Sample description
OOL-11-01-002-F-S WET

Spectrum Filename: C:\GammaVision\Spectra\101F_18APRIL2006_0849.An1

Acquisition information

Start time:	18-Apr-2006 08:50:58
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:	1.8130E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.8130E+03) = 5.5157E+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	17-Apr-2006 21:37:00
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. 17 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.5001

***** 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
74.54	210.	15.11	1.00	1.651E-02				
74.54	210.	15.11	1.00	1.651E-02	74.81	9.600	9.590E-01	PB212
77.06	308.	9.68	1.01	1.724E-02	77.11	10.700	1.232E+00	PB214
					77.11	17.500	7.623E-01	PB212
89.96	78.	34.34	1.02	1.957E-02				
93.01	96.	28.42	1.02	1.991E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
185.99	127.	24.86	1.32	1.858E-02				
185.99	127.	24.86	1.32	1.858E-02	185.99	3.280	1.553E+00	RA226
208.60	85.	30.69	1.21	1.726E-02				
238.53	689.	4.40	1.12	1.559E-02				
238.53	689.	4.40	1.12	1.559E-02	238.63	43.100	7.577E-01	PB212
241.61	93.	21.67	1.12	1.542E-02	241.00	3.900	1.138E+00	RA224
270.30	71.	32.14	1.27	1.400E-02				
294.91	150.	15.38	1.17	1.293E-02				
294.91	150.	15.38	1.17	1.293E-02	295.22	19.200	4.454E-01	PB214
299.88	56.	36.93	1.24	1.273E-02				
338.11	108.	20.45	0.89	1.136E-02	338.40	12.010	5.764E-01	AC228
351.78	269.	10.71	1.36	1.093E-02				
351.78	269.	10.71	1.36	1.093E-02	351.99	37.100	4.918E-01	PB214
408.91	50.	40.79	0.98	9.433E-03				
462.74	64.	28.56	0.80	8.355E-03				
510.34	102.	19.41	0.81	7.596E-03	510.72	22.500	3.743E-01	TL208
582.70	207.	10.46	1.39	6.689E-03	583.14	86.000	2.656E-01	TL208
608.84	181.	11.53	1.16	6.417E-03	609.32	46.090	4.532E-01	BI214
661.58	120.	18.27	1.14	5.938E-03	661.62	84.620	1.770E-01	CS137
727.36	50.	23.65	1.03	5.442E-03	723.30	19.700	3.448E-01	EU154

					727.17	11.800	5.747E-01	BI212
794.15	21.	37.97	1.50	5.016E-03	795.76	85.400	PBC<MDA	CS134
859.98	39.	31.32	1.00	4.680E-03				
910.42	126.	13.43	1.57	4.449E-03	911.07	29.000	7.158E-01	AC228
967.81	78.	21.31	1.16	4.216E-03	968.90	17.460	7.883E-01	AC228
1119.07	37.	27.08	1.71	3.711E-03	1120.28	15.040	4.985E-01	BI214
1172.33	37.	27.88	1.75	3.565E-03	1173.23	99.860	7.692E-02	CO60
1331.45	34.	22.76	1.85	3.190E-03	1332.51	99.980	7.942E-02	CO60
1459.59	567.	4.36	1.93	2.945E-03	1460.75	10.700	1.338E+01	K40
1762.89	27.	19.25	2.00	2.481E-03	1764.51	15.920	5.012E-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	
148.64	74.72	396.	210.	0.105	45.33	1.005	BI-207	D
153.70	77.24	291.	308.	0.154	29.05	1.006	PB-214	D
179.50	89.92	323.	78.	0.039	103.02	1.016	PB-214	lD
416.88	208.60	251.	85.	0.043	92.06	1.213	LU-177	
476.76	238.43	114.	688.	0.344	13.19	1.121	PB-212	D
540.32	270.30	186.	71.	0.035	96.41	1.273	AC-228	
599.50	299.88	152.	56.	0.028	100.71	1.237	TH-227	
817.66	408.91	122.	50.	0.025	122.38	0.983	CS-138	
925.39	462.74	100.	54.	0.027	87.83	0.797	CS-138	s
1720.25	859.98	38.	39.	0.020	93.96	0.996	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	148.94	74.68	837.	194.	0.097	65.05	1.499
PB-214	153.79	77.11	856.	241.	0.121	54.06	1.499D
PB-212	153.79	77.11	852.	245.	0.123	54.06	1.499D
TH-234	185.62	93.02	821.	106.	0.053	106.63	1.499s
TH-234	185.65	93.04	814.	109.	0.054	108.72	1.499s
RA-226	371.64	185.99	394.	128.	0.064	71.01	1.499D
PB-212	476.72	238.51	304.	602.	0.301	17.11	1.499
RA-224	481.70	241.00	282.	90.	0.045	84.09	1.123D
PB-214	589.93	295.09	180.	130.	0.065	50.40	1.499s
AC-228	676.00	338.11	142.	105.	0.053	61.34	0.892
PB-214	703.31	351.76	126.	218.	0.109	29.46	1.499
TL-208	1020.63	510.34	106.	86.	0.043	58.23	0.812s
TL-208	1165.41	582.70	75.	205.	0.102	31.37	1.387s
BI-214	1217.72	608.84	80.	180.	0.090	34.58	1.163
CS-137	1323.25	661.58	94.	119.	0.060	54.80	1.144s
BI-212	1454.88	727.36	38.	50.	0.025	70.94	1.031s
CS-134	1588.53	794.15	22.	21.	0.010	113.92	1.502s
AC-228	1821.20	910.42	50.	124.	0.062	40.30	1.571
AC-228	1936.04	967.81	58.	78.	0.039	63.92	1.163
BI-214	2238.72	1119.07	34.	37.	0.019	81.25	1.713s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
CO-60	2345.31	1172.33	35.	37.	0.018	83.63	1.746s
CO-60	2663.74	1331.45	13.	34.	0.017	68.28	1.846
K-40	2920.19	1459.59	11.	565.	0.283	13.09	1.927
BI-214	3527.21	1762.89	0.	27.	0.013	57.74	1.999

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		5.4561E-02					
			477.56	5.456E-02	%(	3.596E-01 1.04E-01	G
K-40		1.3379E+01					
			1460.75	1.338E+01	(P	4.281E-01 5.86E-01	G
MN-54		1.2488E-02					
			834.81	1.249E-02	&(P	4.670E-02 1.36E-02	G
CO-57		3.8040E-04					
			122.07	3.804E-04	%(	4.617E-02 1.37E-02	G K
			136.43	-6.168E-04	%	3.502E-01 1.04E-01	G
CO-60		7.8175E-02					
			1332.51	7.942E-02	(P	4.578E-02 1.81E-02	G K
			1173.23	7.692E-02	*(P	6.305E-02 2.15E-02	G K
Sr-85		-1.7076E-02					
			514.00	-1.708E-02	%(	5.774E-02 1.72E-02	G
Kr-85		-4.1943E+02					
			513.99	-4.194E+02	%(P	1.332E+03 3.95E+02	G
Y-88		0.0000E+00					
			1836.01	0.000E+00	%(	2.319E-02 3.15E-03	G K
			898.02	2.036E-02	% P	5.104E-02 1.52E-02	G
NB-94		-7.0641E-03					
			871.10	-7.064E-03	&(P	5.367E-02 1.53E-02	G K
			702.50	-6.627E-03	% P	4.294E-02 1.23E-02	G K
Ag-108M		-3.3575E-02					
			722.95	-3.357E-02	%(	7.349E-02 2.22E-02	G K
			614.37	5.445E-03	& P	4.193E-02 1.20E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		433.93	2.276E-02	%	3.981E-02	1.22E-02	G
CD-109	-1.9394E-01						
		88.04	-1.939E-01	%(P	1.517E+00	4.54E-01	G
SN-113	1.2601E-03						
		391.71	1.260E-03	%(	6.449E-02	1.86E-02	G K
		255.04	-6.277E-02	% P	1.823E+00	5.34E-01	G
SB-125	-1.4810E-02						
		427.95	-1.481E-02	%(P	1.329E-01	3.85E-02	G K
		600.77	-4.364E-02	% P	2.590E-01	7.51E-02	G
		636.15	-3.072E-03	% P	3.735E-01	1.04E-01	G
		463.51	7.291E-02	% P	4.575E-01	1.34E-01	G
		176.29	8.306E-02	% P	6.282E-01	1.87E-01	G
I-131	2.3372E-03						
		364.48	2.337E-03	%(	4.747E-02	1.37E-02	G K
		636.97	-3.046E-02	%	5.463E-01	1.53E-01	G
		284.29	-8.896E-02	%	6.753E-01	1.99E-01	G
CS-134	1.9315E-02						
		604.66	4.583E-03	%(P	4.640E-02	1.33E-02	G K
		795.76	3.615E-02	*(P	4.292E-02	1.40E-02	G
		569.29	2.744E-02	& P	3.081E-01	8.87E-02	G
		801.84	7.999E-02	%	4.542E-01	1.29E-01	G
CS-137	1.7701E-01						
		661.62	1.770E-01	@(P	7.094E-02	3.26E-02	G
CE-139	-2.1116E-02						
		165.85	-2.112E-02	%(P	5.078E-02	1.53E-02	G
EU-152	1.3823E-03						
		121.78	1.382E-03	%(P	1.431E-01	4.24E-02	G K
		344.30	-2.525E-02	% P	1.447E-01	4.24E-02	G
		1408.08	1.072E-01	% P	2.236E-01	6.80E-02	G
		964.00	1.776E-02	& P	5.901E-01	1.70E-01	G
		1112.07	-7.030E-02	& P	5.017E-01	1.44E-01	G
		778.90	-1.037E-02	& P	3.275E-01	9.06E-02	G
EU-154	1.2258E-02						
		123.10	1.226E-02	&(P	1.028E-01	3.06E-02	G K
		1274.80	4.638E-02	& P	1.456E-01	4.26E-02	G
		723.30	-3.437E-02	% P	2.785E-01	8.00E-02	G
		1004.80	1.062E-01	% P	2.814E-01	8.37E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	2.5387E-03						
		86.45	2.539E-03	%(	1.843E-01	5.50E-02	G K
		105.31	3.755E-02	%	1.944E-01	5.82E-02	G
HG-203	-4.4125E-03						
		279.17	-4.413E-03	&(	5.026E-02	1.48E-02	G K
		72.87	-2.370E-01	% P	1.078E+00	3.23E-01	G
		70.83	4.829E-01	%	1.734E+00	5.21E-01	G
		82.50	1.936E-02	%	2.638E+00	7.86E-01	G
TL-208	2.6557E-01						
		583.14	2.656E-01	*(P	5.590E-02	2.81E-02	G
		510.72	3.743E-01	+ P	2.214E-01	8.62E-02	G
PB-212	6.5055E-01						
		238.63	6.684E-01	(P	9.318E-02	3.85E-02	G K
							Energy duplication
		77.11	6.067E-01	(	3.435E-01	1.09E-01	G
		74.81	9.097E-01	& P	6.456E-01	2.03E-01	G
PB-214	3.9776E-01						
		351.99	4.017E-01	(P	1.012E-01	3.98E-02	G K
		295.22	3.901E-01	@(P	1.962E-01	6.64E-02	G
							Energy duplication
		77.11	9.772E-01	+ P	5.631E-01	1.79E-01	G
		241.92	-6.537E-02	% P	6.606E-01	1.96E-01	G
BI-212	5.7472E-01						
		727.17	5.747E-01	*(P	3.669E-01	1.38E-01	G K
		1620.56	0.000E+00	%	7.449E-01	1.01E-01	G
		785.42	5.560E-01	% P	2.177E+00	6.32E-01	G
BI-214	4.7194E-01						
		609.32	4.532E-01	(P	1.121E-01	5.25E-02	G K
		1764.51	5.012E-01	(P	1.391E-01	9.80E-02	G
		1120.28	4.985E-01	&(P	3.974E-01	1.36E-01	G
RA-224	1.1188E+00						
		241.00	1.119E+00	(P	1.001E+00	3.16E-01	G
RA-226	1.5632E+00						
							Energy duplication
		185.99	1.563E+00	*(	1.164E+00	3.70E-01	G
AC-228	7.0883E-01						
		911.07	7.158E-01	(P	2.065E-01	9.75E-02	G K
		968.90	7.883E-01	(P	3.878E-01	1.69E-01	G
		338.40	5.764E-01	(P	3.180E-01	1.20E-01	G

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

TH-227      -4.8132E-05
                          236.00-4.813E-05 %(P 4.319E-01 1.28E-01 G K
                          256.25 7.210E-02 & P 5.506E-01 1.62E-01 G

PA-234       8.6609E-04
                           98.44 8.661E-04 %(  1.833E-01 5.44E-02 G K
                          946.00 1.462E-01 %   2.431E-01 7.56E-02 G
                          131.28 8.669E-02 &   1.830E-01 5.55E-02 G
                           94.67-5.621E-02 &   3.346E-01 1.00E-01 G
                          883.24-7.464E-02 %   4.314E-01 1.24E-01 G
                          926.70 0.000E+00 &   5.503E-01 1.54E-01 G
                          569.26 4.344E-02 &   4.559E-01 1.31E-01 G

TH-234       9.7912E-01
                           63.29 3.092E-01 &(P 2.120E+00 6.31E-01 G K
                           92.80 1.356E+00  (P 1.694E+00 5.20E-01 G
                           92.38 1.555E+00  (P 1.991E+00 6.09E-01 G

AM-241      -8.4838E-02
                           59.54-8.484E-02 %(P 2.576E-01 7.74E-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
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R - Coincidence Corrected C - Coincidence Peak
H - Halflife limit exceeded

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

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	5.4230E-02	5.4561E-02	3.1236E-01	3.1238E-01	3.574E-01
K-40		1.3379E+01	1.3379E+01	1.7584E+00	1.9140E+00	
MN-54	#A	1.2475E-02	1.2488E-02	4.0772E-02	4.0778E-02	4.666E-02
CO-57	#B	3.7995E-04	3.8040E-04	4.1038E-02	4.1038E-02	4.612E-02
CO-60	#	7.8162E-02	7.8175E-02	4.2347E-02	4.2577E-02	4.577E-02
Sr-85	#A	-1.6990E-02	-1.7076E-02	5.1611E-02	5.1620E-02	5.745E-02
Kr-85	#A	-4.1943E+02	-4.1943E+02	1.3490E+03	1.3492E+03	1.332E+03
Y-88	#B	0.0000E+00	0.0000E+00	9.4392E-03	9.4409E-03	2.312E-02
NB-94	#B	-7.0641E-03	-7.0641E-03	4.8795E-02	4.8797E-02	5.367E-02
Ag-108M	#B	-3.3575E-02	-3.3575E-02	6.6695E-02	6.6722E-02	7.349E-02
CD-109	#A	-1.9380E-01	-1.9394E-01	1.4308E+00	1.4308E+00	1.516E+00
SN-113	#B	1.2566E-03	1.2601E-03	5.5916E-02	5.5916E-02	6.431E-02
SB-125	#B	-1.4805E-02	-1.4810E-02	1.3059E-01	1.3059E-01	1.329E-01
I-131	#B	2.2448E-03	2.3372E-03	4.1221E-02	4.1221E-02	4.560E-02
CS-134	#B	1.9306E-02	1.9315E-02	2.2445E-02	2.2471E-02	4.638E-02
CS-137	#	1.7701E-01	1.7701E-01	9.7726E-02	9.8236E-02	
CE-139	#A	-2.1066E-02	-2.1116E-02	4.6714E-02	4.6730E-02	5.066E-02
EU-152	#B	1.3822E-03	1.3823E-03	1.2734E-01	1.2734E-01	1.431E-01
EU-154	#B	1.2257E-02	1.2258E-02	9.1933E-02	9.1936E-02	1.028E-01
EU-155	#B	2.5382E-03	2.5387E-03	1.6492E-01	1.6492E-01	1.842E-01
HG-203	#B	-4.3819E-03	-4.4125E-03	4.4393E-02	4.4393E-02	4.991E-02
TL-208	#	2.6557E-01	2.6557E-01	8.4264E-02	8.5590E-02	
PB-212	#	6.5055E-01	6.5055E-01	1.1246E-01	1.1832E-01	9.318E-02
PB-214	#	3.9776E-01	3.9776E-01	1.1756E-01	1.1969E-01	1.012E-01
BI-212	#	5.7472E-01	5.7472E-01	4.1330E-01	4.1457E-01	
BI-214		4.7194E-01	4.7194E-01	1.6419E-01	1.6634E-01	
RA-224		1.1188E+00	1.1188E+00	9.4827E-01	9.5038E-01	
RA-226	#	1.5632E+00	1.5632E+00	1.1100E+00	1.1135E+00	1.164E+00
AC-228		7.0883E-01	7.0883E-01	2.3336E-01	2.3677E-01	
TH-227	#B	-4.8132E-05	-4.8132E-05	4.0317E-01	4.0317E-01	4.319E-01
PA-234	#B	8.6609E-04	8.6609E-04	1.6329E-01	1.6329E-01	1.833E-01
TH-234	#B	9.7912E-01	9.7912E-01	1.1250E+00	1.1263E+00	2.120E+00
AM-241	#A	-8.4838E-02	-8.4838E-02	2.4430E-01	2.4435E-01	2.576E-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_18APRIL2006_0849.An1

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

Total Activity (270.1 to 1999.1 keV) 1.6695662E+01 pCi/gm
Total Decayed Activity (270.1 to 1999.1 keV) 1.6695667E+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_18APRIL2006_0935.An1

Sample description
OOL-11-01-007-F-S WET

Spectrum Filename: C:\GammaVision\Spectra\101F_18APRIL2006_0935.An1

Acquisition information
Start time: 18-Apr-2006 09:35:58
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: 1.5950E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.5950E+03) =
6.2696E+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	17-Apr-2006 21:16:00
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: 0.4413

***** 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	133.	29.96	1.50	1.654E-02	72.87	6.400	PBC<MDA	HG203
					74.81	9.600	PBC<MDA	PB212
76.97	230.	17.08	1.50	1.720E-02	77.11	10.700	1.057E+00	PB214
					77.11	17.500	6.463E-01	PB212
76.97	233.	17.08	1.50	1.720E-02	77.11	10.700	1.057E+00	PB214
					77.11	17.500	6.568E-01	PB212
86.95	87.	34.67	1.06	1.917E-02	86.45	32.740	1.182E-01	EU155
					88.04	3.790	PBC<MDA	CD109
92.50	99.	31.04	1.19	1.986E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
185.88	118.	18.95	1.07	1.859E-02	185.99	3.280	1.635E+00	RA226
209.21	46.	37.81	1.31	1.722E-02				
238.61	444.	5.81	1.12	1.558E-02				
238.61	444.	5.81	1.12	1.558E-02	238.63	43.100	5.528E-01	PB212
241.49	116.	15.73	1.12	1.543E-02	241.00	3.900	1.615E+00	RA224
295.19	172.	10.35	1.32	1.292E-02				
295.19	172.	10.35	1.32	1.292E-02	295.22	19.200	5.814E-01	PB214
337.83	120.	16.57	1.02	1.137E-02	338.40	12.010	7.323E-01	AC228
351.77	273.	7.95	1.25	1.093E-02				
351.77	273.	7.95	1.25	1.093E-02	351.99	37.100	5.663E-01	PB214
510.20	91.	14.38	1.42	7.598E-03	510.72	22.500	3.699E-01	TL208
582.67	136.	13.19	1.27	6.690E-03	583.14	86.000	1.962E-01	TL208
608.70	198.	8.42	1.42	6.419E-03	609.32	46.090	5.633E-01	BI214
726.51	35.	26.84	1.29	5.447E-03	727.17	11.800	4.554E-01	BI212
910.37	88.	15.79	1.54	4.450E-03	911.07	29.000	5.659E-01	AC228
966.82	90.	15.83	1.66	4.220E-03	968.90	17.460	1.026E+00	AC228
1119.41	46.	21.01	0.91	3.711E-03	1120.28	15.040	7.046E-01	BI214

1459.68	409.	5.15	2.07	2.944E-03	1460.75	10.700	1.093E+01	K40
1763.57	13.	40.23	2.11	2.481E-03	1764.51	15.920	PBC<MDA	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
418.09	209.21	135.	46.	0.023	113.43	1.309	AC-228	
476.93	238.54	111.	444.	0.222	17.44	1.121	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	149.17	74.80	793.	133.	0.066	89.87	1.499s
PB-214	153.79	77.11	682.	230.	0.115	51.25	1.499D
PB-212	153.79	77.11	678.	233.	0.117	51.25	1.499D
EU-155	173.62	87.02	591.	100.	0.050	107.70	1.499
CD-109	173.60	87.01	516.	99.	0.049	101.51	1.499
TH-234	185.38	92.90	566.	85.	0.043	113.93	1.499s
RA-226	371.42	185.88	180.	118.	0.059	56.84	1.070s
PB-212	476.87	238.59	245.	360.	0.180	23.79	1.499
RA-224	481.70	241.00	231.	92.	0.046	76.24	1.123D
PB-214	590.07	295.16	90.	169.	0.084	32.77	1.499
AC-228	675.45	337.83	104.	118.	0.059	49.71	1.019s
PB-214	703.34	351.77	41.	261.	0.131	21.09	1.499
TL-208	1020.34	510.20	46.	75.	0.037	43.13	1.418s
TL-208	1165.35	582.67	55.	133.	0.067	39.56	1.269
BI-214	1217.43	608.70	32.	196.	0.098	25.25	1.419
BI-212	1453.18	726.51	21.	35.	0.017	80.53	1.292
AC-228	1821.09	910.37	32.	86.	0.043	47.36	1.536
AC-228	1936.96	968.27	41.	42.	0.021	78.03	1.616s
BI-214	2239.40	1119.41	20.	46.	0.023	63.04	0.911s
K-40	2920.37	1459.68	10.	406.	0.203	15.46	2.067s
BI-214	3528.58	1763.57	8.	13.	0.006	120.70	2.106s

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		1.0589E-01					
			477.56	1.059E-01	%(	3.893E-01 1.15E-01	G
K-40		1.0934E+01					
			1460.75	1.093E+01	@(P	4.631E-01 5.66E-01	G
MN-54		1.6890E-02					
			834.81	1.689E-02	%(P	4.463E-02 1.32E-02	G
CO-57		-4.6299E-03					
			122.07	-4.630E-03	%(	4.721E-02 1.40E-02	G K
			136.43	-6.804E-02	%	3.929E-01 1.17E-01	G
CO-60		-2.3025E-04					
			1332.51	-2.303E-04	%(P	8.159E-02 2.25E-02	G K
			1173.23	-3.571E-04	% P	7.674E-02 2.13E-02	G K
Sr-85		-2.1134E-02					
			514.00	-2.113E-02	%(	5.726E-02 1.72E-02	G
Kr-85		-5.1592E+02					
			513.99	-5.159E+02	%(P	1.322E+03 3.94E+02	G
Y-88		3.9709E-03					
			1836.01	3.971E-03	%(	3.267E-02 7.93E-03	G K
			898.02	2.122E-02	% P	5.077E-02 1.52E-02	G
NB-94		4.7577E-04					
			871.10	4.758E-04	&(P	5.662E-02 1.57E-02	G K
			702.50	-6.705E-03	& P	5.739E-02 1.65E-02	G K
Ag-108M		-1.6488E-02					
			722.95	-1.649E-02	%(	6.505E-02 1.91E-02	G K
			614.37	1.048E-02	% P	4.022E-02 1.17E-02	G
			433.93	-5.683E-04	%	3.748E-02 1.05E-02	G
CD-109		1.1446E+00					
			88.04	1.145E+00	&(P	1.257E+00 3.89E-01	G
SN-113		0.0000E+00					
			391.71	0.000E+00	%(	6.883E-02 1.98E-02	G K
			255.04	5.786E-01	& P	1.629E+00 4.88E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	-7.7922E-03						
		427.95	-7.792E-03	%(P	1.469E-01	4.21E-02	G K
		600.77	6.589E-04	% P	1.451E-01	3.81E-02	G
		636.15	-7.544E-03	& P	3.461E-01	9.47E-02	G
		463.51	-2.551E-02	% P	4.547E-01	1.29E-01	G
		176.29	-1.345E-01	% P	5.924E-01	1.76E-01	G
I-131	1.0905E-02						
		364.48	1.090E-02	%(	4.010E-02	1.18E-02	G K
		636.97	9.980E-04	%	5.650E-01	1.55E-01	G
		284.29	-6.851E-03	%	6.339E-01	1.84E-01	G
CS-134	5.9988E-04						
		604.66	5.999E-04	&(P	1.515E-01	4.49E-02	G K
		795.76	7.988E-03	% P	6.214E-02	1.76E-02	G
		569.29	6.181E-02	& P	2.184E-01	6.35E-02	G
		801.84	-3.558E-02	&	5.876E-01	1.64E-01	G
CS-137	-1.4909E-03						
		661.62	-1.491E-03	%(P	6.734E-02	1.89E-02	G
CE-139	5.6916E-03						
		165.85	5.692E-03	&(P	4.840E-02	1.43E-02	G
EU-152	-1.8359E-02						
		121.78	-1.836E-02	%(P	1.436E-01	4.27E-02	G K
		344.30	3.128E-02	& P	1.231E-01	3.62E-02	G
		1408.08	6.401E-02	% P	2.190E-01	6.25E-02	G
		964.00	2.271E-02	& P	4.861E-01	1.37E-01	G
		1112.07	1.596E-01	% P	3.406E-01	1.03E-01	G
		778.90	-1.973E-03	& P	3.770E-01	1.04E-01	G
EU-154	8.6337E-03						
		123.10	8.634E-03	&(P	9.858E-02	2.92E-02	G K
		1274.80	-1.600E-04	& P	2.336E-01	6.49E-02	G
		723.30	-6.336E-02	% P	2.643E-01	7.66E-02	G
		1004.80	4.691E-02	% P	2.972E-01	8.38E-02	G
EU-155	1.3517E-01						
		86.45	1.352E-01	(	1.572E-01	4.85E-02	G K
		105.31	3.541E-02	&	1.965E-01	5.87E-02	G
HG-203	6.8290E-03						
		279.17	6.829E-03	&(	4.659E-02	1.37E-02	G K
		72.87	-1.385E-01	% P	1.250E+00	3.73E-01	G
		70.83	-4.103E-01	&	2.106E+00	6.31E-01	G
		82.50	-6.821E-01	%	2.390E+00	7.18E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	1.9620E-01						
		583.14	1.962E-01	(P	5.487E-02	2.63E-02	G
		510.72	3.699E-01	+ P	1.710E-01	6.45E-02	G
PB-212	4.5494E-01						
		238.63	4.549E-01	(P	9.557E-02	3.67E-02	G K
							Energy duplication
		77.11	6.568E-01	+	3.492E-01	1.12E-01	G
		74.81	7.092E-01	& P	7.145E-01	2.21E-01	G
PB-214	5.5612E-01						
		351.99	5.457E-01	(P	6.835E-02	3.87E-02	G K
		295.22	5.762E-01	(P	1.602E-01	6.36E-02	G
							Energy duplication
		77.11	1.057E+00	+ P	5.726E-01	1.84E-01	G
		241.92	-2.013E-01	% P	6.764E-01	2.03E-01	G
BI-212	4.5540E-01						
		727.17	4.554E-01	(P	3.206E-01	1.25E-01	G K
		1620.56	0.000E+00	%	1.826E+00	4.60E-01	G
		785.42	-2.921E-01	% P	2.518E+00	7.09E-01	G
BI-214	5.6326E-01						
		609.32	5.633E-01	(P	8.275E-02	4.76E-02	G K
		1764.51	2.767E-01	- P	3.438E-01	1.15E-01	G
		1120.28	7.046E-01	+ P	3.542E-01	1.49E-01	G
RA-224	1.2916E+00						
		241.00	1.292E+00	(P	1.034E+00	3.31E-01	G
RA-226	1.6347E+00						
		185.99	1.635E+00	(	9.077E-01	3.10E-01	G
AC-228	5.7546E-01						
		911.07	5.659E-01	(P	1.906E-01	9.12E-02	G K
		968.90	4.834E-01	&(P	3.750E-01	1.28E-01	G
		338.40	7.323E-01	(P	3.125E-01	1.23E-01	G
TH-227	-1.5157E-01						
		236.00	-1.516E-01	%(P	4.469E-01	1.34E-01	G K
		256.25	-4.287E-02	& P	4.271E-01	1.23E-01	G
PA-234	5.2861E-03						
		98.44	5.286E-03	&(	1.884E-01	5.59E-02	G K
		946.00	7.533E-03	&	2.188E-01	5.89E-02	G
		131.28	3.153E-02	&	2.056E-01	6.13E-02	G
		94.67	-1.190E-01	%	3.314E-01	1.00E-01	G
		883.24	1.987E-01	%	3.602E-01	1.11E-01	G
		926.70	-1.892E-02	%	3.689E-01	9.92E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 9.705E-02 &   3.216E-01 9.42E-02 G

TH-234       8.3197E-01
                           63.29 5.387E-01 %(P 2.092E+00 6.25E-01 G K
                           92.80 1.213E+00 *(P 1.612E+00 4.94E-01 G
                           92.38 9.598E-01 % P 1.945E+00 5.88E-01 G

AM-241      -2.4254E-03
                           59.54-2.425E-03 %(P 3.092E-01 9.15E-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

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

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	1.0518E-01	1.0589E-01	3.4369E-01	3.4374E-01	3.867E-01
K-40	#	1.0934E+01	1.0934E+01	1.6999E+00	1.8087E+00	
MN-54	#A	1.6871E-02	1.6890E-02	3.9658E-02	3.9669E-02	4.458E-02
CO-57	#B	-4.6238E-03	-4.6299E-03	4.2062E-02	4.2063E-02	4.715E-02
CO-60	#B	-2.3021E-04	-2.3025E-04	1.1725E-02	1.1725E-02	8.157E-02

Sr-85	#A	-2.1018E-02	-2.1134E-02	5.1472E-02	5.1486E-02	5.695E-02
Kr-85	#A	-5.1592E+02	-5.1592E+02	1.3314E+03	1.3318E+03	1.322E+03
Y-88	#B	3.9576E-03	3.9709E-03	2.3776E-02	2.3777E-02	3.256E-02
NB-94	#B	4.7577E-04	4.7577E-04	4.7074E-02	4.7074E-02	5.662E-02
Ag-108M	#B	-1.6488E-02	-1.6488E-02	5.7267E-02	5.7275E-02	6.505E-02
CD-109	#A	1.1437E+00	1.1446E+00	1.1674E+00	1.1692E+00	1.256E+00
SN-113	#B	0.0000E+00	0.0000E+00	5.9345E-02	5.9345E-02	6.862E-02
SB-125	#B	-7.7895E-03	-7.7922E-03	1.6514E-01	1.6514E-01	1.468E-01
I-131	#B	1.0432E-02	1.0905E-02	3.5422E-02	3.5427E-02	3.836E-02
CS-134	#B	5.9959E-04	5.9988E-04	1.3459E-01	1.3459E-01	1.514E-01
CS-137	#A	-1.4908E-03	-1.4909E-03	1.0034E-01	1.0034E-01	6.733E-02
CE-139	#A	5.6769E-03	5.6916E-03	4.3048E-02	4.3049E-02	4.827E-02
EU-152	#B	-1.8358E-02	-1.8359E-02	1.4401E-01	1.4402E-01	1.436E-01
EU-154	#B	8.6327E-03	8.6337E-03	8.7698E-02	8.7699E-02	9.856E-02
EU-155	#A	1.3514E-01	1.3517E-01	1.4558E-01	1.4578E-01	1.572E-01
HG-203	#B	6.7770E-03	6.8290E-03	4.1096E-02	4.1098E-02	4.623E-02
TL-208		1.9620E-01	1.9620E-01	7.9000E-02	7.9774E-02	
PB-212	#	4.5494E-01	4.5494E-01	1.1008E-01	1.1304E-01	9.557E-02
PB-214	#	5.5612E-01	5.5612E-01	1.0940E-01	1.1383E-01	6.835E-02
BI-212		4.5540E-01	4.5540E-01	3.7393E-01	3.7481E-01	
BI-214		5.6326E-01	5.6326E-01	1.4303E-01	1.4653E-01	
RA-224		1.2916E+00	1.2916E+00	9.9242E-01	9.9510E-01	
RA-226	#	1.6347E+00	1.6347E+00	9.2914E-01	9.3372E-01	
AC-228		5.7546E-01	5.7546E-01	2.0304E-01	2.0563E-01	
TH-227	#B	-1.5157E-01	-1.5157E-01	4.1419E-01	4.1428E-01	4.469E-01
PA-234	#B	5.2861E-03	5.2861E-03	1.6767E-01	1.6767E-01	1.884E-01
TH-234	#B	8.3197E-01	8.3197E-01	1.0164E+00	1.0175E+00	2.092E+00
AM-241	#A	-2.4253E-03	-2.4254E-03	4.8753E-01	4.8753E-01	3.092E-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 (295.1 to 1999.1 keV) 1.5650681E+01 pCi/gm
Total Decayed Activity (295.1 to 1999.1 keV) 1.5650683E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

Sample description
OOL-11-01-011-F-S WET

Spectrum Filename: C:\GammaVision\Spectra\101F_18APRIL_2006_1019.An1

Acquisition information
Start time: 18-Apr-2006 10:20:17
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: 1.7710E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.7710E+03) =
5.6465E+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	17-Apr-2006 20:50:00
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. 17 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.4104

***** 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
74.64	200.	15.33	1.00	1.651E-02				
74.64	200.	15.33	1.00	1.651E-02	74.81	9.600	9.351E-01	PB212
74.77	182.	23.15	1.50	1.654E-02				
74.77	182.	23.15	1.50	1.654E-02	74.81	9.600	8.769E-01	PB212
76.93	247.	17.29	1.50	1.720E-02	77.11	10.700	1.009E+00	PB214
					77.11	17.500	6.264E-01	PB212
77.04	303.	10.05	1.01	1.720E-02	77.11	10.700	1.254E+00	PB214
					77.11	17.500	7.667E-01	PB212
87.15	84.	40.15	0.83	1.920E-02	86.45	32.740	1.030E-01	EU155
92.72	101.	32.24	1.50	2.008E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
					94.67	15.500	2.472E-01	PA234
92.76	88.	39.40	1.50	1.989E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
					94.67	15.500	PBC<MDA	PA234
92.77	85.	38.87	1.50	1.985E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
					94.67	15.500	PBC<MDA	PA234
186.10	114.	24.92	1.37	1.858E-02	185.99	3.280	1.430E+00	RA226
238.56	531.	5.30	1.12	1.558E-02				
238.56	531.	5.30	1.12	1.558E-02	238.63	43.100	5.972E-01	PB212
242.05	79.	24.61	1.12	1.539E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	5.189E-01	PB214
269.72	71.	33.77	1.21	1.403E-02				
277.30	51.	36.74	0.94	1.368E-02				
295.07	130.	16.65	1.31	1.293E-02	295.22	19.200	3.950E-01	PB214
338.15	99.	16.40	1.53	1.136E-02	338.40	12.010	5.442E-01	AC228

351.77	230.	10.42	1.14	1.093E-02	351.99	37.100	4.285E-01	PB214
462.57	50.	25.89	1.32	8.358E-03				
462.57	50.	25.89	1.32	8.358E-03	463.51	10.000	4.443E-01	SB125
510.56	106.	17.30	1.60	7.593E-03	510.72	22.500	4.038E-01	TL208
582.69	160.	11.00	1.60	6.689E-03	583.14	86.000	2.088E-01	TL208

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
608.82	200.	10.91	1.36	6.418E-03	609.32	46.090	5.140E-01	BI214
661.03	85.	16.65	1.71	5.942E-03	661.62	84.620	1.279E-01	CS137
726.70	40.	23.34	1.17	5.446E-03	727.17	11.800	4.695E-01	BI212
794.64	47.	29.62	1.31	5.022E-03				
794.64	47.	29.62	1.31	5.022E-03	795.76	85.400	8.373E-02	CS134
910.30	113.	13.08	1.47	4.450E-03	911.07	29.000	6.576E-01	AC228
967.96	100.	16.11	1.50	4.216E-03	968.90	17.460	1.030E+00	AC228
1119.06	34.	29.21	0.69	3.711E-03	1120.28	15.040	4.651E-01	BI214
1172.96	77.	22.80	1.66	3.565E-03	1173.23	99.860	1.639E-01	CO60
1331.12	46.	21.54	0.78	3.190E-03	1332.51	99.980	1.089E-01	CO60
1459.73	462.	4.75	1.99	2.944E-03	1460.75	10.700	1.114E+01	K40
1763.13	29.	18.57	1.10	2.481E-03	1764.51	15.920	5.517E-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	
148.86	74.72	369.	200.	0.100	45.98	1.005	BI-207	D
173.89	87.15	484.	84.	0.042	120.45	0.825	PB-214	l
476.83	238.56	127.	533.	0.266	15.79	1.121	PB-212	D
539.15	269.72	180.	71.	0.036	101.32	1.208	AC-228	s
554.34	277.30	123.	48.	0.024	107.65	0.936	TL-208	

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	149.10	74.77	856.	182.	0.091	69.46	1.499s
PB-214	153.79	77.11	324.	303.	0.151	30.16	1.006D
PB-212	153.79	77.11	790.	247.	0.124	51.87	1.499D
PA-234	185.02	92.72	478.	101.	0.050	96.71	1.499
RA-226	371.69	186.02	365.	109.	0.054	79.76	1.499s
PB-212	476.91	238.61	318.	434.	0.217	22.25	1.499
RA-224	482.96	241.63	392.	74.	0.037	118.29	1.499
PB-214	483.54	241.92	125.	88.	0.044	61.82	1.124D
PB-214	589.88	295.07	128.	128.	0.064	49.95	1.315
AC-228	676.09	338.15	78.	97.	0.049	49.20	1.535s
PB-214	703.34	351.77	124.	228.	0.114	31.26	1.137
SB-125	925.23	462.67	59.	35.	0.018	101.38	1.499s
TL-208	1021.07	510.56	89.	90.	0.045	51.89	1.605s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
TL-208	1165.38	582.69	54.	157.	0.079	32.99	1.598
BI-214	1217.67	608.82	74.	199.	0.100	32.72	1.361
CS-137	1322.14	661.03	41.	84.	0.042	49.96	1.712s
BI-212	1453.56	726.70	21.	40.	0.020	70.02	1.172
CS-134	1589.25	794.51	24.	27.	0.013	95.83	1.502s
AC-228	1820.95	910.30	35.	111.	0.056	39.25	1.468
AC-228	1936.32	967.96	43.	99.	0.050	48.34	1.496
BI-214	2238.71	1119.06	26.	34.	0.017	87.63	0.690s
CO-60	2346.57	1172.96	55.	76.	0.038	68.41	1.664s
CO-60	2663.08	1331.12	12.	46.	0.023	64.61	0.782s
K-40	2920.48	1459.73	7.	460.	0.230	14.24	1.987
BI-214	3527.70	1763.13	0.	29.	0.014	55.71	1.099s

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		4.5538E-02					
			477.56	4.554E-02	&(	3.272E-01 9.40E-02	G
K-40		1.1137E+01					
			1460.75	1.114E+01	(P	3.746E-01 5.31E-01	G
MN-54		9.7408E-03					
			834.81	9.741E-03	&(P	4.711E-02 1.35E-02	G
CO-57		6.4661E-04					
			122.07	6.466E-04	%(	3.639E-02 1.07E-02	G K
			136.43	-4.892E-02	&	3.814E-01 1.14E-01	G
CO-60		1.3639E-01					
			1332.51	1.089E-01	@(P	4.589E-02 2.35E-02	G K
			1173.23	1.639E-01	(P	7.960E-02 3.74E-02	G K
Sr-85		-1.8471E-02					
			514.00	-1.847E-02	%(	5.370E-02 1.61E-02	G
Kr-85		-4.5153E+02					
			513.99	-4.515E+02	%(P	1.238E+03 3.68E+02	G
Y-88		0.0000E+00					
			1836.01	0.000E+00	%(	5.342E-02 1.36E-02	G K
			898.02	8.781E-03	& P	3.618E-02 1.03E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
NB-94	5.2987E-04						
		871.10	5.299E-04	&(P	4.195E-02	1.14E-02	G K
		702.50	1.377E-02	% P	3.642E-02	1.08E-02	G K
Ag-108M	-1.2990E-02						
		722.95	-1.299E-02	&(	5.534E-02	1.62E-02	G K
		614.37	-4.501E-03	% P	4.928E-02	1.41E-02	G
		433.93	-2.052E-04	&	4.722E-02	1.36E-02	G
CD-109	-2.2630E-01						
		88.04	-2.263E-01	%(P	1.427E+00	4.27E-01	G
SN-113	-1.1475E-03						
		391.71	-1.147E-03	%(	5.290E-02	1.51E-02	G K
		255.04	-3.261E-03	% P	1.871E+00	5.47E-01	G
SB-125	6.1023E-02						
		427.95	-2.685E-02	%(P	1.429E-01	4.18E-02	G K
		600.77	-4.980E-02	% P	2.406E-01	6.99E-02	G
		636.15	8.006E-02	% P	3.396E-01	9.84E-02	G
		463.51	3.211E-01	@(P	3.535E-01	1.13E-01	G
		176.29	-1.392E-01	% P	6.404E-01	1.91E-01	G
I-131	6.8819E-03						
		364.48	6.882E-03	%(	4.985E-02	1.46E-02	G K
		636.97	1.207E-01	&	6.009E-01	1.74E-01	G
		284.29	5.013E-02	&	6.104E-01	1.79E-01	G
CS-134	2.5909E-02						
		604.66	6.935E-03	&(P	3.763E-02	1.08E-02	G K
		795.76	4.759E-02	*(P	4.584E-02	1.54E-02	G
		569.29	4.368E-02	% P	2.453E-01	7.06E-02	G
		801.84	-8.754E-02	%	5.055E-01	1.44E-01	G
CS-137	1.2790E-01						
		661.62	1.279E-01	(P	4.931E-02	2.15E-02	G
CE-139	-4.7905E-04						
		165.85	-4.791E-04	%(P	4.879E-02	1.44E-02	G
EU-152	-6.0025E-03						
		121.78	-6.003E-03	%(P	1.148E-01	3.39E-02	G K
		344.30	2.728E-02	% P	1.270E-01	3.73E-02	G
		1408.08	8.635E-02	% P	1.525E-01	4.83E-02	G
		964.00	1.775E-01	& P	5.072E-01	1.51E-01	G
		1112.07	-4.527E-02	% P	3.874E-01	1.08E-01	G
		778.90	-1.730E-02	% P	3.385E-01	9.41E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-154	1.1927E-02						
		123.10	1.193E-02	%(P	9.543E-02	2.84E-02	G K
		1274.80	7.842E-04	% P	1.704E-01	4.64E-02	G
		723.30	-6.001E-02	& P	2.664E-01	7.75E-02	G
		1004.80	3.353E-02	% P	2.547E-01	7.10E-02	G
EU-155	1.0594E-01						
		86.45	1.059E-01	%(	1.551E-01	4.74E-02	G K
		105.31	4.333E-02	%	1.834E-01	5.49E-02	G
HG-203	2.2211E-03						
		279.17	2.221E-03	&(	4.214E-02	1.23E-02	G K
		72.87	-4.493E-02	& P	1.436E+00	4.29E-01	G
		70.83	1.263E-01	&	1.911E+00	5.70E-01	G
		82.50	-1.676E+00	%	2.320E+00	7.11E-01	G
TL-208	2.0882E-01						
		583.14	2.088E-01	(P	4.891E-02	2.33E-02	G
		510.72	4.038E-01	+ P	2.081E-01	8.22E-02	G
PB-212	4.9296E-01						
		238.63	4.930E-01	(P	9.756E-02	3.71E-02	G K
							Energy duplication
		77.11	6.264E-01	+	3.387E-01	1.08E-01	G
		74.81	8.769E-01	& P	6.682E-01	2.09E-01	G
PB-214	4.1710E-01						
		351.99	4.285E-01	(P	1.029E-01	4.50E-02	G K
		295.22	3.950E-01	(P	1.702E-01	6.67E-02	G
							Energy duplication
		77.11	1.254E+00	+ P	3.592E-01	1.28E-01	G
		241.92	5.862E-01	+ P	3.630E-01	1.22E-01	G
BI-212	4.6954E-01						
		727.17	4.695E-01	(P	2.888E-01	1.11E-01	G K
		1620.56	5.897E-02	%	1.548E+00	3.93E-01	G
		785.42	2.328E-01	& P	2.183E+00	6.14E-01	G
BI-214	5.1224E-01						
		609.32	5.140E-01	(P	1.104E-01	5.63E-02	G K
		1764.51	5.517E-01	(P	1.424E-01	1.04E-01	G
		1120.28	4.651E-01	(P	3.618E-01	1.37E-01	G
RA-224	9.3088E-01						
		241.00	9.309E-01	(P	1.203E+00	3.71E-01	G
RA-226	1.3636E+00						
		185.99	1.364E+00	*(	1.148E+00	3.63E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
AC-228	6.2440E-01						
		911.07	6.576E-01	(P	1.789E-01	8.74E-02	G K
		968.90	1.030E+00	+ P	3.441E-01	1.67E-01	G
		338.40	5.442E-01	(P	2.452E-01	9.12E-02	G
TH-227	-1.7477E-01						
		236.00	-1.748E-01	%(P	4.723E-01	1.42E-01	G K
		256.25	-1.321E-01	% P	5.944E-01	1.76E-01	G
PA-234	8.0509E-02						
		98.44	-2.240E-02	%(	1.452E-01	4.32E-02	G K
		946.00	4.941E-03	%	1.798E-01	4.77E-02	G
		131.28	5.785E-03	&	2.088E-01	6.19E-02	G
		94.67	2.472E-01	?(	2.563E-01	7.97E-02	G
		883.24	1.399E-01	%	3.574E-01	1.07E-01	G
		926.70	-6.279E-02	%	4.807E-01	1.37E-01	G
		569.26	6.950E-02	%	3.621E-01	1.05E-01	G
TH-234	3.3070E-01						
		63.29	3.307E-01	%(P	2.147E+00	6.40E-01	G K
		92.80	1.123E+00	% P	1.548E+00	4.74E-01	G
		92.38	1.271E+00	% P	1.826E+00	5.57E-01	G
AM-241	-2.5635E-02						
		59.54	-2.563E-02	%(P	2.998E-01	8.92E-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:
T - Thermal Neutron Activation
F - Fast Neutron Activation

Peak Codes:
G - Gamma Ray
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

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

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	4.5207E-02	4.5538E-02	2.8196E-01	2.8198E-01	3.248E-01
K-40		1.1137E+01	1.1137E+01	1.5938E+00	1.7135E+00	
MN-54	#A	9.7286E-03	9.7408E-03	4.0600E-02	4.0604E-02	4.705E-02
CO-57	#B	6.4568E-04	6.4661E-04	3.2125E-02	3.2125E-02	3.633E-02
CO-60	#	1.3636E-01	1.3639E-01	6.4291E-02	6.4751E-02	
Sr-85	#A	-1.8360E-02	-1.8471E-02	4.8162E-02	4.8173E-02	5.338E-02
Kr-85	#A	-4.5153E+02	-4.5153E+02	1.2495E+03	1.2498E+03	1.238E+03
Y-88	#B	0.0000E+00	0.0000E+00	4.0687E-02	4.0688E-02	5.323E-02
NB-94	#B	5.2987E-04	5.2987E-04	3.4188E-02	3.4188E-02	4.195E-02
Ag-108M	#B	-1.2990E-02	-1.2990E-02	4.8473E-02	4.8479E-02	5.534E-02
CD-109	#A	-2.2610E-01	-2.2630E-01	1.3377E+00	1.3378E+00	1.426E+00
SN-113	#B	-1.1436E-03	-1.1475E-03	4.5305E-02	4.5305E-02	5.272E-02
SB-125	#B	6.0999E-02	6.1023E-02	6.4417E-02	6.4510E-02	1.429E-01
I-131	#B	6.5560E-03	6.8819E-03	4.3751E-02	4.3753E-02	4.749E-02
CS-134	#B	2.5896E-02	2.5909E-02	2.5217E-02	2.5260E-02	3.762E-02
CS-137		1.2790E-01	1.2790E-01	6.4566E-02	6.4969E-02	
CE-139	#A	-4.7770E-04	-4.7905E-04	8.6099E-02	8.6099E-02	4.865E-02
EU-152	#B	-6.0020E-03	-6.0025E-03	1.4074E-01	1.4074E-01	1.148E-01
EU-154	#B	1.1925E-02	1.1927E-02	8.5205E-02	8.5208E-02	9.542E-02
EU-155	#B	1.0592E-01	1.0594E-01	1.4230E-01	1.4242E-01	1.550E-01
HG-203	#B	2.2026E-03	2.2211E-03	3.6844E-02	3.6844E-02	4.179E-02
TL-208		2.0882E-01	2.0882E-01	6.9938E-02	7.0926E-02	
PB-212	#	4.9296E-01	4.9296E-01	1.1122E-01	1.1466E-01	9.756E-02
PB-214		4.1710E-01	4.1710E-01	1.2440E-01	1.2662E-01	
BI-212		4.6954E-01	4.6954E-01	3.3442E-01	3.3547E-01	
BI-214		5.1224E-01	5.1224E-01	1.6855E-01	1.7102E-01	
RA-224	#A	9.3088E-01	9.3088E-01	1.1119E+00	1.1131E+00	1.203E+00
RA-226	#	1.3636E+00	1.3636E+00	1.0876E+00	1.0903E+00	1.148E+00
AC-228		6.2440E-01	6.2440E-01	2.0048E-01	2.0356E-01	
TH-227	#B	-1.7477E-01	-1.7477E-01	4.3647E-01	4.3658E-01	4.723E-01
PA-234	#B	8.0509E-02	8.0509E-02	7.7859E-02	7.7987E-02	1.452E-01
TH-234	#B	3.3070E-01	3.3070E-01	1.9189E+00	1.9190E+00	2.147E+00
AM-241	#A	-2.5634E-02	-2.5635E-02	3.1757E-01	3.1757E-01	2.998E-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) 1.3633151E+01 pCi/gm
Total Decayed Activity (269.6 to 1999.1 keV) 1.3633183E+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_19APRIL2006_0953.An1

Sample description
FSS OOL-11-01-005-F

Spectrum Filename: C:\GammaVision\Spectra\102F_19APRIL2006_0953.An1

Acquisition information

Start time:	19-Apr-2006 09:54:58
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:	1.5090E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.5090E+03) = 6.6269E+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: 102F_19APRIL2006_0953.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	17-Apr-2006 21:25:00
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: 0.6274

***** 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
76.69	270.	15.69	0.99	9.418E-03				
76.69	270.	15.69	0.99	9.418E-03	77.11	17.500	1.445E+00	PB212
					77.11	10.700	2.364E+00	PB214
186.14	105.	29.53	1.05	1.626E-02	185.99	3.280	1.689E+00	RA226
210.17	48.	37.85	1.39	1.515E-02				
239.36	623.	6.27	1.13	1.377E-02	238.63	43.100	9.379E-01	PB212
270.59	66.	29.38	1.88	1.241E-02				
295.53	125.	12.78	1.25	1.146E-02	295.22	19.200	5.084E-01	PB214
338.85	114.	18.19	1.14	1.005E-02	338.40	12.010	8.428E-01	AC228
352.50	220.	10.62	1.28	9.665E-03	351.99	37.100	5.477E-01	PB214
511.78	76.	24.66	1.36	6.681E-03	510.72	22.500	4.489E-01	TL208
584.16	164.	11.50	1.50	5.880E-03	583.14	86.000	2.885E-01	TL208
609.86	171.	11.81	1.69	5.645E-03	609.32	46.090	5.885E-01	BI214
662.34	139.	12.77	1.11	5.224E-03	661.62	84.620	2.813E-01	CS137
728.23	56.	25.74	0.81	4.794E-03	727.17	11.800	8.865E-01	BI212
861.08	43.	32.35	1.14	4.121E-03				
912.47	110.	12.86	1.61	3.917E-03	911.07	29.000	8.675E-01	AC228
970.23	42.	21.93	1.29	3.713E-03	968.90	17.460	5.762E-01	AC228
1174.47	37.	27.41	1.85	3.157E-03	1173.23	99.860	1.051E-01	CO60
1462.40	456.	4.76	2.09	2.618E-03	1460.75	10.700	1.457E+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
419.97	210.17	141.	48.	0.024	113.54	1.394	NP-239

478.35	239.36	785.	130.	0.065	94.98	1.131	PB-212	s
540.81	270.59	127.	66.	0.033	88.13	1.884	AC-228	s
1722.25	861.08	39.	43.	0.021	77.17	1.137	TL-208	

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	153.80	77.11	742.	192.	0.096	64.03	1.500D
PB-214	153.80	77.11	742.	192.	0.096	64.03	1.500D
PB-212	477.49	238.93	339.	460.	0.230	21.99	1.500s
PB-214	590.64	295.49	149.	120.	0.060	51.24	1.500s
AC-228	677.38	338.85	108.	114.	0.057	54.57	1.140s
PB-214	704.36	352.34	97.	199.	0.099	29.85	1.500s
TL-208	1023.14	511.68	69.	44.	0.022	92.65	1.499
TL-208	1167.86	584.01	62.	141.	0.071	34.42	1.499
BI-214	1219.58	609.86	61.	171.	0.086	35.44	1.687
CS-137	1324.57	662.34	55.	139.	0.069	38.31	1.113
BI-212	1456.42	728.23	46.	56.	0.028	77.22	0.811s
AC-228	1825.08	912.47	28.	110.	0.055	38.57	1.614
AC-228	1940.68	970.23	19.	42.	0.021	65.79	1.295
CO-60	2349.42	1174.47	33.	37.	0.018	82.24	1.854
K-40	2925.78	1462.44	3.	435.	0.217	14.47	2.042s

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		1.1447E-01					
			477.56	1.145E-01	&(	5.283E-01	1.55E-01 G
K-40		1.3882E+01					
			1460.75	1.388E+01	?(P	3.264E-01	6.70E-01 G
MN-54		-6.8561E-03					
			834.81	-6.856E-03	&(P	6.601E-02	1.86E-02 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CO-57	-7.3495E-03						
		122.07	-7.350E-03	%(	7.027E-02	2.09E-02	G K
		136.43	7.009E-02	&	5.068E-01	1.51E-01	G
CO-60	4.9008E-02						
		1332.51	-7.058E-03	%(P	8.765E-02	2.44E-02	G K
		1173.23	1.051E-01	(	8.370E-02	2.88E-02	G K
Sr-85	0.0000E+00						
		514.00	0.000E+00	&(	5.491E-02	1.55E-02	G
Kr-85	0.0000E+00						
		513.99	0.000E+00	&(	1.247E+03	3.53E+02	G
Y-88	1.2602E-03						
		1836.01	1.260E-03	&(P	5.631E-02	1.38E-02	G K
		898.02	-1.009E-02	% P	7.472E-02	2.10E-02	G
NB-94	-1.3690E-05						
		871.10	-1.369E-05	%(	5.137E-02	1.38E-02	G K
		702.50	2.523E-02	&	4.323E-02	1.35E-02	G K
Ag-108M	1.5833E-02						
		722.95	1.583E-02	%(	5.922E-02	1.73E-02	G K
		614.37	-4.012E-02	% P	8.206E-02	2.49E-02	G
		433.93	0.000E+00	%	5.375E-02	1.53E-02	G
CD-109	1.6120E+00						
		88.04	1.612E+00	%(P	2.343E+00	7.17E-01	G
SN-113	7.3314E-03						
		391.71	7.331E-03	%(	7.743E-02	2.24E-02	G K
		255.04	2.076E-01	%	2.454E+00	7.22E-01	G
SB-125	4.5068E-02						
		427.95	4.507E-02	&(P	1.167E-01	3.46E-02	G K
		600.77	3.830E-02	% P	2.607E-01	7.43E-02	G
		636.15	7.135E-02	& P	4.824E-01	1.38E-01	G
		463.51	3.208E-01	% P	4.644E-01	1.44E-01	G
		176.29	6.870E-02	% P	7.515E-01	2.22E-01	G
I-131	2.8926E-02						
		364.48	2.893E-02	%(	5.751E-02	1.75E-02	G K
		636.97	1.138E-01	&	8.114E-01	2.31E-01	G
		284.29	-1.511E-02	%	8.836E-01	2.57E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CS-134	2.3388E-03						
		604.66	2.339E-03	%(	4.737E-02	1.32E-02	G K
		795.76	2.750E-02	%	6.262E-02	1.89E-02	G
		569.29	0.000E+00	&	4.274E-01	1.22E-01	G
		801.84	1.783E-02	& P	5.242E-01	1.41E-01	G
CS-137	2.8132E-01						
		661.62	2.813E-01	(	7.543E-02	3.60E-02	G
CE-139	-2.8346E-03						
		165.85	-2.835E-03	%(P	5.771E-02	1.70E-02	G
EU-152	-5.5843E-03						
		121.78	-5.584E-03	&(P	2.080E-01	6.16E-02	G K
		344.30	-4.305E-02	&	1.751E-01	5.18E-02	G
		1408.08	3.895E-02	%	2.996E-01	8.19E-02	G
		964.00	4.624E-02	% P	4.400E-01	1.23E-01	G
		1112.07	-6.681E-02	&	5.666E-01	1.60E-01	G
		778.90	-1.424E-01	% P	5.502E-01	1.61E-01	G
EU-154	-1.3195E-02						
		123.10	-1.319E-02	%(P	1.429E-01	4.25E-02	G K
		1274.80	-4.492E-05	&	2.228E-01	6.06E-02	G
		723.30	6.046E-02	& P	2.813E-01	8.11E-02	G
		1004.80	-1.283E-02	&	3.769E-01	1.04E-01	G
EU-155	1.9466E-01						
		86.45	1.947E-01	%(P	2.832E-01	8.65E-02	G K
		105.31	0.000E+00	%	3.199E-01	9.49E-02	G
HG-203	1.4055E-03						
		279.17	1.406E-03	%(P	5.997E-02	1.75E-02	G K
		72.87	-8.950E-01	&	2.545E+00	7.68E-01	G
		70.83	-2.600E-03	%	4.392E+00	1.30E+00	G
		82.50	-9.292E-01	%	4.682E+00	1.40E+00	G
TL-208	2.5181E-01						
		583.14	2.499E-01	(P	6.957E-02	2.88E-02	G
		510.72	2.591E-01	(	2.459E-01	8.00E-02	G
PB-212	6.9280E-01						
		238.63	6.928E-01	@(	1.332E-01	5.08E-02	G K
							Energy duplication
		77.11	1.028E+00	+	6.951E-01	2.19E-01	G
		74.81	3.700E-01	& P	1.494E+00	4.49E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PB-214	4.9259E-01						
		351.99	4.954E-01	*(P	1.212E-01	4.94E-02	G K
		295.22	4.872E-01	@(	2.427E-01	8.32E-02	G
							Energy duplication
		77.11	1.682E+00	+	1.137E+00	3.59E-01	G
		241.92	2.492E-01	%	8.866E-01	2.66E-01	G
BI-212	8.8651E-01						
		727.17	8.865E-01	(	5.432E-01	2.28E-01	G K
		1620.56	-4.559E-02	% P	1.001E+00	1.36E-01	G
		785.42	-9.297E-01	% P	3.677E+00	1.08E+00	G
BI-214	5.8848E-01						
		609.32	5.885E-01	(	1.344E-01	6.96E-02	G K
		1764.51	-2.191E-03	& P	1.863E-01	2.53E-02	G
		1120.28	-5.354E-02	&	6.019E-01	1.71E-01	G
RA-224	5.2684E-01						
		241.00	5.268E-01	%(P	1.663E+00	4.99E-01	G
RA-226	1.0995E+00						
		185.99	1.100E+00	%(P	1.543E+00	4.73E-01	G
AC-228	8.6023E-01						
		911.07	8.675E-01	(P	2.149E-01	1.12E-01	G K
		968.90	5.762E-01	- P	3.193E-01	1.27E-01	G
		338.40	8.428E-01	@(	3.795E-01	1.53E-01	G
TH-227	-3.0714E-01						
		236.00	-3.071E-01	%(P	5.904E-01	1.79E-01	G K
		256.25	-4.437E-03	&	7.050E-01	2.06E-01	G
PA-234	3.3462E-03						
		98.44	3.346E-03	%(	2.869E-01	8.51E-02	G K
		946.00	-3.454E-02	&	3.303E-01	9.28E-02	G
		131.28	-4.546E-02	%	2.940E-01	8.78E-02	G
		94.67	-1.049E-01	%	5.419E-01	1.62E-01	G
		883.24	-7.978E-02	%	5.939E-01	1.69E-01	G
		926.70	7.930E-03	%	5.175E-01	1.40E-01	G
		569.26	0.000E+00	&	6.331E-01	1.80E-01	G
TH-234	1.0833E+00						
		63.29	1.083E+00	%(P	5.509E+00	1.65E+00	G K
		92.80	1.222E+00	&	2.865E+00	8.67E-01	G
		92.38	5.948E-01	& P	3.092E+00	9.25E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
AM-241	-7.8195E-02						
		59.54	-7.820E-02	&(	8.459E-01	2.52E-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:
T - Thermal Neutron Activation
F - Fast Neutron Activation
I - Fission Product
N - Naturally Occurring Isotope
P - Photon Reaction
C - Charged Particle Reaction
M - No MDA Calculation
R - Coincidence Corrected
H - Halflife limit exceeded

