7675E+00	
MN-54	#A	1.1188E-02	1.1317E-02	3.1782E-02	3.1789E-02	3.524E-02
CO-57	#B	-6.9372E-03	-7.0293E-03	4.8829E-02	4.8831E-02	5.143E-02

CO-60	#B	-3.1813E-03	-3.1872E-03	5.2636E-01	5.2636E-01	3.685E-02
Sr-85	#A	-7.7977E-03	-8.2376E-03	3.9460E-02	3.9462E-02	4.190E-02
Kr-85	#A	-1.7991E+02	-1.7992E+02	8.6231E+02	8.6237E+02	9.673E+02
Y-88	#B	1.2982E-02	1.3423E-02	1.8671E-02	1.8687E-02	1.790E-02
NB-94	#B	4.9463E-05	4.9463E-05	2.7019E-02	2.7019E-02	3.179E-02
Ag-108M	#B	1.5992E-03	1.5993E-03	5.4947E-02	5.4947E-02	6.228E-02
CD-109	#A	-1.1683E-01	-1.1775E-01	1.8869E+00	1.8869E+00	2.086E+00
SN-113	#B	-6.9179E-04	-7.1351E-04	4.4640E-02	4.4640E-02	4.925E-02
SB-125	#F	1.0874E-01	1.0912E-01	7.7489E-02	7.7747E-02	1.023E-01
I-131	#B	5.4394E-03	8.4680E-03	4.8931E-02	4.8933E-02	3.544E-02
CS-134	#B	1.9552E-02	1.9645E-02	1.5481E-02	1.5523E-02	3.710E-02
CS-137	#A	9.9498E-03	9.9530E-03	3.3654E-02	3.3659E-02	3.799E-02
CE-139	#A	-1.7377E-03	-1.7833E-03	4.4248E-02	4.4248E-02	4.818E-02
EU-152	#B	-2.0999E-02	-2.1015E-02	1.4846E-01	1.4846E-01	1.509E-01
EU-154	#B	-1.5161E-03	-1.5178E-03	1.0154E-01	1.0154E-01	1.133E-01
EU-155	#B	1.3745E-01	1.3772E-01	2.1904E-01	2.1918E-01	2.395E-01
HG-203	#B	2.3693E-02	2.5574E-02	3.6235E-02	3.6265E-02	3.654E-02
TL-208	#	3.1174E-01	3.1174E-01	6.1014E-02	6.3641E-02	
PB-212		8.6635E-01	8.6635E-01	8.7106E-02	1.0059E-01	
PB-214		4.8103E-01	4.8103E-01	1.2220E-01	1.2535E-01	
BI-212	#	6.6494E-01	6.6494E-01	4.0531E-01	4.0714E-01	
BI-214		5.5233E-01	5.5233E-01	1.4134E-01	1.4493E-01	
RA-224	A	9.6394E-01	9.6394E-01	1.1376E+00	1.1389E+00	
RA-226	#	1.3704E+00	1.3705E+00	1.0596E+00	1.0626E+00	1.137E+00
AC-228		9.0651E-01	9.0651E-01	1.6705E-01	1.7514E-01	
TH-227	#B	-1.8143E-01	-1.8143E-01	3.6669E-01	3.6684E-01	4.034E-01
PA-234	#B	6.0982E-02	6.0982E-02	1.9887E-01	1.9890E-01	2.202E-01
TH-234	#B	8.5617E-01	8.5617E-01	5.6389E+00	5.6391E+00	6.295E+00
AM-241	#A	1.7835E-01	1.7836E-01	9.9744E-01	9.9749E-01	1.111E+00

- 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 (269.9 to 2000.7 keV) 2.3713902E+01 pCi/gm
Total Decayed Activity (269.9 to 2000.7 keV) 2.3713902E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 103F_15SEPT2006_1338.An1

Sample description
FSS-SSS-01-01-005-F

Spectrum Filename: C:\GammaVision\Spectra\103F_15SEPT2006_1338.An1

Acquisition information
Start time: 15-Sep-2006 13:38:08
Live time: 2000
Real time: 2003
Dead time: 0.13 %
Detector ID: 4

Detector system
Det 103 - DSPE-471

Calibration
Filename: D3_1LSa.Clb
Detector_103 1.0 Liter Sand Geometry

Energy Calibration
Created: 08-Aug-2005 11:09:41
Zero offset: 0.409 keV
Gain: 0.500 keV/channel
Quadratic: 1.092E-08 keV/channel^2

Efficiency Calibration
Created: 08-Aug-2005 11:11:25
Type: Polynomial
Uncertainty: 0.993 %
Coefficients: -0.264059 -5.138468 0.638383
-0.089199 0.005011 -0.000129

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.41keV)
Stop channel: 4000 (2000.67keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.8510E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.8510E+03) =
5.4025E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five 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	09-Sep-2006 07:59:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	103_150K_05AUG05.Pbc 08-Aug-2005 12:54:15
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 19 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.2839

***** 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. pCi/gm	Nuc
74.90	163.	19.92	0.99	9.130E-03	74.81	9.600	1.346E+00	PB212
77.29	247.	13.72	0.99	1.023E-02	77.11	17.500	1.006E+00	PB212
					77.11	10.700	1.645E+00	PB214
87.38	134.	37.86	1.50	1.410E-02	86.45	32.740	PBC<MDA	EU155
					88.04	3.790	1.768E+00	CD109
87.39	146.	32.91	1.50	1.472E-02	86.45	32.740	PBC<MDA	EU155
					88.04	3.790	1.927E+00	CD109
186.18	228.	20.77	1.04	2.566E-02	185.99	3.280	1.868E+00	RA226
209.75	129.	24.01	1.09	2.469E-02				
238.81	1267.	3.39	1.09	2.319E-02	238.63	43.100	9.167E-01	PB212
242.14	165.	17.00	1.10	2.301E-02	241.00	3.900	1.336E+00	RA224
					241.92	7.470	6.991E-01	PB214
270.09	97.	32.62	0.85	2.152E-02				
276.99	77.	38.32	1.30	2.116E-02				
295.42	338.	11.09	0.98	2.024E-02	295.22	19.200	6.264E-01	PB214
300.50	89.	31.80	1.23	1.999E-02				
328.08	107.	31.58	1.10	1.874E-02				
338.40	255.	15.91	1.13	1.830E-02	338.40	12.010	8.420E-01	AC228
352.14	525.	6.64	1.17	1.775E-02	351.99	37.100	5.761E-01	PB214
462.79	102.	25.46	1.28	1.426E-02				
462.79	102.	25.46	1.28	1.426E-02	463.51	10.000	5.209E-01	SB125
511.17	238.	12.77	1.43	1.316E-02	510.72	22.500	5.196E-01	TL208
583.46	436.	7.07	1.54	1.184E-02	583.14	86.000	3.095E-01	TL208
609.62	438.	7.21	1.55	1.143E-02	609.32	46.090	5.975E-01	BI214
727.84	145.	15.85	1.41	9.958E-03	727.17	11.800	8.978E-01	BI212
796.18	59.	34.19	1.42	9.298E-03	795.76	85.400	5.446E-02	CS134
836.85	62.	31.23	1.24	8.954E-03				

861.11	58.	26.93	1.30	8.763E-03				
911.83	340.	7.54	1.73	8.396E-03	911.07	29.000	1.009E+00	AC228
964.68	46.	27.81	1.54	8.052E-03	964.00	14.580	2.831E-01	EU152
969.74	155.	11.03	1.54	8.021E-03	968.90	17.460	8.073E-01	AC228
1107.08	35.	39.18	1.30	7.275E-03				
1120.68	162.	17.95	2.14	7.210E-03	1120.28	15.040	1.078E+00	BI214
1461.55	1996.	2.32	1.89	5.930E-03	1460.75	10.700	2.274E+01	K40
1591.13	60.	15.56	0.81	5.564E-03				
1622.05	26.	24.28	1.23	5.488E-03	1620.56	2.750	1.246E+00	BI212

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1765.62	82.	12.36	1.45	5.139E-03	1764.51	15.920	7.057E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
418.65	209.75	415.	129.	0.064	72.02	1.093	NP-239	
539.33	270.09	375.	97.	0.048	97.87	0.851	AC-228	s
553.12	276.99	331.	89.	0.045	92.29	1.299	TL-208	
600.14	300.50	300.	89.	0.045	95.41	1.231	PB-212	s
655.31	328.08	373.	107.	0.054	94.75	1.098	AC-228	
1672.74	836.85	91.	77.	0.038	63.12	1.237	J-135	
1721.26	861.11	70.	58.	0.029	80.79	1.299	TL-208	
1929.85	964.68	54.	51.	0.026	74.07	1.539	AC-228	D
3181.08	1591.13	8.	60.	0.030	46.69	0.810	-	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: FSS_Rev_1.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 3 Sigma %	FWHM keV
PB-212	148.79	74.81	427.	163.	0.082	57.41	0.993D
PB-212	153.39	77.11	452.	188.	0.094	42.20	0.995A
EU-155	173.93	87.38	1216.	134.	0.067	113.57	1.500s
CD-109	173.95	87.39	1079.	146.	0.073	98.72	1.500s
RA-226	371.67	186.25	894.	172.	0.086	71.39	1.500s
PB-212	476.84	238.84	753.	1310.	0.655	12.93	1.019
RA-224	482.76	241.80	970.	133.	0.067	102.60	1.500
PB-214	589.99	295.42	398.	334.	0.167	33.28	0.984
AC-228	675.95	338.40	434.	254.	0.127	47.74	1.133
PB-214	703.42	352.14	271.	520.	0.260	19.91	1.172
SB-125	925.62	463.25	184.	85.	0.042	73.95	1.500
TL-208	1021.46	511.17	240.	211.	0.105	38.31	1.433s
TL-208	1166.02	583.46	170.	432.	0.216	21.21	1.538
BI-214	1218.34	609.62	166.	432.	0.216	21.64	1.548s
BI-212	1454.75	727.84	124.	145.	0.072	47.56	1.411s
CS-134	1589.85	795.40	95.	43.	0.022	105.12	1.500
AC-228	1822.68	911.83	102.	337.	0.168	22.61	1.727
EU-152	1929.24	965.11	65.	51.	0.025	78.70	1.538s
AC-228	1936.81	968.90	64.	155.	0.078	32.51	1.541D

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-214	2240.34	1120.68	173.	160.	0.080	53.86	2.142s
K-40	2921.97	1461.55	53.	1977.	0.989	6.95	1.895
BI-212	3242.91	1622.05	3.	26.	0.013	72.84	1.233s
BI-214	3529.99	1765.62	9.	79.	0.040	37.07	1.449

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 pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		-1.6103E-02					
			477.56	-1.610E-02	&(	3.787E-01 1.11E-01	G
K-40		2.2742E+01					
			1460.75	2.274E+01	(P	4.207E-01 5.32E-01	G
MN-54		-1.3295E-02					
			834.81	-1.329E-02	%(P	4.323E-02 1.28E-02	G
CO-57		-1.4189E-02					
			122.07	-1.419E-02	%(P	5.717E-02 1.72E-02	G K
			136.43	-1.406E-02	&	4.153E-01 1.24E-01	G
CO-60		-9.8191E-03					
			1332.51	-9.819E-03	%(P	4.571E-02 1.30E-02	G K
			1173.23	2.337E-02	% P	5.148E-02 1.55E-02	G K
Sr-85		-2.4786E-02					
			514.00	-2.479E-02	&(	5.364E-02 1.63E-02	G
Kr-85		-5.3540E+02					
			513.99	-5.354E+02	&(	1.159E+03 3.51E+02	G
Y-88		-4.6911E-03					
			1836.01	-4.691E-03	%(P	3.444E-02 9.55E-03	G K
			898.02	1.228E-02	% P	4.338E-02 1.28E-02	G
NB-94		1.1015E-02					
			871.10	1.101E-02	&(	3.654E-02 1.08E-02	G K
			702.50	-4.581E-03	&	4.238E-02 1.24E-02	G K
Ag-108M		-1.7173E-02					
			722.95	-1.717E-02	%(	4.884E-02 1.46E-02	G K
			614.37	-1.857E-02	% P	4.693E-02 1.41E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		433.93	-6.153E-03	%	3.813E-02	1.13E-02	G
CD-109	1.9272E+00						
		88.04	1.927E+00	@(	2.058E+00	6.34E-01	G
SN-113	-1.7397E-02						
		391.71	-1.740E-02	%(	5.757E-02	1.72E-02	G K
		255.04	-4.723E-01	%	1.844E+00	5.53E-01	G
SB-125	1.1107E-01						
		427.95	8.618E-04	%(P	1.039E-01	3.02E-02	G K
		600.77	-8.855E-04	% P	1.815E-01	5.23E-02	G
		636.15	1.950E-03	% P	3.329E-01	9.61E-02	G
		463.51	4.373E-01	(P	3.393E-01	1.09E-01	G
		176.29	1.919E-01	&	6.428E-01	1.94E-01	G
I-131	-7.9611E-04						
		364.48	-7.961E-04	&(P	7.870E-02	2.31E-02	G K
		636.97	1.389E-02	&	6.441E-01	1.83E-01	G
		284.29	-7.433E-02	% P	9.808E-01	2.91E-01	G
CS-134	1.7101E-02						
		604.66	-3.109E-03	%(	3.164E-02	9.18E-03	G K
		795.76	4.020E-02	(P	4.446E-02	1.41E-02	G
		569.29	-2.359E-02	& P	2.345E-01	6.80E-02	G
		801.84	7.170E-02	& P	3.607E-01	1.04E-01	G
CS-137	1.4475E-02						
		661.62	1.448E-02	%(P	4.663E-02	1.39E-02	G
CE-139	6.8600E-03						
		165.85	6.860E-03	%(	5.096E-02	1.52E-02	G
EU-152	7.6927E-02						
		121.78	-4.181E-02	%(P	1.652E-01	4.97E-02	G K
		344.30	2.063E-03	% P	1.326E-01	3.90E-02	G
		1408.08	0.000E+00	%	1.833E-01	5.10E-02	G
		964.00	3.151E-01	(P	2.508E-01	8.35E-02	G
		1112.07	8.349E-02	%	3.387E-01	9.98E-02	G
		778.90	4.562E-02	%	2.777E-01	8.11E-02	G
EU-154	1.1575E-02						
		123.10	1.157E-02	%(	1.182E-01	3.54E-02	G K
		1274.80	-1.589E-02	%	1.392E-01	4.03E-02	G
		723.30	-1.739E-03	%	2.039E-01	5.89E-02	G
		1004.80	1.796E-02	%	2.169E-01	6.22E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	2.1203E-01						
		86.45	2.120E-01	&(	2.618E-01	8.03E-02	G K
		105.31	5.191E-03	&	2.574E-01	7.68E-02	G
HG-203	-7.9697E-03						
		279.17	-7.970E-03	&(P	5.233E-02	1.56E-02	G K
		72.87	5.282E-03	% P	2.908E+00	8.70E-01	G
		70.83	1.362E+00	&	4.404E+00	1.33E+00	G
		82.50	-8.421E-01	%	4.602E+00	1.38E+00	G
TL-208	3.0947E-01						
		583.14	3.095E-01	(P	4.551E-02	2.21E-02	G
		510.72	5.196E-01	+ P	1.845E-01	7.48E-02	G
PB-212	9.7216E-01						
		238.63	9.567E-01	(P	9.533E-02	4.16E-02	G K
							Energy duplication
		77.11	7.758E-01	} P	4.198E-01	1.09E-01	G
		74.81	1.372E+00	+ P	8.315E-01	2.67E-01	G
PB-214	5.9326E-01						
		351.99	5.761E-01	(P	8.808E-02	3.87E-02	G K
		295.22	6.264E-01	(P	1.798E-01	7.04E-02	G
							Energy duplication
		77.11	1.657E-01	} P	1.015E+00	2.41E-01	G
		241.92	2.283E-01	%	6.479E-01	1.96E-01	G
BI-212	9.6364E-01						
		727.17	8.978E-01	*(P	3.395E-01	1.43E-01	G K
		1620.56	1.246E+00	(P	5.372E-01	3.03E-01	G
		785.42	4.136E-02	%	2.331E+00	6.77E-01	G
BI-214	6.2532E-01						
		609.32	5.975E-01	*(P	8.701E-02	4.38E-02	G K
		1764.51	7.057E-01	(P	1.480E-01	9.09E-02	G
		1120.28	1.078E+00	+ P	4.307E-01	1.96E-01	G
RA-224	1.0802E+00						
		241.00	1.080E+00	(	1.200E+00	3.69E-01	G
RA-226	1.4957E+00						
		185.99	1.496E+00	*(P	1.232E+00	3.83E-01	G
AC-228	1.0087E+00						
		911.07	1.009E+00	(P	1.494E-01	7.68E-02	G K
		968.90	8.078E-01	- P	2.083E-01	8.76E-02	G
		338.40	8.420E-01	- P	3.316E-01	1.35E-01	G

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

TH-227      -2.2496E-01
                          236.00-2.250E-01 &(  4.346E-01 1.32E-01 G K
                          256.25-1.558E-02 % P 5.830E-01 1.73E-01 G

PA-234       6.8397E-02
                           98.44 6.840E-02 %(P 2.481E-01 7.47E-02 G K
                          946.00-2.763E-02 % P 2.113E-01 6.14E-02 G
                          131.28-2.514E-03 & P 2.315E-01 6.90E-02 G
                           94.67-1.418E-01 & P 4.519E-01 1.36E-01 G
                          883.24-6.650E-02 &   3.576E-01 1.05E-01 G
                          926.70 7.854E-02 &   3.605E-01 1.06E-01 G
                          569.26-3.187E-02 & P 3.455E-01 1.00E-01 G

TH-234       1.1494E+00
                           63.29 1.149E+00 %(P 7.400E+00 2.21E+00 G K
                           92.80 1.396E+00 % P 2.406E+00 7.30E-01 G
                           92.38 1.648E+00 & P 2.865E+00 8.69E-01 G

AM-241      -2.0160E-01
                           59.54-2.016E-01 %(P 1.289E+00 3.86E-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

- -

***** 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 pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	-1.4851E-02	-1.6103E-02	3.3240E-01	3.3240E-01	3.493E-01
K-40		2.2742E+01	2.2742E+01	1.5947E+00	2.0703E+00	
MN-54	#A	-1.3112E-02	-1.3295E-02	4.0290E-02	4.0297E-02	4.264E-02
CO-57	#B	-1.3964E-02	-1.4189E-02	5.2755E-02	5.2761E-02	5.626E-02
CO-60	#B	-9.7971E-03	-9.8191E-03	7.3891E-02	7.3893E-02	4.561E-02
Sr-85	#A	-2.3187E-02	-2.4786E-02	4.8751E-02	4.8772E-02	5.018E-02
Kr-85	#A	-5.3538E+02	-5.3540E+02	1.0529E+03	1.0534E+03	1.159E+03
Y-88	#B	-4.5047E-03	-4.6911E-03	2.9859E-02	2.9860E-02	3.308E-02
NB-94	#B	1.1015E-02	1.1015E-02	3.2500E-02	3.2506E-02	3.654E-02
Ag-108M	#B	-1.7172E-02	-1.7173E-02	4.3920E-02	4.3931E-02	4.884E-02
CD-109	#A	1.9089E+00	1.9272E+00	1.9025E+00	1.9055E+00	2.039E+00
SN-113	#B	-1.6756E-02	-1.7397E-02	5.1736E-02	5.1745E-02	5.545E-02
SB-125	#F	1.1059E-01	1.1107E-01	8.3362E-02	8.3611E-02	1.035E-01
I-131	#B	-4.6506E-04	-7.9611E-04	5.2205E-01	5.2205E-01	4.598E-02
CS-134	#B	1.7003E-02	1.7101E-02	1.8013E-02	1.8040E-02	3.146E-02
CS-137	#A	1.4470E-02	1.4475E-02	4.1643E-02	4.1652E-02	4.661E-02
CE-139	#A	6.6477E-03	6.8600E-03	4.5747E-02	4.5749E-02	4.938E-02
EU-152	#B	7.6855E-02	7.6927E-02	6.1192E-02	6.1340E-02	1.651E-01
EU-154	#B	1.1559E-02	1.1575E-02	1.0610E-01	1.0610E-01	1.180E-01
EU-155	#A	2.1153E-01	2.1203E-01	2.4081E-01	2.4110E-01	2.612E-01
HG-203	#B	-7.2636E-03	-7.9697E-03	4.7057E-02	4.7059E-02	4.769E-02
TL-208		3.0947E-01	3.0947E-01	6.6284E-02	6.8676E-02	
PB-212		9.7216E-01	9.7216E-01	1.2686E-01	1.3885E-01	
PB-214		5.9326E-01	5.9326E-01	1.1639E-01	1.2138E-01	
BI-212	#	9.6364E-01	9.6364E-01	4.2009E-01	4.2380E-01	
BI-214		6.2532E-01	6.2532E-01	1.3733E-01	1.4205E-01	
RA-224	A	1.0802E+00	1.0802E+00	1.1084E+00	1.1101E+00	1.200E+00
RA-226	#	1.4957E+00	1.4957E+00	1.1479E+00	1.1512E+00	1.232E+00
AC-228		1.0087E+00	1.0087E+00	2.3039E-01	2.3771E-01	
TH-227	#B	-2.2496E-01	-2.2496E-01	3.9600E-01	3.9622E-01	4.346E-01
PA-234	#B	6.8397E-02	6.8397E-02	2.2412E-01	2.2415E-01	2.481E-01
TH-234	#B	1.1494E+00	1.1494E+00	6.6436E+00	6.6439E+00	7.400E+00
AM-241	#A	-2.0159E-01	-2.0160E-01	1.1791E+00	1.1792E+00	1.289E+00

- 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

YAEC Chemistry Lab Spectrum name: 103F_15SEPT2006_1338.An1

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

Total Activity (1107.0 to 2000.7 keV) 2.8294500E+01 pCi/gm
Total Decayed Activity (1107.0 to 2000.7 keV) 2.8294500E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 103F_15SEPT2006_1419.An1

Sample description
FSS-SSS-01-01-018-F

Spectrum Filename: C:\GammaVision\Spectra\103F_15SEPT2006_1419.An1

Acquisition information
Start time: 15-Sep-2006 14:19:00
Live time: 2000
Real time: 2002
Dead time: 0.12 %
Detector ID: 4

Detector system
Det 103 - DSPE-471

Calibration
Filename: D3_1LSa.Clb
Detector_103 1.0 Liter Sand Geometry

Energy Calibration
Created: 08-Aug-2005 11:09:41
Zero offset: 0.409 keV
Gain: 0.500 keV/channel
Quadratic: 1.092E-08 keV/channel^2

Efficiency Calibration
Created: 08-Aug-2005 11:11:25
Type: Polynomial
Uncertainty: 0.993 %
Coefficients: -0.264059 -5.138468 0.638383
-0.089199 0.005011 -0.000129

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.41keV)
Stop channel: 4000 (2000.67keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.8980E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.8980E+03) =
5.2687E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five 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	10-Sep-2006 15:10:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	103_150K_05AUG05.Pbc 08-Aug-2005 12:54:15
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 15 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.2254

***** 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. pCi/gm	Nuc
74.78	111.	26.10	0.99	9.055E-03	74.81	9.600	8.859E-01	PB212
77.24	253.	12.32	0.99	1.019E-02	77.11	17.500	1.008E+00	PB212
					77.11	10.700	1.648E+00	PB214
86.84	97.	30.44	1.00	1.427E-02	86.45	32.740	1.496E-01	EU155
89.90	99.	30.87	1.00	1.542E-02				
93.95	105.	30.43	1.00	1.685E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.35	152.	25.15	1.09	2.566E-02	185.99	3.280	1.172E+00	RA226
209.70	108.	30.87	0.95	2.469E-02				
238.81	1141.	3.52	1.09	2.319E-02	238.63	43.100	8.038E-01	PB212
241.53	165.	20.22	1.09	2.305E-02	241.00	3.900	1.305E+00	RA224
					241.92	7.470	6.825E-01	PB214
270.49	130.	25.63	1.18	2.150E-02				
277.49	86.	34.83	0.86	2.114E-02				
295.46	260.	9.20	1.13	2.024E-02	295.22	19.200	4.686E-01	PB214
300.08	82.	24.74	1.13	2.001E-02				
328.22	122.	22.25	1.20	1.873E-02				
338.49	257.	14.18	1.22	1.830E-02	338.40	12.010	8.277E-01	AC228
352.08	499.	7.83	1.22	1.775E-02	351.99	37.100	5.335E-01	PB214
463.30	124.	22.06	1.84	1.425E-02				
463.30	124.	22.06	1.84	1.425E-02	463.51	10.000	6.129E-01	SB125
511.02	171.	15.79	1.45	1.317E-02	510.72	22.500	3.467E-01	TL208
583.48	417.	7.50	1.45	1.184E-02	583.14	86.000	2.883E-01	TL208
609.51	399.	7.10	1.26	1.144E-02	609.32	46.090	5.298E-01	BI214
727.94	131.	15.63	0.97	9.957E-03	727.17	11.800	7.902E-01	BI212
795.36	53.	24.46	1.20	9.305E-03				
795.36	53.	24.46	1.20	9.305E-03	795.76	85.400	4.783E-02	CS134

911.65	309.	8.20	1.61	8.397E-03	911.07	29.000	8.932E-01	AC228
965.11	56.	22.38	1.54	8.049E-03	964.00	14.580	PBC<MDA	EU152
969.66	165.	9.78	1.54	8.021E-03	968.90	17.460	8.385E-01	AC228
1120.71	82.	21.05	0.90	7.210E-03	1120.28	15.040	5.258E-01	BI214
1461.55	1720.	2.52	1.92	5.930E-03	1460.75	10.700	1.908E+01	K40
1589.15	62.	16.84	0.89	5.569E-03				
1765.28	82.	12.36	2.07	5.140E-03	1764.51	15.920	6.883E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
172.86	86.86	386.	97.	0.048	91.31	1.001	TB-160	lD
178.97	89.91	418.	99.	0.050	92.60	1.002	PB-214	lD
418.56	209.70	456.	108.	0.054	92.60	0.953	NP-239	
540.13	270.49	374.	130.	0.065	76.88	1.181	AC-228	s
554.13	277.49	332.	83.	0.041	98.96	0.864	NP-239	
599.30	300.08	204.	77.	0.038	85.80	0.707	PB-212	
655.58	328.22	246.	122.	0.061	66.76	1.198	AC-228	s
1930.80	965.21	61.	46.	0.023	85.18	1.539	AC-228	D
3177.12	1589.15	9.	62.	0.031	50.52	0.887	AC-228	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: FSS_Rev_1.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 3 Sigma %	FWHM keV
PB-212	148.79	74.81	370.	107.	0.054	78.78	0.993D
PB-212	153.39	77.11	364.	197.	0.098	4.20	0.995A
TH-234	185.83	93.33	1003.	152.	0.076	82.05	1.500s
TH-234	185.82	93.32	979.	157.	0.078	78.79	1.500s
RA-226	371.85	186.35	578.	139.	0.069	75.46	1.089s
PB-212	476.74	238.79	723.	1082.	0.541	14.69	1.063
RA-224	482.84	241.84	794.	138.	0.069	90.14	1.500
PB-214	590.06	295.46	255.	236.	0.118	35.15	0.974
AC-228	676.11	338.49	345.	256.	0.128	42.54	1.216
PB-214	703.29	352.08	337.	494.	0.247	23.49	1.216
SB-125	925.81	463.34	191.	77.	0.039	81.82	1.500s
TL-208	1021.15	511.02	213.	144.	0.072	47.37	1.446s
TL-208	1166.07	583.48	175.	412.	0.206	22.51	1.452
BI-214	1218.13	609.51	137.	392.	0.196	21.31	1.264
BI-212	1454.95	727.94	96.	131.	0.065	46.88	0.970s
CS-134	1589.64	795.29	48.	57.	0.029	64.64	1.500
AC-228	1822.33	911.65	98.	306.	0.153	24.59	1.612s
AC-228	1936.81	968.90	54.	165.	0.082	30.08	1.541D
BI-214	2240.39	1120.71	74.	80.	0.040	63.16	0.900s
K-40	2921.98	1461.55	56.	1701.	0.850	7.57	1.924
BI-214	3529.30	1765.28	9.	79.	0.040	37.07	2.074

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 pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		7.1885E-02					
			477.56	7.188E-02	%(	3.497E-01 1.04E-01	G
K-40		1.9079E+01					
			1460.75	1.908E+01	(P	4.220E-01 4.87E-01	G
MN-54		-2.6167E-03					
			834.81	-2.617E-03	&(P	3.814E-02 1.10E-02	G
CO-57		-6.9497E-03					
			122.07	-6.950E-03	%(P	5.466E-02 1.64E-02	G K
			136.43	-7.015E-03	%	3.481E-01 1.04E-01	G
CO-60		-4.9999E-03					
			1332.51	-5.000E-03	%(P	3.855E-02 1.06E-02	G K
			1173.23	6.574E-03	% P	5.018E-02 1.45E-02	G K
Sr-85		-2.0423E-02					
			514.00	-2.042E-02	&(	4.571E-02 1.38E-02	G
Kr-85		-4.4714E+02					
			513.99	-4.471E+02	&(	1.001E+03 3.03E+02	G
Y-88		4.6274E-03					
			1836.01	4.627E-03	&(P	2.045E-02 5.62E-03	G K
			898.02	1.072E-02	% P	3.774E-02 1.11E-02	G
NB-94		9.4455E-03					
			871.10	9.446E-03	%(	3.330E-02 9.83E-03	G K
			702.50	9.994E-04	%	3.331E-02 9.57E-03	G K
Ag-108M		1.2423E-03					
			722.95	1.242E-03	%(	4.446E-02 1.29E-02	G K
			614.37	-3.241E-02	& P	4.715E-02 1.45E-02	G
			433.93	-1.559E-02	%	3.907E-02 1.18E-02	G
CD-109		-2.6182E-01					
			88.04	-2.618E-01	&(	1.519E+00 4.54E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SN-113	-7.2506E-04						
		391.71	-7.251E-04	%(	5.196E-02	1.52E-02	G K
		255.04	3.258E-01	&	1.618E+00	4.83E-01	G
SB-125	9.7728E-02						
		427.95	-1.232E-04	%(P	1.063E-01	3.10E-02	G K
		600.77	5.846E-02	% P	1.537E-01	4.61E-02	G
		636.15	6.200E-03	& P	2.502E-01	7.13E-02	G
		463.51	3.874E-01	*(P	3.368E-01	1.07E-01	G
		176.29	2.750E-02	%	5.873E-01	1.75E-01	G
I-131	-5.7027E-03						
		364.48	-5.703E-03	&(P	5.794E-02	1.70E-02	G K
		636.97	-8.704E-02	%	7.206E-01	2.10E-01	G
		284.29	1.547E-01	% P	7.656E-01	2.28E-01	G
CS-134	2.3869E-02						
		604.66	-5.297E-04	%(	3.674E-02	1.06E-02	G K
		795.76	5.175E-02	(P	3.158E-02	1.12E-02	G
		569.29	-6.486E-03	& P	2.445E-01	7.07E-02	G
		801.84	-1.618E-02	% P	4.119E-01	1.17E-01	G
CS-137	6.7302E-03						
		661.62	6.730E-03	%(P	4.056E-02	1.19E-02	G
CE-139	-9.7804E-03						
		165.85	-9.780E-03	&(	4.712E-02	1.41E-02	G
EU-152	-1.8470E-02						
		121.78	-1.847E-02	%(P	1.582E-01	4.73E-02	G K
		344.30	-4.601E-03	% P	1.172E-01	3.44E-02	G
		1408.08	6.860E-02	%	1.503E-01	4.55E-02	G
		964.00	3.313E-03	% P	3.763E-01	1.09E-01	G
		1112.07	8.364E-03	%	3.498E-01	1.01E-01	G
		778.90	-6.871E-02	%	3.011E-01	8.89E-02	G
EU-154	-1.2363E-02						
		123.10	-1.236E-02	%(	9.240E-02	2.76E-02	G K
		1274.80	-2.825E-02	%	1.409E-01	4.13E-02	G
		723.30	3.312E-02	%	2.001E-01	5.88E-02	G
		1004.80	-5.748E-03	%	2.494E-01	7.16E-02	G
EU-155	1.3797E-01						
		86.45	1.380E-01	%(	2.345E-01	7.14E-02	G K
		105.31	1.768E-02	&	2.290E-01	6.84E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
HG-203	1.6084E-03						
		279.17	1.608E-03	&(P	4.356E-02	1.29E-02	G K
		72.87	-7.222E-01	% P	2.312E+00	6.97E-01	G
		70.83	-1.293E-01	%	5.027E+00	1.50E+00	G
		82.50	-1.080E+00	%	3.915E+00	1.18E+00	G
TL-208	3.0042E-01						
		583.14	2.883E-01	(P	4.492E-02	2.19E-02	G
		510.72	3.467E-01	*(P	1.698E-01	6.49E-02	G
PB-212	7.9059E-01						
		238.63	7.705E-01	(P	9.115E-02	3.82E-02	G K
							Energy duplication
		77.11	7.906E-01	} P	3.683E-01	1.11E-02	G
		74.81	8.808E-01	(P	7.561E-01	2.38E-01	G
PB-214	5.3354E-01						
		351.99	5.335E-01	(P	9.547E-02	4.23E-02	G K
		295.22	4.325E-01	- P	1.412E-01	5.16E-02	G
							Energy duplication
		77.11	9.024E-02	} P	8.893E-01	2.37E-01	G
		241.92	2.970E-01	%	5.781E-01	1.76E-01	G
BI-212	7.9023E-01						
		727.17	7.902E-01	(P	2.936E-01	1.24E-01	G K
		1620.56	7.007E-02	& P	1.021E+00	2.77E-01	G
		785.42	-7.700E-02	%	1.953E+00	5.64E-01	G
BI-214	5.2883E-01						
		609.32	5.298E-01	(P	7.723E-02	3.83E-02	G K
		1764.51	6.883E-01	+ P	1.443E-01	8.86E-02	G
		1120.28	5.258E-01	*(P	2.807E-01	1.13E-01	G
RA-224	1.0945E+00						
		241.00	1.094E+00	&(	1.061E+00	3.29E-01	G
RA-226	1.1717E+00						
		185.99	1.172E+00	*(P	9.708E-01	3.22E-01	G
AC-228	8.6285E-01						
		911.07	8.932E-01	@(P	1.430E-01	7.41E-02	G K
		968.90	8.367E-01	(P	1.883E-01	8.40E-02	G
		338.40	8.277E-01	(P	2.894E-01	1.18E-01	G
TH-227	-1.2573E-01						
		236.00	-1.257E-01	%(	3.873E-01	1.17E-01	G K
		256.25	1.137E-01	% P	4.814E-01	1.44E-01	G

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

PA-234      -1.9834E-03
                           98.44-1.983E-03 %(P 2.221E-01 6.61E-02 G K
                          946.00-2.521E-04 & P 1.507E-01 4.22E-02 G
                          131.28-9.115E-04 & P 2.117E-01 6.30E-02 G
                           94.67 3.907E-02 % P 3.504E-01 1.05E-01 G
                          883.24 8.626E-02 %   2.532E-01 7.52E-02 G
                          926.70 5.011E-02 &   2.931E-01 8.49E-02 G
                          569.26-9.578E-03 & P 3.610E-01 1.04E-01 G

TH-234       1.7170E+00
                           63.29 7.335E-01 %(P 6.936E+00 2.07E+00 G K
                           92.80 2.261E+00 &(P 2.143E+00 6.61E-01 G
                           92.38 2.574E+00 &(P 2.554E+00 7.86E-01 G

AM-241       3.4941E-01
                           59.54 3.494E-01 &(P 1.080E+00 3.25E-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

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

***** 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 pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	6.7398E-02	7.1885E-02	3.1087E-01	3.1090E-01	3.279E-01
K-40		1.9079E+01	1.9079E+01	1.4607E+00	1.8332E+00	
MN-54	#A	-2.5880E-03	-2.6167E-03	4.1059E-02	4.1059E-02	3.772E-02
CO-57	#B	-6.8617E-03	-6.9497E-03	5.1328E-02	5.1329E-02	5.397E-02
CO-60	#B	-4.9909E-03	-4.9999E-03	1.2478E-01	1.2478E-01	3.848E-02
Sr-85	#A	-1.9368E-02	-2.0423E-02	4.1487E-02	4.1504E-02	4.334E-02
Kr-85	#A	-4.4713E+02	-4.4714E+02	9.0830E+02	9.0867E+02	1.001E+03
Y-88	#B	4.4804E-03	4.6274E-03	1.6857E-02	1.6859E-02	1.980E-02
NB-94	#B	9.4455E-03	9.4455E-03	2.9498E-02	2.9503E-02	3.330E-02
Ag-108M	#B	1.2422E-03	1.2423E-03	3.8648E-02	3.8648E-02	4.445E-02
CD-109	#A	-2.5984E-01	-2.6182E-01	1.3627E+00	1.3627E+00	1.508E+00
SN-113	#B	-7.0370E-04	-7.2506E-04	4.5626E-02	4.5626E-02	5.043E-02
SB-125	#B	9.7396E-02	9.7728E-02	8.1282E-02	8.1480E-02	1.060E-01
I-131	#B	-3.7171E-03	-5.7027E-03	6.1642E-02	6.1643E-02	3.777E-02
CS-134	#B	2.3760E-02	2.3869E-02	1.5453E-02	1.5515E-02	3.657E-02
CS-137	#A	6.7281E-03	6.7302E-03	3.5559E-02	3.5561E-02	4.055E-02
CE-139	#A	-9.5387E-03	-9.7804E-03	4.2400E-02	4.2404E-02	4.596E-02
EU-152	#B	-1.8456E-02	-1.8470E-02	1.5816E-01	1.5816E-01	1.581E-01
EU-154	#B	-1.2350E-02	-1.2363E-02	8.2787E-02	8.2790E-02	9.230E-02
EU-155	#B	1.3771E-01	1.3797E-01	2.1424E-01	2.1438E-01	2.341E-01
HG-203	#B	1.4939E-03	1.6084E-03	3.8640E-02	3.8640E-02	4.046E-02
TL-208		3.0042E-01	3.0042E-01	6.8346E-02	7.0536E-02	
PB-212		7.9059E-01	7.9059E-01	1.1746E-01	1.2611E-01	
PB-214		5.3354E-01	5.3354E-01	1.2676E-01	1.3049E-01	
BI-212	#	7.9023E-01	7.9023E-01	3.7184E-01	3.7466E-01	
BI-214		5.2883E-01	5.2883E-01	1.1455E-01	1.1859E-01	
RA-224	#	1.0945E+00	1.0945E+00	9.8651E-01	9.8855E-01	1.061E+00
RA-226	#	1.1717E+00	1.1717E+00	9.6686E-01	9.6925E-01	
AC-228		8.6285E-01	8.6285E-01	1.6648E-01	1.7385E-01	
TH-227	#B	-1.2573E-01	-1.2573E-01	3.5033E-01	3.5041E-01	3.873E-01
PA-234	#B	-1.9834E-03	-1.9834E-03	1.5655E+00	1.5655E+00	2.221E-01
TH-234	#B	1.7170E+00	1.7170E+00	1.5052E+00	1.5082E+00	6.936E+00
AM-241	#A	3.4940E-01	3.4941E-01	9.7584E-01	9.7603E-01	1.080E+00

- 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

YAEC Chemistry Lab Spectrum name: 103F_15SEPT2006_1419.An1

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

Total Activity (1120.0 to 2000.7 keV) 2.4057386E+01 pCi/gm
Total Decayed Activity (1120.0 to 2000.7 keV) 2.4057394E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 103F_15SEPT2006_1458.An1

Sample description
FSS-SSS-01-01-018-F-RC

Spectrum Filename: C:\GammaVision\Spectra\103F_15SEPT2006_1458.An1

Acquisition information
Start time: 15-Sep-2006 14:58:16
Live time: 2000
Real time: 2002
Dead time: 0.12 %
Detector ID: 4