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

- -

***** 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	1.1223E-01	1.1447E-01	4.6438E-01	4.6443E-01	5.180E-01
K-40	#	1.3882E+01	1.3882E+01	2.0091E+00	2.1548E+00	3.264E-01
MN-54	#A	-6.8330E-03	-6.8561E-03	6.3705E-02	6.3707E-02	6.579E-02
CO-57	#B	-7.3209E-03	-7.3495E-03	6.2766E-02	6.2767E-02	7.000E-02
CO-60	#B	4.8982E-02	4.9008E-02	4.0304E-02	4.0397E-02	8.760E-02
Sr-85	#A	0.0000E+00	0.0000E+00	4.6596E-02	4.6596E-02	5.403E-02
Kr-85	#A	0.0000E+00	0.0000E+00	1.0584E+03	1.0584E+03	1.247E+03
Y-88	#B	1.2478E-03	1.2602E-03	4.1388E-02	4.1388E-02	5.576E-02
NB-94	#B	-1.3690E-05	-1.3690E-05	4.1353E-02	4.1353E-02	5.137E-02
Ag-108M	#B	1.5833E-02	1.5833E-02	5.1757E-02	5.1765E-02	5.922E-02
CD-109	#A	1.6082E+00	1.6120E+00	2.1505E+00	2.1523E+00	2.338E+00

SN-113	#B	7.2645E-03	7.3314E-03	6.7302E-02	6.7303E-02	7.672E-02
SB-125	#B	4.5021E-02	4.5068E-02	1.0386E-01	1.0389E-01	1.165E-01
I-131	#B	2.5372E-02	2.8926E-02	5.2490E-02	5.2516E-02	5.044E-02
CS-134	#B	2.3355E-03	2.3388E-03	3.9571E-02	3.9571E-02	4.730E-02
CS-137		2.8130E-01	2.8132E-01	1.0776E-01	1.0891E-01	
CE-139	#A	-2.8129E-03	-2.8346E-03	6.2644E-02	6.2645E-02	5.727E-02
EU-152	#B	-5.5830E-03	-5.5843E-03	3.3317E-01	3.3317E-01	2.079E-01
EU-154	#B	-1.3190E-02	-1.3195E-02	1.3279E-01	1.3279E-01	1.429E-01
EU-155	#B	1.9454E-01	1.9466E-01	2.5963E-01	2.5985E-01	2.830E-01
HG-203	#B	1.3741E-03	1.4055E-03	5.2403E-02	5.2403E-02	5.862E-02
TL-208	#	2.5181E-01	2.5181E-01	8.6934E-02	8.8075E-02	6.957E-02
PB-212	#	6.9280E-01	6.9280E-01	1.5234E-01	1.5723E-01	1.332E-01
PB-214	#	4.9259E-01	4.9259E-01	1.4613E-01	1.4872E-01	1.212E-01
BI-212		8.8651E-01	8.8651E-01	6.8460E-01	6.8641E-01	
BI-214		5.8848E-01	5.8848E-01	2.0857E-01	2.1117E-01	
RA-224	#A	5.2684E-01	5.2684E-01	1.4983E+00	1.4986E+00	1.663E+00
RA-226	#A	1.0995E+00	1.0995E+00	1.4187E+00	1.4201E+00	1.543E+00
AC-228		8.6023E-01	8.6023E-01	2.8763E-01	2.9165E-01	
TH-227	#B	-3.0714E-01	-3.0714E-01	5.4386E-01	5.4414E-01	5.904E-01
PA-234	#B	3.3462E-03	3.3462E-03	2.5522E-01	2.5522E-01	2.869E-01
TH-234	#B	1.0833E+00	1.0833E+00	4.9450E+00	4.9454E+00	5.509E+00
AM-241	#A	-7.8195E-02	-7.8195E-02	7.5595E-01	7.5596E-01	8.459E-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) 2.6165066E+00 pCi/gm
Total Decayed Activity (50.2 to 1999.0 keV) 2.6165335E+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_19APRIL2006_1039.An1

Sample description
FSS OOL-11-01-005-F-RC

Spectrum Filename: C:\GammaVision\Spectra\102F_19APRIL2006_1039.An1

Acquisition information
Start time: 19-Apr-2006 10:40:54
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: 1.5090E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.5090E+03) =
6.6269E+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	17-Apr-2006 21:25:00
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. 14 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.5648

***** 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
77.23	179.	22.98	1.50	9.541E-03	77.11	10.700	1.566E+00	PB214
					77.11	17.500	9.574E-01	PB212
77.23	179.	22.98	1.50	9.541E-03	77.11	10.700	1.566E+00	PB214
					77.11	17.500	9.574E-01	PB212
129.02	103.	26.49	0.81	1.715E-02				
186.28	105.	27.46	1.58	1.625E-02	185.99	3.280	1.694E+00	RA226
209.35	58.	40.16	0.87	1.519E-02				
238.94	549.	5.07	1.21	1.379E-02	238.63	43.100	8.260E-01	PB212
242.13	90.	19.95	1.22	1.364E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	7.920E-01	PB214
295.50	110.	14.64	1.25	1.146E-02	295.22	19.200	4.495E-01	PB214
300.79	36.	34.93	1.26	1.127E-02				
339.15	129.	16.50	1.49	1.004E-02	338.40	12.010	9.562E-01	AC228
352.26	217.	10.94	1.54	9.671E-03	351.99	37.100	5.395E-01	PB214
463.82	34.	35.22	1.50	7.365E-03	463.51	10.000	PBC<MDA	SB125
511.21	113.	16.38	1.23	6.689E-03	510.72	22.500	6.706E-01	TL208
583.91	171.	12.28	1.21	5.883E-03	583.14	86.000	3.023E-01	TL208
610.02	173.	12.52	1.68	5.643E-03	609.32	46.090	5.936E-01	BI214
662.52	132.	14.55	0.96	5.223E-03	661.62	84.620	2.665E-01	CS137
727.78	34.	27.95	1.34	4.790E-03	727.17	11.800	5.351E-01	BI212
912.21	104.	11.77	1.63	3.918E-03	911.07	29.000	8.155E-01	AC228
969.41	86.	15.79	1.88	3.716E-03	968.90	17.460	1.187E+00	AC228
1121.69	67.	22.75	1.51	3.283E-03	1120.28	15.040	1.212E+00	BI214
1174.29	24.	39.22	1.85	3.157E-03	1173.23	99.860	PBC<MDA	CO60
1462.50	434.	4.85	2.15	2.618E-03	1460.75	10.700	1.384E+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	
418.31	209.35	214.	58.	0.029	120.47	0.869	AC-228	s
477.52	238.95	112.	549.	0.274	15.20	1.215	PB-212	D
483.90	242.14	117.	90.	0.045	59.84	1.217	PB-214	D
601.01	300.68	62.	45.	0.023	86.67	1.590	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
PB-214	153.80	77.11	752.	179.	0.089	68.95	1.500D
PB-212	153.80	77.11	752.	179.	0.089	68.95	1.500D
RA-226	371.85	186.12	298.	94.	0.047	79.73	1.500s
PB-212	477.59	238.98	302.	441.	0.221	21.98	1.500
PB-214	590.62	295.48	109.	115.	0.057	47.71	1.500s
AC-228	677.98	339.15	108.	129.	0.064	49.50	1.487s
PB-214	704.66	352.49	114.	181.	0.091	33.41	1.500
SB-125	927.38	463.82	62.	34.	0.017	105.67	1.500s
TL-208	1022.20	511.21	67.	113.	0.056	49.13	1.230s
TL-208	1167.66	583.91	70.	171.	0.085	36.83	1.209s
BI-214	1219.89	610.02	75.	173.	0.086	37.55	1.678s
CS-137	1324.93	662.52	71.	132.	0.066	43.64	0.959s
BI-212	1455.51	727.78	25.	34.	0.017	83.85	1.342
AC-228	1824.57	912.21	16.	104.	0.052	35.30	1.628
AC-228	1939.03	969.41	30.	86.	0.043	47.36	1.880
BI-214	2243.77	1121.69	34.	67.	0.033	68.25	1.512s
CO-60	2349.05	1174.29	31.	24.	0.012	117.65	1.854s
K-40	2925.91	1462.50	4.	433.	0.217	14.56	2.152

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

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

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		1.0916E-01					
			477.56	1.092E-01	&(	5.261E-01 1.54E-01	G
K-40		1.3842E+01					
			1460.75	1.384E+01	(P	3.670E-01 6.72E-01	G
MN-54		-6.0907E-03					
			834.81	-6.091E-03	%(P	6.772E-02 1.91E-02	G
CO-57		7.4621E-03					
			122.07	7.462E-03	%(	6.907E-02 2.06E-02	G K
			136.43	-2.745E-02	%	5.005E-01 1.48E-01	G
CO-60		5.9921E-02					
			1332.51	5.284E-02	%(P	6.884E-02 2.24E-02	G K
			1173.23	6.701E-02	(	8.139E-02 2.63E-02	G K
Sr-85		-1.1543E-02					
			514.00	-1.154E-02	%(	6.827E-02 2.00E-02	G
Kr-85		-2.6208E+02					
			513.99	-2.621E+02	%(	1.550E+03 4.54E+02	G
Y-88		-2.7813E-05					
			1836.01	-2.781E-05	%(P	7.132E-02 1.82E-02	G K
			898.02	-1.341E-03	% P	6.538E-02 1.77E-02	G
NB-94		-5.3169E-03					
			871.10	-5.317E-03	%(	4.866E-02 1.34E-02	G K
			702.50	-1.838E-03	%	5.864E-02 1.64E-02	G K
Ag-108M		-2.2612E-03					
			722.95	-2.261E-03	&(	8.567E-02 2.44E-02	G K
			614.37	-4.727E-02	% P	9.044E-02 2.75E-02	G
			433.93	-1.349E-03	&	5.621E-02 1.61E-02	G
CD-109		-1.0611E-01					
			88.04	-1.061E-01	&(P	2.522E+00 7.50E-01	G
SN-113		1.1295E-02					
			391.71	1.129E-02	&(	6.987E-02 2.03E-02	G K
			255.04	-5.189E-01	%	1.809E+00 5.38E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	9.0201E-02						
		427.95	-1.948E-02	%(P	1.700E-01	4.88E-02	G K
		600.77	3.283E-02	& P	1.764E-01	4.93E-02	G
		636.15	1.343E-01	& P	4.154E-01	1.22E-01	G
		463.51	4.148E-01	(P	4.813E-01	1.53E-01	G
		176.29	1.046E-01	& P	6.556E-01	1.94E-01	G
I-131	-1.4345E-03						
		364.48	-1.435E-03	%(	6.882E-02	1.98E-02	G K
		636.97	2.530E-01	&	6.800E-01	2.02E-01	G
		284.29	-1.303E-01	%	8.203E-01	2.41E-01	G
CS-134	1.0926E-02						
		604.66	1.093E-02	%(	5.650E-02	1.64E-02	G K
		795.76	3.923E-02	%	7.131E-02	2.19E-02	G
		569.29	5.072E-02	&	3.192E-01	9.16E-02	G
		801.84	-6.112E-02	% P	6.546E-01	1.83E-01	G
CS-137	2.6655E-01						
		661.62	2.665E-01	(	8.512E-02	3.88E-02	G
CE-139	-6.5633E-03						
		165.85	-6.563E-03	&(P	5.999E-02	1.78E-02	G
EU-152	3.2240E-04						
		121.78	3.224E-04	&(P	1.989E-01	5.89E-02	G K
		344.30	-4.043E-02	%	1.909E-01	5.64E-02	G
		1408.08	-5.819E-02	%	3.222E-01	9.01E-02	G
		964.00	-1.718E-01	% P	6.163E-01	1.81E-01	G
		1112.07	-7.243E-02	%	5.663E-01	1.60E-01	G
		778.90	4.136E-02	% P	3.927E-01	1.09E-01	G
EU-154	-2.1975E-02						
		123.10	-2.197E-02	%(P	1.362E-01	4.06E-02	G K
		1274.80	7.674E-04	&	2.382E-01	6.53E-02	G
		723.30	1.096E-01	& P	2.063E-01	6.34E-02	G
		1004.80	-3.601E-02	%	3.589E-01	9.99E-02	G
EU-155	-6.2832E-03						
		86.45	-6.283E-03	%(P	3.098E-01	9.19E-02	G K
		105.31	6.053E-02	%	3.029E-01	9.06E-02	G
HG-203	-1.2533E-02						
		279.17	-1.253E-02	&(P	6.022E-02	1.78E-02	G K
		72.87	7.494E-02	%	2.152E+00	6.40E-01	G
		70.83	2.183E-02	%	4.429E+00	1.32E+00	G
		82.50	-1.735E+00	%	4.714E+00	1.42E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	3.0231E-01						
		583.14	3.023E-01	@(P	7.372E-02	3.72E-02	G
		510.72	6.706E-01	+	2.432E-01	1.10E-01	G
PB-212	6.6442E-01						
		238.63	6.644E-01	(	1.260E-01	4.87E-02	G K
							Energy duplication
		77.11	9.574E-01	+	7.001E-01	2.20E-01	G
		74.81	6.778E-01	& P	1.388E+00	4.21E-01	G
PB-214	4.5739E-01						
		351.99	4.524E-01	(P	1.311E-01	5.05E-02	G K
		295.22	4.670E-01	@(	2.092E-01	7.43E-02	G
							Energy duplication
		77.11	1.566E+00	+	1.145E+00	3.60E-01	G
		241.92	3.288E-01	%	8.205E-01	2.48E-01	G
BI-212	5.3507E-01						
		727.17	5.351E-01	(	4.132E-01	1.50E-01	G K
		1620.56	-4.559E-02	% P	2.230E+00	5.54E-01	G
		785.42	5.030E-01	% P	2.713E+00	7.74E-01	G
BI-214	5.9363E-01						
		609.32	5.936E-01	*(	1.485E-01	7.44E-02	G K
		1764.51	-2.191E-03	% P	1.863E-01	2.53E-02	G
		1120.28	1.212E+00	+	5.434E-01	2.76E-01	G
RA-224	1.9097E-01						
		241.00	1.910E-01	&(P	1.559E+00	4.62E-01	G
RA-226	1.5784E+00						
		185.99	1.578E+00	(P	1.395E+00	4.39E-01	G
AC-228	8.5669E-01						
		911.07	8.155E-01	(P	1.701E-01	9.63E-02	G K
		968.90	1.187E+00	+ P	3.891E-01	1.88E-01	G
		338.40	9.562E-01	*(	3.790E-01	1.58E-01	G
TH-227	-2.4943E-01						
		236.00	-2.494E-01	&(P	5.830E-01	1.76E-01	G K
		256.25	-5.346E-02	&	6.643E-01	1.95E-01	G
PA-234	7.9703E-03						
		98.44	7.970E-03	%(	2.274E-01	6.71E-02	G K
		946.00	7.818E-02	%	2.923E-01	8.46E-02	G
		131.28	-8.450E-02	%	2.922E-01	8.78E-02	G
		94.67	7.354E-03	%	5.105E-01	1.52E-01	G
		883.24	1.205E-03	&	5.334E-01	1.47E-01	G
		926.70	-6.236E-02	%	5.808E-01	1.63E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 7.447E-02 &   4.732E-01 1.36E-01 G

TH-234       4.2412E-01
                           63.29 4.241E-01 &(P 5.699E+00 1.70E+00 G K
                           92.80 1.319E+00 %   2.702E+00 8.20E-01 G
                           92.38 9.402E-01 & P 2.890E+00 8.69E-01 G

AM-241       9.5864E-02
                           59.54 9.586E-02 %(  7.878E-01 2.35E-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	1.0699E-01	1.0916E-01	4.6176E-01	4.6180E-01	5.156E-01
K-40		1.3842E+01	1.3842E+01	2.0160E+00	2.1604E+00	
MN-54	#A	-6.0697E-03	-6.0907E-03	6.6403E-02	6.6404E-02	6.749E-02
CO-57	#B	7.4324E-03	7.4621E-03	6.1681E-02	6.1683E-02	6.879E-02
CO-60	#B	5.9887E-02	5.9921E-02	5.1881E-02	5.1990E-02	6.880E-02

Sr-85	#A	-1.1353E-02	-1.1543E-02	5.9961E-02	5.9965E-02	6.715E-02
Kr-85	#A	-2.6208E+02	-2.6208E+02	1.3615E+03	1.3615E+03	1.550E+03
Y-88	#B	-2.7534E-05	-2.7813E-05	7.1476E-04	7.1476E-04	7.060E-02
NB-94	#B	-5.3169E-03	-5.3169E-03	4.0216E-02	4.0217E-02	4.866E-02
Ag-108M	#B	-2.2612E-03	-2.2612E-03	7.3217E-02	7.3217E-02	8.567E-02
CD-109	#A	-1.0586E-01	-1.0611E-01	3.9004E+00	3.9004E+00	2.516E+00
SN-113	#B	1.1190E-02	1.1295E-02	6.0980E-02	6.0983E-02	6.922E-02
SB-125	#B	9.0105E-02	9.0201E-02	9.9640E-02	9.9769E-02	1.698E-01
I-131	#B	-1.2548E-03	-1.4345E-03	5.9474E-02	5.9474E-02	6.019E-02
CS-134	#B	1.0910E-02	1.0926E-02	4.9100E-02	4.9103E-02	5.642E-02
CS-137		2.6652E-01	2.6655E-01	1.1632E-01	1.1727E-01	
CE-139	#A	-6.5121E-03	-6.5633E-03	5.8228E-02	5.8229E-02	5.952E-02
EU-152	#B	3.2233E-04	3.2240E-04	1.7657E-01	1.7657E-01	1.989E-01
EU-154	#B	-2.1967E-02	-2.1975E-02	1.2484E-01	1.2484E-01	1.362E-01
EU-155	#B	-6.2794E-03	-6.2832E-03	1.7020E+00	1.7020E+00	3.096E-01
HG-203	#B	-1.2247E-02	-1.2533E-02	5.4242E-02	5.4247E-02	5.885E-02
TL-208	#	3.0231E-01	3.0231E-01	1.1161E-01	1.1289E-01	
PB-212	#	6.6442E-01	6.6442E-01	1.4602E-01	1.5071E-01	1.260E-01
PB-214	#	4.5739E-01	4.5739E-01	1.3329E-01	1.3574E-01	1.311E-01
BI-212		5.3507E-01	5.3507E-01	4.4864E-01	4.4964E-01	
BI-214	#	5.9363E-01	5.9363E-01	2.2289E-01	2.2537E-01	
RA-224	#A	1.9097E-01	1.9097E-01	1.3870E+00	1.3870E+00	1.559E+00
RA-226	#	1.5784E+00	1.5784E+00	1.3182E+00	1.3212E+00	1.395E+00
AC-228		8.5669E-01	8.5669E-01	2.6060E-01	2.6500E-01	
TH-227	#B	-2.4943E-01	-2.4943E-01	5.3565E-01	5.3584E-01	5.830E-01
PA-234	#B	7.9703E-03	7.9703E-03	2.0137E-01	2.0137E-01	2.274E-01
TH-234	#B	4.2412E-01	4.2412E-01	5.0894E+00	5.0894E+00	5.699E+00
AM-241	#A	9.5863E-02	9.5864E-02	7.0407E-01	7.0409E-01	7.878E-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 1999.0 keV) 1.6396467E+01 pCi/gm
Total Decayed Activity (295.2 to 1999.0 keV) 1.6396494E+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_19APRIL2006_1118.An1

Sample description
FSS OOL-11-01-020-F

Spectrum Filename: C:\GammaVision\Spectra\102F_19APRIL2006_1118.An1

Acquisition information
Start time: 19-Apr-2006 11:19:46
Live time: 2000
Real time: 2020
Dead time: 1.00 %
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: 1.4200E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.4200E+03) =
7.0423E+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	17-Apr-2006 19:08:00
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: 0.6529

***** 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
77.17	152.	26.74	1.50	9.541E-03	77.11	10.700	1.415E+00	PB214
					77.11	17.500	8.651E-01	PB212
77.17	152.	26.74	1.50	9.541E-03	77.11	10.700	1.415E+00	PB214
					77.11	17.500	8.651E-01	PB212
87.30	104.	34.78	1.50	1.235E-02	86.45	32.740	PBC<MDA	EU155
					88.04	3.790	PBC<MDA	CD109
92.95	97.	34.88	1.50	1.368E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	2.296E+00	TH234
					94.67	15.500	4.331E-01	PA234
185.84	121.	22.42	1.03	1.627E-02				
185.84	121.	22.42	1.03	1.627E-02	185.99	3.280	2.079E+00	RA226
239.25	621.	6.89	1.26	1.378E-02	238.63	43.100	9.938E-01	PB212
					241.00	3.900	1.105E+01	RA224
295.50	94.	18.78	1.18	1.146E-02	295.22	19.200	4.068E-01	PB214
338.61	104.	16.91	1.52	1.005E-02	338.40	12.010	8.160E-01	AC228
352.51	208.	12.17	1.22	9.665E-03	351.99	37.100	5.500E-01	PB214
511.44	75.	23.21	1.61	6.686E-03	510.72	22.500	4.738E-01	TL208
583.91	146.	9.80	1.55	5.883E-03	583.14	86.000	2.728E-01	TL208
609.99	153.	12.75	1.56	5.643E-03	609.32	46.090	5.592E-01	BI214
662.61	129.	12.49	1.64	5.222E-03	661.62	84.620	2.779E-01	CS137
728.41	47.	32.56	1.21	4.787E-03	727.17	11.800	7.907E-01	BI212
911.97	112.	12.19	1.85	3.919E-03	911.07	29.000	9.369E-01	AC228
970.44	56.	16.90	1.37	3.713E-03	968.90	17.460	8.205E-01	AC228
1121.39	25.	37.41	1.82	3.283E-03	1120.28	15.040	PBC<MDA	BI214
1334.33	28.	31.15	1.96	2.834E-03	1332.51	99.980	9.474E-02	CO60
1462.46	426.	5.13	2.12	2.618E-03	1460.75	10.700	1.444E+01	K40
1766.47	28.	21.49	2.24	2.225E-03	1764.51	15.920	7.413E-01	BI214

No unknown peaks passed sensitivity test.

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	748.	152.	0.076	80.21	1.500D
PB-212	153.80	77.11	748.	152.	0.076	80.21	1.500D
CD-109	174.17	87.30	617.	104.	0.052	104.33	1.500s
PA-234	185.48	92.95	518.	97.	0.048	104.65	1.500s
RA-226	372.16	186.28	296.	94.	0.047	79.76	1.500s
PB-212	477.55	238.96	330.	426.	0.213	23.23	1.500s
RA-224	477.58	238.98	191.	449.	0.225	19.19	1.500s
PB-214	590.93	295.64	132.	84.	0.042	66.93	1.500s
AC-228	676.90	338.61	88.	104.	0.052	50.73	1.521s
PB-214	704.44	352.38	101.	174.	0.087	33.38	1.500
TL-208	1022.67	511.44	76.	75.	0.038	69.63	1.606
TL-208	1167.66	583.91	27.	145.	0.073	29.41	1.548
BI-214	1219.83	609.99	69.	153.	0.076	38.26	1.564
CS-137	1325.12	662.61	47.	129.	0.065	37.46	1.641
BI-212	1456.78	728.41	52.	47.	0.023	97.68	1.207
AC-228	1824.07	911.97	21.	112.	0.056	36.57	1.850
AC-228	1941.09	970.44	14.	56.	0.028	50.71	1.367
BI-214	2243.18	1121.39	30.	25.	0.012	112.24	1.819s
CO-60	2669.36	1334.33	25.	28.	0.014	93.46	1.959
K-40	2925.83	1462.46	13.	425.	0.213	15.39	2.116
BI-214	3534.40	1766.47	4.	28.	0.014	64.47	2.237s

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		5.1792E-02					
			477.56	5.179E-02	%(	5.663E-01 1.63E-01	G
K-40		1.4438E+01					
			1460.75	1.444E+01	(P	6.522E-01 7.41E-01	G
MN-54		-8.6912E-03					
			834.81	-8.691E-03	&(P	7.641E-02 2.17E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CO-57	1.1968E-02						
		122.07	1.197E-02	&(	5.673E-02	1.69E-02	G K
		136.43	-1.487E-02	&	4.578E-01	1.35E-01	G
CO-60	9.4744E-02						
		1332.51	9.474E-02	(P	8.697E-02	2.96E-02	G K
		1173.23	3.420E-03	&	8.305E-02	2.29E-02	G K
Sr-85	-1.1178E-02						
		514.00	-1.118E-02	%(	6.746E-02	1.97E-02	G
Kr-85	-2.5349E+02						
		513.99	-2.535E+02	%(	1.530E+03	4.46E+02	G
Y-88	-5.0765E-03						
		1836.01	-5.077E-03	%(P	5.318E-02	1.33E-02	G K
		898.02	2.376E-02	& P	6.006E-02	1.78E-02	G
NB-94	-6.3253E-03						
		871.10	-6.325E-03	%(	6.097E-02	1.70E-02	G K
		702.50	1.712E-04	&	7.105E-02	2.00E-02	G K
Ag-108M	3.2608E-03						
		722.95	3.261E-03	&(	6.208E-02	1.73E-02	G K
		614.37	-5.499E-02	% P	9.714E-02	2.97E-02	G
		433.93	5.111E-03	%	5.166E-02	1.48E-02	G
CD-109	2.1134E+00						
		88.04	2.113E+00	*(P	2.416E+00	7.46E-01	G
SN-113	2.1640E-02						
		391.71	2.164E-02	&(	6.967E-02	2.07E-02	G K
		255.04	-1.673E-02	&	2.188E+00	6.35E-01	G
SB-125	3.4819E-02						
		427.95	3.482E-02	%(P	1.581E-01	4.60E-02	G K
		600.77	-1.602E-02	% P	2.434E-01	6.73E-02	G
		636.15	9.322E-02	% P	4.814E-01	1.39E-01	G
		463.51	3.189E-01	% P	5.641E-01	1.72E-01	G
		176.29	-1.053E-01	% P	8.339E-01	2.46E-01	G
I-131	-5.6586E-03						
		364.48	-5.659E-03	%(	7.272E-02	2.11E-02	G K
		636.97	7.126E-02	&	9.557E-01	2.71E-01	G
		284.29	-1.792E-01	%	7.686E-01	2.27E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CS-134	2.6441E-02						
		604.66	2.644E-02	%(	6.151E-02	1.85E-02	G K
		795.76	2.403E-02	%	7.653E-02	2.25E-02	G
		569.29	0.000E+00	%	4.030E-01	1.14E-01	G
		801.84	-1.290E-01	% P	7.252E-01	2.07E-01	G
CS-137	2.7788E-01						
		661.62	2.779E-01	(	7.439E-02	3.47E-02	G
CE-139	1.3178E-02						
		165.85	1.318E-02	%(P	6.127E-02	1.83E-02	G
EU-152	-6.8278E-03						
		121.78	-6.828E-03	&(P	2.020E-01	5.97E-02	G K
		344.30	4.374E-02	%	1.660E-01	4.91E-02	G
		1408.08	0.000E+00	%	2.871E-01	7.35E-02	G
		964.00	1.726E-02	% P	5.223E-01	1.45E-01	G
		1112.07	2.134E-01	%	4.509E-01	1.37E-01	G
		778.90	-1.227E-03	& P	6.557E-01	1.86E-01	G
EU-154	9.7616E-04						
		123.10	9.762E-04	%(P	1.481E-01	4.38E-02	G K
		1274.80	-5.273E-02	%	2.745E-01	7.89E-02	G
		723.30	-1.505E-01	& P	3.759E-01	1.12E-01	G
		1004.80	-3.748E-02	%	4.141E-01	1.16E-01	G
EU-155	1.9803E-01						
		86.45	1.980E-01	&(P	3.019E-01	9.21E-02	G K
		105.31	9.016E-03	&	3.407E-01	1.01E-01	G
HG-203	7.2604E-03						
		279.17	7.260E-03	%(P	5.981E-02	1.75E-02	G K
		72.87	-9.687E-01	&	2.680E+00	8.09E-01	G
		70.83	1.046E+00	&	3.880E+00	1.16E+00	G
		82.50	-1.326E+00	%	5.321E+00	1.60E+00	G
TL-208	2.7278E-01						
		583.14	2.728E-01	(P	5.042E-02	2.68E-02	G
		510.72	4.738E-01	+	2.738E-01	1.10E-01	G
PB-212	6.8108E-01						
		238.63	6.811E-01	@(	1.398E-01	5.27E-02	G K
							Energy duplication
		77.11	8.651E-01	+	7.417E-01	2.31E-01	G
		74.81	8.929E-01	& P	1.531E+00	4.66E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PB-214	4.5989E-01						
		351.99	4.599E-01	(P	1.311E-01	5.13E-02	G K
		295.22	3.612E-01	-	2.432E-01	8.06E-02	G
							Energy duplication
		77.11	1.415E+00	+	1.213E+00	3.78E-01	G
		241.92	1.348E-01	%	8.967E-01	2.67E-01	G
BI-212	7.9067E-01						
		727.17	7.907E-01	(	6.109E-01	2.58E-01	G K
		1620.56	-4.844E-02	% P	1.064E+00	1.44E-01	G
		785.42	6.927E-01	% P	3.426E+00	9.90E-01	G
BI-214	6.0596E-01						
		609.32	5.592E-01	(	1.514E-01	7.14E-02	G K
		1764.51	7.413E-01	?(P	3.212E-01	1.60E-01	G
		1120.28	4.742E-01	&	5.447E-01	1.77E-01	G
RA-224	8.0032E+00						
		241.00	8.003E+00	&(P	1.195E+00	5.13E-01	G
RA-226	1.6707E+00						
		185.99	1.671E+00	*(P	1.478E+00	4.65E-01	G
AC-228	8.7730E-01						
		911.07	9.369E-01	(P	2.015E-01	1.15E-01	G K
		968.90	8.205E-01	(P	2.957E-01	1.39E-01	G
		338.40	8.160E-01	(	3.665E-01	1.38E-01	G
TH-227	1.9099E-01						
		236.00	1.910E-01	&(P	4.160E-01	1.26E-01	G K
		256.25	9.065E-02	&	5.938E-01	1.74E-01	G
PA-234	1.4858E-01						
		98.44	-2.709E-02	&(	3.144E-01	9.36E-02	G K
		946.00	-3.852E-03	&	3.311E-01	9.04E-02	G
		131.28	5.344E-03	%	2.425E-01	7.14E-02	G
		94.67	4.331E-01	?(	4.883E-01	1.51E-01	G
		883.24	-3.078E-02	%	5.968E-01	1.67E-01	G
		926.70	7.470E-02	%	5.667E-01	1.59E-01	G
		569.26	0.000E+00	%	5.969E-01	1.69E-01	G
TH-234	8.4554E-01						
		63.29	8.455E-01	&(P	5.852E+00	1.75E+00	G K
		92.80	2.170E+00	%	2.966E+00	9.09E-01	G
		92.38	2.460E+00	& P	3.527E+00	1.08E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
AM-241	8.2645E-03						
		59.54	8.264E-03	%(	8.649E-01	2.56E-01	G

(- This peak used in the nuclide activity average.

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

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

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

- -

***** 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	5.0678E-02	5.1792E-02	4.8934E-01	4.8935E-01	5.541E-01
K-40		1.4438E+01	1.4438E+01	2.2223E+00	2.3654E+00	
MN-54	#A	-8.6589E-03	-8.6912E-03	7.2775E-02	7.2776E-02	7.612E-02
CO-57	#B	1.1916E-02	1.1968E-02	5.0719E-02	5.0723E-02	5.648E-02
CO-60	#F	9.4687E-02	9.4744E-02	8.8788E-02	8.8947E-02	8.692E-02
Sr-85	#A	-1.0980E-02	-1.1178E-02	5.9061E-02	5.9064E-02	6.626E-02
Kr-85	#A	-2.5348E+02	-2.5349E+02	1.3393E+03	1.3394E+03	1.530E+03
Y-88	#B	-5.0216E-03	-5.0765E-03	4.0389E-02	4.0390E-02	5.261E-02
NB-94	#B	-6.3253E-03	-6.3253E-03	5.1071E-02	5.1072E-02	6.097E-02
Ag-108M	#B	3.2607E-03	3.2608E-03	5.1763E-02	5.1763E-02	6.208E-02
CD-109	#A	2.1080E+00	2.1134E+00	2.2365E+00	2.2396E+00	2.410E+00

SN-113	#B	2.1422E-02	2.1640E-02	6.1951E-02	6.1963E-02	6.897E-02
SB-125	#B	3.4779E-02	3.4819E-02	1.3812E-01	1.3814E-01	1.580E-01
I-131	#B	-4.8978E-03	-5.6586E-03	6.3223E-02	6.3224E-02	6.294E-02
CS-134	#B	2.6400E-02	2.6441E-02	5.5568E-02	5.5588E-02	6.141E-02
CS-137		2.7785E-01	2.7788E-01	1.0409E-01	1.0525E-01	
CE-139	#A	1.3067E-02	1.3178E-02	5.4794E-02	5.4799E-02	6.076E-02
EU-152	#B	-6.8261E-03	-6.8278E-03	2.9787E-01	2.9787E-01	2.019E-01
EU-154	#B	9.7580E-04	9.7616E-04	1.3140E-01	1.3140E-01	1.480E-01
EU-155	#B	1.9790E-01	1.9803E-01	2.7640E-01	2.7662E-01	3.017E-01
HG-203	#B	7.0817E-03	7.2604E-03	5.2617E-02	5.2618E-02	5.834E-02
TL-208		2.7278E-01	2.7278E-01	8.0438E-02	8.1882E-02	
PB-212	#	6.8108E-01	6.8108E-01	1.5819E-01	1.6274E-01	1.398E-01
PB-214	#	4.5989E-01	4.5989E-01	1.5385E-01	1.5600E-01	1.311E-01
BI-212		7.9067E-01	7.9067E-01	7.7234E-01	7.7362E-01	
BI-214		6.0596E-01	6.0596E-01	2.2765E-01	2.3018E-01	
RA-224	#	8.0032E+00	8.0032E+00	1.5395E+00	1.6037E+00	1.195E+00
RA-226	#	1.6707E+00	1.6707E+00	1.3960E+00	1.3991E+00	1.478E+00
AC-228		8.7730E-01	8.7730E-01	2.3561E-01	2.4070E-01	
TH-227	#B	1.9099E-01	1.9099E-01	3.7774E-01	3.7789E-01	4.160E-01
PA-234	#B	1.4858E-01	1.4858E-01	1.5549E-01	1.5571E-01	3.144E-01
TH-234	#B	8.4554E-01	8.4554E-01	5.2403E+00	5.2405E+00	5.852E+00
AM-241	#A	8.2644E-03	8.2645E-03	7.6916E-01	7.6916E-01	8.649E-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) 1.7262882E+01 pCi/gm
Total Decayed Activity (50.2 to 1999.0 keV) 1.7262913E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

Sample description
FSS OOL-11-01-015-F

Spectrum Filename: C:\GammaVision\Spectra\102F_19APRIL2006_1156.An1

Acquisition information
Start time: 19-Apr-2006 11:57:58
Live time: 2000
Real time: 2017
Dead time: 0.83 %
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: 1.0140E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.0140E+03) =
9.8619E+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	17-Apr-2006 20:24:00
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: 0.7296

***** 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
74.70	82.	28.19	1.10	8.880E-03	74.81	9.600	PBC<MDA	PB212
77.26	146.	16.16	1.10	9.648E-03	77.11	10.700	1.902E+00	PB214
					77.11	17.500	1.163E+00	PB212
186.39	94.	29.24	1.77	1.625E-02	185.99	3.280	2.237E+00	RA226
239.16	440.	7.69	1.30	1.378E-02	238.63	43.100	9.847E-01	PB212
295.66	93.	21.63	1.42	1.145E-02	295.22	19.200	5.606E-01	PB214
339.39	83.	18.39	1.06	1.003E-02	338.40	12.010	9.155E-01	AC228
352.34	172.	10.07	1.38	9.669E-03	351.99	37.100	6.384E-01	PB214
463.55	25.	36.46	1.50	7.365E-03	463.51	10.000	PBC<MDA	SB125
511.57	37.	29.90	1.50	6.695E-03	510.72	22.500	3.235E-01	TL208
583.93	130.	13.11	1.80	5.882E-03	583.14	86.000	3.404E-01	TL208
610.13	132.	12.05	0.98	5.642E-03	609.32	46.090	6.766E-01	BI214
662.43	46.	21.80	1.12	5.224E-03	661.62	84.620	1.401E-01	CS137
912.32	80.	14.47	0.91	3.917E-03	911.07	29.000	9.347E-01	AC228
970.51	52.	17.79	1.40	3.713E-03	968.90	17.460	1.067E+00	AC228
1462.54	400.	5.17	1.84	2.618E-03	1460.75	10.700	1.898E+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	
148.98	74.92	226.	82.	0.041	84.57	1.098	BI-207	D
154.09	77.48	204.	146.	0.073	48.48	1.100	PB-214	D
477.95	239.16	549.	97.	0.049	106.70	1.296	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
PB-214	153.80	77.11	557.	120.	0.060	88.02	1.500D
PB-212	153.80	77.11	557.	120.	0.060	88.02	1.500D
RA-226	372.30	186.35	232.	64.	0.032	99.90	1.500s
PB-212	477.55	238.96	215.	330.	0.165	25.04	1.500s
PB-214	591.11	295.73	96.	90.	0.045	55.82	1.500
AC-228	678.46	339.39	60.	83.	0.041	55.17	1.057s
PB-214	704.23	352.27	40.	153.	0.077	29.75	1.500
SB-125	926.85	463.55	36.	25.	0.013	109.39	1.500s
TL-208	1022.93	511.57	41.	37.	0.018	89.70	1.500s
TL-208	1168.03	584.10	44.	90.	0.045	44.34	1.499s
BI-214	1220.12	610.13	37.	132.	0.066	36.14	0.977s
CS-137	1324.75	662.43	22.	46.	0.023	65.40	1.123
AC-228	1824.78	912.32	18.	80.	0.040	43.41	0.913s
AC-228	1941.23	970.51	14.	52.	0.026	53.38	1.401
K-40	2926.01	1462.55	6.	393.	0.197	15.44	1.841

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		1.5101E-01					
			477.56	1.510E-01	&(	6.236E-01	1.82E-01 G
K-40		1.8684E+01					
			1460.75	1.868E+01	(P	6.645E-01	9.62E-01 G
MN-54		-1.6555E-03					
			834.81	-1.655E-03	%(P	9.411E-02	2.59E-02 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CO-57	2.5472E-02						
		122.07	2.547E-02	&(	7.982E-02	2.40E-02	G K
		136.43	1.043E-01	%	5.734E-01	1.70E-01	G
CO-60	-9.8091E-04						
		1332.51	-9.809E-04	%(P	1.007E-01	2.67E-02	G K
		1173.23	6.843E-02	&	1.218E-01	3.76E-02	G K
Sr-85	-3.7614E-02						
		514.00	-3.761E-02	&(	9.559E-02	2.87E-02	G
Kr-85	-8.1337E+02						
		513.99	-8.134E+02	&(	2.150E+03	6.44E+02	G
Y-88	-4.1416E-05						
		1836.01	-4.142E-05	&(P	4.651E-02	6.31E-03	G K
		898.02	1.701E-03	% P	9.174E-02	2.48E-02	G
NB-94	-5.8105E-05						
		871.10	-5.811E-05	%(	6.188E-02	1.61E-02	G K
		702.50	0.000E+00	%	6.325E-02	1.70E-02	G K
Ag-108M	-4.3792E-03						
		722.95	-4.379E-03	%(	9.925E-02	2.78E-02	G K
		614.37	1.572E-03	% P	8.710E-02	2.43E-02	G
		433.93	4.289E-03	&	6.364E-02	1.80E-02	G
CD-109	1.2919E+00						
		88.04	1.292E+00	%(P	3.099E+00	9.36E-01	G
SN-113	-1.3560E-02						
		391.71	-1.356E-02	%(	7.547E-02	2.17E-02	G K
		255.04	3.268E-01	&	2.636E+00	7.70E-01	G
SB-125	1.0425E-01						
		427.95	-1.619E-02	%(P	1.931E-01	5.39E-02	G K
		600.77	2.362E-02	% P	3.253E-01	8.99E-02	G
		636.15	3.168E-02	% P	5.470E-01	1.50E-01	G
		463.51	4.607E-01	@(P	5.587E-01	1.78E-01	G
		176.29	4.286E-02	% P	8.625E-01	2.52E-01	G
I-131	0.0000E+00						
		364.48	0.000E+00	%(	9.833E-02	2.82E-02	G K
		636.97	-2.206E-01	%	1.128E+00	3.24E-01	G
		284.29	3.237E-01	%	9.611E-01	2.86E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CS-134	4.2667E-03						
		604.66	4.267E-03	%(	6.987E-02	1.95E-02	G K
		795.76	1.997E-02	%	8.282E-02	2.38E-02	G
		569.29	6.883E-02	%	4.377E-01	1.25E-01	G
		801.84	1.662E-01	% P	8.254E-01	2.34E-01	G
CS-137	1.4005E-01						
		661.62	1.401E-01	(	7.474E-02	3.06E-02	G
CE-139	2.8916E-02						
		165.85	2.892E-02	&(P	6.322E-02	1.91E-02	G
EU-152	-3.5158E-02						
		121.78	-3.516E-02	&(P	2.336E-01	6.92E-02	G K
		344.30	-4.992E-02	%	2.269E-01	6.67E-02	G
		1408.08	-4.660E-02	&	4.754E-01	1.29E-01	G
		964.00	-9.168E-03	% P	7.312E-01	2.01E-01	G
		1112.07	-7.588E-02	%	8.446E-01	2.37E-01	G
		778.90	-2.484E-02	% P	6.256E-01	1.72E-01	G
EU-154	5.0112E-02						
		123.10	5.011E-02	%(P	1.640E-01	4.92E-02	G K
		1274.80	-1.905E-02	%	3.376E-01	9.33E-02	G
		723.30	-4.573E-02	& P	4.971E-01	1.41E-01	G
		1004.80	5.927E-02	%	4.708E-01	1.30E-01	G
EU-155	-9.5128E-02						
		86.45	-9.513E-02	%(P	3.943E-01	1.18E-01	G K
		105.31	3.199E-02	%	4.124E-01	1.22E-01	G
HG-203	-9.9233E-03						
		279.17	-9.923E-03	&(P	7.426E-02	2.17E-02	G K
		72.87	3.835E-01	%	2.083E+00	6.19E-01	G
		70.83	3.010E-01	&	5.618E+00	1.67E+00	G
		82.50	-1.198E-01	&	6.025E+00	1.78E+00	G
TL-208	2.5381E-01						
		583.14	2.356E-01	*(P	8.828E-02	3.50E-02	G
		510.72	3.235E-01	*(	2.895E-01	9.67E-02	G
PB-212	7.3953E-01						
		238.63	7.395E-01	@(	1.590E-01	6.17E-02	G K
							Energy duplication
		77.11	9.553E-01	+	8.992E-01	2.80E-01	G
		74.81	1.158E+00	& P	1.843E+00	5.62E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PB-214	5.6160E-01						
		351.99	5.690E-01	(P	1.190E-01	5.66E-02	G K
		295.22	5.473E-01	(	2.932E-01	1.02E-01	G
							Energy duplication
		77.11	1.562E+00	+	1.471E+00	4.58E-01	G
		241.92	2.242E-02	%	9.871E-01	2.89E-01	G
BI-212	4.8571E-01						
		727.17	4.857E-01	%(	7.157E-01	2.25E-01	G K
		1620.56	-6.784E-02	% P	3.318E+00	8.24E-01	G
		785.42	-7.394E-01	% P	4.507E+00	1.29E+00	G
BI-214	6.7665E-01						
		609.32	6.766E-01	(	1.586E-01	8.16E-02	G K
		1764.51	-2.760E-03	% P	6.366E-01	1.62E-01	G
		1120.28	3.511E-01	&	7.600E-01	2.30E-01	G
RA-224	2.7675E-01						
		241.00	2.767E-01	%(P	1.963E+00	5.80E-01	G
RA-226	1.6064E+00						
		185.99	1.606E+00	*(P	1.842E+00	5.72E-01	G
AC-228	9.7023E-01						
		911.07	9.347E-01	(P	2.649E-01	1.36E-01	G K
		968.90	1.067E+00	(P	4.140E-01	1.90E-01	G
		338.40	9.155E-01	*(	4.281E-01	1.69E-01	G
TH-227	-1.8748E-01						
		236.00	-1.875E-01	&(P	6.704E-01	2.00E-01	G K
		256.25	6.204E-02	%	8.331E-01	2.42E-01	G
PA-234	-2.3286E-02						
		98.44	-2.329E-02	%(	3.656E-01	1.08E-01	G K
		946.00	7.234E-02	%	3.459E-01	9.73E-02	G
		131.28	-1.647E-02	&	3.575E-01	1.06E-01	G
		94.67	-1.254E-01	%	7.210E-01	2.15E-01	G
		883.24	-1.388E-01	%	7.460E-01	2.13E-01	G
		926.70	0.000E+00	%	1.068E+00	2.98E-01	G
		569.26	1.020E-01	%	6.484E-01	1.85E-01	G
TH-234	2.3762E+00						
		63.29	2.376E+00	%(P	7.390E+00	2.22E+00	G K
		92.80	1.792E+00	%	3.694E+00	1.12E+00	G
		92.38	9.457E-02	& P	4.115E+00	1.22E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
AM-241	9.4940E-03						
		59.54	9.494E-03	%(	1.081E+00	3.20E-01	G

(- This peak used in the nuclide activity average.

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

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

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

- -

***** 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	1.4782E-01	1.5101E-01	5.4571E-01	5.4577E-01	6.104E-01
K-40		1.8684E+01	1.8684E+01	2.8863E+00	3.0709E+00	
MN-54	#A	-1.6494E-03	-1.6555E-03	1.8468E-01	1.8468E-01	9.377E-02
CO-57	#B	2.5364E-02	2.5472E-02	7.1874E-02	7.1888E-02	7.948E-02
CO-60	#B	-9.8033E-04	-9.8091E-04	1.7537E-01	1.7537E-01	1.007E-01
Sr-85	#A	-3.6957E-02	-3.7614E-02	8.6099E-02	8.6125E-02	9.392E-02
Kr-85	#A	-8.1336E+02	-8.1337E+02	1.9330E+03	1.9336E+03	2.150E+03
Y-88	#B	-4.0975E-05	-4.1416E-05	2.4850E-04	2.4851E-04	4.601E-02
NB-94	#B	-5.8105E-05	-5.8105E-05	4.8292E-02	4.8292E-02	6.188E-02
Ag-108M	#B	-4.3791E-03	-4.3792E-03	8.3542E-02	8.3543E-02	9.924E-02
CD-109	#A	1.2886E+00	1.2919E+00	2.8085E+00	2.8094E+00	3.091E+00

SN-113	#B	-1.3426E-02	-1.3560E-02	6.5071E-02	6.5075E-02	7.473E-02
SB-125	#B	1.0413E-01	1.0425E-01	1.2097E-01	1.2111E-01	1.929E-01
I-131	#B	0.0000E+00	0.0000E+00	8.4535E-02	8.4535E-02	8.530E-02
CS-134	#B	4.2602E-03	4.2667E-03	5.8481E-02	5.8481E-02	6.977E-02
CS-137		1.4004E-01	1.4005E-01	9.1592E-02	9.1928E-02	
CE-139	#A	2.8676E-02	2.8916E-02	5.7375E-02	5.7398E-02	6.270E-02
EU-152	#B	-3.5149E-02	-3.5158E-02	2.3778E-01	2.3779E-01	2.336E-01
EU-154	#B	5.0093E-02	5.0112E-02	1.4746E-01	1.4748E-01	1.639E-01
EU-155	#B	-9.5068E-02	-9.5128E-02	4.6448E-01	4.6451E-01	3.940E-01
HG-203	#B	-9.6829E-03	-9.9233E-03	6.6814E-02	6.6816E-02	7.246E-02
TL-208	#	2.5381E-01	2.5381E-01	1.1306E-01	1.1395E-01	8.828E-02
PB-212	#	7.3953E-01	7.3953E-01	1.8518E-01	1.8978E-01	1.590E-01
PB-214	#	5.6160E-01	5.6160E-01	1.6747E-01	1.7041E-01	1.190E-01
BI-212	#B	4.8571E-01	4.8571E-01	6.7467E-01	6.7522E-01	7.157E-01
BI-214		6.7665E-01	6.7665E-01	2.4455E-01	2.4748E-01	
RA-224	#A	2.7675E-01	2.7675E-01	1.7414E+00	1.7415E+00	1.963E+00
RA-226	#A	1.6063E+00	1.6064E+00	1.7161E+00	1.7185E+00	1.842E+00
AC-228		9.7023E-01	9.7023E-01	2.8548E-01	2.9063E-01	
TH-227	#B	-1.8748E-01	-1.8748E-01	6.1671E-01	6.1680E-01	6.704E-01
PA-234	#B	-2.3286E-02	-2.3286E-02	3.2487E-01	3.2487E-01	3.656E-01
TH-234	#B	2.3762E+00	2.3762E+00	6.6674E+00	6.6687E+00	7.390E+00
AM-241	#A	9.4940E-03	9.4940E-03	9.5865E-01	9.5865E-01	1.081E+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 (87.2 to 1999.0 keV) 2.0471216E+01 pCi/gm
Total Decayed Activity (87.2 to 1999.0 keV) 2.0471231E+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_19APRIL2006_1327.An1

Sample description
FSS OOL-11-01-012-F

Spectrum Filename: C:\GammaVision\Spectra\102F_19APRIL2006_1327.An1

Acquisition information
Start time: 19-Apr-2006 13:29:10
Live time: 2000
Real time: 2012
Dead time: 0.61 %
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: 8.9600E+02
Activity scaling factor: 1.0000E+06/(1.0000E+00* 8.9600E+02) =
1.1161E+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	17-Apr-2006 20:42:00
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: 0.5165

***** 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
186.43	38.	39.59	1.29	1.625E-02	185.99	3.280	PBC<MDA	RA226
239.46	216.	10.11	1.32	1.377E-02	238.63	43.100	5.485E-01	PB212
295.73	88.	18.81	1.02	1.145E-02	295.22	19.200	6.029E-01	PB214
338.67	34.	39.34	0.69	1.005E-02	338.40	12.010	4.194E-01	AC228
352.37	124.	13.20	1.13	9.668E-03	351.99	37.100	5.192E-01	PB214
584.05	57.	19.46	1.63	5.881E-03	583.14	86.000	1.685E-01	TL208
609.95	84.	15.25	1.68	5.644E-03	609.32	46.090	4.837E-01	BI214
662.56	130.	10.18	1.83	5.223E-03	661.62	84.620	4.438E-01	CS137
912.68	31.	25.45	1.46	3.922E-03	911.07	29.000	4.160E-01	AC228
1462.62	215.	6.82	2.17	2.618E-03	1460.75	10.700	1.156E+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	
372.47	186.43	88.	38.	0.019	118.77	1.287	PA-234	l
1940.10	969.95	6.	15.	0.007	103.92	0.936	AC-228	l

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	477.57	238.97	124.	157.	0.079	38.36	1.500s
PB-214	591.11	295.73	62.	68.	0.034	60.96	1.500
AC-228	677.02	338.67	50.	34.	0.017	118.02	0.693s
PB-214	704.50	352.41	36.	109.	0.055	36.77	1.500
TL-208	1168.19	584.18	15.	48.	0.024	54.17	1.499s
BI-214	1219.75	609.95	22.	84.	0.042	45.76	1.683
CS-137	1325.02	662.56	14.	130.	0.065	30.55	1.826s
AC-228	1825.51	912.68	12.	31.	0.016	76.34	1.457s
K-40	2926.14	1462.62	0.	215.	0.107	20.46	2.172

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		7.1151E-02					
			477.56	7.115E-02	%(	5.817E-01 1.64E-01	G
K-40		1.1555E+01					
			1460.75	1.156E+01	(P	3.964E-01 7.89E-01	G
MN-54		-7.6277E-04					
			834.81	-7.628E-04	&(P	6.474E-02 1.65E-02	G
CO-57		-1.7703E-03					
			122.07	-1.770E-03	%(	7.962E-02 2.33E-02	G K
			136.43	6.942E-03	%	5.561E-01 1.62E-01	G
CO-60		2.8233E-02					
			1332.51	2.823E-02	%(P	9.125E-02 2.63E-02	G K
			1173.23	-1.206E-02	%	8.809E-02 2.40E-02	G K
Sr-85		-8.9992E-04					
			514.00	-8.999E-04	%(	6.586E-02 1.81E-02	G
Kr-85		-1.4766E+00					
			513.99	-1.477E+00	%(	1.505E+03 4.14E+02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Y-88	-4.6886E-05						
		1836.01	-4.689E-05	%(P	5.265E-02	7.14E-03	G K
		898.02	-1.865E-02	% P	9.496E-02	2.63E-02	G
NB-94	-1.2816E-02						
		871.10	-1.282E-02	%(	8.063E-02	2.25E-02	G K
		702.50	5.550E-03	&	5.607E-02	1.51E-02	G K
Ag-108M	3.0220E-03						
		722.95	3.022E-03	%(	8.000E-02	2.17E-02	G K
		614.37	-5.437E-02	% P	9.951E-02	3.04E-02	G
		433.93	6.974E-03	%	5.963E-02	1.68E-02	G
CD-109	4.0379E-01						
		88.04	4.038E-01	&(P	2.896E+00	8.59E-01	G
SN-113	2.9034E-03						
		391.71	2.903E-03	&(	1.208E-01	3.45E-02	G K
		255.04	-5.032E-01	%	2.534E+00	7.42E-01	G
SB-125	7.8330E-02						
		427.95	7.833E-02	%(P	1.641E-01	4.94E-02	G K
		600.77	-2.002E-03	% P	3.512E-01	9.45E-02	G
		636.15	-5.543E-02	& P	6.135E-01	1.69E-01	G
		463.51	1.161E-01	% P	5.516E-01	1.56E-01	G
		176.29	7.071E-02	% P	8.016E-01	2.32E-01	G
I-131	5.3931E-03						
		364.48	5.393E-03	&(	6.819E-02	1.91E-02	G K
		636.97	1.961E-01	&	9.181E-01	2.59E-01	G
		284.29	9.896E-02	%	8.212E-01	2.34E-01	G
CS-134	0.0000E+00						
		604.66	0.000E+00	&(	1.048E-01	2.96E-02	G K
		795.76	1.753E-02	%	5.794E-02	1.66E-02	G
		569.29	0.000E+00	&	5.005E-01	1.39E-01	G
		801.84	-3.265E-02	& P	7.821E-01	2.07E-01	G
CS-137	4.4380E-01						
		661.62	4.438E-01	@(	6.824E-02	4.52E-02	G
CE-139	-1.0213E-04						
		165.85	-1.021E-04	&(P	6.369E-02	1.84E-02	G
EU-152	-4.1990E-03						
		121.78	-4.199E-03	%(P	2.445E-01	7.16E-02	G K
		344.30	-1.774E-02	%	1.715E-01	4.84E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		1408.08	0.000E+00	%	1.939E-01	2.63E-02	G
		964.00	2.194E-02	% P	5.428E-01	1.43E-01	G
		1112.07	7.244E-02	%	7.182E-01	1.97E-01	G
		778.90	-5.095E-02	% P	6.326E-01	1.74E-01	G
EU-154	3.4172E-02						
		123.10	3.417E-02	&(P	1.683E-01	5.00E-02	G K
		1274.80	-1.382E-02	&	2.748E-01	7.29E-02	G
		723.30	3.040E-03	% P	3.423E-01	9.08E-02	G
		1004.80	8.557E-02	%	4.650E-01	1.30E-01	G
EU-155	4.2196E-02						
		86.45	4.220E-02	%(P	3.609E-01	1.07E-01	G K
		105.31	4.660E-02	%	4.026E-01	1.19E-01	G
HG-203	-6.4621E-04						
		279.17	-6.462E-04	&(P	6.204E-02	1.75E-02	G K
		72.87	-9.885E-01	%	2.944E+00	8.86E-01	G
		70.83	-1.770E+00	&	5.662E+00	1.70E+00	G
		82.50	-4.143E-01	&	5.795E+00	1.71E+00	G
TL-208	1.4428E-01						
		583.14	1.443E-01	@(P	6.162E-02	2.63E-02	G
		510.72	0.000E+00	%	2.616E-01	7.12E-02	G
PB-212	3.9892E-01						
		238.63	3.989E-01	@(	1.383E-01	5.10E-02	G K
							Energy duplication
		77.11	5.122E-01	%	8.443E-01	2.58E-01	G
		74.81	6.283E-01	& P	1.690E+00	5.08E-01	G
PB-214	4.6078E-01						
		351.99	4.580E-01	(P	1.282E-01	5.63E-02	G K
		295.22	4.661E-01	(	2.690E-01	9.47E-02	G
							Energy duplication
		77.11	8.376E-01	%	1.381E+00	4.22E-01	G
		241.92	1.792E-01	&	8.816E-01	2.61E-01	G
BI-212	3.9938E-01						
		727.17	3.994E-01	%(	5.292E-01	1.73E-01	G K
		1620.56	-7.677E-02	& P	1.686E+00	2.29E-01	G
		785.42	-5.483E-01	& P	4.249E+00	1.19E+00	G
BI-214	4.8367E-01						
		609.32	4.837E-01	(	1.437E-01	7.39E-02	G K
		1764.51	-7.257E-03	% P	5.607E-01	1.35E-01	G
		1120.28	-1.907E-05	&	6.736E-01	1.79E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
RA-224	4.3071E-01						
		241.00	4.307E-01	%(P	1.615E+00	4.79E-01	G
RA-226	6.9406E-01						
		185.99	6.941E-01	%(P	1.559E+00	4.67E-01	G
AC-228	4.1701E-01						
		911.07	4.160E-01	@(P	2.467E-01	1.07E-01	G K
		968.90	4.079E-02	% P	4.364E-01	1.17E-01	G
		338.40	4.194E-01	(	4.468E-01	1.65E-01	G
TH-227	-2.7588E-03						
		236.00	-2.759E-03	%(P	7.001E-01	2.04E-01	G K
		256.25	9.759E-02	&	7.510E-01	2.18E-01	G
PA-234	4.4641E-03						
		98.44	4.464E-03	%(	3.850E-01	1.13E-01	G K
		946.00	-9.897E-04	&	3.750E-01	9.76E-02	G
		131.28	4.827E-02	&	2.930E-01	8.65E-02	G
		94.67	-7.007E-04	%	5.968E-01	1.75E-01	G
		883.24	-1.564E-01	%	7.763E-01	2.21E-01	G
		926.70	7.871E-02	&	7.083E-01	1.93E-01	G
		569.26	0.000E+00	&	7.414E-01	2.05E-01	G
TH-234	1.4998E+00						
		63.29	1.500E+00	&(P	7.247E+00	2.16E+00	G K
		92.80	1.347E+00	%	3.655E+00	1.10E+00	G
		92.38	2.141E+00	% P	4.221E+00	1.28E+00	G
AM-241	6.8322E-02						
		59.54	6.832E-02	&(	1.090E+00	3.22E-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	6.9599E-02	7.1151E-02	4.9174E-01	4.9176E-01	5.690E-01
K-40		1.1555E+01	1.1555E+01	2.3659E+00	2.4531E+00	
MN-54	#A	-7.5989E-04	-7.6277E-04	2.1175E-02	2.1176E-02	6.450E-02
CO-57	#B	-1.7626E-03	-1.7703E-03	7.0018E-02	7.0018E-02	7.928E-02
CO-60	#B	2.8215E-02	2.8233E-02	7.8892E-02	7.8908E-02	9.119E-02
Sr-85	#A	-8.8372E-04	-8.9992E-04	5.4398E-02	5.4398E-02	6.468E-02
Kr-85	#A	-1.4766E+00	-1.4766E+00	1.2408E+03	1.2408E+03	1.505E+03
Y-88	#B	-4.6371E-05	-4.6886E-05	2.8132E-04	2.8133E-04	5.207E-02
NB-94	#B	-1.2816E-02	-1.2816E-02	6.7526E-02	6.7529E-02	8.063E-02
Ag-108M	#B	3.0219E-03	3.0220E-03	6.5033E-02	6.5033E-02	8.000E-02
CD-109	#A	4.0275E-01	4.0379E-01	2.5773E+00	2.5774E+00	2.889E+00
SN-113	#B	2.8738E-03	2.9034E-03	1.0363E-01	1.0363E-01	1.196E-01
SB-125	#B	7.8239E-02	7.8330E-02	1.4833E-01	1.4840E-01	1.639E-01
I-131	#B	4.6581E-03	5.3931E-03	5.7396E-02	5.7396E-02	5.890E-02
CS-134	#B	0.0000E+00	0.0000E+00	8.8707E-02	8.8707E-02	1.046E-01
CS-137	#	4.4375E-01	4.4380E-01	1.3556E-01	1.3783E-01	
CE-139	#A	-1.0126E-04	-1.0213E-04	8.4358E-02	8.4358E-02	6.315E-02
EU-152	#B	-4.1979E-03	-4.1990E-03	9.8193E-01	9.8193E-01	2.445E-01
EU-154	#B	3.4159E-02	3.4172E-02	1.5006E-01	1.5007E-01	1.683E-01
EU-155	#B	4.2169E-02	4.2196E-02	3.2054E-01	3.2055E-01	3.606E-01
HG-203	#B	-6.3008E-04	-6.4621E-04	8.3277E-02	8.3277E-02	6.050E-02
TL-208	#	1.4428E-01	1.4428E-01	7.8811E-02	7.9226E-02	6.162E-02
PB-212	#	3.9892E-01	3.9892E-01	1.5302E-01	1.5465E-01	1.383E-01
PB-214	#	4.6078E-01	4.6078E-01	1.6416E-01	1.6619E-01	1.282E-01
BI-212	#B	3.9938E-01	3.9938E-01	5.1857E-01	5.1905E-01	5.292E-01
BI-214		4.8367E-01	4.8367E-01	2.2135E-01	2.2300E-01	
RA-224	#A	4.3071E-01	4.3071E-01	1.4360E+00	1.4362E+00	1.615E+00
RA-226	#A	6.9406E-01	6.9406E-01	1.4020E+00	1.4026E+00	1.559E+00
AC-228		4.1701E-01	4.1701E-01	2.9370E-01	2.9463E-01	
TH-227	#B	-2.7588E-03	-2.7588E-03	3.4987E-01	3.4987E-01	7.001E-01

PA-234 #B	4.4641E-03	4.4641E-03	3.4045E-01	3.4045E-01	3.850E-01

TH-234 #B	1.4998E+00	1.4998E+00	6.4838E+00	6.4844E+00	7.247E+00
AM-241 #A	6.8321E-02	6.8322E-02	9.6677E-01	9.6678E-01	1.090E+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 (50.2 to 1999.0 keV) 1.2899769E+01 pCi/gm
Total Decayed Activity (50.2 to 1999.0 keV) 1.2899817E+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_19APRIL2006_1412.An1

Sample description
FSS OOL-11-01-010-F

Spectrum Filename: C:\GammaVision\Spectra\102F_19APRIL2006_1412.An1

Acquisition information
Start time: 19-Apr-2006 14:14:30
Live time: 2000
Real time: 2016
Dead time: 0.78 %
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: 1.1180E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.1180E+03) =
8.9445E+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	17-Apr-2006 20:55:00
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. 14 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.6909

***** 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
77.20	140.	26.49	1.50	9.541E-03	77.11	10.700	1.652E+00	PB214
					77.11	17.500	1.010E+00	PB212
77.20	140.	26.49	1.50	9.541E-03	77.11	10.700	1.652E+00	PB214
					77.11	17.500	1.010E+00	PB212
93.04	92.	37.76	1.50	1.333E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	2.784E+00	TH234
186.36	119.	22.30	2.00	1.625E-02	185.99	3.280	2.604E+00	RA226
209.64	40.	36.63	0.91	1.518E-02				
239.05	381.	5.95	1.22	1.378E-02	238.63	43.100	7.739E-01	PB212
					241.92	7.470	4.515E+00	PB214
295.63	111.	19.25	1.15	1.145E-02	295.22	19.200	6.073E-01	PB214
338.55	90.	20.80	1.06	1.006E-02	338.40	12.010	9.004E-01	AC228
352.38	213.	10.64	1.33	9.668E-03	351.99	37.100	7.150E-01	PB214
463.26	38.	30.71	1.02	7.369E-03				
463.26	38.	30.71	1.02	7.369E-03	463.51	10.000	6.072E-01	SB125
511.69	37.	31.44	1.50	6.695E-03	510.72	22.500	2.978E-01	TL208
					513.99	0.004	1.568E+03	Kr85
					514.00	99.270	6.918E-02	Sr85
511.75	40.	25.23	1.50	6.653E-03	510.72	22.500	PBC<MDA	TL208
					513.99	0.004	1.696E+03	Kr85
					514.00	99.270	7.483E-02	Sr85
511.75	40.	25.23	1.50	6.653E-03	510.72	22.500	3.221E-01	TL208
					513.99	0.004	1.696E+03	Kr85
					514.00	99.270	7.483E-02	Sr85
583.96	108.	13.87	1.41	5.882E-03	583.14	86.000	2.572E-01	TL208
610.08	112.	12.17	1.28	5.643E-03	609.32	46.090	5.190E-01	BI214
662.53	37.	25.97	0.87	5.223E-03	661.62	84.620	9.998E-02	CS137

728.10	28.	24.23	1.06	4.788E-03	727.17	11.800	6.025E-01	BI212

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
912.33	96.	14.91	0.95	3.917E-03	911.07	29.000	1.020E+00	AC228
969.73	66.	19.28	1.07	3.715E-03	964.00	14.580	1.461E+00	EU152
					968.90	17.460	1.228E+00	AC228
1462.66	309.	5.85	1.91	2.618E-03	1460.75	10.700	1.331E+01	K40
1766.50	12.	40.87	2.24	2.225E-03	1764.51	15.920	PBC<MDA	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
418.89	209.64	94.	40.	0.020	109.88	0.914	NP-239	
477.73	239.20	66.	381.	0.190	17.84	1.215	PB-212	D
926.27	463.26	40.	38.	0.019	92.12	1.025	SB-125	l
2243.55	1121.57	21.	34.	0.017	88.60	0.994	TA-182	l

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-214	153.80	77.11	614.	140.	0.070	79.48	1.500D
PB-212	153.80	77.11	614.	140.	0.070	79.48	1.500D
TH-234	185.65	93.04	559.	92.	0.046	113.27	1.500s
RA-226	372.34	186.36	215.	115.	0.057	66.91	2.005s
PB-212	477.74	239.05	192.	324.	0.162	24.64	1.500s
PB-214	477.74	239.06	85.	355.	0.178	19.37	1.500
PB-214	591.16	295.75	114.	107.	0.054	51.28	1.500
AC-228	676.78	338.55	84.	90.	0.045	62.40	1.057s
PB-214	704.50	352.41	64.	167.	0.084	30.77	1.500
TL-208	1023.16	511.69	49.	37.	0.019	94.31	1.500s
Kr-85	1023.28	511.75	31.	40.	0.020	75.69	1.500s
Sr-85	1023.28	511.75	31.	40.	0.020	75.69	1.500s
TL-208	1167.80	583.99	33.	94.	0.047	40.14	1.499
BI-214	1220.01	610.08	27.	112.	0.056	36.52	1.282s
CS-137	1324.97	662.53	22.	37.	0.018	77.92	0.874s
BI-212	1456.15	728.10	9.	28.	0.014	72.68	1.057
AC-228	1824.81	912.33	23.	96.	0.048	44.72	0.952s
AC-228	1939.67	969.73	24.	66.	0.033	57.85	1.068s
K-40	2926.22	1462.66	5.	309.	0.154	17.54	1.915
BI-214	3534.47	1766.50	6.	12.	0.006	122.60	2.237s

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		-3.5057E-02					
			477.56	-3.506E-02	%(	5.371E-01 1.51E-01	G
K-40		1.3313E+01					
			1460.75	1.331E+01	(P	5.727E-01 7.79E-01	G
MN-54		-9.0293E-03					
			834.81	-9.029E-03	%(P	8.268E-02 2.32E-02	G
CO-57		-1.1668E-02					
			122.07	-1.167E-02	%(	8.083E-02 2.40E-02	G K
			136.43	-1.253E-01	%	5.798E-01 1.73E-01	G
CO-60		1.8567E-03					
			1332.51	1.857E-03	&(P	9.861E-02 2.65E-02	G K
			1173.23	-1.792E-02	%	1.111E-01 3.17E-02	G K
Sr-85		7.4834E-02					
			514.00	7.483E-02	&(	5.359E-02 1.89E-02	G
Kr-85		1.6961E+03					
			513.99	1.696E+03	&(	1.215E+03 4.28E+02	G
Y-88		-3.7582E-05					
			1836.01	-3.758E-05	%(P	9.636E-02 2.45E-02	G K
			898.02	1.975E-02	& P	7.265E-02 2.08E-02	G
NB-94		-1.2638E-02					
			871.10	-1.264E-02	%(	6.794E-02 1.92E-02	G K
			702.50	3.398E-02	&	6.223E-02 1.92E-02	G K
Ag-108M		2.2128E-02					
			722.95	2.213E-02	%(	7.230E-02 2.12E-02	G K
			614.37	-2.016E-02	& P	8.706E-02 2.54E-02	G
			433.93	1.624E-02	&	5.234E-02 1.54E-02	G
CD-109		1.4104E+00					
			88.04	1.410E+00	&(P	2.891E+00 8.77E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SN-113	-7.1194E-03						
		391.71	-7.119E-03	&(	8.741E-02	2.50E-02	G K
		255.04	-9.199E-01	%	3.065E+00	9.16E-01	G
SB-125	-5.4120E-03						
		427.95	-5.412E-03	%(P	1.658E-01	4.55E-02	G K
		600.77	-4.376E-02	& P	3.379E-01	9.55E-02	G
		636.15	-5.822E-02	& P	5.019E-01	1.40E-01	G
		463.51	3.970E-01	% P	5.828E-01	1.81E-01	G
		176.29	-1.574E-01	% P	8.633E-01	2.54E-01	G
I-131	2.1376E-02						
		364.48	2.138E-02	%(	6.821E-02	2.02E-02	G K
		636.97	1.347E-01	%	8.356E-01	2.35E-01	G
		284.29	1.963E-01	&	8.728E-01	2.56E-01	G
CS-134	1.7964E-04						
		604.66	1.796E-04	&(	7.111E-02	1.98E-02	G K
		795.76	2.258E-02	%	8.730E-02	2.53E-02	G
		569.29	-4.337E-03	%	3.400E-01	9.28E-02	G
		801.84	-7.237E-04	% P	7.576E-01	2.04E-01	G
CS-137	9.9983E-02						
		661.62	9.998E-02	(	6.765E-02	2.60E-02	G
CE-139	3.1503E-04						
		165.85	3.150E-04	&(P	6.183E-02	1.80E-02	G
EU-152	-3.4311E-02						
		121.78	-3.431E-02	%(P	2.424E-01	7.20E-02	G K
		344.30	4.874E-02	%	1.664E-01	4.91E-02	G
		1408.08	0.000E+00	%	4.140E-01	1.08E-01	G
		964.00	1.630E-02	% P	4.624E-01	1.23E-01	G
		1112.07	-6.649E-02	%	7.290E-01	2.04E-01	G
		778.90	1.200E-01	% P	5.140E-01	1.48E-01	G
EU-154	-2.0979E-02						
		123.10	-2.098E-02	%(P	1.689E-01	5.02E-02	G K
		1274.80	-5.321E-02	%	2.815E-01	7.99E-02	G
		723.30	9.795E-02	% P	3.275E-01	9.55E-02	G
		1004.80	-8.654E-03	&	4.071E-01	1.09E-01	G
EU-155	1.1945E-01						
		86.45	1.194E-01	%(P	3.615E-01	1.09E-01	G K
		105.31	5.533E-02	&	3.777E-01	1.13E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
HG-203	-9.2357E-04						
		279.17	-9.236E-04	&(P	4.653E-02	1.31E-02	G K
		72.87	-2.838E-01	%	3.066E+00	9.15E-01	G
		70.83	-1.120E+00	&	5.751E+00	1.72E+00	G
		82.50	0.000E+00	%	6.574E+00	1.95E+00	G
TL-208	2.4024E-01						
		583.14	2.252E-01	(P	7.077E-02	3.03E-02	G
		510.72	2.978E-01	*(	2.848E-01	9.36E-02	G
PB-212	6.5762E-01						
		238.63	6.576E-01	@(	1.366E-01	5.40E-02	G K
							Energy duplication
		77.11	1.010E+00	+	8.553E-01	2.68E-01	G
		74.81	5.055E-01	& P	1.844E+00	5.54E-01	G
PB-214	5.7104E-01						
		351.99	5.624E-01	(P	1.348E-01	5.78E-02	G K
		295.22	5.878E-01	(	2.879E-01	1.00E-01	G
							Energy duplication
		77.11	1.652E+00	+	1.399E+00	4.38E-01	G
		241.92	4.210E+00	+	5.424E-01	2.72E-01	G
BI-212	6.0255E-01						
		727.17	6.025E-01	(	3.533E-01	1.46E-01	G K
		1620.56	5.471E-02	% P	2.560E+00	6.25E-01	G
		785.42	1.146E+00	% P	4.038E+00	1.18E+00	G
BI-214	4.9200E-01						
		609.32	5.190E-01	@(	1.254E-01	6.33E-02	G K
		1764.51	4.138E-01	&(P	4.959E-01	1.70E-01	G
		1120.28	-1.568E-01	%	6.832E-01	1.97E-01	G
RA-224	7.5717E-01						
		241.00	7.572E-01	&(P	1.585E+00	4.80E-01	G
RA-226	2.6040E+00						
		185.99	2.604E+00	*(P	1.610E+00	6.04E-01	G
AC-228	1.0576E+00						
		911.07	1.020E+00	(P	2.665E-01	1.53E-01	G K
		968.90	1.228E+00	(P	4.759E-01	2.37E-01	G
		338.40	9.004E-01	@(	4.544E-01	1.87E-01	G
TH-227	-1.1214E-01						
		236.00	-1.121E-01	%(P	5.116E-01	1.52E-01	G K
		256.25	-2.456E-01	%	8.800E-01	2.62E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PA-234	7.7085E-02						
		98.44	7.709E-02	%(	3.464E-01	1.04E-01	G K
		946.00	4.426E-03	%	3.838E-01	1.04E-01	G
		131.28	1.703E-01	%	2.999E-01	9.15E-02	G
		94.67	-1.144E-01	&	6.770E-01	2.02E-01	G
		883.24	8.975E-02	&	4.848E-01	1.35E-01	G
		926.70	6.756E-02	%	5.712E-01	1.56E-01	G
		569.26	2.648E-04	%	5.289E-01	1.45E-01	G
TH-234	1.6601E+00						
		63.29	7.957E-01	&(P	6.475E+00	1.93E+00	G K
		92.80	2.784E+00	(	3.411E+00	1.05E+00	G
		92.38	2.690E+00	& P	4.143E+00	1.27E+00	G
AM-241	1.3901E-01						
		59.54	1.390E-01	&(	8.592E-01	2.55E-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	-3.4282E-02	-3.5057E-02	4.5348E-01	4.5348E-01	5.252E-01
K-40		1.3313E+01	1.3313E+01	2.3366E+00	2.4531E+00	
MN-54	#A	-8.9948E-03	-9.0293E-03	7.9654E-02	7.9655E-02	8.236E-02
CO-57	#B	-1.1616E-02	-1.1668E-02	7.2124E-02	7.2127E-02	8.047E-02
CO-60	#B	1.8555E-03	1.8567E-03	7.9611E-02	7.9611E-02	9.854E-02
Sr-85	#	7.3469E-02	7.4834E-02	5.6643E-02	5.6799E-02	5.261E-02
Kr-85	#	1.6961E+03	1.6961E+03	1.2838E+03	1.2873E+03	1.215E+03
Y-88	#B	-3.7163E-05	-3.7582E-05	9.6580E-04	9.6580E-04	9.529E-02
NB-94	#B	-1.2638E-02	-1.2638E-02	5.7549E-02	5.7554E-02	6.794E-02
Ag-108M	#B	2.2127E-02	2.2128E-02	6.3493E-02	6.3505E-02	7.230E-02
CD-109	#A	1.4066E+00	1.4104E+00	2.6298E+00	2.6309E+00	2.883E+00
SN-113	#B	-7.0460E-03	-7.1194E-03	7.5128E-02	7.5129E-02	8.651E-02
SB-125	#B	-5.4056E-03	-5.4120E-03	5.0812E+00	5.0812E+00	1.656E-01
I-131	#B	1.8427E-02	2.1376E-02	6.0552E-02	6.0563E-02	5.880E-02
CS-134	#B	1.7936E-04	1.7964E-04	5.9393E-02	5.9393E-02	7.100E-02
CS-137	#	9.9972E-02	9.9983E-02	7.7903E-02	7.8104E-02	
CE-139	#A	3.1231E-04	3.1503E-04	5.4080E-02	5.4080E-02	6.130E-02
EU-152	#B	-3.4302E-02	-3.4311E-02	2.4505E-01	2.4505E-01	2.423E-01
EU-154	#B	-2.0971E-02	-2.0979E-02	1.5581E-01	1.5581E-01	1.689E-01
EU-155	#B	1.1937E-01	1.1945E-01	3.2614E-01	3.2621E-01	3.613E-01
HG-203	#B	-9.0021E-04	-9.2357E-04	5.0725E-02	5.0725E-02	4.535E-02
TL-208	#	2.4024E-01	2.4024E-01	9.6857E-02	9.7791E-02	7.077E-02
PB-212	#	6.5762E-01	6.5762E-01	1.6204E-01	1.6619E-01	1.366E-01
PB-214	#	5.7104E-01	5.7104E-01	1.7085E-01	1.7383E-01	1.348E-01
BI-212		6.0255E-01	6.0255E-01	4.3795E-01	4.3926E-01	
BI-214	#	4.9200E-01	4.9200E-01	1.7969E-01	1.8179E-01	
RA-224	#A	7.5717E-01	7.5717E-01	1.4397E+00	1.4403E+00	1.585E+00
RA-226	#	2.6040E+00	2.6040E+00	1.8098E+00	1.8157E+00	
AC-228		1.0576E+00	1.0576E+00	3.3912E-01	3.4427E-01	
TH-227	#B	-1.1214E-01	-1.1214E-01	4.7316E-01	4.7320E-01	5.116E-01
PA-234	#B	7.7085E-02	7.7085E-02	3.1088E-01	3.1091E-01	3.464E-01
TH-234	#B	1.6601E+00	1.6601E+00	1.8805E+00	1.8827E+00	6.475E+00
AM-241	#A	1.3901E-01	1.3901E-01	7.6640E-01	7.6644E-01	8.592E-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: 102F_19APRIL2006_1412.An1

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

Total Activity (295.2 to 1999.0 keV) 1.8168644E+01 pCi/gm
Total Decayed Activity (295.2 to 1999.0 keV) 1.8168659E+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_19APRIL2006_1455.An1

Sample description
FSS OOL-11-01-014-F

Spectrum Filename: C:\GammaVision\Spectra\102F_19APRIL2006_1455.An1

Acquisition information

Start time:	19-Apr-2006 14:55:59
Live time:	2000
Real time:	2019
Dead time:	0.96 %
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:	1.3130E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.3130E+03) = 7.6161E+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	19-Apr-2006 20:28:00
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. 14 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.5528

***** 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
77.24	159.	25.95	1.50	9.541E-03	77.11	10.700	1.600E+00	PB214
					77.11	17.500	9.783E-01	PB212
77.24	159.	25.95	1.50	9.541E-03	77.11	10.700	1.600E+00	PB214
					77.11	17.500	9.783E-01	PB212
186.46	64.	37.82	1.05	1.625E-02	185.99	3.280	PBC<MDA	RA226
210.37	124.	23.41	0.91	1.514E-02				
239.00	461.	5.93	1.22	1.379E-02	238.63	43.100	7.969E-01	PB212
242.03	86.	26.38	1.22	1.365E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	8.704E-01	PB214
295.61	145.	14.39	0.92	1.145E-02	295.22	19.200	6.775E-01	PB214
338.52	120.	20.12	1.07	1.006E-02	338.40	12.010	1.021E+00	AC228
352.43	221.	13.73	1.30	9.667E-03	351.99	37.100	6.323E-01	PB214
462.93	48.	33.66	0.74	7.374E-03				
462.93	48.	33.66	0.74	7.374E-03	463.51	10.000	6.463E-01	SB125
511.57	90.	21.77	1.09	6.684E-03	510.72	22.500	6.170E-01	TL208
566.34	20.	40.73	1.50	6.027E-03	569.26	10.400	PBC<MDA	PA234
					569.29	15.430	2.224E-01	CS134
584.06	162.	11.44	1.62	5.881E-03	583.14	86.000	3.287E-01	TL208
610.25	155.	13.39	1.40	5.641E-03	609.32	46.090	6.135E-01	BI214
662.53	153.	13.09	1.38	5.223E-03	661.62	84.620	3.563E-01	CS137
728.31	44.	28.67	1.78	4.787E-03	727.17	11.800	8.023E-01	BI212
912.17	101.	15.56	2.04	3.918E-03	911.07	29.000	9.146E-01	AC228
970.14	62.	22.53	2.09	3.718E-03	968.90	17.460	9.761E-01	AC228
1174.95	70.	21.68	0.86	3.157E-03	1173.23	99.860	2.279E-01	CO60
1334.43	44.	19.48	1.96	2.834E-03	1332.51	99.980	1.613E-01	CO60
1462.75	413.	4.92	1.67	2.618E-03	1460.75	10.700	1.515E+01	K40
1765.82	22.	21.32	2.62	2.225E-03	1764.51	15.920	6.366E-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	
372.52	186.46	239.	64.	0.032	113.46	1.051	PA-234	l
420.35	210.37	265.	124.	0.062	70.23	0.911	TH-227	s
477.64	238.97	143.	461.	0.230	17.80	1.215	PB-212	D
483.70	242.00	216.	86.	0.043	79.14	1.217	PB-214	D
925.61	462.93	78.	48.	0.024	100.99	0.744	AC-228	l

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-214	153.80	77.11	769.	159.	0.079	77.85	1.500D
PB-212	153.80	77.11	769.	159.	0.079	77.85	1.500D
PB-212	477.70	239.04	368.	394.	0.197	25.57	1.500s
PB-214	591.01	295.68	169.	142.	0.071	46.24	1.500
AC-228	676.71	338.52	149.	120.	0.060	60.37	1.073
PB-214	704.63	352.47	114.	194.	0.097	31.76	1.500
TL-208	1022.92	511.57	90.	90.	0.045	65.30	1.091
PA-234	1132.50	566.34	23.	20.	0.010	122.18	1.499s
TL-208	1167.96	584.06	59.	162.	0.081	34.33	1.619
BI-214	1220.35	610.25	73.	155.	0.078	40.17	1.401
CS-137	1324.96	662.53	64.	153.	0.077	39.26	1.377
BI-212	1456.57	728.31	40.	44.	0.022	86.00	1.776
AC-228	1824.47	912.17	38.	101.	0.051	46.67	2.038s
AC-228	1940.49	970.14	36.	62.	0.031	67.59	2.087s
CO-60	2350.37	1174.95	44.	70.	0.035	65.03	0.861s
CO-60	2669.57	1334.43	15.	44.	0.022	58.44	1.959s
K-40	2926.42	1462.76	0.	396.	0.198	15.04	2.042
BI-214	3533.10	1765.82	0.	22.	0.011	63.96	2.622s

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		-2.0050E-01					
			477.56	-2.005E-01	%(	6.675E-01 1.98E-01	G
K-40		1.4551E+01					
			1460.75	1.455E+01	(P	2.705E-01 7.30E-01	G
MN-54		-1.1143E-02					
			834.81	-1.114E-02	&(P	6.850E-02 1.94E-02	G
CO-57		1.7268E-02					
			122.07	1.727E-02	&(	8.055E-02 2.41E-02	G K
			136.43	4.117E-02	%	5.055E-01 1.50E-01	G
CO-60		1.9458E-01					
			1332.51	1.613E-01	&(P	7.624E-02 3.15E-02	G K
			1173.23	2.279E-01	(	1.100E-01 4.95E-02	G K
Sr-85		-3.6801E-03					
			514.00	-3.680E-03	%(	7.259E-02 2.09E-02	G
Kr-85		-8.5306E+01					
			513.99	-8.531E+01	%(	1.680E+03 4.83E+02	G
Y-88		-3.1597E-05					
			1836.01	-3.160E-05	&(P	3.548E-02 4.81E-03	G K
			898.02	6.464E-03	% P	6.462E-02 1.77E-02	G
NB-94		1.3450E-02					
			871.10	1.345E-02	%(	6.810E-02 1.95E-02	G K
			702.50	1.389E-02	&	6.189E-02 1.79E-02	G K
Ag-108M		1.0228E-02					
			722.95	1.023E-02	%(	7.849E-02 2.24E-02	G K
			614.37	-3.216E-02	% P	9.735E-02 2.90E-02	G
			433.93	-1.029E-02	%	6.956E-02 2.03E-02	G
CD-109		-4.9548E-01					
			88.04	-4.955E-01	&(P	3.136E+00 9.38E-01	G
SN-113		7.4364E-03					
			391.71	7.436E-03	%(	8.246E-02 2.38E-02	G K
			255.04	2.882E-01	&	2.536E+00 7.46E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	-4.3819E-02						
		427.95	-4.382E-02	%(P	2.216E-01	6.47E-02	G K
		600.77	1.047E-01	% P	3.179E-01	9.40E-02	G
		636.15	4.862E-02	% P	4.966E-01	1.40E-01	G
		463.51	4.242E-01	% P	6.046E-01	1.88E-01	G
		176.29	-3.956E-02	% P	9.131E-01	2.68E-01	G
I-131	2.5480E-02						
		364.48	2.548E-02	%(	5.162E-02	1.57E-02	G K
		636.97	1.971E-01	%	7.834E-01	2.28E-01	G
		284.29	-1.873E-01	%	8.678E-01	2.57E-01	G
CS-134	-1.2339E-02						
		604.66	-1.234E-02	&(	7.229E-02	2.10E-02	G K
		795.76	2.758E-02	%	7.049E-02	2.10E-02	G
		569.29	2.036E-01	%	2.904E-01	9.22E-02	G
		801.84	1.894E-01	& P	6.934E-01	2.01E-01	G
CS-137	3.5631E-01						
		661.62	3.563E-01	(	9.287E-02	4.67E-02	G
CE-139	-9.7394E-03						
		165.85	-9.739E-03	%(P	7.556E-02	2.25E-02	G
EU-152	4.7441E-02						
		121.78	4.744E-02	%(P	2.435E-01	7.28E-02	G K
		344.30	-4.617E-02	%	2.044E-01	6.04E-02	G
		1408.08	-5.743E-02	%	4.064E-01	1.13E-01	G
		964.00	6.227E-03	% P	5.295E-01	1.45E-01	G
		1112.07	6.821E-02	&	6.138E-01	1.72E-01	G
		778.90	-3.694E-02	% P	4.935E-01	1.37E-01	G
EU-154	-3.2458E-02						
		123.10	-3.246E-02	%(P	1.798E-01	5.38E-02	G K
		1274.80	-1.503E-02	%	2.590E-01	7.15E-02	G
		723.30	4.229E-02	% P	3.370E-01	9.56E-02	G
		1004.80	9.193E-02	%	3.688E-01	1.06E-01	G
EU-155	-3.4671E-02						
		86.45	-3.467E-02	%(P	3.691E-01	1.10E-01	G K
		105.31	7.054E-02	%	3.701E-01	1.11E-01	G
HG-203	-1.2044E-04						
		279.17	-1.204E-04	&(P	6.940E-02	2.02E-02	G K
		72.87	2.072E-02	&	2.989E+00	8.91E-01	G
		70.83	2.515E+00	%	4.634E+00	1.41E+00	G
		82.50	4.668E-01	&	5.339E+00	1.59E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	3.2874E-01						
		583.14	3.287E-01	(P	7.836E-02	3.78E-02	G
		510.72	6.170E-01	+	3.201E-01	1.34E-01	G
PB-212	6.8224E-01						
		238.63	6.822E-01	@(	1.592E-01	5.81E-02	G K
							Energy duplication
		77.11	9.783E-01	+	8.132E-01	2.54E-01	G
		74.81	8.430E-01	& P	1.657E+00	5.03E-01	G
PB-214	5.9266E-01						
		351.99	5.552E-01	(P	1.506E-01	5.89E-02	G K
		295.22	6.651E-01	(	2.961E-01	1.03E-01	G
							Energy duplication
		77.11	1.600E+00	+	1.330E+00	4.15E-01	G
		241.92	6.232E-01	%	9.232E-01	2.83E-01	G
BI-212	8.0234E-01						
		727.17	8.023E-01	(	5.848E-01	2.30E-01	G K
		1620.56	2.924E-01	& P	2.420E+00	6.36E-01	G
		785.42	1.595E+00	% P	3.128E+00	9.56E-01	G
BI-214	6.1941E-01						
		609.32	6.135E-01	(	1.679E-01	8.23E-02	G K
		1764.51	6.366E-01	(P	2.141E-01	1.36E-01	G
		1120.28	0.000E+00	%	8.276E-01	2.34E-01	G
RA-224	1.2708E+00						
		241.00	1.271E+00	&(P	1.775E+00	5.45E-01	G
RA-226	1.0482E+00						
		185.99	1.048E+00	%(P	1.718E+00	5.24E-01	G
AC-228	9.5490E-01						
		911.07	9.146E-01	@(P	2.842E-01	1.43E-01	G K
		968.90	9.761E-01	(P	4.889E-01	2.20E-01	G
		338.40	1.021E+00	(	5.078E-01	2.06E-01	G
TH-227	-3.0379E-01						
		236.00	-3.038E-01	&(P	7.171E-01	2.17E-01	G K
		256.25	1.625E-01	%	8.082E-01	2.40E-01	G
PA-234	9.4526E-02						
		98.44	-3.046E-03	%(	3.634E-01	1.08E-01	G K
		946.00	9.507E-02	&	3.408E-01	9.90E-02	G
		131.28	6.601E-02	%	3.333E-01	9.97E-02	G
		94.67	-2.183E-01	%	6.753E-01	2.04E-01	G
		883.24	0.000E+00	%	5.556E-01	1.51E-01	G
		926.70	1.580E-01	%	6.554E-01	1.89E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 3.300E-01 ?(  4.151E-01 1.34E-01 G

TH-234       1.4376E+00
                           63.29 1.438E+00 %(P 6.656E+00 1.99E+00 G K
                           92.80 1.798E+00 %   3.382E+00 1.03E+00 G
                           92.38 2.074E+00 % P 4.004E+00 1.22E+00 G

AM-241      -8.1928E-02
                           59.54-8.193E-02 &(  1.015E+00 3.02E-01 G
   ( - This peak used in the nuclide activity average.

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

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

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** 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	-2.0110E-01	-2.0050E-01	5.9488E-01	5.9499E-01	6.695E-01
K-40		1.4551E+01	1.4551E+01	2.1899E+00	2.3372E+00	2.705E-01
MN-54	#A	-1.1149E-02	-1.1143E-02	6.3879E-02	6.3882E-02	6.853E-02
CO-57	#B	1.7278E-02	1.7268E-02	7.2346E-02	7.2352E-02	8.060E-02
CO-60		1.9459E-01	1.9458E-01	8.5126E-02	8.5823E-02	7.625E-02

Sr-85	#A	-3.6892E-03	-3.6801E-03	6.2668E-02	6.2669E-02	7.277E-02
Kr-85	#A	-8.5307E+01	-8.5306E+01	1.4503E+03	1.4503E+03	1.680E+03
Y-88	#B	-3.1644E-05	-3.1597E-05	1.8958E-04	1.8959E-04	3.553E-02
NB-94	#B	1.3450E-02	1.3450E-02	5.8449E-02	5.8454E-02	6.810E-02
Ag-108M	#B	1.0228E-02	1.0228E-02	6.7272E-02	6.7275E-02	7.849E-02
CD-109	#A	-4.9566E-01	-4.9548E-01	3.2121E+00	3.2122E+00	3.137E+00
SN-113	#B	7.4467E-03	7.4364E-03	7.1402E-02	7.1403E-02	8.257E-02
SB-125	#B	-4.3826E-02	-4.3819E-02	2.3707E-01	2.3708E-01	2.217E-01
I-131	#B	2.5991E-02	2.5480E-02	4.7070E-02	4.7092E-02	5.265E-02
CS-134	#B	-1.2341E-02	-1.2339E-02	6.2901E-02	6.2905E-02	7.230E-02
CS-137		3.5631E-01	3.5631E-01	1.3990E-01	1.4132E-01	
CE-139	#A	-9.7507E-03	-9.7394E-03	7.2101E-02	7.2103E-02	7.565E-02
EU-152	#B	4.7443E-02	4.7441E-02	2.1850E-01	2.1852E-01	2.435E-01
EU-154	#B	-3.2460E-02	-3.2458E-02	1.6439E-01	1.6440E-01	1.798E-01
EU-155	#B	-3.4674E-02	-3.4671E-02	5.9736E-01	5.9736E-01	3.692E-01
HG-203	#B	-1.2085E-04	-1.2044E-04	5.5178E-01	5.5178E-01	6.963E-02
TL-208		3.2874E-01	3.2874E-01	1.1313E-01	1.1463E-01	
PB-212	#	6.8224E-01	6.8224E-01	1.7442E-01	1.7857E-01	1.592E-01
PB-214	#	5.9266E-01	5.9266E-01	1.6634E-01	1.6963E-01	1.506E-01
BI-212		8.0234E-01	8.0234E-01	6.8999E-01	6.9146E-01	
BI-214		6.1941E-01	6.1941E-01	2.3458E-01	2.3714E-01	
RA-224	#A	1.2708E+00	1.2708E+00	1.6356E+00	1.6372E+00	1.775E+00
RA-226	#A	1.0482E+00	1.0482E+00	1.5706E+00	1.5718E+00	1.718E+00
AC-228		9.5490E-01	9.5490E-01	3.2470E-01	3.2910E-01	
TH-227	#B	-3.0379E-01	-3.0379E-01	6.5845E-01	6.5867E-01	7.171E-01
PA-234	#B	9.4526E-02	9.4526E-02	1.1550E-01	1.1561E-01	3.634E-01
TH-234	#B	1.4376E+00	1.4376E+00	5.9843E+00	5.9849E+00	6.656E+00
AM-241	#A	-8.1928E-02	-8.1928E-02	9.0707E-01	9.0708E-01	1.015E+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 (295.2 to 1999.0 keV) 1.7807638E+01 pCi/gm
Total Decayed Activity (295.2 to 1999.0 keV) 1.7807617E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JJM

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

Sample description
FSS OOL-11-01-004-F

Spectrum Filename: C:\GammaVision\Spectra\102F_19APRIL2006_1541.An1

Acquisition information
Start time: 19-Apr-2006 15:41:21
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: 1.5390E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.5390E+03) =
6.4977E+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	17-Apr-2006 21:30:00
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. 16 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.5590

***** 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	101.	40.94	1.50	8.847E-03				
74.90	101.	40.94	1.50	8.847E-03	74.81	9.600	PBC<MDA	PB212
77.17	187.	21.97	1.50	9.541E-03	77.11	10.700	1.610E+00	PB214
					77.11	17.500	9.844E-01	PB212
77.17	187.	21.97	1.50	9.541E-03	77.11	10.700	1.610E+00	PB214
					77.11	17.500	9.844E-01	PB212
87.64	117.	36.53	1.19	1.226E-02	86.45	32.740	PBC<MDA	EU155
					88.04	3.790	PBC<MDA	CD109
186.43	106.	27.42	1.52	1.625E-02	185.99	3.280	1.679E+00	RA226
210.01	79.	32.62	1.00	1.516E-02				
239.06	611.	4.77	1.22	1.379E-02	238.63	43.100	9.011E-01	PB212
241.96	89.	28.69	1.22	1.365E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	7.645E-01	PB214
271.15	71.	27.95	1.73	1.239E-02				
277.65	48.	39.25	1.27	1.213E-02				
295.79	139.	19.79	0.98	1.144E-02	295.22	19.200	5.544E-01	PB214
329.14	42.	39.28	1.44	1.034E-02				
338.64	140.	16.54	1.57	1.005E-02	338.40	12.010	1.017E+00	AC228
352.53	220.	10.44	1.47	9.664E-03	351.99	37.100	5.373E-01	PB214
511.73	66.	21.55	0.92	6.682E-03	510.72	22.500	3.859E-01	TL208
583.97	180.	12.18	1.28	5.882E-03	583.14	86.000	3.110E-01	TL208
610.24	165.	11.64	1.25	5.641E-03	609.32	46.090	5.564E-01	BI214
662.75	172.	13.79	1.22	5.221E-03	661.62	84.620	3.423E-01	CS137
728.31	42.	26.11	1.38	4.794E-03	727.17	11.800	6.488E-01	BI212
796.45	22.	38.08	1.60	4.420E-03	795.76	85.400	PBC<MDA	CS134
912.52	128.	14.37	1.57	3.916E-03	911.07	29.000	9.833E-01	AC228
969.99	108.	18.32	1.86	3.714E-03				

1121.88	49.	27.58	0.78	3.283E-03	1120.28	15.040	8.642E-01	BI214
1334.60	23.	24.97	1.09	2.830E-03				
1462.85	468.	4.62	2.05	2.618E-03	1460.75	10.700	1.465E+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	
174.85	87.64	684.	117.	0.058	109.60	1.185	PB-214	l
419.63	210.01	234.	79.	0.040	97.85	1.001	NP-239	M
477.75	239.06	119.	611.	0.305	14.32	1.215	PB-212	D
483.55	241.95	280.	89.	0.044	86.08	1.217	PB-214	D
541.95	271.15	142.	71.	0.036	83.86	1.731	AC-228	sM
554.95	277.65	121.	64.	0.032	82.56	1.270	NP-239	M
657.95	329.14	94.	42.	0.021	117.85	1.437	LA-140	sM
1940.18	969.99	47.	120.	0.060	36.45	1.861	AC-228	sM
2669.89	1334.60	2.	25.	0.012	66.41	1.093	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	752.	187.	0.094	65.92	1.500D
PB-212	153.80	77.11	752.	187.	0.094	65.92	1.500D
RA-226	372.34	186.37	346.	83.	0.042	95.12	1.500s
PB-212	477.68	239.02	350.	550.	0.275	19.29	1.500
PB-214	591.14	295.74	168.	115.	0.058	55.25	1.500
AC-228	677.29	338.81	126.	113.	0.057	50.78	1.500
PB-214	704.53	352.42	125.	189.	0.095	33.12	1.500
TL-208	1023.25	511.73	53.	66.	0.033	64.64	0.918s
TL-208	1167.78	583.97	84.	179.	0.090	36.53	1.280
BI-214	1220.33	610.24	60.	165.	0.083	34.93	1.254s
CS-137	1325.40	662.75	88.	172.	0.086	41.38	1.224
BI-212	1456.57	728.31	32.	42.	0.021	78.32	1.384
CS-134	1592.91	796.45	24.	22.	0.011	114.25	1.601s
AC-228	1825.11	912.48	25.	95.	0.048	37.87	1.679
BI-214	2244.15	1121.88	36.	49.	0.024	82.73	0.781s
K-40	2926.62	1462.85	2.	456.	0.228	14.09	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		-1.2983E-02					
			477.56	-1.298E-02	%(	5.684E-01 1.63E-01	G
K-40		1.4289E+01					
			1460.75	1.429E+01	(P	2.709E-01 6.71E-01	G
MN-54		-4.4414E-04					
			834.81	-4.441E-04	%(P	6.748E-02 1.87E-02	G
CO-57		-1.4301E-02					
			122.07	-1.430E-02	%(	6.467E-02 1.93E-02	G K
			136.43	-2.299E-01	%	5.504E-01 1.66E-01	G
CO-60		-1.3291E-02					
			1332.51	-1.329E-02	%(P	8.273E-02 2.34E-02	G K
			1173.23	-1.701E-02	&	9.313E-02 2.69E-02	G K
Sr-85		-7.8433E-03					
			514.00	-7.843E-03	%(	5.833E-02 1.69E-02	G
Kr-85		-1.4116E+02					
			513.99	-1.412E+02	%(	1.180E+03 3.39E+02	G
Y-88		-2.7307E-05					
			1836.01	-2.731E-05	%(P	3.066E-02 4.16E-03	G K
			898.02	9.809E-03	% P	6.526E-02 1.84E-02	G
NB-94		1.0599E-02					
			871.10	1.060E-02	&(	5.383E-02 1.53E-02	G K
			702.50	3.453E-03	%	5.278E-02 1.48E-02	G K
Ag-108M		8.7831E-03					
			722.95	8.783E-03	%(	6.057E-02 1.72E-02	G K
			614.37	-3.042E-02	% P	8.203E-02 2.45E-02	G
			433.93	-3.720E-03	&	4.436E-02 1.26E-02	G
CD-109		1.6052E+00					
			88.04	1.605E+00	%(P	2.425E+00 7.41E-01	G
SN-113		2.0089E-02					
			391.71	2.009E-02	%(	7.125E-02 2.11E-02	G K
			255.04	-3.648E-01	%	2.308E+00 6.82E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	5.5059E-02						
		427.95	5.506E-02	%(P	1.299E-01	3.89E-02	G K
		600.77	-6.243E-02	% P	3.044E-01	8.83E-02	G
		636.15	8.594E-02	% P	4.062E-01	1.17E-01	G
		463.51	2.387E-01	% P	5.506E-01	1.65E-01	G
		176.29	5.632E-02	% P	7.638E-01	2.26E-01	G
I-131	5.0023E-03						
		364.48	5.002E-03	%(	6.511E-02	1.88E-02	G K
		636.97	8.193E-02	&	8.138E-01	2.30E-01	G
		284.29	2.167E-01	&	8.105E-01	2.41E-01	G
CS-134	2.9349E-02						
		604.66	1.061E-02	%(	5.246E-02	1.52E-02	G K
		795.76	5.077E-02	(	5.899E-02	1.93E-02	G
		569.29	1.210E-01	%	3.869E-01	1.15E-01	G
		801.84	-1.165E-03	% P	9.865E-01	2.80E-01	G
CS-137	3.4232E-01						
		661.62	3.423E-01	(	9.188E-02	4.73E-02	G
CE-139	7.2836E-03						
		165.85	7.284E-03	%(P	5.142E-02	1.52E-02	G
EU-152	-4.7648E-02						
		121.78	-4.765E-02	%(P	1.967E-01	5.89E-02	G K
		344.30	-3.414E-02	%	1.863E-01	5.49E-02	G
		1408.08	3.983E-04	%	2.772E-01	7.16E-02	G
		964.00	3.257E-01	& P	4.393E-01	1.40E-01	G
		1112.07	1.322E-01	%	4.777E-01	1.39E-01	G
		778.90	-1.132E-03	& P	6.098E-01	1.73E-01	G
EU-154	-1.5271E-02						
		123.10	-1.527E-02	%(P	1.370E-01	4.07E-02	G K
		1274.80	3.744E-02	%	1.700E-01	4.81E-02	G
		723.30	4.339E-02	% P	2.476E-01	7.03E-02	G
		1004.80	5.174E-02	%	4.010E-01	1.14E-01	G
EU-155	1.4786E-01						
		86.45	1.479E-01	%(P	3.035E-01	9.20E-02	G K
		105.31	7.745E-02	%	3.219E-01	9.66E-02	G
HG-203	-1.8608E-02						
		279.17	-1.861E-02	&(P	6.752E-02	2.02E-02	G K
		72.87	-5.477E-01	&	2.419E+00	7.27E-01	G
		70.83	-3.606E-02	%	5.132E+00	1.53E+00	G
		82.50	-4.234E-01	%	4.576E+00	1.36E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	3.2651E-01						
		583.14	3.110E-01	(P	7.856E-02	3.80E-02	G
		510.72	3.859E-01	(	2.132E-01	8.33E-02	G
PB-212	8.1168E-01						
		238.63	8.117E-01	(	1.327E-01	5.22E-02	G K
							Energy duplication
		77.11	9.844E-01	+	6.865E-01	2.16E-01	G
		74.81	1.040E+00	& P	1.434E+00	4.39E-01	G
PB-214	4.6178E-01						
		351.99	4.629E-01	(P	1.340E-01	5.12E-02	G K
		295.22	4.596E-01	(	2.514E-01	8.46E-02	G
							Energy duplication
		77.11	1.610E+00	+	1.123E+00	3.54E-01	G
		241.92	8.916E-02	%	8.893E-01	2.64E-01	G
BI-212	6.4881E-01						
		727.17	6.488E-01	(	4.525E-01	1.70E-01	G K
		1620.56	5.759E-01	% P	1.927E+00	5.45E-01	G
		785.42	-6.307E-01	% P	3.248E+00	9.38E-01	G
BI-214	5.5643E-01						
		609.32	5.564E-01	@(	1.309E-01	6.49E-02	G K
		1764.51	2.623E-01	% P	3.367E-01	1.15E-01	G
		1120.28	8.642E-01	+	5.482E-01	2.39E-01	G
RA-224	1.0099E+00						
		241.00	1.010E+00	%(P	1.531E+00	4.69E-01	G
RA-226	1.3683E+00						
		185.99	1.368E+00	(P	1.472E+00	4.57E-01	G
AC-228	7.6084E-01						
		911.07	7.358E-01	(P	2.014E-01	9.31E-02	G K
		968.90	-1.601E-01	% P	6.045E-01	1.78E-01	G
		338.40	8.213E-01	(	4.005E-01	1.39E-01	G
TH-227	-3.3423E-01						
		236.00	-3.342E-01	%(P	6.290E-01	1.91E-01	G K
		256.25	1.746E-02	&	5.621E-01	1.63E-01	G
PA-234	-2.0192E-02						
		98.44	-2.019E-02	%(	3.024E-01	9.00E-02	G K
		946.00	0.000E+00	&	4.089E-01	1.15E-01	G
		131.28	9.669E-02	&	2.560E-01	7.72E-02	G
		94.67	-6.819E-02	&	5.552E-01	1.66E-01	G
		883.24	1.044E-02	%	4.388E-01	1.19E-01	G
		926.70	1.000E-02	&	5.762E-01	1.59E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 1.792E-01 %   5.730E-01 1.70E-01 G

TH-234       8.5030E-01
                           63.29 8.503E-01 %(P 4.904E+00 1.46E+00 G K
                           92.80 1.667E+00 &   2.901E+00 8.83E-01 G
                           92.38-3.871E-01 & P 3.568E+00 1.07E+00 G

AM-241       9.8874E-02
                           59.54 9.887E-02 &(  8.344E-01 2.49E-01 G
   ( - This peak used in the nuclide activity average.

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

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

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** 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	-1.2690E-02	-1.2983E-02	4.8889E-01	4.8889E-01	5.556E-01
K-40		1.4289E+01	1.4289E+01	2.0135E+00	2.1673E+00	2.709E-01
MN-54	#A	-4.4241E-04	-4.4414E-04	2.3956E-02	2.3956E-02	6.721E-02
CO-57	#B	-1.4236E-02	-1.4301E-02	5.8046E-02	5.8052E-02	6.437E-02
CO-60	#B	-1.3283E-02	-1.3291E-02	7.2809E-02	7.2813E-02	8.268E-02

Sr-85	#A	-7.6973E-03	-7.8433E-03	5.0719E-02	5.0721E-02	5.725E-02
Kr-85	#A	-1.4116E+02	-1.4116E+02	1.0180E+03	1.0180E+03	1.180E+03
Y-88	#B	-2.6997E-05	-2.7307E-05	1.6384E-04	1.6385E-04	3.032E-02
NB-94	#B	1.0599E-02	1.0599E-02	4.5988E-02	4.5992E-02	5.383E-02
Ag-108M	#B	8.7828E-03	8.7831E-03	5.1737E-02	5.1739E-02	6.057E-02
CD-109	#A	1.6009E+00	1.6052E+00	2.2227E+00	2.2245E+00	2.419E+00
SN-113	#B	1.9877E-02	2.0089E-02	6.3261E-02	6.3271E-02	7.050E-02
SB-125	#B	5.4992E-02	5.5059E-02	1.1673E-01	1.1677E-01	1.298E-01
I-131	#B	4.2989E-03	5.0023E-03	5.6503E-02	5.6504E-02	5.596E-02
CS-134	#B	2.9302E-02	2.9349E-02	3.3533E-02	3.3573E-02	5.238E-02
CS-137		3.4229E-01	3.4232E-01	1.4167E-01	1.4296E-01	
CE-139	#A	7.2193E-03	7.2836E-03	4.5658E-02	4.5659E-02	5.096E-02
EU-152	#B	-4.7636E-02	-4.7648E-02	1.8867E-01	1.8869E-01	1.967E-01
EU-154	#B	-1.5265E-02	-1.5271E-02	1.2650E-01	1.2651E-01	1.369E-01
EU-155	#B	1.4776E-01	1.4786E-01	2.7589E-01	2.7601E-01	3.033E-01
HG-203	#B	-1.8127E-02	-1.8608E-02	6.1034E-02	6.1043E-02	6.578E-02
TL-208		3.2651E-01	3.2651E-01	1.1954E-01	1.2094E-01	
PB-212	#	8.1168E-01	8.1168E-01	1.5659E-01	1.6308E-01	1.327E-01
PB-214	#	4.6178E-01	4.6178E-01	1.4881E-01	1.5105E-01	1.340E-01
BI-212		6.4881E-01	6.4881E-01	5.0814E-01	5.0944E-01	
BI-214	#	5.5643E-01	5.5643E-01	1.9434E-01	1.9683E-01	
RA-224	#A	1.0099E+00	1.0099E+00	1.4066E+00	1.4077E+00	1.531E+00
RA-226	#A	1.3683E+00	1.3683E+00	1.3713E+00	1.3735E+00	1.472E+00
AC-228		7.6084E-01	7.6084E-01	2.4118E-01	2.4493E-01	2.014E-01
TH-227	#B	-3.3423E-01	-3.3423E-01	5.7905E-01	5.7936E-01	6.290E-01
PA-234	#B	-2.0192E-02	-2.0192E-02	2.7008E-01	2.7008E-01	3.024E-01
TH-234	#B	8.5030E-01	8.5030E-01	4.3900E+00	4.3903E+00	4.904E+00
AM-241	#A	9.8873E-02	9.8874E-02	7.4660E-01	7.4662E-01	8.344E-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) 1.6923851E+01 pCi/gm
Total Decayed Activity (270.7 to 1999.0 keV) 1.6923889E+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_19APRIL2006_1623.An1

Sample description
FSS OOL-11-01-003-F

Spectrum Filename: C:\GammaVision\Spectra\102F_19APRIL2006_1623.An1

Acquisition information

Start time:	19-Apr-2006 16:24:00
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:	1.8120E+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	17-Apr-2006 21:39:00
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. 14 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.7402

***** 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
77.23	148.	28.54	1.50	9.541E-03	77.11	10.700	1.080E+00	PB214
					77.11	17.500	6.605E-01	PB212
77.23	148.	28.54	1.50	9.541E-03	77.11	10.700	1.080E+00	PB214
					77.11	17.500	6.605E-01	PB212
186.09	103.	33.70	1.31	1.626E-02	185.99	3.280	1.377E+00	RA226
209.78	78.	28.26	1.13	1.517E-02				
239.17	624.	7.73	1.16	1.378E-02	238.63	43.100	7.819E-01	PB212
295.75	114.	15.29	1.26	1.144E-02	295.22	19.200	3.873E-01	PB214
300.71	36.	38.47	1.26	1.127E-02				
339.24	112.	22.16	1.01	1.004E-02	338.40	12.010	6.913E-01	AC228
352.50	230.	12.22	1.33	9.665E-03	351.99	37.100	4.769E-01	PB214
511.35	117.	19.28	1.36	6.687E-03	510.72	22.500	5.778E-01	TL208
584.31	188.	9.50	1.29	5.879E-03	583.14	86.000	2.768E-01	TL208
610.08	142.	12.55	1.63	5.643E-03	609.32	46.090	4.073E-01	BI214
662.67	258.	9.21	1.57	5.222E-03	661.62	84.620	4.344E-01	CS137
795.69	26.	27.74	1.34	4.420E-03				
795.69	26.	27.74	1.34	4.420E-03	795.76	85.400	5.146E-02	CS134
912.62	116.	12.81	1.78	3.916E-03	911.07	29.000	7.585E-01	AC228
970.24	60.	20.82	1.72	3.718E-03	968.90	17.460	6.948E-01	AC228
1334.78	53.	18.46	1.81	2.830E-03				
1462.90	509.	4.47	2.05	2.617E-03	1460.75	10.700	1.352E+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

419.18	209.78	204.	78.	0.039	84.79	1.129	NP-239	s
601.07	300.79	79.	36.	0.018	115.40	1.258	PB-212	lD
678.16	339.24	217.	63.	0.031	106.49	1.013	AC-228	s

Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	Suspected	
1457.58	728.81	48.	55.	0.027	80.25	1.392	J-132	l
2670.26	1334.78	13.	53.	0.026	50.56	1.810	CO-60	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	817.	148.	0.074	85.62	1.500D
PB-212	153.80	77.11	817.	148.	0.074	85.62	1.500D
RA-226	371.94	186.16	405.	91.	0.045	94.43	1.500s
PB-212	477.66	239.02	345.	514.	0.257	20.24	1.500
PB-214	591.18	295.76	156.	133.	0.067	47.55	1.500
AC-228	677.45	338.89	181.	60.	0.030	102.18	1.500
PB-214	704.92	352.62	104.	200.	0.100	30.21	1.500
TL-208	1022.47	511.35	105.	117.	0.058	57.84	1.356s
TL-208	1168.45	584.31	46.	188.	0.094	28.51	1.294s
BI-214	1220.01	610.08	61.	142.	0.071	37.65	1.632
CS-137	1325.24	662.67	78.	258.	0.129	27.62	1.571s
CS-134	1591.80	795.89	21.	25.	0.012	98.81	1.601
AC-228	1825.06	912.46	32.	108.	0.054	36.44	1.679
AC-228	1940.69	970.24	49.	60.	0.030	62.46	1.718s
K-40	2926.78	1462.93	9.	493.	0.247	13.75	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		-1.4936E-02					
			477.56	-1.494E-02	&(	4.995E-01	1.44E-01 G
K-40		1.3112E+01					
			1460.75	1.311E+01	(P	4.410E-01	6.01E-01 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
MN-54	-7.8302E-03						
		834.81	-7.830E-03	%(P	5.396E-02	1.53E-02	G
CO-57	-1.2697E-02						
		122.07	-1.270E-02	%(	6.601E-02	1.98E-02	G K
		136.43	-5.323E-02	%	4.733E-01	1.41E-01	G
CO-60	-2.0486E-04						
		1332.51	-2.049E-04	%(P	7.368E-02	2.02E-02	G K
		1173.23	-3.117E-03	%	8.307E-02	2.34E-02	G K
Sr-85	2.2246E-03						
		514.00	2.225E-03	%(	5.720E-02	1.65E-02	G
Kr-85	4.8832E+01						
		513.99	4.883E+01	%(	1.296E+03	3.74E+02	G
Y-88	8.5139E-03						
		1836.01	8.514E-03	%(P	3.786E-02	1.02E-02	G K
		898.02	-7.295E-03	% P	5.103E-02	1.41E-02	G
NB-94	1.5528E-02						
		871.10	1.553E-02	%(	4.821E-02	1.42E-02	G K
		702.50	-1.946E-02	&	6.807E-02	2.02E-02	G K
Ag-108M	-6.2181E-03						
		722.95	-6.218E-03	&(	5.137E-02	1.46E-02	G K
		614.37	-4.587E-02	& P	8.060E-02	2.46E-02	G
		433.93	1.765E-04	&	4.673E-02	1.33E-02	G
CD-109	1.4401E+00						
		88.04	1.440E+00	%(P	2.152E+00	6.57E-01	G
SN-113	-8.0664E-03						
		391.71	-8.066E-03	&(	7.086E-02	2.07E-02	G K
		255.04	1.538E-01	&	2.182E+00	6.43E-01	G
SB-125	-7.3304E-03						
		427.95	-7.330E-03	%(P	1.593E-01	4.57E-02	G K
		600.77	7.914E-03	% P	2.630E-01	7.43E-02	G
		636.15	8.026E-02	& P	5.136E-01	1.49E-01	G
		463.51	3.032E-01	% P	4.863E-01	1.49E-01	G
		176.29	1.798E-01	% P	6.799E-01	2.03E-01	G
I-131	2.1175E-02						
		364.48	2.118E-02	%(	5.418E-02	1.63E-02	G K
		636.97	9.636E-02	&	8.869E-01	2.55E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		284.29	-1.306E-01	%	8.181E-01	2.42E-01	G
CS-134	1.7240E-02						
		604.66	-1.049E-02	%(	5.392E-02	1.57E-02	G K
		795.76	4.893E-02	(	4.742E-02	1.61E-02	G
		569.29	-4.175E-02	%	3.507E-01	1.01E-01	G
		801.84	6.832E-02	% P	5.068E-01	1.42E-01	G
CS-137	4.3435E-01						
		661.62	4.344E-01	@(	7.407E-02	4.01E-02	G
CE-139	-1.6836E-02						
		165.85	-1.684E-02	%(P	5.716E-02	1.72E-02	G
EU-152	-1.3310E-03						
		121.78	-1.331E-03	%(P	1.965E-01	5.84E-02	G K
		344.30	-3.634E-02	%	1.709E-01	5.06E-02	G
		1408.08	-2.068E-02	%	2.461E-01	6.61E-02	G
		964.00	-1.623E-01	% P	5.304E-01	1.57E-01	G
		1112.07	6.989E-02	&	5.152E-01	1.47E-01	G
		778.90	9.409E-02	% P	4.115E-01	1.19E-01	G
EU-154	-2.9030E-02						
		123.10	-2.903E-02	%(P	1.368E-01	4.10E-02	G K
		1274.80	3.380E-02	&	1.690E-01	4.80E-02	G
		723.30	1.466E-02	& P	1.933E-01	5.32E-02	G
		1004.80	3.181E-02	%	3.085E-01	8.62E-02	G
EU-155	3.1429E-03						
		86.45	3.143E-03	%(P	2.354E-01	6.98E-02	G K
		105.31	1.704E-02	%	2.413E-01	7.17E-02	G
HG-203	-2.5580E-03						
		279.17	-2.558E-03	%(P	5.544E-02	1.62E-02	G K
		72.87	-4.698E-02	%	1.988E+00	5.92E-01	G
		70.83	-3.064E-02	%	4.439E+00	1.32E+00	G
		82.50	-8.342E-01	&	3.799E+00	1.14E+00	G
TL-208	2.7678E-01						
		583.14	2.768E-01	*(P	5.053E-02	2.64E-02	G
		510.72	5.778E-01	+	2.502E-01	1.12E-01	G
PB-212	6.4909E-01						
		238.63	6.444E-01	(	1.119E-01	4.35E-02	G K Energy duplication
		77.11	6.605E-01	(	6.070E-01	1.89E-01	G
		74.81	6.496E-01	& P	1.266E+00	3.84E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PB-214	4.2751E-01						
		351.99	4.155E-01	(P	1.043E-01	4.19E-02	G K
		295.22	4.506E-01	(	2.062E-01	7.14E-02	G
							Energy duplication
		77.11	1.080E+00	+	9.927E-01	3.08E-01	G
		241.92	2.828E-01	%	7.292E-01	2.20E-01	G
BI-212	1.4546E-02						
		727.17	1.455E-02	&(	5.420E-01	1.54E-01	G K
		1620.56	-3.796E-02	% P	8.338E-01	1.13E-01	G
		785.42	-9.733E-02	% P	3.219E+00	9.12E-01	G
BI-214	4.0730E-01						
		609.32	4.073E-01	(	1.118E-01	5.12E-02	G K
		1764.51	-1.824E-03	% P	1.551E-01	2.11E-02	G
		1120.28	-1.951E-02	%	5.335E-01	1.50E-01	G
RA-224	2.8295E-01						
		241.00	2.830E-01	&(P	1.365E+00	4.07E-01	G
RA-226	1.2677E+00						
		185.99	1.268E+00	*(P	1.350E+00	4.19E-01	G
AC-228	7.0209E-01						
		911.07	7.065E-01	(P	1.913E-01	8.60E-02	G K
		968.90	6.948E-01	(P	4.065E-01	1.45E-01	G
		338.40	3.728E-01	-	4.041E-01	1.27E-01	G
TH-227	-9.2643E-02						
		236.00	-9.264E-02	%(P	4.744E-01	1.42E-01	G K
		256.25	7.224E-02	&	6.266E-01	1.85E-01	G
PA-234	-6.1412E-02						
		98.44	-6.141E-02	&(	2.587E-01	7.76E-02	G K
		946.00	-3.697E-02	&	3.217E-01	9.16E-02	G
		131.28	-1.622E-02	&	2.553E-01	7.59E-02	G
		94.67	-3.104E-03	%	4.047E-01	1.20E-01	G
		883.24	-4.949E-02	%	4.602E-01	1.30E-01	G
		926.70	4.380E-02	%	4.900E-01	1.37E-01	G
		569.26	-6.187E-02	%	5.195E-01	1.50E-01	G
TH-234	3.0714E-01						
		63.29	3.071E-01	&(P	4.770E+00	1.42E+00	G K
		92.80	1.649E+00	%	2.630E+00	8.02E-01	G
		92.38	-2.401E-03	% P	3.173E+00	9.45E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
AM-241	2.1629E-01						
		59.54	2.163E-01	%(	6.996E-01	2.11E-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:
T - Thermal Neutron Activation
F - Fast Neutron Activation
I - Fission Product
N - Naturally Occurring Isotope
P - Photon Reaction
C - Charged Particle Reaction
M - No MDA Calculation
R - Coincidence Corrected
H - Halflife limit exceeded

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

- -

***** 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	-1.4595E-02	-1.4936E-02	4.3079E-01	4.3079E-01	4.881E-01
K-40		1.3112E+01	1.3112E+01	1.8028E+00	1.9472E+00	4.410E-01
MN-54	#A	-7.7993E-03	-7.8302E-03	5.0585E-02	5.0587E-02	5.374E-02
CO-57	#B	-1.2639E-02	-1.2697E-02	5.9316E-02	5.9320E-02	6.571E-02
CO-60	#B	-2.0473E-04	-2.0486E-04	9.4110E-03	9.4111E-03	7.363E-02
Sr-85	#A	2.1826E-03	2.2246E-03	4.9475E-02	4.9475E-02	5.613E-02
Kr-85	#A	4.8831E+01	4.8832E+01	1.1207E+03	1.1207E+03	1.296E+03
Y-88	#B	8.4159E-03	8.5139E-03	3.0547E-02	3.0550E-02	3.742E-02
NB-94	#B	1.5528E-02	1.5528E-02	4.2500E-02	4.2509E-02	4.821E-02
Ag-108M	#B	-6.2179E-03	-6.2181E-03	4.3663E-02	4.3665E-02	5.137E-02
CD-109	#A	1.4362E+00	1.4401E+00	1.9718E+00	1.9734E+00	2.146E+00