Detector system
Det 103 - DSPE-471

Calibration
Filename: D3_1LSa.Clb
Detector_103 1.0 Liter Sand Geometry

Energy Calibration
Created: 08-Aug-2005 11:09:41
Zero offset: 0.409 keV
Gain: 0.500 keV/channel
Quadratic: 1.092E-08 keV/channel^2

Efficiency Calibration
Created: 08-Aug-2005 11:11:25
Type: Polynomial
Uncertainty: 0.993 %
Coefficients: -0.264059 -5.138468 0.638383
-0.089199 0.005011 -0.000129

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.41keV)
Stop channel: 4000 (2000.67keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.8980E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.8980E+03) =
5.2687E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five 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	10-Sep-2006 15:10:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	103_150K_05AUG05.Pbc 08-Aug-2005 12:54:15
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 17 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.2935

***** 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. pCi/gm	Nuc
74.91	138.	21.83	0.99	9.052E-03	74.81	9.600	1.127E+00	PB212
77.21	185.	14.04	0.99	1.011E-02	77.11	17.500	9.668E-01	PB212
					77.11	10.700	1.581E+00	PB214
93.48	130.	38.35	1.41	1.668E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
128.65	99.	39.77	1.04	2.432E-02				
186.33	158.	23.43	0.94	2.566E-02	185.99	3.280	1.223E+00	RA226
209.86	90.	33.92	1.02	2.469E-02				
238.80	1234.	3.33	1.09	2.319E-02	238.63	43.100	8.704E-01	PB212
242.49	123.	22.74	1.10	2.299E-02	241.00	3.900	9.726E-01	RA224
					241.92	7.470	5.089E-01	PB214
270.62	96.	26.49	1.05	2.149E-02				
277.42	88.	35.57	1.40	2.114E-02				
277.42	88.	35.57	1.40	2.114E-02	279.17	81.500	PBC<MDA	HG203
295.30	284.	10.83	1.28	2.024E-02	295.22	19.200	5.134E-01	PB214
300.21	58.	36.90	1.41	2.001E-02				
328.14	83.	26.82	1.46	1.874E-02				
338.63	280.	11.36	1.11	1.829E-02	338.40	12.010	9.025E-01	AC228
352.20	482.	6.99	1.27	1.774E-02	351.99	37.100	5.145E-01	PB214
409.18	47.	36.04	1.24	1.576E-02				
463.02	67.	26.23	0.79	1.426E-02				
463.02	67.	26.23	0.79	1.426E-02	463.51	10.000	3.286E-01	SB125
511.14	200.	15.96	1.62	1.316E-02	510.72	22.500	4.152E-01	TL208
583.51	416.	6.16	1.27	1.184E-02	583.14	86.000	2.878E-01	TL208
609.65	379.	7.48	1.48	1.143E-02	609.32	46.090	5.033E-01	BI214
727.95	102.	20.94	1.43	9.957E-03	727.17	11.800	6.177E-01	BI212
795.71	79.	27.16	1.22	9.302E-03				

795.71	79.	27.16	1.22	9.302E-03	795.76	85.400	7.124E-02	CS134
836.68	32.	32.41	1.11	8.955E-03				
860.84	60.	25.82	1.44	8.765E-03				
911.71	286.	8.22	1.51	8.397E-03	911.07	29.000	8.257E-01	AC228
964.87	47.	27.51	1.54	8.050E-03	964.00	14.580	PBC<MDA	EU152
969.61	140.	10.57	1.54	8.021E-03	968.90	17.460	7.095E-01	AC228
1120.93	83.	24.35	1.79	7.209E-03	1120.28	15.040	5.324E-01	BI214
1461.61	1600.	2.62	1.94	5.929E-03	1460.75	10.700	1.774E+01	K40
1765.49	80.	11.99	1.42	5.140E-03	1764.51	15.920	6.674E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
418.88	209.86	421.	90.	0.045	101.76	1.024	NP-239	s
540.39	270.62	263.	96.	0.048	79.48	1.053	AC-228	
554.00	277.42	352.	88.	0.044	106.71	1.397	TL-208	l
599.57	300.21	200.	58.	0.029	110.69	1.406	PB-212	s
655.43	328.14	197.	83.	0.042	80.45	1.455	AC-228	s
817.49	409.18	120.	47.	0.023	108.13	1.242	CS-138	
1590.49	795.71	147.	45.	0.022	123.65	1.224	CS-134	
1720.73	860.84	65.	60.	0.030	77.47	1.439	TL-208	
1930.10	964.90	52.	55.	0.028	68.39	1.539	AC-228	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: FSS_Rev_1.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 3 Sigma %	FWHM keV
PB-212	148.79	74.81	404.	138.	0.069	65.49	0.993D
PB-212	153.39	77.11	397.	185.	0.093	42.13	0.995A
RA-226	371.82	186.33	691.	143.	0.072	82.74	0.943
PB-212	476.86	238.85	828.	1173.	0.587	14.74	1.052
RA-224	482.62	241.73	868.	119.	0.059	108.64	1.500
PB-214	589.74	295.30	293.	280.	0.140	32.48	1.281
AC-228	676.40	338.63	271.	279.	0.139	34.08	1.112
PB-214	703.53	352.20	247.	476.	0.238	20.97	1.266
SB-125	925.49	463.18	165.	56.	0.028	102.92	1.500s
TL-208	1021.39	511.14	259.	173.	0.086	47.87	1.623s
TL-208	1166.12	583.51	100.	412.	0.206	18.47	1.267
BI-214	1218.39	609.65	135.	373.	0.186	22.44	1.484
BI-212	1454.97	727.95	116.	102.	0.051	62.81	1.431s
AC-228	1822.45	911.71	89.	283.	0.141	24.67	1.505
EU-152	1929.78	965.38	101.	41.	0.020	113.20	1.538
AC-228	1936.81	968.90	47.	140.	0.070	32.78	1.541D
BI-214	2240.83	1120.93	107.	81.	0.041	73.05	1.785
K-40	2922.09	1461.61	51.	1581.	0.791	7.87	1.943
BI-214	3529.73	1765.49	6.	77.	0.038	35.97	1.419s

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 pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		4.9729E-02					
			477.56	4.973E-02	&(	3.112E-01 9.15E-02	G
K-40		1.7738E+01					
			1460.75	1.774E+01	(P	4.027E-01 4.71E-01	G
MN-54		-1.3234E-02					
			834.81	-1.323E-02	%(P	4.128E-02 1.23E-02	G
CO-57		4.7953E-04					
			122.07	4.795E-04	&(P	4.638E-02 1.38E-02	G K
			136.43	6.404E-02	%	4.155E-01 1.25E-01	G
CO-60		-3.9664E-04					
			1332.51	-3.966E-04	%(P	3.073E-02 8.17E-03	G K
			1173.23	1.590E-02	% P	5.564E-02 1.65E-02	G K
Sr-85		-1.1165E-02					
			514.00	-1.117E-02	&(	4.643E-02 1.38E-02	G
Kr-85		-2.4436E+02					
			513.99	-2.444E+02	&(	1.016E+03 3.03E+02	G
Y-88		-3.2350E-04					
			1836.01	-3.235E-04	%(P	2.362E-02 5.95E-03	G K
			898.02	7.957E-03	& P	3.770E-02 1.10E-02	G
NB-94		1.6431E-05					
			871.10	1.643E-05	%(	3.442E-02 9.77E-03	G K
			702.50	6.888E-03	&	3.706E-02 1.09E-02	G K
Ag-108M		-1.3939E-02					
			722.95	-1.394E-02	&(	4.532E-02 1.35E-02	G K
			614.37	-1.703E-02	% P	4.396E-02 1.32E-02	G
			433.93	3.419E-03	%	3.493E-02 1.03E-02	G
CD-109		1.3279E+00					
			88.04	1.328E+00	%(	1.946E+00 5.95E-01	G
SN-113		-2.4613E-04					
			391.71	-2.461E-04	%(	4.927E-02 1.44E-02	G K
			255.04	-2.912E-01	%	1.566E+00 4.67E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	7.3564E-02						
		427.95	3.815E-03	%(P	1.125E-01	3.29E-02	G K
		600.77	-8.904E-05	% P	1.584E-01	4.53E-02	G
		636.15	1.186E-02	& P	3.080E-01	8.90E-02	G
		463.51	2.800E-01	*(P	3.135E-01	9.83E-02	G
		176.29	-3.186E-02	&	5.223E-01	1.55E-01	G
I-131	-1.3642E-03						
		364.48	-1.364E-03	&(P	6.330E-02	1.86E-02	G K
		636.97	0.000E+00	%	8.434E-01	2.45E-01	G
		284.29	-1.923E-01	% P	8.290E-01	2.48E-01	G
CS-134	-9.0969E-03						
		604.66	-9.097E-03	%(	3.435E-02	1.02E-02	G K
		795.76	3.099E-02	% P	4.162E-02	1.30E-02	G
		569.29	-9.482E-03	% P	2.342E-01	6.76E-02	G
		801.84	-9.207E-02	% P	4.331E-01	1.26E-01	G
CS-137	-7.2550E-03						
		661.62	-7.255E-03	%(P	4.086E-02	1.19E-02	G
CE-139	4.4091E-03						
		165.85	4.409E-03	&(	4.731E-02	1.41E-02	G
EU-152	7.1970E-02						
		121.78	-1.549E-02	%(P	1.288E-01	3.84E-02	G K
		344.30	-2.891E-02	& P	1.272E-01	3.79E-02	G
		1408.08	1.081E-01	%	1.448E-01	4.64E-02	G
		964.00	2.474E-01	(P	3.012E-01	9.46E-02	G
		1112.07	2.414E-02	%	3.431E-01	9.91E-02	G
		778.90	-4.288E-02	%	2.680E-01	7.82E-02	G
EU-154	-1.1328E-02						
		123.10	-1.133E-02	&(	1.122E-01	3.36E-02	G K
		1274.80	7.236E-02	%	1.074E-01	3.35E-02	G
		723.30	-3.849E-03	&	3.105E-01	9.13E-02	G
		1004.80	-3.718E-02	%	2.439E-01	7.11E-02	G
EU-155	1.5639E-01						
		86.45	1.564E-01	&(	2.449E-01	7.47E-02	G K
		105.31	4.264E-02	%	2.332E-01	6.99E-02	G
HG-203	2.3829E-02						
		279.17	2.383E-02	%(P	4.155E-02	1.27E-02	G K
		72.87	-8.491E-01	% P	2.331E+00	7.04E-01	G
		70.83	-1.180E+00	&	4.746E+00	1.43E+00	G
		82.50	-8.753E-02	&	4.468E+00	1.33E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.8775E-01						
		583.14	2.878E-01	(P	3.452E-02	1.79E-02	G
		510.72	4.152E-01	+ P	1.867E-01	7.65E-02	G
PB-212	8.7327E-01						
		238.63	8.353E-01	(P	9.741E-02	4.15E-02	G K
							Energy duplication
		77.11	7.452E-01	} P	3.842E-01	1.05E-01	G
		74.81	1.127E+00	+ P	7.900E-01	2.52E-01	G
PB-214	5.1414E-01						
		351.99	5.145E-01	(P	8.211E-02	3.64E-02	G K
		295.22	5.134E-01	(P	1.510E-01	5.64E-02	G
							Energy duplication
		77.11	1.976E-01	} P	9.414E-01	2.23E-01	G
		241.92	4.871E-02	%	6.181E-01	1.85E-01	G
BI-212	6.1766E-01						
		727.17	6.177E-01	*(P	3.203E-01	1.30E-01	G K
		1620.56	-2.426E-01	& P	9.894E-01	2.82E-01	G
		785.42	6.629E-01	%	1.742E+00	5.22E-01	G
BI-214	5.1049E-01						
		609.32	5.033E-01	(P	7.685E-02	3.83E-02	G K
		1764.51	6.674E-01	+ P	1.251E-01	8.35E-02	G
		1120.28	5.324E-01	(P	3.340E-01	1.33E-01	G
RA-224	9.4122E-01						
		241.00	9.412E-01	(	1.108E+00	3.41E-01	G
RA-226	1.2098E+00						
		185.99	1.210E+00	(P	1.059E+00	3.64E-01	G
AC-228	8.0710E-01						
		911.07	8.257E-01	(P	1.367E-01	6.87E-02	G K
		968.90	7.107E-01	(P	1.763E-01	7.77E-02	G
		338.40	9.025E-01	(P	2.575E-01	1.03E-01	G
TH-227	-2.3019E-03						
		236.00	-2.302E-03	%(	3.771E-01	1.12E-01	G K
		256.25	5.761E-04	% P	4.938E-01	1.46E-01	G
PA-234	-9.7996E-03						
		98.44	-9.800E-03	&(P	2.334E-01	6.96E-02	G K
		946.00	-4.540E-02	& P	2.057E-01	6.05E-02	G
		131.28	-4.862E-02	% P	2.237E-01	6.72E-02	G
		94.67	-1.429E-01	% P	4.154E-01	1.25E-01	G
		883.24	4.096E-02	%	2.773E-01	8.03E-02	G
		926.70	4.130E-02	&	2.996E-01	8.64E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-1.561E-02 % P 3.461E-01 1.00E-01 G

TH-234      -2.1497E-01
                           63.29-2.150E-01 %(P 6.778E+00 2.01E+00 G K
                           92.80 1.461E+00 % P 2.295E+00 6.97E-01 G
                           92.38 1.720E+00 % P 2.725E+00 8.28E-01 G

AM-241      -1.7333E-03
                           59.54-1.733E-03 &(P 1.224E+00 3.64E-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

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

***** 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 pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	4.6609E-02	4.9729E-02	2.7457E-01	2.7459E-01	2.916E-01
K-40		1.7738E+01	1.7738E+01	1.4118E+00	1.7475E+00	
MN-54	#A	-1.3088E-02	-1.3234E-02	3.8468E-02	3.8475E-02	4.082E-02
CO-57	#B	4.7342E-04	4.7953E-04	4.1353E-02	4.1353E-02	4.579E-02
CO-60	#B	-3.9593E-04	-3.9664E-04	3.2069E-02	3.2069E-02	3.068E-02

Sr-85	#A	-1.0585E-02	-1.1165E-02	4.1548E-02	4.1553E-02	4.401E-02
Kr-85	#A	-2.4435E+02	-2.4436E+02	9.0935E+02	9.0946E+02	1.016E+03
Y-88	#B	-3.1316E-04	-3.2350E-04	3.2376E-02	3.2376E-02	2.287E-02
NB-94	#B	1.6431E-05	1.6431E-05	2.9317E-02	2.9317E-02	3.442E-02
Ag-108M	#B	-1.3938E-02	-1.3939E-02	4.0553E-02	4.0561E-02	4.531E-02
CD-109	#A	1.3178E+00	1.3279E+00	1.7839E+00	1.7855E+00	1.932E+00
SN-113	#B	-2.3884E-04	-2.4613E-04	4.3144E-02	4.3144E-02	4.781E-02
SB-125	#B	7.3313E-02	7.3564E-02	7.7440E-02	7.7558E-02	1.122E-01
I-131	#B	-8.8713E-04	-1.3642E-03	1.2729E-01	1.2729E-01	4.116E-02
CS-134	#B	-9.0552E-03	-9.0969E-03	3.0565E-02	3.0569E-02	3.419E-02
CS-137	#A	-7.2527E-03	-7.2550E-03	4.8268E-02	4.8270E-02	4.085E-02
CE-139	#A	4.2995E-03	4.4091E-03	4.2369E-02	4.2369E-02	4.613E-02
EU-152	#B	7.1916E-02	7.1970E-02	8.2558E-02	8.2654E-02	1.287E-01
EU-154	#B	-1.1316E-02	-1.1328E-02	1.0069E-01	1.0069E-01	1.121E-01
EU-155	#B	1.5609E-01	1.5639E-01	2.2404E-01	2.2421E-01	2.444E-01
HG-203	#B	2.2123E-02	2.3829E-02	3.8012E-02	3.8037E-02	3.858E-02
TL-208		2.8775E-01	2.8775E-01	5.3706E-02	5.6244E-02	
PB-212		8.7327E-01	8.7327E-01	1.3000E-01	1.3954E-01	
PB-214		5.1414E-01	5.1414E-01	1.0075E-01	1.0508E-01	
BI-212	#	6.1766E-01	6.1766E-01	3.8984E-01	3.9148E-01	
BI-214		5.1049E-01	5.1049E-01	1.1652E-01	1.2023E-01	
RA-224	A	9.4122E-01	9.4122E-01	1.0225E+00	1.0240E+00	1.108E+00
RA-226		1.2098E+00	1.2098E+00	1.0916E+00	1.0938E+00	
AC-228		8.0710E-01	8.0710E-01	1.4413E-01	1.5156E-01	
TH-227	#B	-2.3019E-03	-2.3019E-03	3.3673E-01	3.3673E-01	3.771E-01
PA-234	#B	-9.7996E-03	-9.7996E-03	2.8654E-01	2.8655E-01	2.334E-01
TH-234	#B	-2.1497E-01	-2.1497E-01	8.8183E+01	8.8183E+01	6.778E+00
AM-241	#A	-1.7332E-03	-1.7333E-03	4.3448E-01	4.3448E-01	1.224E+00

- 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 (1120.0 to 2000.7 keV) 2.3499029E+01 pCi/gm
Total Decayed Activity (1120.0 to 2000.7 keV) 2.3499037E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 103F_16SEPT2006_0737.An1

Sample description
FSS-SSS-01-01-025-F

Spectrum Filename: C:\GammaVision\Spectra\103F_16SEPT2006_0737.An1

Acquisition information
Start time: 16-Sep-2006 07:37:55
Live time: 2000
Real time: 2002
Dead time: 0.11 %
Detector ID: 4

Detector system
Det 103 - DSPE-471

Calibration
Filename: D3_1LSa.Clb
Detector_103 1.0 Liter Sand Geometry

Energy Calibration
Created: 08-Aug-2005 11:09:41
Zero offset: 0.409 keV
Gain: 0.500 keV/channel
Quadratic: 1.092E-08 keV/channel^2

Efficiency Calibration
Created: 08-Aug-2005 11:11:25
Type: Polynomial
Uncertainty: 0.993 %
Coefficients: -0.264059 -5.138468 0.638383
-0.089199 0.005011 -0.000129

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.41keV)
Stop channel: 4000 (2000.67keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.5630E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.5630E+03) =
6.3980E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five 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	08-Sep-2006 09:18:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	103_150K_05AUG05.Pbc 08-Aug-2005 12:54:15
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 19 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.3523

***** 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. pCi/gm	Nuc
74.71	119.	22.85	0.99	9.100E-03	74.81	9.600	1.157E+00	PB212
77.31	274.	11.42	0.99	1.029E-02	77.11	10.700	2.162E+00	PB214
					77.11	17.500	1.322E+00	PB212
87.25	126.	34.36	1.50	1.472E-02	86.45	32.740	PBC<MDA	EU155
					88.04	3.790	1.971E+00	CD109
87.25	133.	33.77	1.50	1.410E-02	86.45	32.740	PBC<MDA	EU155
					88.04	3.790	2.087E+00	CD109
93.33	95.	40.63	1.50	1.631E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
					94.67	15.500	PBC<MDA	PA234
93.33	101.	38.25	1.50	1.645E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
					94.67	15.500	PBC<MDA	PA234
186.47	155.	19.81	1.12	2.565E-02	185.99	3.280	1.459E+00	RA226
209.29	118.	32.88	0.89	2.471E-02				
238.81	1334.	3.10	1.09	2.319E-02	238.63	43.100	1.143E+00	PB212
241.89	179.	14.52	1.10	2.303E-02	241.00	3.900	1.720E+00	RA224
					241.92	7.470	8.998E-01	PB214
270.10	141.	24.78	1.47	2.152E-02				
277.59	88.	32.05	0.81	2.113E-02				
295.27	277.	11.93	1.01	2.025E-02	295.22	19.200	6.079E-01	PB214
300.21	94.	28.84	1.14	2.001E-02				
327.83	104.	24.27	1.26	1.875E-02				
338.28	314.	11.64	1.14	1.831E-02	338.40	12.010	1.231E+00	AC228
352.04	456.	6.07	1.27	1.775E-02	351.99	37.100	5.907E-01	PB214
409.63	57.	39.80	1.52	1.574E-02				
463.17	74.	24.53	1.46	1.425E-02				

463.17	74.	24.53	1.46	1.425E-02	463.51	10.000	4.450E-01	SB125
510.87	210.	16.19	1.60	1.317E-02	510.72	22.500	5.360E-01	TL208
583.53	402.	8.22	1.18	1.184E-02	583.14	86.000	3.376E-01	TL208
609.50	366.	8.04	1.36	1.144E-02	609.32	46.090	5.889E-01	BI214
727.68	127.	15.45	1.68	9.959E-03	727.17	11.800	9.302E-01	BI212
768.48	65.	27.39	1.52	9.552E-03				
785.66	58.	28.23	1.84	9.394E-03	785.42	2.000	2.669E+00	BI212
795.56	80.	18.30	1.96	9.303E-03				

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
795.56	80.	18.30	1.96	9.303E-03	795.76	85.400	8.729E-02	CS134
861.01	58.	19.02	1.73	8.764E-03				
911.62	315.	8.25	1.75	8.398E-03	911.07	29.000	1.105E+00	AC228
934.08	34.	40.33	1.05	8.247E-03				
965.18	57.	20.76	1.54	8.048E-03				
969.36	153.	9.61	1.54	8.022E-03	968.90	17.460	9.414E-01	AC228
1121.06	101.	21.34	1.94	7.208E-03	1120.28	15.040	7.884E-01	BI214
1461.48	1266.	2.97	2.02	5.930E-03	1460.75	10.700	1.698E+01	K40
1765.47	68.	13.37	1.42	5.140E-03	1764.51	15.920	6.794E-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 Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
417.73	209.29	555.	118.	0.059	98.65	0.893	AC-228	
539.35	270.10	383.	141.	0.070	74.35	1.471	AC-228	s
554.34	277.59	287.	88.	0.044	87.73	0.809	NP-239	s
599.56	300.21	254.	94.	0.047	86.53	1.137	PB-212	
654.81	327.83	221.	104.	0.052	72.81	1.259	AC-228	s
818.40	409.63	176.	57.	0.029	119.39	1.524	AC-228	s
1536.02	768.48	84.	65.	0.032	70.45	1.519	BI-214	
1721.05	861.01	27.	58.	0.029	57.07	1.725	TL-208	s
1867.18	934.08	58.	34.	0.017	107.47	1.054	BI-214	s
1930.38	965.28	45.	54.	0.027	66.96	1.539	AC-228	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: FSS_Rev_1.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 3 Sigma %	FWHM keV
PB-212	148.79	74.81	369.	122.	0.061	69.98	0.993D
PB-212	153.39	77.11	368.	235.	0.118	37.77	0.995A
EU-155	173.68	87.25	943.	133.	0.067	101.32	1.500
CD-109	173.67	87.25	869.	126.	0.063	103.07	1.500
RA-226	372.10	186.47	407.	142.	0.071	59.44	1.118
PB-212	476.75	238.80	689.	1312.	0.656	12.72	1.025
RA-224	482.56	241.70	738.	150.	0.075	80.42	1.500
PB-214	482.79	241.81	331.	73.	0.036	106.58	1.473s
PB-214	589.68	295.27	307.	273.	0.137	35.78	1.013s
AC-228	675.70	338.28	320.	313.	0.156	34.91	1.143s
PB-214	703.22	352.04	153.	450.	0.225	18.21	1.268
SB-125	925.71	463.30	147.	59.	0.030	93.07	1.500s

TL-208	1020.86	510.87	270.	184.	0.092	48.57	1.600s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
TL-208	1166.15	583.53	181.	398.	0.199	24.65	1.182
BI-214	1218.10	609.50	153.	359.	0.180	24.11	1.362
BI-212	1454.43	727.68	86.	127.	0.063	46.35	1.676s
BI-212	1570.38	785.66	70.	58.	0.029	84.68	1.842s
CS-134	1589.90	795.42	40.	63.	0.031	57.11	1.500s
AC-228	1822.27	911.62	101.	311.	0.156	24.75	1.750s
AC-228	1936.81	968.90	38.	152.	0.076	29.66	1.541D
BI-214	2241.09	1121.06	97.	99.	0.049	64.01	1.935
K-40	2921.83	1461.48	49.	1247.	0.623	8.91	2.022
BI-214	3529.70	1765.47	8.	64.	0.032	40.11	1.415s

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

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

Nuclide Name	Nuclide Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		3.6377E-02					
			477.56	3.638E-02	%(	3.926E-01 1.15E-01 G	
K-40		1.6984E+01					
			1460.75	1.698E+01	(P	4.818E-01 5.12E-01 G	
MN-54		-6.0320E-03					
			834.81	-6.032E-03	%(P	4.288E-02 1.24E-02 G	
CO-57		7.4566E-04					
			122.07	7.457E-04	&(P	6.381E-02 1.90E-02 G K	
			136.43	1.158E-01	%	4.558E-01 1.37E-01 G	
CO-60		-4.0487E-03					
			1332.51	-4.049E-03	%(P	4.353E-02 1.17E-02 G K	
			1173.23	-2.020E-02	% P	6.037E-02 1.78E-02 G K	
Sr-85		-1.6427E-02					
			514.00	-1.643E-02	%(	5.582E-02 1.67E-02 G	
Kr-85		-3.4816E+02					
			513.99	-3.482E+02	%(	1.184E+03 3.54E+02 G	
Y-88		-8.6285E-04					
			1836.01	-8.629E-04	%(P	3.692E-02 9.74E-03 G K	
			898.02	7.218E-04	% P	3.975E-02 1.11E-02 G	

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
NB-94	5.8821E-03						
		871.10	5.882E-03	%(	3.393E-02	9.78E-03	G K
		702.50	-5.159E-03	&	4.589E-02	1.34E-02	G K
Ag-108M	1.0161E-03						
		722.95	1.016E-03	&(	7.538E-02	2.21E-02	G K
		614.37	-1.381E-02	% P	4.876E-02	1.45E-02	G
		433.93	6.505E-03	%	3.669E-02	1.08E-02	G
CD-109	1.9709E+00						
		88.04	1.971E+00	(	2.197E+00	6.77E-01	G
SN-113	0.0000E+00						
		391.71	0.000E+00	&(	5.799E-02	1.69E-02	G K
		255.04	-3.466E-01	%	2.040E+00	6.09E-01	G
SB-125	8.8120E-02						
		427.95	-4.187E-03	&(P	1.255E-01	3.66E-02	G K
		600.77	-2.437E-02	% P	1.943E-01	5.65E-02	G
		636.15	1.187E-02	& P	3.238E-01	9.28E-02	G
		463.51	3.613E-01	(P	3.614E-01	1.15E-01	G
		176.29	2.017E-01	%	6.619E-01	1.99E-01	G
I-131	1.3596E-03						
		364.48	1.360E-03	%(P	7.805E-02	2.27E-02	G K
		636.97	2.413E-02	%	9.867E-01	2.83E-01	G
		284.29	-6.370E-04	% P	1.244E+00	3.66E-01	G
CS-134	3.1716E-02						
		604.66	-8.878E-04	&(	3.822E-02	1.10E-02	G K
		795.76	6.898E-02	(P	3.548E-02	1.31E-02	G
		569.29	-3.998E-02	% P	2.580E-01	7.50E-02	G
		801.84	-1.127E-01	% P	4.366E-01	1.26E-01	G
CS-137	1.1941E-02						
		661.62	1.194E-02	%(P	4.200E-02	1.24E-02	G
CE-139	-1.3789E-03						
		165.85	-1.379E-03	&(	5.427E-02	1.61E-02	G
EU-152	1.4827E-03						
		121.78	1.483E-03	&(P	1.781E-01	5.30E-02	G K
		344.30	-1.224E-02	% P	1.404E-01	4.14E-02	G
		1408.08	6.591E-02	%	1.569E-01	4.71E-02	G
		964.00	-5.902E-02	% P	3.433E-01	9.99E-02	G
		1112.07	7.287E-02	%	3.491E-01	1.02E-01	G
		778.90	7.321E-02	%	2.592E-01	7.63E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-154	-5.5608E-02						
		123.10	-5.561E-02	%(	1.314E-01	3.98E-02	G K
		1274.80	-2.072E-02	%	1.492E-01	4.31E-02	G
		723.30	8.536E-02	%	1.267E-01	3.99E-02	G
		1004.80	-6.030E-02	%	2.455E-01	7.20E-02	G
EU-155	2.4983E-01						
		86.45	2.498E-01	(	2.738E-01	8.44E-02	G K
		105.31	1.222E-01	%	2.734E-01	8.28E-02	G
HG-203	2.7260E-04						
		279.17	2.726E-04	&(P	5.263E-02	1.55E-02	G K
		72.87	-2.270E-02	& P	1.912E+00	5.64E-01	G
		70.83	-1.562E-01	%	5.725E+00	1.71E+00	G
		82.50	-1.746E+00	%	5.161E+00	1.56E+00	G
TL-208	3.3763E-01						
		583.14	3.376E-01	(P	5.554E-02	2.81E-02	G
		510.72	5.360E-01	+ P	2.314E-01	9.94E-02	G
PB-212	1.1501E+00						
		238.63	1.135E+00	(P	1.081E-01	4.86E-02	G K
							Energy duplication
		77.11	1.150E+00	} P	4.497E-01	1.45E-01	G
		74.81	1.218E+00	(P	9.179E-01	2.91E-01	G
PB-214	5.9654E-01						
		351.99	5.907E-01	(P	7.923E-02	3.63E-02	G K
		295.22	6.079E-01	@(P	1.875E-01	7.36E-02	G
							Energy duplication
		77.11	2.095E-01	} P	1.117E+00	2.83E-01	G
		241.92	3.660E-01	-	4.400E-01	1.30E-01	G
BI-212	9.3019E-01						
		727.17	9.302E-01	@(P	3.386E-01	1.44E-01	G K
		1620.56	6.072E-01	% P	9.697E-01	3.09E-01	G
		785.42	2.669E+00	+	1.919E+00	7.54E-01	G
BI-214	6.1216E-01						
		609.32	5.889E-01	(P	9.893E-02	4.82E-02	G K
		1764.51	6.794E-01	(P	1.650E-01	9.55E-02	G
		1120.28	7.884E-01	+ P	3.876E-01	1.72E-01	G
RA-224	1.4460E+00						
		241.00	1.446E+00	(	1.243E+00	3.88E-01	G
RA-226	1.4588E+00						
		185.99	1.459E+00	(P	9.933E-01	3.16E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
AC-228	1.0818E+00						
		911.07	1.105E+00	@(P	1.755E-01	9.22E-02	G K
		968.90	9.403E-01	(P	1.930E-01	9.31E-02	G
		338.40	1.231E+00	@(P	3.386E-01	1.44E-01	G
TH-227	-1.2438E-01						
		236.00	-1.244E-01	%(	4.351E-01	1.31E-01	G K
		256.25	-1.225E-01	% P	5.338E-01	1.60E-01	G
PA-234	-4.7206E-02						
		98.44	-4.721E-02	&(P	2.679E-01	8.02E-02	G K
		946.00	-6.797E-02	% P	2.360E-01	6.99E-02	G
		131.28	1.082E-01	% P	2.147E-01	6.52E-02	G
		94.67	2.364E-03	% P	4.784E-01	1.43E-01	G
		883.24	-8.016E-02	&	3.401E-01	9.98E-02	G
		926.70	3.130E-02	&	3.654E-01	1.05E-01	G
		569.26	-5.901E-02	% P	3.800E-01	1.10E-01	G
TH-234	1.3358E+00						
		63.29	1.336E+00	&(P	7.847E+00	2.35E+00	G K
		92.80	1.764E+00	& P	2.607E+00	7.93E-01	G
		92.38	1.960E+00	& P	3.109E+00	9.44E-01	G
AM-241	1.2728E-01						
		59.54	1.273E-01	%(P	1.385E+00	4.13E-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
N - Naturally Occurring Isotope
P - Photon Reaction
C - Charged Particle Reaction
M - No MDA Calculation
R - Coincidence Corrected
H - Halflife limit exceeded

P - Positron Decay
S - Single-Escape
D - Double-Escape
K - Key Line
A - Not in Average
C - Coincidence Peak

- -

***** 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 pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	3.2819E-02	3.6377E-02	3.4409E-01	3.4410E-01	3.542E-01
K-40		1.6984E+01	1.6984E+01	1.5353E+00	1.8247E+00	
MN-54	#A	-5.9267E-03	-6.0320E-03	4.1811E-02	4.1812E-02	4.213E-02
CO-57	#B	7.3063E-04	7.4566E-04	5.7031E-02	5.7031E-02	6.252E-02
CO-60	#B	-4.0372E-03	-4.0487E-03	6.2011E-01	6.2011E-01	4.341E-02
Sr-85	#A	-1.5092E-02	-1.6427E-02	5.0115E-02	5.0124E-02	5.128E-02
Kr-85	#A	-3.4814E+02	-3.4816E+02	1.0629E+03	1.0631E+03	1.184E+03
Y-88	#B	-8.1948E-04	-8.6285E-04	3.8277E-02	3.8277E-02	3.506E-02
NB-94	#B	5.8821E-03	5.8821E-03	2.9351E-02	2.9353E-02	3.393E-02
Ag-108M	#B	1.0160E-03	1.0161E-03	6.6344E-02	6.6344E-02	7.538E-02
CD-109	#A	1.9471E+00	1.9709E+00	2.0314E+00	2.0343E+00	2.171E+00
SN-113	#B	0.0000E+00	0.0000E+00	5.0661E-02	5.0661E-02	5.529E-02
SB-125	#B	8.7642E-02	8.8120E-02	8.3779E-02	8.3935E-02	1.248E-01
I-131	#B	6.8623E-04	1.3596E-03	6.8092E-02	6.8092E-02	3.940E-02
CS-134	#B	3.1486E-02	3.1716E-02	1.8137E-02	1.8230E-02	3.794E-02
CS-137	#A	1.1935E-02	1.1941E-02	3.7137E-02	3.7143E-02	4.198E-02
CE-139	#A	-1.3248E-03	-1.3789E-03	4.8403E-02	4.8403E-02	5.215E-02
EU-152	#B	1.4810E-03	1.4827E-03	1.5905E-01	1.5905E-01	1.779E-01
EU-154	#B	-5.5509E-02	-5.5608E-02	1.1927E-01	1.1931E-01	1.311E-01
EU-155	#A	2.4907E-01	2.4983E-01	2.5313E-01	2.5351E-01	2.730E-01
HG-203	#B	2.4226E-04	2.7260E-04	4.6535E-02	4.6535E-02	4.678E-02
TL-208		3.3763E-01	3.3763E-01	8.4143E-02	8.6397E-02	
PB-212		1.1501E+00	1.1501E+00	1.4758E-01	1.6198E-01	
PB-214		5.9654E-01	5.9654E-01	1.1002E-01	1.1534E-01	
BI-212	#	9.3019E-01	9.3019E-01	4.3283E-01	4.3618E-01	
BI-214		6.1216E-01	6.1216E-01	1.4929E-01	1.5346E-01	
RA-224		1.4460E+00	1.4460E+00	1.1629E+00	1.1659E+00	1.243E+00
RA-226		1.4588E+00	1.4588E+00	9.4613E-01	9.4991E-01	
AC-228		1.0818E+00	1.0818E+00	1.8855E-01	1.9873E-01	
TH-227	#B	-1.2438E-01	-1.2438E-01	3.9271E-01	3.9278E-01	4.351E-01
PA-234	#B	-4.7206E-02	-4.7206E-02	2.6055E-01	2.6056E-01	2.679E-01
TH-234	#B	1.3358E+00	1.3358E+00	7.0369E+00	7.0373E+00	7.847E+00
AM-241	#A	1.2728E-01	1.2728E-01	1.2392E+00	1.2392E+00	1.384E+00

- 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 (1120.0 to 2000.7 keV) 2.4597530E+01 pCi/gm
Total Decayed Activity (1120.0 to 2000.7 keV) 2.4597542E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JJM

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 103F_16SEPT2006_0816.An1

Sample description
FSS-SSS-01-01-001-F

Spectrum Filename: C:\GammaVision\Spectra\103F_16SEPT2006_0816.An1

Acquisition information
Start time: 16-Sep-2006 08:16:48
Live time: 2000
Real time: 2002
Dead time: 0.12 %
Detector ID: 4

Detector system
Det 103 - DSPE-471

Calibration
Filename: D3_1LSa.Clb
Detector_103 1.0 Liter Sand Geometry

Energy Calibration
Created: 08-Aug-2005 11:09:41
Zero offset: 0.409 keV
Gain: 0.500 keV/channel
Quadratic: 1.092E-08 keV/channel^2

Efficiency Calibration
Created: 08-Aug-2005 11:11:25
Type: Polynomial
Uncertainty: 0.993 %
Coefficients: -0.264059 -5.138468 0.638383
-0.089199 0.005011 -0.000129

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.41keV)
Stop channel: 4000 (2000.67keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.8320E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.8320E+03) =
5.4585E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five 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	16-Sep-2006 08:40:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	103_150K_05AUG05.Pbc 08-Aug-2005 12:54:15
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 19 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.2462

***** 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. pCi/gm	Nuc
75.08	187.	16.69	0.99	9.198E-03	74.81	9.600	1.563E+00	PB212
129.43	100.	40.84	1.50	2.461E-02				
129.43	100.	40.84	1.50	2.461E-02	131.28	20.000	PBC<MDA	PA234
186.07	140.	26.42	1.12	2.566E-02	185.99	3.280	PBC<MDA	RA226
209.56	148.	25.71	0.72	2.470E-02				
238.79	1252.	3.32	1.09	2.320E-02	238.63	43.100	9.149E-01	PB212
241.88	191.	15.17	1.10	2.303E-02	241.00	3.900	1.566E+00	RA224
					241.92	7.470	8.192E-01	PB214
270.44	116.	23.94	1.84	2.150E-02				
295.43	298.	10.06	0.91	2.024E-02	295.22	19.200	5.585E-01	PB214
300.35	83.	27.02	1.14	2.000E-02				
328.09	105.	22.60	1.07	1.874E-02				
338.51	264.	14.20	1.15	1.830E-02	338.40	12.010	8.837E-01	AC228
352.18	552.	6.22	1.19	1.775E-02	351.99	37.100	6.123E-01	PB214
462.83	111.	25.00	1.16	1.426E-02				
462.83	111.	25.00	1.16	1.426E-02	463.51	10.000	5.691E-01	SB125
510.95	172.	18.27	1.41	1.317E-02	510.72	22.500	3.617E-01	TL208
583.42	459.	7.19	1.23	1.184E-02	583.14	86.000	3.293E-01	TL208
609.59	322.	8.21	1.22	1.144E-02	609.32	46.090	4.409E-01	BI214
727.69	92.	24.55	1.76	9.959E-03	727.17	11.800	5.772E-01	BI212
794.40	57.	29.38	1.35	9.313E-03				
794.40	57.	29.38	1.35	9.313E-03	795.76	85.400	5.266E-02	CS134
860.81	55.	24.48	1.86	8.766E-03				
901.52	23.	35.16	1.50	8.492E-03	898.02	94.000	PBC<MDA	Y88
911.73	290.	8.51	1.46	8.397E-03	911.07	29.000	8.681E-01	AC228
964.96	68.	19.71	1.54	8.050E-03	964.00	14.580	4.240E-01	EU152
969.53	164.	9.84	1.54	8.022E-03	968.90	17.460	8.603E-01	AC228