SN-113	#B	-7.9803E-03	-8.0664E-03	6.1979E-02	6.1981E-02	7.010E-02
SB-125	#B	-7.3215E-03	-7.3304E-03	3.4503E-01	3.4503E-01	1.591E-01
I-131	#B	1.8161E-02	2.1175E-02	4.8796E-02	4.8810E-02	4.647E-02
CS-134	#B	1.7212E-02	1.7240E-02	1.7036E-02	1.7063E-02	5.383E-02
CS-137	#	4.3430E-01	4.3435E-01	1.1999E-01	1.2244E-01	
CE-139	#A	-1.6686E-02	-1.6836E-02	5.2964E-02	5.2972E-02	5.665E-02
EU-152	#B	-1.3307E-03	-1.3310E-03	3.0708E-01	3.0708E-01	1.965E-01
EU-154	#B	-2.9019E-02	-2.9030E-02	1.2489E-01	1.2490E-01	1.367E-01
EU-155	#B	3.1407E-03	3.1429E-03	2.0949E-01	2.0949E-01	2.353E-01
HG-203	#B	-2.4911E-03	-2.5580E-03	5.1554E-02	5.1554E-02	5.399E-02
TL-208	#	2.7678E-01	2.7678E-01	7.9091E-02	8.0602E-02	
PB-212	#	6.4909E-01	6.4909E-01	1.3141E-01	1.3636E-01	1.119E-01
PB-214	#	4.2751E-01	4.2751E-01	1.2049E-01	1.2285E-01	1.043E-01
BI-212	B	1.4546E-02	1.4546E-02	4.6277E-01	4.6277E-01	5.420E-01
BI-214		4.0730E-01	4.0730E-01	1.5336E-01	1.5505E-01	
RA-224	#A	2.8295E-01	2.8295E-01	1.2219E+00	1.2220E+00	1.365E+00
RA-226	#A	1.2677E+00	1.2677E+00	1.2561E+00	1.2581E+00	1.350E+00
AC-228	#	7.0209E-01	7.0209E-01	2.5411E-01	2.5715E-01	1.913E-01
TH-227	#B	-9.2643E-02	-9.2643E-02	4.3731E-01	4.3734E-01	4.744E-01
PA-234	#B	-6.1412E-02	-6.1412E-02	2.3290E-01	2.3293E-01	2.587E-01
TH-234	#B	3.0714E-01	3.0714E-01	4.2576E+00	4.2577E+00	4.770E+00
AM-241	#A	2.1629E-01	2.1629E-01	6.3155E-01	6.3166E-01	6.996E-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) 1.4230039E+01 pCi/gm
Total Decayed Activity (50.2 to 1999.0 keV) 1.4230087E+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_19APRIL2006_1703.An1

Sample description
FSS OOL-11-01-016-F

Spectrum Filename: C:\GammaVision\Spectra\102F_19APRIL2006_1703.An1

Acquisition information
Start time: 19-Apr-2006 17:03:18
Live time: 2000
Real time: 2019
Dead time: 0.92 %
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: 1.3930E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.3930E+03) =
7.1788E+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	17-Apr-2006 20:16:00
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. 14 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.5414

***** 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
74.46	75.	35.21	1.10	8.817E-03				
74.46	75.	35.21	1.10	8.817E-03	74.81	9.600	PBC<MDA	PB212
77.35	200.	13.97	1.10	9.684E-03	77.11	10.700	1.896E+00	PB214
					77.11	17.500	1.159E+00	PB212
92.95	100.	36.77	1.50	1.333E-02	88.04	3.790	PBC<MDA	CD109
					92.38	2.570	PBC<MDA	TH234
					92.80	3.000	2.428E+00	TH234
186.14	91.	28.73	0.91	1.626E-02	185.99	3.280	1.574E+00	RA226
239.26	518.	7.53	1.04	1.378E-02	238.63	43.100	8.443E-01	PB212
295.58	111.	14.65	1.25	1.146E-02	295.22	19.200	4.880E-01	PB214
300.75	36.	34.56	1.26	1.127E-02				
338.84	111.	19.24	1.30	1.005E-02	338.40	12.010	8.937E-01	AC228
352.82	224.	8.81	1.38	9.656E-03	351.99	37.100	6.041E-01	PB214
511.55	80.	22.27	1.94	6.684E-03	510.72	22.500	5.133E-01	TL208
583.92	160.	10.79	1.60	5.882E-03	583.14	86.000	3.060E-01	TL208
610.07	150.	10.83	1.56	5.643E-03	609.32	46.090	5.589E-01	BI214
662.35	70.	26.87	0.77	5.224E-03	661.62	84.620	1.535E-01	CS137
795.89	29.	27.96	1.60	4.420E-03	795.76	85.400	7.538E-02	CS134
862.33	40.	27.21	1.23	4.115E-03				
912.02	120.	12.72	1.69	3.918E-03	911.07	29.000	1.022E+00	AC228
969.86	72.	15.99	1.77	3.715E-03	968.90	17.460	1.072E+00	AC228
1121.79	23.	31.99	1.51	3.283E-03	1120.28	15.040	4.460E-01	BI214
1462.90	454.	4.75	1.86	2.617E-03	1460.75	10.700	1.571E+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	
148.50	74.71	309.	75.	0.037	105.63	1.098	BI-207	D
154.27	77.60	289.	200.	0.100	41.91	1.100	PB-214	D
478.15	239.26	702.	111.	0.056	104.87	1.038	PB-212	
600.89	300.62	88.	40.	0.020	118.07	0.931	PB-212	
1724.75	862.33	24.	40.	0.020	70.79	1.228	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-214	153.80	77.11	683.	188.	0.094	62.94	1.500D
PB-212	153.80	77.11	683.	188.	0.094	62.94	1.500D
TH-234	185.53	92.98	636.	100.	0.050	109.27	1.500
TH-234	185.48	92.95	628.	100.	0.050	110.32	1.500
RA-226	371.88	186.14	241.	87.	0.043	86.19	0.906s
PB-212	477.73	239.05	278.	386.	0.193	23.84	1.500
PB-214	590.83	295.59	132.	104.	0.052	55.24	1.500
AC-228	677.35	338.84	120.	111.	0.056	57.71	1.299
PB-214	704.77	352.54	86.	188.	0.094	30.21	1.500s
TL-208	1022.89	511.55	71.	80.	0.040	66.81	1.943s
TL-208	1167.67	583.92	41.	160.	0.080	32.38	1.595s
BI-214	1220.00	610.07	38.	150.	0.075	32.50	1.561
CS-137	1324.60	662.35	64.	63.	0.032	83.85	0.757s
CS-134	1591.80	795.89	19.	29.	0.015	83.89	1.601
AC-228	1824.18	912.02	29.	120.	0.060	38.17	1.691s
AC-228	1939.93	969.86	16.	72.	0.036	47.96	1.771s
BI-214	2243.98	1121.79	14.	23.	0.011	95.97	1.509
K-40	2926.80	1462.95	8.	436.	0.218	14.62	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		-1.1880E-01					
			477.56	-1.188E-01	%(	5.350E-01 1.56E-01	G
K-40		1.5078E+01					
			1460.75	1.508E+01	(P	5.461E-01 7.35E-01	G
MN-54		3.0143E-02					
			834.81	3.014E-02	&(P	5.240E-02 1.63E-02	G
CO-57		1.3116E-02					
			122.07	1.312E-02	%(	6.955E-02 2.08E-02	G K
			136.43	-2.281E-03	%	5.087E-01 1.50E-01	G
CO-60		3.3449E-03					
			1332.51	3.345E-03	%(P	8.238E-02 2.24E-02	G K
			1173.23	6.470E-02	%	9.026E-02 2.86E-02	G K
Sr-85		-5.6867E-03					
			514.00	-5.687E-03	%(	6.738E-02 1.94E-02	G
Kr-85		-1.4927E+02					
			513.99	-1.493E+02	%(	1.530E+03 4.42E+02	G
Y-88		-3.0191E-05					
			1836.01	-3.019E-05	%(P	3.390E-02 4.60E-03	G K
			898.02	-1.360E-02	% P	8.026E-02 2.27E-02	G
NB-94		0.0000E+00					
			871.10	0.000E+00	%(	8.050E-02 2.25E-02	G K
			702.50	2.682E-02	%	5.281E-02 1.61E-02	G K
Ag-108M		5.4157E-03					
			722.95	5.416E-03	%(	5.894E-02 1.64E-02	G K
			614.37	-2.199E-02	% P	7.015E-02 2.07E-02	G
			433.93	2.543E-03	&	4.978E-02 1.41E-02	G
CD-109		2.0217E-01					
			88.04	2.022E-01	&(P	2.256E+00 6.70E-01	G
SN-113		5.2999E-03					
			391.71	5.300E-03	&(	7.642E-02 2.20E-02	G K
			255.04	-1.531E-01	%	2.175E+00 6.34E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	-1.9709E-02						
		427.95	-1.971E-02	%(P	1.516E-01	4.30E-02	G K
		600.77	-5.691E-02	% P	3.022E-01	8.70E-02	G
		636.15	1.868E-01	% P	4.844E-01	1.45E-01	G
		463.51	2.826E-01	% P	4.525E-01	1.39E-01	G
		176.29	-2.381E-02	% P	7.565E-01	2.21E-01	G
I-131	1.8469E-03						
		364.48	1.847E-03	&(	6.808E-02	1.95E-02	G K
		636.97	0.000E+00	%	9.747E-01	2.72E-01	G
		284.29	-1.862E-01	%	8.625E-01	2.55E-01	G
CS-134	3.0833E-02						
		604.66	-8.143E-03	&(	6.190E-02	1.78E-02	G K
		795.76	7.538E-02	(	5.910E-02	2.11E-02	G
		569.29	0.000E+00	%	3.350E-01	9.31E-02	G
		801.84	8.694E-02	& P	6.678E-01	1.88E-01	G
CS-137	1.3857E-01						
		661.62	1.386E-01	(	8.755E-02	3.88E-02	G
CE-139	1.3006E-02						
		165.85	1.301E-02	&(P	6.041E-02	1.80E-02	G
EU-152	2.9418E-03						
		121.78	2.942E-03	&(P	1.910E-01	5.64E-02	G K
		344.30	-9.398E-03	&	1.800E-01	5.20E-02	G
		1408.08	0.000E+00	&	2.484E-01	6.15E-02	G
		964.00	-4.870E-02	% P	4.813E-01	1.34E-01	G
		1112.07	-3.752E-02	&	5.897E-01	1.64E-01	G
		778.90	-1.600E-01	% P	5.479E-01	1.61E-01	G
EU-154	2.4916E-02						
		123.10	2.492E-02	%(P	1.466E-01	4.37E-02	G K
		1274.80	-2.690E-02	&	2.554E-01	7.16E-02	G
		723.30	7.529E-02	% P	2.059E-01	6.06E-02	G
		1004.80	6.482E-04	%	3.956E-01	1.08E-01	G
EU-155	-1.5414E-03						
		86.45	-1.541E-03	&(P	3.319E-01	9.85E-02	G K
		105.31	4.633E-02	&	3.243E-01	9.67E-02	G
HG-203	1.7319E-02						
		279.17	1.732E-02	%(P	6.074E-02	1.81E-02	G K
		72.87	-5.053E-01	&	2.621E+00	7.86E-01	G
		70.83	-4.886E-01	%	4.795E+00	1.43E+00	G
		82.50	4.299E-02	%	5.160E+00	1.53E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	3.0603E-01						
		583.14	3.060E-01	@(P	6.248E-02	3.32E-02	G
		510.72	5.133E-01	+	2.709E-01	1.14E-01	G
PB-212	6.3001E-01						
		238.63	6.300E-01	(	1.312E-01	5.01E-02	G K
							Energy duplication
		77.11	1.092E+00	+	7.233E-01	2.29E-01	G
		74.81	8.383E-01	& P	1.476E+00	4.49E-01	G
PB-214	4.9075E-01						
		351.99	5.071E-01	*(P	1.239E-01	5.12E-02	G K
		295.22	4.591E-01	(	2.478E-01	8.45E-02	G
							Energy duplication
		77.11	1.785E+00	+	1.183E+00	3.75E-01	G
		241.92	3.686E-01	%	8.597E-01	2.60E-01	G
BI-212	-1.8921E-02						
		727.17	-1.892E-02	%(	5.392E-01	1.51E-01	G K
		1620.56	-4.938E-02	& P	1.085E+00	1.47E-01	G
		785.42	1.197E+00	% P	3.316E+00	9.85E-01	G
BI-214	5.5887E-01						
		609.32	5.589E-01	(	1.171E-01	6.06E-02	G K
		1764.51	-5.153E-02	% P	4.783E-01	1.28E-01	G
		1120.28	4.460E-01	-	3.995E-01	1.43E-01	G
RA-224	3.4342E-01						
		241.00	3.434E-01	%(P	1.618E+00	4.82E-01	G
RA-226	1.5735E+00						
		185.99	1.574E+00	*(P	1.366E+00	4.76E-01	G
AC-228	1.0105E+00						
		911.07	1.022E+00	@(P	2.380E-01	1.30E-01	G K
		968.90	1.072E+00	*(P	3.211E-01	1.72E-01	G
		338.40	8.937E-01	(	4.311E-01	1.72E-01	G
TH-227	-2.2075E-01						
		236.00	-2.207E-01	%(P	5.843E-01	1.76E-01	G K
		256.25	-5.486E-03	&	5.570E-01	1.60E-01	G
PA-234	1.6061E-03						
		98.44	1.606E-03	%(	3.128E-01	9.27E-02	G K
		946.00	-2.880E-03	&	3.635E-01	1.00E-01	G
		131.28	-1.449E-03	&	3.005E-01	8.89E-02	G
		94.67	-5.636E-02	%	4.574E-01	1.36E-01	G
		883.24	-4.251E-02	%	5.015E-01	1.39E-01	G
		926.70	-1.005E-02	%	6.001E-01	1.64E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 0.000E+00 %   4.962E-01 1.38E-01 G

TH-234       1.4835E+00
                           63.29-1.519E-01 %(P 4.849E+00 1.43E+00 G K
                           92.80 2.428E+00  (  2.897E+00 8.93E-01 G
                           92.38 2.862E+00  (P 3.424E+00 1.05E+00 G

AM-241       8.5706E-02
                           59.54 8.571E-02 %(  7.941E-01 2.36E-01 G
   ( - This peak used in the nuclide activity average.

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

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

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** 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	-1.1596E-01	-1.1880E-01	4.6944E-01	4.6949E-01	5.222E-01
K-40		1.5078E+01	1.5078E+01	2.2051E+00	2.3619E+00	5.461E-01
MN-54	#A	3.0019E-02	3.0143E-02	4.8793E-02	4.8822E-02	5.219E-02
CO-57	#B	1.3053E-02	1.3116E-02	6.2294E-02	6.2298E-02	6.922E-02
CO-60	#B	3.3426E-03	3.3449E-03	6.7259E-02	6.7259E-02	8.233E-02

Sr-85	#A	-5.5744E-03	-5.6867E-03	5.8308E-02	5.8309E-02	6.605E-02
Kr-85	#A	-1.4926E+02	-1.4927E+02	1.3270E+03	1.3271E+03	1.530E+03
Y-88	#B	-2.9827E-05	-3.0191E-05	1.8114E-04	1.8115E-04	3.349E-02
NB-94	#B	0.0000E+00	0.0000E+00	6.7418E-02	6.7418E-02	8.050E-02
Ag-108M	#B	5.4155E-03	5.4157E-03	4.9284E-02	4.9285E-02	5.894E-02
CD-109	#A	2.0160E-01	2.0217E-01	2.0110E+00	2.0110E+00	2.250E+00
SN-113	#B	5.2407E-03	5.2999E-03	6.5882E-02	6.5882E-02	7.557E-02
SB-125	#B	-1.9684E-02	-1.9709E-02	1.9694E-01	1.9694E-01	1.514E-01
I-131	#B	1.5724E-03	1.8469E-03	5.8496E-02	5.8496E-02	5.796E-02
CS-134	#B	3.0780E-02	3.0833E-02	2.5867E-02	2.5925E-02	6.180E-02
CS-137		1.3855E-01	1.3857E-01	1.1619E-01	1.1644E-01	
CE-139	#A	1.2884E-02	1.3006E-02	5.3988E-02	5.3993E-02	5.984E-02
EU-152	#B	2.9410E-03	2.9418E-03	1.6909E-01	1.6909E-01	1.910E-01
EU-154	#B	2.4906E-02	2.4916E-02	1.3114E-01	1.3115E-01	1.465E-01
EU-155	#B	-1.5403E-03	-1.5414E-03	4.1099E-01	4.1099E-01	3.316E-01
HG-203	#B	1.6844E-02	1.7319E-02	5.4263E-02	5.4271E-02	5.907E-02
TL-208	#	3.0603E-01	3.0603E-01	9.9335E-02	1.0081E-01	
PB-212	#	6.3001E-01	6.3001E-01	1.5021E-01	1.5432E-01	1.312E-01
PB-214	#	4.9075E-01	4.9075E-01	1.4855E-01	1.5108E-01	1.239E-01
BI-212	#B	-1.8921E-02	-1.8921E-02	4.5185E-01	4.5185E-01	5.392E-01
BI-214		5.5887E-01	5.5887E-01	1.8161E-01	1.8430E-01	
RA-224	#A	3.4342E-01	3.4342E-01	1.4464E+00	1.4465E+00	1.618E+00
RA-226	#	1.5735E+00	1.5735E+00	1.4261E+00	1.4288E+00	
AC-228		1.0105E+00	1.0105E+00	2.8373E-01	2.8934E-01	
TH-227	#B	-2.2075E-01	-2.2075E-01	5.3674E-01	5.3688E-01	5.843E-01
PA-234	#B	1.6061E-03	1.6061E-03	2.7819E-01	2.7819E-01	3.128E-01
TH-234	#B	1.4835E+00	1.4835E+00	1.6366E+00	1.6387E+00	4.849E+00
AM-241	#A	8.5705E-02	8.5706E-02	7.0818E-01	7.0819E-01	7.941E-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 (83.7 to 1999.0 keV) 1.8665707E+01 pCi/gm
Total Decayed Activity (83.7 to 1999.0 keV) 1.8665726E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JJM

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

Sample description
FSS OOL-11-01-007-F

Spectrum Filename: C:\GammaVision\Spectra\102F_20APRIL2006_0640.An1

Acquisition information
Start time: 20-Apr-2006 06:40:58
Live time: 2000
Real time: 2019
Dead time: 0.95 %
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: 1.2900E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.2900E+03) =
7.7519E+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	17-Apr-2006 21:16:00
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: 0.5594

***** 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
77.25	197.	20.33	1.50	9.541E-03	77.11	17.500	1.237E+00	PB212
					77.11	10.700	2.023E+00	PB214
77.25	197.	20.33	1.50	9.541E-03	77.11	17.500	PBC<MDA	PB212
					77.11	10.700	2.023E+00	PB214
87.09	95.	40.35	1.50	1.199E-02	86.45	32.740	PBC<MDA	EU155
93.02	95.	40.59	1.50	1.333E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	2.480E+00	TH234
185.78	116.	21.30	0.91	1.628E-02				
185.78	116.	21.30	0.91	1.628E-02	185.99	3.280	2.194E+00	RA226
239.03	486.	5.39	1.22	1.379E-02	238.63	43.100	8.555E-01	PB212
241.73	106.	21.02	1.22	1.366E-02	241.00	3.900	2.056E+00	RA224
					241.92	7.470	1.088E+00	PB214
270.59	45.	40.33	1.41	1.241E-02				
295.69	162.	10.12	1.25	1.145E-02	295.22	19.200	7.728E-01	PB214
300.31	43.	29.48	1.26	1.129E-02				
328.48	52.	36.36	1.03	1.036E-02				
338.67	98.	18.47	1.44	1.005E-02	338.40	12.010	8.480E-01	AC228
352.45	334.	8.56	1.34	9.666E-03	351.99	37.100	9.718E-01	PB214
511.73	71.	24.01	1.50	6.682E-03	510.72	22.500	4.924E-01	TL208
583.92	157.	12.12	1.80	5.882E-03	583.14	86.000	3.236E-01	TL208
610.13	216.	8.98	1.86	5.642E-03	609.32	46.090	8.682E-01	BI214
795.98	22.	36.50	1.60	4.420E-03	795.76	85.400	PBC<MDA	CS134
912.50	69.	16.42	1.83	3.917E-03	911.07	29.000	6.297E-01	AC228
934.87	47.	30.43	1.53	3.835E-03				
969.48	85.	17.36	1.65	3.716E-03	968.90	17.460	1.365E+00	AC228
1121.26	64.	25.79	1.13	3.283E-03	1120.28	15.040	1.347E+00	BI214
1462.55	434.	4.80	1.70	2.618E-03	1460.75	10.700	1.621E+01	K40

1766.37	35.	16.90	1.31	2.225E-03	1764.51	15.920	1.032E+00	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
477.70	239.04	100.	486.	0.243	16.17	1.215	PB-212	D
483.10	241.74	195.	106.	0.053	63.05	1.217	PB-214	D
540.82	270.59	125.	45.	0.023	120.98	1.407	AC-228	s
600.05	300.19	69.	43.	0.022	93.86	1.402	PB-212	
656.64	328.48	112.	52.	0.026	109.08	1.027	RH-106M	
1869.91	934.87	34.	48.	0.024	67.08	1.528	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	153.80	77.11	705.	197.	0.099	61.00	1.500D
PB-214	153.80	77.11	705.	197.	0.099	61.00	1.500D
TH-234	185.61	93.02	691.	95.	0.047	121.77	1.500
RA-226	371.63	186.01	298.	82.	0.041	90.45	1.500s
PB-212	477.59	238.98	317.	417.	0.208	23.32	1.500
RA-224	483.86	242.12	341.	86.	0.043	95.26	1.500
PB-214	483.28	241.82	353.	74.	0.037	112.80	1.500
PB-214	590.95	295.65	120.	155.	0.077	38.48	1.500
AC-228	677.02	338.67	95.	98.	0.049	55.41	1.442
PB-214	704.56	352.44	97.	297.	0.148	22.37	1.500
TL-208	1023.24	511.73	68.	71.	0.035	72.04	1.497s
TL-208	1167.68	583.92	63.	156.	0.078	36.37	1.799s
BI-214	1220.12	610.13	43.	216.	0.108	26.94	1.864s
CS-134	1591.98	795.98	21.	22.	0.011	109.50	1.601s
AC-228	1825.14	912.50	23.	68.	0.034	49.25	1.828s
AC-228	1939.16	969.48	36.	85.	0.042	52.07	1.649
BI-214	2242.91	1121.26	46.	64.	0.032	77.38	1.126s
K-40	2925.99	1462.54	3.	426.	0.213	14.71	1.694
BI-214	3534.21	1766.37	0.	35.	0.017	50.71	1.311s

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		9.8937E-02					
			477.56	9.894E-02	&(	5.835E-01 1.69E-01	G
K-40		1.5916E+01					
			1460.75	1.592E+01	(P	4.003E-01 7.81E-01	G
MN-54		-5.3061E-04					
			834.81	-5.306E-04	&(P	7.014E-02 1.92E-02	G
CO-57		1.1501E-03					
			122.07	1.150E-03	&(	6.383E-02 1.88E-02	G K
			136.43	7.580E-03	&	5.465E-01 1.61E-01	G
CO-60		-2.8782E-04					
			1332.51	-2.878E-04	&(P	9.287E-02 2.51E-02	G K
			1173.23	2.107E-03	&	9.741E-02 2.70E-02	G K
Sr-85		-1.3935E-02					
			514.00	-1.394E-02	%(	7.408E-02 2.17E-02	G
Kr-85		-3.4538E+01					
			513.99	-3.454E+01	%(	1.407E+03 3.98E+02	G
Y-88		-3.2713E-05					
			1836.01	-3.271E-05	%(P	8.187E-02 2.07E-02	G K
			898.02	9.587E-03	& P	8.225E-02 2.31E-02	G
NB-94		-1.9221E-03					
			871.10	-1.922E-03	%(	6.225E-02 1.69E-02	G K
			702.50	2.374E-02	%	5.340E-02 1.61E-02	G K
Ag-108M		-1.8795E-02					
			722.95	-1.880E-02	%(	8.358E-02 2.43E-02	G K
			614.37	-5.141E-02	% P	1.015E-01 3.08E-02	G
			433.93	5.808E-03	%	6.480E-02 1.87E-02	G
CD-109		-6.3488E-02					
			88.04	-6.349E-02	%(P	2.211E+00 6.52E-01	G
SN-113		2.7145E-02					
			391.71	2.715E-02	&(	7.954E-02 2.37E-02	G K
			255.04	-4.293E-01	&	2.671E+00 7.89E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	-9.4188E-04						
		427.95	-9.419E-04	%(P	1.704E-01	4.78E-02	G K
		600.77	8.702E-02	& P	2.975E-01	8.71E-02	G
		636.15	2.282E-02	& P	4.020E-01	1.10E-01	G
		463.51	2.599E-01	% P	5.846E-01	1.76E-01	G
		176.29	-1.870E-02	% P	7.763E-01	2.26E-01	G
I-131	2.4265E-02						
		364.48	2.426E-02	%(	5.005E-02	1.52E-02	G K
		636.97	1.781E-01	%	9.397E-01	2.69E-01	G
		284.29	-1.106E-01	%	1.086E+00	3.18E-01	G
CS-134	1.8316E-02						
		604.66	-1.852E-02	%(	7.575E-02	2.22E-02	G K
		795.76	6.042E-02	*(	6.632E-02	2.21E-02	G
		569.29	-2.377E-02	&	4.233E-01	1.20E-01	G
		801.84	-1.824E-01	% P	7.668E-01	2.22E-01	G
CS-137	-1.0462E-02						
		661.62	-1.046E-02	%(	7.244E-02	2.06E-02	G
CE-139	-1.7785E-02						
		165.85	-1.779E-02	&(P	7.190E-02	2.15E-02	G
EU-152	-4.1358E-02						
		121.78	-4.136E-02	&(P	2.295E-01	6.84E-02	G K
		344.30	4.368E-02	&	1.795E-01	5.29E-02	G
		1408.08	4.829E-02	%	2.467E-01	6.68E-02	G
		964.00	3.863E-01	% P	5.758E-01	1.81E-01	G
		1112.07	-6.831E-02	%	7.011E-01	1.98E-01	G
		778.90	-3.499E-02	% P	3.916E-01	1.07E-01	G
EU-154	3.4514E-02						
		123.10	3.451E-02	&(P	1.572E-01	4.70E-02	G K
		1274.80	1.261E-03	%	2.431E-01	6.56E-02	G
		723.30	-8.732E-02	% P	3.727E-01	1.08E-01	G
		1004.80	-4.163E-02	&	4.581E-01	1.28E-01	G
EU-155	2.5279E-01						
		86.45	2.528E-01	%(P	3.466E-01	1.06E-01	G K
		105.31	5.797E-02	%	3.786E-01	1.13E-01	G
HG-203	-8.0752E-03						
		279.17	-8.075E-03	&(P	7.061E-02	2.07E-02	G K
		72.87	-1.533E-01	%	2.755E+00	8.21E-01	G
		70.83	-7.242E-01	&	5.337E+00	1.60E+00	G
		82.50	1.124E-01	%	5.424E+00	1.61E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	3.2364E-01						
		583.14	3.236E-01	(P	8.180E-02	3.94E-02	G
		510.72	4.924E-01	+	2.865E-01	1.18E-01	G
PB-212	7.3415E-01						
		238.63	7.341E-01	(	1.508E-01	5.71E-02	G K
							Energy duplication
		77.11	1.237E+00	+	7.932E-01	2.51E-01	G
		74.81	9.296E-01	& P	1.639E+00	4.99E-01	G
PB-214	8.1481E-01						
		351.99	8.658E-01	(P	1.421E-01	6.47E-02	G K
		295.22	7.366E-01	(	2.555E-01	9.45E-02	G
							Energy duplication
		77.11	2.023E+00	+	1.297E+00	4.11E-01	G
		241.92	7.627E-01	&(	9.267E-01	2.87E-01	G
BI-212	1.9596E-01						
		727.17	1.960E-01	%(	5.757E-01	1.70E-01	G K
		1620.56	-3.727E-01	% P	2.424E+00	6.32E-01	G
		785.42	9.447E-01	& P	2.794E+00	8.22E-01	G
BI-214	9.1036E-01						
		609.32	8.682E-01	*(	1.341E-01	7.81E-02	G K
		1764.51	1.032E+00	(P	2.179E-01	1.75E-01	G
		1120.28	1.347E+00	+	7.244E-01	3.48E-01	G
RA-224	1.6874E+00						
		241.00	1.687E+00	&(P	1.741E+00	5.43E-01	G
RA-226	1.6015E+00						
		185.99	1.602E+00	(P	1.632E+00	5.09E-01	G
AC-228	6.9364E-01						
		911.07	6.297E-01	@(P	2.291E-01	1.04E-01	G K
		968.90	1.365E+00	+ P	4.977E-01	2.37E-01	G
		338.40	8.480E-01	(	4.177E-01	1.57E-01	G
TH-227	-2.8525E-01						
		236.00	-2.853E-01	&(P	6.896E-01	2.08E-01	G K
		256.25	2.223E-01	%	7.610E-01	2.27E-01	G
PA-234	1.6611E-02						
		98.44	1.661E-02	%(	3.603E-01	1.07E-01	G K
		946.00	1.337E-01	%	3.498E-01	1.04E-01	G
		131.28	2.904E-03	&	3.303E-01	9.78E-02	G
		94.67	-2.394E-01	%	6.294E-01	1.90E-01	G
		883.24	8.973E-02	&	5.384E-01	1.52E-01	G
		926.70	-3.688E-02	%	6.226E-01	1.71E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-3.524E-02 &   6.266E-01 1.78E-01 G

TH-234       2.4669E+00
                           63.29 2.457E+00 %(P 6.087E+00 1.84E+00 G K
                           92.80 2.480E+00 &(  3.280E+00 1.01E+00 G
                           92.38 2.227E+00 % P 3.989E+00 1.21E+00 G

AM-241      -6.2452E-02
                           59.54-6.245E-02 %(  8.641E-01 2.56E-01 G
   ( - This peak used in the nuclide activity average.

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

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

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** 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	9.5912E-02	9.8937E-02	5.0807E-01	5.0810E-01	5.657E-01
K-40		1.5916E+01	1.5916E+01	2.3423E+00	2.5068E+00	
MN-54	#A	-5.2780E-04	-5.3061E-04	2.4539E-02	2.4539E-02	6.977E-02
CO-57	#B	1.1430E-03	1.1501E-03	5.6379E-02	5.6379E-02	6.344E-02
CO-60	#B	-2.8758E-04	-2.8782E-04	1.1713E-02	1.1713E-02	9.279E-02

Sr-85	#A	-1.3584E-02	-1.3935E-02	6.5020E-02	6.5025E-02	7.221E-02
Kr-85	#A	-3.4537E+01	-3.4538E+01	1.1951E+03	1.1951E+03	1.407E+03
Y-88	#B	-3.2208E-05	-3.2713E-05	8.1662E-04	8.1662E-04	8.060E-02
NB-94	#B	-1.9221E-03	-1.9221E-03	5.0776E-02	5.0776E-02	6.225E-02
Ag-108M	#B	-1.8795E-02	-1.8795E-02	7.3002E-02	7.3010E-02	8.357E-02
CD-109	#A	-6.3257E-02	-6.3488E-02	6.2863E+00	6.2863E+00	2.203E+00
SN-113	#B	2.6757E-02	2.7145E-02	7.1069E-02	7.1085E-02	7.840E-02
SB-125	#B	-9.4033E-04	-9.4188E-04	2.2047E-01	2.2047E-01	1.701E-01
I-131	#B	1.9742E-02	2.4265E-02	4.5636E-02	4.5656E-02	4.072E-02
CS-134	#B	1.8275E-02	1.8316E-02	2.0055E-02	2.0081E-02	7.559E-02
CS-137	#A	-1.0461E-02	-1.0462E-02	6.1933E-02	6.1936E-02	7.242E-02
CE-139	#A	-1.7572E-02	-1.7785E-02	6.6974E-02	6.6981E-02	7.104E-02
EU-152	#B	-4.1343E-02	-4.1358E-02	2.2478E-01	2.2479E-01	2.294E-01
EU-154	#B	3.4496E-02	3.4514E-02	1.4099E-01	1.4100E-01	1.571E-01
EU-155	#B	2.5255E-01	2.5279E-01	3.1831E-01	3.1862E-01	3.463E-01
HG-203	#B	-7.7929E-03	-8.0752E-03	6.3779E-02	6.3781E-02	6.814E-02
TL-208		3.2364E-01	3.2364E-01	1.1802E-01	1.1941E-01	
PB-212	#	7.3415E-01	7.3415E-01	1.7122E-01	1.7610E-01	1.508E-01
PB-214	#	8.1481E-01	8.1481E-01	1.8255E-01	1.8819E-01	1.421E-01
BI-212	#B	1.9596E-01	1.9596E-01	5.1147E-01	5.1159E-01	5.757E-01
BI-214		9.1036E-01	9.1036E-01	2.4528E-01	2.5055E-01	
RA-224	#A	1.6874E+00	1.6874E+00	1.6291E+00	1.6319E+00	1.741E+00
RA-226	#A	1.6015E+00	1.6015E+00	1.5278E+00	1.5304E+00	1.632E+00
AC-228		6.9364E-01	6.9364E-01	2.5749E-01	2.6042E-01	
TH-227	#B	-2.8525E-01	-2.8525E-01	6.3342E-01	6.3362E-01	6.896E-01
PA-234	#B	1.6611E-02	1.6611E-02	3.2155E-01	3.2155E-01	3.603E-01
TH-234	#B	2.4669E+00	2.4669E+00	3.0040E+00	3.0071E+00	6.087E+00
AM-241	#A	-6.2451E-02	-6.2452E-02	7.6920E-01	7.6920E-01	8.641E-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) 1.7843410E+01 pCi/gm
Total Decayed Activity (270.2 to 1999.0 keV) 1.7843410E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JJM

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

Sample description
FSS-OOL-11-01-005-F

Spectrum Filename: C:\GammaVision\Spectra\103F_1MAY2006_0942.An1

Acquisition information

Start time:	01-May-2006 09:43:59
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:	1.5940E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.5940E+03) = 6.2735E+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	17-Apr-2006 21:25:00
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: 0.2047

***** 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
75.01	115.	21.89	0.99	9.052E-03	72.87	6.400	PBC<MDA	HG203
					74.81	9.600	1.125E+00	PB212
77.31	113.	18.26	0.99	1.011E-02	77.11	17.500	6.687E-01	PB212
					77.11	10.700	1.094E+00	PB214
87.46	69.	35.79	1.00	1.450E-02	86.45	32.740	1.272E-01	EU155
					88.04	3.790	1.069E+00	CD109
93.00	81.	32.12	1.00	1.652E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
					94.67	15.500	PBC<MDA	PA234
129.60	100.	40.15	0.67	2.443E-02				
185.98	163.	24.08	1.27	2.567E-02				
185.98	163.	24.08	1.27	2.567E-02	185.99	3.280	1.511E+00	RA226
209.43	87.	35.63	0.95	2.471E-02				
238.79	846.	4.07	1.09	2.319E-02	238.63	43.100	7.073E-01	PB212
241.95	103.	23.92	1.10	2.302E-02	241.00	3.900	9.659E-01	RA224
295.33	221.	12.37	1.22	2.024E-02	295.22	19.200	4.722E-01	PB214
300.40	99.	24.92	1.19	2.000E-02				
327.96	83.	25.52	1.31	1.874E-02				
338.42	207.	13.95	1.38	1.830E-02	338.40	12.010	7.934E-01	AC228
352.03	385.	8.15	1.15	1.775E-02	351.99	37.100	4.883E-01	PB214
462.83	49.	36.38	0.81	1.426E-02				
462.83	49.	36.38	0.81	1.426E-02	463.51	10.000	PBC<MDA	SB125
511.09	166.	14.58	1.31	1.317E-02	510.72	22.500	3.985E-01	TL208
583.41	306.	8.56	1.26	1.184E-02	583.14	86.000	2.513E-01	TL208
609.54	288.	7.15	1.36	1.144E-02	609.32	46.090	4.519E-01	BI214
					614.37	90.393	2.372E-01	Ag108M
661.72	154.	13.22	1.31	1.072E-02	661.62	84.620	1.424E-01	CS137

727.73	68.	21.49	1.90	9.959E-03	727.17	11.800	4.853E-01	BI212
795.28	74.	22.15	0.90	9.305E-03				
795.28	74.	22.15	0.90	9.305E-03	795.76	85.400	8.031E-02	CS134
860.70	48.	28.39	1.30	8.766E-03				
911.53	230.	9.68	1.66	8.398E-03	911.07	29.000	7.886E-01	AC228
964.58	42.	26.04	1.54	8.051E-03				
969.32	113.	12.67	1.54	8.022E-03	968.90	17.460	6.803E-01	AC228
1119.93	91.	17.29	1.23	7.213E-03	1120.28	15.040	6.933E-01	BI214

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1173.46	45.	29.58	1.67	6.972E-03	1173.23	99.860	5.542E-02	CO60
1332.69	65.	21.50	1.54	6.349E-03	1332.51	99.980	8.354E-02	CO60
1461.23	1065.	3.12	1.84	5.931E-03	1460.75	10.700	1.397E+01	K40
1764.89	50.	13.74	0.79	5.142E-03	1764.51	15.920	5.150E-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	
174.09	87.46	270.	69.	0.034	107.37	1.001	PB-214	lD
258.36	129.60	609.	89.	0.045	121.25	0.669	AC-228	s
418.03	209.43	381.	87.	0.044	106.89	0.950	AC-228	s
483.05	241.92	249.	103.	0.051	71.77	1.095	PB-214	lD
599.94	300.40	195.	99.	0.049	74.77	1.186	PB-212	
655.06	327.96	164.	83.	0.041	76.55	1.312	AC-228	s
1720.45	860.70	51.	48.	0.024	85.17	1.299	TL-208	
1929.23	964.77	36.	45.	0.022	72.81	1.538	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	280.	115.	0.058	65.67	0.993D
PB-212	153.39	77.11	297.	113.	0.056	54.78	0.995A
RA-226	371.83	186.33	580.	108.	0.054	87.87	1.500s
PB-212	476.78	238.81	570.	802.	0.401	17.74	0.992
PB-214	589.80	295.33	222.	217.	0.108	37.11	1.216
AC-228	675.97	338.42	224.	206.	0.103	41.84	1.383
PB-214	703.20	352.03	206.	379.	0.190	24.46	1.150
SB-125	925.39	463.13	129.	47.	0.024	107.66	1.500
TL-208	1021.29	511.09	167.	139.	0.070	43.75	1.307s
TL-208	1165.91	583.41	123.	302.	0.151	25.67	1.264
BI-214	1218.17	609.54	65.	281.	0.141	21.44	1.360
CS-137	1322.53	661.72	91.	152.	0.076	39.65	1.313s
BI-212	1454.53	727.73	61.	67.	0.034	64.47	1.896s
CS-134	1589.16	795.05	55.	47.	0.024	79.55	1.500s
AC-228	1822.08	911.53	73.	227.	0.113	29.05	1.660s
AC-228	1936.81	968.90	39.	113.	0.056	36.79	1.541D
BI-214	2238.83	1119.93	50.	89.	0.044	51.88	1.226s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
CO-60	2345.88	1173.46	76.	45.	0.023	88.75	1.667s
CO-60	2664.67	1332.88	31.	49.	0.025	60.54	1.765s
K-40	2921.33	1461.23	28.	1046.	0.523	9.35	1.839
BI-214	3528.54	1764.89	3.	50.	0.025	41.21	0.789s

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		1.6738E-02					
			477.56	1.674E-02	&(	3.395E-01 9.79E-02	G
K-40		1.3975E+01					
			1460.75	1.397E+01	(P	3.639E-01 4.43E-01	G
MN-54		-2.9970E-04					
			834.81	-2.997E-04	&(P	3.569E-02 1.00E-02	G
CO-57		3.2975E-03					
			122.07	3.298E-03	%(P	5.334E-02 1.59E-02	G K
			136.43	0.000E+00	%	4.250E-01 1.26E-01	G
CO-60		6.0646E-02					
			1332.51	6.587E-02	@(P	3.860E-02 1.40E-02	G K
			1173.23	5.542E-02	(P	5.301E-02 1.71E-02	G K
Sr-85		-1.7306E-02					
			514.00	-1.731E-02	%(	5.193E-02 1.56E-02	G
Kr-85		-3.4633E+02					
			513.99	-3.463E+02	%(	1.038E+03 3.11E+02	G
Y-88		-2.0327E-03					
			1836.01	-2.033E-03	%(P	2.214E-02 5.48E-03	G K
			898.02	2.085E-02	% P	4.011E-02 1.22E-02	G
NB-94		-2.8547E-03					
			871.10	-2.855E-03	%(	3.335E-02 9.47E-03	G K
			702.50	1.087E-03	&	2.896E-02 8.16E-03	G K
Ag-108M		1.2418E-02					
			722.95	1.242E-02	%(	3.932E-02 1.17E-02	G K
			614.37	-3.015E-03	% P	4.645E-02 1.35E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		433.93	4.375E-03	%	3.580E-02	1.05E-02	G
CD-109	1.1242E+00						
		88.04	1.124E+00	&(	1.845E+00	5.63E-01	G
SN-113	-1.8700E-03						
		391.71	-1.870E-03	%(	6.009E-02	1.76E-02	G K
		255.04	3.291E-01	&	1.822E+00	5.43E-01	G
SB-125	7.1044E-02						
		427.95	-1.064E-03	%(P	1.205E-01	3.50E-02	G K
		600.77	-5.706E-05	% P	2.065E-01	5.93E-02	G
		636.15	-2.371E-02	% P	2.772E-01	7.90E-02	G
		463.51	2.845E-01	(P	3.345E-01	1.05E-01	G
		176.29	1.103E-01	%	4.500E-01	1.34E-01	G
I-131	2.0764E-03						
		364.48	2.076E-03	%(P	1.308E-01	3.81E-02	G K
		636.97	1.508E-02	&	1.718E+00	4.94E-01	G
		284.29	-1.587E-01	& P	1.854E+00	5.48E-01	G
CS-134	2.2508E-02						
		604.66	-2.440E-03	%(	7.108E-02	2.10E-02	G K
		795.76	5.102E-02	(P	4.031E-02	1.36E-02	G
		569.29	-8.673E-03	& P	2.107E-01	5.96E-02	G
		801.84	-1.145E-01	% P	4.370E-01	1.27E-01	G
CS-137	1.4244E-01						
		661.62	1.424E-01	@(P	4.403E-02	1.90E-02	G
CE-139	-1.1219E-02						
		165.85	-1.122E-02	%(	5.243E-02	1.57E-02	G
EU-152	9.6162E-04						
		121.78	9.616E-04	%(P	1.521E-01	4.51E-02	G K
		344.30	4.205E-03	% P	9.780E-02	2.84E-02	G
		1408.08	7.392E-02	%	1.708E-01	5.14E-02	G
		964.00	-9.250E-02	% P	3.572E-01	1.05E-01	G
		1112.07	-8.707E-02	&	3.356E-01	9.86E-02	G
		778.90	-3.006E-02	&	2.725E-01	7.83E-02	G
EU-154	6.5897E-03						
		123.10	6.590E-03	%(	1.100E-01	3.28E-02	G K
		1274.80	-3.963E-02	%	1.332E-01	3.93E-02	G
		723.30	4.376E-02	%	1.557E-01	4.58E-02	G
		1004.80	-6.969E-03	%	2.356E-01	6.67E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	1.2914E-01						
		86.45	1.291E-01	%(	2.296E-01	6.99E-02	G K
		105.31	-2.996E-03	%	2.122E-01	6.28E-02	G
HG-203	2.6382E-02						
		279.17	2.638E-02	&(P	4.727E-02	1.44E-02	G K
		72.87	5.654E-01	% P	2.611E+00	7.83E-01	G
		70.83	-1.138E+00	%	5.109E+00	1.53E+00	G
		82.50	-7.221E-01	&	4.644E+00	1.39E+00	G
TL-208	2.5125E-01						
		583.14	2.513E-01	(P	4.529E-02	2.18E-02	G
		510.72	3.985E-01	+ P	1.798E-01	6.93E-02	G
PB-212	6.7701E-01						
		238.63	6.804E-01	(P	9.659E-02	4.08E-02	G K
							Energy duplication
		77.11	5.396E-01	} P	3.979E-01	9.85E-02	G
		74.81	1.125E+00	+ P	7.869E-01	2.53E-01	G
PB-214	4.8281E-01						
		351.99	4.883E-01	(P	8.950E-02	4.04E-02	G K
		295.22	4.722E-01	(P	1.575E-01	5.95E-02	G
							Energy duplication
		77.11	0.000E+00	} P	9.369E-01	0.00E+00	G
		241.92	-1.845E-01	%	4.942E-01	1.49E-01	G
BI-212	4.8527E-01						
		727.17	4.853E-01	(P	2.813E-01	1.05E-01	G K
		1620.56	2.953E-01	% P	8.296E-01	2.42E-01	G
		785.42	6.776E-01	%	1.922E+00	5.73E-01	G
BI-214	4.6809E-01						
		609.32	4.519E-01	(P	6.476E-02	3.30E-02	G K
		1764.51	5.150E-01	(P	1.154E-01	7.54E-02	G
		1120.28	6.933E-01	+ P	2.795E-01	1.22E-01	G
RA-224	7.7201E-01						
		241.00	7.720E-01	&(	1.134E+00	3.47E-01	G
RA-226	1.0879E+00						
		185.99	1.088E+00	*(P	1.158E+00	3.57E-01	G
AC-228	7.5755E-01						
		911.07	7.886E-01	(P	1.483E-01	7.75E-02	G K
		968.90	6.813E-01	(P	1.933E-01	8.37E-02	G
		338.40	7.934E-01	(P	2.796E-01	1.11E-01	G

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

TH-227      -1.8757E-01
                          236.00-1.876E-01 %(  3.958E-01 1.20E-01 G K
                          256.25 9.387E-02 & P 5.184E-01 1.54E-01 G

PA-234      -4.4892E-02
                           98.44-4.489E-02 %(P 2.149E-01 6.43E-02 G K
                          946.00 3.953E-02 % P 1.699E-01 4.94E-02 G
                          131.28 1.629E-02 & P 2.241E-01 6.68E-02 G
                           94.67-3.402E-03 & P 3.908E-01 1.16E-01 G
                          883.24-7.483E-03 %   3.008E-01 8.49E-02 G
                          926.70 1.456E-02 &   3.267E-01 9.22E-02 G
                          569.26-9.297E-03 & P 3.084E-01 8.73E-02 G

TH-234       2.6036E-01
                           63.29 2.604E-01 %(P 6.730E+00 1.99E+00 G K
                           92.80 1.418E+00 % P 2.211E+00 6.71E-01 G
                           92.38 1.602E+00 % P 2.633E+00 7.98E-01 G

AM-241      -8.8882E-04
                           59.54-8.888E-04 &(P 1.039E+00 3.07E-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	1.4045E-02	1.6738E-02	2.9355E-01	2.9355E-01	2.849E-01
K-40		1.3975E+01	1.3975E+01	1.3296E+00	1.5576E+00	
MN-54	#A	-2.9085E-04	-2.9970E-04	3.9859E-01	3.9859E-01	3.464E-02
CO-57	#B	3.1851E-03	3.2975E-03	4.7610E-02	4.7611E-02	5.152E-02
CO-60	#	6.0352E-02	6.0646E-02	3.4089E-02	3.4271E-02	3.842E-02
Sr-85	#A	-1.4979E-02	-1.7306E-02	4.6692E-02	4.6703E-02	4.494E-02
Kr-85	#A	-3.4630E+02	-3.4633E+02	9.3312E+02	9.3334E+02	1.038E+03
Y-88	#B	-1.8618E-03	-2.0327E-03	1.8445E-02	1.8446E-02	2.027E-02
NB-94	#B	-2.8547E-03	-2.8547E-03	2.8397E-02	2.8398E-02	3.335E-02
Ag-108M	#B	1.2415E-02	1.2418E-02	3.5017E-02	3.5025E-02	3.931E-02
CD-109	#A	1.1012E+00	1.1242E+00	1.6885E+00	1.6897E+00	1.807E+00
SN-113	#B	-1.7238E-03	-1.8700E-03	5.2681E-02	5.2681E-02	5.539E-02
SB-125	#B	7.0389E-02	7.1044E-02	7.8545E-02	7.8653E-02	1.194E-01
I-131	#B	6.4769E-04	2.0764E-03	1.1440E-01	1.1440E-01	4.081E-02
CS-134	#B	2.2230E-02	2.2508E-02	1.7938E-02	1.7985E-02	7.021E-02
CS-137	#	1.4232E-01	1.4244E-01	5.6992E-02	5.7589E-02	
CE-139	#A	-1.0480E-02	-1.1219E-02	4.7124E-02	4.7129E-02	4.897E-02
EU-152	#B	9.5968E-04	9.6162E-04	1.3543E-01	1.3543E-01	1.518E-01
EU-154	#B	6.5699E-03	6.5897E-03	9.8251E-02	9.8252E-02	1.097E-01
EU-155	#B	1.2848E-01	1.2914E-01	2.0969E-01	2.0981E-01	2.284E-01
HG-203	#B	2.1577E-02	2.6382E-02	4.3238E-02	4.3265E-02	3.866E-02
TL-208		2.5125E-01	2.5125E-01	6.5411E-02	6.7018E-02	
PB-212		6.7701E-01	6.7701E-01	1.2191E-01	1.2809E-01	
PB-214		4.8281E-01	4.8281E-01	1.0918E-01	1.1272E-01	
BI-212		4.8527E-01	4.8527E-01	3.1514E-01	3.1640E-01	
BI-214		4.6809E-01	4.6809E-01	1.0266E-01	1.0619E-01	
RA-224	#A	7.7201E-01	7.7201E-01	1.0412E+00	1.0422E+00	1.134E+00
RA-226	#A	1.0879E+00	1.0879E+00	1.0705E+00	1.0724E+00	1.158E+00
AC-228		7.5755E-01	7.5755E-01	1.5961E-01	1.6556E-01	
TH-227	#B	-1.8757E-01	-1.8757E-01	3.6005E-01	3.6022E-01	3.958E-01
PA-234	#B	-4.4892E-02	-4.4892E-02	2.0917E-01	2.0918E-01	2.149E-01
TH-234	#B	2.6036E-01	2.6036E-01	5.9815E+00	5.9815E+00	6.730E+00
AM-241	#A	-8.8877E-04	-8.8882E-04	2.3111E+00	2.3111E+00	1.038E+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) 1.7239004E+01 pCi/gm
Total Decayed Activity (1120.0 to 2000.7 keV) 1.7239126E+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_19APRIL2006_0948.An1

Sample description
FSS OOL-11-01-019-F

Spectrum Filename: C:\GammaVision\Spectra\103F_19APRIL2006_0948.An1

Acquisition information

Start time:	19-Apr-2006 09:49:50
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:	1.2550E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.2550E+03) = 7.9681E+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	17-Apr-2006 19:24:00
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. 13 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.2126

***** 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
74.96	92.	25.01	0.99	9.052E-03	74.81	9.600	1.140E+00	PB212
77.26	123.	16.37	0.99	1.011E-02	77.11	17.500	9.129E-01	PB212
92.82	138.	23.61	1.20	1.646E-02	92.38	2.570	3.093E+00	TH234
					92.80	3.000	2.626E+00	TH234
185.99	122.	31.07	1.16	2.567E-02	185.99	3.280	1.396E+00	RA226
209.65	81.	32.86	1.04	2.470E-02				
239.01	737.	4.36	1.09	2.318E-02	238.63	43.100	7.806E-01	PB212
241.96	123.	18.74	1.10	2.302E-02	241.00	3.900	1.476E+00	RA224
					241.92	7.470	7.725E-01	PB214
270.27	62.	40.79	0.83	2.151E-02				
295.38	166.	12.68	1.34	2.024E-02	295.22	19.200	4.485E-01	PB214
300.63	54.	33.00	1.05	1.999E-02				
338.42	181.	15.70	1.02	1.830E-02	338.40	12.010	8.804E-01	AC228
352.03	291.	9.34	1.16	1.775E-02	351.99	37.100	4.672E-01	PB214
462.18	79.	25.84	1.36	1.428E-02				
462.18	79.	25.84	1.36	1.428E-02	463.51	10.000	5.896E-01	SB125
510.84	139.	15.86	1.19	1.317E-02	510.72	22.500	4.070E-01	TL208
583.36	261.	8.59	1.48	1.184E-02	583.14	86.000	2.718E-01	TL208
609.50	211.	8.81	1.25	1.144E-02	609.32	46.090	4.177E-01	BI214
661.92	204.	11.30	1.09	1.072E-02	661.62	84.620	2.405E-01	CS137
727.86	45.	35.59	0.69	9.957E-03	727.17	11.800	4.057E-01	BI212
795.02	64.	29.01	1.09	9.308E-03				
795.02	64.	29.01	1.09	9.308E-03	795.76	85.400	8.677E-02	CS134
911.34	192.	8.84	1.44	8.399E-03	911.07	29.000	8.337E-01	AC228
968.92	189.	10.78	1.48	8.026E-03	968.90	17.460	1.451E+00	AC228
1120.64	68.	28.35	1.86	7.210E-03	1120.28	15.040	6.563E-01	BI214
1461.19	1097.	3.12	1.86	5.931E-03	1460.75	10.700	1.829E+01	K40

1765.32	41.	15.08	1.30	5.142E-03	1764.51	15.920	5.358E-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	
418.46	209.65	276.	81.	0.041	98.57	1.044	NP-239	
539.69	270.27	231.	62.	0.031	122.36	0.834	AC-228	s
600.41	300.63	128.	54.	0.027	99.01	1.052	PB-212	s
1454.79	727.86	72.	45.	0.022	106.76	0.685	J-132	l

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	238.	92.	0.046	75.03	0.993D
PB-212	153.39	77.11	242.	123.	0.061	49.10	0.995A
TH-234	185.19	93.01	635.	125.	0.063	77.96	1.500s
TH-234	185.19	93.01	613.	128.	0.064	75.47	1.500s
RA-226	371.15	185.99	501.	109.	0.055	93.22	1.163s
PB-212	477.23	239.04	412.	695.	0.347	17.34	0.984
RA-224	482.91	241.88	457.	113.	0.056	85.33	1.500
PB-214	482.92	241.88	460.	97.	0.049	98.56	1.500s
PB-214	589.91	295.38	136.	162.	0.081	38.05	1.340
AC-228	675.98	338.42	224.	180.	0.090	47.10	1.021
PB-214	703.20	352.03	172.	286.	0.143	28.03	1.156s
SB-125	925.22	463.05	134.	51.	0.026	101.28	1.500s
TL-208	1020.78	510.84	138.	112.	0.056	47.57	1.193s
TL-208	1165.82	583.36	88.	257.	0.129	25.76	1.479s
BI-214	1218.10	609.50	62.	205.	0.102	26.42	1.250
CS-137	1322.92	661.92	92.	203.	0.101	33.91	1.087s
CS-134	1588.84	794.89	56.	33.	0.016	109.48	1.500
AC-228	1821.70	911.34	35.	189.	0.094	26.52	1.436
AC-228	1936.85	968.92	58.	189.	0.094	32.34	1.480s
BI-214	2240.25	1120.64	94.	66.	0.033	85.05	1.859
K-40	2921.24	1461.19	36.	1078.	0.539	9.36	1.855
BI-214	3529.39	1765.32	3.	41.	0.020	45.23	1.300s

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		2.3205E-03						
			477.56	2.320E-03	&(	4.001E-01	1.15E-01	G
K-40		1.8292E+01						
			1460.75	1.829E+01	(P	5.185E-01	5.81E-01	G
MN-54		9.0774E-03						
			834.81	9.077E-03	&(P	4.441E-02	1.29E-02	G
CO-57		9.3807E-04						
			122.07	9.381E-04	%(P	6.007E-02	1.78E-02	G K
			136.43	6.516E-02	&	4.365E-01	1.30E-01	G
CO-60		-1.4849E-03						
			1332.51	-1.485E-03	%(P	4.584E-02	1.21E-02	G K
			1173.23	2.105E-02	% P	5.840E-02	1.73E-02	G K
Sr-85		-1.9139E-02						
			514.00	-1.914E-02	%(	5.570E-02	1.67E-02	G
Kr-85		-4.3435E+02						
			513.99	-4.343E+02	%(	1.264E+03	3.79E+02	G
Y-88		4.2654E-03						
			1836.01	4.265E-03	&(P	3.030E-02	7.98E-03	G K
			898.02	1.099E-02	& P	4.495E-02	1.31E-02	G
NB-94		6.5142E-03						
			871.10	6.514E-03	&(	3.305E-02	9.45E-03	G K
			702.50	8.652E-03	&	4.836E-02	1.41E-02	G K
Ag-108M		-5.1212E-03						
			722.95	-5.121E-03	%(	4.840E-02	1.39E-02	G K
			614.37	-2.313E-02	% P	5.069E-02	1.53E-02	G
			433.93	1.333E-02	%	4.132E-02	1.23E-02	G
CD-109		1.0555E+00						
			88.04	1.056E+00	&(	2.263E+00	6.86E-01	G
SN-113		-4.7681E-04						
			391.71	-4.768E-04	%(	6.186E-02	1.79E-02	G K
			255.04	2.794E-01	%	1.943E+00	5.76E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	6.6910E-02						
		427.95	-4.208E-02	%(P	1.333E-01	3.98E-02	G K
		600.77	-5.564E-02	% P	2.313E-01	6.81E-02	G
		636.15	-5.966E-02	% P	3.795E-01	1.10E-01	G
		463.51	3.895E-01	@(P	4.279E-01	1.35E-01	G
		176.29	-1.474E-02	%	6.902E-01	2.04E-01	G
I-131	3.4227E-03						
		364.48	3.423E-03	&(P	5.409E-02	1.58E-02	G K
		636.97	-1.201E-01	%	6.894E-01	2.01E-01	G
		284.29	-9.682E-02	& P	6.882E-01	2.03E-01	G
CS-134	2.8169E-02						
		604.66	1.369E-02	%(	3.338E-02	1.00E-02	G K
		795.76	4.471E-02	(P	5.110E-02	1.64E-02	G
		569.29	1.002E-01	% P	2.099E-01	6.32E-02	G
		801.84	-1.365E-01	% P	5.361E-01	1.55E-01	G
CS-137	2.4048E-01						
		661.62	2.405E-01	@(P	5.638E-02	2.74E-02	G
CE-139	-1.7635E-03						
		165.85	-1.764E-03	%(	5.418E-02	1.60E-02	G
EU-152	1.8962E-03						
		121.78	1.896E-03	%(P	1.756E-01	5.20E-02	G K
		344.30	4.256E-02	& P	1.339E-01	4.00E-02	G
		1408.08	4.814E-02	%	1.954E-01	5.61E-02	G
		964.00	1.160E-01	% P	3.636E-01	1.08E-01	G
		1112.07	6.897E-02	%	4.565E-01	1.32E-01	G
		778.90	-4.097E-03	%	2.786E-01	7.76E-02	G
EU-154	-2.1227E-02						
		123.10	-2.123E-02	%(	1.310E-01	3.91E-02	G K
		1274.80	1.429E-02	&	1.355E-01	3.82E-02	G
		723.30	-3.279E-02	%	2.355E-01	6.83E-02	G
		1004.80	-8.037E-02	%	3.272E-01	9.62E-02	G
EU-155	1.3562E-01						
		86.45	1.356E-01	%(	2.825E-01	8.57E-02	G K
		105.31	-5.915E-02	%	2.797E-01	8.37E-02	G
HG-203	-6.8281E-03						
		279.17	-6.828E-03	&(P	5.088E-02	1.51E-02	G K
		72.87	-6.628E-03	% P	2.667E+00	7.92E-01	G
		70.83	-2.002E+00	%	5.027E+00	1.52E+00	G
		82.50	-1.223E+00	%	4.873E+00	1.46E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.7176E-01						
		583.14	2.718E-01	@(P	4.905E-02	2.37E-02	G
		510.72	4.070E-01	+ P	2.087E-01	7.99E-02	G
PB-212	7.4806E-01						
		238.63	7.481E-01	(P	1.048E-01	4.40E-02	G K
							Energy duplication
		77.11	7.481E-01	} P	4.572E-01	1.22E-01	G
		74.81	1.140E+00	+ P	9.250E-01	2.95E-01	G
PB-214	4.6082E-01						
		351.99	4.672E-01	@(P	1.044E-01	4.45E-02	G K
		295.22	4.485E-01	(P	1.581E-01	5.83E-02	G
							Energy duplication
		77.11	0.000E+00	} P	1.051E+00	0.00E+00	G
		241.92	6.078E-01	+	6.428E-01	2.00E-01	G
BI-212	2.5543E-01						
		727.17	2.554E-01	%(P	3.647E-01	1.14E-01	G K
		1620.56	2.375E-01	% P	1.336E+00	3.70E-01	G
		785.42	1.358E+00	%	2.101E+00	6.53E-01	G
BI-214	4.1771E-01						
		609.32	4.177E-01	(P	8.076E-02	3.80E-02	G K
		1764.51	5.358E-01	+ P	1.465E-01	8.73E-02	G
		1120.28	6.563E-01	+ P	4.752E-01	1.91E-01	G
RA-224	1.3479E+00						
		241.00	1.348E+00	(	1.224E+00	3.83E-01	G
RA-226	1.3960E+00						
		185.99	1.396E+00	(P	1.369E+00	4.85E-01	G
AC-228	8.4736E-01						
		911.07	8.337E-01	(P	1.345E-01	7.50E-02	G K
		968.90	1.451E+00	+ P	2.939E-01	1.57E-01	G
		338.40	8.804E-01	(P	3.552E-01	1.39E-01	G
TH-227	4.6371E-02						
		236.00	4.637E-02	&(	2.970E-01	8.78E-02	G K
		256.25	1.743E-01	& P	4.912E-01	1.47E-01	G
PA-234	-9.6896E-04						
		98.44	-9.690E-04	&(P	2.119E-01	6.23E-02	G K
		946.00	1.176E-02	& P	2.135E-01	6.00E-02	G
		131.28	-3.394E-02	% P	2.620E-01	7.81E-02	G
		94.67	-1.625E-01	% P	5.157E-01	1.55E-01	G
		883.24	1.111E-02	&	3.739E-01	1.05E-01	G
		926.70	-2.473E-02	&	2.733E-01	7.52E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 1.479E-01 % P 3.111E-01 9.37E-02 G

TH-234       2.7643E+00
                           63.29 2.451E+00 %(P 6.889E+00 2.07E+00 G K
                           92.80 2.785E+00 @(P 2.577E+00 7.98E-01 G
                           92.38 3.215E+00 *(P 3.086E+00 9.53E-01 G

AM-241       1.7098E-01
                           59.54 1.710E-01 &(P 1.353E+00 4.03E-01 G
   ( - This peak used in the nuclide activity average.