1120.94	89.	24.03	1.32	7.209E-03	1120.28	15.040	5.944E-01	BI214
1461.48	1766.	2.43	1.85	5.930E-03	1460.75	10.700	2.031E+01	K40
1590.89	51.	16.82	1.61	5.565E-03				
1620.99	13.	34.46	0.68	5.488E-03	1620.56	2.750	6.528E-01	BI212
1764.96	68.	13.26	1.93	5.141E-03	1764.51	15.920	5.815E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
153.65	77.29	416.	253.	0.127	39.02	0.995	PB-214	lD
418.27	209.56	545.	148.	0.074	77.12	0.721	AC-228	s
540.02	270.44	299.	116.	0.058	71.81	1.841	AC-228	s
599.84	300.35	210.	83.	0.041	81.06	1.135	PB-212	
655.32	328.09	206.	105.	0.052	67.79	1.074	AC-228	s
1587.85	794.40	79.	57.	0.028	88.15	1.354	AC-228	l
1720.66	860.81	56.	55.	0.027	73.45	1.864	TL-208	s
1929.95	964.93	55.	69.	0.035	57.67	1.539	AC-228	D
3180.60	1590.89	7.	51.	0.026	50.46	1.613	AC-228	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: FSS_Rev_1.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 3 Sigma %	FWHM keV
PB-212	148.79	74.81	379.	186.	0.093	48.69	0.993D
PB-212	153.39	77.11	418.	240.	0.120	31.65	0.995A
PA-234	258.04	129.43	792.	100.	0.050	122.52	1.500s
RA-226	371.57	186.20	830.	144.	0.072	80.66	1.500
PB-212	476.84	238.84	630.	1332.	0.666	12.00	1.013
RA-224	482.78	241.81	851.	178.	0.089	73.28	1.500
PB-214	483.03	241.94	920.	133.	0.067	99.92	1.500s
PB-214	590.00	295.43	278.	294.	0.147	30.17	0.907
AC-228	676.16	338.51	371.	263.	0.132	42.61	1.153
PB-214	703.50	352.18	247.	547.	0.273	18.66	1.186
SB-125	925.35	463.11	171.	78.	0.039	77.31	1.500
TL-208	1021.01	510.95	267.	145.	0.073	54.82	1.413s
TL-208	1165.93	583.42	184.	455.	0.227	21.57	1.228
BI-214	1218.28	609.59	146.	315.	0.158	24.64	1.217
BI-212	1454.45	727.69	137.	92.	0.046	73.65	1.756s
Y-88	1802.07	901.52	24.	23.	0.012	105.47	1.500s
AC-228	1822.48	911.73	106.	287.	0.143	25.52	1.463
AC-228	1936.81	968.90	48.	163.	0.082	29.50	1.541D
BI-214	2240.85	1120.94	122.	87.	0.044	72.08	1.317
K-40	2921.83	1461.48	38.	1748.	0.874	7.29	1.846
BI-212	3240.79	1620.99	4.	13.	0.007	103.37	0.682s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-214	3528.67	1764.96	7.	65.	0.032	39.78	1.932

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 pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	Peak COMMENTS
BE-7		7.6618E-02					
			477.56	7.662E-02	%(	3.307E-01	9.82E-02 G
K-40		2.0310E+01					
			1460.75	2.031E+01	(P	3.667E-01	4.99E-01 G
MN-54		-1.5433E-04					
			834.81	-1.543E-04	%(P	3.843E-02	1.10E-02 G
CO-57		2.3094E-02					
			122.07	2.309E-02	%(P	4.510E-02	1.37E-02 G K
			136.43	7.696E-02	%	3.933E-01	1.18E-01 G
CO-60		3.9575E-05					
			1332.51	3.958E-05	&(P	4.043E-02	1.12E-02 G K
			1173.23	-1.470E-02	& P	6.236E-02	1.83E-02 G K
Sr-85		-1.5617E-02					
			514.00	-1.562E-02	%(	4.419E-02	1.33E-02 G
Kr-85		-3.6063E+02					
			513.99	-3.606E+02	%(	1.020E+03	3.07E+02 G
Y-88		9.8732E-03					
			1836.01	-1.196E-03	%(P	2.889E-02	7.63E-03 G K
			898.02	2.157E-02	&(P	2.368E-02	7.79E-03 G
NB-94		3.1819E-05					
			871.10	3.182E-05	%(	3.255E-02	9.18E-03 G K
			702.50	8.029E-03	%	4.063E-02	1.20E-02 G K
Ag-108M		-1.7336E-03					
			722.95	-1.734E-03	&(	6.493E-02	1.91E-02 G K
			614.37	-2.181E-02	% P	4.713E-02	1.43E-02 G
			433.93	3.530E-03	&	3.842E-02	1.13E-02 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CD-109	7.7080E-01						
		88.04	7.708E-01	&(	2.066E+00	6.24E-01	G
SN-113	9.1951E-03						
		391.71	9.195E-03	%(	5.074E-02	1.50E-02	G K
		255.04	6.065E-02	&	1.426E+00	4.21E-01	G
SB-125	8.6272E-02						
		427.95	-2.123E-02	%(P	1.213E-01	3.60E-02	G K
		600.77	-4.209E-02	% P	2.169E-01	6.41E-02	G
		636.15	6.423E-02	% P	2.896E-01	8.51E-02	G
		463.51	4.045E-01	(P	3.294E-01	1.06E-01	G
		176.29	5.792E-03	%	5.924E-01	1.76E-01	G
I-131	1.8198E-02						
		364.48	1.820E-02	%(P	3.142E-02	9.60E-03	G K
		636.97	1.013E-01	%	4.366E-01	1.29E-01	G
		284.29	-1.629E-01	% P	5.876E-01	1.76E-01	G
CS-134	7.6845E-05						
		604.66	7.685E-05	%(	3.470E-02	9.99E-03	G K
		795.76	2.989E-02	% P	4.323E-02	1.34E-02	G
		569.29	-9.461E-02	% P	2.584E-01	7.71E-02	G
		801.84	7.176E-02	% P	4.243E-01	1.23E-01	G
CS-137	-8.4713E-04						
		661.62	-8.471E-04	&(P	4.541E-02	1.30E-02	G
CE-139	2.8098E-03						
		165.85	2.810E-03	&(	4.875E-02	1.45E-02	G
EU-152	-4.6658E-03						
		121.78	-4.666E-03	%(P	1.490E-01	4.43E-02	G K
		344.30	-2.143E-02	% P	1.311E-01	3.89E-02	G
		1408.08	0.000E+00	%	1.851E-01	5.15E-02	G
		964.00	-1.713E-02	& P	4.193E-01	1.22E-01	G
		1112.07	1.813E-03	%	3.969E-01	1.14E-01	G
		778.90	-8.336E-02	&	3.298E-01	9.78E-02	G
EU-154	-2.9648E-02						
		123.10	-2.965E-02	&(	1.220E-01	3.67E-02	G K
		1274.80	-7.916E-03	&	1.425E-01	4.09E-02	G
		723.30	-1.340E-01	&	2.570E-01	7.82E-02	G
		1004.80	-2.974E-02	&	2.407E-01	6.98E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	9.5747E-02						
		86.45	9.575E-02	%(	2.606E-01	7.87E-02	G K
		105.31	7.596E-02	%	2.489E-01	7.50E-02	G
HG-203	-8.6325E-03						
		279.17	-8.632E-03	&(P	4.485E-02	1.34E-02	G K
		72.87	-1.373E+00	% P	2.279E+00	6.94E-01	G
		70.83	2.798E-01	&	5.111E+00	1.53E+00	G
		82.50	-1.194E+00	&	4.250E+00	1.28E+00	G
TL-208	3.3598E-01						
		583.14	3.293E-01	(P	4.777E-02	2.39E-02	G
		510.72	3.617E-01	*(P	1.961E-01	7.83E-02	G
PB-212	1.0009E+00						
		238.63	9.827E-01	(P	8.829E-02	3.97E-02	G K
							Energy duplication
		77.11	1.001E+00	} P	4.084E-01	1.06E-01	G
		74.81	1.578E+00	+ P	7.932E-01	2.60E-01	G
PB-214	5.9142E-01						
		351.99	6.123E-01	(P	8.510E-02	3.85E-02	G K
		295.22	5.585E-01	(P	1.525E-01	5.70E-02	G
							Energy duplication
		77.11	0.000E+00	} P	9.636E-01	0.00E+00	G
		241.92	5.722E-01	(	6.180E-01	1.91E-01	G
BI-212	5.9147E-01						
		727.17	5.772E-01	*(P	3.592E-01	1.43E-01	G K
		1620.56	6.528E-01	(P	5.673E-01	2.26E-01	G
		785.42	5.138E-01	%	1.736E+00	5.15E-01	G
BI-214	4.4089E-01						
		609.32	4.409E-01	(P	8.253E-02	3.70E-02	G K
		1764.51	5.815E-01	+ P	1.392E-01	8.10E-02	G
		1120.28	5.944E-01	+ P	3.679E-01	1.46E-01	G
RA-224	1.4552E+00						
		241.00	1.455E+00	(	1.137E+00	3.55E-01	G
RA-226	1.2655E+00						
		185.99	1.265E+00	(P	1.200E+00	3.71E-01	G
AC-228	8.6902E-01						
		911.07	8.681E-01	(P	1.536E-01	7.48E-02	G K
		968.90	8.604E-01	(P	1.838E-01	8.47E-02	G
		338.40	8.837E-01	(P	3.102E-01	1.26E-01	G

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

TH-227      -2.8100E-01
                          236.00-2.810E-01 %(  4.242E-01 1.30E-01 G K
                          256.25 4.841E-02 & P 5.407E-01 1.61E-01 G

PA-234       3.8623E-02
                           98.44-4.985E-02 %(P 2.370E-01 7.11E-02 G K
                          946.00-5.202E-02 & P 2.217E-01 6.54E-02 G
                          131.28 1.497E-01 &(P 2.007E-01 6.15E-02 G
                           94.67-1.795E-01 & P 4.563E-01 1.38E-01 G
                          883.24 3.298E-03 &   3.035E-01 8.64E-02 G
                          926.70-1.553E-01 &   3.829E-01 1.15E-01 G
                          569.26-1.400E-01 % P 3.834E-01 1.14E-01 G

TH-234       2.4200E+00
                           63.29 2.420E+00 %(P 6.800E+00 2.05E+00 G K
                           92.80 1.289E+00 % P 2.352E+00 7.12E-01 G
                           92.38 1.454E+00 % P 2.811E+00 8.51E-01 G

AM-241       3.7063E-02
                           59.54 3.706E-02 &(P 8.850E-01 2.62E-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

- -

***** 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 pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	7.6634E-02	7.6618E-02	2.9450E-01	2.9453E-01	3.308E-01
K-40		2.0310E+01	2.0310E+01	1.4959E+00	1.9047E+00	
MN-54	#A	-1.5433E-04	-1.5433E-04	1.0550E-01	1.0550E-01	3.843E-02
CO-57	#B	2.3095E-02	2.3094E-02	4.1088E-02	4.1108E-02	4.510E-02
CO-60	#B	3.9575E-05	3.9575E-05	3.3469E-02	3.3469E-02	4.043E-02
Sr-85	#A	-1.5620E-02	-1.5617E-02	3.9842E-02	3.9853E-02	4.419E-02
Kr-85	#A	-3.6063E+02	-3.6063E+02	9.1995E+02	9.2019E+02	1.020E+03
Y-88	#B	9.8742E-03	9.8732E-03	1.0695E-02	1.0710E-02	2.890E-02
NB-94	#B	3.1819E-05	3.1819E-05	2.7542E-02	2.7542E-02	3.255E-02
Ag-108M	#B	-1.7336E-03	-1.7336E-03	5.7220E-02	5.7220E-02	6.493E-02
CD-109	#A	7.7082E-01	7.7080E-01	1.8730E+00	1.8735E+00	2.066E+00
SN-113	#B	9.1960E-03	9.1951E-03	4.5105E-02	4.5108E-02	5.074E-02
SB-125	#B	8.6273E-02	8.6272E-02	6.7784E-02	6.7968E-02	1.213E-01
I-131	#B	1.8224E-02	1.8198E-02	2.8810E-02	2.8829E-02	3.146E-02
CS-134	#B	7.6846E-05	7.6845E-05	2.9984E-02	2.9984E-02	3.470E-02
CS-137	#A	-8.4713E-04	-8.4713E-04	2.7500E-01	2.7500E-01	4.541E-02
CE-139	#A	2.8100E-03	2.8098E-03	4.3617E-02	4.3617E-02	4.876E-02
EU-152	#B	-4.6658E-03	-4.6658E-03	2.0831E-01	2.0831E-01	1.490E-01
EU-154	#B	-2.9648E-02	-2.9648E-02	1.1014E-01	1.1015E-01	1.220E-01
EU-155	#B	9.5748E-02	9.5747E-02	2.3624E-01	2.3630E-01	2.606E-01
HG-203	#B	-8.6346E-03	-8.6325E-03	4.0340E-02	4.0343E-02	4.486E-02
TL-208		3.3598E-01	3.3598E-01	7.3154E-02	7.5710E-02	
PB-212		1.0009E+00	1.0009E+00	1.2116E-01	1.3437E-01	
PB-214		5.9142E-01	5.9142E-01	1.1150E-01	1.1666E-01	
BI-212		5.9147E-01	5.9147E-01	3.7688E-01	3.7844E-01	
BI-214		4.4089E-01	4.4089E-01	1.1089E-01	1.1380E-01	
RA-224		1.4552E+00	1.4552E+00	1.0663E+00	1.0697E+00	1.137E+00
RA-226	#	1.2655E+00	1.2655E+00	1.1123E+00	1.1148E+00	1.200E+00
AC-228		8.6902E-01	8.6902E-01	1.6814E-01	1.7555E-01	
TH-227	#B	-2.8100E-01	-2.8100E-01	3.8856E-01	3.8890E-01	4.242E-01
PA-234	#B	3.8623E-02	3.8623E-02	4.7619E-02	4.7667E-02	2.370E-01
TH-234	#B	2.4200E+00	2.4200E+00	6.1466E+00	6.1481E+00	6.800E+00
AM-241	#A	3.7063E-02	3.7063E-02	7.8525E-01	7.8526E-01	8.850E-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 (1120.0 to 2000.7 keV) 2.5595299E+01 pCi/gm
Total Decayed Activity (1120.0 to 2000.7 keV) 2.5595299E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JJM

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 103F_16SEPT2006_0858.An1

Sample description
FSS-SSS-01-01-002-F

Spectrum Filename: C:\GammaVision\Spectra\103F_16SEPT2006_0858.An1

Acquisition information
Start time: 16-Sep-2006 08:58:52
Live time: 2000
Real time: 2002
Dead time: 0.10 %
Detector ID: 4

Detector system
Det 103 - DSPE-471

Calibration
Filename: D3_1LSa.Clb
Detector_103 1.0 Liter Sand Geometry

Energy Calibration
Created: 08-Aug-2005 11:09:41
Zero offset: 0.409 keV
Gain: 0.500 keV/channel
Quadratic: 1.092E-08 keV/channel^2

Efficiency Calibration
Created: 08-Aug-2005 11:11:25
Type: Polynomial
Uncertainty: 0.993 %
Coefficients: -0.264059 -5.138468 0.638383
-0.089199 0.005011 -0.000129

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.41keV)
Stop channel: 4000 (2000.67keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.7290E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.7290E+03) =
5.7837E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five 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	09-Sep-2006 09:00:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	103_150K_05AUG05.Pbc 08-Aug-2005 12:54:15
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 20 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.2878

***** 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. pCi/gm	Nuc
74.94	143.	19.80	0.99	9.052E-03	74.81	9.600	1.287E+00	PB212
77.24	191.	12.52	0.99	1.011E-02	77.11	17.500	9.631E-01	PB212
93.15	99.	36.82	1.50	1.631E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
93.15	100.	36.04	1.50	1.645E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.19	163.	23.68	1.42	2.566E-02	185.99	3.280	1.393E+00	RA226
209.51	110.	22.17	1.08	2.470E-02				
238.79	1145.	3.43	1.09	2.319E-02	238.63	43.100	8.858E-01	PB212
242.01	209.	13.12	1.10	2.302E-02	241.00	3.900	1.815E+00	RA224
					241.92	7.470	9.494E-01	PB214
270.53	125.	22.94	1.49	2.150E-02				
277.65	68.	36.97	1.50	2.105E-02	279.17	81.500	PBC<MDA	HG203
295.38	279.	9.80	1.10	2.024E-02	295.22	19.200	5.536E-01	PB214
300.87	114.	24.97	1.12	1.998E-02				
328.37	76.	36.25	1.56	1.873E-02				
338.61	307.	11.03	1.33	1.829E-02	338.40	12.010	1.088E+00	AC228
352.07	493.	6.53	1.04	1.775E-02	351.99	37.100	5.788E-01	PB214
409.91	55.	34.53	1.15	1.573E-02				
462.99	76.	22.45	1.71	1.426E-02				
462.99	76.	22.45	1.71	1.426E-02	463.51	10.000	4.108E-01	SB125
510.87	205.	11.35	1.64	1.317E-02	510.72	22.500	4.703E-01	TL208
583.44	373.	7.12	1.31	1.184E-02	583.14	86.000	2.830E-01	TL208
609.54	375.	8.66	1.35	1.144E-02	609.32	46.090	5.463E-01	BI214
727.70	85.	23.62	1.48	9.959E-03	727.17	11.800	5.624E-01	BI212
768.10	62.	29.83	1.47	9.555E-03				
786.42	32.	38.46	1.50	9.394E-03	785.42	2.000	PBC<MDA	BI212

795.69	78.	20.92	0.73	9.302E-03				
795.69	78.	20.92	0.73	9.302E-03	795.76	85.400	7.726E-02	CS134
860.74	53.	24.17	1.19	8.766E-03				
911.70	311.	7.20	1.75	8.397E-03	911.07	29.000	9.856E-01	AC228
964.87	49.	22.22	1.54	8.050E-03	964.00	14.580	PBC<MDA	EU152
969.34	159.	9.42	1.54	8.022E-03	968.90	17.460	8.834E-01	AC228
1121.23	85.	24.06	1.75	7.207E-03	1120.28	15.040	6.017E-01	BI214
1461.49	1335.	2.77	1.78	5.930E-03	1460.75	10.700	1.620E+01	K40

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1621.03	32.	25.20	0.62	5.488E-03	1620.56	2.750	1.671E+00	BI212
1765.12	43.	16.83	2.04	5.142E-03	1764.51	15.920	4.070E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide
418.41	209.63	310.	107.	0.054	73.67	1.019	NP-239
540.21	270.53	279.	125.	0.062	68.83	1.486	AC-228 s
600.89	300.87	269.	114.	0.057	74.91	1.121	PB-212 s
655.89	328.37	266.	76.	0.038	108.75	1.559	RH-106M s
818.94	409.91	131.	55.	0.027	103.58	1.154	AC-228
1535.27	768.10	97.	62.	0.031	89.48	1.468	BI-214 sM
1720.53	860.74	48.	53.	0.026	72.52	1.190	TL-208
1929.77	964.97	41.	43.	0.022	77.24	1.539	AC-228 D

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: FSS_Rev_1.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 3 Sigma %	FWHM keV
PB-212	148.79	74.81	349.	143.	0.072	59.41	0.993D
PB-212	153.39	77.11	367.	191.	0.096	37.57	0.995A
RA-226	371.72	186.28	706.	146.	0.073	74.21	1.500s
PB-212	476.42	238.63	234.	1131.	0.565	10.46	1.093D
RA-224	481.16	241.00	1010.	129.	0.064	109.09	1.095D
PB-214	483.00	241.92	325.	125.	0.063	53.71	1.095A
HG-203	554.46	277.65	279.	68.	0.034	110.92	1.500s
PB-214	589.92	295.38	218.	275.	0.138	29.39	1.097
AC-228	676.36	338.61	272.	306.	0.153	33.08	1.328s
PB-214	703.29	352.07	215.	488.	0.244	19.59	1.043
SB-125	925.09	462.98	129.	82.	0.041	66.38	1.500s
TL-208	1020.86	510.87	139.	178.	0.089	34.04	1.638s
TL-208	1165.98	583.44	123.	369.	0.184	21.36	1.307
BI-214	1218.18	609.54	180.	369.	0.184	25.97	1.350
BI-212	1454.47	727.70	103.	85.	0.042	70.86	1.483
BI-212	1571.89	786.42	61.	32.	0.016	115.38	1.500
CS-134	1590.14	795.54	59.	50.	0.025	77.63	1.500s
AC-228	1822.44	911.70	63.	307.	0.154	21.61	1.754s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
AC-228	1936.81	968.90	33.	158.	0.079	28.31	1.541D
BI-214	2241.44	1121.23	95.	84.	0.042	72.19	1.752s
K-40	2921.85	1461.49	27.	1316.	0.658	8.31	1.780
BI-212	3240.87	1621.03	9.	32.	0.016	75.59	0.619s
BI-214	3528.99	1765.12	8.	43.	0.021	50.49	2.042

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 pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		7.4649E-02					
			477.56	7.465E-02	&(	3.246E-01 9.59E-02 G	
K-40		1.6203E+01					
			1460.75	1.620E+01	(P	3.322E-01 4.55E-01 G	
MN-54		1.9405E-02					
			834.81	1.941E-02	%(P	4.142E-02 1.25E-02 G	
CO-57		-1.0157E-02					
			122.07	-1.016E-02	&(P	5.482E-02 1.64E-02 G K	
			136.43	2.567E-02	%	3.558E-01 1.06E-01 G	
CO-60		-1.1933E-02					
			1332.51	-1.193E-02	%(P	4.456E-02 1.26E-02 G K	
			1173.23	1.723E-02	% P	4.736E-02 1.41E-02 G K	
Sr-85		-1.5508E-02					
			514.00	-1.551E-02	%(	4.758E-02 1.43E-02 G	
Kr-85		-3.3287E+02					
			513.99	-3.329E+02	%(	1.019E+03 3.06E+02 G	
Y-88		3.4505E-03					
			1836.01	3.450E-03	%(P	2.290E-02 6.07E-03 G K	
			898.02	-1.850E-04	% P	3.743E-02 1.05E-02 G	
NB-94		-8.0016E-03					
			871.10	-8.002E-03	&(	4.074E-02 1.19E-02 G K	
			702.50	1.250E-03	&	3.696E-02 1.06E-02 G K	

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Ag-108M	-1.2195E-02						
		722.95	-1.219E-02	%(	4.396E-02	1.30E-02	G K
		614.37	-1.130E-02	% P	4.582E-02	1.36E-02	G
		433.93	-4.296E-03	%	3.577E-02	1.05E-02	G
CD-109	1.3564E-01						
		88.04	1.356E-01	%(	2.108E+00	6.30E-01	G
SN-113	1.4962E-02						
		391.71	1.496E-02	%(	5.491E-02	1.64E-02	G K
		255.04	-2.721E-01	&	1.649E+00	4.91E-01	G
SB-125	1.1549E-01						
		427.95	1.793E-03	&(P	1.181E-01	3.44E-02	G K
		600.77	-4.392E-02	% P	2.214E-01	6.54E-02	G
		636.15	1.687E-03	& P	3.105E-01	8.89E-02	G
		463.51	4.520E-01	(P	3.071E-01	1.02E-01	G
		176.29	-2.817E-02	%	5.159E-01	1.53E-01	G
I-131	-1.3237E-02						
		364.48	-1.324E-02	%(P	7.271E-02	2.15E-02	G K
		636.97	1.294E-01	&	8.371E-01	2.44E-01	G
		284.29	6.697E-02	& P	1.028E+00	3.04E-01	G
CS-134	2.2360E-02						
		604.66	-1.491E-03	%(	7.240E-02	2.14E-02	G K
		795.76	4.962E-02	@(P	3.823E-02	1.29E-02	G
		569.29	5.171E-02	% P	2.320E-01	6.83E-02	G
		801.84	1.630E-02	% P	4.222E-01	1.20E-01	G
CS-137	1.8742E-02						
		661.62	1.874E-02	%(P	4.227E-02	1.27E-02	G
CE-139	1.8763E-02						
		165.85	1.876E-02	%(	4.779E-02	1.44E-02	G
EU-152	-3.0086E-02						
		121.78	-3.009E-02	&(P	1.581E-01	4.74E-02	G K
		344.30	-2.248E-02	& P	1.229E-01	3.65E-02	G
		1408.08	0.000E+00	%	1.963E-01	5.46E-02	G
		964.00	1.817E-02	% P	3.866E-01	1.12E-01	G
		1112.07	-7.707E-02	%	3.815E-01	1.12E-01	G
		778.90	-7.070E-03	&	2.052E-01	5.74E-02	G
EU-154	8.5664E-04						
		123.10	8.566E-04	%(	1.170E-01	3.48E-02	G K
		1274.80	3.689E-02	%	1.172E-01	3.46E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          723.30-1.367E-01 %   2.492E-01 7.60E-02 G
                         1004.80 2.547E-02 &   2.122E-01 6.09E-02 G

EU-155       1.1962E-01
                           86.45 1.196E-01 &(  2.457E-01 7.45E-02 G K
                          105.31 1.590E-02 &   2.397E-01 7.15E-02 G

HG-203       3.4154E-02
                          279.17 3.415E-02 &(P 4.069E-02 1.26E-02 G K
                           72.87-6.324E-01 & P 2.681E+00 8.06E-01 G
                           70.83-3.167E+00 %   4.894E+00 1.49E+00 G
                           82.50 0.000E+00 %   4.718E+00 1.41E+00 G

TL-208       2.8304E-01
                          583.14 2.830E-01  (P 4.175E-02 2.04E-02 G
                          510.72 4.703E-01 + P 1.519E-01 6.13E-02 G

PB-212       9.0677E-01
                          238.63 8.839E-01  (P 5.784E-02 3.11E-02 G K
                                                          Energy duplication
                           77.11 8.453E-01 } P 4.061E-01 1.06E-01 G
                           74.81 1.287E+00 + P 8.073E-01 2.60E-01 G

PB-214       5.7020E-01
                          351.99 5.788E-01  (P 8.435E-02 3.82E-02 G K
                          295.22 5.536E-01  (P 1.437E-01 5.51E-02 G
                                                          Energy duplication
                           77.11 0.000E+00 } P 9.614E-01 0.00E+00 G
                          241.92 5.702E-01 }   3.943E-01 1.02E-01 G

BI-212       5.6237E-01
                          727.17 5.624E-01  (P 3.330E-01 1.34E-01 G K
                         1620.56 1.671E+00 + P 8.541E-01 4.22E-01 G
                          785.42 1.344E+00 +   1.628E+00 5.17E-01 G

BI-214       5.5995E-01
                          609.32 5.463E-01  (P 9.682E-02 4.81E-02 G K
                         1764.51 4.070E-01 - P 1.546E-01 7.38E-02 G
                         1120.28 6.017E-01 *(P 3.477E-01 1.48E-01 G

RA-224       1.1194E+00
                                                          Derived Ave Activity
                          241.00 1.119E+00 }(  1.310E+00 4.17E-01 G

RA-226       1.3552E+00
                          185.99 1.355E+00  (P 1.175E+00 3.65E-01 G

AC-228       9.7592E-01
                          911.07 9.856E-01  (P 1.271E-01 7.18E-02 G K
                          968.90 8.827E-01  (P 1.636E-01 8.34E-02 G
```

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		338.40	1.088E+00	@(P	2.829E-01	1.20E-01	G
TH-227	-1.3323E-01						
		236.00	-1.332E-01	&(	3.957E-01	1.19E-01	G K
		256.25	-5.677E-03	& P	5.047E-01	1.49E-01	G
PA-234	1.2629E-04						
		98.44	1.263E-04	%(P	2.436E-01	7.25E-02	G K
		946.00	6.207E-02	% P	1.162E-01	3.58E-02	G
		131.28	-3.412E-02	& P	2.373E-01	7.10E-02	G
		94.67	-1.409E-01	& P	4.322E-01	1.30E-01	G
		883.24	-1.101E-03	%	3.000E-01	8.49E-02	G
		926.70	8.316E-02	%	2.917E-01	8.57E-02	G
		569.26	4.069E-02	% P	3.558E-01	1.04E-01	G
TH-234	5.1667E-01						
		63.29	5.167E-01	&(P	6.909E+00	2.06E+00	G K
		92.80	1.584E+00	% P	2.204E+00	6.72E-01	G
		92.38	1.839E+00	& P	2.623E+00	7.98E-01	G
AM-241	1.4247E-02						
		59.54	1.425E-02	%(P	1.179E+00	3.50E-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

- -

***** 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 pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	6.8166E-02	7.4649E-02	2.8783E-01	2.8786E-01	2.964E-01
K-40		1.6203E+01	1.6203E+01	1.3656E+00	1.6582E+00	
MN-54	#A	1.9106E-02	1.9405E-02	3.7604E-02	3.7621E-02	4.078E-02
CO-57	#B	-9.9764E-03	-1.0157E-02	5.0968E-02	5.0971E-02	5.384E-02
CO-60	#B	-1.1903E-02	-1.1933E-02	6.6357E-02	6.6361E-02	4.444E-02
Sr-85	#A	-1.4390E-02	-1.5508E-02	4.2794E-02	4.2804E-02	4.415E-02
Kr-85	#A	-3.3286E+02	-3.3287E+02	9.1678E+02	9.1699E+02	1.019E+03
Y-88	#B	3.2970E-03	3.4505E-03	1.8196E-02	1.8197E-02	2.188E-02
NB-94	#B	-8.0016E-03	-8.0016E-03	3.5786E-02	3.5789E-02	4.074E-02
Ag-108M	#B	-1.2194E-02	-1.2195E-02	3.9127E-02	3.9134E-02	4.396E-02
CD-109	#A	1.3420E-01	1.3564E-01	1.8885E+00	1.8885E+00	2.085E+00
SN-113	#B	1.4345E-02	1.4962E-02	4.9151E-02	4.9158E-02	5.265E-02
SB-125	#B	1.1494E-01	1.1549E-01	7.7852E-02	7.8141E-02	1.175E-01
I-131	#B	-7.2398E-03	-1.3237E-02	7.1647E-02	7.1651E-02	3.977E-02
CS-134	#B	2.2217E-02	2.2360E-02	1.7389E-02	1.7438E-02	7.193E-02
CS-137	#A	1.8734E-02	1.8742E-02	3.8182E-02	3.8197E-02	4.225E-02
CE-139	#A	1.8112E-02	1.8763E-02	4.3312E-02	4.3326E-02	4.613E-02
EU-152	#B	-3.0055E-02	-3.0086E-02	1.5283E-01	1.5284E-01	1.580E-01
EU-154	#B	8.5530E-04	8.5664E-04	1.0449E-01	1.0449E-01	1.168E-01
EU-155	#B	1.1930E-01	1.1962E-01	2.2363E-01	2.2373E-01	2.450E-01
HG-203	#A	3.0776E-02	3.4154E-02	3.7906E-02	3.7957E-02	3.667E-02
TL-208		2.8304E-01	2.8304E-01	6.1154E-02	6.3323E-02	
PB-212		9.0677E-01	9.0677E-01	9.5830E-02	1.0934E-01	
PB-214		5.7020E-01	5.7020E-01	1.0209E-01	1.0733E-01	
BI-212		5.6237E-01	5.6237E-01	4.0085E-01	4.0218E-01	
BI-214		5.5995E-01	5.5995E-01	1.4796E-01	1.5149E-01	
RA-224	A	1.1194E+00	1.1194E+00	1.2212E+00	1.2229E+00	
RA-226	#	1.3552E+00	1.3552E+00	1.0950E+00	1.0978E+00	1.175E+00
AC-228		9.7592E-01	9.7592E-01	1.5878E-01	1.6859E-01	
TH-227	#B	-1.3323E-01	-1.3323E-01	3.5795E-01	3.5803E-01	3.957E-01
PA-234	#B	1.2629E-04	1.2629E-04	2.1749E-01	2.1749E-01	2.436E-01
TH-234	#B	5.1667E-01	5.1667E-01	6.1666E+00	6.1667E+00	6.909E+00
AM-241	#A	1.4246E-02	1.4247E-02	1.0501E+00	1.0501E+00	1.179E+00

- 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 (1120.0 to 2000.7 keV) 2.1180925E+01 pCi/gm
Total Decayed Activity (1120.0 to 2000.7 keV) 2.1180925E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JJM

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 103F_16SEPT2006_0936.An1

Sample description
FSS-SSS-01-01-006-F

Spectrum Filename: C:\GammaVision\Spectra\103F_16SEPT2006_0936.An1

Acquisition information
Start time: 16-Sep-2006 09:36:54
Live time: 2000
Real time: 2002
Dead time: 0.11 %
Detector ID: 4

Detector system
Det 103 - DSPE-471

Calibration
Filename: D3_1LSa.Clb
Detector_103 1.0 Liter Sand Geometry

Energy Calibration
Created: 08-Aug-2005 11:09:41
Zero offset: 0.409 keV
Gain: 0.500 keV/channel
Quadratic: 1.092E-08 keV/channel^2

Efficiency Calibration
Created: 08-Aug-2005 11:11:25
Type: Polynomial
Uncertainty: 0.993 %
Coefficients: -0.264059 -5.138468 0.638383
-0.089199 0.005011 -0.000129

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.41keV)
Stop channel: 4000 (2000.67keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.8010E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.8010E+03) =
5.5525E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five 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	11-Sep-2006 10:30:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	103_150K_05AUG05.Pbc 08-Aug-2005 12:54:15
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 18 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.2106

***** 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. pCi/gm	Nuc
74.65	154.	17.81	0.99	9.100E-03	74.81	9.600	1.303E+00	PB212
77.43	229.	13.34	0.99	1.038E-02	77.11	17.500	9.572E-01	PB212
					77.11	10.700	1.566E+00	PB214
87.29	74.	40.52	1.00	1.452E-02				
87.29	74.	40.52	1.00	1.452E-02	88.04	3.790	9.969E-01	CD109
93.05	113.	26.14	1.00	1.661E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.49	157.	20.09	1.02	2.565E-02	185.99	3.280	1.284E+00	RA226
209.66	134.	27.50	1.41	2.470E-02				
238.78	1184.	3.41	1.09	2.319E-02	238.63	43.100	8.796E-01	PB212
241.82	157.	17.27	1.09	2.303E-02	241.00	3.900	1.306E+00	RA224
					241.92	7.470	6.834E-01	PB214
270.44	103.	28.57	0.75	2.150E-02				
295.37	300.	10.88	1.01	2.024E-02	295.22	19.200	5.714E-01	PB214
300.26	86.	31.51	0.93	2.001E-02				
328.17	86.	35.19	1.00	1.873E-02				
338.45	264.	11.92	1.19	1.830E-02	338.40	12.010	8.982E-01	AC228
352.11	574.	7.43	1.21	1.775E-02	351.99	37.100	6.475E-01	PB214
409.32	36.	39.38	1.10	1.575E-02				
463.52	80.	22.16	0.97	1.425E-02	463.51	10.000	4.176E-01	SB125
511.15	206.	14.39	1.51	1.316E-02	510.72	22.500	4.547E-01	TL208
583.46	353.	7.39	1.27	1.184E-02	583.14	86.000	2.568E-01	TL208
609.52	360.	7.48	1.37	1.144E-02	609.32	46.090	5.031E-01	BI214
728.41	102.	20.44	1.40	9.952E-03	727.17	11.800	6.471E-01	BI212
795.30	77.	20.85	1.63	9.305E-03				
795.30	77.	20.85	1.63	9.305E-03	795.76	85.400	7.270E-02	CS134
835.84	28.	37.35	1.20	8.962E-03	834.81	99.978	PBC<MDA	MN54

861.05	76.	26.61	1.07	8.764E-03				
911.58	261.	7.51	1.39	8.398E-03	911.07	29.000	7.925E-01	AC228
964.83	46.	26.54	1.54	8.051E-03	964.00	14.580	2.931E-01	EU152
969.56	139.	10.54	1.54	8.022E-03	968.90	17.460	7.416E-01	AC228
1120.62	97.	16.81	1.13	7.210E-03	1120.28	15.040	6.607E-01	BI214
1461.44	1503.	2.73	1.67	5.930E-03	1460.75	10.700	1.754E+01	K40
1621.34	25.	26.93	1.89	5.488E-03	1620.56	2.750	1.226E+00	BI212

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1765.46	77.	11.79	2.01	5.140E-03	1764.51	15.920	6.767E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
173.75	87.52	408.	74.	0.037	121.57	1.001	PB-214	lD
418.49	209.66	508.	134.	0.067	82.49	1.413	NP-239	s
540.02	270.44	321.	103.	0.052	85.72	0.751	AC-228	s
599.67	300.26	262.	86.	0.043	94.52	0.933	PB-212	s
655.49	328.17	293.	86.	0.043	105.56	1.003	AC-228	
817.76	409.32	93.	36.	0.018	118.15	1.097	AC-228	
1670.74	835.84	41.	28.	0.014	111.81	1.195	AC-228	s
1721.14	861.05	94.	76.	0.038	63.75	1.072	TL-208	
1929.79	964.80	44.	55.	0.027	65.43	1.539	AC-228	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: FSS_Rev_1.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 3 Sigma %	FWHM keV
PB-212	148.79	74.81	352.	167.	0.084	51.95	0.993D
PB-212	153.39	77.11	362.	188.	0.094	39.84	0.995A
TH-234	185.33	93.08	955.	117.	0.059	99.85	1.500
TH-234	185.33	93.08	953.	115.	0.057	101.34	1.500
RA-226	372.14	186.49	432.	144.	0.072	60.27	1.016
PB-212	476.72	238.78	774.	1062.	0.531	15.43	0.976
RA-224	482.48	241.66	821.	143.	0.071	88.81	1.500
PB-214	589.90	295.37	288.	296.	0.148	32.65	1.010
AC-228	676.04	338.45	252.	263.	0.132	35.76	1.194
PB-214	703.37	352.11	361.	568.	0.284	22.28	1.209
SB-125	925.68	463.28	130.	67.	0.034	79.29	1.500s
TL-208	1021.42	511.15	231.	180.	0.090	43.18	1.511s
TL-208	1166.02	583.46	121.	349.	0.174	22.17	1.269
BI-214	1218.14	609.52	128.	354.	0.177	22.45	1.368
Ag-108M	1222.61	611.76	170.	-48.	-0.024	123.80	1.500s
BI-212	1455.89	728.41	108.	101.	0.051	61.33	1.396s
CS-134	1589.92	795.43	62.	58.	0.029	69.55	1.500s
AC-228	1822.18	911.58	57.	257.	0.129	22.53	1.390
EU-152	1929.74	965.36	73.	44.	0.022	93.47	1.538

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
AC-228	1936.81	968.90	40.	139.	0.069	31.96	1.541D
BI-214	2240.22	1120.62	67.	96.	0.048	50.42	1.129
K-40	2921.75	1461.44	53.	1484.	0.742	8.20	1.667
BI-212	3241.49	1621.34	6.	25.	0.012	80.78	1.888s
BI-214	3529.68	1765.46	5.	74.	0.037	35.37	2.009s

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 pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		-9.5697E-02					
			477.56	-9.570E-02	%(	3.694E-01 1.10E-01	G
K-40		1.7542E+01					
			1460.75	1.754E+01	(P	4.335E-01 4.85E-01	G
MN-54		-7.4931E-04					
			834.81	-7.493E-04	%(P	3.827E-02 1.09E-02	G
CO-57		1.0194E-02					
			122.07	1.019E-02	%(P	5.427E-02 1.63E-02	G K
			136.43	9.313E-03	&	4.200E-01 1.25E-01	G
CO-60		-4.3818E-03					
			1332.51	-4.382E-03	%(P	3.741E-02 1.01E-02	G K
			1173.23	1.429E-02	% P	4.980E-02 1.47E-02	G K
Sr-85		-1.5416E-02					
			514.00	-1.542E-02	%(	5.039E-02 1.51E-02	G
Kr-85		-3.3752E+02					
			513.99	-3.375E+02	%(	1.103E+03 3.31E+02	G
Y-88		-3.3542E-03					
			1836.01	-3.354E-03	%(P	2.903E-02 7.83E-03	G K
			898.02	6.089E-03	% P	3.861E-02 1.12E-02	G
NB-94		8.1640E-03					
			871.10	8.164E-03	&(	3.251E-02 9.53E-03	G K
			702.50	1.367E-02	%	3.936E-02 1.18E-02	G K

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Ag-108M	-1.8618E-02						
		722.95	-1.862E-02	%(	4.650E-02	1.40E-02	G K
		614.37	-3.492E-02	+ P	4.635E-02	1.44E-02	G
		433.93	2.949E-04	%	3.041E-02	8.78E-03	G
CD-109	-1.1539E-01						
		88.04	-1.154E-01	%(	2.135E+00	6.38E-01	G
SN-113	-1.4791E-02						
		391.71	-1.479E-02	&(	5.434E-02	1.62E-02	G K
		255.04	-5.891E-01	%	1.728E+00	5.20E-01	G
SB-125	8.7754E-02						
		427.95	-2.264E-03	&(P	1.018E-01	2.96E-02	G K
		600.77	9.810E-02	& P	1.601E-01	4.93E-02	G
		636.15	4.690E-02	% P	3.105E-01	9.07E-02	G
		463.51	3.542E-01	@(P	2.952E-01	9.54E-02	G
		176.29	-5.008E-02	&	6.069E-01	1.81E-01	G
I-131	1.5785E-02						
		364.48	1.579E-02	%(P	6.066E-02	1.81E-02	G K
		636.97	1.737E-01	%	6.727E-01	1.99E-01	G
		284.29	6.826E-03	% P	8.564E-01	2.52E-01	G
CS-134	2.5735E-02						
		604.66	0.000E+00	%(	6.588E-02	1.94E-02	G K
		795.76	5.515E-02	*(P	3.740E-02	1.28E-02	G
		569.29	-8.701E-03	% P	2.162E-01	6.19E-02	G
		801.84	2.377E-01	% P	3.506E-01	1.09E-01	G
CS-137	2.1557E-02						
		661.62	2.156E-02	%(P	4.374E-02	1.32E-02	G
CE-139	-8.3269E-03						
		165.85	-8.327E-03	%(	5.084E-02	1.52E-02	G
EU-152	1.1216E-01						
		121.78	2.899E-02	%(P	1.573E-01	4.72E-02	G K
		344.30	-2.061E-02	% P	1.241E-01	3.68E-02	G
		1408.08	6.946E-02	%	1.317E-01	4.05E-02	G
		964.00	2.789E-01	(P	2.722E-01	8.80E-02	G
		1112.07	1.067E-01	%	2.860E-01	8.54E-02	G
		778.90	8.181E-02	%	2.585E-01	7.68E-02	G
EU-154	1.9374E-03						
		123.10	1.937E-03	%(	8.829E-02	2.62E-02	G K
		1274.80	0.000E+00	%	1.532E-01	4.38E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          723.30-1.078E-01 %   2.351E-01 7.11E-02 G
                         1004.80-4.479E-02 %   2.127E-01 6.21E-02 G

EU-155       1.4708E-02
                           86.45 1.471E-02 %(  2.153E-01 6.42E-02 G K
                          105.31 5.147E-02 &   2.387E-01 7.17E-02 G

HG-203      -3.2111E-03
                          279.17-3.211E-03 &(P 4.693E-02 1.39E-02 G K
                           72.87-8.047E-01 & P 2.436E+00 7.35E-01 G
                           70.83-2.725E+00 %   4.576E+00 1.39E+00 G
                           82.50-4.032E-02 &   4.159E+00 1.24E+00 G

TL-208       2.5685E-01
                          583.14 2.568E-01  (P 3.980E-02 1.92E-02 G
                          510.72 4.548E-01 + P 1.863E-01 7.52E-02 G

PB-212       7.9729E-01
                          238.63 7.973E-01  (P 9.930E-02 4.15E-02 G K
                                                          Energy duplication
                           77.11 7.973E-01 } P 3.872E-01 1.06E-01 G
                           74.81 1.442E+00 + P 7.782E-01 2.54E-01 G

PB-214       6.2153E-01
                          351.99 6.475E-01  (P 1.039E-01 4.86E-02 G K
                          295.22 5.714E-01  (P 1.579E-01 6.31E-02 G
                                                          Energy duplication
                           77.11 0.000E+00 } P 9.360E-01 0.00E+00 G
                          241.92 3.577E-01 %   6.250E-01 1.90E-01 G

BI-212       6.4710E-01
                          727.17 6.471E-01 @(P 3.257E-01 1.33E-01 G K
                         1620.56 1.226E+00 + P 7.184E-01 3.31E-01 G
                          785.42 9.548E-01 %   1.659E+00 5.09E-01 G

BI-214       5.0312E-01
                          609.32 5.031E-01  (P 7.903E-02 3.84E-02 G K
                         1764.51 6.767E-01 + P 1.220E-01 8.33E-02 G
                         1120.28 6.607E-01 + P 2.836E-01 1.13E-01 G

RA-224       1.1903E+00
                          241.00 1.190E+00  (  1.136E+00 3.52E-01 G

RA-226       1.2839E+00
                          185.99 1.284E+00  (P 8.874E-01 2.81E-01 G

AC-228       7.9946E-01
                          911.07 7.925E-01  (P 1.164E-01 6.03E-02 G K
                          968.90 7.431E-01  (P 1.728E-01 7.93E-02 G
                          338.40 8.982E-01  (P 2.617E-01 1.08E-01 G
```