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

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

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** 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	2.2727E-03	2.3205E-03	3.4561E-01	3.4561E-01	3.919E-01
K-40		1.8292E+01	1.8292E+01	1.7422E+00	2.0403E+00	
MN-54	#A	9.0452E-03	9.0774E-03	3.8692E-02	3.8696E-02	4.425E-02
CO-57	#B	9.3422E-04	9.3807E-04	5.3390E-02	5.3390E-02	5.982E-02
CO-60	#B	-1.4840E-03	-1.4849E-03	7.2174E-02	7.2174E-02	4.581E-02

Sr-85	#A	-1.8814E-02	-1.9139E-02	5.0099E-02	5.0112E-02	5.475E-02
Kr-85	#A	-4.3434E+02	-4.3435E+02	1.1370E+03	1.1372E+03	1.264E+03
Y-88	#B	4.2213E-03	4.2654E-03	2.3940E-02	2.3942E-02	2.999E-02
NB-94	#B	6.5142E-03	6.5142E-03	2.8346E-02	2.8349E-02	3.305E-02
Ag-108M	#B	-5.1210E-03	-5.1212E-03	4.1789E-02	4.1790E-02	4.839E-02
CD-109	#A	1.0530E+00	1.0555E+00	2.0577E+00	2.0585E+00	2.257E+00
SN-113	#B	-4.7223E-04	-4.7681E-04	5.3803E-02	5.3803E-02	6.127E-02
SB-125	#B	6.6837E-02	6.6910E-02	6.9448E-02	6.9556E-02	1.332E-01
I-131	#B	2.9813E-03	3.4227E-03	4.7308E-02	4.7308E-02	4.711E-02
CS-134	#B	2.8128E-02	2.8169E-02	3.0921E-02	3.0964E-02	3.333E-02
CS-137	#	2.4045E-01	2.4048E-01	8.2097E-02	8.3275E-02	
CE-139	#A	-1.7493E-03	-1.7635E-03	4.8127E-02	4.8127E-02	5.374E-02
EU-152	#B	1.8958E-03	1.8962E-03	1.5598E-01	1.5598E-01	1.755E-01
EU-154	#B	-2.1219E-02	-2.1227E-02	1.1740E-01	1.1741E-01	1.310E-01
EU-155	#B	1.3553E-01	1.3562E-01	2.5709E-01	2.5720E-01	2.824E-01
HG-203	#B	-6.6673E-03	-6.8281E-03	4.5502E-02	4.5503E-02	4.968E-02
TL-208	#	2.7176E-01	2.7176E-01	7.1182E-02	7.2909E-02	
PB-212		7.4806E-01	7.4806E-01	1.3193E-01	1.3890E-01	
PB-214		4.6082E-01	4.6082E-01	1.1141E-01	1.1457E-01	
BI-212	#B	2.5543E-01	2.5543E-01	3.4125E-01	3.4157E-01	3.647E-01
BI-214		4.1771E-01	4.1771E-01	1.1387E-01	1.1642E-01	
RA-224	#	1.3479E+00	1.3479E+00	1.1501E+00	1.1528E+00	1.224E+00
RA-226	#	1.3960E+00	1.3960E+00	1.4558E+00	1.4581E+00	
AC-228		8.4736E-01	8.4736E-01	2.2870E-01	2.3393E-01	
TH-227	#B	4.6371E-02	4.6371E-02	2.6348E-01	2.6349E-01	2.970E-01
PA-234	#B	-9.6896E-04	-9.6896E-04	4.5403E-01	4.5403E-01	2.119E-01
TH-234	#B	2.7643E+00	2.7643E+00	2.3746E+00	2.3795E+00	6.889E+00
AM-241	#A	1.7097E-01	1.7098E-01	1.2076E+00	1.2076E+00	1.353E+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 (86.4 to 2000.7 keV) 2.2674576E+01 pCi/gm
Total Decayed Activity (86.4 to 2000.7 keV) 2.2674603E+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_19APRIL2006_1029.An1

Sample description
FSS OOL-11-01-009-F

Spectrum Filename: C:\GammaVision\Spectra\103F_19APRIL2006_1029.An1

Acquisition information
Start time: 19-Apr-2006 10:31:02
Live time: 2000
Real time: 2003
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: 1.6120E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.6120E+03) =
6.2035E+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	17-Apr-2006 21:07:00
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: 0.1845

***** 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
74.96	108.	23.18	0.99	9.052E-03	74.81	9.600	1.045E+00	PB212
77.26	172.	12.56	0.99	1.011E-02	77.11	10.700	1.444E+00	PB214
					77.11	17.500	8.827E-01	PB212
87.34	74.	36.97	1.00	1.448E-02	86.45	32.740	1.340E-01	EU155
					88.04	3.790	1.111E+00	CD109
89.84	80.	33.83	1.00	1.542E-02				
93.19	122.	21.42	1.00	1.661E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.39	174.	20.17	1.21	2.565E-02	185.99	3.280	1.604E+00	RA226
209.91	102.	25.79	1.33	2.468E-02				
239.02	890.	4.07	1.09	2.318E-02	238.63	43.100	7.365E-01	PB212
242.05	114.	21.42	1.10	2.302E-02	241.92	7.470	5.539E-01	PB214
270.73	88.	23.88	1.05	2.149E-02				
276.84	77.	32.82	0.84	2.117E-02				
295.20	229.	10.92	1.04	2.025E-02	295.22	19.200	4.851E-01	PB214
300.43	79.	31.68	1.38	2.000E-02				
327.96	64.	31.40	1.26	1.874E-02				
338.49	200.	13.88	1.07	1.830E-02	338.40	12.010	7.605E-01	AC228
351.94	408.	8.27	1.09	1.775E-02	351.99	37.100	5.124E-01	PB214
462.96	92.	17.93	0.98	1.426E-02				
462.96	92.	17.93	0.98	1.426E-02	463.51	10.000	5.344E-01	SB125
510.84	153.	14.30	1.24	1.317E-02	510.72	22.500	3.570E-01	TL208
583.33	330.	7.39	1.34	1.184E-02	583.14	86.000	2.680E-01	TL208
609.52	319.	7.46	1.23	1.144E-02	609.32	46.090	4.972E-01	BI214
662.12	73.	22.54	0.70	1.072E-02	661.62	84.620	6.599E-02	CS137
728.06	79.	19.91	1.15	9.955E-03	727.17	11.800	5.568E-01	BI212
794.84	42.	28.45	1.24	9.309E-03				

794.84	42.	28.45	1.24	9.309E-03	795.76	85.400	4.430E-02	CS134
860.52	44.	27.30	1.56	8.768E-03				
911.36	208.	8.07	1.64	8.399E-03	911.07	29.000	7.048E-01	AC228
968.39	214.	9.04	1.40	8.029E-03	968.90	17.460	1.278E+00	AC228
1120.38	86.	16.55	2.06	7.211E-03	1120.28	15.040	6.462E-01	BI214
1461.23	1127.	3.17	1.94	5.931E-03	1460.75	10.700	1.463E+01	K40
1764.99	56.	13.02	2.63	5.142E-03	1764.51	15.920	5.707E-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	
173.86	87.41	335.	74.	0.037	110.91	1.001	PB-214	lD
178.86	89.91	330.	80.	0.040	101.50	1.002	PB-214	lD
418.99	209.91	283.	102.	0.051	77.36	1.327	NP-239	s
483.25	242.04	239.	114.	0.057	64.25	1.095	PB-214	lD
540.60	270.73	170.	88.	0.044	71.63	1.049	AC-228	
552.83	276.84	222.	92.	0.046	75.42	0.835	TL-208	
600.01	300.43	219.	79.	0.040	95.05	1.382	PB-212	s
655.07	327.96	152.	64.	0.032	94.21	1.258	AC-228	s
1588.73	794.84	42.	42.	0.021	85.36	1.237	AC-228	l
1720.09	860.52	34.	44.	0.022	81.90	1.561	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	281.	108.	0.054	69.54	0.993D
PB-212	153.39	77.11	285.	172.	0.086	37.67	0.995A
TH-234	185.33	93.08	757.	117.	0.058	89.61	1.500s
TH-234	185.32	93.07	737.	117.	0.059	88.11	1.500s
RA-226	371.50	186.17	532.	139.	0.069	68.30	1.500s
PB-212	477.18	239.01	546.	938.	0.469	15.78	0.990
PB-214	589.55	295.20	184.	225.	0.112	32.75	1.040
AC-228	676.12	338.49	214.	199.	0.100	41.63	1.071
PB-214	703.02	351.94	234.	403.	0.201	24.82	1.095s
SB-125	925.21	463.04	74.	82.	0.041	54.68	1.500
TL-208	1020.80	510.84	139.	126.	0.063	42.90	1.238s
TL-208	1165.75	583.33	92.	326.	0.163	22.16	1.336
BI-214	1218.13	609.52	98.	313.	0.156	22.38	1.229
CS-137	1323.33	662.12	72.	71.	0.036	67.63	0.703s
BI-212	1455.19	728.06	60.	78.	0.039	59.73	1.151s
AC-228	1821.75	911.36	34.	205.	0.102	24.20	1.637s
AC-228	1935.80	968.39	43.	214.	0.107	27.12	1.398s
BI-214	2239.73	1120.38	44.	84.	0.042	49.65	2.063s
K-40	2921.33	1461.23	49.	1108.	0.554	9.50	1.944
BI-214	3528.73	1764.99	3.	56.	0.028	39.06	2.635s

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		3.7440E-02					
			477.56	3.744E-02	&(	3.399E-01 9.94E-02	G
K-40		1.4632E+01					
			1460.75	1.463E+01	(P	4.671E-01 4.71E-01	G
MN-54		2.3644E-02					
			834.81	2.364E-02	&(P	3.572E-02 1.11E-02	G
CO-57		-7.5850E-03					
			122.07	-7.585E-03	&(P	5.096E-02 1.52E-02	G K
			136.43	1.088E-01	&	3.948E-01 1.19E-01	G
CO-60		-3.2663E-03					
			1332.51	-3.266E-03	%(P	4.287E-02 1.15E-02	G K
			1173.23	-1.568E-02	% P	5.479E-02 1.60E-02	G K
Sr-85		-1.3644E-02					
			514.00	-1.364E-02	%(	4.519E-02 1.35E-02	G
Kr-85		-3.0943E+02					
			513.99	-3.094E+02	%(	1.026E+03 3.07E+02	G
Y-88		-1.0766E-04					
			1836.01	-1.077E-04	%(P	2.799E-02 7.06E-03	G K
			898.02	1.788E-02	& P	3.045E-02 9.40E-03	G
NB-94		2.9068E-03					
			871.10	2.907E-03	%(	2.830E-02 7.97E-03	G K
			702.50	1.046E-03	%	3.393E-02 9.67E-03	G K
Ag-108M		2.3520E-03					
			722.95	2.352E-03	%(	4.003E-02 1.15E-02	G K
			614.37	-1.060E-02	% P	4.360E-02 1.29E-02	G
			433.93	3.977E-04	&	2.759E-02 7.88E-03	G
CD-109		1.1157E+00					
			88.04	1.116E+00	&(	1.979E+00 6.02E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SN-113	-1.2552E-03						
		391.71	-1.255E-03	%(	4.798E-02	1.39E-02	G K
		255.04	8.609E-02	%	1.506E+00	4.44E-01	G
SB-125	1.4577E-01						
		427.95	3.237E-02	%(P	9.834E-02	2.94E-02	G K
		600.77	-4.449E-02	% P	1.910E-01	5.63E-02	G
		636.15	-1.079E-01	% P	3.260E-01	9.68E-02	G
		463.51	4.814E-01	(P	2.524E-01	8.91E-02	G
		176.29	-1.094E-02	%	5.726E-01	1.70E-01	G
I-131	1.5895E-03						
		364.48	1.589E-03	%(P	3.734E-02	1.08E-02	G K
		636.97	-1.670E-01	%	5.636E-01	1.67E-01	G
		284.29	-6.486E-02	% P	6.421E-01	1.90E-01	G
CS-134	-1.5911E-03						
		604.66	-1.591E-03	&(	6.786E-02	2.00E-02	G K
		795.76	2.932E-02	% P	4.003E-02	1.26E-02	G
		569.29	6.874E-03	% P	1.985E-01	5.65E-02	G
		801.84	-1.702E-02	& P	4.039E-01	1.12E-01	G
CS-137	6.5987E-02						
		661.62	6.599E-02	(P	3.894E-02	1.52E-02	G
CE-139	1.0848E-02						
		165.85	1.085E-02	&(	4.656E-02	1.40E-02	G
EU-152	-2.2894E-02						
		121.78	-2.289E-02	&(P	1.490E-01	4.45E-02	G K
		344.30	4.664E-03	% P	1.233E-01	3.61E-02	G
		1408.08	2.323E-02	%	1.490E-01	4.17E-02	G
		964.00	1.689E-01	% P	3.094E-01	9.45E-02	G
		1112.07	1.188E-01	%	2.712E-01	8.17E-02	G
		778.90	-3.370E-02	%	2.508E-01	7.21E-02	G
EU-154	-1.4961E-02						
		123.10	-1.496E-02	%(	1.129E-01	3.37E-02	G K
		1274.80	2.165E-02	%	1.213E-01	3.50E-02	G
		723.30	0.000E+00	%	3.246E-01	9.50E-02	G
		1004.80	1.006E-03	%	2.077E-01	5.81E-02	G
EU-155	2.5573E-03						
		86.45	2.557E-03	%(	2.402E-01	7.14E-02	G K
		105.31	9.255E-02	&	2.255E-01	6.82E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
HG-203	-7.8519E-03						
		279.17	-7.852E-03	&(P	4.580E-02	1.36E-02	G K
		72.87	-3.474E-01	& P	2.190E+00	6.55E-01	G
		70.83	-1.331E+00	&	4.665E+00	1.40E+00	G
		82.50	-3.328E-02	%	3.094E+00	9.14E-01	G
TL-208	2.6803E-01						
		583.14	2.680E-01	(P	3.908E-02	2.01E-02	G
		510.72	3.570E-01	+ P	1.629E-01	6.19E-02	G
PB-212	8.1432E-01						
		238.63	7.866E-01	(P	9.356E-02	4.20E-02	G K
							Energy duplication
		77.11	8.143E-01	} P	3.852E-01	1.02E-01	G
		74.81	1.045E+00	+ P	7.793E-01	2.49E-01	G
PB-214	5.0306E-01						
		351.99	5.124E-01	@(P	9.427E-02	4.30E-02	G K
		295.22	4.851E-01	(P	1.422E-01	5.39E-02	G
							Energy duplication
		77.11	6.007E-02	} P	9.244E-01	2.37E-01	G
		241.92	3.706E-01	%	5.740E-01	1.75E-01	G
BI-212	5.5685E-01						
		727.17	5.568E-01	*(P	2.764E-01	1.12E-01	G K
		1620.56	2.624E-01	% P	9.705E-01	2.76E-01	G
		785.42	7.661E-01	%	1.553E+00	4.72E-01	G
BI-214	5.1610E-01						
		609.32	4.972E-01	(P	7.776E-02	3.79E-02	G K
		1764.51	5.707E-01	(P	1.141E-01	7.87E-02	G
		1120.28	6.462E-01	+ P	2.609E-01	1.09E-01	G
RA-224	1.8528E-01						
		241.00	1.853E-01	&(	1.114E+00	3.33E-01	G
RA-226	1.3801E+00						
		185.99	1.380E+00	(P	1.098E+00	3.44E-01	G
AC-228	7.2112E-01						
		911.07	7.048E-01	(P	1.030E-01	5.78E-02	G K
		968.90	1.278E+00	+ P	1.998E-01	1.16E-01	G
		338.40	7.605E-01	(P	2.701E-01	1.06E-01	G
TH-227	-1.1454E-01						
		236.00	-1.145E-01	%(	3.532E-01	1.06E-01	G K
		256.25	-6.598E-02	% P	4.790E-01	1.42E-01	G

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

PA-234      -6.8573E-02
                            98.44-6.857E-02 &(P 2.019E-01 6.07E-02 G K
                           946.00 1.199E-02 % P 1.791E-01 5.07E-02 G
                           131.28 1.323E-03 & P 2.159E-01 6.41E-02 G
                            94.67 2.004E-02 % P 3.324E-01 9.86E-02 G
                           883.24-4.535E-02 %   2.074E-01 5.95E-02 G
                           926.70 2.081E-02 &   3.023E-01 8.53E-02 G
                           569.26 4.590E-02 % P 3.035E-01 8.79E-02 G

TH-234       2.2745E+00
                            63.29 2.449E+00 %(P 6.725E+00 2.02E+00 G K
                            92.80 1.994E+00 *(P 2.195E+00 6.74E-01 G
                            92.38 2.337E+00 *(P 2.619E+00 8.04E-01 G

AM-241      -2.7476E-01
                            59.54-2.748E-01 %(P 1.098E+00 3.29E-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

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

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	3.6691E-02	3.7440E-02	2.9814E-01	2.9814E-01	3.331E-01
K-40		1.4632E+01	1.4632E+01	1.4134E+00	1.6491E+00	
MN-54	#A	2.3562E-02	2.3644E-02	3.3306E-02	3.3335E-02	3.560E-02
CO-57	#B	-7.5547E-03	-7.5850E-03	4.7879E-02	4.7881E-02	5.075E-02
CO-60	#B	-3.2645E-03	-3.2663E-03	1.0146E+00	1.0146E+00	4.284E-02
Sr-85	#A	-1.3419E-02	-1.3644E-02	4.0535E-02	4.0543E-02	4.445E-02
Kr-85	#A	-3.0942E+02	-3.0943E+02	9.2024E+02	9.2041E+02	1.026E+03
Y-88	#B	-1.0657E-04	-1.0766E-04	2.6679E-03	2.6679E-03	2.770E-02
NB-94	#B	2.9068E-03	2.9068E-03	2.3921E-02	2.3922E-02	2.830E-02
Ag-108M	#B	2.3520E-03	2.3520E-03	3.4446E-02	3.4446E-02	4.003E-02
CD-109	#A	1.1130E+00	1.1157E+00	1.8073E+00	1.8083E+00	1.975E+00
SN-113	#B	-1.2435E-03	-1.2552E-03	4.1802E-02	4.1802E-02	4.754E-02
SB-125	#F	1.4561E-01	1.4577E-01	8.0948E-02	8.1390E-02	9.823E-02
I-131	#B	1.3896E-03	1.5895E-03	3.2418E-02	3.2418E-02	3.265E-02
CS-134	#B	-1.5888E-03	-1.5911E-03	6.0030E-02	6.0030E-02	6.777E-02
CS-137		6.5981E-02	6.5987E-02	4.5496E-02	4.5657E-02	
CE-139	#A	1.0763E-02	1.0848E-02	4.1862E-02	4.1867E-02	4.619E-02
EU-152	#B	-2.2889E-02	-2.2894E-02	1.4776E-01	1.4777E-01	1.489E-01
EU-154	#B	-1.4956E-02	-1.4961E-02	1.0119E-01	1.0119E-01	1.128E-01
EU-155	#B	2.5558E-03	2.5573E-03	2.1427E-01	2.1427E-01	2.400E-01
HG-203	#B	-7.6720E-03	-7.8519E-03	4.1097E-02	4.1100E-02	4.475E-02
TL-208		2.6803E-01	2.6803E-01	6.0172E-02	6.2152E-02	
PB-212		8.1432E-01	8.1432E-01	1.3016E-01	1.3848E-01	
PB-214		5.0306E-01	5.0306E-01	1.0507E-01	1.0906E-01	
BI-212	#	5.5685E-01	5.5685E-01	3.3473E-01	3.3628E-01	
BI-214		5.1610E-01	5.1610E-01	1.1790E-01	1.2165E-01	
RA-224	#A	1.8528E-01	1.8528E-01	9.9943E-01	9.9948E-01	1.114E+00
RA-226	#	1.3801E+00	1.3801E+00	1.0307E+00	1.0338E+00	1.098E+00
AC-228		7.2112E-01	7.2112E-01	1.7507E-01	1.8001E-01	
TH-227	#B	-1.1454E-01	-1.1454E-01	3.1885E-01	3.1892E-01	3.532E-01
PA-234	#B	-6.8573E-02	-6.8573E-02	1.9206E-01	1.9210E-01	2.019E-01
TH-234	#B	2.2745E+00	2.2745E+00	2.1767E+00	2.1804E+00	6.725E+00
AM-241	#A	-2.7475E-01	-2.7476E-01	1.0020E+00	1.0021E+00	1.098E+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_19APRIL2006_1029.An1

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

Total Activity (82.9 to 2000.7 keV) 1.8077692E+01 pCi/gm
Total Decayed Activity (82.9 to 2000.7 keV) 1.8077700E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

Sample description
FSS OOL-11-01-013-F

Spectrum Filename: C:\GammaVision\Spectra\103F_19APRIL2006_1106.An1

Acquisition information
Start time: 19-Apr-2006 11:09:13
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: 1.1300E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.1300E+03) =
8.8496E+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	17-Apr-2006 20:35:00
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. 23 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.2031

***** 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	126.	19.64	0.99	9.052E-03	74.81	9.600	1.734E+00	PB212
77.22	149.	14.27	0.99	1.011E-02	77.11	17.500	1.252E+00	PB212
					77.11	10.700	2.048E+00	PB214
87.53	98.	25.24	1.00	1.462E-02	86.45	32.740	2.530E-01	EU155
					88.04	3.790	2.098E+00	CD109
93.19	121.	21.01	1.00	1.667E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.28	204.	19.73	1.35	2.566E-02	185.99	3.280	2.708E+00	RA226
209.69	106.	24.87	0.74	2.469E-02				
238.99	932.	3.84	1.09	2.319E-02	238.63	43.100	1.100E+00	PB212
242.55	115.	20.44	1.10	2.299E-02	241.00	3.900	1.531E+00	RA224
					241.92	7.470	8.012E-01	PB214
278.34	83.	30.07	1.45	2.109E-02				
278.34	83.	30.07	1.45	2.109E-02	279.17	81.500	5.923E-02	HG203
295.43	177.	11.25	1.13	2.024E-02	295.22	19.200	5.324E-01	PB214
299.96	41.	40.52	1.13	2.002E-02				
328.05	48.	40.84	0.92	1.874E-02				
338.53	172.	13.69	1.01	1.830E-02	338.40	12.010	9.299E-01	AC228
352.00	328.	7.40	1.30	1.775E-02	351.99	37.100	5.851E-01	PB214
463.54	66.	30.80	1.32	1.425E-02	463.51	10.000	5.406E-01	SB125
511.06	185.	14.84	1.24	1.317E-02	510.72	22.500	6.392E-01	TL208
583.35	278.	8.47	1.25	1.184E-02	583.14	86.000	3.213E-01	TL208
609.51	305.	7.53	1.35	1.144E-02	609.32	46.090	6.771E-01	BI214
661.84	103.	14.49	1.26	1.072E-02	661.62	84.620	1.339E-01	CS137
727.33	92.	18.70	1.58	9.963E-03	727.17	11.800	9.307E-01	BI212
795.10	38.	26.32	1.83	9.307E-03				
795.10	38.	26.32	1.83	9.307E-03	795.76	85.400	5.716E-02	CS134

860.70	43.	25.15	1.50	8.766E-03				
911.57	192.	9.11	1.43	8.398E-03	911.07	29.000	9.284E-01	AC228
964.32	31.	32.50	1.54	8.053E-03	964.00	14.580	PBC<MDA	EU152
969.24	139.	9.83	1.54	8.023E-03	968.90	17.460	1.185E+00	AC228
1120.31	117.	13.23	1.82	7.212E-03	1120.28	15.040	1.269E+00	BI214

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1461.22	898.	3.42	1.85	5.931E-03	1460.75	10.700	1.657E+01	K40
1621.59	17.	27.81	0.67	5.488E-03	1620.56	2.750	1.352E+00	BI212
1764.81	61.	12.50	1.80	5.142E-03	1764.51	15.920	8.872E-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
418.54	209.69	269.	106.	0.053	74.61	0.737	NP-239
599.07	300.00	118.	41.	0.021	121.56	1.130	PB-212 lD
655.24	328.05	150.	48.	0.024	122.52	0.925	AC-228 s
1720.44	860.70	29.	43.	0.022	75.46	1.497	TL-208
1928.48	964.41	29.	36.	0.018	80.09	1.538	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	260.	126.	0.063	58.92	0.993D
PB-212	153.39	77.11	263.	149.	0.074	42.82	0.995A
EU-155	174.08	87.45	650.	96.	0.048	116.41	1.500
CD-109	173.97	87.40	627.	94.	0.047	117.42	1.500
TH-234	185.50	93.16	638.	127.	0.064	77.16	1.500s
TH-234	185.48	93.15	610.	128.	0.064	75.04	1.500s
RA-226	371.73	186.28	499.	191.	0.095	59.20	1.354s
PB-212	477.14	238.99	464.	882.	0.441	14.93	0.904
RA-224	483.11	241.98	483.	130.	0.065	76.49	1.500
PB-214	483.32	242.08	538.	112.	0.056	92.34	1.500s
HG-203	554.78	277.81	223.	59.	0.030	114.07	1.500s
PB-214	590.09	295.47	203.	157.	0.079	47.02	1.228
AC-228	676.20	338.53	154.	171.	0.085	41.07	1.005
PB-214	703.14	352.00	119.	322.	0.161	22.19	1.299
SB-125	925.39	463.13	97.	61.	0.030	77.04	1.500
TL-208	1021.23	511.06	181.	158.	0.079	44.52	1.237s
TL-208	1165.79	583.35	96.	274.	0.137	25.40	1.250
BI-214	1218.11	609.51	80.	299.	0.149	22.58	1.349
CS-137	1322.77	661.84	53.	102.	0.051	43.46	1.260
BI-212	1453.74	727.33	68.	92.	0.046	56.10	1.581s
CS-134	1589.88	795.41	31.	42.	0.021	72.38	1.500s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
AC-228	1822.17	911.57	46.	189.	0.095	27.32	1.434
EU-152	1929.00	964.99	54.	29.	0.014	119.38	1.538
AC-228	1936.81	968.90	24.	139.	0.069	29.43	1.541D
BI-214	2239.59	1120.31	37.	115.	0.058	39.68	1.817s
K-40	2921.31	1461.22	32.	879.	0.440	10.27	1.847
BI-212	3242.00	1621.59	2.	17.	0.009	83.42	0.667s
BI-214	3528.37	1764.81	3.	61.	0.030	37.50	1.800

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		-9.6968E-02					
			477.56	-9.697E-02	%(	4.736E-01 1.40E-01	G
K-40		1.6567E+01					
			1460.75	1.657E+01	(P	5.455E-01 5.79E-01	G
MN-54		2.1767E-02					
			834.81	2.177E-02	&(P	4.910E-02 1.48E-02	G
CO-57		-2.5787E-04					
			122.07	-2.579E-04	%(P	7.241E-02 2.15E-02	G K
			136.43	8.160E-02	%	4.937E-01 1.47E-01	G
CO-60		-4.9888E-03					
			1332.51	-4.989E-03	&(P	6.380E-02 1.73E-02	G K
			1173.23	1.466E-02	% P	6.350E-02 1.84E-02	G K
Sr-85		-2.3439E-02					
			514.00	-2.344E-02	%(	6.491E-02 1.95E-02	G
Kr-85		-5.3205E+02					
			513.99	-5.321E+02	%(	1.473E+03 4.43E+02	G
Y-88		-5.3474E-03					
			1836.01	-5.347E-03	%(P	4.469E-02 1.21E-02	G K
			898.02	-1.103E-03	& P	4.499E-02 1.23E-02	G
NB-94		-2.5540E-03					
			871.10	-2.554E-03	&(	4.998E-02 1.42E-02	G K
			702.50	1.406E-02	%	4.308E-02 1.28E-02	G K

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Ag-108M	4.7571E-03						
		722.95	4.757E-03	%(	4.536E-02	1.29E-02	G K
		614.37	1.457E-03	% P	5.726E-02	1.65E-02	G
		433.93	-1.271E-03	&	5.084E-02	1.47E-02	G
CD-109	2.0151E+00						
		88.04	2.015E+00	(	2.565E+00	7.89E-01	G
SN-113	-1.5193E-02						
		391.71	-1.519E-02	%(	7.314E-02	2.17E-02	G K
		255.04	4.081E-01	&	2.133E+00	6.34E-01	G
SB-125	1.0198E-01						
		427.95	-3.599E-02	&(P	1.534E-01	4.54E-02	G K
		600.77	-3.205E-02	% P	2.599E-01	7.55E-02	G
		636.15	-3.444E-03	& P	3.433E-01	9.58E-02	G
		463.51	5.104E-01	(P	4.085E-01	1.34E-01	G
		176.29	0.000E+00	%	7.172E-01	2.12E-01	G
I-131	-6.3892E-03						
		364.48	-6.389E-03	%(P	5.953E-02	1.74E-02	G K
		636.97	-7.426E-02	&	7.096E-01	2.04E-01	G
		284.29	-1.662E-01	& P	7.461E-01	2.21E-01	G
CS-134	3.6675E-02						
		604.66	1.314E-02	%(	4.195E-02	1.24E-02	G K
		795.76	6.357E-02	(P	4.316E-02	1.54E-02	G
		569.29	7.647E-02	& P	3.004E-01	8.83E-02	G
		801.84	1.184E-01	% P	5.431E-01	1.57E-01	G
CS-137	1.3394E-01						
		661.62	1.339E-01	(P	4.846E-02	1.97E-02	G
CE-139	9.5241E-03						
		165.85	9.524E-03	&(	5.667E-02	1.69E-02	G
EU-152	9.6248E-02						
		121.78	-1.669E-03	%(P	2.053E-01	6.08E-02	G K
		344.30	2.360E-03	% P	1.572E-01	4.57E-02	G
		1408.08	1.904E-02	%	1.946E-01	5.31E-02	G
		964.00	2.926E-01	(P	3.756E-01	1.19E-01	G
		1112.07	-9.146E-02	&	4.607E-01	1.34E-01	G
		778.90	8.172E-02	&	3.117E-01	9.11E-02	G
EU-154	-2.5789E-02						
		123.10	-2.579E-02	%(	1.185E-01	3.54E-02	G K
		1274.80	-1.583E-03	&	1.708E-01	4.77E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          723.30-1.001E-01 %   3.371E-01 1.00E-01 G
                         1004.80-4.917E-02 %   3.236E-01 9.34E-02 G

EU-155       2.4952E-01
                           86.45 2.495E-01  (  3.149E-01 9.68E-02 G K
                          105.31 1.927E-01 %   2.911E-01 8.91E-02 G

HG-203       4.2142E-02
                          279.17 4.214E-02 *(P 5.158E-02 1.60E-02 G K
                           72.87-4.399E-01 % P 3.251E+00 9.72E-01 G
                           70.83-1.534E-01 &   5.075E+00 1.50E+00 G
                           82.50-1.249E+00 &   5.131E+00 1.54E+00 G

TL-208       3.2131E-01
                          583.14 3.213E-01  (P 5.687E-02 2.76E-02 G
                          510.72 6.392E-01 + P 2.636E-01 1.11E-01 G

PB-212       1.0547E+00
                          238.63 1.055E+00  (P 1.233E-01 5.33E-02 G K
                                                          Energy duplication
                           77.11 1.005E+00 } P 5.286E-01 1.44E-01 G
                           74.81 1.734E+00 + P 1.071E+00 3.49E-01 G

PB-214       5.8513E-01
                          351.99 5.851E-01  (P 9.712E-02 4.40E-02 G K
                          295.22 4.834E-01 - P 2.125E-01 7.78E-02 G
                                                          Energy duplication
                           77.11 2.135E-01 } P 1.243E+00 3.17E-01 G
                          241.92 7.790E-01 +   7.708E-01 2.40E-01 G

BI-212       1.0102E+00
                          727.17 9.307E-01  (P 4.198E-01 1.75E-01 G K
                         1620.56 1.352E+00  (P 7.297E-01 3.77E-01 G
                          785.42 9.932E-01 %   2.047E+00 6.22E-01 G

BI-214       6.7713E-01
                          609.32 6.771E-01  (P 1.010E-01 5.21E-02 G K
                         1764.51 8.872E-01 + P 1.627E-01 1.17E-01 G
                         1120.28 1.269E+00 + P 3.420E-01 1.71E-01 G

RA-224       1.7259E+00
                          241.00 1.726E+00  (  1.397E+00 4.40E-01 G

RA-226       2.7082E+00
                          185.99 2.708E+00  (P 1.518E+00 5.71E-01 G

AC-228       9.2880E-01
                          911.07 9.284E-01  (P 1.682E-01 8.61E-02 G K
                          968.90 1.185E+00 + P 2.165E-01 1.16E-01 G
                          338.40 9.299E-01  (P 3.295E-01 1.28E-01 G
```

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

TH-227      -1.9479E-02
                          236.00-1.948E-02 %(  7.810E-01 2.33E-01 G K
                          256.25 1.245E-01 & P 6.258E-01 1.86E-01 G

PA-234      -2.4472E-03
                           98.44-2.447E-03 &(P 2.786E-01 8.23E-02 G K
                          946.00 2.649E-02 & P 1.970E-01 5.55E-02 G
                          131.28 1.070E-01 & P 2.514E-01 7.60E-02 G
                           94.67 1.288E-02 % P 5.318E-01 1.58E-01 G
                          883.24 0.000E+00 %   3.809E-01 1.06E-01 G
                          926.70 2.866E-02 %   3.710E-01 1.04E-01 G
                          569.26 1.147E-01 & P 4.444E-01 1.31E-01 G

TH-234       2.1538E+00
                           63.29 4.513E-01 %(P 9.027E+00 2.67E+00 G K
                           92.80 3.106E+00  (P 2.854E+00 8.84E-01 G
                           92.38 3.627E+00 &(P 3.436E+00 1.06E+00 G

AM-241      -3.9512E-02
                           59.54-3.951E-02 &(P 1.221E+00 3.59E-01 G
   ( - This peak used in the nuclide activity average.

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

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

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

- -

***** 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	-9.4966E-02	-9.6968E-02	4.1908E-01	4.1912E-01	4.638E-01
K-40		1.6567E+01	1.6567E+01	1.7374E+00	1.9858E+00	
MN-54	#A	2.1689E-02	2.1767E-02	4.4389E-02	4.4407E-02	4.892E-02
CO-57	#B	-2.5681E-04	-2.5787E-04	5.5586E-02	5.5586E-02	7.211E-02
CO-60	#B	-4.9860E-03	-4.9888E-03	2.7434E-01	2.7434E-01	6.376E-02
Sr-85	#A	-2.3039E-02	-2.3439E-02	5.8504E-02	5.8520E-02	6.381E-02
Kr-85	#A	-5.3204E+02	-5.3205E+02	1.3277E+03	1.3280E+03	1.473E+03
Y-88	#B	-5.2918E-03	-5.3474E-03	3.8326E-02	3.8327E-02	4.423E-02
NB-94	#B	-2.5540E-03	-2.5540E-03	4.2481E-02	4.2481E-02	4.998E-02
Ag-108M	#B	4.7570E-03	4.7571E-03	3.8774E-02	3.8775E-02	4.536E-02
CD-109	#A	2.0102E+00	2.0151E+00	2.3662E+00	2.3688E+00	2.559E+00
SN-113	#B	-1.5046E-02	-1.5193E-02	6.4973E-02	6.4979E-02	7.244E-02
SB-125	#B	1.0187E-01	1.0198E-01	8.0208E-02	8.0426E-02	1.533E-01
I-131	#B	-5.5625E-03	-6.3892E-03	6.4369E-02	6.4370E-02	5.183E-02
CS-134	#B	3.6621E-02	3.6675E-02	2.6601E-02	2.6686E-02	4.189E-02
CS-137		1.3393E-01	1.3394E-01	5.9001E-02	5.9511E-02	
CE-139	#A	9.4473E-03	9.5241E-03	5.0662E-02	5.0665E-02	5.622E-02
EU-152	#B	9.6224E-02	9.6248E-02	1.1708E-01	1.1720E-01	2.053E-01
EU-154	#B	-2.5779E-02	-2.5789E-02	1.0616E-01	1.0617E-01	1.184E-01
EU-155	#A	2.4937E-01	2.4952E-01	2.9046E-01	2.9079E-01	3.147E-01
HG-203	#A	4.1146E-02	4.2142E-02	4.8101E-02	4.8164E-02	5.036E-02
TL-208		3.2131E-01	3.2131E-01	8.2898E-02	8.4971E-02	
PB-212		1.0547E+00	1.0547E+00	1.5963E-01	1.7097E-01	
PB-214		5.8513E-01	5.8513E-01	1.3209E-01	1.3639E-01	
BI-212		1.0102E+00	1.0102E+00	5.0956E-01	5.1292E-01	
BI-214		6.7713E-01	6.7713E-01	1.5621E-01	1.6108E-01	
RA-224		1.7259E+00	1.7259E+00	1.3201E+00	1.3239E+00	1.397E+00
RA-226	#	2.7082E+00	2.7082E+00	1.7122E+00	1.7194E+00	
AC-228		9.2880E-01	9.2880E-01	2.3135E-01	2.3755E-01	
TH-227	#B	-1.9479E-02	-1.9479E-02	7.0035E-01	7.0036E-01	7.810E-01
PA-234	#B	-2.4472E-03	-2.4472E-03	9.1984E+00	9.1984E+00	2.786E-01
TH-234	#B	2.1538E+00	2.1538E+00	1.8389E+00	1.8428E+00	9.027E+00
AM-241	#A	-3.9512E-02	-3.9512E-02	1.2490E+00	1.2490E+00	1.221E+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_19APRIL2006_1106.An1

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

Total Activity (1120.0 to 2000.7 keV) 2.5711878E+01 pCi/gm
Total Decayed Activity (1120.0 to 2000.7 keV) 2.5711897E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

Sample description
FSS OOL-11-01-002-F

Spectrum Filename: C:\GammaVision\Spectra\103F_19APRIL2006_1147.An1

Acquisition information
Start time: 19-Apr-2006 11:49:23
Live time: 2000
Real time: 2003
Dead time: 0.14 %
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: 1.7560E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.7560E+03) =
5.6948E+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	17-Apr-2006 21:37:00
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: 0.1800

***** 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
74.69	110.	25.71	0.99	8.941E-03	74.81	9.600	9.434E-01	PB212
77.28	191.	15.44	0.99	1.014E-02	77.11	17.500	8.195E-01	PB212
					77.11	10.700	1.340E+00	PB214
92.92	117.	37.86	1.48	1.649E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
					94.67	15.500	3.391E-01	PA234
186.27	138.	25.63	1.36	2.566E-02	185.99	3.280	1.148E+00	RA226
209.28	130.	28.54	0.94	2.471E-02				
238.99	1004.	3.81	1.09	2.318E-02	238.63	43.100	7.638E-01	PB212
242.29	119.	20.24	1.10	2.300E-02	241.00	3.900	1.014E+00	RA224
					241.92	7.470	5.303E-01	PB214
262.38	60.	36.94	0.99	2.192E-02				
270.23	68.	33.01	1.08	2.151E-02				
295.22	230.	13.19	1.15	2.025E-02	295.22	19.200	4.463E-01	PB214
300.06	61.	35.80	1.15	2.001E-02				
338.55	269.	11.55	0.99	1.829E-02	338.40	12.010	9.366E-01	AC228
351.98	372.	9.18	0.96	1.775E-02	351.99	37.100	4.278E-01	PB214
409.62	50.	37.00	0.67	1.574E-02				
463.15	92.	19.64	1.35	1.426E-02				
463.15	92.	19.64	1.35	1.426E-02	463.51	10.000	4.922E-01	SB125
511.02	162.	18.16	1.40	1.317E-02	510.72	22.500	3.527E-01	TL208
583.38	343.	7.96	1.34	1.184E-02	583.14	86.000	2.559E-01	TL208
609.65	314.	8.66	1.27	1.143E-02	609.32	46.090	4.481E-01	BI214
661.78	223.	11.68	1.47	1.072E-02	661.62	84.620	1.880E-01	CS137
727.56	113.	22.77	1.53	9.961E-03	727.17	11.800	7.389E-01	BI212
795.32	41.	31.37	1.50	9.301E-03	795.76	85.400	3.942E-02	CS134
836.07	53.	29.72	0.99	8.960E-03				

861.05	45.	41.24	1.38	8.764E-03				
911.57	259.	8.57	1.60	8.398E-03	911.07	29.000	8.087E-01	AC228
964.81	46.	25.63	1.54	8.051E-03	964.00	14.580	PBC<MDA	EU152
969.44	151.	9.74	1.54	8.023E-03	968.90	17.460	8.305E-01	AC228
1120.90	115.	17.71	1.63	7.209E-03	1120.28	15.040	8.025E-01	BI214
1173.66	111.	20.76	2.18	6.970E-03	1173.23	99.860	1.206E-01	CO60
1237.90	79.	28.04	1.15	6.703E-03				
1332.50	86.	19.39	1.50	6.349E-03	1332.51	99.980	1.011E-01	CO60

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1461.22	1177.	2.96	1.84	5.931E-03	1460.75	10.700	1.405E+01	K40
1764.96	59.	14.12	1.68	5.141E-03	1764.51	15.920	5.258E-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	
185.01	92.92	738.	117.	0.058	113.58	1.485	TH-234	l
417.72	209.28	502.	130.	0.065	85.61	0.942	AC-228	s
523.91	262.38	207.	60.	0.030	108.47	0.992	J-132	
539.60	270.23	218.	68.	0.034	99.04	1.081	AC-228	
599.26	300.06	198.	61.	0.031	107.39	1.150	PB-212	
818.37	409.62	129.	50.	0.025	110.99	0.675	AC-228	s
1721.14	861.05	86.	45.	0.022	123.73	1.378	TL-208	
1929.50	964.75	49.	45.	0.022	80.76	1.538	AC-228	D
2474.73	1237.90	104.	79.	0.039	84.12	1.146	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	148.79	74.81	324.	128.	0.064	63.71	0.993D
PB-212	153.39	77.11	343.	160.	0.080	41.83	0.995A
RA-226	371.78	186.31	686.	129.	0.065	81.52	1.500s
PB-212	477.18	239.01	530.	979.	0.490	14.31	1.004
RA-224	483.15	242.00	593.	100.	0.050	107.36	1.500
PB-214	589.59	295.22	279.	225.	0.113	39.56	1.154
AC-228	676.24	338.55	240.	268.	0.134	34.66	0.989s
PB-214	703.10	351.98	262.	366.	0.183	27.55	0.958
SB-125	925.26	463.07	128.	91.	0.045	60.39	1.500s
TL-208	1021.16	511.02	229.	136.	0.068	54.49	1.395s
TL-208	1165.87	583.38	138.	339.	0.169	23.87	1.338
BI-214	1218.39	609.65	143.	307.	0.154	25.97	1.272
CS-137	1322.64	661.78	139.	222.	0.111	35.04	1.473
BI-212	1454.20	727.56	146.	113.	0.056	68.31	1.530
CS-134	1589.70	795.32	61.	41.	0.020	94.11	1.500s
AC-228	1822.17	911.57	79.	256.	0.128	25.70	1.599
AC-228	1936.81	968.90	40.	147.	0.073	30.84	1.541D
BI-214	2240.78	1120.90	83.	113.	0.057	53.12	1.635s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
CO-60	2346.28	1173.66	122.	109.	0.055	62.28	2.183s
CO-60	2663.91	1332.50	51.	83.	0.042	58.16	1.496
K-40	2921.30	1461.22	26.	1159.	0.579	8.88	1.836
BI-214	3528.68	1764.96	6.	56.	0.028	42.35	1.677

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		-3.4774E-02					
			477.56	-3.477E-02	%(	3.081E-01 9.01E-02	G
K-40		1.4048E+01					
			1460.75	1.405E+01	(P	3.227E-01 4.23E-01	G
MN-54		-6.6713E-03					
			834.81	-6.671E-03	%(P	3.846E-02 1.12E-02	G
CO-57		-1.2481E-02					
			122.07	-1.248E-02	%(P	5.049E-02 1.52E-02	G K
			136.43	-6.830E-02	%	4.099E-01 1.23E-01	G
CO-60		1.1086E-01					
			1332.51	1.011E-01	(P	4.351E-02 2.02E-02	G K
			1173.23	1.206E-01	*(P	5.991E-02 2.55E-02	G K
Sr-85		-1.1635E-02					
			514.00	-1.164E-02	&(	4.049E-02 1.21E-02	G
Kr-85		-1.9318E+02					
			513.99	-1.932E+02	&(	9.281E+02 2.75E+02	G
Y-88		3.3997E-03					
			1836.01	3.400E-03	&(P	2.794E-02 7.54E-03	G K
			898.02	-6.287E-03	% P	4.205E-02 1.21E-02	G
NB-94		-7.8852E-03					
			871.10	-7.885E-03	%(	3.654E-02 1.07E-02	G K
			702.50	-1.479E-04	&	3.721E-02 1.07E-02	G K
Ag-108M		1.9746E-03					
			722.95	1.975E-03	%(	4.707E-02 1.36E-02	G K
			614.37	-2.229E-02	% P	4.522E-02 1.37E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		433.93	1.358E-02	%	3.540E-02	1.06E-02	G
CD-109	7.8807E-01						
		88.04	7.881E-01	&(	1.892E+00	5.73E-01	G
SN-113	7.2028E-03						
		391.71	7.203E-03	%(	4.706E-02	1.39E-02	G K
		255.04	-1.765E-01	&	1.591E+00	4.72E-01	G
SB-125	1.2553E-01						
		427.95	1.759E-03	%(P	1.226E-01	3.58E-02	G K
		600.77	-3.211E-02	& P	2.104E-01	6.18E-02	G
		636.15	-4.147E-02	& P	2.909E-01	8.43E-02	G
		463.51	4.919E-01	*(P	2.992E-01	1.00E-01	G
		176.29	-1.142E-01	%	5.752E-01	1.72E-01	G
I-131	-1.4857E-03						
		364.48	-1.486E-03	&(P	3.947E-02	1.15E-02	G K
		636.97	-2.241E-02	%	4.441E-01	1.27E-01	G
		284.29	1.505E-01	% P	5.434E-01	1.62E-01	G
CS-134	2.0571E-02						
		604.66	4.082E-03	%(	3.756E-02	1.10E-02	G K
		795.76	3.942E-02	@(P	3.802E-02	1.24E-02	G
		569.29	-8.263E-02	% P	2.493E-01	7.40E-02	G
		801.84	-2.281E-02	% P	4.044E-01	1.14E-01	G
CS-137	1.8799E-01						
		661.62	1.880E-01	(P	4.897E-02	2.21E-02	G
CE-139	8.5201E-03						
		165.85	8.520E-03	%(	4.775E-02	1.43E-02	G
EU-152	-9.3799E-03						
		121.78	-9.380E-03	%(P	1.199E-01	3.56E-02	G K
		344.30	-2.701E-02	% P	1.133E-01	3.37E-02	G
		1408.08	6.102E-02	&	1.387E-01	4.18E-02	G
		964.00	2.003E-01	% P	3.033E-01	9.38E-02	G
		1112.07	-5.275E-02	%	3.279E-01	9.53E-02	G
		778.90	-2.852E-02	&	2.983E-01	8.64E-02	G
EU-154	-3.4381E-02						
		123.10	-3.438E-02	%(	1.104E-01	3.33E-02	G K
		1274.80	2.845E-02	&	1.136E-01	3.32E-02	G
		723.30	-1.267E-01	%	2.561E-01	7.78E-02	G
		1004.80	6.474E-02	&	1.528E-01	4.59E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	-2.8749E-02						
		86.45	-2.875E-02	%(	2.015E-01	6.02E-02	G K
		105.31	2.147E-02	%	2.362E-01	7.05E-02	G
HG-203	-8.4785E-03						
		279.17	-8.479E-03	&(P	4.271E-02	1.27E-02	G K
		72.87	-6.401E-01	% P	2.340E+00	7.04E-01	G
		70.83	-1.604E+00	%	4.509E+00	1.36E+00	G
		82.50	-1.365E-02	&	3.423E+00	1.02E+00	G
TL-208	2.5587E-01						
		583.14	2.559E-01	(P	4.345E-02	2.06E-02	G
		510.72	3.527E-01	+ P	1.902E-01	7.67E-02	G
PB-212	7.7486E-01						
		238.63	7.535E-01	(P	8.465E-02	3.64E-02	G K
							Energy duplication
		77.11	6.946E-01	} P	3.868E-01	9.69E-02	G
		74.81	1.132E+00	+ P	7.670E-01	2.46E-01	G
PB-214	4.3412E-01						
		351.99	4.278E-01	(P	9.127E-02	3.99E-02	G K
		295.22	4.463E-01	(P	1.593E-01	5.99E-02	G
							Energy duplication
		77.11	0.000E+00	} P	9.365E-01	0.00E+00	G
		241.92	2.860E-01	%	5.612E-01	1.70E-01	G
BI-212	7.3894E-01						
		727.17	7.389E-01	(P	3.864E-01	1.69E-01	G K
		1620.56	1.389E-01	% P	1.028E+00	2.83E-01	G
		785.42	0.000E+00	%	1.946E+00	5.57E-01	G
BI-214	4.6808E-01						
		609.32	4.481E-01	(P	8.529E-02	3.96E-02	G K
		1764.51	5.258E-01	(P	1.334E-01	7.86E-02	G
		1120.28	8.025E-01	+ P	3.202E-01	1.45E-01	G
RA-224	8.5747E-01						
		241.00	8.575E-01	&(	9.941E-01	3.07E-01	G
RA-226	1.1794E+00						
		185.99	1.179E+00	(P	1.141E+00	3.53E-01	G
AC-228	8.3375E-01						
		911.07	8.087E-01	(P	1.394E-01	7.02E-02	G K
		968.90	8.046E-01	(P	1.777E-01	8.28E-02	G
		338.40	9.366E-01	@(P	2.625E-01	1.09E-01	G

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

TH-227      -2.5070E-02
                          236.00-2.507E-02 %(  5.486E-01 1.64E-01 G K
                          256.25 1.162E-01 % P 4.663E-01 1.39E-01 G

PA-234      -3.6365E-03
                           98.44-3.636E-03 %(P 2.029E-01 6.02E-02 G K
                          946.00 1.015E-03 & P 1.873E-01 5.30E-02 G
                          131.28-4.248E-02 & P 2.196E-01 6.58E-02 G
                           94.67-6.390E-02 % P 3.379E-01 1.01E-01 G
                          883.24-4.194E-02 %   2.912E-01 8.41E-02 G
                          926.70 0.000E+00 &   4.136E-01 1.19E-01 G
                          569.26-1.224E-01 % P 3.693E-01 1.10E-01 G

TH-234       4.7458E-01
                           63.29 4.746E-01 %(P 6.685E+00 1.99E+00 G K
                           92.80 1.223E+00 % P 2.177E+00 6.59E-01 G
                           92.38 1.422E+00 % P 2.593E+00 7.85E-01 G

AM-241      -1.6101E-01
                           59.54-1.610E-01 &(P 1.142E+00 3.41E-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	-3.4062E-02	-3.4774E-02	2.7017E-01	2.7018E-01	3.018E-01
K-40		1.4048E+01	1.4048E+01	1.2673E+00	1.5070E+00	
MN-54	#A	-6.6477E-03	-6.6713E-03	3.6807E-02	3.6810E-02	3.832E-02
CO-57	#B	-1.2430E-02	-1.2481E-02	4.6699E-02	4.6705E-02	5.028E-02
CO-60		1.1079E-01	1.1086E-01	4.8383E-02	4.8809E-02	
Sr-85	#A	-1.1439E-02	-1.1635E-02	3.6257E-02	3.6263E-02	3.981E-02
Kr-85	#A	-1.9318E+02	-1.9318E+02	8.2579E+02	8.2586E+02	9.281E+02
Y-88	#B	3.3647E-03	3.3997E-03	2.2624E-02	2.2625E-02	2.766E-02
NB-94	#B	-7.8852E-03	-7.8852E-03	3.2081E-02	3.2084E-02	3.654E-02
Ag-108M	#B	1.9746E-03	1.9746E-03	4.0941E-02	4.0941E-02	4.707E-02
CD-109	#A	7.8615E-01	7.8807E-01	1.7175E+00	1.7181E+00	1.888E+00
SN-113	#B	7.1341E-03	7.2028E-03	4.1600E-02	4.1602E-02	4.661E-02
SB-125	#F	1.2539E-01	1.2553E-01	7.6864E-02	7.7209E-02	1.224E-01
I-131	#B	-1.2952E-03	-1.4857E-03	6.2456E-02	6.2456E-02	3.441E-02
CS-134	#B	2.0541E-02	2.0571E-02	1.9400E-02	1.9437E-02	3.750E-02
CS-137		1.8797E-01	1.8799E-01	6.6282E-02	6.7174E-02	
CE-139	#A	8.4520E-03	8.5201E-03	4.2889E-02	4.2892E-02	4.737E-02
EU-152	#B	-9.3777E-03	-9.3799E-03	1.3427E-01	1.3427E-01	1.199E-01
EU-154	#B	-3.4368E-02	-3.4381E-02	9.9758E-02	9.9776E-02	1.103E-01
EU-155	#B	-2.8732E-02	-2.8749E-02	1.8054E-01	1.8055E-01	2.014E-01
HG-203	#B	-8.2801E-03	-8.4785E-03	3.8366E-02	3.8370E-02	4.171E-02
TL-208		2.5587E-01	2.5587E-01	6.1861E-02	6.3620E-02	
PB-212		7.7486E-01	7.7486E-01	1.1223E-01	1.2091E-01	
PB-214		4.3412E-01	4.3412E-01	1.0643E-01	1.0938E-01	
BI-212		7.3894E-01	7.3894E-01	5.0696E-01	5.0877E-01	
BI-214		4.6808E-01	4.6808E-01	1.2190E-01	1.2489E-01	
RA-224	#A	8.5747E-01	8.5747E-01	9.2056E-01	9.2190E-01	9.941E-01
RA-226	#	1.1794E+00	1.1794E+00	1.0581E+00	1.0603E+00	1.141E+00
AC-228		8.3375E-01	8.3375E-01	1.4816E-01	1.5587E-01	
TH-227	#B	-2.5070E-02	-2.5070E-02	4.9287E-01	4.9287E-01	5.486E-01
PA-234	#B	-3.6365E-03	-3.6365E-03	4.8427E-01	4.8427E-01	2.029E-01
TH-234	#B	4.7458E-01	4.7458E-01	5.9640E+00	5.9640E+00	6.685E+00
AM-241	#A	-1.6101E-01	-1.6101E-01	1.0471E+00	1.0472E+00	1.142E+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) 1.7852617E+01 pCi/gm
Total Decayed Activity (1120.0 to 2000.7 keV) 1.7852699E+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_19APRIL2006_1320.An1

Sample description
FSS OOL-11-01-001-F

Spectrum Filename: C:\GammaVision\Spectra\103F_19APRIL2006_1320.An1

Acquisition information
Start time: 19-Apr-2006 13:22:27
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: 1.5160E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.5160E+03) =
6.5963E+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	17-Apr-2006 21:50:00
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: 0.2567

***** 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
74.87	89.	26.31	0.99	9.052E-03	74.81	9.600	9.143E-01	PB212
77.17	150.	13.18	0.99	1.011E-02	77.11	10.700	1.282E+00	PB214
					77.11	17.500	7.839E-01	PB212
92.82	82.	38.21	1.50	1.631E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
92.82	84.	36.30	1.50	1.645E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
185.85	157.	21.42	1.20	2.567E-02				
185.85	157.	21.42	1.20	2.567E-02	185.99	3.280	1.525E+00	RA226
209.32	73.	39.40	1.04	2.471E-02				
239.01	842.	4.11	1.09	2.318E-02	238.63	43.100	7.397E-01	PB212
241.84	130.	19.01	1.10	2.303E-02	241.00	3.900	1.286E+00	RA224
					241.92	7.470	6.726E-01	PB214
270.70	132.	17.34	1.75	2.149E-02				
277.24	70.	32.57	1.02	2.115E-02				
295.61	197.	12.60	0.88	2.023E-02	295.22	19.200	4.429E-01	PB214
338.44	204.	14.92	1.17	1.830E-02	338.40	12.010	8.245E-01	AC228
352.04	311.	10.34	1.10	1.775E-02	351.99	37.100	4.131E-01	PB214
462.54	84.	23.40	1.21	1.427E-02				
462.54	84.	23.40	1.21	1.427E-02	463.51	10.000	5.182E-01	SB125
510.81	151.	12.50	1.74	1.317E-02	510.72	22.500	3.727E-01	TL208
583.34	291.	8.31	1.42	1.184E-02	583.14	86.000	2.509E-01	TL208
609.47	267.	8.16	1.13	1.144E-02	609.32	46.090	4.405E-01	BI214
727.43	73.	21.63	1.18	9.962E-03	727.17	11.800	5.497E-01	BI212
786.00	26.	40.05	1.50	9.394E-03	785.42	2.000	PBC<MDA	BI212
795.18	53.	32.81	1.43	9.306E-03				
795.18	53.	32.81	1.43	9.306E-03	795.76	85.400	5.958E-02	CS134

911.69	214.	8.81	1.64	8.397E-03	911.07	29.000	7.717E-01	AC228
968.65	163.	14.03	1.74	8.027E-03	968.90	17.460	1.036E+00	AC228
1120.99	97.	17.97	1.64	7.208E-03	1120.28	15.040	7.800E-01	BI214
1461.35	1163.	3.02	1.83	5.930E-03	1460.75	10.700	1.607E+01	K40
1765.20	53.	14.64	1.91	5.142E-03	1764.51	15.920	5.753E-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	
417.79	209.32	329.	73.	0.037	118.20	1.037	AC-228	
540.55	270.70	172.	132.	0.066	52.02	1.750	AC-228	s
553.62	277.24	186.	70.	0.035	90.38	1.023	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	251.	89.	0.045	78.93	0.993D
PB-212	153.39	77.11	259.	150.	0.075	39.55	0.995A
RA-226	371.63	186.23	528.	133.	0.067	70.33	1.500
PB-212	477.17	239.01	486.	866.	0.433	15.88	1.048
RA-224	482.95	241.90	586.	106.	0.053	101.00	1.500
PB-214	590.37	295.61	195.	193.	0.097	37.79	0.883
AC-228	676.03	338.44	228.	203.	0.102	44.75	1.171s
PB-214	703.22	352.04	239.	305.	0.153	31.02	1.103
SB-125	925.39	463.14	113.	60.	0.030	82.69	1.500s
TL-208	1020.74	510.81	105.	124.	0.062	37.50	1.740s
TL-208	1165.78	583.34	102.	287.	0.143	24.93	1.425
BI-214	1218.03	609.47	86.	261.	0.130	24.49	1.128
BI-212	1453.94	727.43	63.	73.	0.036	64.90	1.176s
BI-212	1571.05	786.00	41.	26.	0.013	120.15	1.500
CS-134	1589.55	795.25	47.	36.	0.018	94.96	1.500
AC-228	1822.41	911.69	56.	211.	0.105	26.44	1.645
AC-228	1936.32	968.65	90.	163.	0.081	42.09	1.738
BI-214	2240.96	1120.99	59.	95.	0.047	53.92	1.645
K-40	2921.56	1461.35	35.	1144.	0.572	9.05	1.826
BI-214	3529.15	1765.20	6.	53.	0.026	43.91	1.912

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		-4.6021E-02					
			477.56	-4.602E-02	&(	3.502E-01 1.02E-01	G
K-40		1.6070E+01					
			1460.75	1.607E+01	(P	4.237E-01 4.93E-01	G
MN-54		2.4707E-04					
			834.81	2.471E-04	%(P	3.774E-02 1.06E-02	G
CO-57		-1.9223E-04					
			122.07	-1.922E-04	%(P	5.254E-02 1.56E-02	G K
			136.43	-4.702E-03	%	4.147E-01 1.23E-01	G
CO-60		-3.1708E-03					
			1332.51	-3.171E-03	%(P	4.476E-02 1.20E-02	G K
			1173.23	-4.726E-03	% P	5.274E-02 1.48E-02	G K
Sr-85		-1.7904E-02					
			514.00	-1.790E-02	%(	4.458E-02 1.34E-02	G
Kr-85		-4.0625E+02					
			513.99	-4.062E+02	%(	1.011E+03 3.05E+02	G
Y-88		-4.8021E-03					
			1836.01	-4.802E-03	%(P	3.215E-02 8.74E-03	G K
			898.02	-5.662E-03	% P	4.294E-02 1.23E-02	G
NB-94		-6.0551E-03					
			871.10	-6.055E-03	%(	3.835E-02 1.11E-02	G K
			702.50	3.650E-03	&	3.578E-02 1.03E-02	G K
Ag-108M		-6.1420E-03					
			722.95	-6.142E-03	&(	4.645E-02 1.35E-02	G K
			614.37	-6.656E-03	& P	4.216E-02 1.23E-02	G
			433.93	6.425E-03	%	3.480E-02 1.02E-02	G
CD-109		-3.7447E-01					
			88.04	-3.745E-01	%(	1.788E+00 5.35E-01	G
SN-113		1.1958E-02					
			391.71	1.196E-02	%(	5.320E-02 1.58E-02	G K
			255.04	4.500E-01	&	1.550E+00 4.64E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	9.1731E-02						
		427.95	-3.902E-03	%(P	9.844E-02	2.84E-02	G K
		600.77	-3.801E-02	& P	1.842E-01	5.39E-02	G
		636.15	-5.199E-02	& P	3.505E-01	1.02E-01	G
		463.51	3.748E-01	*(P	3.267E-01	1.06E-01	G
		176.29	-1.615E-01	%	5.802E-01	1.74E-01	G
I-131	1.4230E-02						
		364.48	1.423E-02	%(P	4.256E-02	1.27E-02	G K
		636.97	-1.588E-04	%	5.412E-01	1.54E-01	G
		284.29	1.480E-01	& P	5.951E-01	1.77E-01	G
CS-134	1.9357E-02						
		604.66	8.460E-04	&(	7.018E-02	2.07E-02	G K
		795.76	4.051E-02	(P	3.912E-02	1.29E-02	G
		569.29	6.156E-02	& P	2.213E-01	6.52E-02	G
		801.84	-5.222E-02	% P	4.178E-01	1.18E-01	G
CS-137	1.8610E-02						
		661.62	1.861E-02	%(P	4.201E-02	1.26E-02	G
CE-139	-6.2595E-03						
		165.85	-6.260E-03	&(	4.837E-02	1.44E-02	G
EU-152	-1.2441E-03						
		121.78	-1.244E-03	%(P	1.488E-01	4.41E-02	G K
		344.30	-2.363E-02	% P	1.223E-01	3.62E-02	G
		1408.08	1.513E-02	%	1.411E-01	3.85E-02	G
		964.00	4.145E-03	% P	4.580E-01	1.33E-01	G
		1112.07	6.545E-02	%	3.004E-01	8.72E-02	G
		778.90	3.913E-02	&	2.475E-01	7.12E-02	G
EU-154	-4.3752E-03						
		123.10	-4.375E-03	&(	1.131E-01	3.36E-02	G K
		1274.80	-2.026E-02	&	1.380E-01	3.97E-02	G
		723.30	-6.172E-02	%	2.250E-01	6.67E-02	G
		1004.80	-1.152E-02	%	2.204E-01	6.22E-02	G
EU-155	2.1243E-02						
		86.45	2.124E-02	%(	2.071E-01	6.16E-02	G K
		105.31	4.357E-02	%	2.445E-01	7.31E-02	G
HG-203	-1.5237E-03						
		279.17	-1.524E-03	&(P	3.468E-02	1.01E-02	G K
		72.87	1.834E-01	% P	2.257E+00	6.73E-01	G
		70.83	-5.897E-01	%	4.563E+00	1.36E+00	G
		82.50	3.425E-01	%	3.544E+00	1.05E+00	G

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

TL-208       2.5088E-01
                          583.14 2.509E-01  (P 4.362E-02 2.12E-02 G
                          510.72 3.727E-01 + P 1.518E-01 5.66E-02 G

PB-212       7.7529E-01
                          238.63 7.718E-01  (P 9.403E-02 4.15E-02 G K
                                                          Energy duplication
                           77.11 7.530E-01 } P 3.916E-01 9.93E-02 G
                           74.81 9.143E-01 + P 7.857E-01 2.49E-01 G

PB-214       4.2327E-01
                          351.99 4.131E-01  (P 1.011E-01 4.35E-02 G K
                          295.22 4.429E-01  (P 1.554E-01 5.70E-02 G
                                                          Energy duplication
                           77.11 0.000E+00 } P 9.546E-01 0.00E+00 G
                          241.92 4.451E-01 %   6.047E-01 1.86E-01 G

BI-212       5.4966E-01
                          727.17 5.497E-01 *(P 3.020E-01 1.20E-01 G K
                         1620.56-4.768E-03 % P 1.021E+00 2.61E-01 G
                          785.42 1.226E+00 +   1.538E+00 4.91E-01 G

BI-214       4.4047E-01
                          609.32 4.405E-01  (P 7.785E-02 3.69E-02 G K
                         1764.51 5.753E-01 + P 1.556E-01 8.94E-02 G
                         1120.28 7.800E-01 + P 3.167E-01 1.43E-01 G

RA-224       1.0519E+00
                          241.00 1.052E+00 &(  1.144E+00 3.54E-01 G

RA-226       1.4126E+00
                          185.99 1.413E+00  (P 1.163E+00 3.63E-01 G

AC-228       7.8720E-01
                          911.07 7.717E-01  (P 1.376E-01 6.91E-02 G K
                          968.90 1.036E+00 + P 2.987E-01 1.45E-01 G
                          338.40 8.245E-01 *(P 2.962E-01 1.24E-01 G

TH-227      -2.0663E-01
                          236.00-2.066E-01 %(  4.069E-01 1.24E-01 G K
                          256.25-7.078E-03 & P 5.469E-01 1.61E-01 G

PA-234       6.3505E-03
                           98.44 6.351E-03 &(P 2.416E-01 7.18E-02 G K
                          946.00 5.794E-03 % P 2.351E-01 6.71E-02 G
                          131.28-2.935E-02 & P 2.250E-01 6.71E-02 G
                           94.67-4.851E-02 % P 4.317E-01 1.29E-01 G
                          883.24 4.042E-02 %   2.963E-01 8.49E-02 G
                          926.70 3.398E-02 &   2.936E-01 8.31E-02 G
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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 9.206E-02 & P 3.276E-01 9.66E-02 G

TH-234      -7.7174E-02
                           63.29-7.717E-02 %(P 6.208E+00 1.83E+00 G K
                           92.80 1.522E+00 % P 2.197E+00 6.68E-01 G
                           92.38 1.750E+00 % P 2.674E+00 8.12E-01 G

AM-241      -1.4021E-01
                           59.54-1.402E-01 &(P 1.132E+00 3.37E-01 G
   ( - This peak used in the nuclide activity average.

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

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

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** 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	-4.5047E-02	-4.6021E-02	3.0743E-01	3.0744E-01	3.428E-01
K-40		1.6070E+01	1.6070E+01	1.4777E+00	1.7476E+00	
MN-54	#A	2.4616E-04	2.4707E-04	3.1880E-02	3.1880E-02	3.760E-02
CO-57	#B	-1.9142E-04	-1.9223E-04	4.0306E-02	4.0306E-02	5.232E-02
CO-60	#B	-3.1689E-03	-3.1708E-03	4.5390E-01	4.5390E-01	4.473E-02

Sr-85	#A	-1.7591E-02	-1.7904E-02	4.0291E-02	4.0304E-02	4.381E-02
Kr-85	#A	-4.0624E+02	-4.0625E+02	9.1394E+02	9.1425E+02	1.011E+03
Y-88	#B	-4.7509E-03	-4.8021E-03	2.7493E-02	2.7494E-02	3.181E-02
NB-94	#B	-6.0551E-03	-6.0551E-03	3.3235E-02	3.3236E-02	3.835E-02
Ag-108M	#B	-6.1418E-03	-6.1420E-03	4.0539E-02	4.0541E-02	4.645E-02
CD-109	#A	-3.7353E-01	-3.7447E-01	1.6054E+00	1.6055E+00	1.784E+00
SN-113	#B	1.1840E-02	1.1958E-02	4.7303E-02	4.7308E-02	5.268E-02
SB-125	#B	9.1628E-02	9.1731E-02	7.7464E-02	7.7647E-02	9.833E-02
I-131	#B	1.2346E-02	1.4230E-02	3.8148E-02	3.8157E-02	3.693E-02
CS-134	#B	1.9328E-02	1.9357E-02	1.8426E-02	1.8460E-02	7.007E-02
CS-137	#A	1.8608E-02	1.8610E-02	3.7891E-02	3.7906E-02	4.200E-02
CE-139	#A	-6.2078E-03	-6.2595E-03	4.3259E-02	4.3260E-02	4.797E-02
EU-152	#B	-1.2438E-03	-1.2441E-03	2.5265E-01	2.5265E-01	1.488E-01
EU-154	#B	-4.3736E-03	-4.3752E-03	1.0084E-01	1.0084E-01	1.130E-01
EU-155	#B	2.1230E-02	2.1243E-02	1.8475E-01	1.8475E-01	2.069E-01
HG-203	#B	-1.4868E-03	-1.5237E-03	3.1202E-02	3.1202E-02	3.384E-02
TL-208		2.5088E-01	2.5088E-01	6.3496E-02	6.5145E-02	
PB-212		7.7529E-01	7.7529E-01	1.2481E-01	1.3268E-01	
PB-214		4.2327E-01	4.2327E-01	1.0554E-01	1.0836E-01	
BI-212		5.4966E-01	5.4966E-01	3.5916E-01	3.6058E-01	
BI-214		4.4047E-01	4.4047E-01	1.1054E-01	1.1346E-01	
RA-224	#A	1.0519E+00	1.0519E+00	1.0625E+00	1.0642E+00	1.144E+00
RA-226	#	1.4126E+00	1.4126E+00	1.0900E+00	1.0930E+00	1.163E+00
AC-228		7.8720E-01	7.8720E-01	2.0623E-01	2.1123E-01	
TH-227	#B	-2.0663E-01	-2.0663E-01	3.7068E-01	3.7088E-01	4.069E-01
PA-234	#B	6.3505E-03	6.3505E-03	2.1536E-01	2.1536E-01	2.416E-01
TH-234	#B	-7.7174E-02	-7.7174E-02	9.1344E+00	9.1344E+00	6.208E+00
AM-241	#A	-1.4021E-01	-1.4021E-01	1.0417E+00	1.0418E+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 (86.9 to 2000.7 keV) 1.9296770E+01 pCi/gm
Total Decayed Activity (86.9 to 2000.7 keV) 1.9296770E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

Sample description
FSS OOL-11-01-006-F

Spectrum Filename: C:\GammaVision\Spectra\103F_19APRIL2006_1405.An1

Acquisition information
Start time: 19-Apr-2006 14:06:41
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: 1.5490E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.5490E+03) =
6.4558E+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	17-Apr-2006 21:22:00
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: 0.2636

***** 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
74.64	79.	30.70	0.99	9.176E-03	74.81	9.600	PBC<MDA	PB212
77.31	200.	13.17	0.99	1.041E-02	77.11	17.500	9.693E-01	PB212
87.12	98.	39.19	1.50	1.472E-02	86.45	32.740	PBC<MDA	EU155
					88.04	3.790	1.531E+00	CD109
87.15	112.	35.34	1.50	1.410E-02	86.45	32.740	PBC<MDA	EU155
					88.04	3.790	1.750E+00	CD109
92.52	118.	35.13	1.47	1.636E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
185.78	98.	31.23	1.19	2.567E-02				
185.78	98.	31.23	1.19	2.567E-02	185.99	3.280	PBC<MDA	RA226
209.48	75.	37.42	1.70	2.470E-02				
239.01	847.	4.11	1.09	2.318E-02	238.63	43.100	7.286E-01	PB212
242.27	131.	17.73	1.10	2.300E-02	241.00	3.900	1.274E+00	RA224
					241.92	7.470	6.665E-01	PB214
270.79	134.	23.46	1.56	2.148E-02				
295.14	226.	12.19	1.19	2.025E-02	295.22	19.200	4.980E-01	PB214
338.40	180.	16.56	1.19	1.830E-02	338.40	12.010	7.109E-01	AC228
352.03	360.	9.18	1.14	1.775E-02	351.99	37.100	4.694E-01	PB214
463.19	46.	38.25	1.50	1.425E-02	463.51	10.000	PBC<MDA	SB125
511.11	132.	17.91	1.37	1.316E-02	510.72	22.500	3.086E-01	TL208
583.38	327.	8.15	1.40	1.184E-02	583.14	86.000	2.765E-01	TL208
609.48	292.	10.03	1.26	1.144E-02	609.32	46.090	4.718E-01	BI214
661.88	222.	10.26	1.41	1.072E-02	661.62	84.620	2.118E-01	CS137
727.21	89.	25.44	1.66	9.964E-03	727.17	11.800	6.537E-01	BI212
795.17	51.	36.60	0.86	9.307E-03				
795.17	51.	36.60	0.86	9.307E-03	795.76	85.400	5.600E-02	CS134
911.36	228.	10.35	1.78	8.399E-03	911.07	29.000	8.051E-01	AC228

969.26	180.	13.85	1.58	8.024E-03	968.90	17.460	1.118E+00	AC228
1121.13	71.	22.10	1.81	7.208E-03	1120.28	15.040	5.574E-01	BI214
1173.62	60.	29.32	0.66	6.970E-03	1173.23	99.860	7.292E-02	CO60

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1332.95	64.	17.42	1.26	6.348E-03	1332.51	99.980	8.451E-02	CO60
1461.36	990.	3.25	1.87	5.930E-03	1460.75	10.700	1.336E+01	K40
1620.96	23.	28.26	1.20	5.488E-03	1620.56	2.750	1.315E+00	BI212
1765.33	63.	12.60	1.42	5.140E-03	1764.51	15.920	6.366E-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
418.12	209.48	324.	75.	0.038	112.27	1.703	AC-228 s
540.72	270.79	304.	134.	0.067	70.39	1.558	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	263.	78.	0.039	90.12	0.993D
PB-212	153.39	77.11	251.	149.	0.075	50.40	0.995A
EU-155	173.47	87.15	722.	112.	0.056	106.01	1.500
CD-109	173.41	87.12	684.	98.	0.049	117.58	1.500
TH-234	185.07	92.95	748.	103.	0.051	99.14	1.500s
TH-234	185.05	92.94	743.	102.	0.051	99.58	1.500s
RA-226	371.31	186.07	554.	94.	0.047	96.90	1.500
PB-212	477.16	239.00	546.	831.	0.416	17.01	0.899
RA-224	483.24	242.04	530.	130.	0.065	79.47	1.500s
PB-214	589.44	295.14	217.	222.	0.111	36.56	1.194s
AC-228	675.95	338.40	255.	179.	0.090	49.69	1.189s
PB-214	703.21	352.03	250.	354.	0.177	27.54	1.143s
SB-125	925.49	463.19	140.	46.	0.023	114.76	1.500s
TL-208	1021.33	511.11	163.	105.	0.052	53.73	1.372s
TL-208	1165.86	583.38	117.	323.	0.161	24.44	1.397
BI-214	1218.06	609.48	155.	285.	0.143	30.09	1.257
CS-137	1322.85	661.88	94.	220.	0.110	30.79	1.414
BI-212	1453.49	727.21	114.	88.	0.044	76.33	1.656
CS-134	1589.46	795.20	49.	36.	0.018	96.60	1.500s
AC-228	1821.75	911.36	90.	225.	0.112	31.06	1.775
AC-228	1937.53	969.26	102.	180.	0.090	41.56	1.584
BI-214	2241.24	1121.13	63.	69.	0.035	66.29	1.814s
CO-60	2346.19	1173.62	78.	58.	0.029	87.97	0.661s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
CO-60	2664.81	1332.95	24.	61.	0.031	52.27	1.261s
K-40	2921.58	1461.36	30.	972.	0.486	9.75	1.873
BI-212	3240.74	1620.96	5.	23.	0.011	84.78	1.200s
BI-214	3529.41	1765.33	3.	60.	0.030	37.80	1.417s

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

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

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		0.0000E+00					
			477.56	0.000E+00	&(	3.780E-01 1.10E-01 G	
K-40		1.3355E+01					
			1460.75	1.336E+01	(P	3.899E-01 4.42E-01 G	
MN-54		5.4976E-04					
			834.81	5.498E-04	%(P	3.922E-02 1.11E-02 G	
CO-57		-6.5247E-04					
			122.07	-6.525E-04	%(P	5.541E-02 1.65E-02 G K	
			136.43	-1.432E-01	%	4.272E-01 1.29E-01 G	
CO-60		7.8715E-02					
			1332.51	8.451E-02	*(P	3.482E-02 1.54E-02 G K	
			1173.23	7.292E-02	(P	5.495E-02 2.21E-02 G K	
Sr-85		-1.6001E-02					
			514.00	-1.600E-02	&(	4.775E-02 1.43E-02 G	
Kr-85		-3.6291E+02					
			513.99	-3.629E+02	&(	1.083E+03 3.25E+02 G	
Y-88		-6.0755E-04					
			1836.01	-6.075E-04	&(P	3.179E-02 8.21E-03 G K	
			898.02	-5.000E-04	& P	3.721E-02 1.03E-02 G	
NB-94		8.8079E-03					
			871.10	8.808E-03	%(	3.254E-02 9.52E-03 G K	
			702.50	-6.555E-03	%	3.572E-02 1.04E-02 G K	
Ag-108M		-1.8480E-02					
			722.95	-1.848E-02	%(	4.938E-02 1.48E-02 G K	
			614.37	-1.770E-02	% P	4.849E-02 1.45E-02 G	

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		433.93	1.327E-02	%	3.696E-02	1.11E-02	G
CD-109	1.5309E+00						
		88.04	1.531E+00	&(	1.953E+00	6.00E-01	G
SN-113	-1.4931E-02						
		391.71	-1.493E-02	%(	5.827E-02	1.74E-02	G K
		255.04	4.435E-01	%	1.474E+00	4.41E-01	G
SB-125	8.3226E-02						
		427.95	1.657E-02	&(P	1.090E-01	3.20E-02	G K
		600.77	2.535E-02	% P	1.808E-01	5.25E-02	G
		636.15	1.922E-02	% P	2.908E-01	8.31E-02	G
		463.51	2.805E-01	(P	3.542E-01	1.10E-01	G
		176.29	-1.076E-01	%	6.357E-01	1.90E-01	G
I-131	-1.2583E-03						
		364.48	-1.258E-03	&(P	4.900E-02	1.43E-02	G K
		636.97	6.721E-02	&	4.920E-01	1.42E-01	G
		284.29	1.403E-01	% P	6.165E-01	1.84E-01	G
CS-134	1.7460E-02						
		604.66	-1.656E-03	%(	7.353E-02	2.17E-02	G K
		795.76	3.931E-02	(P	3.875E-02	1.27E-02	G
		569.29	4.437E-02	% P	2.134E-01	6.23E-02	G
		801.84	-5.376E-02	% P	4.500E-01	1.28E-01	G
CS-137	2.1176E-01						
		661.62	2.118E-01	(P	4.600E-02	2.19E-02	G
CE-139	5.0554E-03						
		165.85	5.055E-03	&(	4.437E-02	1.32E-02	G
EU-152	-2.8940E-03						
		121.78	-2.894E-03	%(P	1.528E-01	4.53E-02	G K
		344.30	2.146E-02	% P	1.298E-01	3.84E-02	G
		1408.08	3.342E-02	%	1.640E-01	4.67E-02	G
		964.00	-2.026E-02	% P	4.013E-01	1.16E-01	G
		1112.07	4.612E-03	&	3.734E-01	1.06E-01	G
		778.90	-1.798E-02	&	2.663E-01	7.58E-02	G
EU-154	3.2091E-02						
		123.10	3.209E-02	%(	1.134E-01	3.41E-02	G K
		1274.80	9.820E-04	&	1.246E-01	3.48E-02	G
		723.30	0.000E+00	%	3.582E-01	1.05E-01	G
		1004.80	0.000E+00	%	2.610E-01	7.40E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	2.1100E-01						
		86.45	2.110E-01	(	2.418E-01	7.46E-02	G K
		105.31	6.665E-02	%	2.485E-01	7.47E-02	G
HG-203	3.3340E-03						
		279.17	3.334E-03	&(P	4.170E-02	1.23E-02	G K
		72.87	-2.615E-01	& P	2.252E+00	6.72E-01	G
		70.83	-5.729E-01	&	4.378E+00	1.31E+00	G
		82.50	-4.683E-01	%	3.510E+00	1.05E+00	G
TL-208	2.8318E-01						
		583.14	2.765E-01	(P	4.551E-02	2.28E-02	G
		510.72	3.086E-01	*(P	1.832E-01	6.93E-02	G
PB-212	7.3667E-01						
		238.63	7.253E-01	(P	9.735E-02	4.18E-02	G K
							Energy duplication
		77.11	7.367E-01	} P	3.774E-01	1.24E-01	G
		74.81	7.879E-01	(P	7.853E-01	2.46E-01	G
PB-214	4.7915E-01						
		351.99	4.694E-01	@(P	1.011E-01	4.38E-02	G K
		295.22	4.980E-01	@(P	1.601E-01	6.18E-02	G
							Energy duplication
		77.11	0.000E+00	} P	8.644E-01	0.00E+00	G
		241.92	1.206E-01	%	6.370E-01	1.91E-01	G
BI-212	7.7877E-01						
		727.17	6.537E-01	(P	3.891E-01	1.67E-01	G K
		1620.56	1.315E+00	(P	7.736E-01	3.73E-01	G
		785.42	4.634E-01	%	1.904E+00	5.59E-01	G
BI-214	4.9287E-01						
		609.32	4.718E-01	(P	1.004E-01	4.84E-02	G K
		1764.51	6.366E-01	+ P	1.187E-01	8.46E-02	G
		1120.28	5.574E-01	*(P	3.186E-01	1.27E-01	G
RA-224	1.2629E+00						
		241.00	1.263E+00	&(	1.067E+00	3.35E-01	G
RA-226	9.7153E-01						
		185.99	9.715E-01	(P	1.164E+00	3.57E-01	G
AC-228	7.7749E-01						
		911.07	8.051E-01	(P	1.681E-01	8.46E-02	G K
		968.90	1.118E+00	+ P	3.105E-01	1.55E-01	G
		338.40	7.109E-01	@(P	3.061E-01	1.18E-01	G

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

TH-227       3.5525E-03
                          236.00 3.552E-03 %(  5.682E-01 1.70E-01 G K
                          256.25-1.625E-01 % P 5.451E-01 1.64E-01 G

PA-234       1.3919E-03
                           98.44 1.392E-03 %(P 1.939E-01 5.73E-02 G K
                          946.00-2.137E-03 & P 2.174E-01 6.17E-02 G
                          131.28-1.923E-03 % P 1.947E-01 5.76E-02 G
                           94.67-1.298E-01 & P 4.509E-01 1.36E-01 G
                          883.24-1.124E-02 &   2.750E-01 7.71E-02 G
                          926.70-8.389E-02 &   3.962E-01 1.16E-01 G
                          569.26 6.436E-02 % P 3.165E-01 9.23E-02 G

TH-234       1.0781E+00
                           63.29-1.740E-01 %(P 7.015E+00 2.07E+00 G K
                           92.80 1.798E+00 @(P 2.293E+00 7.00E-01 G
                           92.38 2.138E+00 *(P 2.710E+00 8.28E-01 G

AM-241       1.3754E-01
                           59.54 1.375E-01 %(P 1.157E+00 3.44E-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	3.2881E-01	3.2881E-01	3.698E-01
K-40		1.3355E+01	1.3355E+01	1.3270E+00	1.5369E+00	
MN-54	#A	5.4769E-04	5.4976E-04	3.3328E-02	3.3328E-02	3.908E-02
CO-57	#B	-6.4963E-04	-6.5247E-04	8.9386E-02	8.9386E-02	5.516E-02
CO-60		7.8667E-02	7.8715E-02	4.1721E-02	4.1971E-02	
Sr-85	#A	-1.5713E-02	-1.6001E-02	4.2949E-02	4.2959E-02	4.689E-02
Kr-85	#A	-3.6290E+02	-3.6291E+02	9.7373E+02	9.7395E+02	1.083E+03
Y-88	#B	-6.0088E-04	-6.0755E-04	3.5785E-02	3.5785E-02	3.144E-02
NB-94	#B	8.8079E-03	8.8079E-03	2.8573E-02	2.8578E-02	3.254E-02
Ag-108M	#B	-1.8479E-02	-1.8480E-02	4.4421E-02	4.4434E-02	4.938E-02
CD-109	#A	1.5269E+00	1.5309E+00	1.8000E+00	1.8020E+00	1.947E+00
SN-113	#B	-1.4779E-02	-1.4931E-02	5.2071E-02	5.2078E-02	5.768E-02
SB-125	#B	8.3129E-02	8.3226E-02	9.8175E-02	9.8294E-02	1.089E-01
I-131	#B	-1.0870E-03	-1.2583E-03	9.7860E-02	9.7860E-02	4.233E-02
CS-134	#B	1.7433E-02	1.7460E-02	1.6907E-02	1.6938E-02	7.342E-02
CS-137		2.1174E-01	2.1176E-01	6.5613E-02	6.6755E-02	
CE-139	#A	5.0123E-03	5.0554E-03	3.9596E-02	3.9597E-02	4.399E-02
EU-152	#B	-2.8933E-03	-2.8940E-03	3.3333E-01	3.3333E-01	1.527E-01
EU-154	#B	3.2079E-02	3.2091E-02	1.0229E-01	1.0230E-01	1.134E-01
EU-155	#A	2.1086E-01	2.1100E-01	2.2369E-01	2.2399E-01	2.417E-01
HG-203	#B	3.2508E-03	3.3340E-03	3.6892E-02	3.6893E-02	4.066E-02
TL-208		2.8318E-01	2.8318E-01	7.0141E-02	7.2042E-02	
PB-212		7.3667E-01	7.3667E-01	1.2708E-01	1.3408E-01	
PB-214	#	4.7915E-01	4.7915E-01	1.1156E-01	1.1498E-01	
BI-212		7.7877E-01	7.7877E-01	4.4582E-01	4.4810E-01	
BI-214		4.9287E-01	4.9287E-01	1.5168E-01	1.5435E-01	
RA-224	#	1.2629E+00	1.2629E+00	1.0036E+00	1.0063E+00	1.067E+00
RA-226	#A	9.7153E-01	9.7153E-01	1.0715E+00	1.0730E+00	1.164E+00
AC-228		7.7749E-01	7.7749E-01	2.2975E-01	2.3414E-01	
TH-227	#B	3.5525E-03	3.5525E-03	5.0920E-01	5.0920E-01	5.682E-01
PA-234	#B	1.3919E-03	1.3919E-03	1.7183E-01	1.7183E-01	1.939E-01
TH-234	#B	1.0781E+00	1.0781E+00	1.2524E+00	1.2538E+00	7.015E+00
AM-241	#A	1.3754E-01	1.3754E-01	1.0335E+00	1.0335E+00	1.157E+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 (86.9 to 2000.7 keV) 1.7193865E+01 pCi/gm
Total Decayed Activity (86.9 to 2000.7 keV) 1.7193935E+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_19APRIL2006_1452.An1

Sample description
OOL-11-01-018-F

Spectrum Filename: C:\GammaVision\Spectra\103F_19APRIL2006_1452.An1

Acquisition information
Start time: 19-Apr-2006 14:52:54
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: 1.4990E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.4990E+03) =
6.6711E+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: 103F_19APRIL2006_1452.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	17-Apr-2006 19:14:00
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: 0.3008

***** 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
75.15	134.	18.76	0.99	9.216E-03	74.81	9.600	1.358E+00	PB212
77.21	187.	14.44	0.99	1.016E-02	77.11	17.500	9.397E-01	PB212
					77.11	10.700	1.537E+00	PB214
186.12	115.	29.65	0.98	2.566E-02	185.99	3.280	PBC<MDA	RA226
209.86	68.	32.76	1.15	2.469E-02				
239.03	866.	4.05	1.09	2.318E-02	238.63	43.100	7.705E-01	PB212
270.04	65.	36.66	0.80	2.152E-02				
295.43	196.	14.94	1.21	2.024E-02	295.22	19.200	4.463E-01	PB214
300.34	67.	36.72	0.81	2.000E-02				
338.68	186.	17.02	1.45	1.829E-02	338.40	12.010	7.600E-01	AC228
352.09	348.	7.75	1.31	1.775E-02	351.99	37.100	4.683E-01	PB214
463.26	61.	34.49	0.88	1.425E-02				
463.26	61.	34.49	0.88	1.425E-02	463.51	10.000	3.778E-01	SB125
511.27	185.	13.78	1.39	1.316E-02	510.72	22.500	4.807E-01	TL208
583.40	316.	7.65	1.09	1.184E-02	583.14	86.000	2.755E-01	TL208
597.10	33.	31.59	1.50	1.157E-02	600.77	18.400	1.398E-01	SB125
609.49	255.	8.94	1.18	1.144E-02	609.32	46.090	4.256E-01	BI214
661.88	148.	15.93	1.10	1.072E-02	661.62	84.620	1.457E-01	CS137
728.08	82.	20.92	1.43	9.955E-03	727.17	11.800	6.234E-01	BI212
911.50	212.	13.04	1.60	8.398E-03	911.07	29.000	7.727E-01	AC228
964.98	50.	23.75	1.54	8.056E-03	964.00	14.580	3.875E-01	EU152
969.35	167.	11.29	1.57	8.023E-03	968.90	17.460	1.074E+00	AC228
1121.13	84.	17.64	0.88	7.208E-03	1120.28	15.040	6.866E-01	BI214
1173.53	62.	25.89	0.91	6.970E-03	1173.23	99.860	7.730E-02	CO60
1333.43	52.	24.76	0.97	6.349E-03	1332.51	99.980	7.425E-02	CO60
1461.36	1216.	2.98	1.97	5.930E-03	1460.75	10.700	1.701E+01	K40
1765.23	62.	12.70	1.67	5.140E-03	1764.51	15.920	6.468E-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	227.	68.	0.034	98.27	1.155	NP-239
483.85	242.34	210.	137.	0.069	51.60	1.095	XE-138 lD
539.23	270.04	232.	65.	0.033	109.99	0.802	AC-228
599.82	300.34	210.	67.	0.034	110.15	0.811	PB-212
925.65	463.26	131.	61.	0.030	103.46	0.880	SB-125 l

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	236.	132.	0.066	54.22	0.993D
PB-212	153.39	77.11	275.	152.	0.076	41.42	0.995A
RA-226	371.53	186.18	557.	112.	0.056	83.35	1.500
PB-212	477.16	239.00	561.	860.	0.430	16.70	1.080
PB-214	590.01	295.43	251.	192.	0.096	44.83	1.214
AC-228	676.51	338.68	266.	185.	0.093	51.06	1.454s
PB-214	703.32	352.09	164.	342.	0.171	23.26	1.308
TL-208	1021.65	511.27	167.	158.	0.079	41.34	1.387s
TL-208	1165.91	583.40	100.	311.	0.156	22.95	1.095
SB-125	1193.30	597.10	38.	33.	0.016	94.78	1.500s
BI-214	1218.07	609.49	105.	249.	0.124	26.83	1.180
CS-137	1322.85	661.88	103.	147.	0.073	47.80	1.104
BI-212	1455.22	728.08	79.	81.	0.041	62.77	1.433
AC-228	1822.03	911.50	129.	209.	0.104	39.12	1.598
EU-152	1928.97	964.98	48.	50.	0.025	71.25	1.538
AC-228	1937.70	969.35	61.	167.	0.083	33.87	1.569
BI-214	2241.23	1121.13	49.	83.	0.041	52.93	0.883s
CO-60	2346.02	1173.53	73.	60.	0.030	77.68	0.915s
CO-60	2665.78	1333.43	38.	52.	0.026	74.28	0.966s
K-40	2921.60	1461.36	44.	1197.	0.599	8.95	1.973
BI-214	3529.22	1765.23	3.	59.	0.029	38.10	1.667

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		-5.1565E-02					
			477.56	-5.157E-02	%(	2.938E-01 8.58E-02	G
K-40		1.7008E+01					
			1460.75	1.701E+01	(P	4.751E-01 5.16E-01	G
MN-54		1.2890E-02					
			834.81	1.289E-02	%(P	3.058E-02 9.17E-03	G
CO-57		2.5980E-03					
			122.07	2.598E-03	%(P	4.046E-02 1.20E-02	G K
			136.43	-1.289E-01	%	4.495E-01 1.35E-01	G
CO-60		7.5775E-02					
			1332.51	7.425E-02	(P	4.454E-02 1.93E-02	G K
			1173.23	7.730E-02	(P	5.523E-02 2.07E-02	G K
Sr-85		-1.4257E-02					
			514.00	-1.426E-02	%(	5.091E-02 1.52E-02	G
Kr-85		-3.3032E+02					
			513.99	-3.303E+02	%(	1.145E+03 3.42E+02	G
Y-88		-3.3835E-03					
			1836.01	-3.383E-03	%(P	3.366E-02 9.01E-03	G K
			898.02	-7.966E-03	% P	4.262E-02 1.23E-02	G
NB-94		-1.4335E-03					
			871.10	-1.434E-03	%(	2.987E-02 8.30E-03	G K
			702.50	6.057E-03	%	3.211E-02 9.31E-03	G K
Ag-108M		1.5927E-02					
			722.95	1.593E-02	%(	4.494E-02 1.34E-02	G K
			614.37	5.503E-04	& P	8.324E-03 1.91E-03	G
			433.93	3.829E-04	&	3.058E-02 8.75E-03	G
CD-109		9.5214E-01					
			88.04	9.521E-01	%(	2.037E+00 6.18E-01	G
SN-113		-4.9407E-03					
			391.71	-4.941E-03	&(	5.334E-02 1.56E-02	G K
			255.04	-3.315E-01	%	1.833E+00 5.46E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	4.8339E-02						
		427.95	-8.491E-03	&(P	1.191E-01	3.47E-02	G K
		600.77	1.398E-01	*(P	1.330E-01	4.42E-02	G
		636.15	1.447E-01	% P	2.815E-01	8.57E-02	G
		463.51	2.286E-01	% P	3.376E-01	1.04E-01	G
		176.29	-1.075E-01	%	5.979E-01	1.79E-01	G
I-131	1.7878E-02						
		364.48	1.788E-02	%(P	4.616E-02	1.39E-02	G K
		636.97	2.518E-01	%	5.257E-01	1.59E-01	G
		284.29	-4.814E-02	& P	6.981E-01	2.06E-01	G
CS-134	-8.1416E-03						
		604.66	-8.142E-03	&(	4.516E-02	1.33E-02	G K
		795.76	1.992E-02	% P	3.502E-02	1.08E-02	G
		569.29	8.558E-02	& P	1.907E-01	5.73E-02	G
		801.84	3.027E-02	& P	3.899E-01	1.10E-01	G
CS-137	1.4569E-01						
		661.62	1.457E-01	(P	4.978E-02	2.34E-02	G
CE-139	-1.0501E-02						
		165.85	-1.050E-02	%(	5.181E-02	1.55E-02	G
EU-152	1.1240E-01						
		121.78	-2.478E-02	%(P	1.274E-01	3.79E-02	G K
		344.30	8.029E-04	& P	1.262E-01	3.68E-02	G
		1408.08	-8.967E-03	%	1.791E-01	4.93E-02	G
		964.00	3.875E-01	&(P	2.698E-01	9.30E-02	G
		1112.07	0.000E+00	&	3.554E-01	1.00E-01	G
		778.90	-6.017E-02	&	3.094E-01	9.03E-02	G
EU-154	-1.2617E-02						
		123.10	-1.262E-02	&(	1.140E-01	3.40E-02	G K
		1274.80	2.049E-03	&	1.064E-01	2.92E-02	G
		723.30	6.554E-02	%	2.093E-01	6.22E-02	G
		1004.80	-3.373E-03	&	2.388E-01	6.72E-02	G
EU-155	4.1589E-03						
		86.45	4.159E-03	%(	2.795E-01	8.33E-02	G K
		105.31	6.937E-02	%	2.393E-01	7.19E-02	G
HG-203	1.6417E-03						
		279.17	1.642E-03	&(P	4.900E-02	1.45E-02	G K
		72.87	-1.000E+00	% P	2.504E+00	7.57E-01	G
		70.83	-1.098E+00	%	4.741E+00	1.42E+00	G
		82.50	-4.319E-01	%	4.270E+00	1.27E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.7549E-01						
		583.14	2.755E-01	(P	4.358E-02	2.14E-02	G
		510.72	4.807E-01	+ P	1.914E-01	7.75E-02	G
PB-212	7.7534E-01						
		238.63	7.753E-01	(P	1.020E-01	4.38E-02	G K
							Energy duplication
		77.11	7.753E-01	} P	4.073E-01	1.07E-01	G
		74.81	1.374E+00	+ P	7.700E-01	2.54E-01	G
PB-214	4.6080E-01						
		351.99	4.683E-01	(P	8.535E-02	3.69E-02	G K
		295.22	4.463E-01	(P	1.773E-01	6.81E-02	G
							Energy duplication
		77.11	0.000E+00	} P	9.531E-01	0.00E+00	G
		241.92	4.106E-02	%	6.713E-01	2.00E-01	G
BI-212	6.2336E-01						
		727.17	6.234E-01	(P	3.377E-01	1.31E-01	G K
		1620.56	1.654E-01	% P	1.017E+00	2.78E-01	G
		785.42	6.538E-01	%	1.988E+00	5.91E-01	G
BI-214	4.2563E-01						
		609.32	4.256E-01	(P	8.631E-02	3.91E-02	G K
		1764.51	6.468E-01	+ P	1.227E-01	8.67E-02	G
		1120.28	6.866E-01	+ P	2.947E-01	1.24E-01	G
RA-224	-1.7366E-02						
		241.00	-1.737E-02	&(	1.101E+00	3.26E-01	G
RA-226	1.2034E+00						
		185.99	1.203E+00	(P	1.206E+00	3.73E-01	G
AC-228	8.6010E-01						
		911.07	7.727E-01	(P	2.060E-01	1.02E-01	G K
		968.90	1.074E+00	(P	2.517E-01	1.21E-01	G
		338.40	7.600E-01	(P	3.227E-01	1.30E-01	G
TH-227	-2.0590E-01						
		236.00	-2.059E-01	&(	4.489E-01	1.36E-01	G K
		256.25	7.928E-02	& P	5.183E-01	1.54E-01	G
PA-234	2.8196E-02						
		98.44	2.820E-02	%(P	2.424E-01	7.23E-02	G K
		946.00	2.557E-02	& P	2.023E-01	5.81E-02	G
		131.28	2.366E-02	& P	2.349E-01	7.01E-02	G
		94.67	-1.289E-01	% P	4.545E-01	1.37E-01	G
		883.24	-6.666E-02	&	3.384E-01	9.85E-02	G
		926.70	1.112E-01	%	2.872E-01	8.57E-02	G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 1.272E-01 & P 2.822E-01 8.48E-02 G

TH-234      -2.4600E-01
                           63.29-2.460E-01 %(P 7.248E+00 2.14E+00 G K
                           92.80 1.087E+00 % P 2.397E+00 7.22E-01 G
                           92.38 1.222E+00 % P 2.856E+00 8.60E-01 G

AM-241       1.9413E-01
                           59.54 1.941E-01 &(P 1.122E+00 3.35E-01 G
   ( - This peak used in the nuclide activity average.

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

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

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** 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	-5.0362E-02	-5.1565E-02	2.5747E-01	2.5749E-01	2.870E-01
K-40		1.7008E+01	1.7008E+01	1.5468E+00	1.8351E+00	
MN-54	#A	1.2838E-02	1.2890E-02	2.7503E-02	2.7514E-02	3.046E-02
CO-57	#B	2.5859E-03	2.5980E-03	3.5863E-02	3.5863E-02	4.027E-02
CO-60		7.5725E-02	7.5775E-02	4.2400E-02	4.2628E-02	

Sr-85	#A	-1.3982E-02	-1.4257E-02	4.5616E-02	4.5624E-02	4.993E-02
Kr-85	#A	-3.3032E+02	-3.3032E+02	1.0265E+03	1.0267E+03	1.145E+03
Y-88	#B	-3.3437E-03	-3.3835E-03	2.8964E-02	2.8965E-02	3.326E-02
NB-94	#B	-1.4335E-03	-1.4335E-03	2.4901E-02	2.4901E-02	2.987E-02
Ag-108M	#B	1.5926E-02	1.5927E-02	4.0273E-02	4.0283E-02	4.494E-02
CD-109	#A	9.4949E-01	9.5214E-01	1.8525E+00	1.8533E+00	2.031E+00
SN-113	#B	-4.8868E-03	-4.9407E-03	4.6831E-02	4.6832E-02	5.276E-02
SB-125	#B	4.8279E-02	4.8339E-02	4.5836E-02	4.5921E-02	1.189E-01
I-131	#B	1.5283E-02	1.7878E-02	4.1604E-02	4.1617E-02	3.946E-02
CS-134	#B	-8.1279E-03	-8.1416E-03	3.9876E-02	3.9879E-02	4.508E-02
CS-137		1.4567E-01	1.4569E-01	7.0294E-02	7.0801E-02	
CE-139	#A	-1.0405E-02	-1.0501E-02	4.6540E-02	4.6544E-02	5.134E-02
EU-152	#B	1.1237E-01	1.1240E-01	8.0946E-02	8.1186E-02	1.274E-01