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

TH-227      -1.6296E-01
                          236.00-1.630E-01 %(  3.670E-01 1.11E-01 G K
                          256.25-3.863E-02 & P 4.835E-01 1.43E-01 G

PA-234       3.5672E-03
                           98.44 3.567E-03 %(P 2.292E-01 6.82E-02 G K
                          946.00 4.467E-02 % P 1.620E-01 4.76E-02 G
                          131.28-9.606E-04 % P 2.167E-01 6.45E-02 G
                           94.67-5.622E-02 & P 4.202E-01 1.26E-01 G
                          883.24-7.134E-02 %   3.352E-01 9.84E-02 G
                          926.70 4.958E-02 %   3.699E-01 1.07E-01 G
                          569.26-1.269E-02 % P 3.192E-01 9.14E-02 G

TH-234       1.8101E+00
                           63.29 1.672E+00 %(P 6.883E+00 2.06E+00 G K
                           92.80 1.746E+00  (P 2.228E+00 6.80E-01 G
                           92.38 2.095E+00  (P 2.627E+00 8.02E-01 G

AM-241      -1.8266E-03
                           59.54-1.827E-03 &(P 1.253E+00 3.73E-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

- -

***** 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 pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	-8.9726E-02	-9.5697E-02	3.2989E-01	3.2994E-01	3.463E-01
K-40		1.7542E+01	1.7542E+01	1.4557E+00	1.7766E+00	
MN-54	#A	-7.4110E-04	-7.4931E-04	7.7099E-02	7.7099E-02	3.785E-02
CO-57	#B	1.0065E-02	1.0194E-02	4.8831E-02	4.8834E-02	5.359E-02
CO-60	#B	-4.3740E-03	-4.3818E-03	1.8228E-01	1.8228E-01	3.734E-02
Sr-85	#A	-1.4620E-02	-1.5416E-02	4.5315E-02	4.5323E-02	4.778E-02
Kr-85	#A	-3.3751E+02	-3.3752E+02	9.9210E+02	9.9229E+02	1.103E+03
Y-88	#B	-3.2477E-03	-3.3542E-03	2.4924E-02	2.4924E-02	2.810E-02
NB-94	#B	8.1640E-03	8.1640E-03	2.8596E-02	2.8599E-02	3.251E-02
Ag-108M	#B	-1.8617E-02	-1.8618E-02	4.1979E-02	4.1993E-02	4.650E-02
CD-109	#A	-1.1452E-01	-1.1539E-01	1.9142E+00	1.9142E+00	2.119E+00
SN-113	#B	-1.4356E-02	-1.4791E-02	4.8671E-02	4.8679E-02	5.274E-02
SB-125	#B	8.7457E-02	8.7754E-02	7.0906E-02	7.1089E-02	1.015E-01
I-131	#B	1.0290E-02	1.5785E-02	5.4249E-02	5.4257E-02	3.954E-02
CS-134	#B	2.5618E-02	2.5735E-02	1.7927E-02	1.7989E-02	6.558E-02
CS-137	#A	2.1550E-02	2.1557E-02	3.9745E-02	3.9765E-02	4.373E-02
CE-139	#A	-8.1212E-03	-8.3269E-03	4.5683E-02	4.5686E-02	4.959E-02
EU-152	#B	1.1208E-01	1.1216E-01	1.0615E-01	1.0633E-01	1.572E-01
EU-154	#B	1.9352E-03	1.9374E-03	7.8528E-02	7.8528E-02	8.819E-02
EU-155	#B	1.4681E-02	1.4708E-02	1.9260E-01	1.9260E-01	2.149E-01
HG-203	#B	-2.9825E-03	-3.2111E-03	4.2201E-02	4.2202E-02	4.359E-02
TL-208		2.5685E-01	2.5685E-01	5.7650E-02	5.9547E-02	
PB-212		7.9729E-01	7.9729E-01	1.2443E-01	1.3276E-01	
PB-214		6.2153E-01	6.2153E-01	1.2436E-01	1.2949E-01	
BI-212	#	6.4710E-01	6.4710E-01	3.9877E-01	4.0054E-01	
BI-214		5.0312E-01	5.0312E-01	1.1504E-01	1.1869E-01	
RA-224		1.1903E+00	1.1903E+00	1.0572E+00	1.0594E+00	1.136E+00
RA-226		1.2838E+00	1.2839E+00	8.4343E-01	8.4672E-01	
AC-228		7.9946E-01	7.9946E-01	1.4186E-01	1.4926E-01	
TH-227	#B	-1.6296E-01	-1.6296E-01	3.3338E-01	3.3352E-01	3.670E-01
PA-234	#B	3.5672E-03	3.5672E-03	2.0474E-01	2.0474E-01	2.292E-01
TH-234	#B	1.8101E+00	1.8101E+00	2.0799E+00	2.0823E+00	6.883E+00
AM-241	#A	-1.8266E-03	-1.8266E-03	4.4450E-01	4.4450E-01	1.253E+00

- 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 (1120.0 to 2000.7 keV) 2.3641050E+01 pCi/gm
Total Decayed Activity (1120.0 to 2000.7 keV) 2.3641058E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JJM

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 103F_16SEPT2006_1017.An1

Sample description
FSS-SSS-01-01-030-F-B

Spectrum Filename: C:\GammaVision\Spectra\103F_16SEPT2006_1017.An1

Acquisition information
Start time: 16-Sep-2006 10:17:40
Live time: 2000
Real time: 2003
Dead time: 0.13 %
Detector ID: 4

Detector system
Det 103 - DSPE-471

Calibration
Filename: D3_1LSa.Clb
Detector_103 1.0 Liter Sand Geometry

Energy Calibration
Created: 08-Aug-2005 11:09:41
Zero offset: 0.409 keV
Gain: 0.500 keV/channel
Quadratic: 1.092E-08 keV/channel^2

Efficiency Calibration
Created: 08-Aug-2005 11:11:25
Type: Polynomial
Uncertainty: 0.993 %
Coefficients: -0.264059 -5.138468 0.638383
-0.089199 0.005011 -0.000129

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.41keV)
Stop channel: 4000 (2000.67keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.8640E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.8640E+03) =
5.3648E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five 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	10-Sep-2006 07:20:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	103_150K_05AUG05.Pbc 08-Aug-2005 12:54:15
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 15 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.2272

***** 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. pCi/gm	Nuc
74.94	144.	21.64	0.99	9.052E-03	74.81	9.600	1.201E+00	PB212
77.24	203.	13.65	0.99	1.011E-02	77.11	17.500	1.115E+00	PB212
					77.11	10.700	1.824E+00	PB214
87.22	120.	38.99	1.50	1.472E-02	86.45	32.740	PBC<MDA	EU155
					88.04	3.790	1.572E+00	CD109
186.10	207.	20.28	1.23	2.566E-02	185.99	3.280	1.668E+00	RA226
238.82	1279.	3.31	1.09	2.319E-02	238.63	43.100	9.189E-01	PB212
242.50	109.	26.93	1.10	2.299E-02	241.00	3.900	8.780E-01	RA224
					241.92	7.470	4.594E-01	PB214
270.02	124.	26.51	1.57	2.152E-02				
277.19	81.	39.11	0.91	2.115E-02				
295.37	301.	9.67	0.90	2.024E-02	295.22	19.200	5.543E-01	PB214
300.25	61.	36.91	1.23	2.001E-02				
327.87	65.	37.01	1.08	1.875E-02				
338.61	254.	12.84	1.19	1.829E-02	338.40	12.010	8.329E-01	AC228
352.14	541.	5.72	1.10	1.775E-02	351.99	37.100	5.888E-01	PB214
463.15	109.	22.31	1.19	1.426E-02				
463.15	109.	22.31	1.19	1.426E-02	463.51	10.000	5.490E-01	SB125
510.50	218.	11.42	1.40	1.318E-02	510.72	22.500	4.690E-01	TL208
583.40	463.	7.46	1.40	1.184E-02	583.14	86.000	3.266E-01	TL208
609.61	418.	6.78	1.55	1.143E-02	609.32	46.090	5.659E-01	BI214
727.63	148.	18.84	1.65	9.960E-03	727.17	11.800	9.082E-01	BI212
767.47	88.	24.86	1.31	9.561E-03				
785.95	29.	40.99	1.57	9.394E-03	785.42	2.000	PBC<MDA	BI212
795.52	71.	30.26	1.22	9.303E-03				
795.52	71.	30.26	1.22	9.303E-03	795.76	85.400	6.509E-02	CS134
861.39	75.	22.98	1.19	8.761E-03				

895.07	27.	34.43	1.50	8.492E-03	898.02	94.000	PBC<MDA	Y88
911.38	285.	8.13	1.75	8.399E-03	911.07	29.000	8.380E-01	AC228
965.23	48.	25.13	1.54	8.048E-03				
969.33	195.	8.39	1.54	8.023E-03	968.90	17.460	1.011E+00	AC228
1120.73	105.	18.43	1.42	7.210E-03	1120.28	15.040	6.865E-01	BI214
1238.94	46.	41.66	1.90	6.698E-03				
1461.50	1924.	2.32	1.67	5.930E-03	1460.75	10.700	2.177E+01	K40
1765.18	96.	11.81	2.08	5.140E-03	1764.51	15.920	8.177E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
484.16	242.42	376.	109.	0.054	80.79	1.095	XE-138	lD
539.19	270.02	380.	124.	0.062	79.54	1.569	AC-228	s
553.54	277.19	369.	81.	0.041	105.69	0.906	TL-208	s
599.65	300.25	223.	61.	0.031	110.74	1.234	PB-212	
654.89	327.87	230.	65.	0.032	111.02	1.083	AC-228	
1533.99	767.47	126.	88.	0.044	74.58	1.307	J-134	s
1721.82	861.39	74.	75.	0.038	68.93	1.192	TL-208	s
1930.31	965.24	55.	43.	0.022	85.33	1.539	AC-228	D
2476.82	1238.94	117.	46.	0.023	124.97	1.902	CO-56	

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

This section based on library: FSS_Rev_1.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 3 Sigma %	FWHM keV
PB-212	148.79	74.81	436.	144.	0.072	64.93	0.993D
PB-212	153.39	77.11	455.	203.	0.102	40.95	0.995A
CD-109	173.61	87.22	1033.	120.	0.060	116.96	1.500s
RA-226	371.86	186.35	817.	175.	0.087	67.69	1.500s
PB-212	476.85	238.85	814.	1257.	0.628	13.86	1.050
PB-214	589.89	295.37	265.	297.	0.149	29.01	0.903
AC-228	676.36	338.61	311.	253.	0.126	38.53	1.192
PB-214	703.42	352.14	194.	535.	0.267	17.15	1.099
SB-125	925.66	463.27	174.	65.	0.032	92.20	1.500s
TL-208	1020.10	510.50	176.	192.	0.096	34.27	1.396s
TL-208	1165.90	583.40	207.	459.	0.229	22.37	1.400s
CS-134	1214.12	607.51	208.	-61.	-0.031	107.40	1.500s
BI-214	1218.32	609.61	139.	412.	0.206	20.35	1.555
BI-212	1453.86	727.39	171.	137.	0.069	60.26	1.636s
BI-212	1570.95	785.95	54.	29.	0.015	122.97	1.571
CS-134	1589.48	795.21	98.	49.	0.025	95.28	1.500s
Y-88	1789.18	895.07	31.	27.	0.013	103.30	1.500s
AC-228	1821.79	911.38	93.	282.	0.141	24.39	1.751
AC-228	1936.81	968.90	39.	195.	0.098	25.35	1.541D
BI-214	2240.43	1120.73	97.	103.	0.051	55.30	1.420
K-40	2921.87	1461.50	40.	1906.	0.953	6.97	1.666

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-214	3528.99	1765.12	6.	64.	0.032	37.96	2.033

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 pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	Peak COMMENTS
BE-7		-1.8208E-02					
			477.56	-1.821E-02	%(	3.329E-01	9.71E-02 G
K-40		2.1766E+01					
			1460.75	2.177E+01	(P	3.689E-01	5.11E-01 G
MN-54		-7.5454E-03					
			834.81	-7.545E-03	%(P	3.916E-02	1.15E-02 G
CO-57		2.1491E-02					
			122.07	2.149E-02	%(P	5.280E-02	1.60E-02 G K
			136.43	6.740E-03	%	4.409E-01	1.32E-01 G
CO-60		-1.7176E-02					
			1332.51	-1.718E-02	&(P	4.724E-02	1.37E-02 G K
			1173.23	2.265E-02	% P	5.674E-02	1.70E-02 G K
Sr-85		-2.2231E-02					
			514.00	-2.223E-02	&(	4.925E-02	1.49E-02 G
Kr-85		-4.8096E+02					
			513.99	-4.810E+02	&(	1.065E+03	3.22E+02 G
Y-88		1.2527E-02					
			1836.01	5.553E-04	&(P	3.123E-02	8.27E-03 G K
			898.02	2.518E-02	?(P	2.712E-02	8.88E-03 G
NB-94		-2.3780E-04					
			871.10	-2.378E-04	%(	3.413E-02	9.68E-03 G K
			702.50	9.914E-03	&	3.548E-02	1.05E-02 G K
Ag-108M		-3.4221E-03					
			722.95	-3.422E-03	%(	4.515E-02	1.31E-02 G K
			614.37	-2.798E-02	% P	4.734E-02	1.45E-02 G
			433.93	1.369E-02	%	3.685E-02	1.11E-02 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CD-109	1.5725E+00						
		88.04	1.572E+00	&(	1.999E+00	6.13E-01	G
SN-113	3.6310E-03						
		391.71	3.631E-03	%(	5.094E-02	1.50E-02	G K
		255.04	1.964E-02	&	1.780E+00	5.27E-01	G
SB-125	8.3418E-02						
		427.95	-6.042E-05	&(P	1.158E-01	3.38E-02	G K
		600.77	-3.563E-03	% P	1.923E-01	5.57E-02	G
		636.15	-2.644E-03	& P	3.013E-01	8.64E-02	G
		463.51	3.305E-01	*(P	3.277E-01	1.04E-01	G
		176.29	7.834E-02	&	5.819E-01	1.74E-01	G
I-131	-1.5758E-02						
		364.48	-1.576E-02	%(P	7.457E-02	2.22E-02	G K
		636.97	-9.297E-02	%	8.570E-01	2.50E-01	G
		284.29	-1.410E-01	% P	9.874E-01	2.94E-01	G
CS-134	-3.9595E-02						
		604.66	-3.960E-02	?(	4.538E-02	1.42E-02	G K
		795.76	4.519E-02	+ P	4.486E-02	1.44E-02	G
		569.29	3.143E-02	% P	2.294E-01	6.71E-02	G
		801.84	9.961E-03	% P	4.700E-01	1.35E-01	G
CS-137	-1.4508E-02						
		661.62	-1.451E-02	%(P	4.709E-02	1.40E-02	G
CE-139	4.3121E-03						
		165.85	4.312E-03	&(	5.196E-02	1.55E-02	G
EU-152	2.8761E-02						
		121.78	2.876E-02	%(P	1.564E-01	4.69E-02	G K
		344.30	-2.567E-02	& P	1.301E-01	3.87E-02	G
		1408.08	1.004E-01	%	1.631E-01	5.08E-02	G
		964.00	-1.283E-01	% P	3.115E-01	9.34E-02	G
		1112.07	3.522E-03	%	3.812E-01	1.10E-01	G
		778.90	0.000E+00	&	2.991E-01	8.59E-02	G
EU-154	8.0876E-04						
		123.10	8.088E-04	%(	1.269E-01	3.79E-02	G K
		1274.80	3.826E-03	%	1.554E-01	4.47E-02	G
		723.30	-4.184E-03	%	2.152E-01	6.24E-02	G
		1004.80	-8.362E-02	&	2.771E-01	8.25E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	1.7700E-01						
		86.45	1.770E-01	%(	2.518E-01	7.70E-02	G K
		105.31	7.422E-02	%	2.421E-01	7.30E-02	G
HG-203	-6.2338E-03						
		279.17	-6.234E-03	&(P	4.133E-02	1.23E-02	G K
		72.87	-8.916E-01	% P	2.745E+00	8.29E-01	G
		70.83	-1.835E-01	%	5.080E+00	1.52E+00	G
		82.50	-8.245E-01	&	4.275E+00	1.28E+00	G
TL-208	3.2660E-01						
		583.14	3.266E-01	@(P	4.966E-02	2.46E-02	G
		510.72	4.690E-01	+ P	1.580E-01	6.10E-02	G
PB-212	9.1115E-01						
		238.63	9.111E-01	(P	9.839E-02	4.25E-02	G K
							Energy duplication
		77.11	8.320E-01	} P	4.181E-01	1.14E-01	G
		74.81	1.201E+00	+ P	8.344E-01	2.66E-01	G
PB-214	5.7706E-01						
		351.99	5.888E-01	(P	7.443E-02	3.40E-02	G K
		295.22	5.543E-01	(P	1.465E-01	5.43E-02	G
							Energy duplication
		77.11	4.420E-01	} P	1.013E+00	2.50E-01	G
		241.92	2.656E-01	%	6.271E-01	1.90E-01	G
BI-212	8.8714E-01						
		727.17	8.472E-01	@(P	3.920E-01	1.71E-01	G K
		1620.56	-1.321E-02	& P	1.082E+00	2.89E-01	G
		785.42	1.123E+00	(	1.425E+00	4.61E-01	G
BI-214	5.6592E-01						
		609.32	5.659E-01	(P	7.940E-02	3.90E-02	G K
		1764.51	5.661E-01	?(P	1.235E-01	7.53E-02	G
		1120.28	6.865E-01	+ P	3.253E-01	1.29E-01	G
RA-224	7.9441E-01						
		241.00	7.944E-01	%(	1.198E+00	3.66E-01	G
RA-226	1.5059E+00						
		185.99	1.506E+00	@(P	1.170E+00	3.65E-01	G
AC-228	8.8836E-01						
		911.07	8.380E-01	(P	1.420E-01	6.90E-02	G K
		968.90	1.010E+00	(P	1.641E-01	8.54E-02	G
		338.40	8.329E-01	(P	2.802E-01	1.07E-01	G

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

TH-227      -2.6828E-01
                          236.00-2.683E-01 %(  4.447E-01 1.35E-01 G K
                          256.25-2.246E-03 & P 4.196E-01 1.23E-01 G

PA-234       6.9000E-03
                           98.44 6.900E-03 %(P 2.137E-01 6.36E-02 G K
                          946.00-2.671E-02 % P 2.366E-01 6.90E-02 G
                          131.28 2.050E-02 % P 2.001E-01 5.98E-02 G
                           94.67-1.280E-01 & P 4.632E-01 1.40E-01 G
                          883.24 1.738E-01 %   2.874E-01 8.86E-02 G
                          926.70-9.568E-02 &   3.727E-01 1.10E-01 G
                          569.26 2.941E-02 % P 3.453E-01 1.01E-01 G

TH-234       1.1410E+00
                           63.29 1.141E+00 &(P 6.343E+00 1.90E+00 G K
                           92.80 1.416E+00 % P 2.345E+00 7.12E-01 G
                           92.38 1.618E+00 % P 2.786E+00 8.45E-01 G

AM-241      -1.1591E-01
                           59.54-1.159E-01 %(P 1.119E+00 3.34E-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

- -

***** 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 pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	-1.6817E-02	-1.8208E-02	2.9115E-01	2.9116E-01	3.075E-01
K-40		2.1766E+01	2.1766E+01	1.5316E+00	1.9856E+00	
MN-54	#A	-7.4435E-03	-7.5454E-03	3.7131E-02	3.7134E-02	3.863E-02
CO-57	#B	2.1156E-02	2.1491E-02	4.7910E-02	4.7925E-02	5.198E-02
CO-60	#B	-1.7138E-02	-1.7176E-02	5.8860E-02	5.8868E-02	4.714E-02
Sr-85	#A	-2.0822E-02	-2.2231E-02	4.4719E-02	4.4738E-02	4.613E-02
Kr-85	#A	-4.8094E+02	-4.8096E+02	9.6705E+02	9.6745E+02	1.065E+03
Y-88	#B	1.2038E-02	1.2527E-02	1.3247E-02	1.3267E-02	3.001E-02
NB-94	#B	-2.3780E-04	-2.3780E-04	2.9047E-02	2.9047E-02	3.413E-02
Ag-108M	#B	-3.4218E-03	-3.4221E-03	3.9446E-02	3.9447E-02	4.515E-02
CD-109	#A	1.5578E+00	1.5725E+00	1.8392E+00	1.8413E+00	1.981E+00
SN-113	#B	3.4995E-03	3.6310E-03	4.4868E-02	4.4868E-02	4.910E-02
SB-125	#B	8.3069E-02	8.3418E-02	7.8429E-02	7.8578E-02	1.153E-01
I-131	#B	-9.2947E-03	-1.5758E-02	7.1821E-02	7.1827E-02	4.398E-02
CS-134	#A	-3.9373E-02	-3.9595E-02	4.2523E-02	4.2585E-02	4.512E-02
CS-137	#A	-1.4503E-02	-1.4508E-02	4.8802E-02	4.8809E-02	4.707E-02
CE-139	#A	4.1811E-03	4.3121E-03	4.6570E-02	4.6571E-02	5.038E-02
EU-152	#B	2.8735E-02	2.8761E-02	1.4074E-01	1.4075E-01	1.563E-01
EU-154	#B	8.0765E-04	8.0876E-04	1.1364E-01	1.1364E-01	1.267E-01
EU-155	#B	1.7659E-01	1.7700E-01	2.3088E-01	2.3109E-01	2.512E-01
HG-203	#B	-5.6910E-03	-6.2338E-03	3.7048E-02	3.7049E-02	3.773E-02
TL-208	#	3.2660E-01	3.2660E-01	7.3755E-02	7.6153E-02	
PB-212		9.1115E-01	9.1115E-01	1.2749E-01	1.3803E-01	
PB-214		5.7706E-01	5.7706E-01	9.8479E-02	1.0402E-01	
BI-212		8.8714E-01	8.8714E-01	5.3652E-01	5.3898E-01	
BI-214		5.6592E-01	5.6592E-01	1.1696E-01	1.2148E-01	
RA-224	#A	7.9441E-01	7.9441E-01	1.0976E+00	1.0986E+00	1.198E+00
RA-226	#	1.5059E+00	1.5059E+00	1.0948E+00	1.0983E+00	1.170E+00
AC-228		8.8836E-01	8.8836E-01	1.5529E-01	1.6363E-01	
TH-227	#B	-2.6828E-01	-2.6828E-01	4.0638E-01	4.0667E-01	4.447E-01
PA-234	#B	6.9000E-03	6.9000E-03	1.9082E-01	1.9083E-01	2.137E-01
TH-234	#B	1.1410E+00	1.1410E+00	5.6865E+00	5.6868E+00	6.343E+00
AM-241	#A	-1.1591E-01	-1.1591E-01	1.0327E+00	1.0327E+00	1.119E+00

- 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 (1120.0 to 2000.7 keV) 2.5922634E+01 pCi/gm
Total Decayed Activity (1120.0 to 2000.7 keV) 2.5922634E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JJM

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 107_13SEPT2006_0814.An1

Sample description
SSS-01-01-020-F-S WET

Spectrum Filename: C:\GammaVision\Spectra\107_13SEPT2006_0814.An1

Acquisition information
Start time: 13-Sep-2006 08:14:07
Live time: 2000
Real time: 2002
Dead time: 0.12 %
Detector ID: 2

Detector system
Det 107- DSPE- 634

Calibration
Filename: 107_500S.Clb
Detector 107 500 ml Sand Geometry (800 g)

Energy Calibration
Created: 21-Nov-2004 02:37:40
Zero offset: 0.150 keV
Gain: 0.500 keV/channel
Quadratic: -1.833E-08 keV/channel^2

Efficiency Calibration
Created: 21-Nov-2004 06:51:17
Type: Polynomial
Uncertainty: 1.459 %
Coefficients: -0.291037 -4.391410 0.659468
-0.095428 0.006081 -0.000153

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.17keV)
Stop channel: 4000 (2000.50keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.0030E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.0030E+03) =
9.9701E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five 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	11-Sep-2006 08:04:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	1010K_Background_Det101.Pbc 17-May-2004 16:32:19
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 18 cutoff 20.00000 %
Energy Calibration
Normalized diff: 1.0000

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

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
76.14	878.	7.45	2.28	5.062E-02	74.81	9.600	2.484E+00	PB212
					77.11	17.500	1.318E+00	PB212
					77.11	10.700	2.155E+00	PB214
93.23	153.	29.97	2.25	5.829E-02	92.38	2.570	1.382E+00	TH234
					92.80	3.000	1.181E+00	TH234
					94.67	15.500	2.267E-01	PA234
185.53	196.	20.77	1.88	5.843E-02	185.99	3.280	1.379E+00	RA226
239.23	1370.	4.39	1.99	5.108E-02	238.63	43.100	8.373E-01	PB212
					241.00	3.900	9.312E+00	RA224
241.53	161.	20.78	1.30	5.072E-02	241.00	3.900	1.092E+00	RA224
					241.92	7.470	5.715E-01	PB214
296.03	383.	9.89	2.09	4.397E-02	295.22	19.200	6.105E-01	PB214
338.59	208.	16.47	1.69	3.957E-02	338.40	12.010	5.888E-01	AC228
352.11	499.	7.04	2.20	3.834E-02	351.99	37.100	4.725E-01	PB214
510.92	143.	14.36	3.20	2.812E-02	510.72	22.500	3.051E-01	TL208
					513.99	0.004	1.605E+03	Kr85
					514.00	99.270	7.104E-02	Sr85
583.27	380.	7.54	2.49	2.518E-02	583.14	86.000	2.363E-01	TL208
609.41	359.	7.88	2.16	2.429E-02	609.32	46.090	4.318E-01	BI214
662.22	103.	18.63	2.03	2.271E-02	661.62	84.620	7.251E-02	CS137
726.82	117.	15.74	1.76	2.105E-02	727.17	11.800	6.349E-01	BI212
911.27	290.	8.85	2.27	1.760E-02	911.07	29.000	7.661E-01	AC228
968.72	199.	12.63	1.30	1.677E-02	968.90	17.460	9.136E-01	AC228
1120.53	73.	19.76	1.92	1.499E-02	1120.28	15.040	4.364E-01	BI214
1461.22	1314.	2.87	2.86	1.218E-02	1460.75	10.700	1.359E+01	K40
1765.18	74.	15.02	2.57	1.045E-02	1764.51	15.920	5.991E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
477.25	239.23	454.	797.	0.398	15.55	1.299	PB-212	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: FSS_Rev_1.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 3 Sigma %	FWHM keV
PB-212	149.57	74.96	1486.	211.	0.106	80.19	1.500s
PB-212	153.87	77.11	1275.	403.	0.202	40.41	1.500D
PB-214	153.87	77.11	1132.	878.	0.439	22.34	2.283D
TH-234	185.66	93.01	1045.	119.	0.059	118.53	1.500s
TH-234	185.63	93.00	1015.	118.	0.059	118.26	1.500s
RA-226	370.65	185.53	522.	196.	0.098	62.32	1.883s
TH-227	471.52	235.98	1316.	-154.	-0.077	103.07	1.500s
PB-212	477.24	238.84	861.	783.	0.391	19.18	1.500s
PB-214	483.39	241.92	477.	161.	0.080	62.35	1.301D
PB-214	591.58	296.03	320.	383.	0.192	29.68	2.088s
AC-228	676.67	338.59	283.	208.	0.104	49.40	1.688s
PB-214	703.71	352.11	223.	499.	0.249	21.13	2.202s
TL-208	1021.24	510.92	104.	143.	0.072	43.07	3.201s
TL-208	1165.91	583.27	122.	380.	0.190	22.62	2.490s
BI-214	1218.17	609.41	122.	359.	0.179	23.63	2.159s
CS-137	1323.77	662.22	84.	103.	0.052	55.88	2.030s
BI-212	1452.95	726.82	74.	117.	0.058	47.21	1.765s
AC-228	1821.78	911.27	86.	290.	0.145	26.54	2.266s
AC-228	1936.65	968.72	102.	199.	0.099	37.88	1.303s
BI-214	2240.22	1120.53	54.	73.	0.036	59.27	1.923s
K-40	2921.51	1461.22	20.	1314.	0.657	8.60	2.860s
BI-214	3529.38	1765.18	9.	74.	0.037	45.05	2.565s

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 pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		2.8217E-02					
			477.56	2.822E-02	&(	2.323E-01 6.77E-02	G
K-40		1.3588E+01					
			1460.75	1.359E+01	*(	2.461E-01 3.90E-01	G
MN-54		5.8262E-03					
			834.81	5.826E-03	&(	3.247E-02 9.49E-03	G
CO-57		-8.2486E-03					
			122.07	-8.249E-03	%(P	3.220E-02 9.66E-03	G K
			136.43	-1.060E-03	%	2.314E-01 6.86E-02	G
CO-60		9.9541E-03					
			1332.51	9.954E-03	%(P	3.342E-02 9.48E-03	G K
			1173.23	1.227E-02	% P	4.818E-02 1.40E-02	G K
Sr-85		-1.3148E-02					
			514.00	-1.315E-02	&(	3.631E-02 1.09E-02	G
Kr-85		-2.9720E+02					
			513.99	-2.972E+02	&(	8.204E+02 2.47E+02	G
Y-88		1.9167E-03					
			1836.01	1.917E-03	%(P	2.125E-02 5.53E-03	G K
			898.02	8.001E-03	% P	2.930E-02 8.58E-03	G
NB-94		3.0632E-03					
			871.10	3.063E-03	&(	2.746E-02 7.87E-03	G K
			702.50	0.000E+00	%	3.291E-02 9.48E-03	G K
Ag-108M		-1.2551E-02					
			722.95	-1.255E-02	%(	4.314E-02 1.29E-02	G K
			614.37	-2.472E-02	%	4.043E-02 1.24E-02	G
			433.93	2.132E-03	&	2.124E-02 6.14E-03	G
CD-109		6.2218E-01					
			88.04	6.222E-01	%(	9.651E-01 2.94E-01	G
SN-113		-1.0331E-03					
			391.71	-1.033E-03	&(P	3.700E-02 1.07E-02	G K
			255.04	1.037E-01	&	1.137E+00 3.36E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	-3.5996E-03						
		427.95	-3.600E-03	&(	7.933E-02	2.30E-02	G K
		600.77	-3.491E-03	&	1.264E-01	3.61E-02	G
		636.15	3.244E-02	%	2.242E-01	6.51E-02	G
		463.51	1.358E-01	%	2.495E-01	7.61E-02	G
		176.29	-1.671E-02	&	3.977E-01	1.18E-01	G
I-131	9.8359E-03						
		364.48	9.836E-03	%(	3.072E-02	9.17E-03	G K
		636.97	-1.468E-02	%	4.402E-01	1.26E-01	G
		284.29	8.275E-02	&	4.926E-01	1.46E-01	G
CS-134	-2.3313E-02						
		604.66	-2.331E-02	%(	4.237E-02	1.29E-02	G K
		795.76	2.163E-02	%	3.470E-02	1.07E-02	G
		569.29	3.574E-02	%	1.690E-01	4.97E-02	G
		801.84	4.543E-02	%	3.429E-01	9.94E-02	G
CS-137	7.2508E-02						
		661.62	7.251E-02	(	3.178E-02	1.35E-02	G
CE-139	-7.0008E-03						
		165.85	-7.001E-03	%(P	3.254E-02	9.74E-03	G
EU-152	-2.2848E-02						
		121.78	-2.285E-02	%(	9.615E-02	2.89E-02	G K
		344.30	-3.255E-02	%	8.961E-02	2.69E-02	G
		1408.08	-2.298E-02	%	1.420E-01	4.04E-02	G
		964.00	-8.940E-02	%	3.317E-01	9.87E-02	G
		1112.07	7.211E-02	%	2.506E-01	7.39E-02	G
		778.90	-1.653E-02	&	2.089E-01	5.98E-02	G
EU-154	-1.2022E-02						
		123.10	-1.202E-02	%(	6.700E-02	2.01E-02	G K
		1274.80	9.889E-05	%	9.938E-02	2.79E-02	G
		723.30	-3.514E-02	%	1.891E-01	5.58E-02	G
		1004.80	4.914E-03	%	1.607E-01	4.52E-02	G
EU-155	6.5967E-02						
		86.45	6.597E-02	%(	1.184E-01	3.60E-02	G K
		105.31	3.128E-02	%	1.263E-01	3.79E-02	G
HG-203	3.9594E-03						
		279.17	3.959E-03	&(P	3.045E-02	8.98E-03	G K
		72.87	1.445E-02	%	9.895E-01	2.97E-01	G
		70.83	-7.777E-01	&	1.486E+00	4.51E-01	G
		82.50	-9.636E-01	%	1.730E+00	5.26E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.3626E-01						
		583.14	2.363E-01	*(	3.373E-02	1.78E-02	G
		510.72	3.051E-01	+	1.068E-01	4.38E-02	G
PB-212	4.7812E-01						
		238.63	4.781E-01	*(	8.518E-02	3.06E-02	G K
							Energy duplication
		77.11	6.055E-01	+	2.538E-01	8.16E-02	G
		74.81	5.971E-01	+	5.159E-01	1.60E-01	G
PB-214	4.8905E-01						
		351.99	4.725E-01	*(	6.848E-02	3.33E-02	G K
		295.22	6.105E-01	+	1.370E-01	6.04E-02	G
							Energy duplication
		77.11	2.155E+00	+	3.914E-01	1.62E-01	G
		241.92	5.715E-01	(	3.717E-01	1.19E-01	G
BI-212	6.3494E-01						
		727.17	6.349E-01	*(	2.323E-01	9.99E-02	G K
		1620.56	2.853E-01	%	7.632E-01	2.25E-01	G
		785.42	4.683E-01	%	1.360E+00	4.05E-01	G
BI-214	4.3293E-01						
		609.32	4.318E-01	*(	6.526E-02	3.40E-02	G K
		1764.51	5.991E-01	+	1.351E-01	9.00E-02	G
		1120.28	4.364E-01	(	2.209E-01	8.62E-02	G
RA-224	-9.7201E-02						
		241.00	-9.720E-02	&(	1.094E+00	3.27E-01	G
RA-226	1.3794E+00						
		185.99	1.379E+00	*(	7.683E-01	2.86E-01	G
AC-228	8.2150E-01						
		911.07	7.661E-01	*(	1.211E-01	6.78E-02	G K
		968.90	9.136E-01	*(	2.294E-01	1.15E-01	G
		338.40	5.888E-01	-	2.299E-01	9.70E-02	G
TH-227	-3.5866E-01						
		236.00	-3.587E-01	?(	4.010E-01	1.23E-01	G K
		256.25	3.421E-02	%	3.433E-01	1.02E-01	G
PA-234	-2.3100E-02						
		98.44	-2.310E-02	%(	1.182E-01	3.54E-02	G K
		946.00	1.730E-02	&	1.545E-01	4.44E-02	G
		131.28	1.453E-02	&	1.391E-01	4.15E-02	G
		94.67	-1.104E-02	%	2.069E-01	6.17E-02	G
		883.24	5.887E-02	&	2.129E-01	6.25E-02	G
		926.70	1.111E-03	%	2.967E-01	8.43E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		569.26	5.289E-02	%	2.503E-01	7.36E-02	G
TH-234	7.2078E-01						
		63.29	3.440E-01	&(	1.399E+00	4.21E-01	G K
		92.80	9.078E-01	*(	1.167E+00	3.58E-01	G
		92.38	1.074E+00	*(	1.385E+00	4.24E-01	G
AM-241	7.6170E-03						
		59.54	7.617E-03	%(P	1.906E-01	5.68E-02	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	