EU-154	#B	-1.2612E-02	-1.2617E-02	1.0195E-01	1.0195E-01	1.139E-01
EU-155	#B	4.1560E-03	4.1589E-03	2.4983E-01	2.4983E-01	2.793E-01
HG-203	#B	1.5979E-03	1.6417E-03	4.3371E-02	4.3372E-02	4.769E-02
TL-208		2.7549E-01	2.7549E-01	6.4091E-02	6.6056E-02	
PB-212		7.7534E-01	7.7534E-01	1.3125E-01	1.3875E-01	
PB-214		4.6080E-01	4.6080E-01	1.0897E-01	1.1221E-01	
BI-212		6.2336E-01	6.2336E-01	3.9367E-01	3.9533E-01	
BI-214		4.2563E-01	4.2563E-01	1.1715E-01	1.1973E-01	
RA-224	#A	-1.7366E-02	-1.7366E-02	9.7854E-01	9.7854E-01	1.101E+00
RA-226	#A	1.2034E+00	1.2034E+00	1.1187E+00	1.1209E+00	1.206E+00
AC-228		8.6010E-01	8.6010E-01	2.1005E-01	2.1591E-01	
TH-227	#B	-2.0590E-01	-2.0590E-01	4.0808E-01	4.0825E-01	4.489E-01
PA-234	#B	2.8196E-02	2.8196E-02	2.1688E-01	2.1688E-01	2.424E-01
TH-234	#B	-2.4600E-01	-2.4600E-01	5.4162E+01	5.4162E+01	7.248E+00
AM-241	#A	1.9412E-01	1.9413E-01	1.0039E+00	1.0040E+00	1.122E+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 (86.9 to 2000.7 keV) 2.0649975E+01 pCi/gm
Total Decayed Activity (86.9 to 2000.7 keV) 2.0650040E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JJM

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

Sample description
OOL-11-01-017-F

Spectrum Filename: C:\GammaVision\Spectra\103F_19APRIL2006_1532.An1

Acquisition information

Start time:	19-Apr-2006 15:32:47
Live time:	2000
Real time:	2002
Dead time:	0.09 %
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:	8.4500E+02
Activity scaling factor:	1.0000E+06/(1.0000E+00* 8.4500E+02) = 1.1834E+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	17-Apr-2006 19:42:00
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: 0.1824

***** 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
74.93	60.	30.84	0.99	9.052E-03	74.81	9.600	PBC<MDA	PB212
77.23	79.	20.86	0.99	1.011E-02	77.11	17.500	9.245E-01	PB212
					77.11	10.700	1.512E+00	PB214
186.53	146.	20.48	1.18	2.565E-02	185.99	3.280	2.535E+00	RA226
239.00	510.	5.33	1.09	2.318E-02	238.63	43.100	7.965E-01	PB212
242.03	87.	21.97	1.10	2.302E-02	241.00	3.900	1.546E+00	RA224
					241.92	7.470	8.088E-01	PB214
270.20	61.	33.86	0.75	2.151E-02				
295.12	171.	14.70	1.07	2.025E-02	295.22	19.200	6.884E-01	PB214
338.43	122.	14.88	1.20	1.830E-02	338.40	12.010	8.812E-01	AC228
352.07	264.	10.42	1.10	1.775E-02	351.99	37.100	6.283E-01	PB214
511.36	99.	20.81	1.23	1.316E-02	510.72	22.500	3.892E-01	TL208
583.26	144.	13.30	1.51	1.184E-02	583.14	86.000	2.187E-01	TL208
609.42	162.	11.77	1.15	1.144E-02	609.32	46.090	4.724E-01	BI214
661.93	598.	4.68	1.39	1.072E-02	661.62	84.620	1.052E+00	CS137
727.97	35.	32.54	1.50	9.965E-03	727.17	11.800	PBC<MDA	BI212
795.20	23.	37.07	1.50	9.301E-03	795.76	85.400	PBC<MDA	CS134
911.33	127.	12.70	1.57	8.400E-03	911.07	29.000	8.128E-01	AC228
968.52	107.	17.11	1.70	8.028E-03	968.90	17.460	1.219E+00	AC228
1120.48	54.	25.95	1.36	7.211E-03	1120.28	15.040	7.727E-01	BI214
1173.61	57.	23.21	1.29	6.970E-03	1173.23	99.860	1.256E-01	CO60
1332.64	40.	24.77	1.84	6.349E-03	1332.51	99.980	9.442E-02	CO60
1461.52	745.	3.78	1.79	5.930E-03	1460.75	10.700	1.830E+01	K40
1765.01	37.	16.44	1.33	5.141E-03	1764.51	15.920	6.589E-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
539.56	270.20	157.	61.	0.030	101.59	0.746	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	160.	60.	0.030	92.53	0.993D
PB-212	153.39	77.11	164.	79.	0.040	62.57	0.995A
RA-226	371.61	186.23	363.	81.	0.040	90.46	1.500s
PB-212	477.26	239.05	270.	542.	0.271	19.17	0.964
RA-224	483.64	242.24	311.	76.	0.038	104.14	1.500
PB-214	589.38	295.12	170.	167.	0.084	44.11	1.071s
AC-228	676.01	338.43	96.	121.	0.061	44.65	1.199
PB-214	703.27	352.07	165.	259.	0.129	31.26	1.102
TL-208	1021.83	511.36	128.	72.	0.036	62.42	1.230s
TL-208	1165.63	583.26	76.	139.	0.070	39.91	1.506
BI-214	1217.93	609.42	81.	156.	0.078	35.30	1.146
CS-137	1322.96	661.93	63.	597.	0.298	14.05	1.390
BI-212	1455.01	727.97	50.	35.	0.018	97.62	1.500s
CS-134	1589.45	795.20	26.	23.	0.012	111.21	1.500s
AC-228	1821.68	911.33	45.	124.	0.062	38.10	1.573
AC-228	1936.06	968.52	57.	107.	0.053	51.32	1.705s
BI-214	2239.93	1120.48	46.	52.	0.026	77.84	1.364
CO-60	2346.19	1173.61	43.	55.	0.027	69.62	1.286
K-40	2921.91	1461.52	31.	726.	0.363	11.34	1.789

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		-1.4420E-01					
			477.56	-1.442E-01	&(	5.959E-01 1.76E-01	G
K-40		1.8299E+01					
			1460.75	1.830E+01	(P	7.190E-01 7.10E-01	G
MN-54		7.1195E-03					
			834.81	7.120E-03	%(P	4.520E-02 1.27E-02	G
CO-57		-8.7582E-04					
			122.07	-8.758E-04	&(P	7.323E-02 2.16E-02	G K
			136.43	-7.433E-02	&	5.762E-01 1.71E-01	G
CO-60		8.5974E-02					
			1332.51	4.637E-02	%(P	6.394E-02 2.00E-02	G K
			1173.23	1.256E-01	(P	7.675E-02 3.02E-02	G K
Sr-85		-1.7607E-04					
			514.00	-1.761E-04	&(	6.482E-02 1.86E-02	G
Kr-85		-2.9676E+00					
			513.99	-2.968E+00	&(	1.467E+03 4.22E+02	G
Y-88		-5.6675E-03					
			1836.01	-5.667E-03	&(P	4.725E-02 1.23E-02	G K
			898.02	-1.135E-02	% P	5.881E-02 1.66E-02	G
NB-94		-5.9397E-03					
			871.10	-5.940E-03	&(	5.528E-02 1.56E-02	G K
			702.50	2.190E-04	&	4.767E-02 1.32E-02	G K
Ag-108M		-1.8793E-03					
			722.95	-1.879E-03	&(	8.687E-02 2.50E-02	G K
			614.37	-5.743E-02	% P	7.956E-02 2.47E-02	G
			433.93	1.306E-02	%	6.262E-02 1.85E-02	G
CD-109		-6.1191E-02					
			88.04	-6.119E-02	%(	3.237E+00 9.60E-01	G
SN-113		2.7160E-02					
			391.71	2.716E-02	&(	7.365E-02 2.21E-02	G K
			255.04	0.000E+00	&	2.684E+00 7.86E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	9.4168E-03						
		427.95	9.417E-03	%(P	1.777E-01	5.13E-02	G K
		600.77	-5.158E-03	& P	3.035E-01	8.61E-02	G
		636.15	-4.183E-02	& P	4.939E-01	1.40E-01	G
		463.51	2.915E-01	% P	5.872E-01	1.78E-01	G
		176.29	5.403E-02	%	7.816E-01	2.30E-01	G
I-131	-7.7371E-03						
		364.48	-7.737E-03	&(P	7.385E-02	2.15E-02	G K
		636.97	1.002E-01	%	8.232E-01	2.36E-01	G
		284.29	-3.575E-02	% P	9.169E-01	2.67E-01	G
CS-134	2.1463E-02						
		604.66	-7.508E-04	&(	5.031E-02	1.41E-02	G K
		795.76	4.685E-02	(P	5.319E-02	1.74E-02	G
		569.29	1.435E-02	% P	3.407E-01	9.63E-02	G
		801.84	1.194E-01	& P	5.010E-01	1.42E-01	G
CS-137	1.0517E+00						
		661.62	1.052E+00	(P	7.018E-02	4.94E-02	G
CE-139	1.0317E-02						
		165.85	1.032E-02	%(	6.810E-02	2.02E-02	G
EU-152	-8.6356E-02						
		121.78	-8.636E-02	&(P	2.000E-01	6.03E-02	G K
		344.30	2.470E-02	& P	1.836E-01	5.38E-02	G
		1408.08	1.447E-03	%	2.673E-01	7.11E-02	G
		964.00	1.881E-01	% P	4.870E-01	1.45E-01	G
		1112.07	1.109E-01	&	4.691E-01	1.36E-01	G
		778.90	-7.284E-02	%	4.159E-01	1.20E-01	G
EU-154	-1.1788E-02						
		123.10	-1.179E-02	%(	1.575E-01	4.66E-02	G K
		1274.80	-1.136E-02	&	1.968E-01	5.48E-02	G
		723.30	-8.565E-02	&	3.665E-01	1.08E-01	G
		1004.80	1.214E-02	&	3.382E-01	9.38E-02	G
EU-155	1.4756E-02						
		86.45	1.476E-02	%(	3.692E-01	1.09E-01	G K
		105.31	-4.056E-03	&	3.495E-01	1.03E-01	G
HG-203	-5.2955E-03						
		279.17	-5.295E-03	&(P	6.921E-02	2.03E-02	G K
		72.87	-4.730E-01	% P	3.373E+00	1.00E+00	G
		70.83	-1.385E-01	%	7.084E+00	2.10E+00	G
		82.50	-7.513E-01	&	5.312E+00	1.58E+00	G

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

TL-208       2.1868E-01
                          583.14 2.187E-01  (P 6.791E-02 3.00E-02 G
                          510.72 3.892E-01 + P 2.990E-01 1.11E-01 G

PB-212       8.8313E-01
                          238.63 8.663E-01  (P 1.269E-01 5.67E-02 G K
                                                          Energy duplication
                           77.11 7.178E-01 } P 5.631E-01 1.50E-01 G
                           74.81 1.102E+00 + P 1.135E+00 3.57E-01 G

PB-214       6.4879E-01
                          351.99 6.283E-01  (P 1.520E-01 6.69E-02 G K
                          295.22 6.884E-01 *(P 2.608E-01 1.04E-01 G
                                                          Energy duplication
                           77.11 6.054E-02 } P 1.294E+00 3.24E-01 G
                          241.92 1.509E-01 %   8.994E-01 2.68E-01 G

BI-212       4.7714E-01
                          727.17 4.771E-01  (P 4.837E-01 1.57E-01 G K
                         1620.56-6.705E-02 & P 1.880E+00 4.89E-01 G
                          785.42 4.430E-01 %   1.982E+00 5.66E-01 G

BI-214       4.7236E-01
                          609.32 4.724E-01  (P 1.356E-01 5.79E-02 G K
                         1764.51 2.533E-01 % P 3.463E-01 1.08E-01 G
                         1120.28 7.727E-01 + P 5.039E-01 2.08E-01 G

RA-224       1.3519E+00
                          241.00 1.352E+00 &(  1.508E+00 4.69E-01 G

RA-226       1.5296E+00
                          185.99 1.530E+00 @(P 1.739E+00 5.35E-01 G

AC-228       8.3285E-01
                          911.07 8.128E-01  (P 2.234E-01 1.06E-01 G K
                          968.90 1.219E+00 + P 4.330E-01 2.09E-01 G
                          338.40 8.812E-01  (P 3.517E-01 1.32E-01 G

TH-227      -1.8585E-01
                          236.00-1.858E-01 %(  5.801E-01 1.74E-01 G K
                          256.25 1.562E-01 & P 7.520E-01 2.23E-01 G

PA-234      -7.5024E-02
                           98.44-7.502E-02 %(P 3.397E-01 1.01E-01 G K
                          946.00-5.942E-02 % P 3.346E-01 9.65E-02 G
                          131.28 1.809E-02 % P 3.286E-01 9.73E-02 G
                           94.67 1.052E-01 % P 5.981E-01 1.78E-01 G
                          883.24 1.468E-01 &   4.020E-01 1.19E-01 G
                          926.70 1.373E-01 %   4.613E-01 1.35E-01 G
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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 2.219E-02 % P 5.045E-01 1.43E-01 G

TH-234       1.4221E+00
                           63.29 1.422E+00 &(P 9.657E+00 2.86E+00 G K
                           92.80 1.468E+00 & P 3.329E+00 9.98E-01 G
                           92.38 1.716E+00 % P 3.940E+00 1.18E+00 G

AM-241      -1.5649E-01
                           59.54-1.565E-01 &(P 1.767E+00 5.23E-01 G
   ( - This peak used in the nuclide activity average.

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

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

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** 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	-1.4082E-01	-1.4420E-01	5.2854E-01	5.2860E-01	5.819E-01
K-40		1.8299E+01	1.8299E+01	2.1285E+00	2.3790E+00	
MN-54	#A	7.0907E-03	7.1195E-03	3.8128E-02	3.8130E-02	4.502E-02
CO-57	#B	-8.7172E-04	-8.7582E-04	1.4878E-01	1.4878E-01	7.288E-02
CO-60	F	8.5917E-02	8.5974E-02	6.1986E-02	6.2186E-02	6.390E-02

Sr-85	#A	-1.7266E-04	-1.7607E-04	5.5944E-02	5.5944E-02	6.357E-02
Kr-85	#A	-2.9676E+00	-2.9676E+00	1.2663E+03	1.2663E+03	1.467E+03
Y-88	#B	-5.6006E-03	-5.6675E-03	3.9808E-02	3.9810E-02	4.669E-02
NB-94	#B	-5.9397E-03	-5.9397E-03	4.6854E-02	4.6855E-02	5.528E-02
Ag-108M	#B	-1.8793E-03	-1.8793E-03	7.4931E-02	7.4931E-02	8.687E-02
CD-109	#A	-6.1020E-02	-6.1191E-02	2.8792E+00	2.8792E+00	3.228E+00
SN-113	#B	2.6863E-02	2.7160E-02	6.6164E-02	6.6183E-02	7.285E-02
SB-125	#B	9.4050E-03	9.4168E-03	1.5394E-01	1.5394E-01	1.774E-01
I-131	#B	-6.6096E-03	-7.7371E-03	8.1638E-02	8.1639E-02	6.309E-02
CS-134	#B	2.1427E-02	2.1463E-02	2.3959E-02	2.3991E-02	5.023E-02
CS-137		1.0516E+00	1.0517E+00	1.4808E-01	1.6017E-01	
CE-139	#A	1.0223E-02	1.0317E-02	6.0683E-02	6.0686E-02	6.747E-02
EU-152	#B	-8.6333E-02	-8.6356E-02	1.9057E-01	1.9063E-01	1.999E-01
EU-154	#B	-1.1783E-02	-1.1788E-02	1.3991E-01	1.3991E-01	1.574E-01
EU-155	#B	1.4745E-02	1.4756E-02	3.2827E-01	3.2827E-01	3.689E-01
HG-203	#B	-5.1535E-03	-5.2955E-03	6.1870E-02	6.1871E-02	6.735E-02
TL-208		2.1868E-01	2.1868E-01	8.9975E-02	9.0866E-02	
PB-212		8.8313E-01	8.8313E-01	1.7303E-01	1.8047E-01	
PB-214		6.4879E-01	6.4879E-01	1.7949E-01	1.8340E-01	
BI-212	#A	4.7714E-01	4.7714E-01	4.7233E-01	4.7314E-01	4.837E-01
BI-214		4.7236E-01	4.7236E-01	1.7365E-01	1.7580E-01	
RA-224	#A	1.3519E+00	1.3519E+00	1.4079E+00	1.4101E+00	1.508E+00
RA-226	#A	1.5296E+00	1.5296E+00	1.6063E+00	1.6087E+00	1.739E+00
AC-228		8.3285E-01	8.3285E-01	2.4851E-01	2.5317E-01	
TH-227	#B	-1.8585E-01	-1.8585E-01	5.2297E-01	5.2308E-01	5.801E-01
PA-234	#B	-7.5024E-02	-7.5024E-02	3.3339E-01	3.3342E-01	3.397E-01
TH-234	#B	1.4221E+00	1.4221E+00	8.5707E+00	8.5710E+00	9.657E+00
AM-241	#A	-1.5649E-01	-1.5649E-01	1.6489E+00	1.6489E+00	1.767E+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 (89.9 to 2000.7 keV) 2.2492437E+01 pCi/gm
Total Decayed Activity (89.9 to 2000.7 keV) 2.2492615E+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_19APRIL2006_1610.An1

Sample description
FSS OOL-11-01-008-F

Spectrum Filename: C:\GammaVision\Spectra\103F_19APRIL2006_1610.An1

Acquisition information
Start time: 19-Apr-2006 16:10:36
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: 9.6200E+02
Activity scaling factor: 1.0000E+06/(1.0000E+00* 9.6200E+02) =
1.0395E+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.

YAEC Chemistry Lab Spectrum name: 103F_19APRIL2006_1610.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	17-Apr-2006 21:02:00
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: 0.2411

***** 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
74.85	74.	28.27	0.99	9.052E-03	74.81	9.600	1.203E+00	PB212
77.15	99.	20.95	0.99	1.011E-02	77.11	17.500	1.060E+00	PB212
					77.11	10.700	1.734E+00	PB214
93.29	91.	24.92	1.00	1.668E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.29	103.	25.73	1.46	2.566E-02	185.99	3.280	PBC<MDA	RA226
209.32	73.	40.85	0.83	2.471E-02				
239.03	650.	4.64	1.09	2.317E-02	236.00	11.200	3.493E+00	TH227
					238.63	43.100	8.964E-01	PB212
241.27	74.	39.86	1.09	2.305E-02	241.00	3.900	1.162E+00	RA224
					241.92	7.470	6.077E-01	PB214
270.26	59.	38.46	0.81	2.151E-02				
277.30	44.	40.02	0.79	2.115E-02				
295.37	176.	14.80	0.96	2.024E-02	295.22	19.200	6.202E-01	PB214
300.53	76.	23.57	1.35	1.999E-02				
338.74	159.	16.48	1.06	1.829E-02	338.40	12.010	1.009E+00	AC228
352.17	298.	7.81	1.22	1.775E-02	351.99	37.100	6.244E-01	PB214
463.41	72.	25.83	1.10	1.425E-02				
463.41	72.	25.83	1.10	1.425E-02	463.51	10.000	6.962E-01	SB125
511.20	132.	18.70	1.46	1.316E-02	510.72	22.500	5.016E-01	TL208
583.35	221.	10.03	1.11	1.184E-02	583.14	86.000	2.985E-01	TL208
609.49	208.	9.08	1.49	1.144E-02	609.32	46.090	5.380E-01	BI214
661.96	410.	6.13	1.19	1.072E-02	661.62	84.620	6.321E-01	CS137
727.42	52.	27.71	1.48	9.962E-03	727.17	11.800	6.129E-01	BI212
911.50	140.	12.54	1.90	8.398E-03	911.07	29.000	7.889E-01	AC228
967.88	153.	11.18	1.68	8.032E-03	968.90	17.460	1.528E+00	AC228
1121.93	84.	17.42	1.49	7.204E-03	1120.28	15.040	1.063E+00	BI214

1173.24	65.	24.57	1.97	6.972E-03	1173.23	99.860	1.313E-01	CO60
1333.19	71.	14.97	1.01	6.347E-03	1332.51	99.980	1.507E-01	CO60
1461.39	774.	3.77	1.75	5.930E-03	1460.75	10.700	1.673E+01	K40
1765.63	49.	14.29	0.89	5.139E-03	1764.51	15.920	7.847E-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	
417.80	209.32	310.	73.	0.036	122.56	0.826	AC-228	s
539.68	270.26	199.	59.	0.030	115.37	0.809	AC-228	
553.74	277.30	123.	54.	0.027	96.04	0.790	TL-208	
600.20	300.53	118.	76.	0.038	70.72	1.351	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
PB-212	148.79	74.81	205.	74.	0.037	84.81	0.993D
PB-212	153.39	77.11	214.	99.	0.050	62.84	0.995A
TH-234	185.51	93.17	545.	91.	0.046	93.83	1.500s
TH-234	185.52	93.17	544.	88.	0.044	96.59	1.500s
RA-226	371.72	186.28	414.	92.	0.046	86.34	1.500s
PB-212	477.30	239.07	431.	632.	0.316	19.87	0.891
RA-224	482.90	241.87	416.	100.	0.050	91.94	1.500s
PB-214	483.14	241.99	435.	89.	0.044	104.46	1.500
PB-214	589.88	295.37	189.	172.	0.086	44.39	0.959
AC-228	676.62	338.74	177.	158.	0.079	49.45	1.058
PB-214	703.48	352.17	112.	293.	0.146	23.44	1.221
SB-125	925.67	463.27	89.	46.	0.023	94.69	1.500
TL-208	1021.52	511.20	164.	106.	0.053	56.09	1.458s
TL-208	1165.81	583.35	84.	216.	0.108	30.08	1.114
BI-214	1218.07	609.49	64.	202.	0.101	27.24	1.492
CS-137	1323.00	661.96	73.	408.	0.204	18.40	1.189
BI-212	1453.90	727.42	54.	51.	0.026	83.14	1.476
AC-228	1822.04	911.50	56.	137.	0.068	37.62	1.899s
AC-228	1934.77	967.88	37.	152.	0.076	33.53	1.682s
BI-214	2240.79	1120.91	56.	53.	0.026	70.06	1.634s
CO-60	2345.44	1173.24	62.	65.	0.033	73.71	1.969
CO-60	2665.30	1333.19	18.	68.	0.034	44.91	1.015s
K-40	2921.65	1461.39	36.	756.	0.378	11.31	1.747
BI-214	3530.02	1765.63	3.	46.	0.023	42.86	0.889s

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		1.0686E-02					
			477.56	1.069E-02	%(	5.313E-01 1.53E-01	G
K-40		1.6726E+01					
			1460.75	1.673E+01	(P	6.807E-01 6.47E-01	G
MN-54		-1.5774E-02					
			834.81	-1.577E-02	&(P	6.417E-02 1.88E-02	G
CO-57		6.9337E-03					
			122.07	6.934E-03	%(P	5.532E-02 1.64E-02	G K
			136.43	-8.892E-02	%	5.614E-01 1.67E-01	G
CO-60		1.4102E-01					
			1332.51	1.507E-01	@(P	4.971E-02 2.34E-02	G K
			1173.23	1.313E-01	(P	7.953E-02 3.32E-02	G K
Sr-85		-1.8984E-02					
			514.00	-1.898E-02	&(	7.416E-02 2.21E-02	G
Kr-85		-4.2990E+02					
			513.99	-4.299E+02	&(	1.680E+03 5.00E+02	G
Y-88		2.8181E-04					
			1836.01	2.818E-04	%(P	4.575E-02 1.15E-02	G K
			898.02	1.261E-02	% P	6.417E-02 1.86E-02	G
NB-94		1.0217E-02					
			871.10	1.022E-02	%(	4.403E-02 1.27E-02	G K
			702.50	-2.556E-03	%	5.488E-02 1.56E-02	G K
Ag-108M		1.7210E-03					
			722.95	1.721E-03	%(	3.429E-02 9.28E-03	G K
			614.37	-3.120E-02	& P	6.901E-02 2.09E-02	G
			433.93	1.324E-02	%	4.825E-02 1.43E-02	G
CD-109		5.3746E-02					
			88.04	5.375E-02	%(	2.979E+00 8.84E-01	G
SN-113		1.4921E-02					
			391.71	1.492E-02	%(	7.478E-02 2.20E-02	G K
			255.04	-5.311E-01	%	2.560E+00 7.63E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	9.1652E-02						
		427.95	-3.102E-02	&(P	1.784E-01	5.25E-02	G K
		600.77	9.145E-02	& P	2.303E-01	6.90E-02	G
		636.15	7.316E-02	% P	4.038E-01	1.16E-01	G
		463.51	4.548E-01	(P	4.613E-01	1.48E-01	G
		176.29	-9.718E-02	%	8.290E-01	2.46E-01	G
I-131	1.2987E-02						
		364.48	1.299E-02	&(P	6.857E-02	2.02E-02	G K
		636.97	-4.473E-02	&	9.194E-01	2.64E-01	G
		284.29	1.344E-01	& P	9.126E-01	2.69E-01	G
CS-134	-1.2673E-02						
		604.66	-1.267E-02	&(	6.120E-02	1.80E-02	G K
		795.76	3.617E-02	% P	5.673E-02	1.77E-02	G
		569.29	7.195E-02	% P	3.093E-01	9.02E-02	G
		801.84	-8.749E-02	% P	6.338E-01	1.78E-01	G
CS-137	6.3208E-01						
		661.62	6.321E-01	(P	6.576E-02	3.89E-02	G
CE-139	-7.0964E-03						
		165.85	-7.096E-03	&(	6.597E-02	1.96E-02	G
EU-152	-5.2622E-02						
		121.78	-5.262E-02	%(P	2.062E-01	6.17E-02	G K
		344.30	-4.408E-02	% P	1.853E-01	5.50E-02	G
		1408.08	6.444E-02	%	2.130E-01	6.17E-02	G
		964.00	-6.520E-03	% P	6.175E-01	1.77E-01	G
		1112.07	-3.646E-03	&	5.258E-01	1.48E-01	G
		778.90	5.049E-03	%	2.727E-01	7.37E-02	G
EU-154	-4.1722E-02						
		123.10	-4.172E-02	%(	1.467E-01	4.40E-02	G K
		1274.80	-2.725E-02	&	2.377E-01	6.84E-02	G
		723.30	-9.416E-03	%	2.115E-01	5.89E-02	G
		1004.80	-9.654E-02	%	3.891E-01	1.14E-01	G
EU-155	-5.4559E-03						
		86.45	-5.456E-03	&(	3.538E-01	1.05E-01	G K
		105.31	1.046E-02	&	2.709E-01	7.98E-02	G
HG-203	-1.1989E-02						
		279.17	-1.199E-02	%(P	6.633E-02	1.97E-02	G K
		72.87	-4.945E-02	% P	3.733E+00	1.11E+00	G
		70.83	1.075E+00	%	4.768E+00	1.42E+00	G
		82.50	-1.107E+00	&	4.953E+00	1.48E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.9855E-01						
		583.14	2.985E-01	(P	6.246E-02	3.05E-02	G
		510.72	5.016E-01	+ P	2.958E-01	1.18E-01	G
PB-212	9.3731E-01						
		238.63	8.874E-01	(P	1.398E-01	5.99E-02	G K
							Energy duplication
		77.11	7.865E-01	} P	5.630E-01	1.65E-01	G
		74.81	1.203E+00	+ P	1.121E+00	3.54E-01	G
PB-214	6.3513E-01						
		351.99	6.244E-01	(P	1.111E-01	4.97E-02	G K
		295.22	6.202E-01	(P	2.415E-01	9.40E-02	G
							Energy duplication
		77.11	2.311E-01	} P	1.330E+00	3.27E-01	G
		241.92	7.268E-01	(	8.165E-01	2.53E-01	G
BI-212	6.1293E-01						
		727.17	6.129E-01	(P	4.403E-01	1.72E-01	G K
		1620.56	5.167E-01	% P	1.449E+00	4.24E-01	G
		785.42	8.689E-01	%	2.496E+00	7.41E-01	G
BI-214	5.7360E-01						
		609.32	5.380E-01	(P	1.066E-01	5.04E-02	G K
		1764.51	7.847E-01	+ P	1.912E-01	1.20E-01	G
		1120.28	6.827E-01	&(P	4.864E-01	1.65E-01	G
RA-224	1.5554E+00						
		241.00	1.555E+00	&(	1.527E+00	4.77E-01	G
RA-226	1.5287E+00						
		185.99	1.529E+00	(P	1.627E+00	5.02E-01	G
AC-228	8.5344E-01						
		911.07	7.889E-01	(P	2.170E-01	1.01E-01	G K
		968.90	1.528E+00	+ P	3.096E-01	1.71E-01	G
		338.40	1.009E+00	(P	4.137E-01	1.68E-01	G
TH-227	-3.2087E-01						
		236.00	-3.209E-01	%(	5.941E-01	1.81E-01	G K
		256.25	2.933E-02	& P	7.025E-01	2.06E-01	G
PA-234	-6.4537E-05						
		98.44	-6.454E-05	%(P	3.154E-01	9.31E-02	G K
		946.00	3.421E-02	& P	2.850E-01	8.12E-02	G
		131.28	-2.058E-03	& P	2.892E-01	8.54E-02	G
		94.67	-1.637E-01	% P	6.224E-01	1.87E-01	G
		883.24	2.144E-02	%	4.311E-01	1.21E-01	G
		926.70	-1.752E-02	%	4.523E-01	1.26E-01	G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 1.057E-01 % P 4.585E-01 1.34E-01 G

TH-234       1.6101E+00
                           63.29-3.799E-02 &(P 8.030E+00 2.35E+00 G K
                           92.80 2.506E+00  (P 3.171E+00 9.69E-01 G
                           92.38 3.065E+00  (P 3.738E+00 1.14E+00 G

AM-241       4.8270E-02
                           59.54 4.827E-02 &(P 1.659E+00 4.90E-01 G
   ( - This peak used in the nuclide activity average.

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

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

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** 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	1.0439E-02	1.0686E-02	4.5999E-01	4.5999E-01	5.190E-01
K-40		1.6726E+01	1.6726E+01	1.9394E+00	2.1689E+00	
MN-54	#A	-1.5711E-02	-1.5774E-02	6.0510E-02	6.0517E-02	6.392E-02
CO-57	#B	6.9018E-03	6.9337E-03	4.9063E-02	4.9065E-02	5.507E-02
CO-60		1.4093E-01	1.4102E-01	6.2831E-02	6.3362E-02	

Sr-85	#A	-1.8623E-02	-1.8984E-02	6.6241E-02	6.6250E-02	7.275E-02
Kr-85	#A	-4.2990E+02	-4.2990E+02	1.5001E+03	1.5003E+03	1.680E+03
Y-88	#B	2.7853E-04	2.8181E-04	3.4608E-02	3.4608E-02	4.522E-02
NB-94	#B	1.0217E-02	1.0217E-02	3.8099E-02	3.8104E-02	4.403E-02
Ag-108M	#B	1.7210E-03	1.7210E-03	2.7830E-02	2.7830E-02	3.429E-02
CD-109	#A	5.3599E-02	5.3746E-02	2.6520E+00	2.6520E+00	2.971E+00
SN-113	#B	1.4760E-02	1.4921E-02	6.6131E-02	6.6136E-02	7.398E-02
SB-125	#B	9.1539E-02	9.1652E-02	8.9185E-02	8.9343E-02	1.782E-01
I-131	#B	1.1122E-02	1.2987E-02	6.0613E-02	6.0617E-02	5.873E-02
CS-134	#B	-1.2652E-02	-1.2673E-02	5.3965E-02	5.3970E-02	6.110E-02
CS-137		6.3201E-01	6.3208E-01	1.1668E-01	1.2232E-01	
CE-139	#A	-7.0324E-03	-7.0964E-03	5.8757E-02	5.8758E-02	6.538E-02
EU-152	#B	-5.2608E-02	-5.2622E-02	1.9935E-01	1.9937E-01	2.062E-01
EU-154	#B	-4.1706E-02	-4.1722E-02	1.3200E-01	1.3202E-01	1.466E-01
EU-155	#B	-5.4521E-03	-5.4559E-03	3.1481E-01	3.1481E-01	3.535E-01
HG-203	#B	-1.1673E-02	-1.1989E-02	5.9403E-02	5.9407E-02	6.458E-02
TL-208		2.9855E-01	2.9855E-01	9.1585E-02	9.3211E-02	
PB-212		9.3731E-01	9.3731E-01	1.8981E-01	1.9746E-01	
PB-214		6.3513E-01	6.3513E-01	1.5174E-01	1.5616E-01	
BI-212		6.1293E-01	6.1293E-01	5.1450E-01	5.1573E-01	
BI-214		5.7360E-01	5.7360E-01	1.6128E-01	1.6468E-01	
RA-224	#	1.5554E+00	1.5554E+00	1.4301E+00	1.4329E+00	1.527E+00
RA-226	#A	1.5287E+00	1.5287E+00	1.5066E+00	1.5092E+00	1.627E+00
AC-228		8.5344E-01	8.5344E-01	2.6873E-01	2.7326E-01	
TH-227	#B	-3.2087E-01	-3.2087E-01	5.4213E-01	5.4245E-01	5.941E-01
PA-234	#B	-6.4537E-05	-6.4537E-05	2.9160E-01	2.9160E-01	3.154E-01
TH-234	#B	1.6101E+00	1.6101E+00	1.8023E+00	1.8045E+00	8.030E+00
AM-241	#A	4.8270E-02	4.8270E-02	1.4704E+00	1.4704E+00	1.659E+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 (87.4 to 2000.7 keV) 2.1410324E+01 pCi/gm
Total Decayed Activity (87.4 to 2000.7 keV) 2.1410484E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JJM

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

Sample description
FSS OOL-11-01-011-F

Spectrum Filename: C:\GammaVision\Spectra\103F_19APRIL2006_1648.An1

Acquisition information
Start time: 19-Apr-2006 16:48:38
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: 1.4530E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.4530E+03) =
6.8823E+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	17-Apr-2006 20:50:00
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: 0.2452

***** 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
74.41	67.	36.90	0.99	8.909E-03	74.81	9.600	PBC<MDA	PB212
77.38	174.	15.04	0.99	1.028E-02	77.11	17.500	9.003E-01	PB212
					77.11	10.700	1.473E+00	PB214
86.61	107.	37.20	1.05	1.417E-02	86.45	32.740	2.156E-01	EU155
					88.04	3.790	1.789E+00	CD109
92.83	110.	34.48	1.43	1.646E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
128.70	94.	35.35	1.25	2.433E-02				
186.25	93.	26.09	1.16	2.566E-02	185.99	3.280	8.843E-01	RA226
239.03	831.	4.15	1.09	2.318E-02	238.63	43.100	7.615E-01	PB212
242.50	136.	16.92	1.10	2.299E-02	241.92	7.470	7.372E-01	PB214
270.40	74.	40.03	1.01	2.150E-02				
295.41	226.	12.65	1.05	2.024E-02	295.22	19.200	5.305E-01	PB214
327.75	48.	35.96	0.71	1.875E-02				
338.43	185.	16.10	1.20	1.830E-02	338.40	12.010	7.773E-01	AC228
352.05	316.	9.20	1.25	1.775E-02	351.99	37.100	4.383E-01	PB214
409.55	43.	40.52	1.35	1.574E-02				
463.07	118.	18.05	1.12	1.426E-02				
463.07	118.	18.05	1.12	1.426E-02	463.51	10.000	7.636E-01	SB125
510.46	155.	14.45	1.10	1.318E-02	510.72	22.500	4.017E-01	TL208
583.50	287.	8.81	1.03	1.184E-02	583.14	86.000	2.577E-01	TL208
609.65	288.	7.73	1.35	1.143E-02	609.32	46.090	4.957E-01	BI214
661.87	186.	14.00	1.41	1.072E-02	661.62	84.620	1.893E-01	CS137
727.71	81.	26.38	1.82	9.959E-03	727.17	11.800	6.399E-01	BI212
768.62	43.	33.70	0.90	9.550E-03				
795.45	27.	38.27	1.50	9.301E-03	795.76	85.400	PBC<MDA	CS134
911.55	202.	10.34	1.54	8.398E-03	911.07	29.000	7.602E-01	AC228

968.46	170.	11.94	1.73	8.028E-03	968.90	17.460	1.130E+00	AC228
1120.46	65.	25.87	0.78	7.211E-03	1120.28	15.040	5.437E-01	BI214
1173.70	60.	26.46	1.20	6.970E-03	1173.23	99.860	7.761E-02	CO60
1238.33	54.	40.46	1.11	6.701E-03				
1333.14	74.	22.11	1.74	6.347E-03	1332.51	99.980	1.039E-01	CO60
1461.52	1003.	3.19	1.84	5.930E-03	1460.75	10.700	1.442E+01	K40

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1765.14	61.	12.50	1.67	5.142E-03	1764.51	15.920	6.900E-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	
172.40	86.61	591.	107.	0.054	111.60	1.053	BI-207	l
256.56	128.70	407.	125.	0.062	73.56	1.247	AC-228	s
484.15	242.51	198.	136.	0.068	50.75	1.095	XE-138	lD
539.94	270.40	307.	74.	0.037	120.08	1.014	AC-228	s
654.65	327.75	125.	48.	0.024	107.89	0.712	AC-228	s
818.23	409.55	106.	43.	0.021	121.56	1.351	AC-228	
1536.31	768.62	66.	43.	0.022	101.11	0.900	BI-214	sM
2346.35	1173.70	64.	60.	0.030	79.37	1.198	CO-60	l
2475.60	1238.33	107.	54.	0.027	121.39	1.105	CO-56	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	148.79	74.81	248.	94.	0.047	74.75	0.993D
PB-212	153.39	77.11	277.	129.	0.065	51.31	0.995A
TH-234	185.28	93.05	723.	95.	0.047	103.99	1.500s
TH-234	185.28	93.05	705.	96.	0.048	101.66	1.500s
RA-226	371.67	186.25	274.	80.	0.040	78.28	1.158
PB-212	477.19	239.02	461.	884.	0.442	15.37	1.055
PB-214	589.97	295.41	231.	222.	0.111	37.96	1.046
AC-228	676.01	338.43	251.	184.	0.092	48.30	1.199
PB-214	703.25	352.05	195.	310.	0.155	27.60	1.252
SB-125	925.37	463.12	115.	80.	0.040	65.20	1.500s
TL-208	1020.04	510.46	138.	128.	0.064	43.35	1.098s
TL-208	1166.11	583.50	118.	282.	0.141	26.44	1.027
BI-214	1218.40	609.65	83.	281.	0.141	23.19	1.353
CS-137	1322.83	661.87	124.	185.	0.092	42.00	1.414
BI-212	1454.49	727.71	107.	74.	0.037	86.31	1.803s
CS-134	1589.96	795.45	40.	27.	0.014	114.80	1.500s
AC-228	1822.13	911.55	71.	199.	0.100	31.03	1.543
AC-228	1935.94	968.46	68.	170.	0.085	35.81	1.726s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-214	2239.90	1120.46	69.	63.	0.032	77.61	0.778s
CO-60	2665.18	1333.14	49.	71.	0.035	66.34	1.739s
K-40	2921.92	1461.52	26.	984.	0.492	9.58	1.837
BI-214	3529.03	1765.14	3.	61.	0.030	37.50	1.667s

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		3.8729E-03					
			477.56	3.873E-03	&(	3.944E-01 1.14E-01 G	
K-40		1.4424E+01					
			1460.75	1.442E+01	(P	3.853E-01 4.69E-01 G	
MN-54		-2.1210E-03					
			834.81	-2.121E-03	&(P	4.243E-02 1.21E-02 G	
CO-57		1.1154E-02					
			122.07	1.115E-02	%(P	5.221E-02 1.56E-02 G K	
			136.43	7.083E-02	%	4.222E-01 1.26E-01 G	
CO-60		1.0387E-01					
			1332.51	1.039E-01	*(P	5.187E-02 2.38E-02 G K	
			1173.23	-5.764E-03	% P	5.886E-02 1.67E-02 G K	
Sr-85		-1.8079E-02					
			514.00	-1.808E-02	%(	5.071E-02 1.52E-02 G	
Kr-85		-4.0939E+02					
			513.99	-4.094E+02	%(	1.148E+03 3.45E+02 G	
Y-88		2.2317E-03					
			1836.01	2.232E-03	%(P	3.344E-02 8.82E-03 G K	
			898.02	3.950E-04	% P	4.003E-02 1.12E-02 G	
NB-94		-2.7294E-03					
			871.10	-2.729E-03	%(	3.641E-02 1.03E-02 G K	
			702.50	-1.070E-02	%	4.157E-02 1.23E-02 G K	
Ag-108M		-1.3192E-02					
			722.95	-1.319E-02	&(	4.886E-02 1.45E-02 G K	
			614.37	-2.196E-02	% P	4.836E-02 1.46E-02 G	

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		433.93	1.176E-02	%	3.858E-02	1.15E-02	G
CD-109	9.3235E-01						
		88.04	9.324E-01	&(	2.099E+00	6.36E-01	G
SN-113	9.5605E-04						
		391.71	9.561E-04	%(	6.428E-02	1.88E-02	G K
		255.04	-4.046E-01	%	1.866E+00	5.57E-01	G
SB-125	1.4566E-01						
		427.95	1.899E-02	&(P	1.076E-01	3.16E-02	G K
		600.77	2.081E-02	% P	1.950E-01	5.64E-02	G
		636.15	-9.461E-03	& P	3.691E-01	1.06E-01	G
		463.51	5.206E-01	*(P	3.450E-01	1.15E-01	G
		176.29	2.631E-02	%	5.956E-01	1.76E-01	G
I-131	-5.7153E-03						
		364.48	-5.715E-03	&(P	4.773E-02	1.40E-02	G K
		636.97	9.142E-02	&	6.445E-01	1.88E-01	G
		284.29	4.567E-03	% P	5.973E-01	1.74E-01	G
CS-134	1.0525E-02						
		604.66	-7.987E-03	%(	3.995E-02	1.17E-02	G K
		795.76	3.168E-02	@(P	3.788E-02	1.22E-02	G
		569.29	-4.742E-02	% P	2.372E-01	6.87E-02	G
		801.84	-2.796E-02	% P	4.295E-01	1.19E-01	G
CS-137	1.8926E-01						
		661.62	1.893E-01	(P	5.606E-02	2.67E-02	G
CE-139	3.8545E-03						
		165.85	3.854E-03	%(	5.278E-02	1.57E-02	G
EU-152	4.4185E-02						
		121.78	4.418E-02	%(P	1.463E-01	4.39E-02	G K
		344.30	3.866E-03	% P	1.405E-01	4.12E-02	G
		1408.08	2.480E-02	%	1.797E-01	5.04E-02	G
		964.00	-4.325E-03	% P	3.842E-01	1.10E-01	G
		1112.07	9.327E-02	%	3.447E-01	1.01E-01	G
		778.90	3.627E-02	&	3.116E-01	8.99E-02	G
EU-154	-1.9058E-02						
		123.10	-1.906E-02	%(	1.197E-01	3.58E-02	G K
		1274.80	4.332E-02	&	1.283E-01	3.80E-02	G
		723.30	-3.391E-02	&	2.317E-01	6.76E-02	G
		1004.80	7.499E-03	%	2.354E-01	6.63E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	9.4673E-02						
		86.45	9.467E-02	%(	2.625E-01	7.92E-02	G K
		105.31	8.017E-02	%	2.484E-01	7.48E-02	G
HG-203	-4.9649E-04						
		279.17	-4.965E-04	&(P	4.247E-02	1.24E-02	G K
		72.87	-2.773E-01	% P	2.285E+00	6.81E-01	G
		70.83	-8.058E-02	%	5.152E+00	1.53E+00	G
		82.50	-1.961E+00	%	4.525E+00	1.37E+00	G
TL-208	2.5774E-01						
		583.14	2.577E-01	(P	4.863E-02	2.31E-02	G
		510.72	4.017E-01	+ P	1.803E-01	7.02E-02	G
PB-212	8.4843E-01						
		238.63	8.225E-01	(P	9.556E-02	4.28E-02	G K
							Energy duplication
		77.11	6.792E-01	} P	4.220E-01	1.16E-01	G
		74.81	1.007E+00	+ P	8.142E-01	2.59E-01	G
PB-214	4.6970E-01						
		351.99	4.383E-01	(P	9.563E-02	4.11E-02	G K
		295.22	5.305E-01	(P	1.760E-01	6.84E-02	G
							Energy duplication
		77.11	2.738E-01	} P	1.008E+00	2.53E-01	G
		241.92	-6.332E-02	%	6.962E-01	2.08E-01	G
BI-212	5.8456E-01						
		727.17	5.846E-01	(P	4.029E-01	1.69E-01	G K
		1620.56	-1.860E-01	% P	1.251E+00	3.45E-01	G
		785.42	8.006E-01	%	1.805E+00	5.45E-01	G
BI-214	5.0753E-01						
		609.32	4.957E-01	(P	7.966E-02	3.92E-02	G K
		1764.51	6.900E-01	+ P	1.266E-01	9.09E-02	G
		1120.28	5.437E-01	*(P	3.542E-01	1.45E-01	G
RA-224	5.0950E-02						
		241.00	5.095E-02	&(	9.788E-01	2.89E-01	G
RA-226	8.8430E-01						
		185.99	8.843E-01	(P	8.820E-01	2.68E-01	G
AC-228	7.6519E-01						
		911.07	7.602E-01	(P	1.601E-01	8.00E-02	G K
		968.90	1.130E+00	+ P	2.726E-01	1.35E-01	G
		338.40	7.773E-01	(P	3.240E-01	1.26E-01	G

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

TH-227       1.1167E-03
                          236.00 1.117E-03 %(  2.689E-01 7.87E-02 G K
                          256.25-7.108E-02 % P 5.412E-01 1.61E-01 G

PA-234      -4.7708E-02
                           98.44-4.771E-02 &(P 2.153E-01 6.43E-02 G K
                          946.00 2.552E-02 & P 1.855E-01 5.30E-02 G
                          131.28-6.651E-02 % P 2.320E-01 6.97E-02 G
                           94.67-1.052E-01 % P 4.472E-01 1.34E-01 G
                          883.24-6.254E-02 &   3.094E-01 8.97E-02 G
                          926.70 4.204E-03 %   3.667E-01 1.03E-01 G
                          569.26-7.047E-02 % P 3.449E-01 9.98E-02 G

TH-234       1.3694E+00
                           63.29 5.423E-01 %(P 7.323E+00 2.17E+00 G K
                           92.80 1.813E+00 *(P 2.382E+00 7.27E-01 G
                           92.38 2.107E+00 *(P 2.841E+00 8.66E-01 G

AM-241       2.9374E-01
                           59.54 2.937E-01 &(P 1.232E+00 3.69E-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	3.7818E-03	3.8729E-03	3.4298E-01	3.4299E-01	3.851E-01
K-40		1.4424E+01	1.4424E+01	1.4079E+00	1.6382E+00	
MN-54	#A	-2.1124E-03	-2.1210E-03	5.1613E-02	5.1613E-02	4.226E-02
CO-57	#B	1.1102E-02	1.1154E-02	4.6880E-02	4.6884E-02	5.197E-02
CO-60	#F	1.0381E-01	1.0387E-01	7.1482E-02	7.1736E-02	
Sr-85	#A	-1.7729E-02	-1.8079E-02	4.5691E-02	4.5703E-02	4.973E-02
Kr-85	#A	-4.0939E+02	-4.0939E+02	1.0344E+03	1.0346E+03	1.148E+03
Y-88	#B	2.2053E-03	2.2317E-03	2.6447E-02	2.6447E-02	3.304E-02
NB-94	#B	-2.7294E-03	-2.7294E-03	3.0935E-02	3.0936E-02	3.641E-02
Ag-108M	#B	-1.3192E-02	-1.3192E-02	4.3382E-02	4.3389E-02	4.886E-02
CD-109	#A	9.2974E-01	9.3235E-01	1.9069E+00	1.9076E+00	2.093E+00
SN-113	#B	9.4556E-04	9.5605E-04	5.6380E-02	5.6380E-02	6.358E-02
SB-125	#F	1.4548E-01	1.4566E-01	9.6494E-02	9.6863E-02	1.075E-01
I-131	#B	-4.8801E-03	-5.7153E-03	5.0468E-02	5.0469E-02	4.076E-02
CS-134	#B	1.0507E-02	1.0525E-02	1.2122E-02	1.2138E-02	3.989E-02
CS-137		1.8924E-01	1.8926E-01	8.0081E-02	8.0832E-02	
CE-139	#A	3.8190E-03	3.8545E-03	4.7109E-02	4.7110E-02	5.230E-02
EU-152	#B	4.4172E-02	4.4185E-02	1.3181E-01	1.3183E-01	1.462E-01
EU-154	#B	-1.9050E-02	-1.9058E-02	1.0734E-01	1.0735E-01	1.196E-01
EU-155	#B	9.4606E-02	9.4673E-02	2.3766E-01	2.3772E-01	2.623E-01
HG-203	#B	-4.8313E-04	-4.9649E-04	4.0700E-02	4.0700E-02	4.133E-02
TL-208		2.5774E-01	2.5774E-01	6.9192E-02	7.0792E-02	
PB-212		8.4843E-01	8.4843E-01	1.3216E-01	1.4104E-01	
PB-214		4.6970E-01	4.6970E-01	1.1224E-01	1.1551E-01	
BI-212		5.8456E-01	5.8456E-01	5.0791E-01	5.0904E-01	
BI-214		5.0753E-01	5.0753E-01	1.2043E-01	1.2398E-01	
RA-224	#A	5.0950E-02	5.0950E-02	8.6839E-01	8.6839E-01	9.788E-01
RA-226		8.8430E-01	8.8430E-01	8.0428E-01	8.0591E-01	
AC-228		7.6519E-01	7.6519E-01	2.2167E-01	2.2608E-01	
TH-227	#B	1.1167E-03	1.1167E-03	2.3615E-01	2.3615E-01	2.689E-01
PA-234	#B	-4.7708E-02	-4.7708E-02	2.0999E-01	2.1000E-01	2.153E-01
TH-234	#B	1.3694E+00	1.3694E+00	1.6475E+00	1.6493E+00	7.323E+00
AM-241	#A	2.9374E-01	2.9374E-01	1.1071E+00	1.1072E+00	1.232E+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 (86.4 to 2000.7 keV) 1.9034298E+01 pCi/gm
Total Decayed Activity (86.4 to 2000.7 keV) 1.9034391E+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_5JUL2006_1715.An1

Sample description
FSS-OOL-11-02-017-F-S WET

Spectrum Filename: C:\GammaVision\Spectra\101F_5JUL2006_1715.An1

Acquisition information
Start time: 05-Jul-2006 17:15:58
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: 1.6850E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.6850E+03) =
5.9347E+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	29-Jun-2006 14:25:00
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: 0.2550

***** 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	105.	38.94	1.50	1.654E-02	72.87	6.400	PBC<MDA	HG203
					74.81	9.600	PBC<MDA	PB212
77.13	204.	19.80	1.50	1.720E-02	77.11	10.700	8.890E-01	PB214
					77.11	17.500	PBC<MDA	PB212
77.13	208.	19.80	1.50	1.720E-02	77.11	10.700	8.890E-01	PB214
					77.11	17.500	5.534E-01	PB212
92.94	99.	35.86	1.50	1.989E-02	88.04	3.790	PBC<MDA	CD109
					92.80	3.000	PBC<MDA	TH234
115.56	73.	38.37	1.19	2.110E-02				
186.26	99.	24.65	1.01	1.857E-02	185.99	3.280	1.305E+00	RA226
210.04	65.	34.61	1.45	1.717E-02				
238.87	443.	5.92	1.12	1.557E-02	238.63	43.100	5.214E-01	PB212
241.56	73.	26.48	1.12	1.542E-02	241.00	3.900	PBC<MDA	RA224
295.42	133.	13.60	1.29	1.291E-02	295.22	19.200	4.242E-01	PB214
338.38	88.	20.62	1.49	1.135E-02				
338.38	88.	20.62	1.49	1.135E-02	338.40	12.010	5.025E-01	AC228
352.23	254.	9.91	1.26	1.092E-02	351.99	37.100	4.987E-01	PB214
510.97	71.	20.22	1.44	7.587E-03	510.72	22.500	2.581E-01	TL208
583.15	157.	10.54	1.36	6.684E-03	583.14	86.000	2.152E-01	TL208
609.52	186.	9.50	1.67	6.411E-03	609.32	46.090	5.017E-01	BI214
662.15	51.	24.58	1.90	5.933E-03	661.62	84.620	7.987E-02	CS137
726.89	56.	21.13	1.43	5.445E-03	727.17	11.800	6.958E-01	BI212
911.44	104.	12.70	2.18	4.445E-03	911.07	29.000	6.352E-01	AC228
969.23	42.	21.30	1.36	4.211E-03	968.90	17.460	4.502E-01	AC228
1121.03	67.	20.67	1.66	3.709E-03	1120.28	15.040	9.630E-01	BI214
1461.33	640.	4.04	1.70	2.941E-03	1460.75	10.700	1.625E+01	K40
1764.95	28.	18.90	0.73	2.481E-03	1764.51	15.920	5.596E-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	
419.76	210.04	199.	65.	0.032	103.84	1.450	NP-239	s
477.43	238.78	122.	443.	0.221	17.75	1.122	PB-212	D
482.83	241.47	148.	73.	0.036	79.44	1.124	PB-214	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	149.11	74.77	869.	105.	0.052	116.83	1.499
PB-214	153.79	77.11	746.	204.	0.102	59.39	1.499D
PB-212	153.79	77.11	742.	208.	0.104	59.39	1.499D
TH-234	185.47	92.94	668.	99.	0.050	107.58	1.499s
RA-226	371.76	186.05	282.	107.	0.054	79.89	1.021s
PB-212	477.29	238.80	328.	358.	0.179	26.14	1.499
PB-214	590.61	295.43	159.	137.	0.068	46.14	1.499
AC-228	676.73	338.47	110.	90.	0.045	57.34	1.499s
PB-214	704.26	352.23	112.	209.	0.104	29.54	1.499s
TL-208	1021.89	510.97	70.	55.	0.027	60.65	1.440s
TL-208	1166.31	583.15	44.	154.	0.077	31.62	1.359s
BI-214	1219.07	609.52	46.	185.	0.092	28.49	1.675s
CS-137	1324.09	662.00	46.	35.	0.017	94.40	1.499s
BI-212	1453.94	726.89	31.	56.	0.028	63.40	1.428s
AC-228	1823.61	911.63	26.	73.	0.037	44.26	1.578s
AC-228	1939.19	969.39	32.	44.	0.022	69.96	1.616
BI-214	2242.66	1121.03	40.	67.	0.034	62.01	1.664s
K-40	2923.68	1461.33	9.	638.	0.319	12.11	1.695
BI-214	3531.33	1764.95	0.	28.	0.014	56.69	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		4.2487E-02					
			477.56	4.249E-02	%(	4.545E-01 1.31E-01	G
K-40		1.6255E+01					
			1460.75	1.625E+01	(P	4.228E-01 6.59E-01	G
MN-54		-6.1047E-03					
			834.81	-6.105E-03	%(P	5.459E-02 1.54E-02	G
CO-57		1.3073E-02					
			122.07	1.307E-02	%(	4.602E-02 1.38E-02	G K
			136.43	2.891E-02	%	3.913E-01 1.16E-01	G
CO-60		1.2291E-02					
			1332.51	1.229E-02	%(P	4.905E-02 1.40E-02	G K
			1173.23	1.823E-02	% P	6.547E-02 1.91E-02	G K
Sr-85		-1.0493E-02					
			514.00	-1.049E-02	%(	5.943E-02 1.74E-02	G
Kr-85		-2.5542E+02					
			513.99	-2.554E+02	%(P	1.291E+03 3.77E+02	G
Y-88		7.9658E-03					
			1836.01	7.966E-03	%(	4.936E-02 1.32E-02	G K
			898.02	-7.333E-03	% P	5.935E-02 1.68E-02	G
NB-94		-3.6729E-04					
			871.10	-3.673E-04	%(P	4.441E-02 1.20E-02	G K
			702.50	-1.516E-04	% P	5.020E-02 1.41E-02	G K
Ag-108M		4.5257E-03					
			722.95	4.526E-03	%(	5.255E-02 1.49E-02	G K
			614.37	-7.326E-03	% P	4.847E-02 1.39E-02	G
			433.93	-8.962E-03	%	4.025E-02 1.18E-02	G
CD-109		-6.4176E-02					
			88.04	-6.418E-02	&(P	1.323E+00 3.93E-01	G
SN-113		-1.6658E-02					
			391.71	-1.666E-02	%(	7.265E-02 2.15E-02	G K
			255.04	-2.466E-01	% P	1.921E+00 5.66E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	-4.1937E-03						
		427.95	-4.194E-03	&(P	1.584E-01	4.56E-02	G K
		600.77	-1.530E-03	% P	2.507E-01	7.04E-02	G
		636.15	-1.593E-02	% P	3.832E-01	1.07E-01	G
		463.51	2.091E-01	% P	3.954E-01	1.20E-01	G
		176.29	9.405E-02	% P	5.013E-01	1.48E-01	G
I-131	-9.2964E-03						
		364.48	-9.296E-03	%(	7.715E-02	2.24E-02	G K
		636.97	-9.362E-02	%	9.968E-01	2.83E-01	G
		284.29	2.026E-01	%	1.039E+00	3.07E-01	G
CS-134	1.9326E-03						
		604.66	1.933E-03	%(P	1.013E-01	2.97E-02	G K
		795.76	3.566E-02	% P	4.911E-02	1.56E-02	G
		569.29	5.555E-02	% P	2.308E-01	6.68E-02	G
		801.84	9.343E-02	%	4.840E-01	1.38E-01	G
CS-137	5.5270E-02						
		661.62	5.527E-02	(P	5.453E-02	1.78E-02	G
CE-139	7.0184E-03						
		165.85	7.018E-03	%(P	4.802E-02	1.43E-02	G
EU-152	3.4056E-02						
		121.78	3.406E-02	%(P	1.366E-01	4.09E-02	G K
		344.30	-5.412E-03	% P	1.413E-01	4.07E-02	G
		1408.08	-2.214E-03	& P	2.616E-01	6.87E-02	G
		964.00	5.538E-02	% P	4.439E-01	1.27E-01	G
		1112.07	9.259E-02	% P	4.284E-01	1.23E-01	G
		778.90	1.603E-02	% P	3.645E-01	1.02E-01	G
EU-154	1.6808E-02						
		123.10	1.681E-02	&(P	9.909E-02	2.96E-02	G K
		1274.80	2.585E-02	% P	1.970E-01	5.58E-02	G
		723.30	-7.636E-03	% P	2.731E-01	7.67E-02	G
		1004.80	-2.423E-03	% P	2.852E-01	7.74E-02	G
EU-155	1.0711E-01						
		86.45	1.071E-01	%(	1.676E-01	5.12E-02	G K
		105.31	3.410E-02	%	1.935E-01	5.78E-02	G
HG-203	-1.1149E-02						
		279.17	-1.115E-02	%(	5.203E-02	1.54E-02	G K
		72.87	-8.217E-02	% P	1.177E+00	3.50E-01	G
		70.83	7.873E-02	%	2.073E+00	6.17E-01	G
		82.50	-7.469E-01	%	2.795E+00	8.40E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.2407E-01						
		583.14	2.152E-01	@(P	4.679E-02	2.30E-02	G
		510.72	2.581E-01	*(P	1.958E-01	6.74E-02	G
PB-212	4.4664E-01						
		238.63	4.282E-01	(P	1.041E-01	3.79E-02	G K
							Energy duplication
		77.11	5.534E-01	+	3.453E-01	1.10E-01	G
		74.81	5.294E-01	&(P	7.074E-01	2.16E-01	G
PB-214	4.2247E-01						
		351.99	4.126E-01	@(P	1.028E-01	4.10E-02	G K
		295.22	4.416E-01	(P	1.988E-01	6.88E-02	G
							Energy duplication
		77.11	8.890E-01	+ P	5.662E-01	1.79E-01	G
		241.92	3.811E-03	% P	4.536E-01	1.32E-01	G
BI-212	6.9580E-01						
		727.17	6.958E-01	@(P	3.593E-01	1.49E-01	G K
		1620.56	2.501E-01	&	1.440E+00	3.85E-01	G
		785.42	-1.031E-01	% P	2.908E+00	8.20E-01	G
BI-214	5.1655E-01						
		609.32	5.017E-01	@(P	9.321E-02	4.79E-02	G K
		1764.51	5.596E-01	(P	1.496E-01	1.07E-01	G
		1120.28	9.630E-01	+ P	4.624E-01	2.00E-01	G
RA-224	5.8111E-01						
		241.00	5.811E-01	%(P	1.243E+00	3.77E-01	G
RA-226	1.4079E+00						
		185.99	1.408E+00	*(	1.065E+00	3.75E-01	G
AC-228	4.7576E-01						
		911.07	4.549E-01	(P	1.635E-01	6.88E-02	G K
		968.90	4.751E-01	(P	3.165E-01	1.13E-01	G
		338.40	5.272E-01	(P	3.038E-01	1.03E-01	G
TH-227	-7.9414E-02						
		236.00	-7.941E-02	%(P	4.416E-01	1.32E-01	G K
		256.25	-7.904E-03	% P	5.580E-01	1.62E-01	G
PA-234	-2.8394E-02						
		98.44	-2.839E-02	%(	1.767E-01	5.28E-02	G K
		946.00	0.000E+00	%	3.461E-01	9.74E-02	G
		131.28	-6.773E-02	%	2.285E-01	6.87E-02	G
		94.67	-6.160E-02	%	3.270E-01	9.79E-02	G
		883.24	1.257E-01	&	3.832E-01	1.13E-01	G
		926.70	7.387E-02	%	3.732E-01	1.06E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 8.697E-02 %   3.385E-01 9.86E-02 G

TH-234       7.1423E-01
                           63.29 2.381E-01 %(P 2.219E+00 6.59E-01 G K
                           92.80 1.333E+00  (P 1.655E+00 5.08E-01 G
                           92.38-1.455E-01 % P 1.779E+00 5.22E-01 G

AM-241      -1.0640E-02
                           59.54-1.064E-02 &(P 2.397E-01 7.07E-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

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

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	3.9243E-02	4.2487E-02	3.9323E-01	3.9324E-01	4.198E-01
K-40		1.6255E+01	1.6255E+01	1.9762E+00	2.1792E+00	
MN-54	#A	-6.0223E-03	-6.1047E-03	5.8287E-02	5.8288E-02	5.385E-02
CO-57	#B	1.2869E-02	1.3073E-02	4.1434E-02	4.1440E-02	4.530E-02
CO-60	#B	1.2264E-02	1.2291E-02	4.1851E-02	4.1856E-02	4.894E-02

Sr-85	#A	-9.8287E-03	-1.0493E-02	5.2331E-02	5.2334E-02	5.567E-02
Kr-85	#A	-2.5541E+02	-2.5542E+02	1.4221E+03	1.4222E+03	1.291E+03
Y-88	#B	7.6551E-03	7.9658E-03	3.9596E-02	3.9598E-02	4.744E-02
NB-94	#B	-3.6729E-04	-3.6729E-04	1.5859E-01	1.5859E-01	4.441E-02
Ag-108M	#B	4.5253E-03	4.5257E-03	4.4597E-02	4.4597E-02	5.255E-02
CD-109	#A	-6.3578E-02	-6.4176E-02	1.3861E+00	1.3861E+00	1.310E+00
SN-113	#B	-1.6056E-02	-1.6658E-02	6.4441E-02	6.4448E-02	7.002E-02
SB-125	#B	-4.1762E-03	-4.1937E-03	2.2067E-01	2.2067E-01	1.577E-01
I-131	#B	-5.4856E-03	-9.2964E-03	6.7322E-02	6.7324E-02	4.552E-02
CS-134	#B	1.9217E-03	1.9326E-03	8.9122E-02	8.9122E-02	1.007E-01
CS-137	#	5.5249E-02	5.5270E-02	5.3510E-02	5.3601E-02	5.451E-02
CE-139	#A	6.8052E-03	7.0184E-03	4.2801E-02	4.2803E-02	4.656E-02
EU-152	#B	3.4025E-02	3.4056E-02	1.2278E-01	1.2280E-01	1.365E-01
EU-154	#B	1.6785E-02	1.6808E-02	8.8662E-02	8.8666E-02	9.895E-02
EU-155	#B	1.0686E-01	1.0711E-01	1.5352E-01	1.5363E-01	1.672E-01
HG-203	#B	-1.0178E-02	-1.1149E-02	4.6278E-02	4.6283E-02	4.750E-02
TL-208	#	2.2407E-01	2.2407E-01	7.1954E-02	7.3060E-02	
PB-212	#	4.4664E-01	4.4664E-01	1.1874E-01	1.2139E-01	1.041E-01
PB-214	#	4.2247E-01	4.2247E-01	1.1713E-01	1.1953E-01	1.028E-01
BI-212	#	6.9580E-01	6.9580E-01	4.4652E-01	4.4825E-01	
BI-214		5.1655E-01	5.1655E-01	1.4805E-01	1.5090E-01	
RA-224	#A	5.8111E-01	5.8111E-01	1.1300E+00	1.1305E+00	1.243E+00
RA-226	#	1.4079E+00	1.4079E+00	1.1248E+00	1.1276E+00	
AC-228	#	4.7576E-01	4.7576E-01	1.6303E-01	1.6523E-01	1.635E-01
TH-227	#B	-7.9414E-02	-7.9414E-02	4.1492E-01	4.1495E-01	4.416E-01
PA-234	#B	-2.8394E-02	-2.8394E-02	1.5828E-01	1.5829E-01	1.767E-01
TH-234	#B	7.1423E-01	7.1423E-01	8.1626E-01	8.1722E-01	2.219E+00
AM-241	#A	-1.0640E-02	-1.0640E-02	3.2871E-01	3.2871E-01	2.397E-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) 1.9098909E+01 pCi/gm
Total Decayed Activity (270.6 to 1999.1 keV) 1.9098919E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
DAT

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

Sample description
FSS-OOL-11-02-004-F

Spectrum Filename: C:\GammaVision\Spectra\101F_6JUL2006_1744.An1

Acquisition information

Start time:	06-Jul-2006 17:45:03
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:	1.8490E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.8490E+03) = 5.4083E+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	29-Jun-2006 16:16:00
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: 0.2953

***** 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	206.	23.47	1.50	1.654E-02				
74.80	206.	23.47	1.50	1.654E-02	74.81	9.600	9.461E-01	PB212
77.14	279.	17.26	1.50	1.720E-02	77.11	17.500	6.768E-01	PB212
					77.11	10.700	1.092E+00	PB214
77.14	275.	17.26	1.50	1.720E-02	77.11	17.500	6.678E-01	PB212
					77.11	10.700	1.092E+00	PB214
87.33	108.	41.10	1.50	1.910E-02	86.45	32.740	PBC<MDA	EU155
					88.04	3.790	PBC<MDA	CD109
89.54	74.	39.63	1.02	1.953E-02				
93.48	121.	24.46	1.02	1.997E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
185.88	168.	16.62	1.06	1.859E-02	185.99	3.280	2.019E+00	RA226
209.60	83.	35.30	1.21	1.720E-02				
238.88	729.	4.38	1.12	1.556E-02	238.63	43.100	7.865E-01	PB212
241.94	107.	19.55	1.12	1.540E-02	241.00	3.900	1.286E+00	RA224
270.29	70.	29.50	1.03	1.400E-02				
277.29	58.	37.95	1.16	1.368E-02				
295.48	162.	13.73	1.10	1.291E-02	295.22	19.200	4.732E-01	PB214
338.48	174.	16.17	0.98	1.135E-02	338.40	12.010	9.212E-01	AC228
352.20	272.	10.04	1.23	1.092E-02	351.99	37.100	4.869E-01	PB214
511.06	128.	17.43	1.18	7.586E-03	510.72	22.500	4.805E-01	TL208
583.39	189.	10.96	1.42	6.682E-03	583.14	86.000	2.373E-01	TL208
609.73	214.	10.34	1.39	6.409E-03	609.32	46.090	5.274E-01	BI214
727.92	75.	22.56	1.20	5.438E-03	727.17	11.800	8.457E-01	BI212
911.95	167.	11.15	1.60	4.443E-03	911.07	29.000	9.382E-01	AC228
969.39	109.	19.75	1.65	4.210E-03	968.90	17.460	1.078E+00	AC228
1120.76	48.	32.37	1.66	3.711E-03	1120.28	15.040	6.288E-01	BI214

1239.06	54.	31.07	1.00	3.399E-03				
1461.52	812.	3.59	1.80	2.941E-03	1460.75	10.700	1.879E+01	K40
1764.72	32.	17.68	1.27	2.481E-03	1764.51	15.920	5.839E-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	
178.67	89.63	397.	74.	0.037	118.89	1.015	PB-214	lD
418.86	209.60	325.	83.	0.042	105.91	1.209	NP-239	
477.45	238.93	144.	729.	0.364	13.13	1.122	PB-212	D
483.59	241.99	164.	107.	0.053	58.66	1.124	PB-214	D
540.31	270.29	162.	70.	0.035	88.50	1.033	AC-228	s
2478.85	1239.06	65.	54.	0.027	93.21	1.003	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	149.16	74.80	1123.	206.	0.103	70.40	1.499
PB-212	153.79	77.11	1019.	279.	0.139	51.79	1.499D
PB-214	153.79	77.11	1023.	275.	0.138	51.79	1.499D
EU-155	174.23	87.33	925.	108.	0.054	123.31	1.499
TH-234	185.81	93.11	981.	128.	0.064	98.68	1.499s
TH-234	185.78	93.10	937.	136.	0.068	94.24	1.499s
RA-226	371.42	185.88	280.	168.	0.084	49.87	1.057s
PB-212	477.50	238.90	435.	646.	0.323	17.88	1.499
RA-224	483.16	241.73	484.	84.	0.042	115.22	1.499
PB-214	590.79	295.52	187.	165.	0.083	41.68	1.499s