- -

***** 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 pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	2.7492E-02	2.8217E-02	2.0316E-01	2.0317E-01	2.263E-01
K-40	#	1.3588E+01	1.3588E+01	1.1682E+00	1.4319E+00	
MN-54	#A	5.8003E-03	5.8262E-03	2.8464E-02	2.8466E-02	3.233E-02
CO-57	#B	-8.2062E-03	-8.2486E-03	3.1430E-02	3.1433E-02	3.204E-02
CO-60	#B	9.9469E-03	9.9541E-03	2.8426E-02	2.8433E-02	3.340E-02

Sr-85	#A	-1.2869E-02	-1.3148E-02	3.2741E-02	3.2751E-02	3.554E-02
Kr-85	#A	-2.9720E+02	-2.9720E+02	7.3984E+02	7.4006E+02	8.204E+02
Y-88	#B	1.8919E-03	1.9167E-03	1.6587E-02	1.6587E-02	2.097E-02
NB-94	#B	3.0632E-03	3.0632E-03	2.3616E-02	2.3616E-02	2.746E-02
Ag-108M	#B	-1.2551E-02	-1.2551E-02	3.8587E-02	3.8594E-02	4.314E-02
CD-109	#A	6.2027E-01	6.2218E-01	8.8330E-01	8.8397E-01	9.621E-01
SN-113	#B	-1.0207E-03	-1.0331E-03	1.8400E-01	1.8400E-01	3.655E-02
SB-125	#B	-3.5947E-03	-3.5996E-03	6.9104E-02	6.9105E-02	7.922E-02
I-131	#B	8.2731E-03	9.8359E-03	2.7525E-02	2.7531E-02	2.584E-02
CS-134	#B	-2.3270E-02	-2.3313E-02	3.8743E-02	3.8769E-02	4.229E-02
CS-137	#	7.2498E-02	7.2508E-02	4.0516E-02	4.0756E-02	
CE-139	#A	-6.9303E-03	-7.0008E-03	2.9561E-02	2.9564E-02	3.221E-02
EU-152	#B	-2.2841E-02	-2.2848E-02	8.6594E-02	8.6603E-02	9.612E-02
EU-154	#B	-1.2016E-02	-1.2022E-02	6.0164E-02	6.0168E-02	6.697E-02
EU-155	#B	6.5917E-02	6.5967E-02	1.0800E-01	1.0806E-01	1.183E-01
HG-203	#B	3.8429E-03	3.9594E-03	2.6941E-02	2.6942E-02	2.956E-02
TL-208	#	2.3626E-01	2.3626E-01	5.3430E-02	5.5336E-02	
PB-212	#	4.7812E-01	4.7812E-01	9.1713E-02	9.6230E-02	8.518E-02
PB-214		4.8905E-01	4.8905E-01	1.0335E-01	1.0756E-01	
BI-212	#	6.3494E-01	6.3494E-01	2.9976E-01	3.0224E-01	
BI-214	#	4.3293E-01	4.3293E-01	1.0230E-01	1.0565E-01	
RA-224	#A	-9.7201E-02	-9.7201E-02	9.8242E-01	9.8244E-01	1.094E+00
RA-226	#	1.3794E+00	1.3794E+00	8.5957E-01	8.6367E-01	
AC-228	#	8.2150E-01	8.2150E-01	1.8997E-01	1.9645E-01	
TH-227	#A	-3.5866E-01	-3.5866E-01	3.6968E-01	3.7033E-01	4.010E-01
PA-234	#B	-2.3100E-02	-2.3100E-02	1.0623E-01	1.0624E-01	1.182E-01
TH-234	#B	7.2078E-01	7.2078E-01	8.5236E-01	8.5330E-01	1.399E+00
AM-241	#A	7.6169E-03	7.6170E-03	1.7040E-01	1.7040E-01	1.906E-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 (294.7 to 2000.5 keV) 1.7654854E+01 pCi/gm
Total Decayed Activity (294.7 to 2000.5 keV) 1.7654867E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 107_15SEPT2006_1303.An1

Sample description
FSS-SSS-01-01-020-F

Spectrum Filename: C:\GammaVision\Spectra\107_15SEPT2006_1303.An1

Acquisition information
Start time: 15-Sep-2006 13:03:55
Live time: 2000
Real time: 2002
Dead time: 0.10 %
Detector ID: 2

Detector system
Det 107- DSPE- 634

Calibration
Filename: 107_500S.Clb
Detector 107 500 ml Sand Geometry (800 g)

Energy Calibration
Created: 21-Nov-2004 02:37:40
Zero offset: 0.150 keV
Gain: 0.500 keV/channel
Quadratic: -1.833E-08 keV/channel^2

Efficiency Calibration
Created: 21-Nov-2004 06:51:17
Type: Polynomial
Uncertainty: 1.459 %
Coefficients: -0.291037 -4.391410 0.659468
-0.095428 0.006081 -0.000153

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.17keV)
Stop channel: 4000 (2000.50keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 5.9900E+02
Activity scaling factor: 1.0000E+06/(1.0000E+00* 5.9900E+02) =
1.6694E+03
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five 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	11-Sep-2006 08:04:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	1010K_Background_Det101.Pbc 17-May-2004 16:32:19
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 17 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1964

***** 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. pCi/gm	Nuc
76.12	637.	9.58	3.48	5.061E-02	72.87	6.400	4.988E+00	HG203
					74.81	9.600	3.019E+00	PB212
					77.11	10.700	2.619E+00	PB214
					77.11	17.500	1.601E+00	PB212
86.99	106.	38.54	1.35	5.630E-02	86.45	32.740	1.307E-01	EU155
					88.04	3.790	1.123E+00	CD109
92.35	152.	27.34	1.81	5.804E-02				
92.35	152.	27.34	1.81	5.804E-02	92.38	2.570	2.306E+00	TH234
					92.80	3.000	1.972E+00	TH234
185.76	162.	20.00	1.93	5.840E-02				
185.76	162.	20.00	1.93	5.840E-02	185.99	3.280	1.914E+00	RA226
238.85	630.	6.00	1.30	5.113E-02	238.63	43.100	6.444E-01	PB212
241.99	145.	20.75	1.30	5.070E-02	241.00	3.900	1.649E+00	RA224
270.74	85.	30.94	1.07	4.697E-02				
296.03	255.	13.11	1.89	4.397E-02	295.22	19.200	6.790E-01	PB214
338.64	240.	13.01	1.83	3.957E-02	338.40	12.010	1.139E+00	AC228
352.14	376.	9.08	2.02	3.833E-02	351.99	37.100	5.956E-01	PB214
463.05	43.	37.47	1.50	3.050E-02	463.51	10.000	PBC<MDA	SB125
511.27	183.	14.67	3.53	2.812E-02	510.72	22.500	6.525E-01	TL208
					513.99	0.004	3.433E+03	Kr85
					514.00	99.270	1.555E-01	Sr85
583.64	307.	8.36	2.65	2.517E-02	583.14	86.000	3.194E-01	TL208
609.62	279.	8.86	2.69	2.428E-02	609.32	46.090	5.614E-01	BI214
661.95	156.	14.57	1.62	2.270E-02	661.62	84.620	1.830E-01	CS137
727.69	77.	27.27	2.10	2.104E-02	727.17	11.800	6.979E-01	BI212
911.73	252.	8.91	2.03	1.759E-02	911.07	29.000	1.114E+00	AC228
969.24	167.	13.04	1.41	1.677E-02	968.90	17.460	1.289E+00	AC228

1122.07	70.	24.64	1.12	1.499E-02	1120.28	15.040	7.006E-01	BI214
1461.49	1037.	3.20	2.60	1.218E-02	1460.75	10.700	1.794E+01	K40

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1620.46	16.	28.45	1.08	1.121E-02	1620.56	2.750	1.186E+00	BI212
1765.26	53.	15.31	2.69	1.045E-02	1764.51	15.920	7.171E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
151.89	76.12	1379.	224.	0.112	73.11	3.477	BI-207	s
173.62	86.99	654.	106.	0.053	115.62	1.347	BI-207	l
477.25	238.87	398.	630.	0.315	17.99	1.299	PB-212	D
483.54	242.01	380.	145.	0.072	62.26	1.301	PB-214	D
541.01	270.74	218.	85.	0.043	92.83	1.070	AC-228	
591.58	296.03	429.	94.	0.047	98.54	1.885	PB-214	s
703.78	352.14	495.	99.	0.049	100.35	2.024	PB-214	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: FSS_Rev_1.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 3 Sigma %	FWHM keV
PB-212	151.16	75.75	1223.	131.	0.065	116.54	1.500s
PB-214	153.87	77.11	961.	282.	0.141	49.87	1.500D
PB-212	153.87	77.11	961.	282.	0.141	49.87	1.500D
TH-234	185.33	92.85	817.	116.	0.058	108.04	1.500s
TH-234	185.34	92.85	769.	121.	0.061	100.91	1.500s
RA-226	371.72	186.07	340.	96.	0.048	87.10	1.500s
PB-212	477.25	238.85	648.	638.	0.319	20.68	1.500s
PB-214	590.22	295.35	266.	161.	0.080	49.11	1.500s
AC-228	676.78	338.64	210.	240.	0.120	39.03	1.829s
PB-214	704.00	352.25	201.	277.	0.138	28.24	1.500s
SB-125	925.52	463.05	106.	43.	0.021	112.42	1.500s
TL-208	1021.95	511.27	128.	183.	0.091	44.01	3.527s
TL-208	1166.66	583.64	92.	307.	0.153	25.09	2.648s
BI-214	1218.88	609.76	101.	296.	0.148	26.09	2.702s
CS-137	1323.23	661.95	97.	156.	0.078	43.72	1.621
BI-212	1454.68	727.69	95.	77.	0.038	81.80	2.105s
AC-228	1822.70	911.73	63.	252.	0.126	26.73	2.028s
AC-228	1937.70	969.24	74.	167.	0.084	39.12	1.411
BI-214	2243.30	1122.07	65.	70.	0.035	73.92	1.117s
K-40	2922.06	1461.49	14.	1037.	0.518	9.61	2.602s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-212	3239.95	1620.46	2.	16.	0.008	85.35	1.078s
BI-214	3529.54	1765.26	3.	53.	0.026	45.94	2.688s

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 pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		-8.3688E-02					
			477.56	-8.369E-02	&(	3.874E-01 1.14E-01	G
K-40		1.7943E+01					
			1460.75	1.794E+01	*(	3.530E-01 5.75E-01	G
MN-54		-6.1315E-03					
			834.81	-6.131E-03	%(	5.286E-02 1.53E-02	G
CO-57		2.2210E-03					
			122.07	2.221E-03	%(P	4.447E-02 1.32E-02	G K
			136.43	-3.366E-05	&	3.482E-01 1.03E-01	G
CO-60		1.5794E-02					
			1332.51	1.579E-02	%(P	5.603E-02 1.58E-02	G K
			1173.23	1.239E-02	% P	6.056E-02 1.72E-02	G K
Sr-85		-5.6136E-03					
			514.00	-5.614E-03	%(	5.597E-02 1.64E-02	G
Kr-85		-1.2389E+02					
			513.99	-1.239E+02	%(	1.235E+03 3.63E+02	G
Y-88		4.2931E-03					
			1836.01	4.293E-03	&(P	3.662E-02 9.67E-03	G K
			898.02	5.812E-03	& P	4.920E-02 1.40E-02	G
NB-94		7.4431E-03					
			871.10	7.443E-03	%(	3.714E-02 1.07E-02	G K
			702.50	-5.992E-03	%	4.214E-02 1.22E-02	G K
Ag-108M		-1.0833E-02					
			722.95	-1.083E-02	%(	5.434E-02 1.59E-02	G K
			614.37	-2.667E-02	%	6.372E-02 1.92E-02	G
			433.93	-8.223E-03	%	4.455E-02 1.31E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CD-109	7.8516E-01						
		88.04	7.852E-01	%(	1.491E+00	4.53E-01	G
SN-113	8.0970E-03						
		391.71	8.097E-03	%(P	5.986E-02	1.75E-02	G K
		255.04	0.000E+00	%	1.783E+00	5.22E-01	G
SB-125	7.9553E-02						
		427.95	-1.347E-04	%(	1.245E-01	3.59E-02	G K
		600.77	6.085E-02	%	1.922E-01	5.69E-02	G
		636.15	-1.036E-01	%	3.848E-01	1.14E-01	G
		463.51	3.154E-01	*(	3.755E-01	1.18E-01	G
		176.29	3.995E-02	&	5.649E-01	1.67E-01	G
I-131	8.5854E-03						
		364.48	8.585E-03	&(	6.274E-02	1.84E-02	G K
		636.97	-1.068E-01	%	8.125E-01	2.35E-01	G
		284.29	-1.257E-02	%	8.389E-01	2.45E-01	G
CS-134	-2.4094E-02						
		604.66	-2.409E-02	%(	5.639E-02	1.70E-02	G K
		795.76	3.033E-02	%	4.513E-02	1.41E-02	G
		569.29	1.481E-02	%	2.146E-01	6.11E-02	G
		801.84	8.410E-02	&	4.956E-01	1.43E-01	G
CS-137	1.8296E-01						
		661.62	1.830E-01	(	5.714E-02	2.67E-02	G
CE-139	-9.0498E-03						
		165.85	-9.050E-03	%(P	4.858E-02	1.45E-02	G
EU-152	9.8518E-04						
		121.78	9.852E-04	%(	1.301E-01	3.85E-02	G K
		344.30	-1.076E-03	%	1.125E-01	3.24E-02	G
		1408.08	3.471E-02	%	2.094E-01	5.91E-02	G
		964.00	4.400E-03	%	5.001E-01	1.44E-01	G
		1112.07	0.000E+00	&	4.999E-01	1.43E-01	G
		778.90	-1.041E-02	%	4.117E-01	1.18E-01	G
EU-154	9.6505E-04						
		123.10	9.650E-04	%(	9.136E-02	2.70E-02	G K
		1274.80	-5.958E-02	%	1.778E-01	5.28E-02	G
		723.30	-2.739E-02	&	2.887E-01	8.40E-02	G
		1004.80	-4.517E-02	&	2.984E-01	8.62E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	9.8567E-02						
		86.45	9.857E-02	%(	1.709E-01	5.20E-02	G K
		105.31	9.746E-02	%	1.794E-01	5.46E-02	G
HG-203	-3.2719E-03						
		279.17	-3.272E-03	&(P	4.835E-02	1.40E-02	G K
		72.87	-3.566E-01	%	1.376E+00	4.14E-01	G
		70.83	-1.079E-01	%	1.447E+00	4.29E-01	G
		82.50	-9.681E-02	%	2.063E+00	6.11E-01	G
TL-208	3.1936E-01						
		583.14	3.194E-01	*(	4.948E-02	2.67E-02	G
		510.72	6.525E-01	+	1.976E-01	9.58E-02	G
PB-212	6.6237E-01						
		238.63	6.528E-01	*(	1.241E-01	4.50E-02	G K
							Energy duplication
		77.11	7.098E-01	*(	3.699E-01	1.18E-01	G
		74.81	6.189E-01	*(	7.848E-01	2.40E-01	G
PB-214	4.3550E-01						
		351.99	4.391E-01	*(	1.092E-01	4.13E-02	G K
		295.22	4.285E-01	*(	2.098E-01	7.01E-02	G
							Energy duplication
		77.11	1.161E+00	+	6.049E-01	1.93E-01	G
		241.92	-4.359E-01	%	8.096E-01	2.46E-01	G
BI-212	7.9007E-01						
		727.17	6.979E-01	@(	4.378E-01	1.90E-01	G K
		1620.56	1.186E+00	*(	6.559E-01	3.37E-01	G
		785.42	1.066E+00	%	2.149E+00	6.54E-01	G
BI-214	6.4125E-01						
		609.32	5.957E-01	*(	1.000E-01	5.18E-02	G K
		1764.51	7.171E-01	*(	1.480E-01	1.10E-01	G
		1120.28	7.006E-01	@(	4.032E-01	1.73E-01	G
RA-224	5.9369E-01						
		241.00	5.937E-01	&(	1.526E+00	4.61E-01	G
RA-226	1.1308E+00						
		185.99	1.131E+00	*(	1.045E+00	3.28E-01	G
AC-228	1.1714E+00						
		911.07	1.114E+00	*(	1.755E-01	9.93E-02	G K
		968.90	1.289E+00	(	3.288E-01	1.68E-01	G
		338.40	1.139E+00	*(	3.333E-01	1.48E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-227	-4.0852E-01						
		236.00	-4.085E-01	%(	5.727E-01	1.75E-01	G K
		256.25	-6.859E-02	&	5.354E-01	1.58E-01	G
PA-234	-3.6306E-03						
		98.44	-3.631E-03	&(	1.334E-01	3.93E-02	G K
		946.00	-4.884E-02	%	2.586E-01	7.52E-02	G
		131.28	-6.904E-02	&	2.014E-01	6.07E-02	G
		94.67	-7.596E-02	%	3.310E-01	9.94E-02	G
		883.24	-5.058E-02	&	3.917E-01	1.13E-01	G
		926.70	0.000E+00	&	5.083E-01	1.45E-01	G
		569.26	2.198E-02	%	3.172E-01	9.04E-02	G
TH-234	1.4239E+00						
		63.29	1.095E+00	%(	2.056E+00	6.25E-01	G K
		92.80	1.566E+00	(	1.706E+00	5.27E-01	G
		92.38	1.757E+00	(	2.056E+00	6.33E-01	G
AM-241	-6.5915E-02						
		59.54	-6.592E-02	%(P	2.705E-01	8.11E-02	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

- -

***** 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 pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	-7.9240E-02	-8.3688E-02	3.4220E-01	3.4223E-01	3.668E-01
K-40	#	1.7943E+01	1.7943E+01	1.7245E+00	2.0419E+00	
MN-54	#A	-6.0745E-03	-6.1315E-03	4.5879E-02	4.5880E-02	5.237E-02
CO-57	#B	2.1971E-03	2.2210E-03	3.9514E-02	3.9514E-02	4.399E-02
CO-60	#B	1.5770E-02	1.5794E-02	4.7515E-02	4.7524E-02	5.594E-02
Sr-85	#A	-5.3666E-03	-5.6136E-03	4.9299E-02	4.9300E-02	5.351E-02
Kr-85	#A	-1.2389E+02	-1.2389E+02	1.0881E+03	1.0881E+03	1.235E+03
Y-88	#B	4.1772E-03	4.2931E-03	2.9009E-02	2.9010E-02	3.563E-02
NB-94	#B	7.4431E-03	7.4431E-03	3.2077E-02	3.2081E-02	3.714E-02
Ag-108M	#B	-1.0832E-02	-1.0833E-02	4.7784E-02	4.7789E-02	5.434E-02
CD-109	#A	7.8012E-01	7.8516E-01	1.3594E+00	1.3601E+00	1.482E+00
SN-113	#B	7.8944E-03	8.0970E-03	5.2576E-02	5.2579E-02	5.837E-02
SB-125	#B	7.9324E-02	7.9553E-02	8.9435E-02	8.9566E-02	1.241E-01
I-131	#B	5.9730E-03	8.5854E-03	5.5229E-02	5.5231E-02	4.365E-02
CS-134	#B	-2.4001E-02	-2.4094E-02	5.1054E-02	5.1076E-02	5.617E-02
CS-137		1.8291E-01	1.8296E-01	7.9985E-02	8.0758E-02	
CE-139	#A	-8.8598E-03	-9.0498E-03	4.4141E-02	4.4144E-02	4.756E-02
EU-152	#B	9.8456E-04	9.8518E-04	1.1544E-01	1.1544E-01	1.300E-01
EU-154	#B	9.6414E-04	9.6505E-04	8.1021E-02	8.1021E-02	9.127E-02
EU-155	#B	9.8409E-02	9.8567E-02	1.5608E-01	1.5618E-01	1.706E-01
HG-203	#B	-3.0733E-03	-3.2719E-03	4.2830E-01	4.2830E-01	4.542E-02
TL-208	#	3.1936E-01	3.1936E-01	8.0140E-02	8.2469E-02	
PB-212	#	6.6237E-01	6.6237E-01	1.3696E-01	1.4278E-01	1.241E-01
PB-214	#	4.3550E-01	4.3550E-01	1.2299E-01	1.2582E-01	1.092E-01
BI-212	#	7.9007E-01	7.9007E-01	4.6701E-01	4.6949E-01	
BI-214	#	6.4125E-01	6.4125E-01	1.6727E-01	1.7178E-01	
RA-224	#A	5.9369E-01	5.9369E-01	1.3831E+00	1.3836E+00	1.526E+00
RA-226	#	1.1308E+00	1.1308E+00	9.8497E-01	9.8738E-01	1.045E+00
AC-228		1.1714E+00	1.1714E+00	2.3969E-01	2.5010E-01	
TH-227	#B	-4.0852E-01	-4.0852E-01	5.2559E-01	5.2618E-01	5.727E-01
PA-234	#B	-3.6306E-03	-3.6306E-03	1.1796E-01	1.1796E-01	1.334E-01
TH-234	#B	1.4239E+00	1.4239E+00	1.0736E+00	1.0765E+00	2.056E+00
AM-241	#A	-6.5914E-02	-6.5915E-02	2.4775E-01	2.4778E-01	2.705E-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

YAEC Chemistry Lab Spectrum name: 107_15SEPT2006_1303.An1

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

Total Activity (270.7 to 2000.5 keV) 2.1047831E+01 pCi/gm
Total Decayed Activity (270.7 to 2000.5 keV) 2.1047880E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 107F_15SEPT2006_0842.An1

Sample description
FSS-SSS-01-01-032-F-B

Spectrum Filename: C:\GammaVision\Spectra\107F_15SEPT2006_0842.An1

Acquisition information
Start time: 15-Sep-2006 08:42:13
Live time: 2000
Real time: 2004
Dead time: 0.20 %
Detector ID: 2

Detector system
Det 107- DSPE- 634

Calibration
Filename: D7_1LSa.Clb
Detector 107 Calibration for 1 Liter Sand Marinelli

Energy Calibration
Created: 29-Oct-2004 06:48:53
Zero offset: 0.157 keV
Gain: 0.500 keV/channel
Quadratic: -1.676E-08 keV/channel^2

Efficiency Calibration
Created: 29-Oct-2004 06:51:32
Type: Polynomial
Uncertainty: 1.174 %
Coefficients: -0.279532 -4.778179 0.614896
-0.087174 0.005356 -0.000131

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.16keV)
Stop channel: 4000 (2000.15keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 2.0240E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 2.0240E+03) =
4.9407E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five 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	11-Sep-2006 07:25:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	107_150K_28APR05.Pbc 01-May-2005 05:30:33
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 18 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.0845

***** 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. pCi/gm	Nuc
74.78	372.	13.76	1.18	2.849E-02	74.81	9.600	9.075E-01	PB212
77.08	217.	21.96	1.18	2.957E-02	77.11	17.500	5.831E-01	PB212
					77.11	10.700	9.436E-01	PB214
77.20	217.	25.93	1.50	2.957E-02	77.11	17.500	PBC<MDA	PB212
					77.11	10.700	PBC<MDA	PB214
93.26	141.	39.98	1.50	3.438E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
129.82	162.	36.23	0.95	3.820E-02				
129.82	162.	36.23	0.95	3.820E-02	131.28	20.000	1.413E-01	PA234
186.16	272.	19.82	2.76	3.609E-02	185.99	3.280	1.531E+00	RA226
209.42	138.	30.05	0.74	3.428E-02				
239.27	2044.	3.69	1.94	3.184E-02	238.63	43.100	9.851E-01	PB212
					241.00	3.900	1.103E+01	RA224
242.08	245.	17.50	1.30	3.163E-02	241.00	3.900	1.325E+00	RA224
					241.92	7.470	6.936E-01	PB214
269.33	153.	25.57	1.35	2.951E-02				
295.69	392.	13.31	2.12	2.764E-02	295.22	19.200	4.867E-01	PB214
338.85	365.	10.98	2.17	2.498E-02	338.40	12.010	8.044E-01	AC228
351.84	741.	6.42	2.11	2.427E-02	351.99	37.100	5.461E-01	PB214
463.26	64.	31.12	1.13	1.954E-02				
463.26	64.	31.12	1.13	1.954E-02	463.51	10.000	PBC<MDA	SB125
510.93	219.	17.43	1.95	1.808E-02	510.72	22.500	3.039E-01	TL208
583.32	636.	6.49	2.23	1.629E-02	583.14	86.000	3.009E-01	TL208
609.30	557.	7.42	2.36	1.574E-02	609.32	46.090	5.083E-01	BI214
662.11	289.	9.85	2.44	1.476E-02	661.62	84.620	1.525E-01	CS137
726.60	212.	14.86	1.95	1.375E-02	727.17	11.800	8.675E-01	BI212
795.19	55.	32.91	1.68	1.284E-02	795.76	85.400	PBC<MDA	CS134

860.65	94.	21.44	1.24	1.211E-02				
911.33	398.	7.06	2.47	1.161E-02	911.07	29.000	7.810E-01	AC228
968.35	278.	10.79	2.17	1.110E-02	968.90	17.460	9.493E-01	AC228
1119.73	224.	15.75	1.57	9.973E-03	1120.28	15.040	9.935E-01	BI214

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1173.83	47.	33.23	1.93	9.637E-03	1173.23	99.860	PBC<MDA	CO60
1332.71	27.	38.30	2.03	8.773E-03	1332.51	99.980	PBC<MDA	CO60
1377.90	33.	31.02	1.42	8.557E-03				
1461.06	2300.	2.14	2.56	8.190E-03	1460.75	10.700	1.748E+01	K40
1620.75	29.	23.72	0.64	7.569E-03	1620.56	2.750	9.398E-01	BI212
1764.82	113.	9.83	0.88	7.083E-03	1764.51	15.920	6.649E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
418.47	209.42	682.	138.	0.069	90.15	0.737	AC-228	s
538.28	269.33	510.	153.	0.076	76.70	1.349	AC-228	s
1720.86	860.65	104.	94.	0.047	64.31	1.236	TL-208	s
2755.39	1377.90	27.	33.	0.016	93.06	1.423	BI-214	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: FSS_Rev_1.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 3 Sigma %	FWHM keV
PB-212	149.29	74.81	1151.	372.	0.186	41.27	1.178D
PB-212	153.89	77.11	1232.	217.	0.108	65.87	1.179A
PB-214	153.89	77.11	2129.	217.	0.108	77.78	1.500A
PA-234	257.79	129.07	1047.	128.	0.064	110.49	1.500s
RA-226	371.56	185.96	1038.	187.	0.093	76.52	1.500s
PB-212	476.89	238.63	713.	1278.	0.639	12.03	1.297D
PB-214	483.47	241.92	812.	245.	0.123	52.50	1.299D
PB-214	590.70	295.54	800.	362.	0.181	45.87	2.084s
AC-228	677.31	338.85	417.	362.	0.181	32.95	2.166s
PB-214	703.30	351.84	454.	736.	0.368	19.27	2.110s
TL-208	1021.45	510.93	377.	185.	0.093	52.29	1.954s
TL-208	1166.23	583.32	272.	631.	0.316	19.47	2.233s
BI-214	1218.19	609.30	272.	552.	0.276	22.26	2.365s
Ag-108M	1224.93	612.68	350.	-84.	-0.042	99.95	1.561
CS-137	1323.79	662.11	172.	285.	0.143	29.54	2.444s
BI-212	1452.78	726.60	196.	211.	0.105	44.57	1.954s
CS-134	1589.96	795.19	139.	55.	0.027	98.74	1.684s
AC-228	1822.23	911.33	130.	394.	0.197	21.17	2.471s
AC-228	1936.26	968.35	170.	275.	0.138	32.37	2.166s
BI-214	2238.92	1119.67	211.	210.	0.105	50.26	1.549s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
CO-60	2347.22	1173.83	124.	47.	0.024	99.70	1.931s
K-40	2921.72	1461.06	30.	2295.	1.148	6.41	2.560s
BI-212	3241.12	1620.75	8.	29.	0.015	71.16	0.641s
BI-214	3529.29	1764.82	4.	112.	0.056	29.49	0.877s

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 pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		3.4649E-02					
			477.56	3.465E-02	&(	2.460E-01 7.26E-02	G
K-40		1.7484E+01					
			1460.75	1.748E+01	*(P	2.149E-01 3.74E-01	G
MN-54		-2.3332E-04					
			834.81	-2.333E-04	&(P	3.704E-02 1.08E-02	G
CO-57		-2.0281E-03					
			122.07	-2.028E-03	%(P	3.783E-02 1.13E-02	G K
			136.43	4.533E-02	% P	2.877E-01 8.64E-02	G
CO-60		2.6602E-02					
			1332.51	2.044E-02	%(P	2.889E-02 8.93E-03	G K
			1173.23	3.278E-02	(P	3.794E-02 1.19E-02	G K
Sr-85		-1.1233E-02					
			514.00	-1.123E-02	&(	3.549E-02 1.07E-02	G
Kr-85		-2.7414E+02					
			513.99	-2.741E+02	&(P	7.877E+02 2.36E+02	G
Y-88		1.6549E-03					
			1836.01	1.655E-03	%(P	2.235E-02 6.03E-03	G K
			898.02	-1.884E-04	& P	3.965E-02 1.15E-02	G
NB-94		4.5372E-05					
			871.10	4.537E-05	&(P	2.627E-02 7.51E-03	G K
			702.50	-6.560E-05	% P	2.969E-02 8.61E-03	G K
Ag-108M		2.7794E-03					
			722.95	2.779E-03	&(	3.102E-02 9.06E-03	G K
			614.37	-3.969E-02	+	4.245E-02 1.32E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		433.93	-6.666E-04	& P	2.958E-02	8.65E-03	G
CD-109	5.8340E-01						
		88.04	5.834E-01	%(P	1.109E+00	3.37E-01	G
SN-113	-8.4621E-03						
		391.71	-8.462E-03	&(P	4.159E-02	1.23E-02	G K
		255.04	9.912E-02	%	1.338E+00	3.98E-01	G
SB-125	-2.4564E-02						
		427.95	-2.456E-02	%(P	9.502E-02	2.83E-02	G K
		600.77	-8.164E-03	% P	1.577E-01	4.59E-02	G
		636.15	-2.788E-02	% P	2.373E-01	6.94E-02	G
		463.51	1.818E-01	% P	2.584E-01	7.94E-02	G
		176.29	6.438E-02	% P	4.271E-01	1.28E-01	G
I-131	-3.8563E-03						
		364.48	-3.856E-03	%(	4.159E-02	1.23E-02	G K
		636.97	-8.192E-02	%	5.133E-01	1.51E-01	G
		284.29	-1.707E-01	%	6.144E-01	1.84E-01	G
CS-134	1.1272E-02						
		604.66	-8.182E-03	%(P	2.728E-02	8.12E-03	G K
		795.76	3.350E-02	*(P	3.521E-02	1.11E-02	G
		569.29	-9.644E-03	&	1.645E-01	4.80E-02	G
		801.84	1.853E-02	% P	3.536E-01	1.03E-01	G
CS-137	1.5252E-01						
		661.62	1.525E-01	*(P	3.406E-02	1.52E-02	G
CE-139	-1.1770E-02						
		165.85	-1.177E-02	%(P	3.682E-02	1.11E-02	G
EU-152	-1.2874E-02						
		121.78	-1.287E-02	%(P	1.076E-01	3.23E-02	G K
		344.30	-3.339E-02	% P	1.028E-01	3.09E-02	G
		1408.08	2.472E-02	% P	1.057E-01	3.04E-02	G
		964.00	-1.866E-03	& P	3.493E-01	1.03E-01	G
		1112.07	-1.011E-01	% P	2.949E-01	8.81E-02	G
		778.90	-5.496E-02	% P	2.188E-01	6.47E-02	G
EU-154	-5.2327E-03						
		123.10	-5.233E-03	&(P	7.442E-02	2.23E-02	G K
		1274.80	-3.635E-03	% P	1.309E-01	3.81E-02	G
		723.30	4.096E-02	& P	1.244E-01	3.71E-02	G
		1004.80	3.830E-03	& P	2.076E-01	6.02E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	5.4035E-02						
		86.45	5.404E-02	%(	1.366E-01	4.14E-02	G K
		105.31	3.947E-03	% P	1.548E-01	4.63E-02	G
HG-203	8.9779E-03						
		279.17	8.978E-03	%(P	3.141E-02	9.42E-03	G K
		72.87	-5.401E-01	% P	1.067E+00	3.24E-01	G
		70.83	-6.269E-01	%	1.764E+00	5.34E-01	G
		82.50	1.626E-01	%	2.054E+00	6.17E-01	G
TL-208	3.0155E-01						
		583.14	3.009E-01	*(P	3.789E-02	1.97E-02	G
		510.72	3.039E-01	@(P	1.529E-01	6.26E-02	G
PB-212	6.0969E-01						
		238.63	6.205E-01	(P	6.177E-02	2.52E-02	G K
							Energy duplication
		77.11	2.798E-01	}	2.145E-01	6.14E-02	G
		74.81	9.075E-01	+ P	3.925E-01	1.26E-01	G
PB-214	5.4608E-01						
		351.99	5.461E-01	*(P	7.566E-02	3.53E-02	G K
		295.22	4.554E-01	- P	1.690E-01	7.05E-02	G
							Energy duplication
		77.11	4.568E-01	} P	4.594E-01	1.18E-01	G
		241.92	6.936E-01	+ P	3.828E-01	1.22E-01	G
BI-212	8.8120E-01						
		727.17	8.675E-01	*(P	2.800E-01	1.30E-01	G K
		1620.56	9.398E-01	(P	5.018E-01	2.27E-01	G
		785.42	-1.512E-01	& P	1.593E+00	4.64E-01	G
BI-214	5.0830E-01						
		609.32	5.083E-01	*(P	7.317E-02	3.80E-02	G K
		1764.51	6.649E-01	+ P	6.909E-02	6.59E-02	G
		1120.28	9.329E-01	+ P	3.138E-01	1.57E-01	G
RA-224	2.6529E-01						
		241.00	2.653E-01	&(P	1.081E+00	3.26E-01	G
RA-226	1.0516E+00						
		185.99	1.052E+00	*(	8.620E-01	2.68E-01	G
AC-228	7.8784E-01						
		911.07	7.810E-01	*(P	1.109E-01	5.57E-02	G K
		968.90	9.493E-01	+ P	2.186E-01	1.03E-01	G
		338.40	8.044E-01	*(P	2.177E-01	8.92E-02	G

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

TH-227      -2.4840E-03
                          236.00-2.484E-03 %(P 3.908E-01 1.17E-01 G K
                          256.25 2.856E-02 % P 3.864E-01 1.15E-01 G

PA-234       4.1240E-02
                           98.44-1.495E-02 %(  1.428E-01 4.29E-02 G K
                          946.00 4.833E-03 &   1.646E-01 4.77E-02 G
                          131.28 1.118E-01 &(  1.340E-01 4.12E-02 G
                           94.67-7.439E-02 %   2.532E-01 7.64E-02 G
                          883.24 4.474E-02 &   2.524E-01 7.42E-02 G
                          926.70 1.931E-02 &   2.993E-01 8.71E-02 G
                          569.26-2.173E-02 &   2.365E-01 6.92E-02 G

TH-234       2.0451E-01
                           63.29 2.045E-01 %(P 1.645E+00 4.93E-01 G K
                           92.80 9.119E-01 % P 1.367E+00 4.16E-01 G
                           92.38-2.430E-01 % P 1.632E+00 4.90E-01 G

AM-241      -1.1387E-02
                           59.54-1.139E-02 %(P 2.190E-01 6.56E-02 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

- -

***** 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 pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	3.2873E-02	3.4649E-02	2.1772E-01	2.1773E-01	2.334E-01
K-40	#	1.7484E+01	1.7484E+01	1.1233E+00	1.5258E+00	
MN-54	#A	-2.3123E-04	-2.3332E-04	2.7745E-02	2.7745E-02	3.671E-02
CO-57	#B	-2.0071E-03	-2.0281E-03	3.5954E-02	3.5954E-02	3.744E-02
CO-60	#B	2.6563E-02	2.6602E-02	2.2628E-02	2.2683E-02	2.885E-02
Sr-85	#A	-1.0757E-02	-1.1233E-02	3.1967E-02	3.1974E-02	3.398E-02
Kr-85	#A	-2.7413E+02	-2.7414E+02	8.5369E+02	8.5384E+02	7.876E+02
Y-88	#B	1.6119E-03	1.6549E-03	1.8080E-02	1.8080E-02	2.177E-02
NB-94	#B	4.5372E-05	4.5372E-05	2.2540E-02	2.2540E-02	2.627E-02
Ag-108M	#B	2.7792E-03	2.7794E-03	2.7173E-02	2.7174E-02	3.102E-02
CD-109	#A	5.7980E-01	5.8340E-01	1.0101E+00	1.0106E+00	1.102E+00
SN-113	#B	-8.2581E-03	-8.4621E-03	4.5471E-02	4.5474E-02	4.058E-02
SB-125	#B	-2.4495E-02	-2.4564E-02	9.6240E-02	9.6251E-02	9.476E-02
I-131	#B	-2.7189E-03	-3.8563E-03	3.6879E-02	3.6880E-02	2.932E-02
CS-134	#B	1.1230E-02	1.1272E-02	1.1237E-02	1.1256E-02	2.718E-02
CS-137	#	1.5248E-01	1.5252E-01	4.5613E-02	4.6494E-02	
CE-139	#A	-1.1532E-02	-1.1770E-02	3.3760E-02	3.3767E-02	3.608E-02
EU-152	#B	-1.2866E-02	-1.2874E-02	9.8079E-02	9.8082E-02	1.075E-01
EU-154	#B	-5.2280E-03	-5.2327E-03	7.3101E-02	7.3102E-02	7.435E-02
EU-155	#B	5.3951E-02	5.4035E-02	1.2405E-01	1.2409E-01	1.364E-01
HG-203	#B	8.4525E-03	8.9779E-03	2.8269E-02	2.8274E-02	2.957E-02
TL-208	#	3.0155E-01	3.0155E-01	5.9138E-02	6.1761E-02	
PB-212		6.0969E-01	6.0969E-01	7.4238E-02	8.2511E-02	
PB-214		5.4608E-01	5.4608E-01	1.0597E-01	1.1077E-01	
BI-212		8.8120E-01	8.8120E-01	3.7513E-01	3.7873E-01	
BI-214	#	5.0830E-01	5.0830E-01	1.1403E-01	1.1791E-01	
RA-224	#A	2.6529E-01	2.6529E-01	9.7674E-01	9.7687E-01	1.081E+00
RA-226	#	1.0516E+00	1.0516E+00	8.0476E-01	8.0715E-01	8.620E-01
AC-228	#	7.8784E-01	7.8784E-01	1.5572E-01	1.6253E-01	
TH-227	#B	-2.4840E-03	-2.4840E-03	5.3167E-01	5.3167E-01	3.908E-01
PA-234	#B	4.1240E-02	4.1240E-02	4.5565E-02	4.5623E-02	1.428E-01
TH-234	#B	2.0451E-01	2.0451E-01	1.4788E+00	1.4788E+00	1.645E+00
AM-241	#A	-1.1387E-02	-1.1387E-02	2.2379E-01	2.2379E-01	2.190E-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

YAEC Chemistry Lab Spectrum name: 107F_15SEPT2006_0842.An1

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

Total Activity (269.2 to 2000.1 keV) 2.1270924E+01 pCi/gm
Total Decayed Activity (269.2 to 2000.1 keV) 2.1270962E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 107F_15SEPT2006_1003.An1

Sample description
FSS-SSS-01-01-037-F-B

Spectrum Filename: C:\GammaVision\Spectra\107F_15SEPT2006_1003.An1

Acquisition information
Start time: 15-Sep-2006 10:03:12
Live time: 2000
Real time: 2003
Dead time: 0.17 %
Detector ID: 2