AC-228	676.75	338.48	208.	172.	0.086	48.52	0.983s
PB-214	704.20	352.20	155.	240.	0.120	29.01	1.499s
TL-208	1022.06	511.06	129.	112.	0.056	52.30	1.178s
TL-208	1166.79	583.39	82.	187.	0.093	32.88	1.424
BI-214	1219.50	609.73	83.	213.	0.107	31.03	1.388
BI-212	1455.99	727.92	67.	74.	0.037	67.67	1.202s
AC-228	1824.24	911.95	49.	166.	0.083	33.44	1.599s
AC-228	1939.19	969.39	88.	108.	0.054	59.25	1.648
BI-214	2242.11	1120.76	62.	48.	0.024	97.12	1.659s
K-40	2924.05	1461.52	12.	809.	0.405	10.77	1.797
BI-214	3530.88	1764.72	0.	32.	0.016	53.03	1.266s

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		5.1062E-03						
			477.56	5.106E-03	&(	3.929E-01	1.12E-01	G
K-40		1.8789E+01						
			1460.75	1.879E+01	(P	4.310E-01	6.77E-01	G
MN-54		1.3975E-02						
			834.81	1.398E-02	%(P	4.764E-02	1.39E-02	G
CO-57		4.3758E-04						
			122.07	4.376E-04	%(	5.212E-02	1.55E-02	G K
			136.43	5.484E-03	%	3.148E-01	9.29E-02	G
CO-60		-6.4977E-03						
			1332.51	-6.498E-03	%(P	6.340E-02	1.77E-02	G K
			1173.23	-4.671E-03	& P	6.736E-02	1.90E-02	G K
Sr-85		-1.8032E-02						
			514.00	-1.803E-02	%(	6.834E-02	2.03E-02	G
Kr-85		-4.1256E+02						
			513.99	-4.126E+02	%(P	1.468E+03	4.36E+02	G
Y-88		0.0000E+00						
			1836.01	0.000E+00	%(	7.187E-02	1.92E-02	G K
			898.02	2.138E-03	% P	5.251E-02	1.46E-02	G
NB-94		-9.4537E-03						
			871.10	-9.454E-03	%(P	5.001E-02	1.44E-02	G K
			702.50	-1.128E-02	& P	6.310E-02	1.85E-02	G K
Ag-108M		-1.5104E-02						
			722.95	-1.510E-02	&(	6.645E-02	1.95E-02	G K
			614.37	-1.403E-02	% P	6.262E-02	1.84E-02	G
			433.93	1.049E-02	%	4.135E-02	1.22E-02	G
CD-109		-5.8419E-02						
			88.04	-5.842E-02	%(P	1.610E+00	4.81E-01	G
SN-113		8.9619E-03						
			391.71	8.962E-03	&(	6.897E-02	2.02E-02	G K
			255.04	-5.789E-02	& P	1.954E+00	5.73E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	-3.2217E-02						
		427.95	-3.222E-02	&(P	1.473E-01	4.34E-02	G K
		600.77	-2.410E-02	% P	2.393E-01	6.85E-02	G
		636.15	-1.398E-01	% P	4.775E-01	1.41E-01	G
		463.51	2.308E-01	% P	4.394E-01	1.34E-01	G
		176.29	6.883E-02	% P	6.597E-01	1.96E-01	G
I-131	-2.1577E-02						
		364.48	-2.158E-02	%(	9.452E-02	2.80E-02	G K
		636.97	-3.978E-01	%	1.407E+00	4.17E-01	G
		284.29	-1.445E-01	&	1.111E+00	3.27E-01	G
CS-134	-3.6274E-03						
		604.66	-3.627E-03	%(P	4.336E-02	1.23E-02	G K
		795.76	2.760E-02	% P	5.206E-02	1.59E-02	G
		569.29	5.945E-02	% P	2.890E-01	8.43E-02	G
		801.84	7.410E-02	&	5.138E-01	1.46E-01	G
CS-137	3.9949E-02						
		661.62	3.995E-02	%(P	6.012E-02	1.86E-02	G
CE-139	-6.3247E-03						
		165.85	-6.325E-03	%(P	5.394E-02	1.61E-02	G
EU-152	3.6932E-02						
		121.78	3.693E-02	%(P	1.498E-01	4.50E-02	G K
		344.30	1.132E-03	% P	1.313E-01	3.78E-02	G
		1408.08	-2.018E-03	% P	2.893E-01	7.82E-02	G
		964.00	2.863E-02	% P	4.403E-01	1.25E-01	G
		1112.07	-1.529E-03	% P	4.912E-01	1.37E-01	G
		778.90	-1.198E-01	% P	4.310E-01	1.27E-01	G
EU-154	1.3458E-02						
		123.10	1.346E-02	&(P	1.134E-01	3.39E-02	G K
		1274.80	6.087E-03	% P	1.878E-01	5.22E-02	G
		723.30	-7.826E-02	% P	3.100E-01	9.12E-02	G
		1004.80	8.511E-02	% P	3.071E-01	8.97E-02	G
EU-155	1.2618E-01						
		86.45	1.262E-01	(	1.693E-01	5.19E-02	G K
		105.31	5.064E-02	&	2.078E-01	6.24E-02	G
HG-203	-5.5677E-03						
		279.17	-5.568E-03	&(	5.618E-02	1.66E-02	G K
		72.87	-2.031E-01	% P	1.208E+00	3.62E-01	G
		70.83	-4.192E-01	%	2.507E+00	7.53E-01	G
		82.50	-1.629E+00	%	2.652E+00	8.09E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.3727E-01						
		583.14	2.373E-01	(P	5.722E-02	2.63E-02	G
		510.72	4.805E-01	+ P	2.379E-01	9.57E-02	G
PB-212	6.9577E-01						
		238.63	7.035E-01	(P	1.088E-01	4.23E-02	G K
							Energy duplication
		77.11	6.768E-01	(	3.677E-01	1.17E-01	G
		74.81	9.461E-01	& P	7.313E-01	2.28E-01	G
PB-214	4.5129E-01						
		351.99	4.331E-01	@(P	1.095E-01	4.22E-02	G K
		295.22	4.864E-01	@(P	1.957E-01	6.83E-02	G
							Energy duplication
		77.11	1.092E+00	+ P	6.025E-01	1.91E-01	G
		241.92	-3.319E-01	% P	7.018E-01	2.13E-01	G
BI-212	8.4574E-01						
		727.17	8.457E-01	@(P	4.638E-01	1.93E-01	G K
		1620.56	-3.661E-02	%	1.710E+00	4.42E-01	G
		785.42	1.077E+00	% P	2.443E+00	7.36E-01	G
BI-214	5.5889E-01						
		609.32	5.274E-01	(P	1.115E-01	5.49E-02	G K
		1764.51	5.839E-01	*(P	1.364E-01	1.05E-01	G
		1120.28	6.288E-01	*(P	5.159E-01	2.05E-01	G
RA-224	1.0149E+00						
		241.00	1.015E+00	(P	1.276E+00	3.93E-01	G
RA-226	2.0193E+00						
		185.99	2.019E+00	@(	9.668E-01	3.36E-01	G
AC-228	9.7648E-01						
		911.07	9.382E-01	@(P	2.011E-01	1.06E-01	G K
		968.90	1.078E+00	(P	4.602E-01	2.14E-01	G
		338.40	9.212E-01	@(P	3.750E-01	1.51E-01	G
TH-227	-6.2310E-03						
		236.00	-6.231E-03	&(P	5.257E-01	1.56E-01	G K
		256.25	1.920E-01	% P	5.373E-01	1.61E-01	G
PA-234	8.6576E-04						
		98.44	8.658E-04	%(	1.979E-01	5.89E-02	G K
		946.00	-6.574E-02	%	3.279E-01	9.55E-02	G
		131.28	1.307E-01	%	1.983E-01	6.06E-02	G
		94.67	2.570E-02	&	2.660E-01	7.92E-02	G
		883.24	5.551E-03	&	4.826E-01	1.36E-01	G
		926.70	7.640E-02	%	4.466E-01	1.28E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 9.211E-02 %   4.247E-01 1.24E-01 G

TH-234       1.2574E+00
                           63.29 5.629E-01 %(P 2.241E+00 6.72E-01 G K
                           92.80 1.670E+00 *(P 1.780E+00 5.48E-01 G
                           92.38 1.830E+00 &(P 2.129E+00 6.53E-01 G

AM-241      -4.8763E-02
                           59.54-4.876E-02 %(P 3.029E-01 9.05E-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

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

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	4.6590E-03	5.1062E-03	3.3470E-01	3.3470E-01	3.585E-01
K-40		1.8789E+01	1.8789E+01	2.0301E+00	2.2910E+00	
MN-54	#A	1.3758E-02	1.3975E-02	4.1837E-02	4.1845E-02	4.690E-02
CO-57	#B	4.2972E-04	4.3758E-04	4.6451E-02	4.6451E-02	5.118E-02
CO-60	#B	-6.4812E-03	-6.4977E-03	5.6579E-02	5.6580E-02	6.324E-02

Sr-85	#A	-1.6721E-02	-1.8032E-02	6.1040E-02	6.1049E-02	6.337E-02
Kr-85	#A	-4.1254E+02	-4.1256E+02	1.4862E+03	1.4864E+03	1.468E+03
Y-88	#B	0.0000E+00	0.0000E+00	5.7492E-02	5.7492E-02	6.865E-02
NB-94	#B	-9.4537E-03	-9.4537E-03	4.5078E-02	4.5081E-02	5.001E-02
Ag-108M	#B	-1.5102E-02	-1.5104E-02	5.8597E-02	5.8603E-02	6.645E-02
CD-109	#A	-5.7791E-02	-5.8419E-02	1.6969E+00	1.6969E+00	1.593E+00
SN-113	#B	8.5888E-03	8.9619E-03	6.0621E-02	6.0623E-02	6.610E-02
SB-125	#B	-3.2061E-02	-3.2217E-02	1.3762E-01	1.3763E-01	1.466E-01
I-131	#B	-1.1738E-02	-2.1577E-02	8.4018E-02	8.4026E-02	5.142E-02
CS-134	#B	-3.6039E-03	-3.6274E-03	5.5082E-02	5.5083E-02	4.308E-02
CS-137	#A	3.9931E-02	3.9949E-02	5.5874E-02	5.5920E-02	6.009E-02
CE-139	#A	-6.1035E-03	-6.3247E-03	5.0648E-02	5.0649E-02	5.206E-02
EU-152	#B	3.6893E-02	3.6932E-02	1.3493E-01	1.3495E-01	1.497E-01
EU-154	#B	1.3437E-02	1.3458E-02	1.0161E-01	1.0161E-01	1.132E-01
EU-155	#A	1.2584E-01	1.2618E-01	1.5558E-01	1.5574E-01	1.688E-01
HG-203	#B	-5.0124E-03	-5.5677E-03	4.9709E-02	4.9710E-02	5.057E-02
TL-208		2.3727E-01	2.3727E-01	7.8998E-02	8.0127E-02	
PB-212	#	6.9577E-01	6.9577E-01	1.2556E-01	1.3157E-01	1.088E-01
PB-214	#	4.5129E-01	4.5129E-01	1.1572E-01	1.1849E-01	1.095E-01
BI-212	#	8.4574E-01	8.4574E-01	5.7753E-01	5.7950E-01	
BI-214		5.5889E-01	5.5889E-01	1.7434E-01	1.7717E-01	
RA-224	#A	1.0149E+00	1.0149E+00	1.1793E+00	1.1807E+00	1.276E+00
RA-226	#	2.0193E+00	2.0193E+00	1.0069E+00	1.0134E+00	
AC-228		9.7648E-01	9.7648E-01	2.7456E-01	2.8005E-01	
TH-227	#B	-6.2310E-03	-6.2310E-03	8.5222E-01	8.5222E-01	5.257E-01
PA-234	#B	8.6576E-04	8.6576E-04	1.7665E-01	1.7665E-01	1.979E-01
TH-234	#B	1.2574E+00	1.2574E+00	1.2387E+00	1.2407E+00	2.241E+00
AM-241	#A	-4.8761E-02	-4.8763E-02	2.9595E-01	2.9597E-01	3.029E-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) 2.3426931E+01 pCi/gm
Total Decayed Activity (270.1 to 1999.1 keV) 2.3426949E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
DAT

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 101F_6JULY2006_1020.An1

Sample description
FSS-OOL-11-02-025-F

Spectrum Filename: C:\GammaVision\Spectra\101F_6JULY2006_1020.An1

Acquisition information
Start time: 06-Jul-2006 10:20:45
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: 1.6820E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.6820E+03) =
5.9453E+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	29-Jun-2006 13:50:00
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. 12 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1636

***** 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	143.	26.86	1.50	1.654E-02				
74.83	143.	26.86	1.50	1.654E-02	74.81	9.600	7.233E-01	PB212
77.13	175.	22.19	1.50	1.720E-02	77.11	10.700	7.623E-01	PB214
					77.11	17.500	PBC<MDA	PB212
77.13	178.	22.19	1.50	1.720E-02	77.11	10.700	7.623E-01	PB214
					77.11	17.500	4.760E-01	PB212
93.07	115.	30.58	1.50	1.989E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.69	66.	40.62	1.19	1.854E-02	185.99	3.280	8.673E-01	RA226
209.64	75.	36.50	0.74	1.719E-02				
238.88	470.	5.71	1.12	1.557E-02	238.63	43.100	5.557E-01	PB212
242.25	70.	26.23	1.12	1.539E-02				
295.30	145.	15.69	1.16	1.292E-02	295.22	19.200	4.626E-01	PB214
338.19	89.	23.70	1.67	1.136E-02				
338.19	89.	23.70	1.67	1.136E-02	338.40	12.010	5.129E-01	AC228
352.18	259.	9.15	1.16	1.092E-02	351.99	37.100	5.095E-01	PB214
463.35	32.	38.91	1.50	8.342E-03				
463.35	32.	38.91	1.50	8.342E-03	463.51	10.000	PBC<MDA	SB125
510.99	68.	22.70	1.03	7.587E-03	510.72	22.500	2.450E-01	TL208
583.72	137.	12.49	1.24	6.678E-03	583.14	86.000	1.881E-01	TL208
609.50	154.	10.67	1.42	6.411E-03	609.32	46.090	4.161E-01	BI214
					614.37	90.393	2.153E-01	Ag108M
661.84	156.	9.84	1.26	5.936E-03	661.62	84.620	2.488E-01	CS137
728.90	46.	24.44	1.51	5.431E-03				
911.48	96.	17.27	1.65	4.445E-03	911.07	29.000	5.890E-01	AC228
969.44	36.	30.42	1.62	4.212E-03	968.90	17.460	3.880E-01	AC228
1120.25	37.	40.21	1.51	3.711E-03	1120.28	15.040	PBC<MDA	BI214

1461.37	593.	4.14	1.82	2.941E-03	1460.75	10.700	1.508E+01	K40
1764.99	11.	41.19	2.11	2.481E-03	1764.51	15.920	PBC<MDA	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
373.04	186.69	270.	66.	0.033	121.85	1.186	PA-234	l
418.96	209.64	261.	75.	0.038	109.49	0.742	NP-239	
477.47	238.79	126.	470.	0.235	17.13	1.122	PB-212	D
484.20	242.15	136.	70.	0.035	78.70	1.124	PB-214	D
1457.96	728.90	47.	28.	0.014	117.06	1.512	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
PB-212	149.23	74.83	723.	143.	0.071	80.58	1.499
PB-214	153.79	77.11	698.	175.	0.087	66.57	1.499D
PB-212	153.79	77.11	694.	178.	0.089	66.57	1.499D
TH-234	185.72	93.07	636.	115.	0.058	91.73	1.499s
PB-212	477.42	238.86	366.	410.	0.205	24.28	1.499
PB-214	590.81	295.53	173.	134.	0.067	48.38	1.499s
AC-228	676.10	338.16	106.	61.	0.031	77.71	1.499s
PB-214	704.16	352.18	104.	224.	0.112	27.54	1.499
SB-125	926.60	463.35	70.	32.	0.016	116.74	1.499
TL-208	1021.92	510.99	75.	52.	0.026	68.09	1.033s
TL-208	1167.46	583.72	54.	135.	0.067	37.48	1.242s
BI-214	1219.04	609.50	46.	153.	0.077	32.01	1.422s
CS-137	1323.76	661.84	34.	156.	0.078	29.53	1.259
AC-228	1823.35	911.50	24.	80.	0.040	41.10	1.578
AC-228	1939.29	969.44	43.	36.	0.018	91.26	1.616s
BI-214	2241.09	1120.25	56.	36.	0.018	120.63	1.509
K-40	2923.75	1461.37	5.	591.	0.295	12.43	1.817

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		-6.0213E-02					
			477.56	-6.021E-02	&(	3.583E-01 1.03E-01	G
K-40		1.5079E+01					
			1460.75	1.508E+01	(P	3.372E-01 6.27E-01	G
MN-54		1.6245E-02					
			834.81	1.625E-02	%(P	5.075E-02 1.49E-02	G
CO-57		-1.0696E-03					
			122.07	-1.070E-03	%(	4.447E-02 1.31E-02	G K
			136.43	-1.472E-01	%	3.794E-01 1.14E-01	G
CO-60		2.3088E-02					
			1332.51	2.309E-02	%(P	5.325E-02 1.60E-02	G K
			1173.23	-3.394E-04	& P	1.050E-01 3.00E-02	G K
Sr-85		-1.2512E-02					
			514.00	-1.251E-02	%(	5.729E-02 1.69E-02	G
Kr-85		-2.9796E+02					
			513.99	-2.980E+02	%(P	1.236E+03 3.62E+02	G
Y-88		-3.7906E-03					
			1836.01	-3.791E-03	%(	4.209E-02 1.05E-02	G K
			898.02	8.731E-03	% P	4.559E-02 1.29E-02	G
NB-94		5.8141E-05					
			871.10	5.814E-05	&(P	5.350E-02 1.48E-02	G K
			702.50	-6.356E-05	& P	4.997E-02 1.40E-02	G K
Ag-108M		1.5921E-02					
			722.95	1.592E-02	&(	4.408E-02 1.31E-02	G K
			614.37	-7.279E-03	% P	5.798E-02 1.67E-02	G
			433.93	0.000E+00	%	5.347E-02 1.54E-02	G
CD-109		-1.3500E-01					
			88.04	-1.350E-01	&(P	1.501E+00 4.48E-01	G
SN-113		2.2671E-02					
			391.71	2.267E-02	%(	6.303E-02 1.89E-02	G K
			255.04	1.254E-02	& P	1.947E+00 5.68E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	8.8817E-02						
		427.95	1.362E-02	%(P	1.328E-01	3.83E-02	G K
		600.77	-1.086E-02	& P	2.455E-01	6.93E-02	G
		636.15	8.215E-02	% P	3.819E-01	1.11E-01	G
		463.51	3.114E-01	(P	4.042E-01	1.27E-01	G
		176.29	-1.482E-02	& P	6.121E-01	1.80E-01	G
I-131	0.0000E+00						
		364.48	0.000E+00	%(	9.442E-02	2.73E-02	G K
		636.97	3.454E-02	%	1.176E+00	3.32E-01	G
		284.29	-2.170E-01	&	1.071E+00	3.17E-01	G
CS-134	-1.4921E-02						
		604.66	-1.492E-02	&(P	5.764E-02	1.69E-02	G K
		795.76	1.364E-02	% P	5.278E-02	1.53E-02	G
		569.29	-3.245E-02	% P	2.975E-01	8.50E-02	G
		801.84	-3.652E-02	&	5.825E-01	1.64E-01	G
CS-137	2.4879E-01						
		661.62	2.488E-01	(P	4.811E-02	2.46E-02	G
CE-139	-1.1493E-02						
		165.85	-1.149E-02	%(P	5.359E-02	1.60E-02	G
EU-152	-2.9264E-03						
		121.78	-2.926E-03	%(P	1.261E-01	3.72E-02	G K
		344.30	-5.348E-05	& P	1.058E-01	2.98E-02	G
		1408.08	3.114E-02	% P	2.274E-01	6.18E-02	G
		964.00	-6.016E-03	& P	6.552E-01	1.88E-01	G
		1112.07	8.617E-02	% P	4.025E-01	1.15E-01	G
		778.90	3.517E-02	% P	3.845E-01	1.09E-01	G
EU-154	-4.6323E-03						
		123.10	-4.632E-03	%(P	9.437E-02	2.79E-02	G K
		1274.80	-1.159E-02	% P	1.943E-01	5.41E-02	G
		723.30	7.550E-02	& P	1.990E-01	5.90E-02	G
		1004.80	2.851E-02	% P	2.989E-01	8.34E-02	G
EU-155	9.0456E-02						
		86.45	9.046E-02	&(	1.562E-01	4.76E-02	G K
		105.31	1.511E-02	&	1.959E-01	5.82E-02	G
HG-203	-3.8773E-04						
		279.17	-3.877E-04	&(	4.211E-02	1.21E-02	G K
		72.87	-5.248E-01	% P	1.268E+00	3.83E-01	G
		70.83	-1.058E+00	%	2.234E+00	6.77E-01	G
		82.50	-6.133E-01	%	2.661E+00	7.98E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	1.9993E-01						
		583.14	1.881E-01	*(P	5.181E-02	2.39E-02	G
		510.72	2.450E-01	@(P	2.025E-01	7.27E-02	G
PB-212	4.8681E-01						
		238.63	4.912E-01	(P	1.100E-01	4.04E-02	G K
							Energy duplication
		77.11	4.760E-01	(	3.349E-01	1.06E-01	G
		74.81	7.233E-01	& P	6.479E-01	2.01E-01	G
PB-214	4.3999E-01						
		351.99	4.436E-01	(P	9.947E-02	4.11E-02	G K
		295.22	4.331E-01	(P	2.072E-01	7.08E-02	G
							Energy duplication
		77.11	7.623E-01	+ P	5.491E-01	1.73E-01	G
		241.92	-3.240E-01	% P	7.581E-01	2.29E-01	G
BI-212	2.1949E-01						
		727.17	2.195E-01	%(P	4.338E-01	1.32E-01	G K
		1620.56	3.496E-02	%	1.504E+00	3.72E-01	G
		785.42	2.104E-02	% P	2.531E+00	7.03E-01	G
BI-214	4.4274E-01						
		609.32	4.161E-01	@(P	9.319E-02	4.47E-02	G K
		1764.51	2.145E-01	% P	2.708E-01	9.20E-02	G
		1120.28	5.242E-01	(P	5.391E-01	2.13E-01	G
RA-224	3.4121E-01						
		241.00	3.412E-01	%(P	1.299E+00	3.89E-01	G
RA-226	7.9811E-01						
		185.99	7.981E-01	%(	1.196E+00	3.67E-01	G
AC-228	4.3786E-01						
		911.07	4.995E-01	(P	1.591E-01	7.00E-02	G K
		968.90	3.880E-01	(P	3.648E-01	1.20E-01	G
		338.40	3.614E-01	(P	2.984E-01	9.69E-02	G
TH-227	-1.3946E-01						
		236.00	-1.395E-01	%(P	4.569E-01	1.37E-01	G K
		256.25	2.317E-01	% P	5.233E-01	1.58E-01	G
PA-234	4.7061E-02						
		98.44	4.706E-02	%(	1.744E-01	5.23E-02	G K
		946.00	-6.353E-02	%	2.996E-01	8.67E-02	G
		131.28	5.304E-04	&	2.062E-01	6.10E-02	G
		94.67	-5.466E-02	%	3.306E-01	9.89E-02	G
		883.24	1.224E-01	%	3.467E-01	1.02E-01	G
		926.70	0.000E+00	%	5.242E-01	1.45E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-6.374E-02 %   4.459E-01 1.29E-01 G

TH-234       9.9528E-01
                           63.29 5.659E-01 %(P 2.211E+00 6.61E-01 G K
                           92.80 1.554E+00 *(P 1.619E+00 5.00E-01 G
                           92.38 3.020E-02 % P 1.953E+00 5.78E-01 G

AM-241      -1.1884E-02
                           59.54-1.188E-02 %(P 2.879E-01 8.53E-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

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

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	-5.5087E-02	-6.0213E-02	3.0956E-01	3.0958E-01	3.278E-01
K-40		1.5079E+01	1.5079E+01	1.8812E+00	2.0651E+00	
MN-54	#A	1.6000E-02	1.6245E-02	4.4756E-02	4.4765E-02	4.999E-02
CO-57	#B	-1.0510E-03	-1.0696E-03	3.9428E-02	3.9428E-02	4.369E-02
CO-60	#B	2.3031E-02	2.3088E-02	4.8007E-02	4.8025E-02	5.312E-02

Sr-85	#A	-1.1628E-02	-1.2512E-02	5.0610E-02	5.0615E-02	5.324E-02
Kr-85	#A	-2.9795E+02	-2.9796E+02	1.3214E+03	1.3215E+03	1.236E+03
Y-88	#B	-3.6254E-03	-3.7906E-03	3.1568E-02	3.1568E-02	4.025E-02
NB-94	#B	5.8141E-05	5.8141E-05	4.4391E-02	4.4391E-02	5.350E-02
Ag-108M	#B	1.5920E-02	1.5921E-02	3.9215E-02	3.9225E-02	4.408E-02
CD-109	#A	-1.3359E-01	-1.3500E-01	1.4515E+00	1.4515E+00	1.486E+00
SN-113	#B	2.1754E-02	2.2671E-02	5.6554E-02	5.6568E-02	6.048E-02
SB-125	#B	8.8401E-02	8.8817E-02	1.0835E-01	1.0846E-01	1.322E-01
I-131	#B	0.0000E+00	0.0000E+00	8.1793E-02	8.1793E-02	5.229E-02
CS-134	#B	-1.4828E-02	-1.4921E-02	5.6460E-02	5.6466E-02	5.728E-02
CS-137		2.4868E-01	2.4879E-01	7.3890E-02	7.5216E-02	
CE-139	#A	-1.1102E-02	-1.1493E-02	4.9504E-02	4.9508E-02	5.177E-02
EU-152	#B	-2.9234E-03	-2.9264E-03	2.3095E-01	2.3095E-01	1.260E-01
EU-154	#B	-4.6252E-03	-4.6323E-03	1.2178E-01	1.2178E-01	9.423E-02
EU-155	#B	9.0219E-02	9.0456E-02	1.4279E-01	1.4288E-01	1.558E-01
HG-203	#B	-3.5014E-04	-3.8773E-04	3.6399E-02	3.6399E-02	3.803E-02
TL-208	#	1.9993E-01	1.9993E-01	7.6263E-02	7.7095E-02	
PB-212	#	4.8681E-01	4.8681E-01	1.1997E-01	1.2309E-01	1.100E-01
PB-214	#	4.3999E-01	4.3999E-01	1.2222E-01	1.2473E-01	9.947E-02
BI-212	#B	2.1949E-01	2.1949E-01	3.9538E-01	3.9557E-01	4.338E-01
BI-214		4.4274E-01	4.4274E-01	1.4274E-01	1.4492E-01	
RA-224	#A	3.4121E-01	3.4121E-01	1.1674E+00	1.1675E+00	1.299E+00
RA-226	#A	7.9811E-01	7.9811E-01	1.1005E+00	1.1014E+00	1.196E+00
AC-228	#	4.3786E-01	4.3786E-01	1.8413E-01	1.8579E-01	1.591E-01
TH-227	#B	-1.3946E-01	-1.3946E-01	4.2336E-01	4.2343E-01	4.569E-01
PA-234	#B	4.7061E-02	4.7061E-02	1.5702E-01	1.5704E-01	1.744E-01
TH-234	#B	9.9528E-01	9.9528E-01	9.6191E-01	9.6349E-01	2.211E+00
AM-241	#A	-1.1883E-02	-1.1884E-02	3.7875E-01	3.7875E-01	2.879E-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 (295.1 to 1999.1 keV) 1.5970492E+01 pCi/gm
Total Decayed Activity (295.1 to 1999.1 keV) 1.5970600E+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_6JULY2006_1103.An1

Sample description
FSS-OOL-11-02-022-F

Spectrum Filename: C:\GammaVision\Spectra\101F_6JULY2006_1103.An1

Acquisition information
Start time: 06-Jul-2006 11:03:04
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: 1.8080E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.8080E+03) =
5.5310E+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	29-Jun-2006 14:00:00
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: 0.3044

***** 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
63.07	78.	40.60	1.24	1.105E-02				
63.07	78.	40.60	1.24	1.105E-02	63.29	3.900	PBC<MDA	TH234
74.80	151.	28.92	1.50	1.654E-02				
74.80	151.	28.92	1.50	1.654E-02	74.81	9.600	7.101E-01	PB212
77.17	195.	22.10	1.50	1.720E-02	77.11	17.500	4.853E-01	PB212
					77.11	10.700	7.786E-01	PB214
77.17	192.	22.10	1.50	1.720E-02	77.11	17.500	PBC<MDA	PB212
					77.11	10.700	7.786E-01	PB214
129.71	122.	30.50	1.49	2.109E-02				
186.33	111.	25.70	1.12	1.856E-02	185.99	3.280	1.364E+00	RA226
238.85	502.	5.65	1.12	1.557E-02	238.63	43.100	5.524E-01	PB212
242.07	102.	21.34	1.12	1.539E-02	241.00	3.900	1.259E+00	RA224
					241.92	7.470	PBC<MDA	PB214
295.31	138.	17.01	1.02	1.292E-02	295.22	19.200	4.119E-01	PB214
338.73	130.	17.36	1.55	1.134E-02	338.40	12.010	6.986E-01	AC228
352.14	237.	11.92	1.29	1.092E-02	351.99	37.100	4.341E-01	PB214
510.90	83.	28.29	1.35	7.588E-03	510.72	22.500	2.935E-01	TL208
583.31	196.	11.22	1.32	6.683E-03	583.14	86.000	2.517E-01	TL208
609.53	200.	11.18	1.45	6.411E-03	609.32	46.090	5.025E-01	BI214
661.94	192.	10.58	1.47	5.935E-03	661.62	84.620	2.837E-01	CS137
911.67	92.	14.05	1.93	4.444E-03	911.07	29.000	5.224E-01	AC228
969.44	103.	16.32	1.21	4.210E-03	968.90	17.460	1.035E+00	AC228
1120.64	49.	28.67	1.33	3.710E-03	1120.28	15.040	6.484E-01	BI214
1461.37	699.	3.84	1.86	2.941E-03	1460.75	10.700	1.654E+01	K40
1765.63	28.	18.90	0.90	2.481E-03	1764.51	15.920	5.215E-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	
125.69	63.07	434.	78.	0.039	121.79	1.244	PA-234	l
259.03	129.71	559.	91.	0.046	114.53	1.488	AC-228	s
477.40	238.81	152.	502.	0.251	16.95	1.122	PB-212	D
483.85	242.03	187.	102.	0.051	64.02	1.124	PB-214	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	149.17	74.80	946.	151.	0.075	86.75	1.499
PB-212	153.79	77.11	835.	195.	0.098	66.29	1.499D
PB-214	153.79	77.11	839.	192.	0.096	66.29	1.499D
RA-226	371.98	186.16	415.	90.	0.045	100.66	1.499s
PB-212	477.38	238.84	456.	406.	0.203	26.36	1.499
RA-224	484.24	242.27	436.	93.	0.046	99.49	1.499s
PB-214	590.62	295.44	181.	124.	0.062	52.62	1.499
AC-228	677.25	338.73	142.	127.	0.064	52.07	1.552s
PB-214	704.19	352.20	136.	204.	0.102	31.73	1.499
TL-208	1022.04	511.05	104.	53.	0.026	77.48	1.330s
TL-208	1166.62	583.31	74.	194.	0.097	33.67	1.321s
BI-214	1219.10	609.53	84.	199.	0.099	33.55	1.449
CS-137	1323.96	661.94	63.	191.	0.095	31.73	1.473s
AC-228	1823.68	911.67	32.	90.	0.045	42.14	1.932s
AC-228	1939.30	969.44	50.	102.	0.051	48.97	1.213
BI-214	2241.87	1120.64	44.	48.	0.024	86.00	1.327
K-40	2923.75	1461.37	8.	697.	0.348	11.53	1.855
BI-214	3532.69	1765.63	0.	28.	0.014	56.69	0.899s

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		5.2514E-02					
			477.56	5.251E-02	%(	4.621E-01 1.34E-01	G
K-40		1.6545E+01					
			1460.75	1.654E+01	(P	3.788E-01 6.38E-01	G
MN-54		1.7718E-02					
			834.81	1.772E-02	&(P	3.641E-02 1.10E-02	G
CO-57		4.6117E-03					
			122.07	4.612E-03	%(	4.655E-02 1.39E-02	G K
			136.43	5.692E-02	%	4.108E-01 1.23E-01	G
CO-60		2.3249E-02					
			1332.51	2.325E-02	%(P	6.061E-02 1.80E-02	G K
			1173.23	4.082E-02	% P	6.730E-02 2.08E-02	G K
Sr-85		-8.7072E-03					
			514.00	-8.707E-03	&(	5.659E-02 1.66E-02	G
Kr-85		-2.1362E+02					
			513.99	-2.136E+02	&(P	1.220E+03 3.56E+02	G
Y-88		3.6793E-03					
			1836.01	3.679E-03	%(	3.905E-02 9.78E-03	G K
			898.02	5.093E-03	% P	5.074E-02 1.42E-02	G
NB-94		-2.1540E-04					
			871.10	-2.154E-04	%(P	5.821E-02 1.63E-02	G K
			702.50	9.148E-03	% P	4.455E-02 1.29E-02	G K
Ag-108M		4.7189E-03					
			722.95	4.719E-03	&(	5.526E-02 1.58E-02	G K
			614.37	-1.032E-02	& P	5.093E-02 1.48E-02	G
			433.93	1.014E-02	%	4.395E-02 1.29E-02	G
CD-109		-1.8415E-01					
			88.04	-1.842E-01	&(P	1.200E+00 3.58E-01	G
SN-113		1.1747E-02					
			391.71	1.175E-02	%(	6.843E-02 2.01E-02	G K
			255.04	1.878E-01	& P	1.997E+00 5.89E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	3.0739E-02						
		427.95	3.074E-02	%(P	1.392E-01	4.10E-02	G K
		600.77	-6.597E-03	& P	2.403E-01	6.79E-02	G
		636.15	-8.444E-02	% P	4.188E-01	1.22E-01	G
		463.51	1.905E-01	% P	4.312E-01	1.30E-01	G
		176.29	2.102E-01	% P	6.258E-01	1.88E-01	G
I-131	-1.4984E-02						
		364.48	-1.498E-02	%(	8.572E-02	2.52E-02	G K
		636.97	-2.131E-01	%	1.112E+00	3.23E-01	G
		284.29	1.776E-02	%	1.294E+00	3.79E-01	G
CS-134	-1.3725E-02						
		604.66	-1.372E-02	%(P	5.461E-02	1.60E-02	G K
		795.76	2.460E-02	% P	4.897E-02	1.49E-02	G
		569.29	8.656E-02	% P	2.613E-01	7.74E-02	G
		801.84	7.391E-02	&	4.445E-01	1.26E-01	G
CS-137	2.8369E-01						
		661.62	2.837E-01	@(P	5.925E-02	3.02E-02	G
CE-139	2.9340E-03						
		165.85	2.934E-03	&(P	5.105E-02	1.51E-02	G
EU-152	4.5988E-03						
		121.78	4.599E-03	%(P	1.392E-01	4.13E-02	G K
		344.30	-4.005E-02	% P	1.487E-01	4.41E-02	G
		1408.08	1.636E-02	% P	1.995E-01	5.26E-02	G
		964.00	-9.592E-02	% P	4.258E-01	1.23E-01	G
		1112.07	-1.567E-02	% P	4.704E-01	1.31E-01	G
		778.90	-1.101E-03	% P	3.956E-01	1.11E-01	G
EU-154	-1.8850E-02						
		123.10	-1.885E-02	%(P	1.028E-01	3.07E-02	G K
		1274.80	-3.014E-02	% P	1.772E-01	5.05E-02	G
		723.30	2.801E-02	& P	2.453E-01	7.00E-02	G
		1004.80	-8.759E-02	% P	3.533E-01	1.03E-01	G
EU-155	-1.3154E-02						
		86.45	-1.315E-02	&(	1.352E-01	4.02E-02	G K
		105.31	1.764E-02	%	2.002E-01	5.97E-02	G
HG-203	7.9196E-04						
		279.17	7.920E-04	%(	4.667E-02	1.36E-02	G K
		72.87	-4.753E-01	& P	1.299E+00	3.92E-01	G
		70.83	-2.094E-01	%	1.884E+00	5.62E-01	G
		82.50	7.892E-02	%	2.136E+00	6.33E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.4744E-01						
		583.14	2.517E-01	*(P	5.578E-02	2.86E-02	G
		510.72	2.310E-01	@(P	2.201E-01	7.78E-02	G
PB-212	4.6180E-01						
		238.63	4.523E-01	(P	1.138E-01	4.03E-02	G K
							Energy duplication
		77.11	4.853E-01	(	3.411E-01	1.07E-01	G
		74.81	7.101E-01	& P	6.874E-01	2.12E-01	G
PB-214	3.7469E-01						
		351.99	3.759E-01	(P	1.052E-01	4.01E-02	G K
		295.22	3.724E-01	(P	1.970E-01	6.63E-02	G
							Energy duplication
		77.11	7.786E-01	+ P	5.590E-01	1.75E-01	G
		241.92	8.227E-02	% P	7.940E-01	2.37E-01	G
BI-212	2.7497E-01						
		727.17	2.750E-01	%(P	4.207E-01	1.31E-01	G K
		1620.56	7.109E-02	%	1.520E+00	3.87E-01	G
		785.42	1.150E+00	% P	1.814E+00	5.69E-01	G
BI-214	5.3489E-01						
		609.32	5.025E-01	(P	1.151E-01	5.65E-02	G K
		1764.51	5.215E-01	(P	1.394E-01	1.00E-01	G
		1120.28	6.484E-01	(P	4.483E-01	1.87E-01	G
RA-224	1.1523E+00						
		241.00	1.152E+00	&(P	1.240E+00	3.85E-01	G
RA-226	1.1090E+00						
		185.99	1.109E+00	*(	1.198E+00	3.72E-01	G
AC-228	5.7405E-01						
		911.07	5.224E-01	*(P	1.682E-01	7.49E-02	G K
		968.90	1.035E+00	+ P	3.628E-01	1.70E-01	G
		338.40	6.986E-01	(P	3.189E-01	1.23E-01	G
TH-227	-7.5895E-02						
		236.00	-7.590E-02	%(P	4.447E-01	1.33E-01	G K
		256.25	-7.303E-03	& P	6.019E-01	1.76E-01	G
PA-234	1.9331E-06						
		98.44	1.933E-06	&(	1.671E-01	4.95E-02	G K
		946.00	6.504E-02	%	2.189E-01	6.39E-02	G
		131.28	5.527E-02	&	2.264E-01	6.80E-02	G
		94.67	-4.862E-02	&	3.313E-01	9.91E-02	G
		883.24	-5.503E-02	&	4.139E-01	1.18E-01	G
		926.70	-4.396E-02	&	5.072E-01	1.44E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 1.323E-01 %   3.837E-01 1.14E-01 G

TH-234       9.1672E-01
                           63.29 9.167E-01 %(P 2.217E+00 6.69E-01 G K
                           92.80 8.163E-01 % P 1.695E+00 5.13E-01 G
                           92.38 8.389E-01 % P 2.019E+00 6.09E-01 G

AM-241      -6.2137E-03
                           59.54-6.214E-03 &(P 3.045E-01 9.04E-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

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

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	4.8029E-02	5.2514E-02	4.0235E-01	4.0236E-01	4.226E-01
K-40		1.6545E+01	1.6545E+01	1.9134E+00	2.1296E+00	
MN-54	#A	1.7450E-02	1.7718E-02	3.3139E-02	3.3154E-02	3.586E-02
CO-57	#B	4.5310E-03	4.6117E-03	4.1559E-02	4.1560E-02	4.574E-02
CO-60	#B	2.3191E-02	2.3249E-02	5.4091E-02	5.4106E-02	6.046E-02

Sr-85	#A	-8.0901E-03	-8.7072E-03	4.9729E-02	4.9732E-02	5.258E-02
Kr-85	#A	-2.1361E+02	-2.1362E+02	1.3767E+03	1.3768E+03	1.220E+03
Y-88	#B	3.5184E-03	3.6793E-03	2.9353E-02	2.9354E-02	3.734E-02
NB-94	#B	-2.1540E-04	-2.1540E-04	1.3053E-02	1.3053E-02	5.821E-02
Ag-108M	#B	4.7184E-03	4.7189E-03	4.7266E-02	4.7267E-02	5.525E-02
CD-109	#A	-1.8222E-01	-1.8415E-01	1.1322E+00	1.1322E+00	1.187E+00
SN-113	#B	1.1271E-02	1.1747E-02	6.0344E-02	6.0347E-02	6.565E-02
SB-125	#B	3.0594E-02	3.0739E-02	1.2289E-01	1.2291E-01	1.385E-01
I-131	#B	-8.2823E-03	-1.4984E-02	7.5576E-02	7.5581E-02	4.738E-02
CS-134	#B	-1.3638E-02	-1.3725E-02	5.3538E-02	5.3544E-02	5.426E-02
CS-137	#	2.8357E-01	2.8369E-01	9.0434E-02	9.1843E-02	
CE-139	#A	2.8341E-03	2.9340E-03	4.5398E-02	4.5399E-02	4.931E-02
EU-152	#B	4.5941E-03	4.5988E-03	1.2389E-01	1.2389E-01	1.390E-01
EU-154	#B	-1.8822E-02	-1.8850E-02	1.0024E-01	1.0025E-01	1.026E-01
EU-155	#B	-1.3119E-02	-1.3154E-02	1.2074E-01	1.2074E-01	1.349E-01
HG-203	#B	7.1494E-04	7.9196E-04	4.0716E-02	4.0716E-02	4.213E-02
TL-208	#	2.4744E-01	2.4744E-01	8.4343E-02	8.5494E-02	
PB-212	#	4.6180E-01	4.6180E-01	1.2357E-01	1.2629E-01	1.138E-01
PB-214	#	3.7469E-01	3.7469E-01	1.1663E-01	1.1853E-01	1.052E-01
BI-212	#B	2.7497E-01	2.7497E-01	3.9183E-01	3.9213E-01	4.207E-01
BI-214		5.3489E-01	5.3489E-01	1.8046E-01	1.8298E-01	
RA-224	#A	1.1523E+00	1.1523E+00	1.1553E+00	1.1571E+00	1.240E+00
RA-226	#A	1.1090E+00	1.1090E+00	1.1164E+00	1.1181E+00	1.198E+00
AC-228		5.7405E-01	5.7405E-01	1.9583E-01	1.9850E-01	
TH-227	#B	-7.5895E-02	-7.5895E-02	4.1769E-01	4.1771E-01	4.447E-01
PA-234	#B	1.9331E-06	1.9331E-06	1.4854E-01	1.4854E-01	1.671E-01
TH-234	#B	9.1672E-01	9.1672E-01	2.0061E+00	2.0067E+00	2.217E+00
AM-241	#A	-6.2135E-03	-6.2137E-03	5.5621E-01	5.5621E-01	3.045E-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) 1.8184608E+01 pCi/gm
Total Decayed Activity (270.1 to 1999.1 keV) 1.8184731E+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_7JUL2006_1523.An1

Sample description
FSS-OOL-11-02-012-F

Spectrum Filename: C:\GammaVision\Spectra\101F_7JUL2006_1523.An1

Acquisition information

Start time:	07-Jul-2006 15:23:58
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:	1.5140E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.5140E+03) = 6.6050E+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	29-Jun-2006 15:10:00
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: 0.1825

***** 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	172.	25.30	1.50	1.654E-02	74.81	9.600	9.666E-01	PB212
77.14	264.	16.45	1.50	1.720E-02	77.11	17.500	7.835E-01	PB212
					77.11	10.700	1.263E+00	PB214
77.14	261.	16.45	1.50	1.720E-02	77.11	17.500	7.725E-01	PB212
					77.11	10.700	1.263E+00	PB214
87.23	101.	38.50	1.50	1.910E-02	86.45	32.740	PBC<MDA	EU155
90.13	86.	30.12	1.02	1.960E-02				
92.99	108.	22.73	1.02	1.992E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.11	81.	33.58	1.05	1.858E-02	185.99	3.280	1.180E+00	RA226
209.43	93.	27.79	0.94	1.721E-02				
238.85	734.	5.47	1.16	1.556E-02	238.63	43.100	9.678E-01	PB212
270.47	78.	23.85	1.22	1.399E-02				
295.35	182.	12.91	1.30	1.291E-02	295.22	19.200	6.495E-01	PB214
338.45	138.	19.92	0.88	1.135E-02	338.40	12.010	8.874E-01	AC228
352.16	268.	11.38	1.13	1.092E-02	351.99	37.100	5.867E-01	PB214
463.78	84.	20.89	1.06	8.337E-03	463.51	10.000	8.839E-01	SB125
511.19	141.	15.54	1.62	7.584E-03	510.72	22.500	6.531E-01	TL208
583.43	209.	9.36	1.35	6.681E-03	583.14	86.000	3.208E-01	TL208
602.38	22.	31.37	1.50	6.459E-03	604.66	97.600	3.124E-02	CS134
609.53	174.	10.84	1.29	6.411E-03	609.32	46.090	5.227E-01	BI214
661.70	51.	27.38	1.34	5.937E-03	661.62	84.620	8.908E-02	CS137
727.60	50.	23.21	1.76	5.443E-03	727.17	11.800	6.938E-01	BI212
795.03	39.	35.21	1.20	5.020E-03				
795.03	39.	35.21	1.20	5.020E-03	795.76	85.400	8.057E-02	CS134
911.71	145.	12.42	1.50	4.444E-03	911.07	29.000	9.880E-01	AC228
968.63	111.	13.72	1.72	4.213E-03	968.90	17.460	1.341E+00	AC228

1001.49	19.	40.27	1.64	4.080E-03	1004.80	17.600	PBC<MDA	EU154
1120.43	65.	23.13	0.95	3.710E-03	1120.28	15.040	1.030E+00	BI214
1461.44	647.	4.01	1.92	2.941E-03	1460.75	10.700	1.827E+01	K40

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1765.23	26.	23.17	0.63	2.481E-03	1764.51	15.920	5.821E-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	
179.84	90.21	290.	86.	0.043	90.35	1.016	PB-214	lD
185.33	93.07	276.	98.	0.049	78.30	1.018	TH-234	D
418.54	209.43	248.	93.	0.046	83.38	0.942	AC-228	s
477.40	238.85	852.	174.	0.087	74.80	1.161	PB-212	
540.66	270.47	121.	78.	0.039	71.56	1.224	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	149.12	74.77	922.	172.	0.086	75.90	1.499s
PB-212	153.79	77.11	813.	264.	0.132	49.35	1.499D
PB-214	153.79	77.11	817.	261.	0.130	49.35	1.499D
EU-155	174.03	87.23	704.	101.	0.050	115.50	1.499
TH-234	185.40	92.91	658.	107.	0.054	95.27	1.499
TH-234	185.36	92.89	624.	114.	0.057	91.68	1.499
RA-226	372.11	186.23	398.	83.	0.041	107.63	1.499s
PB-212	477.42	238.86	354.	494.	0.247	20.74	1.499
PB-214	590.46	295.36	141.	150.	0.075	41.07	1.499
AC-228	676.68	338.45	188.	136.	0.068	59.76	0.880
PB-214	704.19	352.19	134.	222.	0.111	29.55	1.499
SB-125	926.48	463.29	67.	48.	0.024	80.96	1.499s
TL-208	1022.32	511.19	103.	125.	0.062	46.63	1.625s
TL-208	1166.86	583.43	60.	207.	0.103	28.09	1.349
CS-134	1204.78	602.38	14.	22.	0.011	94.10	1.499
BI-214	1219.10	609.53	60.	173.	0.087	32.52	1.289s
CS-137	1323.48	661.70	49.	50.	0.025	82.14	1.336
BI-212	1455.36	727.60	37.	50.	0.025	69.64	1.758s
CS-134	1590.89	795.33	28.	29.	0.014	93.75	1.502
AC-228	1823.76	911.71	51.	143.	0.071	37.25	1.495s
AC-228	1937.68	968.63	38.	110.	0.055	41.15	1.723s
EU-154	2003.44	1001.49	19.	19.	0.009	120.80	1.639s
BI-214	2241.46	1120.43	44.	64.	0.032	69.39	0.949s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
K-40	2923.89	1461.44	9.	644.	0.322	12.04	1.924
BI-214	3531.90	1765.23	3.	26.	0.013	69.50	0.628s

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		1.3933E-01					
			477.56	1.393E-01	%(	5.103E-01 1.51E-01	G
K-40		1.8266E+01					
			1460.75	1.827E+01	(P	4.660E-01 7.36E-01	G
MN-54		-7.8255E-03					
			834.81	-7.826E-03	%(P	6.492E-02 1.84E-02	G
CO-57		-1.3105E-02					
			122.07	-1.310E-02	%(	4.921E-02 1.47E-02	G K
			136.43	-9.861E-02	%	3.869E-01 1.16E-01	G
CO-60		-9.9861E-04					
			1332.51	-9.986E-04	%(P	6.702E-02 1.81E-02	G K
			1173.23	1.303E-02	% P	9.771E-02 2.82E-02	G K
Sr-85		-1.9232E-02					
			514.00	-1.923E-02	&(	6.932E-02 2.06E-02	G
Kr-85		-4.4056E+02					
			513.99	-4.406E+02	&(P	1.476E+03 4.36E+02	G
Y-88		0.0000E+00					
			1836.01	0.000E+00	&(	2.916E-02 3.96E-03	G K
			898.02	1.466E-02	% P	5.604E-02 1.62E-02	G
NB-94		1.1442E-02					
			871.10	1.144E-02	%(P	5.207E-02 1.50E-02	G K
			702.50	8.572E-03	& P	4.463E-02 1.28E-02	G K
Ag-108M		7.1258E-04					
			722.95	7.126E-04	&(	6.921E-02 1.96E-02	G K
			614.37	2.795E-04	% P	6.079E-02 1.72E-02	G
			433.93	-5.538E-04	%	4.232E-02 1.19E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CD-109	-2.2195E-02						
		88.04	-2.219E-02	%(P	1.346E+00	3.98E-01	G
SN-113	4.2137E-03						
		391.71	4.214E-03	%(	6.436E-02	1.85E-02	G K
		255.04	-7.111E-02	% P	2.250E+00	6.59E-01	G
SB-125	1.4688E-01						
		427.95	2.068E-02	%(P	1.561E-01	4.53E-02	G K
		600.77	-8.161E-02	% P	3.118E-01	9.16E-02	G
		636.15	-5.468E-02	% P	4.623E-01	1.32E-01	G
		463.51	5.205E-01	*(P	4.393E-01	1.45E-01	G
		176.29	-4.823E-02	& P	7.131E-01	2.10E-01	G
I-131	1.7306E-02						
		364.48	1.731E-02	&(	9.459E-02	2.77E-02	G K
		636.97	0.000E+00	%	1.507E+00	4.25E-01	G
		284.29	1.569E-01	&	1.285E+00	3.77E-01	G
CS-134	4.4906E-02						
		604.66	3.124E-02	&(P	2.901E-02	1.01E-02	G K
		795.76	6.052E-02	(P	5.704E-02	1.92E-02	G
		569.29	-1.199E-02	% P	3.529E-01	1.00E-01	G
		801.84	1.119E-02	%	4.434E-01	1.19E-01	G
CS-137	8.9077E-02						
		661.62	8.908E-02	(P	6.273E-02	2.48E-02	G
CE-139	2.1700E-03						
		165.85	2.170E-03	%(P	5.304E-02	1.56E-02	G
EU-152	-4.6376E-02						
		121.78	-4.638E-02	%(P	1.482E-01	4.45E-02	G K
		344.30	-1.371E-03	% P	1.778E-01	5.14E-02	G
		1408.08	3.407E-02	& P	2.746E-01	7.49E-02	G
		964.00	-1.488E-01	% P	6.235E-01	1.82E-01	G
		1112.07	1.468E-01	& P	4.454E-01	1.31E-01	G
		778.90	-9.740E-02	% P	5.060E-01	1.47E-01	G
EU-154	9.4888E-02						
		123.10	3.521E-02	%(P	1.127E-01	3.39E-02	G K
		1274.80	-1.688E-04	% P	2.715E-01	7.61E-02	G
		723.30	-1.761E-01	% P	4.256E-01	1.28E-01	G
		1004.80	2.321E-01	&(P	2.871E-01	9.38E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	1.4448E-01						
		86.45	1.445E-01	(	1.809E-01	5.56E-02	G K
		105.31	5.733E-02	&	2.268E-01	6.80E-02	G
HG-203	-1.6163E-02						
		279.17	-1.616E-02	&(	6.229E-02	1.86E-02	G K
		72.87	-7.835E-01	& P	1.595E+00	4.83E-01	G
		70.83	6.032E-02	%	3.247E+00	9.70E-01	G
		82.50	-5.207E-01	%	3.236E+00	9.69E-01	G
TL-208	3.2082E-01						
		583.14	3.208E-01	(P	6.043E-02	3.04E-02	G
		510.72	6.531E-01	+ P	2.614E-01	1.15E-01	G
PB-212	6.9322E-01						
		238.63	6.566E-01	(P	1.201E-01	4.60E-02	G K
							Energy duplication
		77.11	7.835E-01	(	4.019E-01	1.29E-01	G
		74.81	9.666E-01	+ P	8.105E-01	2.52E-01	G
PB-214	5.0631E-01						
		351.99	4.898E-01	(P	1.247E-01	4.87E-02	G K
		295.22	5.383E-01	(P	2.088E-01	7.46E-02	G
							Energy duplication
		77.11	1.263E+00	+ P	6.588E-01	2.11E-01	G
		241.92	-2.804E-01	% P	7.138E-01	2.15E-01	G
BI-212	6.9378E-01						
		727.17	6.938E-01	*(P	4.320E-01	1.63E-01	G K
		1620.56	6.315E-01	%	1.643E+00	4.86E-01	G
		785.42	6.161E-01	% P	2.978E+00	8.62E-01	G
BI-214	5.3797E-01						
		609.32	5.227E-01	@(P	1.171E-01	5.70E-02	G K
		1764.51	5.821E-01	(P	2.507E-01	1.37E-01	G
		1120.28	1.030E+00	+ P	5.353E-01	2.40E-01	G
RA-224	8.8235E-01						
		241.00	8.824E-01	%(P	1.435E+00	4.38E-01	G
RA-226	1.2101E+00						
		185.99	1.210E+00	(	1.401E+00	4.34E-01	G
AC-228	1.0727E+00						
		911.07	9.880E-01	@(P	2.497E-01	1.24E-01	G K
		968.90	1.341E+00	*(P	3.793E-01	1.85E-01	G
		338.40	8.874E-01	(P	4.367E-01	1.80E-01	G

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

TH-227      -1.3554E-01
                          236.00-1.355E-01 &(P 5.379E-01 1.61E-01 G K
                          256.25 1.033E-01 % P 6.833E-01 2.02E-01 G

PA-234      -5.4927E-03
                           98.44-5.493E-03 %(  2.043E-01 6.07E-02 G K
                          946.00 5.737E-02 %   3.525E-01 1.01E-01 G
                          131.28 3.208E-02 &   2.417E-01 7.21E-02 G
                           94.67-1.715E-01 %   3.637E-01 1.10E-01 G
                          883.24 0.000E+00 &   5.712E-01 1.60E-01 G
                          926.70-4.278E-02 &   5.068E-01 1.41E-01 G
                          569.26-1.259E-02 %   4.765E-01 1.35E-01 G

TH-234       1.4451E+00
                           63.29 9.548E-01 %(P 2.399E+00 7.22E-01 G K
                           92.80 1.710E+00  (P 1.781E+00 5.51E-01 G
                           92.38 1.880E+00  (P 2.138E+00 6.57E-01 G

AM-241       2.6884E-02
                           59.54 2.688E-02 %(P 3.469E-01 1.03E-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	1.2557E-01	1.3933E-01	4.5208E-01	4.5215E-01	4.599E-01
K-40		1.8266E+01	1.8266E+01	2.2071E+00	2.4365E+00	
MN-54	#A	-7.6876E-03	-7.8255E-03	6.7701E-02	6.7702E-02	6.377E-02
CO-57	#B	-1.2838E-02	-1.3105E-02	4.4238E-02	4.4244E-02	4.821E-02
CO-60	#B	-9.9573E-04	-9.9861E-04	8.9037E-02	8.9037E-02	6.683E-02
Sr-85	#A	-1.7654E-02	-1.9232E-02	6.1759E-02	6.1769E-02	6.364E-02
Kr-85	#A	-4.4053E+02	-4.4056E+02	1.5165E+03	1.5167E+03	1.476E+03
Y-88	#B	0.0000E+00	0.0000E+00	1.1872E-02	1.1874E-02	2.768E-02
NB-94	#B	1.1442E-02	1.1442E-02	4.4862E-02	4.4867E-02	5.207E-02
Ag-108M	#B	7.1250E-04	7.1258E-04	5.8658E-02	5.8658E-02	6.920E-02
CD-109	#A	-2.1925E-02	-2.2195E-02	2.0381E+00	2.0381E+00	1.330E+00
SN-113	#B	4.0152E-03	4.2137E-03	5.5443E-02	5.5444E-02	6.133E-02
SB-125	#B	1.4608E-01	1.4688E-01	1.2247E-01	1.2275E-01	1.553E-01
I-131	#B	8.6754E-03	1.7306E-02	8.2970E-02	8.2975E-02	4.742E-02
CS-134	#	4.4576E-02	4.4906E-02	3.0463E-02	3.0568E-02	2.880E-02
CS-137		8.9032E-02	8.9077E-02	7.4461E-02	7.4631E-02	
CE-139	#A	2.0841E-03	2.1700E-03	4.6950E-02	4.6950E-02	5.094E-02
EU-152	#B	-4.6320E-02	-4.6376E-02	1.4017E-01	1.4019E-01	1.480E-01
EU-154	#B	9.4718E-02	9.4888E-02	1.1501E-01	1.1513E-01	1.125E-01
EU-155	#A	1.4404E-01	1.4448E-01	1.6688E-01	1.6707E-01	1.804E-01
HG-203	#B	-1.4348E-02	-1.6163E-02	5.5671E-02	5.5679E-02	5.529E-02
TL-208		3.2082E-01	3.2082E-01	9.1159E-02	9.2943E-02	
PB-212	#	6.9322E-01	6.9322E-01	1.4560E-01	1.5078E-01	1.201E-01
PB-214	#	5.0631E-01	5.0631E-01	1.2948E-01	1.3261E-01	1.247E-01
BI-212	#	6.9378E-01	6.9378E-01	4.8969E-01	4.9126E-01	
BI-214		5.3797E-01	5.3797E-01	1.7604E-01	1.7865E-01	
RA-224	#A	8.8235E-01	8.8235E-01	1.3152E+00	1.3161E+00	1.435E+00
RA-226	#A	1.2101E+00	1.2101E+00	1.3025E+00	1.3043E+00	1.401E+00
AC-228		1.0727E+00	1.0727E+00	2.9545E-01	3.0161E-01	
TH-227	#B	-1.3554E-01	-1.3554E-01	4.9942E-01	4.9948E-01	5.379E-01
PA-234	#B	-5.4927E-03	-5.4927E-03	1.8197E-01	1.8197E-01	2.043E-01
TH-234	#B	1.4451E+00	1.4451E+00	1.2911E+00	1.2936E+00	2.399E+00
AM-241	#A	2.6883E-02	2.6884E-02	3.0977E-01	3.0977E-01	3.469E-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 (129.2 to 1999.1 keV) 2.0980545E+01 pCi/gm
Total Decayed Activity (129.2 to 1999.1 keV) 2.0980591E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
DAT

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 101F_7JUL2006_1609.An1

Sample description
FSS-OOL-11-02-001-F

Spectrum Filename: C:\GammaVision\Spectra\101F_7JUL2006_1609.An1

Acquisition information
Start time: 07-Jul-2006 16:09:10
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: 1.8520E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.8520E+03) =
5.3996E+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	29-Jun-2006 16:25:00
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: 0.3106

***** 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	148.	31.55	1.50	1.654E-02				
74.77	148.	31.55	1.50	1.654E-02	74.81	9.600	PBC<MDA	PB212
77.13	291.	15.48	1.50	1.720E-02	77.11	10.700	1.155E+00	PB214
					77.11	17.500	7.062E-01	PB212
77.13	295.	15.48	1.50	1.720E-02	77.11	10.700	1.155E+00	PB214
					77.11	17.500	7.152E-01	PB212
87.36	150.	18.80	1.01	1.924E-02	86.45	32.740	1.752E-01	EU155
89.43	94.	30.70	1.02	1.952E-02				
93.18	131.	21.73	1.02	1.994E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.05	152.	25.33	1.02	1.858E-02	185.99	3.280	1.823E+00	RA226
208.72	98.	28.06	1.12	1.725E-02				
238.88	818.	4.02	1.12	1.556E-02	238.63	43.100	8.826E-01	PB212
241.71	106.	24.07	1.12	1.541E-02	241.00	3.900	1.272E+00	RA224
270.35	88.	31.04	1.37	1.400E-02				
295.46	196.	9.72	1.16	1.291E-02	295.22	19.200	5.701E-01	PB214
300.20	44.	34.09	1.16	1.272E-02				
338.76	167.	15.37	1.10	1.134E-02	338.40	12.010	8.823E-01	AC228
352.14	261.	8.50	1.09	1.092E-02	351.99	37.100	4.670E-01	PB214
463.12	64.	26.57	1.21	8.349E-03				
463.12	64.	26.57	1.21	8.349E-03	463.51	10.000	5.458E-01	SB125
510.35	96.	20.73	1.61	7.596E-03	510.72	22.500	3.417E-01	TL208
583.41	249.	9.92	1.35	6.681E-03	583.14	86.000	3.133E-01	TL208
609.54	204.	9.29	1.41	6.410E-03	609.32	46.090	4.997E-01	BI214
662.00	150.	14.75	1.63	5.934E-03	661.62	84.620	2.167E-01	CS137
726.76	56.	27.48	1.33	5.446E-03	727.17	11.800	6.308E-01	BI212
795.61	36.	26.57	1.50	5.016E-03	795.76	85.400	6.210E-02	CS134

911.60	159.	11.48	1.51	4.444E-03	911.07	29.000	8.897E-01	AC228
968.77	110.	13.95	1.31	4.213E-03	968.90	17.460	1.088E+00	AC228
1120.47	56.	25.42	1.42	3.711E-03	1120.28	15.040	7.337E-01	BI214
1461.48	626.	4.07	1.89	2.941E-03	1460.75	10.700	1.447E+01	K40
1765.60	25.	20.00	1.25	2.481E-03	1764.51	15.920	4.537E-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
174.29	87.43	321.	150.	0.075	56.41	1.014	PB-214 lD
178.44	89.51	372.	94.	0.047	92.09	1.015	PB-214 lD
417.12	208.72	289.	98.	0.049	84.17	1.118	LU-177 s
477.47	238.93	131.	818.	0.409	12.05	1.122	PB-212 D
483.12	241.75	271.	106.	0.053	72.22	1.124	PB-214 D
540.42	270.35	243.	88.	0.044	93.11	1.372	AC-228 s
600.16	300.28	88.	44.	0.022	102.28	1.165	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	149.11	74.77	1099.	148.	0.074	94.65	1.499s
PB-214	153.79	77.11	899.	291.	0.146	46.43	1.499D
PB-212	153.79	77.11	896.	295.	0.148	46.43	1.499D
TH-234	185.63	93.02	920.	133.	0.067	92.35	1.499s
TH-234	185.51	92.97	885.	141.	0.071	88.92	1.499s
RA-226	371.83	186.09	519.	116.	0.058	87.47	1.499s
PB-212	477.48	238.89	421.	626.	0.313	18.15	1.499
RA-224	483.50	241.90	460.	100.	0.050	95.34	1.499
PB-214	590.77	295.51	175.	191.	0.096	36.07	1.499
AC-228	677.31	338.76	166.	165.	0.082	46.12	1.097s
PB-214	704.16	352.18	115.	246.	0.123	26.39	1.499
SB-125	926.18	463.14	105.	50.	0.025	94.70	1.499
TL-208	1020.64	510.35	116.	80.	0.040	62.19	1.609s
TL-208	1166.84	583.41	95.	247.	0.123	29.76	1.352
BI-214	1219.12	609.54	63.	202.	0.101	27.86	1.409
CS-137	1324.09	662.00	88.	149.	0.075	44.24	1.631
BI-212	1453.68	726.76	59.	56.	0.028	82.43	1.327s
CS-134	1591.45	795.61	29.	36.	0.018	79.71	1.502s
AC-228	1823.54	911.60	55.	157.	0.079	34.44	1.514
AC-228	1937.95	968.77	40.	110.	0.055	41.84	1.308s
BI-214	2241.54	1120.47	41.	56.	0.028	76.27	1.420s
K-40	2923.98	1461.48	7.	624.	0.312	12.22	1.893
BI-214	3532.64	1765.60	0.	25.	0.012	60.00	1.249s

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		9.1567E-02						
			477.56	9.157E-02	&(	4.645E-01	1.36E-01	G
K-40		1.4467E+01						
			1460.75	1.447E+01	(P	3.440E-01	5.92E-01	G
MN-54		-1.5021E-02						
			834.81	-1.502E-02	&(P	6.233E-02	1.82E-02	G
CO-57		2.2171E-03						
			122.07	2.217E-03	%(	5.140E-02	1.53E-02	G K
			136.43	-4.030E-02	%	4.062E-01	1.21E-01	G
CO-60		2.9184E-02						
			1332.51	2.918E-02	%(P	5.357E-02	1.65E-02	G K
			1173.23	5.564E-03	& P	7.022E-02	1.99E-02	G K
Sr-85		-1.9976E-02						
			514.00	-1.998E-02	%(	6.237E-02	1.86E-02	G
Kr-85		-4.4991E+02						
			513.99	-4.499E+02	%(P	1.327E+03	3.95E+02	G
Y-88		0.0000E+00						
			1836.01	0.000E+00	%(	2.384E-02	3.23E-03	G K
			898.02	4.107E-03	& P	5.139E-02	1.43E-02	G
NB-94		8.9396E-03						
			871.10	8.940E-03	&(P	4.713E-02	1.35E-02	G K
			702.50	-5.773E-05	& P	5.762E-02	1.64E-02	G K
Ag-108M		6.2885E-03						
			722.95	6.288E-03	%(	5.548E-02	1.59E-02	G K
			614.37	-2.482E-02	% P	5.472E-02	1.65E-02	G
			433.93	0.000E+00	%	5.206E-02	1.50E-02	G
CD-109		4.9840E-01						
			88.04	4.984E-01	%(P	1.238E+00	3.74E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SN-113	-9.6375E-03						
		391.71	-9.637E-03	&(	7.572E-02	2.22E-02	G K
		255.04	-3.767E-01	% P	2.087E+00	6.20E-01	G
SB-125	1.2470E-01						
		427.95	1.971E-02	%(P	1.364E-01	3.98E-02	G K
		600.77	5.228E-03	& P	2.627E-01	7.48E-02	G
		636.15	6.982E-02	% P	3.388E-01	9.78E-02	G
		463.51	4.355E-01	(P	4.445E-01	1.41E-01	G
		176.29	-4.090E-02	% P	6.685E-01	1.98E-01	G
I-131	-1.2216E-02						
		364.48	-1.222E-02	%(	1.010E-01	2.96E-02	G K
		636.97	1.563E-05	%	1.084E+00	3.02E-01	G
		284.29	2.167E-01	%	1.341E+00	3.97E-01	G
CS-134	2.5476E-02						
		604.66	-6.567E-03	%(P	5.728E-02	1.66E-02	G K
		795.76	6.210E-02	*(P	4.802E-02	1.67E-02	G
		569.29	-1.148E-02	% P	2.512E-01	7.06E-02	G
		801.84	-5.717E-02	%	5.335E-01	1.51E-01	G
CS-137	2.1667E-01						
		661.62	2.167E-01	(P	6.741E-02	3.22E-02	G
CE-139	6.9364E-03						
		165.85	6.936E-03	&(P	4.294E-02	1.28E-02	G
EU-152	6.9368E-03						
		121.78	6.937E-03	%(P	1.468E-01	4.37E-02	G K
		344.30	-3.559E-02	% P	1.479E-01	4.37E-02	G
		1408.08	-7.455E-02	% P	2.786E-01	8.02E-02	G
		964.00	-9.186E-02	% P	4.442E-01	1.29E-01	G
		1112.07	4.786E-03	% P	3.924E-01	1.07E-01	G
		778.90	3.137E-02	% P	3.908E-01	1.11E-01	G
EU-154	3.5384E-04						
		123.10	3.538E-04	&(P	9.877E-02	2.93E-02	G K
		1274.80	8.999E-02	% P	1.315E-01	4.21E-02	G
		723.30	3.199E-02	& P	2.237E-01	6.39E-02	G
		1004.80	-2.549E-02	& P	3.134E-01	8.81E-02	G
EU-155	8.7233E-03						
		86.45	8.723E-03	&(	1.861E-01	5.56E-02	G K
		105.31	4.353E-02	%	2.138E-01	6.41E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
HG-203	-9.0696E-03						
		279.17	-9.070E-03	&(	5.776E-02	1.71E-02	G K
		72.87	-2.981E-01	% P	1.381E+00	4.15E-01	G
		70.83	2.551E-01	%	2.404E+00	7.20E-01	G
		82.50	-3.158E-01	%	2.802E+00	8.38E-01	G
TL-208	3.1918E-01						
		583.14	3.133E-01	(P	6.114E-02	3.14E-02	G
		510.72	3.417E-01	*(P	2.260E-01	8.50E-02	G
PB-212	6.8883E-01						
		238.63	6.800E-01	(P	1.068E-01	4.15E-02	G K
							Energy duplication
		77.11	7.152E-01	(	3.446E-01	1.11E-01	G
		74.81	6.805E-01	?(P	7.223E-01	2.22E-01	G
PB-214	4.4198E-01						
		351.99	4.420E-01	(P	9.495E-02	3.92E-02	G K
		295.22	5.625E-01	+ P	1.891E-01	6.83E-02	G
							Energy duplication
		77.11	1.155E+00	+ P	5.647E-01	1.81E-01	G
		241.92	1.135E-01	% P	7.673E-01	2.29E-01	G
BI-212	6.3078E-01						
		727.17	6.308E-01	@(P	4.391E-01	1.75E-01	G K
		1620.56	-8.350E-02	%	1.622E+00	4.21E-01	G
		785.42	-9.377E-02	% P	2.704E+00	7.64E-01	G
BI-214	4.8786E-01						
		609.32	4.997E-01	(P	9.772E-02	4.67E-02	G K
		1764.51	4.537E-01	(P	1.361E-01	9.24E-02	G
		1120.28	7.337E-01	+ P	4.250E-01	1.88E-01	G
RA-224	1.2078E+00						
		241.00	1.208E+00	(P	1.243E+00	3.87E-01	G
RA-226	1.3946E+00						
		185.99	1.395E+00	*(	1.303E+00	4.07E-01	G
AC-228	9.4746E-01						
		911.07	8.897E-01	(P	2.105E-01	1.03E-01	G K
		968.90	1.088E+00	@(P	3.205E-01	1.53E-01	G
		338.40	8.823E-01	@(P	3.361E-01	1.38E-01	G
TH-227	-5.1139E-02						
		236.00	-5.114E-02	%(P	4.219E-01	1.25E-01	G K
		256.25	-1.356E-01	% P	5.822E-01	1.73E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PA-234	-2.3686E-02						
		98.44	-2.369E-02	&(	1.951E-01	5.83E-02	G K
		946.00	0.000E+00	&	3.397E-01	9.61E-02	G
		131.28	0.000E+00	&	2.169E-01	6.44E-02	G
		94.67	-6.416E-02	&	3.405E-01	1.02E-01	G
		883.24	-2.560E-02	&	4.254E-01	1.20E-01	G
		926.70	1.264E-01	%	4.988E-01	1.46E-01	G
		569.26	9.114E-02	%	2.299E-01	6.85E-02	G
TH-234	1.2070E+00						
		63.