Detector system
Det 107- DSPE- 634

Calibration
Filename: D7_1LSa.Clb
Detector 107 Calibration for 1 Liter Sand Marinelli

Energy Calibration
Created: 29-Oct-2004 06:48:53
Zero offset: 0.157 keV
Gain: 0.500 keV/channel
Quadratic: -1.676E-08 keV/channel^2

Efficiency Calibration
Created: 29-Oct-2004 06:51:32
Type: Polynomial
Uncertainty: 1.174 %
Coefficients: -0.279532 -4.778179 0.614896
-0.087174 0.005356 -0.000131

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.16keV)
Stop channel: 4000 (2000.15keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.8870E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.8870E+03) =
5.2994E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five 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	11-Sep-2006 14:21:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	107_150K_28APR05.Pbc 01-May-2005 05:30:33
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 18 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.3004

***** 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. pCi/gm	Nuc
76.10	962.	7.85	1.94	2.912E-02	74.81	9.600	2.508E+00	PB212
					77.11	17.500	1.331E+00	PB212
					77.11	10.700	2.166E+00	PB214
87.15	157.	40.18	1.46	3.303E-02	86.45	32.740	1.045E-01	EU155
					88.04	3.790	PBC<MDA	CD109
93.12	165.	32.28	1.65	3.445E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.04	249.	18.05	2.47	3.610E-02	185.99	3.280	1.503E+00	RA226
209.58	164.	22.95	1.57	3.426E-02				
239.29	1644.	4.12	1.94	3.184E-02	238.63	43.100	8.480E-01	PB212
					241.00	3.900	9.506E+00	RA224
242.10	182.	21.19	1.30	3.163E-02	241.92	7.470	5.518E-01	PB214
295.02	366.	9.90	1.61	2.769E-02	295.22	19.200	4.869E-01	PB214
300.92	68.	40.00	1.33	2.730E-02				
328.99	128.	24.90	1.73	2.554E-02				
338.52	348.	11.54	1.54	2.500E-02	338.40	12.010	8.234E-01	AC228
352.10	639.	7.40	2.06	2.425E-02	351.99	37.100	5.045E-01	PB214
463.13	80.	29.67	1.91	1.954E-02				
463.13	80.	29.67	1.91	1.954E-02	463.51	10.000	2.827E-01	SB125
511.10	220.	15.04	2.34	1.807E-02	510.72	22.500	3.287E-01	TL208
583.08	480.	7.66	2.42	1.629E-02	583.14	86.000	2.430E-01	TL208
609.43	509.	6.99	1.97	1.574E-02	609.32	46.090	4.981E-01	BI214
727.11	146.	21.62	0.85	1.374E-02	727.17	11.800	6.400E-01	BI212
794.83	69.	25.69	1.37	1.285E-02				
794.83	69.	25.69	1.37	1.285E-02	795.76	85.400	4.462E-02	CS134
911.39	327.	9.95	2.00	1.160E-02	911.07	29.000	6.875E-01	AC228
968.67	258.	11.15	2.65	1.109E-02	968.90	17.460	9.475E-01	AC228

1120.32	135.	18.01	1.93	9.970E-03	1120.28	15.040	6.405E-01	BI214
1461.10	1738.	2.53	2.75	8.189E-03	1460.75	10.700	1.416E+01	K40
1621.75	22.	28.63	0.64	7.569E-03	1620.56	2.750	7.637E-01	BI212
1764.36	116.	9.28	1.54	7.084E-03	1764.51	15.920	7.310E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
418.79	209.58	519.	164.	0.082	68.86	1.574	NP-239	s
601.46	300.92	280.	68.	0.034	120.01	1.327	PB-212	s
657.60	328.99	296.	128.	0.064	74.71	1.727	LA-140	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: FSS_Rev_1.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 3 Sigma %	FWHM keV
PB-212	149.29	74.81	862.	301.	0.150	44.26	1.178D
PB-212	153.89	77.11	877.	246.	0.123	45.28	1.179A
PB-214	153.89	77.11	1408.	181.	0.090	82.35	1.500A
CD-109	173.92	87.13	1379.	148.	0.074	108.87	1.500s
RA-226	371.71	186.04	678.	249.	0.124	54.14	2.473s
TH-227	470.30	235.33	1477.	-180.	-0.090	93.44	1.500s
PB-212	476.89	238.63	599.	1018.	0.509	13.61	1.297D
RA-224	477.43	238.90	1151.	819.	0.409	20.40	1.500s
PB-214	483.47	241.92	666.	182.	0.091	63.58	1.299D
PB-214	589.65	295.02	355.	361.	0.181	29.70	1.609s
AC-228	676.66	338.52	366.	345.	0.173	34.62	1.539s
PB-214	703.82	352.10	414.	634.	0.317	22.19	2.065s
SB-125	925.94	463.17	150.	57.	0.028	94.67	1.500s
TL-208	1021.79	511.10	271.	187.	0.093	45.13	2.339s
TL-208	1165.75	583.08	213.	475.	0.238	22.99	2.417s
BI-214	1218.45	609.43	193.	505.	0.252	20.96	1.970s
BI-212	1453.78	727.11	195.	145.	0.072	64.85	0.854s
CS-134	1589.65	795.04	85.	57.	0.028	79.00	1.684
AC-228	1822.34	911.39	171.	323.	0.162	29.84	1.999s
AC-228	1936.91	968.67	142.	256.	0.128	33.44	2.646s
BI-214	2240.20	1120.32	115.	134.	0.067	54.02	1.935
K-40	2921.79	1461.10	42.	1733.	0.867	7.58	2.753s
BI-212	3243.12	1621.75	7.	22.	0.011	85.88	0.640s
BI-214	3528.38	1764.36	1.	115.	0.058	27.85	1.538s

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 pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		9.4583E-02					
			477.56	9.458E-02	%(	2.462E-01	7.40E-02 G
K-40		1.4163E+01					
			1460.75	1.416E+01	*(P	2.678E-01	3.59E-01 G
MN-54		-8.2380E-03					
			834.81	-8.238E-03	%(P	3.397E-02	1.00E-02 G
CO-57		1.2821E-03					
			122.07	1.282E-03	&(P	3.221E-02	9.61E-03 G K
			136.43	-4.123E-02	% P	2.797E-01	8.39E-02 G
CO-60		-3.1577E-03					
			1332.51	-3.158E-03	&(P	3.360E-02	9.26E-03 G K
			1173.23	7.067E-03	% P	3.886E-02	1.13E-02 G K
Sr-85		-1.6659E-02					
			514.00	-1.666E-02	&(	3.615E-02	1.10E-02 G
Kr-85		-3.9703E+02					
			513.99	-3.970E+02	&(P	8.048E+02	2.43E+02 G
Y-88		-3.8602E-03					
			1836.01	-3.860E-03	%(P	2.288E-02	6.17E-03 G K
			898.02	-5.053E-03	% P	3.553E-02	1.03E-02 G
NB-94		-8.1165E-05					
			871.10	-8.116E-05	%(P	2.449E-02	6.94E-03 G K
			702.50	5.886E-03	% P	2.779E-02	8.19E-03 G K
Ag-108M		-9.1210E-03					
			722.95	-9.121E-03	%(	4.012E-02	1.19E-02 G K
			614.37	-2.830E-02	%	4.018E-02	1.24E-02 G
			433.93	-1.176E-03	% P	2.503E-02	7.26E-03 G
CD-109		8.4695E-01					
			88.04	8.469E-01	*(P	1.004E+00	3.08E-01 G
SN-113		2.6922E-03					
			391.71	2.692E-03	&(P	3.672E-02	1.08E-02 G K
			255.04	-4.137E-02	&	1.188E+00	3.52E-01 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	5.2518E-02						
		427.95	-3.130E-04	&(P	8.153E-02	2.37E-02	G K
		600.77	1.401E-02	% P	1.197E-01	3.47E-02	G
		636.15	2.193E-03	% P	2.240E-01	6.45E-02	G
		463.51	2.089E-01	*(P	2.198E-01	6.92E-02	G
		176.29	2.045E-02	% P	4.381E-01	1.31E-01	G
I-131	-6.8202E-03						
		364.48	-6.820E-03	&(	3.883E-02	1.15E-02	G K
		636.97	-6.256E-02	&	4.932E-01	1.44E-01	G
		284.29	-1.398E-01	&	5.768E-01	1.73E-01	G
CS-134	1.5285E-02						
		604.66	-3.834E-03	&(P	6.353E-02	1.89E-02	G K
		795.76	3.714E-02	(P	2.999E-02	9.87E-03	G
		569.29	5.331E-02	&	1.525E-01	4.56E-02	G
		801.84	1.871E-02	% P	3.159E-01	9.12E-02	G
CS-137	2.2348E-02						
		661.62	2.235E-02	%(P	3.433E-02	1.05E-02	G
CE-139	7.6482E-03						
		165.85	7.648E-03	%(P	3.326E-02	9.99E-03	G
EU-152	-3.8887E-03						
		121.78	-3.889E-03	&(P	9.650E-02	2.88E-02	G K
		344.30	-2.160E-02	% P	9.427E-02	2.81E-02	G
		1408.08	3.072E-03	% P	9.949E-02	2.69E-02	G
		964.00	-4.089E-02	% P	3.158E-01	9.32E-02	G
		1112.07	8.899E-04	% P	2.296E-01	6.53E-02	G
		778.90	-4.803E-03	& P	1.955E-01	5.58E-02	G
EU-154	6.1075E-03						
		123.10	6.108E-03	&(P	6.911E-02	2.07E-02	G K
		1274.80	7.940E-03	% P	1.044E-01	3.01E-02	G
		723.30	-4.459E-02	& P	1.836E-01	5.46E-02	G
		1004.80	1.708E-02	% P	1.477E-01	4.25E-02	G
EU-155	9.0157E-02						
		86.45	9.016E-02	%(	1.281E-01	3.91E-02	G K
		105.31	4.683E-04	% P	1.398E-01	4.17E-02	G
HG-203	-3.9893E-03						
		279.17	-3.989E-03	&(P	3.254E-02	9.65E-03	G K
		72.87	-2.344E-01	% P	8.378E-01	2.53E-01	G
		70.83	-4.412E-01	%	1.636E+00	4.93E-01	G
		82.50	-6.407E-01	%	1.765E+00	5.33E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.4305E-01						
		583.14	2.430E-01	*(P	3.611E-02	1.88E-02	G
		510.72	3.287E-01	+ P	1.399E-01	5.84E-02	G
PB-212	5.3047E-01						
		238.63	5.305E-01	(P	6.081E-02	2.44E-02	G K
							Energy duplication
		77.11	3.406E-01	}	1.947E-01	5.14E-02	G
		74.81	7.877E-01	+ P	3.653E-01	1.18E-01	G
PB-214	5.0473E-01						
		351.99	5.045E-01	*(P	7.761E-02	3.76E-02	G K
		295.22	4.869E-01	*(P	1.219E-01	4.88E-02	G
							Energy duplication
		77.11	4.093E-01	} P	4.019E-01	1.12E-01	G
		241.92	5.518E-01	(P	3.727E-01	1.18E-01	G
BI-212	6.6334E-01						
		727.17	6.400E-01	*(P	2.994E-01	1.40E-01	G K
		1620.56	7.637E-01	(P	5.114E-01	2.24E-01	G
		785.42	-2.031E-03	% P	1.439E+00	4.13E-01	G
BI-214	4.9813E-01						
		609.32	4.981E-01	*(P	6.663E-02	3.51E-02	G K
		1764.51	7.310E-01	+ P	4.680E-02	6.84E-02	G
		1120.28	6.405E-01	+ P	2.515E-01	1.16E-01	G
RA-224	4.7426E+00						
		241.00	4.743E+00	&(P	9.312E-01	3.23E-01	G
RA-226	1.5035E+00						
		185.99	1.503E+00	*(	7.504E-01	2.71E-01	G
AC-228	7.2731E-01						
		911.07	6.875E-01	@(P	1.353E-01	6.93E-02	G K
		968.90	9.475E-01	+ P	2.152E-01	1.07E-01	G
		338.40	8.234E-01	*(P	2.190E-01	9.59E-02	G
TH-227	-3.5843E-01						
		236.00	-3.584E-01	?(P	3.620E-01	1.11E-01	G K
		256.25	6.541E-02	% P	3.689E-01	1.10E-01	G
PA-234	2.5698E-03						
		98.44	2.570E-03	%(	1.290E-01	3.85E-02	G K
		946.00	2.188E-02	%	1.454E-01	4.23E-02	G
		131.28	6.869E-02	&	1.274E-01	3.87E-02	G
		94.67	-1.097E-01	%	2.259E-01	6.85E-02	G
		883.24	4.796E-02	&	1.875E-01	5.50E-02	G
		926.70	4.099E-02	%	2.645E-01	7.71E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 7.867E-02 &   2.255E-01 6.75E-02 G

TH-234       5.1262E-01
                           63.29 5.126E-01 %(P 1.598E+00 4.81E-01 G K
                           92.80 8.430E-01 % P 1.282E+00 3.90E-01 G
                           92.38 1.086E+00 % P 1.517E+00 4.63E-01 G

AM-241      -5.7978E-02
                           59.54-5.798E-02 %(P 2.148E-01 6.47E-02 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

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

***** 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 pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	9.0007E-02	9.4583E-02	2.2212E-01	2.2219E-01	2.342E-01
K-40	#	1.4163E+01	1.4163E+01	1.0759E+00	1.3628E+00	
MN-54	#A	-8.1684E-03	-8.2380E-03	3.2038E-02	3.2042E-02	3.369E-02
CO-57	#B	1.2696E-03	1.2821E-03	2.8817E-02	2.8818E-02	3.190E-02
CO-60	#B	-3.1534E-03	-3.1577E-03	2.1174E+00	2.1174E+00	3.356E-02

Sr-85	#A	-1.5992E-02	-1.6659E-02	3.2852E-02	3.2867E-02	3.471E-02
Kr-85	#A	-3.9702E+02	-3.9703E+02	8.3731E+02	8.3764E+02	8.048E+02
Y-88	#B	-3.7655E-03	-3.8602E-03	2.9351E-02	2.9352E-02	2.232E-02
NB-94	#B	-8.1165E-05	-8.1165E-05	5.6596E-03	5.6596E-03	2.449E-02
Ag-108M	#B	-9.1205E-03	-9.1210E-03	3.5776E-02	3.5780E-02	4.012E-02
CD-109	#A	8.4201E-01	8.4695E-01	9.2408E-01	9.2527E-01	9.985E-01
SN-113	#B	2.6309E-03	2.6922E-03	3.2296E-02	3.2296E-02	3.589E-02
SB-125	#B	5.2380E-02	5.2518E-02	5.2183E-02	5.2275E-02	8.131E-02
I-131	#B	-4.9061E-03	-6.8202E-03	3.4538E-02	3.4540E-02	2.793E-02
CS-134	#B	1.5231E-02	1.5285E-02	1.2187E-02	1.2220E-02	6.331E-02
CS-137	#A	2.2343E-02	2.2348E-02	3.1550E-02	3.1577E-02	3.432E-02
CE-139	#A	7.5023E-03	7.6482E-03	2.9958E-02	2.9962E-02	3.263E-02
EU-152	#B	-3.8865E-03	-3.8887E-03	9.0446E-02	9.0446E-02	9.645E-02
EU-154	#B	6.1023E-03	6.1075E-03	6.1966E-02	6.1967E-02	6.905E-02
EU-155	#B	9.0026E-02	9.0157E-02	1.1728E-01	1.1739E-01	1.279E-01
HG-203	#B	-3.7688E-03	-3.9893E-03	3.5748E-02	3.5749E-02	3.074E-02
TL-208	#	2.4305E-01	2.4305E-01	5.6422E-02	5.8219E-02	
PB-212		5.3047E-01	5.3047E-01	7.3305E-02	7.9719E-02	
PB-214		5.0473E-01	5.0473E-01	1.1288E-01	1.1675E-01	
BI-212		6.6334E-01	6.6334E-01	3.6325E-01	3.6535E-01	
BI-214		4.9813E-01	4.9813E-01	1.0532E-01	1.0935E-01	
RA-224	#	4.7426E+00	4.7426E+00	9.7019E-01	1.0098E+00	9.312E-01
RA-226	#	1.5035E+00	1.5035E+00	8.1392E-01	8.1875E-01	
AC-228	#	7.2731E-01	7.2731E-01	1.6802E-01	1.7342E-01	
TH-227	#A	-3.5843E-01	-3.5843E-01	3.3542E-01	3.3609E-01	3.620E-01
PA-234	#B	2.5698E-03	2.5698E-03	1.1555E-01	1.1555E-01	1.290E-01
TH-234	#B	5.1262E-01	5.1262E-01	1.4427E+00	1.4430E+00	1.598E+00
AM-241	#A	-5.7977E-02	-5.7978E-02	1.9946E-01	1.9948E-01	2.148E-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 (277.2 to 2000.1 keV) 1.8833954E+01 pCi/gm
Total Decayed Activity (277.2 to 2000.1 keV) 1.8833961E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 107F_15SEPT2006_1127.An1

Sample description
FSS-SSS-01-01-021-F

Spectrum Filename: C:\GammaVision\Spectra\107F_15SEPT2006_1127.An1

Acquisition information
Start time: 15-Sep-2006 11:27:37
Live time: 2000
Real time: 2003
Dead time: 0.14 %
Detector ID: 2

Detector system
Det 107- DSPE- 634

Calibration
Filename: D7_1LSa.Clb
Detector 107 Calibration for 1 Liter Sand Marinelli

Energy Calibration
Created: 29-Oct-2004 06:48:53
Zero offset: 0.157 keV
Gain: 0.500 keV/channel
Quadratic: -1.676E-08 keV/channel^2

Efficiency Calibration
Created: 29-Oct-2004 06:51:32
Type: Polynomial
Uncertainty: 1.174 %
Coefficients: -0.279532 -4.778179 0.614896
-0.087174 0.005356 -0.000131

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.16keV)
Stop channel: 4000 (2000.15keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.4420E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.4420E+03) =
6.9348E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five 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	09-Sep-2006 14:40:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	107_150K_28APR05.Pbc 01-May-2005 05:30:33
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 15 cutoff 20.00000 %
Energy Calibration
Normalized diff: 1.0000

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

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.80	212.	29.41	1.50	2.747E-02	72.87	6.400	1.231E+00	HG203
					74.81	9.600	PBC<MDA	PB212
74.93	402.	11.38	1.18	2.849E-02	72.87	6.400	2.338E+00	HG203
					74.81	9.600	1.377E+00	PB212
77.15	189.	27.22	1.50	2.957E-02	77.11	17.500	PBC<MDA	PB212
					77.11	10.700	PBC<MDA	PB214
77.23	231.	16.48	1.18	2.957E-02	77.11	17.500	7.880E-01	PB212
					77.11	10.700	1.275E+00	PB214
87.21	228.	27.81	1.91	3.305E-02	86.45	32.740	1.993E-01	EU155
					88.04	3.790	1.708E+00	CD109
185.78	182.	22.30	2.21	3.612E-02				
185.78	182.	22.30	2.21	3.612E-02	185.99	3.280	1.442E+00	RA226
239.21	1730.	3.72	2.16	3.185E-02	238.63	43.100	1.168E+00	PB212
					241.00	3.900	1.309E+01	RA224
242.07	175.	21.80	1.30	3.163E-02	241.92	7.470	6.936E-01	PB214
270.37	174.	19.77	2.22	2.943E-02				
295.91	377.	11.93	2.09	2.763E-02	295.22	19.200	6.572E-01	PB214
338.27	357.	9.78	2.44	2.501E-02	338.40	12.010	1.103E+00	AC228
351.94	598.	6.29	2.17	2.426E-02	351.99	37.100	6.178E-01	PB214
463.13	59.	32.23	1.50	1.953E-02	463.51	10.000	PBC<MDA	SB125
510.89	249.	13.05	2.29	1.808E-02	510.72	22.500	4.968E-01	TL208
583.37	525.	6.20	2.15	1.628E-02	583.14	86.000	3.480E-01	TL208
609.57	404.	6.86	1.80	1.574E-02	609.32	46.090	5.157E-01	BI214
727.26	49.	36.93	1.64	1.374E-02	727.17	11.800	PBC<MDA	BI212
795.25	41.	38.01	1.68	1.284E-02	795.76	85.400	PBC<MDA	CS134
859.85	99.	20.37	1.56	1.212E-02				
911.49	386.	7.14	2.25	1.160E-02	911.07	29.000	1.063E+00	AC228

965.07	43.	31.93	1.80	1.112E-02				
969.41	168.	10.82	1.80	1.109E-02	968.90	17.460	8.035E-01	AC228
1120.60	104.	15.95	2.08	9.970E-03	1120.28	15.040	6.495E-01	BI214

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1461.13	1708.	2.48	2.73	8.189E-03	1460.75	10.700	1.821E+01	K40
1765.21	88.	11.25	0.62	7.084E-03	1764.51	15.920	7.330E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
540.37	270.37	372.	174.	0.087	59.30	2.219	AC-228	s
1719.26	859.85	84.	99.	0.050	61.10	1.562	TL-208	s
1929.71	965.20	73.	43.	0.022	95.79	1.797	AC-228	lD

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

This section based on library: FSS_Rev_1.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 3 Sigma %	FWHM keV
HG-203	149.26	74.80	1865.	212.	0.106	88.24	1.500s
PB-212	149.29	74.81	866.	402.	0.201	34.13	1.178D
PB-212	153.89	77.11	990.	231.	0.115	49.44	1.179A
PB-214	153.89	77.11	1421.	189.	0.095	81.67	1.500A
CD-109	174.44	87.39	1387.	135.	0.068	119.16	1.500s
RA-226	371.16	185.76	767.	142.	0.071	86.48	1.500s
PB-212	476.89	238.63	606.	1070.	0.535	13.15	1.297D
RA-224	477.35	238.86	976.	960.	0.480	16.81	1.500s
PB-214	483.47	241.92	652.	175.	0.087	65.40	1.299D
PB-214	591.44	295.91	489.	373.	0.186	35.79	2.085s
AC-228	676.16	338.27	300.	353.	0.177	29.34	2.436s
PB-214	703.49	351.94	270.	593.	0.297	18.88	2.169s
SB-125	925.86	463.13	172.	59.	0.030	96.70	1.500s
TL-208	1021.36	510.89	252.	216.	0.108	39.15	2.289s
TL-208	1166.32	583.37	153.	520.	0.260	18.60	2.155s
BI-214	1218.72	609.57	130.	399.	0.200	20.59	1.797s
BI-212	1454.08	727.26	151.	49.	0.025	110.79	1.638s
CS-134	1590.06	795.25	104.	41.	0.020	114.02	1.684s
AC-228	1822.54	911.49	108.	382.	0.191	21.43	2.251s
AC-228	1937.36	968.90	85.	166.	0.083	32.61	1.799D
BI-214	2240.76	1120.60	68.	104.	0.052	47.86	2.085s
K-40	2921.85	1461.13	21.	1703.	0.852	7.43	2.726s
BI-214	3530.08	1765.21	4.	88.	0.044	33.74	0.624s

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 pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		7.5599E-04					
			477.56	7.560E-04	&(	3.128E-01 9.07E-02	G
K-40		1.8212E+01					
			1460.75	1.821E+01	*(P	2.558E-01 4.52E-01	G
MN-54		2.5935E-02					
			834.81	2.593E-02	%(P	3.802E-02 1.18E-02	G
CO-57		-4.8234E-03					
			122.07	-4.823E-03	%(P	4.528E-02 1.36E-02	G K
			136.43	-2.826E-03	& P	3.290E-01 9.79E-02	G
CO-60		-5.7921E-03					
			1332.51	-5.792E-03	&(P	4.187E-02 1.15E-02	G K
			1173.23	1.729E-03	% P	5.329E-02 1.53E-02	G K
Sr-85		-2.7274E-02					
			514.00	-2.727E-02	%(	4.933E-02 1.50E-02	G
Kr-85		-6.2766E+02					
			513.99	-6.277E+02	%(P	1.074E+03 3.26E+02	G
Y-88		-4.8760E-03					
			1836.01	-4.876E-03	%(P	2.826E-02 7.53E-03	G K
			898.02	-1.751E-02	% P	4.543E-02 1.35E-02	G
NB-94		-1.0532E-02					
			871.10	-1.053E-02	&(P	3.818E-02 1.13E-02	G K
			702.50	-3.543E-04	% P	4.051E-02 1.17E-02	G K
Ag-108M		-4.1565E-03					
			722.95	-4.156E-03	%(	3.658E-02 1.06E-02	G K
			614.37	-2.462E-02	%	4.647E-02 1.41E-02	G
			433.93	4.502E-03	% P	3.038E-02 8.91E-03	G
CD-109		1.0161E+00					
			88.04	1.016E+00	(P	1.322E+00 4.05E-01	G
SN-113		-1.2791E-02					
			391.71	-1.279E-02	&(P	4.988E-02 1.48E-02	G K
			255.04	2.520E-01	%	1.210E+00 3.60E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	5.9916E-02						
		427.95	-1.623E-02	%(P	1.009E-01	2.96E-02	G K
		600.77	-2.584E-02	% P	1.843E-01	5.37E-02	G
		636.15	-5.870E-04	% P	2.534E-01	7.22E-02	G
		463.51	2.853E-01	*(P	3.072E-01	9.63E-02	G
		176.29	-6.491E-03	% P	5.419E-01	1.61E-01	G
I-131	9.2610E-03						
		364.48	9.261E-03	&(	6.053E-02	1.79E-02	G K
		636.97	-3.504E-03	%	6.060E-01	1.72E-01	G
		284.29	-1.438E-01	%	8.390E-01	2.50E-01	G
CS-134	-3.8005E-02						
		604.66	-3.801E-02	&(P	5.309E-02	1.63E-02	G K
		795.76	3.512E-02	+ P	4.309E-02	1.35E-02	G
		569.29	4.115E-02	&	1.851E-01	5.46E-02	G
		801.84	-5.608E-02	% P	4.016E-01	1.17E-01	G
CS-137	2.0788E-02						
		661.62	2.079E-02	%(P	4.466E-02	1.35E-02	G
CE-139	2.0302E-03						
		165.85	2.030E-03	%(P	4.106E-02	1.22E-02	G
EU-152	1.0458E-02						
		121.78	1.046E-02	%(P	1.258E-01	3.76E-02	G K
		344.30	2.021E-02	% P	1.049E-01	3.11E-02	G
		1408.08	-3.252E-03	% P	1.497E-01	4.07E-02	G
		964.00	-9.414E-02	% P	3.846E-01	1.14E-01	G
		1112.07	-4.160E-02	% P	3.340E-01	9.68E-02	G
		778.90	-5.224E-02	% P	2.913E-01	8.53E-02	G
EU-154	-8.7966E-03						
		123.10	-8.797E-03	&(P	9.148E-02	2.73E-02	G K
		1274.80	-1.200E-02	& P	1.276E-01	3.67E-02	G
		723.30	-9.541E-03	% P	2.885E-01	8.48E-02	G
		1004.80	-5.116E-02	& P	2.281E-01	6.70E-02	G
EU-155	1.0566E-01						
		86.45	1.057E-01	%(	1.632E-01	4.98E-02	G K
		105.31	5.195E-02	% P	1.732E-01	5.22E-02	G
HG-203	9.5954E-02						
		279.17	6.798E-03	&(P	4.159E-02	1.24E-02	G K
		72.87	1.231E+00	?(P	1.186E+00	3.65E-01	G
		70.83	7.319E-02	&	2.231E+00	6.69E-01	G
		82.50	-9.231E-01	%	2.597E+00	7.85E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	3.4802E-01						
		583.14	3.480E-01	*(P	4.034E-02	2.18E-02	G
		510.72	4.968E-01	+ P	1.768E-01	7.49E-02	G
PB-212	7.4632E-01						
		238.63	7.294E-01	(P	8.005E-02	3.25E-02	G K
							Energy duplication
		77.11	4.183E-01	}	2.704E-01	6.89E-02	G
		74.81	1.377E+00	+ P	4.791E-01	1.58E-01	G
PB-214	6.3855E-01						
		351.99	6.178E-01	*(P	8.251E-02	3.92E-02	G K
		295.22	6.572E-01	*(P	1.866E-01	7.94E-02	G
							Energy duplication
		77.11	5.611E-01	} P	5.283E-01	1.53E-01	G
		241.92	6.936E-01	(P	4.827E-01	1.52E-01	G
BI-212	2.8557E-01						
		727.17	2.856E-01	*(P	3.469E-01	1.08E-01	G K
		1620.56	5.108E-02	% P	9.612E-01	2.57E-01	G
		785.42	6.344E-01	% P	1.967E+00	5.86E-01	G
BI-214	5.1571E-01						
		609.32	5.157E-01	*(P	7.206E-02	3.58E-02	G K
		1764.51	7.330E-01	+ P	9.797E-02	8.33E-02	G
		1120.28	6.495E-01	+ P	2.572E-01	1.05E-01	G
RA-224	7.2774E+00						
		241.00	7.277E+00	&(P	1.124E+00	4.09E-01	G
RA-226	1.1242E+00						
		185.99	1.124E+00	*(	1.043E+00	3.24E-01	G
AC-228	1.0745E+00						
		911.07	1.063E+00	*(P	1.425E-01	7.68E-02	G K
		968.90	8.025E-01	- P	2.212E-01	8.84E-02	G
		338.40	1.103E+00	*(P	2.602E-01	1.09E-01	G
TH-227	-9.0348E-03						
		236.00	-9.035E-03	%(P	4.975E-01	1.49E-01	G K
		256.25	1.133E-01	% P	4.422E-01	1.32E-01	G
PA-234	-5.1271E-02						
		98.44	-5.127E-02	&(	1.468E-01	4.43E-02	G K
		946.00	-3.635E-02	%	2.083E-01	6.11E-02	G
		131.28	8.268E-03	&	1.673E-01	4.99E-02	G
		94.67	-4.299E-04	%	2.986E-01	8.92E-02	G
		883.24	-4.956E-02	&	3.165E-01	9.24E-02	G
		926.70	1.254E-01	&	2.964E-01	8.92E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 6.043E-02 &   2.732E-01 8.05E-02 G

TH-234       6.7475E-01
                           63.29 6.748E-01 %(P 2.029E+00 6.11E-01 G K
                           92.80-7.948E-02 % P 1.443E+00 4.28E-01 G
                           92.38-4.229E-01 & P 1.938E+00 5.81E-01 G

AM-241       1.0233E-02
                           59.54 1.023E-02 %(P 2.527E-01 7.55E-02 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

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

***** 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 pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	7.0056E-04	7.5599E-04	2.7217E-01	2.7217E-01	2.899E-01
K-40	#	1.8212E+01	1.8212E+01	1.3564E+00	1.7311E+00	
MN-54	#A	2.5599E-02	2.5935E-02	3.5322E-02	3.5355E-02	3.753E-02
CO-57	#B	-4.7513E-03	-4.8234E-03	4.2037E-02	4.2038E-02	4.461E-02
CO-60	#B	-5.7799E-03	-5.7921E-03	1.9271E-01	1.9271E-01	4.179E-02

Sr-85	#A	-2.5616E-02	-2.7274E-02	4.5084E-02	4.5112E-02	4.633E-02
Kr-85	#A	-6.2763E+02	-6.2766E+02	1.0974E+03	1.0980E+03	1.074E+03
Y-88	#B	-4.6935E-03	-4.8760E-03	3.6732E-02	3.6733E-02	2.720E-02
NB-94	#B	-1.0532E-02	-1.0532E-02	3.4597E-02	3.4602E-02	3.818E-02
Ag-108M	#B	-4.1561E-03	-4.1565E-03	3.1892E-02	3.1892E-02	3.657E-02
CD-109	#A	1.0071E+00	1.0161E+00	1.2136E+00	1.2149E+00	1.310E+00
SN-113	#B	-1.2347E-02	-1.2791E-02	5.3809E-02	5.3814E-02	4.815E-02
SB-125	#B	5.9676E-02	5.9916E-02	6.0691E-02	6.0794E-02	1.005E-01
I-131	#B	5.5848E-03	9.2610E-03	5.3746E-02	5.3749E-02	3.651E-02
CS-134	#B	-3.7801E-02	-3.8005E-02	4.9782E-02	4.9833E-02	5.280E-02
CS-137	#A	2.0781E-02	2.0788E-02	4.0355E-02	4.0373E-02	4.464E-02
CE-139	#A	1.9711E-03	2.0302E-03	3.6663E-02	3.6664E-02	3.986E-02
EU-152	#B	1.0449E-02	1.0458E-02	1.1282E-01	1.1282E-01	1.257E-01
EU-154	#B	-8.7851E-03	-8.7966E-03	8.8436E-02	8.8437E-02	9.136E-02
EU-155	#B	1.0542E-01	1.0566E-01	1.4927E-01	1.4938E-01	1.629E-01
HG-203	#F	8.7934E-02	9.5954E-02	8.5358E-02	8.5546E-02	3.812E-02
TL-208	#	3.4802E-01	3.4802E-01	6.5285E-02	6.8444E-02	
PB-212		7.4632E-01	7.4632E-01	9.9618E-02	1.0893E-01	
PB-214		6.3855E-01	6.3855E-01	1.2161E-01	1.2733E-01	
BI-212	#A	2.8557E-01	2.8557E-01	3.2464E-01	3.2508E-01	3.469E-01
BI-214	#	5.1571E-01	5.1571E-01	1.0733E-01	1.1157E-01	
RA-224	#	7.2774E+00	7.2774E+00	1.2264E+00	1.2996E+00	1.124E+00
RA-226	#	1.1242E+00	1.1242E+00	9.7223E-01	9.7449E-01	1.043E+00
AC-228		1.0745E+00	1.0745E+00	1.9711E-01	2.0708E-01	
TH-227	#B	-9.0348E-03	-9.0348E-03	5.2314E-01	5.2314E-01	4.975E-01
PA-234	#B	-5.1271E-02	-5.1271E-02	1.3294E-01	1.3297E-01	1.468E-01
TH-234	#B	6.7475E-01	6.7475E-01	1.8326E+00	1.8330E+00	2.029E+00
AM-241	#A	1.0232E-02	1.0233E-02	2.2641E-01	2.2641E-01	2.527E-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 (1120.2 to 2000.1 keV) 2.1535553E+01 pCi/gm
Total Decayed Activity (1120.2 to 2000.1 keV) 2.1535553E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 107F_15SEPT2006_1424.An1

Sample description
FSS-SSS-01-01-023-F

Spectrum Filename: C:\GammaVision\Spectra\107F_15SEPT2006_1424.An1

Acquisition information
Start time: 15-Sep-2006 14:24:11
Live time: 2000
Real time: 2009
Dead time: 0.44 %
Detector ID: 2

Detector system
Det 107- DSPE- 634

Calibration
Filename: D7_1LSa.Clb
Detector 107 Calibration for 1 Liter Sand Marinelli

Energy Calibration
Created: 29-Oct-2004 06:48:53
Zero offset: 0.157 keV
Gain: 0.500 keV/channel
Quadratic: -1.676E-08 keV/channel^2

Efficiency Calibration
Created: 29-Oct-2004 06:51:32
Type: Polynomial
Uncertainty: 1.174 %
Coefficients: -0.279532 -4.778179 0.614896
-0.087174 0.005356 -0.000131

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.16keV)
Stop channel: 4000 (2000.15keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.5080E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.5080E+03) =
6.6313E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five 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	08-Sep-2006 10:55:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	107_150K_28APR05.Pbc 01-May-2005 05:30:33
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 18 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.3217

***** 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. pCi/gm	Nuc
74.83	403.	11.65	1.18	2.849E-02	74.81	9.600	1.320E+00	PB212
77.13	309.	14.22	1.18	2.957E-02	77.11	17.500	8.767E-01	PB212
					77.11	10.700	1.420E+00	PB214
77.39	169.	31.98	1.50	2.957E-02	77.11	17.500	PBC<MDA	PB212
					77.11	10.700	PBC<MDA	PB214
87.35	188.	32.38	1.99	3.308E-02	86.45	32.740	1.571E-01	EU155
					88.04	3.790	1.349E+00	CD109
93.28	125.	40.61	1.50	3.448E-02	92.80	3.000	PBC<MDA	TH234
105.49	115.	39.06	1.34	3.649E-02	105.31	21.800	PBC<MDA	EU155
186.07	256.	19.91	2.01	3.610E-02	185.99	3.280	1.934E+00	RA226
209.39	148.	25.30	1.44	3.428E-02				
239.02	1941.	3.68	1.97	3.186E-02	238.63	43.100	1.255E+00	PB212
					241.00	3.900	1.405E+01	RA224
242.08	185.	21.53	1.30	3.163E-02	241.92	7.470	7.014E-01	PB214
270.16	156.	26.04	2.30	2.945E-02				
295.35	266.	10.66	1.34	2.768E-02	295.22	19.200	4.404E-01	PB214
300.70	69.	33.59	1.34	2.732E-02				
338.62	399.	11.49	2.09	2.499E-02	338.40	12.010	1.181E+00	AC228
352.15	648.	5.54	2.09	2.425E-02	351.99	37.100	6.405E-01	PB214
409.16	51.	38.39	1.37	2.156E-02				
462.98	113.	22.43	1.56	1.954E-02				
462.98	113.	22.43	1.56	1.954E-02	463.51	10.000	5.081E-01	SB125
510.56	223.	12.71	1.98	1.809E-02	510.72	22.500	4.162E-01	TL208
583.45	608.	6.22	2.17	1.628E-02	583.14	86.000	3.858E-01	TL208
609.51	496.	6.50	2.08	1.574E-02	609.32	46.090	6.068E-01	BI214
663.19	95.	25.34	1.94	1.477E-02	661.62	84.620	6.847E-02	CS137
727.54	137.	17.62	2.23	1.374E-02	727.17	11.800	7.516E-01	BI212

861.23	75.	17.88	2.10	1.210E-02				
911.70	428.	6.48	2.34	1.160E-02	911.07	29.000	1.129E+00	AC228
968.73	289.	9.59	2.06	1.109E-02	968.90	17.460	1.327E+00	AC228
1120.89	113.	20.32	2.91	9.970E-03	1120.28	15.040	6.772E-01	BI214
1461.28	1846.	2.39	2.85	8.189E-03	1460.75	10.700	1.883E+01	K40

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1765.51	112.	9.41	3.17	7.084E-03	1764.51	15.920	8.908E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
186.21	93.28	1066.	125.	0.062	121.83	1.501	U-235	l
210.65	105.49	824.	115.	0.057	109.73	1.342	EU-155	s
418.43	209.39	549.	148.	0.074	75.91	1.436	AC-228	s
539.95	270.16	498.	156.	0.078	78.12	2.296	AC-228	s
600.65	300.51	376.	95.	0.047	103.42	0.548	PB-212	sM
817.93	409.16	154.	51.	0.026	115.16	1.374	CS-138	s
1722.03	861.23	51.	75.	0.038	53.63	2.096	TL-208	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: FSS_Rev_1.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 3 Sigma %	FWHM keV
PB-212	149.29	74.81	923.	403.	0.201	34.94	1.178D
PB-212	153.89	77.11	1042.	309.	0.154	42.65	1.179A
PB-214	153.89	77.11	1577.	169.	0.085	95.93	1.500A
CD-109	174.25	87.29	1551.	152.	0.076	112.40	1.500s
RA-226	371.79	186.07	833.	256.	0.128	59.72	2.006s
TH-227	471.24	235.80	1833.	-219.	-0.110	85.33	1.500s
PB-212	476.89	238.63	637.	1218.	0.609	12.10	1.297D
RA-224	477.33	238.85	972.	1143.	0.572	14.55	1.500s
PB-214	483.47	241.92	713.	185.	0.092	64.58	1.299D
PB-214	589.95	295.16	297.	312.	0.156	29.40	2.033s
AC-228	676.86	338.62	451.	396.	0.198	34.47	2.095s
PB-214	703.91	352.15	234.	643.	0.322	16.61	2.087s
SB-125	925.51	462.95	178.	83.	0.042	72.70	1.500
TL-208	1020.72	510.56	214.	189.	0.094	38.12	1.979s
TL-208	1166.49	583.45	226.	603.	0.302	18.65	2.171s
BI-214	1218.61	609.51	174.	491.	0.246	19.50	2.081s
Ag-108M	1226.03	613.23	324.	-71.	-0.036	112.81	1.561s
CS-137	1325.95	663.19	160.	95.	0.048	76.02	1.942s
BI-212	1454.66	727.54	137.	136.	0.068	52.85	2.226s
AC-228	1822.96	911.70	105.	424.	0.212	19.45	2.344s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
AC-228	1937.03	968.73	128.	287.	0.143	28.76	2.061s
BI-214	2241.35	1120.89	126.	113.	0.057	60.96	2.909s
K-40	2922.17	1461.28	26.	1842.	0.921	7.17	2.853s
BI-214	3530.68	1765.51	1.	112.	0.056	28.22	3.175s

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 pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		-6.3313E-02					
			477.56	-6.331E-02	&(	3.071E-01 9.09E-02	G
K-40		1.8830E+01					
			1460.75	1.883E+01	*(P	2.722E-01 4.51E-01	G
MN-54		5.7703E-04					
			834.81	5.770E-04	&(P	4.422E-02 1.28E-02	G
CO-57		1.2345E-02					
			122.07	1.234E-02	%(P	4.132E-02 1.24E-02	G K
			136.43	1.864E-02	% P	3.617E-01 1.08E-01	G
CO-60		1.0004E-02					
			1332.51	1.000E-02	%(P	3.877E-02 1.12E-02	G K
			1173.23	1.408E-02	% P	4.833E-02 1.42E-02	G K
Sr-85		-2.6630E-02					
			514.00	-2.663E-02	%(	4.871E-02 1.48E-02	G
Kr-85		-6.0437E+02					
			513.99	-6.044E+02	%(P	1.046E+03 3.17E+02	G
Y-88		-1.4157E-03					
			1836.01	-1.416E-03	%(P	2.618E-02 6.61E-03	G K
			898.02	-7.964E-03	% P	4.265E-02 1.24E-02	G
NB-94		-1.0496E-04					
			871.10	-1.050E-04	&(P	3.718E-02 1.07E-02	G K
			702.50	-3.388E-04	& P	3.919E-02 1.14E-02	G K
Ag-108M		-2.4152E-02					
			722.95	-2.415E-02	&(	5.300E-02 1.60E-02	G K
			614.37	-4.521E-02	+	5.488E-02 1.70E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		433.93	-1.847E-03	% P	3.443E-02	1.00E-02	G
CD-109	1.0918E+00						
		88.04	1.092E+00	*(P	1.338E+00	4.10E-01	G
SN-113	-1.4621E-02						
		391.71	-1.462E-02	%(P	5.092E-02	1.52E-02	G K
		255.04	-1.127E-02	%	1.382E+00	4.08E-01	G
SB-125	9.5533E-02						
		427.95	-2.049E-03	&(P	1.009E-01	2.93E-02	G K
		600.77	6.960E-02	% P	1.724E-01	5.18E-02	G
		636.15	-2.834E-02	& P	3.197E-01	9.32E-02	G
		463.51	3.844E-01	(P	2.990E-01	9.63E-02	G
		176.29	1.072E-01	% P	5.362E-01	1.61E-01	G
I-131	1.3750E-03						
		364.48	1.375E-03	%(	6.686E-02	1.96E-02	G K
		636.97	-4.384E-02	&	8.787E-01	2.56E-01	G
		284.29	-1.448E-01	&	1.008E+00	3.00E-01	G
CS-134	-9.4953E-04						
		604.66	-9.495E-04	&(P	7.962E-02	2.37E-02	G K
		795.76	3.179E-02	% P	4.549E-02	1.41E-02	G
		569.29	-2.635E-02	%	2.361E-01	6.94E-02	G
		801.84	2.002E-03	% P	4.391E-01	1.27E-01	G
CS-137	6.8475E-02						
		661.62	6.847E-02	*(P	4.416E-02	1.80E-02	G
CE-139	-8.2169E-04						
		165.85	-8.217E-04	%(P	4.400E-02	1.31E-02	G
EU-152	1.2480E-02						
		121.78	1.248E-02	%(P	1.256E-01	3.76E-02	G K
		344.30	-1.447E-02	% P	1.173E-01	3.47E-02	G
		1408.08	8.541E-02	% P	1.349E-01	4.20E-02	G
		964.00	-1.785E-01	% P	4.495E-01	1.36E-01	G
		1112.07	-8.881E-03	% P	3.212E-01	9.20E-02	G
		778.90	-5.741E-02	% P	3.022E-01	8.88E-02	G
EU-154	2.3827E-02						
		123.10	2.383E-02	%(P	7.758E-02	2.34E-02	G K
		1274.80	-9.342E-04	% P	1.094E-01	3.08E-02	G
		723.30	-1.147E-01	% P	2.515E-01	7.61E-02	G
		1004.80	5.883E-02	% P	2.092E-01	6.19E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	1.1881E-01						
		86.45	1.188E-01	%(	1.630E-01	4.98E-02	G K
		105.31	-7.116E-04	% P	1.828E-01	5.45E-02	G
HG-203	2.0860E-02						
		279.17	2.086E-02	%(P	4.027E-02	1.22E-02	G K
		72.87	-3.855E-01	% P	1.357E+00	4.10E-01	G
		70.83	-7.997E-01	%	2.199E+00	6.65E-01	G
		82.50	-7.318E-01	%	2.566E+00	7.74E-01	G
TL-208	3.9207E-01						
		583.14	3.858E-01	*(P	4.654E-02	2.42E-02	G
		510.72	4.162E-01	*(P	1.561E-01	6.23E-02	G
PB-212	8.1780E-01						
		238.63	7.939E-01	(P	7.845E-02	3.24E-02	G K
							Energy duplication
		77.11	5.349E-01	}	2.651E-01	7.60E-02	G
		74.81	1.320E+00	+ P	4.727E-01	1.55E-01	G
PB-214	6.5073E-01						
		351.99	6.405E-01	*(P	7.363E-02	3.58E-02	G K
		295.22	5.256E-01	- P	1.401E-01	5.23E-02	G
							Energy duplication
		77.11	4.791E-01	} P	5.317E-01	1.53E-01	G
		241.92	7.014E-01	(P	4.822E-01	1.52E-01	G
BI-212	7.5161E-01						
		727.17	7.516E-01	*(P	3.164E-01	1.34E-01	G K
		1620.56	3.571E-01	% P	1.006E+00	2.95E-01	G
		785.42	5.838E-01	% P	1.928E+00	5.73E-01	G
BI-214	6.2410E-01						
		609.32	6.068E-01	*(P	7.921E-02	3.98E-02	G K
		1764.51	8.908E-01	+ P	5.856E-02	8.45E-02	G
		1120.28	6.772E-01	(P	3.284E-01	1.39E-01	G
RA-224	8.2864E+00						
		241.00	8.286E+00	?(P	1.073E+00	4.03E-01	G
RA-226	1.9343E+00						
		185.99	1.934E+00	*(	1.039E+00	3.85E-01	G
AC-228	1.1986E+00						
		911.07	1.129E+00	*(P	1.343E-01	7.40E-02	G K
		968.90	1.327E+00	*(P	2.567E-01	1.28E-01	G
		338.40	1.181E+00	*(P	3.035E-01	1.37E-01	G

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

TH-227      -5.4674E-01
                          236.00-5.467E-01 ?(P 5.039E-01 1.55E-01 G K
                          256.25 1.006E-01 % P 4.669E-01 1.40E-01 G

PA-234       4.2391E-04
                           98.44 4.239E-04 &(  1.429E-01 4.26E-02 G K
                          946.00-2.824E-02 %   2.274E-01 6.66E-02 G
                          131.28 9.280E-02 &   1.716E-01 5.22E-02 G
                           94.67-1.271E-01 %   2.954E-01 8.95E-02 G
                          883.24 7.590E-02 &   2.517E-01 7.45E-02 G
                          926.70-8.857E-02 %   3.373E-01 9.97E-02 G
                          569.26-3.999E-02 %   3.481E-01 1.02E-01 G

TH-234       3.9291E-01
                           63.29 3.929E-01 &(P 1.934E+00 5.80E-01 G K
                           92.80 1.002E+00 % P 1.641E+00 4.98E-01 G
                           92.38-6.635E-01 % P 1.808E+00 5.44E-01 G

AM-241      -7.8369E-06
                           59.54-7.837E-06 &(P 2.617E-01 7.81E-02 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

- -

***** 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 pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	-5.7705E-02	-6.3313E-02	2.7256E-01	2.7259E-01	2.799E-01
K-40	#	1.8830E+01	1.8830E+01	1.3531E+00	1.7515E+00	
MN-54	#A	5.6795E-04	5.7703E-04	3.8473E-02	3.8473E-02	4.353E-02
CO-57	#B	1.2120E-02	1.2345E-02	3.7347E-02	3.7354E-02	4.057E-02
CO-60	#B	9.9782E-03	1.0004E-02	3.3629E-02	3.3634E-02	3.868E-02
Sr-85	#A	-2.4672E-02	-2.6630E-02	4.4499E-02	4.4527E-02	4.513E-02
Kr-85	#A	-6.0434E+02	-6.0437E+02	1.0676E+03	1.0682E+03	1.046E+03
Y-88	#B	-1.3514E-03	-1.4157E-03	1.6987E-01	1.6987E-01	2.499E-02
NB-94	#B	-1.0496E-04	-1.0496E-04	1.9440E+00	1.9440E+00	3.718E-02
Ag-108M	#B	-2.4149E-02	-2.4152E-02	4.8131E-02	4.8153E-02	5.299E-02
CD-109	#A	1.0800E+00	1.0918E+00	1.2298E+00	1.2313E+00	1.324E+00
SN-113	#B	-1.4005E-02	-1.4621E-02	5.3487E-02	5.3494E-02	4.878E-02
SB-125	#B	9.5067E-02	9.5533E-02	7.1795E-02	7.2016E-02	1.004E-01
I-131	#B	7.4265E-04	1.3750E-03	5.8824E-02	5.8824E-02	3.611E-02
CS-134	#B	-9.4331E-04	-9.4953E-04	1.3853E-01	1.3853E-01	7.910E-02
CS-137	#	6.8444E-02	6.8475E-02	5.3983E-02	5.4135E-02	
CE-139	#A	-7.9262E-04	-8.2169E-04	5.0943E-02	5.0943E-02	4.244E-02
EU-152	#B	1.2467E-02	1.2480E-02	1.1273E-01	1.1273E-01	1.254E-01
EU-154	#B	2.3789E-02	2.3827E-02	7.0074E-02	7.0086E-02	7.745E-02
EU-155	#B	1.1848E-01	1.1881E-01	1.4936E-01	1.4950E-01	1.625E-01
HG-203	#B	1.8756E-02	2.0860E-02	3.6691E-02	3.6712E-02	3.621E-02
TL-208	#	3.9207E-01	3.9207E-01	7.3671E-02	7.7225E-02	
PB-212		8.1780E-01	8.1780E-01	1.0025E-01	1.1128E-01	
PB-214		6.5073E-01	6.5073E-01	1.0893E-01	1.1551E-01	
BI-212	#	7.5161E-01	7.5161E-01	4.0101E-01	4.0346E-01	
BI-214		6.2410E-01	6.2410E-01	1.2277E-01	1.2818E-01	
RA-224	#	8.2864E+00	8.2864E+00	1.2078E+00	1.3032E+00	1.073E+00
RA-226	#	1.9343E+00	1.9343E+00	1.1552E+00	1.1609E+00	
AC-228	#	1.1986E+00	1.1986E+00	1.9710E-01	2.0942E-01	
TH-227	#A	-5.4674E-01	-5.4674E-01	4.6711E-01	4.6823E-01	5.039E-01
PA-234	#B	4.2391E-04	4.2391E-04	1.2766E-01	1.2766E-01	1.429E-01
TH-234	#B	3.9291E-01	3.9291E-01	1.7391E+00	1.7393E+00	1.934E+00
AM-241	#A	-7.8367E-06	-7.8369E-06	2.3815E-01	2.3815E-01	2.617E-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 (269.7 to 2000.1 keV) 2.5268064E+01 pCi/gm
Total Decayed Activity (269.7 to 2000.1 keV) 2.5268112E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 107F_15SEPT2006_1443.An1

Sample description
FSS-SSS-01-01-021-F-RC

Spectrum Filename: C:\GammaVision\Spectra\107F_15SEPT2006_1443.An1

Acquisition information
Start time: 15-Sep-2006 13:43:26
Live time: 2000
Real time: 2008
Dead time: 0.41 %
Detector ID: 2

Detector system
Det 107- DSPE- 634

Calibration
Filename: D7_1LSa.Clb
Detector 107 Calibration for 1 Liter Sand Marinelli

Energy Calibration
Created: 29-Oct-2004 06:48:53
Zero offset: 0.157 keV
Gain: 0.500 keV/channel
Quadratic: -1.676E-08 keV/channel^2

Efficiency Calibration
Created: 29-Oct-2004 06:51:32
Type: Polynomial
Uncertainty: 1.174 %
Coefficients: -0.279532 -4.778179 0.614896
-0.087174 0.005356 -0.000131

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.16keV)
Stop channel: 4000 (2000.15keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.4420E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.4420E+03) =
6.9348E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five 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	09-Sep-2040 14:40:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	107_150K_28APR05.Pbc 01-May-2005 05:30:33
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 19 cutoff 20.00000 %
Energy Calibration
Normalized diff: 1.0000

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

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.73	329.	13.48	1.18	2.842E-02	74.81	9.600	1.114E+00	PB212
77.14	548.	8.70	1.18	2.956E-02	77.11	17.500	9.926E-01	PB212
					77.11	10.700	1.609E+00	PB214
87.70	192.	32.13	1.76	3.318E-02	86.45	32.740	1.447E-03	EU155
					88.04	3.790	8.115E-09	CD109
93.14	124.	39.60	1.48	3.445E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.02	239.	18.04	2.05	3.610E-02	185.99	3.280	1.864E+00	RA226
239.19	1880.	3.81	2.14	3.185E-02	238.63	43.100	1.271E+00	PB212
242.12	177.	22.49	1.30	3.163E-02	241.00	3.900	1.345E+00	RA224
					241.92	7.470	7.036E-01	PB214
270.02	162.	23.18	1.58	2.946E-02				
295.47	387.	11.11	2.11	2.766E-02	295.22	19.200	6.738E-01	PB214
338.76	333.	11.68	1.75	2.498E-02	338.40	12.010	1.030E+00	AC228
352.15	607.	5.90	1.82	2.425E-02	351.99	37.100	6.270E-01	PB214
511.03	263.	11.22	2.16	1.807E-02	510.72	22.500	5.283E-01	TL208
583.50	498.	6.03	2.47	1.628E-02	583.14	86.000	3.300E-01	TL208
609.45	478.	6.39	2.07	1.574E-02	609.32	46.090	6.118E-01	BI214
661.61	100.	27.46	1.79	1.477E-02	661.62	84.620	3.320E-02	CS137
727.55	144.	23.16	2.01	1.374E-02	727.17	11.800	8.218E-01	BI212
795.02	84.	27.35	0.99	1.285E-02				
795.02	84.	27.35	0.99	1.285E-02	795.76	85.400	7.841E-07	CS134
860.94	65.	21.82	0.74	1.211E-02				
911.54	402.	6.27	2.01	1.160E-02	911.07	29.000	1.107E+00	AC228
968.27	323.	8.23	1.95	1.110E-02	968.90	17.460	1.552E+00	AC228
1120.86	56.	29.88	1.90	9.970E-03	1120.28	15.040	3.496E-01	BI214
1377.59	40.	24.77	1.25	8.559E-03				

1461.21	1728.	2.50	2.36	8.189E-03	1460.75	10.700	1.843E+01	K40
1765.34	48.	19.03	2.29	7.084E-03	1764.51	15.920	3.961E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
539.66	270.02	428.	162.	0.081	69.54	1.580	AC-228	
1218.49	609.45	474.	142.	0.071	69.67	2.066	BI-214	s
1721.45	860.94	53.	65.	0.033	65.47	0.737	TL-208	s
2754.77	1377.59	19.	40.	0.020	74.32	1.247	BI-214	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: FSS_Rev_1.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 3 Sigma %	FWHM keV
PB-212	149.29	74.81	819.	329.	0.164	39.98	1.178D
PB-212	153.89	77.11	864.	347.	0.174	33.20	1.179A
PB-214	153.89	77.11	1327.	190.	0.095	80.83	1.500A
CD-109	174.45	87.39	1455.	144.	0.072	115.14	1.500s
TH-234	185.51	92.93	1432.	158.	0.079	92.42	1.500s
RA-226	371.69	186.02	648.	239.	0.119	54.12	2.050s
TH-227	471.65	236.01	1644.	-205.	-0.103	86.43	1.500s
PB-212	476.89	238.63	605.	1192.	0.596	12.14	1.297D
PB-214	483.47	241.92	721.	177.	0.089	67.46	1.299D
PB-214	590.57	295.47	475.	382.	0.191	33.33	2.113s
AC-228	677.13	338.76	373.	330.	0.165	35.04	1.748s
PB-214	703.92	352.15	239.	602.	0.301	17.71	1.817s
TL-208	1021.64	511.03	203.	229.	0.115	33.67	2.157s
TL-208	1166.58	583.50	135.	493.	0.247	18.09	2.475s
BI-214	1218.83	609.63	182.	366.	0.183	21.83	1.558s
CS-137	1322.79	661.61	177.	97.	0.048	82.38	1.786s
BI-212	1454.62	727.52	193.	123.	0.062	71.06	1.998s
CS-134	1590.19	795.31	106.	44.	0.022	108.52	1.684s
AC-228	1822.65	911.54	82.	398.	0.199	18.82	2.005s
AC-228	1936.11	968.27	91.	321.	0.160	24.69	1.948s
BI-214	2241.28	1120.86	117.	56.	0.028	89.63	1.897s
K-40	2922.02	1461.21	36.	1724.	0.862	7.51	2.362s
BI-214	3530.32	1765.34	19.	48.	0.024	57.10	2.291s

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 pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		0.0000E+00					
			477.56	0.000E+00	&(	0.000E+00	0.00E+00 G
K-40		1.8432E+01					
			1460.75	1.843E+01	@(P	3.289E-01	4.63E-01 G
MN-54		1.3856E-14					
			834.81	1.386E-14	%(P	4.284E-14	1.28E-14 G
CO-57		3.3837E-17					
			122.07	3.384E-17	%(P	6.356E-16	1.90E-16 G K
			136.43	-3.291E-16	% P	4.252E-15	1.27E-15 G
CO-60		3.4913E-05					
			1332.51	3.491E-05	%(P	4.168E-04	1.16E-04 G K
			1173.23	2.791E-04	% P	5.954E-04	1.79E-04 G K
Sr-85		0.0000E+00					
			514.00	0.000E+00	%(	0.000E+00	0.00E+00 G
Kr-85		-4.1561E+02					
			513.99	-4.156E+02	%(P	9.234E+02	2.78E+02 G
Y-88		-1.5941E-38					
			1836.01	-1.594E-38	&(P	2.247E-37	5.67E-38 G K
			898.02	-1.077E-37	% P	3.711E-37	1.09E-37 G
NB-94		8.5403E-04					
			871.10	8.540E-04	%(P	3.595E-02	1.03E-02 G K
			702.50	7.724E-03	& P	3.867E-02	1.14E-02 G K
Ag-108M		-3.9443E-06					
			722.95	-3.944E-06	%(	3.042E-02	8.72E-03 G K
			614.37	-2.233E-02	%	4.155E-02	1.27E-02 G
			433.93	1.032E-02	% P	2.545E-02	7.65E-03 G
CD-109		6.0878E-09					
			88.04	6.088E-09	*(P	7.648E-09	2.34E-09 G
SN-113		1.1319E-35					
			391.71	1.132E-35	&(P	1.571E-34	4.60E-35 G K
			255.04	-4.972E-35	&	4.656E-33	1.37E-33 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	2.5167E-07						
		427.95	2.517E-07	%(P	2.172E-05	6.33E-06	G K
		600.77	2.047E-06	% P	3.394E-05	9.81E-06	G
		636.15	-1.092E-06	& P	5.276E-05	1.51E-05	G
		463.51	4.276E-05	% P	6.501E-05	1.99E-05	G
		176.29	1.897E-05	& P	9.367E-05	2.80E-05	G
I-131	0.0000E+00						
		364.48	0.000E+00	%(	0.000E+00	0.00E+00	G K
		636.97	0.000E+00	&	0.000E+00	0.00E+00	G
		284.29	0.000E+00	%	0.000E+00	0.00E+00	G
CS-134	1.8414E-07						
		604.66	-1.078E-08	%(P	8.357E-07	2.48E-07	G K
		795.76	4.069E-07	(P	4.728E-07	1.49E-07	G
		569.29	-1.004E-08	&	2.395E-06	6.94E-07	G
		801.84	-7.336E-07	% P	4.673E-06	1.36E-06	G
CS-137	3.3205E-02						
		661.62	3.320E-02	*(P	2.219E-02	9.45E-03	G
CE-139	-2.3276E-30						
		165.85	-2.328E-30	%(P	2.829E-29	8.44E-30	G
EU-152	-1.8272E-05						
		121.78	-1.827E-05	%(P	2.077E-02	6.19E-03	G K
		344.30	-1.700E-03	% P	1.880E-02	5.55E-03	G
		1408.08	-1.530E-03	& P	1.820E-02	4.83E-03	G
		964.00	-1.383E-02	& P	5.118E-02	1.52E-02	G
		1112.07	-6.252E-04	& P	5.806E-02	1.67E-02	G
		778.90	-7.976E-03	% P	4.387E-02	1.28E-02	G
EU-154	8.8957E-04						
		123.10	8.896E-04	%(P	5.366E-03	1.61E-03	G K
		1274.80	-1.205E-03	% P	7.979E-03	2.31E-03	G
		723.30	4.053E-04	% P	2.144E-02	6.33E-03	G
		1004.80	-2.384E-03	% P	1.383E-02	4.03E-03	G
EU-155	9.7096E-04						
		86.45	9.710E-04	%(	1.419E-03	4.33E-04	G K
		105.31	9.773E-04	% P	1.537E-03	4.69E-04	G
HG-203	0.0000E+00						
		279.17	0.000E+00	&(P	0.000E+00	0.00E+00	G K
		72.87	0.000E+00	% P	0.000E+00	0.00E+00	G
		70.83	0.000E+00	%	0.000E+00	0.00E+00	G
		82.50	0.000E+00	%	0.000E+00	0.00E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	3.2996E-01						
		583.14	3.300E-01	*(P	3.800E-02	2.01E-02	G
		510.72	5.283E-01	+ P	1.591E-01	6.80E-02	G
PB-212	8.1248E-01						
		238.63	8.125E-01	(P	8.000E-02	3.33E-02	G K
							Energy duplication
		77.11	6.291E-01	}	2.529E-01	6.96E-02	G
		74.81	1.126E+00	+ P	4.663E-01	1.52E-01	G
PB-214	6.5010E-01						
		351.99	6.270E-01	*(P	7.781E-02	3.73E-02	G K
		295.22	6.738E-01	*(P	1.839E-01	7.57E-02	G
							Energy duplication
		77.11	5.641E-01	} P	5.107E-01	1.52E-01	G
		241.92	7.036E-01	(P	5.069E-01	1.59E-01	G
BI-212	7.1261E-01						
		727.17	7.126E-01	*(P	3.895E-01	1.71E-01	G K
		1620.56	1.849E-01	& P	1.007E+00	2.82E-01	G
		785.42	6.362E-01	% P	1.860E+00	5.54E-01	G
BI-214	4.7274E-01						
		609.32	4.727E-01	*(P	8.475E-02	3.48E-02	G K
		1764.51	3.961E-01	- P	1.928E-01	7.68E-02	G
		1120.28	3.496E-01	- P	3.314E-01	1.06E-01	G
RA-224	2.6453E-01						
		241.00	2.645E-01	%(P	1.307E+00	3.93E-01	G
RA-226	1.8638E+00						
		185.99	1.864E+00	*(	9.462E-01	3.36E-01	G
AC-228	1.0848E+00						
		911.07	1.107E+00	*(P	1.252E-01	7.02E-02	G K
		968.90	1.552E+00	+ P	2.286E-01	1.29E-01	G
		338.40	1.030E+00	*(P	2.893E-01	1.22E-01	G
TH-227	-5.3527E-01						
		236.00	-5.353E-01	?(P	4.994E-01	1.54E-01	G K
		256.25	9.254E-02	& P	4.676E-01	1.40E-01	G
PA-234	-2.4620E-02						
		98.44	-2.462E-02	&(	1.399E-01	4.19E-02	G K
		946.00	-3.919E-02	&	2.268E-01	6.66E-02	G
		131.28	-2.480E-03	%	1.872E-01	5.58E-02	G
		94.67	-1.139E-01	&	3.025E-01	9.15E-02	G
		883.24	9.588E-02	%	2.635E-01	7.87E-02	G
		926.70	1.585E-01	%	2.731E-01	8.41E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-1.212E-04 &   3.250E-01 9.42E-02 G

TH-234       5.2071E-01
                           63.29-1.841E-01 &(P 2.020E+00 6.00E-01 G K
                           92.80 1.437E+00  (P 1.627E+00 4.98E-01 G
                           92.38-2.432E-01 % P 1.977E+00 5.91E-01 G

AM-241       4.5815E-02
                           59.54 4.581E-02 %(P 2.517E-01 7.56E-02 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

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

***** 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 pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	8.2420E-05	0.0000E+00	0.0000E+00	0.0000E+00	2.762E-01
K-40	#	1.8432E+01	1.8432E+01	1.3873E+00	1.7634E+00	
MN-54	#A	1.2899E-02	1.3856E-14	3.8307E-14	3.8316E-14	3.988E-02
CO-57	#B	2.3389E-03	3.3837E-17	5.6949E-16	5.6949E-16	4.394E-02
CO-60	#B	3.0447E-03	3.4913E-05	3.4746E-04	3.4747E-04	3.635E-02

Sr-85	#A	-1.8152E-02	0.0000E+00	0.0000E+00	0.0000E+00	4.362E-02
Kr-85	#A	-4.5546E+02	-4.1561E+02	9.7648E+02	9.7679E+02	1.012E+03
Y-88	#B	-1.8028E-03	-1.5941E-38	7.2562E-37	7.2562E-37	2.541E-02
NB-94	#B	8.5502E-04	8.5403E-04	3.0886E-02	3.0886E-02	3.599E-02
Ag-108M	#B	-4.7481E-06	-3.9443E-06	2.6156E-02	2.6156E-02	3.662E-02
CD-109	#A	1.0677E+00	6.0878E-09	7.0250E-09	7.0331E-09	1.341E+00
SN-113	#B	3.3006E-03	1.1319E-35	1.3807E-34	1.3807E-34	4.582E-02
SB-125	#B	1.2424E-03	2.5167E-07	1.9003E-05	1.9003E-05	1.072E-01
I-131	#B	-2.7900E-03	0.0000E+00	0.0000E+00	0.0000E+00	3.606E-02
CS-134	#B	1.6855E-02	1.8414E-07	2.0225E-07	2.0254E-07	7.649E-02
CS-137	#	7.2626E-02	3.3205E-02	2.8351E-02	2.8419E-02	
CE-139	#A	-3.4905E-03	-2.3276E-30	2.6916E-29	2.6917E-29	4.242E-02
EU-152	#B	-1.1678E-04	-1.8272E-05	5.1326E-03	5.1326E-03	1.327E-01
EU-154	#B	1.4217E-02	8.8957E-04	4.8226E-03	4.8229E-03	8.576E-02
EU-155	#B	1.1217E-01	9.7096E-04	1.2994E-03	1.3005E-03	1.640E-01
HG-203	#B	1.5630E-02	0.0000E+00	0.0000E+00	0.0000E+00	3.571E-02
TL-208	#	3.2996E-01	3.2996E-01	6.0252E-02	6.3325E-02	
PB-212		8.1248E-01	8.1248E-01	9.9909E-02	1.1084E-01	
PB-214		6.5010E-01	6.5010E-01	1.1610E-01	1.2228E-01	
BI-212	#	7.1261E-01	7.1261E-01	5.1167E-01	5.1340E-01	
BI-214	#	4.7274E-01	4.7274E-01	1.0441E-01	1.0808E-01	8.475E-02
RA-224	#A	2.6453E-01	2.6453E-01	1.1786E+00	1.1787E+00	1.307E+00
RA-226	#	1.8915E+00	1.8638E+00	1.0087E+00	1.0147E+00	
AC-228	#	1.0848E+00	1.0848E+00	2.0634E-01	2.1605E-01	
TH-227	#A	-5.3527E-01	-5.3527E-01	4.6323E-01	4.6431E-01	4.994E-01
PA-234	#B	-2.4620E-02	-2.4620E-02	1.2575E-01	1.2575E-01	1.399E-01
TH-234	#B	5.2071E-01	5.2071E-01	5.4126E-01	5.4203E-01	2.020E+00
AM-241	#A	4.8376E-02	4.5815E-02	2.2677E-01	2.2678E-01	2.658E-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 (269.7 to 2000.1 keV) 2.3985695E+01 pCi/gm
Total Decayed Activity (269.7 to 2000.1 keV) 2.3918629E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 107F_15SEPT2006_1504.An1

Sample description
FSS-SSS-01-01-034-F-B

Spectrum Filename: C:\GammaVision\Spectra\107F_15SEPT2006_1504.An1

Acquisition information
Start time: 15-Sep-2006 15:03:46
Live time: 2000
Real time: 2009
Dead time: 0.43 %
Detector ID: 2

Detector system
Det 107- DSPE- 634

Calibration
Filename: D7_1LSa.Clb
Detector 107 Calibration for 1 Liter Sand Marinelli

Energy Calibration
Created: 29-Oct-2004 06:48:53
Zero offset: 0.157 keV
Gain: 0.500 keV/channel
Quadratic: -1.676E-08 keV/channel^2

Efficiency Calibration
Created: 29-Oct-2004 06:51:32
Type: Polynomial
Uncertainty: 1.174 %
Coefficients: -0.279532 -4.778179 0.614896
-0.087174 0.005356 -0.000131

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.16keV)
Stop channel: 4000 (2000.15keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.8820E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.8820E+03) =
5.3135E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five 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	10-Sep-2006 10:30:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	107_150K_28APR05.Pbc 01-May-2005 05:30:33
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 16 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.2707

***** 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. pCi/gm	Nuc
76.19	1064.	7.96	3.69	2.916E-02	72.87	6.400	4.688E+00	HG203
					74.81	9.600	2.783E+00	PB212
					77.11	10.700	2.404E+00	PB214
					77.11	17.500	1.476E+00	PB212
87.06	147.	39.85	1.50	3.327E-02				
87.06	147.	39.85	1.50	3.327E-02	86.45	32.740	PBC<MDA	EU155
					88.04	3.790	PBC<MDA	CD109
93.31	145.	36.66	1.50	3.438E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
185.95	258.	20.00	1.43	3.610E-02	185.99	3.280	1.562E+00	RA226
209.69	156.	33.56	1.13	3.425E-02				
239.21	2017.	3.98	2.04	3.185E-02	238.63	43.100	1.045E+00	PB212
242.11	199.	21.70	1.30	3.163E-02	241.92	7.470	6.047E-01	PB214
295.24	259.	11.56	1.34	2.767E-02	295.22	19.200	3.432E-01	PB214
300.61	88.	26.65	1.34	2.731E-02				
338.40	406.	11.33	2.15	2.500E-02	338.40	12.010	9.619E-01	AC228
351.98	601.	7.34	2.41	2.426E-02	351.99	37.100	4.753E-01	PB214
463.38	120.	26.59	1.76	1.953E-02				
463.38	120.	26.59	1.76	1.953E-02	463.51	10.000	4.336E-01	SB125
511.30	223.	12.82	1.68	1.806E-02	510.72	22.500	3.342E-01	TL208
583.27	618.	6.20	2.14	1.629E-02	583.14	86.000	3.142E-01	TL208
609.62	528.	5.68	2.34	1.574E-02	609.32	46.090	5.185E-01	BI214
727.56	125.	15.53	2.02	1.374E-02	727.17	11.800	5.496E-01	BI212
795.12	42.	39.17	1.68	1.284E-02	795.76	85.400	PBC<MDA	CS134
911.20	470.	7.08	2.31	1.161E-02	911.07	29.000	9.946E-01	AC228
967.92	359.	9.07	1.67	1.110E-02	968.90	17.460	1.323E+00	AC228
1121.09	150.	22.90	1.35	9.965E-03	1120.28	15.040	7.126E-01	BI214

1461.26	2093.	2.25	2.81	8.189E-03	1460.75	10.700	1.711E+01	K40
1619.96	25.	40.34	0.93	7.569E-03	1620.56	2.750	8.796E-01	BI212
1765.31	112.	10.13	0.85	7.084E-03	1764.51	15.920	7.138E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
419.01	209.69	889.	156.	0.078	100.69	1.125	NP-239	s
600.85	300.71	233.	88.	0.044	79.94	1.341	PB-212	lD

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

This section based on library: FSS_Rev_1.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 3 Sigma %	FWHM keV
PB-212	149.29	74.81	966.	323.	0.162	43.50	1.178D
PB-212	153.89	77.11	1059.	464.	0.232	24.58	1.179A
CD-109	173.78	87.06	1654.	147.	0.074	119.56	1.500s
TH-234	186.29	93.31	1759.	145.	0.072	109.98	1.500s
RA-226	371.55	185.95	887.	258.	0.129	59.99	1.432s
TH-227	471.08	235.72	1951.	-214.	-0.107	89.97	1.500s
PB-212	476.89	238.63	708.	1204.	0.602	12.55	1.297D
PB-214	483.47	241.92	847.	199.	0.099	65.10	1.299D
PB-214	590.42	295.40	591.	368.	0.184	37.13	2.149s
AC-228	676.41	338.40	491.	402.	0.201	34.00	2.155s
PB-214	703.57	351.98	425.	596.	0.298	22.02	2.407s
SB-125	926.53	463.47	245.	68.	0.034	100.39	1.500s
TL-208	1022.19	511.30	232.	189.	0.095	38.45	1.679s
TL-208	1166.12	583.27	222.	613.	0.306	18.60	2.141s
BI-214	1218.82	609.62	142.	524.	0.262	17.04	2.338s
BI-212	1454.69	727.56	99.	124.	0.062	46.58	2.020s
CS-134	1589.80	795.12	117.	42.	0.021	117.50	1.684s
AC-228	1821.96	911.20	153.	466.	0.233	21.23	2.314s
AC-228	1935.40	967.92	162.	357.	0.178	27.22	1.666s
BI-214	2241.76	1121.09	219.	149.	0.074	68.71	1.352s
K-40	2922.12	1461.26	35.	2089.	1.044	6.76	2.806s
BI-212	3239.55	1619.96	22.	25.	0.013	121.02	0.925s
BI-214	3530.27	1765.31	7.	112.	0.056	30.39	0.850s

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 pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		2.1735E-02					
			477.56	2.173E-02	&(	2.574E-01 7.55E-02	G
K-40		1.7112E+01					
			1460.75	1.711E+01	*(P	2.491E-01 3.87E-01	G
MN-54		1.6038E-02					
			834.81	1.604E-02	&(P	2.948E-02 8.99E-03	G
CO-57		6.2479E-03					
			122.07	6.248E-03	&(P	3.636E-02 1.09E-02	G K
			136.43	-2.182E-02	% P	2.982E-01 8.92E-02	G
CO-60		1.2545E-02					
			1332.51	1.255E-02	%(P	2.842E-02 8.42E-03	G K
			1173.23	-4.481E-03	% P	4.322E-02 1.24E-02	G K
Sr-85		-1.4103E-02					
			514.00	-1.410E-02	&(	3.852E-02 1.16E-02	G
Kr-85		-3.3577E+02					
			513.99	-3.358E+02	&(P	8.448E+02 2.53E+02	G
Y-88		5.1863E-03					
			1836.01	5.186E-03	%(P	2.182E-02 6.12E-03	G K
			898.02	-1.681E-03	% P	3.733E-02 1.07E-02	G
NB-94		5.3283E-03					
			871.10	5.328E-03	%(P	2.907E-02 8.52E-03	G K
			702.50	-4.558E-04	& P	3.227E-02 9.37E-03	G K
Ag-108M		-8.3579E-03					
			722.95	-8.358E-03	%(	3.946E-02 1.17E-02	G K
			614.37	-2.625E-02	%	4.324E-02 1.32E-02	G
			433.93	4.135E-03	% P	2.937E-02 8.67E-03	G
CD-109		8.4491E-01					
			88.04	8.449E-01	&(P	1.104E+00 3.37E-01	G
SN-113		-1.7700E-02					
			391.71	-1.770E-02	%(P	4.305E-02 1.29E-02	G K
			255.04	3.609E-01	&	1.217E+00 3.65E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	7.4571E-02						
		427.95	1.546E-02	%(P	8.278E-02	2.45E-02	G K
		600.77	5.123E-03	% P	1.527E-01	4.44E-02	G
		636.15	1.098E-02	& P	2.292E-01	6.63E-02	G
		463.51	2.495E-01	*(P	2.794E-01	8.70E-02	G
		176.29	-3.623E-03	% P	4.558E-01	1.36E-01	G
I-131	-1.9025E-04						
		364.48	-1.902E-04	%(	4.720E-02	1.38E-02	G K
		636.97	1.355E-01	&	4.422E-01	1.31E-01	G
		284.29	5.651E-02	&	6.982E-01	2.07E-01	G
CS-134	1.1356E-02						
		604.66	-2.819E-03	%(P	6.574E-02	1.96E-02	G K
		795.76	2.756E-02	*(P	3.499E-02	1.09E-02	G
		569.29	-3.299E-03	%	1.609E-01	4.66E-02	G
		801.84	-4.684E-03	% P	2.519E-01	7.11E-02	G
CS-137	2.3107E-03						
		661.62	2.311E-03	%(P	3.772E-02	1.10E-02	G
CE-139	-3.5499E-04						
		165.85	-3.550E-04	%(P	3.800E-02	1.13E-02	G
EU-152	1.7804E-02						
		121.78	1.780E-02	&(P	1.082E-01	3.25E-02	G K
		344.30	-2.713E-02	% P	1.058E-01	3.16E-02	G
		1408.08	-2.852E-03	% P	1.138E-01	3.09E-02	G
		964.00	1.871E-03	& P	3.137E-01	9.16E-02	G
		1112.07	-5.507E-02	% P	2.866E-01	8.41E-02	G
		778.90	-2.047E-02	% P	2.422E-01	7.05E-02	G
EU-154	-1.3629E-02						
		123.10	-1.363E-02	%(P	8.023E-02	2.41E-02	G K
		1274.80	-1.599E-02	% P	1.181E-01	3.45E-02	G
		723.30	-7.804E-02	% P	1.968E-01	5.92E-02	G
		1004.80	6.046E-02	% P	1.794E-01	5.35E-02	G
EU-155	8.3393E-02						
		86.45	8.339E-02	%(	1.401E-01	4.26E-02	G K
		105.31	8.285E-03	& P	1.530E-01	4.58E-02	G
HG-203	-4.0646E-04						
		279.17	-4.065E-04	&(P	3.195E-02	9.41E-03	G K
		72.87	-3.462E-01	& P	1.067E+00	3.22E-01	G
		70.83	1.133E-01	%	1.390E+00	4.16E-01	G
		82.50	-1.091E+00	%	2.227E+00	6.76E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	3.1832E-01						
		583.14	3.142E-01	*(P	3.698E-02	1.96E-02	G
		510.72	3.342E-01	*(P	1.300E-01	5.05E-02	G
PB-212	6.4360E-01						
		238.63	6.289E-01	(P	6.619E-02	2.67E-02	G K
							Energy duplication
		77.11	6.431E-01	}	2.142E-01	5.27E-02	G
		74.81	8.488E-01	+ P	3.872E-01	1.25E-01	G
PB-214	4.8299E-01						
		351.99	4.753E-01	*(P	7.884E-02	3.52E-02	G K
		295.22	4.979E-01	*(P	1.567E-01	6.24E-02	G
							Energy duplication
		77.11	4.992E-02	} P	4.522E-01	1.26E-01	G
		241.92	6.047E-01	+ P	4.204E-01	1.32E-01	G
BI-212	5.4955E-01						
		727.17	5.496E-01	*(P	2.172E-01	8.63E-02	G K
		1620.56	8.796E-01	+ P	8.389E-01	3.62E-01	G
		785.42	3.342E-01	% P	1.618E+00	4.77E-01	G
BI-214	5.1855E-01						
		609.32	5.185E-01	*(P	5.764E-02	2.97E-02	G K
		1764.51	7.138E-01	+ P	9.517E-02	7.29E-02	G
		1120.28	7.126E-01	+ P	3.433E-01	1.64E-01	G
RA-224	-5.0310E-02						
		241.00	-5.031E-02	&(P	8.399E-01	2.50E-01	G
RA-226	1.5621E+00						
		185.99	1.562E+00	*(	8.582E-01	3.12E-01	G
AC-228	9.8500E-01						
		911.07	9.946E-01	*(P	1.286E-01	7.11E-02	G K
		968.90	1.323E+00	+ P	2.300E-01	1.21E-01	G
		338.40	9.619E-01	*(P	2.533E-01	1.10E-01	G
TH-227	-4.2768E-01						
		236.00	-4.277E-01	?(P	4.164E-01	1.28E-01	G K
		256.25	-5.154E-02	& P	4.076E-01	1.21E-01	G
PA-234	7.4981E-03						
		98.44	7.498E-03	%(	1.108E-01	3.31E-02	G K
		946.00	6.925E-02	%	1.394E-01	4.24E-02	G
		131.28	5.607E-02	&	1.500E-01	4.53E-02	G
		94.67	-1.446E-01	%	2.619E-01	7.96E-02	G
		883.24	-6.440E-03	&	2.580E-01	7.44E-02	G
		926.70	-2.108E-02	%	3.234E-01	9.41E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-2.859E-03 %   2.371E-01 6.86E-02 G

TH-234       3.9674E-01
                           63.29-7.420E-02 &(P 1.739E+00 5.18E-01 G K
                           92.80 1.009E+00  (P 1.379E+00 4.20E-01 G
                           92.38-1.690E-01 % P 1.602E+00 4.79E-01 G

AM-241       3.4036E-02
                           59.54 3.404E-02 &(P 1.913E-01 5.74E-02 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

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

***** 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 pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	2.0319E-02	2.1735E-02	2.2640E-01	2.2640E-01	2.406E-01
K-40	#	1.7112E+01	1.7112E+01	1.1601E+00	1.5386E+00	
MN-54	#A	1.5855E-02	1.6038E-02	2.6982E-02	2.6999E-02	2.914E-02
CO-57	#B	6.1652E-03	6.2479E-03	3.2738E-02	3.2740E-02	3.588E-02
CO-60	#B	1.2522E-02	1.2545E-02	2.5274E-02	2.5285E-02	2.837E-02

Sr-85	#A	-1.3342E-02	-1.4103E-02	3.4809E-02	3.4819E-02	3.645E-02
Kr-85	#A	-3.3576E+02	-3.3577E+02	8.9733E+02	8.9755E+02	8.448E+02
Y-88	#B	5.0142E-03	5.1863E-03	1.8365E-02	1.8368E-02	2.110E-02
NB-94	#B	5.3283E-03	5.3283E-03	2.5547E-02	2.5549E-02	2.907E-02
Ag-108M	#B	-8.3572E-03	-8.3579E-03	3.5128E-02	3.5132E-02	3.946E-02
CD-109	#A	8.3823E-01	8.4491E-01	1.0124E+00	1.0135E+00	1.095E+00
SN-113	#B	-1.7156E-02	-1.7700E-02	4.3166E-02	4.3179E-02	4.173E-02
SB-125	#B	7.4307E-02	7.4571E-02	7.7978E-02	7.8103E-02	8.248E-02
I-131	#B	-1.2162E-04	-1.9025E-04	4.1539E-02	4.1539E-02	3.017E-02
CS-134	#B	1.1302E-02	1.1356E-02	1.3512E-02	1.3529E-02	6.543E-02
CS-137	#A	2.3099E-03	2.3107E-03	3.2947E-02	3.2947E-02	3.771E-02
CE-139	#A	-3.4582E-04	-3.5499E-04	5.5090E-02	5.5090E-02	3.702E-02
EU-152	#B	1.7790E-02	1.7804E-02	9.7414E-02	9.7419E-02	1.081E-01
EU-154	#B	-1.3613E-02	-1.3629E-02	7.4996E-02	7.4999E-02	8.013E-02
EU-155	#B	8.3227E-02	8.3393E-02	1.2792E-01	1.2800E-01	1.399E-01
HG-203	#B	-3.7625E-04	-4.0646E-04	1.0900E+00	1.0900E+00	2.957E-02
TL-208	#	3.1832E-01	3.1832E-01	5.9647E-02	6.2539E-02	
PB-212		6.4360E-01	6.4360E-01	8.1844E-02	9.0241E-02	
PB-214		4.8299E-01	4.8299E-01	1.0543E-01	1.0922E-01	
BI-212		5.4955E-01	5.4955E-01	2.5866E-01	2.6069E-01	
BI-214	#	5.1855E-01	5.1855E-01	8.9073E-02	9.4191E-02	
RA-224	#A	-5.0310E-02	-5.0310E-02	1.2720E+00	1.2720E+00	8.399E-01
RA-226	#	1.5620E+00	1.5621E+00	9.3710E-01	9.4163E-01	
AC-228	#	9.8500E-01	9.8500E-01	1.9905E-01	2.0738E-01	
TH-227	#A	-4.2768E-01	-4.2768E-01	3.8529E-01	3.8611E-01	4.164E-01
PA-234	#B	7.4981E-03	7.4981E-03	9.9175E-02	9.9176E-02	1.108E-01
TH-234	#B	3.9674E-01	3.9674E-01	4.9569E-01	4.9618E-01	1.739E+00
AM-241	#A	3.4036E-02	3.4036E-02	1.7221E-01	1.7222E-01	1.913E-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 (295.2 to 2000.1 keV) 2.2172028E+01 pCi/gm
Total Decayed Activity (295.2 to 2000.1 keV) 2.2172037E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 107F_16SEPT2006_0901.An1

Sample description
FSS-SSS-01-01-033-F-B

Spectrum Filename: C:\GammaVision\Spectra\107F_16SEPT2006_0901.An1

Acquisition information
Start time: 16-Sep-2006 09:01:57
Live time: 2000
Real time: 2005
Dead time: 0.27 %
Detector ID: 2

Detector system
Det 107- DSPE- 634

Calibration
Filename: D7_1LSa.Clb
Detector 107 Calibration for 1 Liter Sand Marinelli

Energy Calibration
Created: 29-Oct-2004 06:48:53
Zero offset: 0.157 keV
Gain: 0.500 keV/channel
Quadratic: -1.676E-08 keV/channel^2

Efficiency Calibration
Created: 29-Oct-2004 06:51:32
Type: Polynomial
Uncertainty: 1.174 %
Coefficients: -0.279532 -4.778179 0.614896
-0.087174 0.005356 -0.000131

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.16keV)
Stop channel: 4000 (2000.15keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.9110E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.9110E+03) =
5.2329E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five 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	10-Sep-2006 11:45:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	107_150K_28APR05.Pbc 01-May-2005 05:30:33
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 14 cutoff 20.00000 %
Energy Calibration
Normalized diff: 1.0000

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

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
76.10	974.	8.07	4.54	2.912E-02	72.87	6.400	4.272E+00	HG203
					74.81	9.600	2.509E+00	PB212
					77.11	10.700	2.167E+00	PB214
					77.11	17.500	1.332E+00	PB212
239.17	1877.	3.87	2.95	3.185E-02	238.63	43.100	9.575E-01	PB212
					241.00	3.900	1.072E+01	RA224
270.75	85.	31.65	1.49	2.941E-02				
295.37	149.	23.89	1.50	2.768E-02	295.22	19.200	1.982E-01	PB214
338.59	283.	13.51	2.09	2.499E-02	338.40	12.010	6.586E-01	AC228
352.00	706.	7.45	2.71	2.426E-02	351.99	37.100	5.506E-01	PB214
463.37	118.	27.86	1.64	1.953E-02				
463.37	118.	27.86	1.64	1.953E-02	463.51	10.000	4.188E-01	SB125
510.92	205.	16.81	2.56	1.808E-02	510.72	22.500	3.562E-01	TL208
583.40	463.	8.42	2.81	1.628E-02	583.14	86.000	2.314E-01	TL208
609.74	522.	7.42	3.13	1.573E-02	604.66	97.600	2.400E-01	CS134
					609.32	46.090	5.048E-01	BI214
					614.37	90.393	2.613E-01	Ag108M
727.49	63.	30.47	1.64	1.374E-02	727.17	11.800	2.729E-01	BI212
911.76	382.	8.01	2.59	1.160E-02	911.07	29.000	7.933E-01	AC228
968.44	281.	9.34	3.12	1.109E-02	964.00	14.580	1.227E+00	EU152
					968.90	17.460	1.028E+00	AC228
1119.70	137.	18.00	3.05	9.970E-03	1120.28	15.040	6.466E-01	BI214
1461.14	1950.	2.34	3.26	8.189E-03	1460.75	10.700	1.570E+01	K40
1764.78	71.	13.47	1.61	7.084E-03	1764.51	15.920	4.421E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide
151.87	76.10	2304.	466.	0.233	45.81	4.539	BI-207 s
477.23	239.17	829.	875.	0.437	17.26	1.297	PB-212 D
541.12	270.75	306.	85.	0.043	94.96	1.494	AC-228 s
703.61	352.00	847.	361.	0.180	37.69	2.709	PB-214 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: FSS_Rev_1.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 3 Sigma %	FWHM keV
PB-212	151.89	76.11	2370.	195.	0.097	105.98	1.500s
PB-214	153.89	77.11	2091.	304.	0.152	64.95	1.500D
PB-212	153.89	77.11	2086.	309.	0.155	64.95	1.500D
TH-227	469.88	235.12	1612.	-172.	-0.086	101.61	1.500s
PB-212	477.50	238.93	1392.	841.	0.420	21.05	1.500s
RA-224	481.63	241.00	1072.	417.	0.208	36.23	1.298D
PB-214	590.36	295.37	600.	149.	0.074	71.66	1.500s
AC-228	676.80	338.59	383.	280.	0.140	40.54	2.091s
PB-214	703.59	351.99	515.	340.	0.170	32.12	1.500D
SB-125	927.25	463.83	236.	60.	0.030	109.72	1.500s
TL-208	1021.43	510.92	360.	205.	0.102	50.44	2.560s
TL-208	1166.37	583.40	269.	458.	0.229	25.25	2.805s
BI-214	1219.07	609.74	243.	518.	0.259	22.25	3.127s
BI-212	1454.55	727.49	159.	63.	0.031	91.41	1.638s
AC-228	1823.08	911.76	146.	378.	0.189	24.03	2.586s
AC-228	1936.44	968.44	110.	281.	0.141	28.02	3.116s
BI-214	2238.97	1119.70	127.	137.	0.069	53.99	3.054s
K-40	2921.88	1461.14	37.	1945.	0.973	7.02	3.257s
BI-214	3529.20	1764.78	7.	71.	0.035	40.41	1.611s

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 pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		-4.9277E-02					
			477.56	-4.928E-02	%(	2.364E-01	6.99E-02 G
K-40		1.5695E+01					
			1460.75	1.570E+01	*(P	2.497E-01	3.68E-01 G
MN-54		-3.1351E-04					
			834.81	-3.135E-04	%(P	3.154E-02	9.08E-03 G
CO-57		-9.3269E-03					
			122.07	-9.327E-03	%(P	3.664E-02	1.10E-02 G K
			136.43	1.567E-03	& P	2.384E-01	7.09E-02 G
CO-60		-3.0396E-03					
			1332.51	-3.040E-03	%(P	3.824E-02	1.07E-02 G K
			1173.23	-3.419E-03	% P	4.216E-02	1.20E-02 G K
Sr-85		-1.2623E-02					
			514.00	-1.262E-02	&(	3.850E-02	1.16E-02 G
Kr-85		-3.0101E+02					
			513.99	-3.010E+02	&(P	8.379E+02	2.51E+02 G
Y-88		-1.2829E-03					
			1836.01	-1.283E-03	&(P	2.323E-02	6.04E-03 G K
			898.02	4.401E-03	% P	3.027E-02	8.77E-03 G
NB-94		6.4518E-04					
			871.10	6.452E-04	&(P	2.746E-02	7.87E-03 G K
			702.50	8.706E-03	& P	2.705E-02	8.06E-03 G K
Ag-108M		-1.5344E-02					
			722.95	-1.534E-02	&(	4.176E-02	1.26E-02 G K
			614.37	-3.377E-02	%	4.796E-02	1.47E-02 G
			433.93	-7.693E-04	% P	2.684E-02	7.80E-03 G
CD-109		4.2165E-01					
			88.04	4.216E-01	%(P	1.063E+00	3.22E-01 G
SN-113		7.2155E-03					
			391.71	7.216E-03	%(P	3.802E-02	1.13E-02 G K
			255.04	1.636E-02	%	1.096E+00	3.23E-01 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	4.8594E-02						
		427.95	-8.738E-03	%(P	7.992E-02	2.34E-02	G K
		600.77	1.186E-02	% P	1.405E-01	4.09E-02	G
		636.15	-1.123E-02	% P	2.394E-01	6.93E-02	G
		463.51	2.183E-01	*(P	2.699E-01	8.36E-02	G
		176.29	4.414E-02	& P	4.537E-01	1.36E-01	G
I-131	-3.9085E-04						
		364.48	-3.908E-04	%(	4.725E-02	1.38E-02	G K
		636.97	-9.375E-02	&	6.160E-01	1.81E-01	G
		284.29	5.204E-02	%	6.863E-01	2.04E-01	G
CS-134	1.2391E-02						
		604.66	1.239E-02	%(P	3.450E-02	1.04E-02	G K
		795.76	4.840E-03	% P	3.848E-02	1.13E-02	G
		569.29	-1.609E-02	%	1.731E-01	5.07E-02	G
		801.84	-7.541E-02	& P	3.215E-01	9.47E-02	G
CS-137	1.5189E-02						
		661.62	1.519E-02	%(P	3.808E-02	1.14E-02	G
CE-139	-8.3066E-05						
		165.85	-8.307E-05	&(P	3.538E-02	1.05E-02	G
EU-152	-3.1878E-02						
		121.78	-3.188E-02	&(P	1.065E-01	3.21E-02	G K
		344.30	-3.358E-02	% P	1.019E-01	3.06E-02	G
		1408.08	4.059E-02	& P	1.095E-01	3.24E-02	G
		964.00	-8.386E-02	& P	3.541E-01	1.06E-01	G
		1112.07	-2.452E-02	% P	2.703E-01	7.83E-02	G
		778.90	-6.431E-02	% P	2.515E-01	7.45E-02	G
EU-154	-2.3349E-02						
		123.10	-2.335E-02	%(P	7.297E-02	2.20E-02	G K
		1274.80	3.094E-02	& P	1.029E-01	3.05E-02	G
		723.30	-7.458E-02	& P	2.006E-01	6.03E-02	G
		1004.80	4.183E-02	% P	1.908E-01	5.62E-02	G
EU-155	4.9841E-02						
		86.45	4.984E-02	&(	1.336E-01	4.04E-02	G K
		105.31	-1.972E-03	& P	1.400E-01	4.18E-02	G
HG-203	-9.3472E-04						
		279.17	-9.347E-04	%(P	3.527E-02	1.04E-02	G K
		72.87	6.217E-01	% P	9.158E-01	2.79E-01	G
		70.83	9.500E-01	&	1.494E+00	4.55E-01	G
		82.50	2.525E-01	%	2.148E+00	6.45E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.3141E-01						
		583.14	2.314E-01	*(P	3.991E-02	1.97E-02	G
		510.72	3.562E-01	+ P	1.584E-01	6.98E-02	G
PB-212	4.3969E-01						
		238.63	4.324E-01	*(P	9.084E-02	3.09E-02	G K
							Energy duplication
		77.11	4.225E-01	*(	2.945E-01	9.15E-02	G
		74.81	5.039E-01	*(P	5.934E-01	1.82E-01	G
PB-214	2.6704E-01						
							Energy duplication
		351.99	2.670E-01	*(P	8.518E-02	2.90E-02	G K
		295.22	1.982E-01	- P	1.555E-01	4.88E-02	G
							Energy duplication
		77.11	6.804E-01	+ P	4.823E-01	1.50E-01	G
		241.92	-3.637E-01	& P	6.322E-01	1.92E-01	G
BI-212	2.7285E-01						
		727.17	2.729E-01	*(P	2.678E-01	8.49E-02	G K
		1620.56	1.887E-01	% P	7.694E-01	2.19E-01	G
		785.42	3.232E-01	& P	1.486E+00	4.38E-01	G
BI-214	4.8873E-01						
		609.32	5.048E-01	*(P	7.345E-02	3.78E-02	G K
		1764.51	4.421E-01	(P	9.700E-02	6.03E-02	G
		1120.28	6.466E-01	+ P	2.603E-01	1.17E-01	G
RA-224	2.3829E+00						
		241.00	2.383E+00	(P	8.882E-01	2.89E-01	G
RA-226	5.3542E-01						
		185.99	5.354E-01	%(	8.675E-01	2.64E-01	G
AC-228	7.9335E-01						
		911.07	7.933E-01	*(P	1.241E-01	6.43E-02	G K
		968.90	1.028E+00	+ P	1.880E-01	9.67E-02	G
		338.40	6.586E-01	- P	2.212E-01	9.00E-02	G
TH-227	-3.3892E-01						
		236.00	-3.389E-01	?(P	3.733E-01	1.15E-01	G K
		256.25	4.558E-02	% P	3.800E-01	1.13E-01	G
PA-234	-1.5325E-02						
		98.44	-1.532E-02	&(	1.375E-01	4.12E-02	G K
		946.00	-8.941E-03	%	1.679E-01	4.87E-02	G
		131.28	2.149E-02	&	1.414E-01	4.24E-02	G
		94.67	-8.724E-02	%	2.482E-01	7.50E-02	G
		883.24	-6.291E-02	%	2.623E-01	7.76E-02	G
		926.70	2.792E-02	%	2.071E-01	5.96E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-2.353E-02 %   2.554E-01 7.48E-02 G

TH-234      -1.7285E-01
                           63.29-1.729E-01 &(P 1.534E+00 4.56E-01 G K
                           92.80 2.653E-01 % P 1.370E+00 4.11E-01 G
                           92.38 5.018E-01 % P 1.605E+00 4.84E-01 G

AM-241       4.8515E-02
                           59.54 4.851E-02 %(P 2.068E-01 6.22E-02 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

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

***** 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 pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	-4.5652E-02	-4.9277E-02	2.0977E-01	2.0979E-01	2.190E-01
K-40	#	1.5695E+01	1.5695E+01	1.1051E+00	1.4424E+00	
MN-54	#A	-3.0943E-04	-3.1351E-04	2.3406E-01	2.3406E-01	3.113E-02
CO-57	#B	-9.1871E-03	-9.3269E-03	3.3525E-02	3.3529E-02	3.609E-02
CO-60	#B	-3.0331E-03	-3.0396E-03	2.4184E-01	2.4184E-01	3.816E-02

Sr-85	#A	-1.1853E-02	-1.2623E-02	3.4707E-02	3.4715E-02	3.615E-02
Kr-85	#A	-3.0099E+02	-3.0101E+02	9.0280E+02	9.0297E+02	8.379E+02
Y-88	#B	-1.2348E-03	-1.2829E-03	9.6261E-02	9.6262E-02	2.235E-02
NB-94	#B	6.4518E-04	6.4518E-04	2.3608E-02	2.3608E-02	2.746E-02
Ag-108M	#B	-1.5342E-02	-1.5344E-02	3.7679E-02	3.7690E-02	4.176E-02
CD-109	#A	4.1787E-01	4.2165E-01	9.6476E-01	9.6504E-01	1.053E+00
SN-113	#B	6.9642E-03	7.2155E-03	3.3788E-02	3.3791E-02	3.670E-02
SB-125	#B	4.8399E-02	4.8594E-02	5.5818E-02	5.5891E-02	7.960E-02
I-131	#B	-2.3529E-04	-3.9085E-04	4.1531E-02	4.1531E-02	2.844E-02
CS-134	#B	1.2324E-02	1.2391E-02	3.1092E-02	3.1101E-02	3.431E-02
CS-137	#A	1.5183E-02	1.5189E-02	3.4266E-02	3.4278E-02	3.806E-02
CE-139	#A	-8.0638E-05	-8.3066E-05	2.1575E-02	2.1575E-02	3.435E-02
EU-152	#B	-3.1850E-02	-3.1878E-02	9.6895E-02	9.6911E-02	1.064E-01
EU-154	#B	-2.3318E-02	-2.3349E-02	6.7431E-02	6.7444E-02	7.287E-02
EU-155	#B	4.9729E-02	4.9841E-02	1.2128E-01	1.2131E-01	1.333E-01
HG-203	#B	-8.5634E-04	-9.3472E-04	8.3675E-02	8.3675E-02	3.231E-02
TL-208	#	2.3141E-01	2.3141E-01	5.9019E-02	6.0581E-02	
PB-212	#	4.3969E-01	4.3969E-01	9.4287E-02	9.7798E-02	9.084E-02
PB-214	#	2.6704E-01	2.6704E-01	8.7050E-02	8.8468E-02	8.518E-02
BI-212	#	2.7285E-01	2.7285E-01	2.5456E-01	2.5507E-01	2.678E-01
BI-214	#	4.8873E-01	4.8873E-01	1.0967E-01	1.1340E-01	
RA-224		2.3829E+00	2.3829E+00	8.6794E-01	8.7927E-01	
RA-226	#A	5.3541E-01	5.3542E-01	7.9340E-01	7.9403E-01	8.675E-01
AC-228	#	7.9335E-01	7.9335E-01	1.9281E-01	1.9842E-01	
TH-227	#A	-3.3892E-01	-3.3892E-01	3.4491E-01	3.4549E-01	3.733E-01
PA-234	#B	-1.5325E-02	-1.5325E-02	1.2363E-01	1.2364E-01	1.375E-01
TH-234	#B	-1.7285E-01	-1.7285E-01	1.1637E+01	1.1637E+01	1.534E+00
AM-241	#A	4.8513E-02	4.8515E-02	1.8672E-01	1.8674E-01	2.068E-01

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

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

Total Activity (270.7 to 2000.1 keV) 1.9591660E+01 pCi/gm
Total Decayed Activity (270.7 to 2000.1 keV) 1.9591660E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JJM

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 107F_16SEPT2006_0940.An1

Sample description
FSS-SSS-01-01-038-F-B

Spectrum Filename: C:\GammaVision\Spectra\107F_16SEPT2006_0940.An1

Acquisition information
Start time: 16-Sep-2006 09:40:09
Live time: 2000
Real time: 2003
Dead time: 0.16 %
Detector ID: 2

Detector system
Det 107- DSPE- 634

Calibration
Filename: D7_1LSa.Clb
Detector 107 Calibration for 1 Liter Sand Marinelli

Energy Calibration
Created: 29-Oct-2004 06:48:53
Zero offset: 0.157 keV
Gain: 0.500 keV/channel
Quadratic: -1.676E-08 keV/channel^2

Efficiency Calibration
Created: 29-Oct-2004 06:51:32
Type: Polynomial
Uncertainty: 1.174 %
Coefficients: -0.279532 -4.778179 0.614896
-0.087174 0.005356 -0.000131

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.16keV)
Stop channel: 4000 (2000.15keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 2.0880E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 2.0880E+03) =
4.7893E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five 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	11-Sep-2006 15:30:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	107_150K_28APR05.Pbc 01-May-2005 05:30:33
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 13 cutoff 20.00000 %
Energy Calibration
Normalized diff: 1.0000

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

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
76.16	1088.	8.18	4.41	2.914E-02	72.87	6.400	4.293E+00	HG203
					74.81	9.600	2.565E+00	PB212
					77.11	17.500	1.361E+00	PB212
					77.11	10.700	2.216E+00	PB214
					82.50	2.240	1.067E+01	HG203
208.91	170.	27.82	1.20	3.432E-02				
239.14	2108.	3.76	3.27	3.185E-02	238.63	43.100	9.851E-01	PB212
					241.00	3.900	1.102E+01	RA224
					241.92	7.470	5.771E+00	PB214
295.17	232.	13.89	1.34	2.768E-02				
295.17	232.	13.89	1.34	2.768E-02	295.22	19.200	2.771E-01	PB214
299.45	87.	29.72	1.34	2.739E-02				
338.81	358.	12.03	3.37	2.498E-02	338.40	12.010	7.646E-01	AC228
352.07	766.	6.65	2.60	2.425E-02	351.99	37.100	5.472E-01	PB214
510.66	71.	24.96	1.50	1.808E-02	510.72	22.500	PBC<MDA	TL208
583.30	568.	7.70	2.81	1.629E-02	583.14	86.000	2.603E-01	TL208
609.54	580.	7.15	3.11	1.574E-02	609.32	46.090	5.136E-01	BI214
					614.37	90.393	2.656E-01	Ag108M
727.36	52.	38.59	1.64	1.374E-02	727.17	11.800	PBC<MDA	BI212
911.51	459.	8.07	2.57	1.160E-02	911.07	29.000	8.743E-01	AC228
967.83	311.	11.66	3.18	1.109E-02	964.00	14.580	1.242E+00	EU152
					968.90	17.460	1.040E+00	AC228
1121.33	159.	16.06	2.15	9.970E-03	1120.28	15.040	6.850E-01	BI214
1172.92	343.	9.42	2.33	9.639E-03	1173.23	99.860	2.284E-01	CO60
1332.86	292.	9.67	3.39	8.771E-03	1332.51	99.980	2.128E-01	CO60
1461.19	2276.	2.16	3.17	8.189E-03	1460.75	10.700	1.678E+01	K40
1764.51	93.	11.83	3.37	7.084E-03	1764.51	15.920	5.355E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
151.99	76.16	2556.	735.	0.368	31.20	4.406	BI-207	s
417.45	208.91	797.	170.	0.085	83.46	1.202	AC-228	s
477.06	239.14	928.	929.	0.464	17.05	1.297	PB-212	D
589.96	295.17	864.	111.	0.055	116.08	1.701	PB-214	s
598.51	299.45	291.	87.	0.044	89.17	1.341	TH-227	lD
703.76	352.07	978.	295.	0.147	48.33	2.598	PB-214	s
1166.18	583.30	635.	239.	0.119	48.87	2.813	TL-208	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: FSS_Rev_1.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 3 Sigma %	FWHM keV
PB-212	153.89	77.11	2571.	241.	0.121	91.18	1.500D
PB-214	153.89	77.11	2575.	237.	0.118	91.18	1.500D
TH-227	470.72	235.54	2043.	-204.	-0.102	96.54	1.500s
PB-212	477.29	238.83	1717.	846.	0.423	22.73	1.500s
RA-224	481.63	241.00	1180.	445.	0.222	35.54	1.298D
PB-214	591.11	295.74	766.	212.	0.106	57.88	1.500s
AC-228	677.23	338.81	486.	355.	0.177	36.09	3.368s
PB-214	703.71	352.05	485.	466.	0.233	24.08	1.500s
TL-208	1020.91	510.66	320.	71.	0.035	74.89	1.500s
TL-208	1166.33	583.37	309.	325.	0.162	27.89	1.540s
BI-214	1218.66	609.54	297.	576.	0.288	21.46	3.111s
Ag-108M	1224.36	612.39	422.	-85.	-0.042	107.97	1.561s
BI-212	1454.29	727.36	188.	52.	0.026	115.78	1.638s
AC-228	1822.58	911.51	207.	455.	0.227	24.21	2.571s
AC-228	1935.22	967.83	230.	311.	0.156	34.99	3.185s
BI-214	2242.23	1121.33	147.	159.	0.079	48.19	2.148s
CO-60	2345.41	1172.92	184.	339.	0.170	28.25	2.328s
CO-60	2665.31	1332.86	111.	288.	0.144	29.02	3.392s
K-40	2921.99	1461.19	36.	2272.	1.136	6.48	3.174s
BI-214	3528.67	1764.51	8.	93.	0.047	35.48	3.371s

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 pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		3.8544E-02					
			477.56	3.854E-02	%(	2.514E-01 7.43E-02	G
K-40		1.6776E+01					
			1460.75	1.678E+01	*(P	2.271E-01 3.63E-01	G
MN-54		6.1971E-03					
			834.81	6.197E-03	%(P	3.296E-02 9.73E-03	G
CO-57		5.9378E-03					
			122.07	5.938E-03	%(P	3.631E-02 1.09E-02	G K
			136.43	-5.303E-02	% P	2.834E-01 8.52E-02	G
CO-60		2.2060E-01					
			1332.51	2.128E-01	*(P	3.830E-02 2.09E-02	G K
			1173.23	2.284E-01	*(P	4.440E-02 2.18E-02	G K
Sr-85		-1.3549E-02					
			514.00	-1.355E-02	%(	3.720E-02 1.12E-02	G
Kr-85		-3.2231E+02					
			513.99	-3.223E+02	%(P	8.191E+02 2.46E+02	G
Y-88		-7.9610E-04					
			1836.01	-7.961E-04	%(P	1.670E-02 4.07E-03	G K
			898.02	8.465E-03	% P	3.042E-02 8.99E-03	G
NB-94		4.2397E-03					
			871.10	4.240E-03	%(P	2.747E-02 8.03E-03	G K
			702.50	-5.224E-03	% P	3.204E-02 9.46E-03	G K
Ag-108M		-2.8993E-03					
			722.95	-2.899E-03	&(	2.963E-02 8.65E-03	G K
			614.37	-3.876E-02	+	4.506E-02 1.39E-02	G
			433.93	1.202E-05	% P	2.811E-02 8.23E-03	G
CD-109		4.5943E-01					
			88.04	4.594E-01	%(P	9.890E-01 3.00E-01	G
SN-113		-9.9680E-03					
			391.71	-9.968E-03	%(P	4.246E-02 1.26E-02	G K
			255.04	-5.553E-03	%	1.289E+00 3.83E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	-1.7018E-02						
		427.95	-1.702E-02	%(P	9.056E-02	2.69E-02	G K
		600.77	3.127E-02	% P	1.450E-01	4.29E-02	G
		636.15	4.836E-02	& P	2.229E-01	6.59E-02	G
		463.51	1.704E-01	% P	2.455E-01	7.54E-02	G
		176.29	-6.336E-02	% P	4.235E-01	1.27E-01	G
I-131	-7.0237E-04						
		364.48	-7.024E-04	&(	4.199E-02	1.23E-02	G K
		636.97	1.011E-01	&	5.075E-01	1.50E-01	G
		284.29	1.162E-02	%	6.394E-01	1.90E-01	G
CS-134	-2.6683E-02						
		604.66	-2.668E-02	%(P	4.048E-02	1.24E-02	G K
		795.76	2.384E-02	% P	3.567E-02	1.10E-02	G
		569.29	1.751E-02	&	1.675E-01	4.92E-02	G
		801.84	-5.040E-02	% P	3.710E-01	1.09E-01	G
CS-137	2.6066E-02						
		661.62	2.607E-02	%(P	3.876E-02	1.19E-02	G
CE-139	5.5570E-03						
		165.85	5.557E-03	&(P	3.393E-02	1.02E-02	G
EU-152	2.1110E-02						
		121.78	2.111E-02	&(P	1.039E-01	3.13E-02	G K
		344.30	-2.656E-02	% P	1.050E-01	3.15E-02	G
		1408.08	6.082E-02	& P	1.232E-01	3.73E-02	G
		964.00	-7.115E-04	& P	3.701E-01	1.09E-01	G
		1112.07	-1.187E-02	& P	2.809E-01	8.15E-02	G
		778.90	-2.088E-03	% P	1.694E-01	4.81E-02	G
EU-154	2.6606E-03						
		123.10	2.661E-03	%(P	7.287E-02	2.18E-02	G K
		1274.80	-2.637E-02	& P	1.207E-01	3.57E-02	G
		723.30	-7.093E-02	% P	1.890E-01	5.68E-02	G
		1004.80	3.093E-02	% P	1.796E-01	5.27E-02	G
EU-155	4.2997E-02						
		86.45	4.300E-02	%(	1.272E-01	3.84E-02	G K
		105.31	2.614E-02	% P	1.375E-01	4.13E-02	G
HG-203	1.0125E-02						
		279.17	1.013E-02	%(P	3.302E-02	9.92E-03	G K
		72.87	-4.342E-01	% P	9.075E-01	2.75E-01	G
		70.83	4.338E-03	%	1.683E+00	5.05E-01	G
		82.50	-9.539E-01	%	1.817E+00	5.52E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	1.5012E-01						
		583.14	1.501E-01	*(P	3.909E-02	1.42E-02	G
		510.72	1.122E-01	- P	1.369E-01	4.14E-02	G
PB-212	3.9842E-01						
		238.63	3.984E-01	*(P	9.217E-02	3.07E-02	G K
							Energy duplication
		77.11	3.019E-01	-	2.989E-01	9.17E-02	G
		74.81	2.547E-01	% P	5.944E-01	1.80E-01	G
PB-214	3.3539E-01						
		351.99	3.354E-01	*(P	7.577E-02	2.72E-02	G K
		295.22	2.578E-01	- P	1.604E-01	5.08E-02	G
							Energy duplication
		77.11	4.840E-01	+ P	4.892E-01	1.50E-01	G
		241.92	-3.186E-01	& P	6.189E-01	1.88E-01	G
BI-212	2.0869E-01						
		727.17	2.087E-01	*(P	2.660E-01	8.25E-02	G K
		1620.56	1.914E-01	% P	6.942E-01	1.99E-01	G
		785.42	3.276E-01	% P	1.606E+00	4.75E-01	G
BI-214	5.1921E-01						
		609.32	5.136E-01	*(P	7.408E-02	3.70E-02	G K
		1764.51	5.355E-01	*(P	8.975E-02	6.39E-02	G
		1120.28	6.850E-01	+ P	2.558E-01	1.11E-01	G
RA-224	2.3278E+00						
		241.00	2.328E+00	(P	8.522E-01	2.77E-01	G
RA-226	5.1530E-01						
		185.99	5.153E-01	%(	8.963E-01	2.73E-01	G
AC-228	9.3664E-01						
		911.07	8.743E-01	*(P	1.342E-01	7.12E-02	G K
		968.90	1.040E+00	*(P	2.451E-01	1.22E-01	G
		338.40	7.646E-01	- P	2.273E-01	9.29E-02	G
TH-227	-3.6678E-01						
		236.00	-3.668E-01	?(P	3.840E-01	1.18E-01	G K
		256.25	-4.299E-02	& P	3.746E-01	1.11E-01	G
PA-234	-3.8757E-02						
		98.44	-3.876E-02	&(	1.289E-01	3.89E-02	G K
		946.00	-3.312E-02	%	1.573E-01	4.64E-02	G
		131.28	-2.277E-02	%	1.587E-01	4.77E-02	G
		94.67	8.955E-03	%	2.485E-01	7.45E-02	G
		883.24	7.107E-02	&	2.321E-01	6.91E-02	G
		926.70	-5.315E-03	%	3.004E-01	8.71E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 2.586E-02 &   2.474E-01 7.27E-02 G

TH-234       3.8369E-01
                           63.29 3.837E-01 %(P 1.612E+00 4.85E-01 G K
                           92.80 6.851E-01 % P 1.325E+00 4.01E-01 G
                           92.38 6.225E-01 % P 1.583E+00 4.79E-01 G

AM-241      -9.5059E-02
                           59.54-9.506E-02 &(P 2.213E-01 6.70E-02 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

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

***** 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 pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	3.6236E-02	3.8544E-02	2.2295E-01	2.2297E-01	2.363E-01
K-40	#	1.6776E+01	1.6776E+01	1.0894E+00	1.4726E+00	
MN-54	#A	6.1320E-03	6.1971E-03	2.9191E-02	2.9193E-02	3.261E-02
CO-57	#B	5.8657E-03	5.9378E-03	3.2726E-02	3.2727E-02	3.587E-02
CO-60	#	2.2023E-01	2.2060E-01	4.5235E-02	4.7074E-02	

Sr-85	#A	-1.2878E-02	-1.3549E-02	3.3625E-02	3.3635E-02	3.535E-02
Kr-85	#A	-3.2230E+02	-3.2231E+02	8.6204E+02	8.6225E+02	8.190E+02
Y-88	#B	-7.7185E-04	-7.9610E-04	1.9885E-02	1.9885E-02	1.619E-02
NB-94	#B	4.2397E-03	4.2397E-03	2.4102E-02	2.4103E-02	2.747E-02
Ag-108M	#B	-2.8991E-03	-2.8993E-03	2.5956E-02	2.5956E-02	2.962E-02
CD-109	#A	4.5610E-01	4.5943E-01	8.9962E-01	8.9998E-01	9.819E-01
SN-113	#B	-9.6865E-03	-9.9680E-03	4.4936E-02	4.4940E-02	4.126E-02
SB-125	#B	-1.6963E-02	-1.7018E-02	9.5935E-02	9.5941E-02	9.026E-02
I-131	#B	-4.6607E-04	-7.0237E-04	3.7021E-02	3.7021E-02	2.787E-02
CS-134	#B	-2.6567E-02	-2.6683E-02	3.7785E-02	3.7818E-02	4.030E-02
CS-137	#A	2.6058E-02	2.6066E-02	3.5630E-02	3.5663E-02	3.875E-02
CE-139	#A	5.4253E-03	5.5570E-03	3.0526E-02	3.0528E-02	3.313E-02
EU-152	#B	2.1095E-02	2.1110E-02	9.3766E-02	9.3774E-02	1.039E-01
EU-154	#B	2.6578E-03	2.6606E-03	6.5374E-02	6.5374E-02	7.279E-02
EU-155	#B	4.2919E-02	4.2997E-02	1.1531E-01	1.1533E-01	1.269E-01
HG-203	#B	9.4333E-03	1.0125E-02	2.9774E-02	2.9780E-02	3.077E-02
TL-208	#	1.5012E-01	1.5012E-01	4.2451E-02	4.3367E-02	3.909E-02
PB-212	#	3.9842E-01	3.9842E-01	9.2226E-02	9.5180E-02	9.217E-02
PB-214	#	3.3539E-01	3.3539E-01	8.1637E-02	8.4005E-02	7.577E-02
BI-212	#A	2.0869E-01	2.0869E-01	2.4757E-01	2.4787E-01	2.660E-01
BI-214	#	5.1921E-01	5.1921E-01	1.0863E-01	1.1287E-01	
RA-224		2.3278E+00	2.3278E+00	8.3136E-01	8.4265E-01	
RA-226	#A	5.1529E-01	5.1530E-01	8.1818E-01	8.1875E-01	8.963E-01
AC-228	#	9.3664E-01	9.3664E-01	2.0086E-01	2.0834E-01	
TH-227	#A	-3.6678E-01	-3.6678E-01	3.5455E-01	3.5521E-01	3.840E-01
PA-234	#B	-3.8757E-02	-3.8757E-02	1.1662E-01	1.1664E-01	1.289E-01
TH-234	#B	3.8369E-01	3.8369E-01	1.4537E+00	1.4538E+00	1.612E+00
AM-241	#A	-9.5057E-02	-9.5059E-02	2.0409E-01	2.0415E-01	2.213E-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 (294.7 to 2000.1 keV) 2.0779703E+01 pCi/gm
Total Decayed Activity (294.7 to 2000.1 keV) 2.0780081E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JJM

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab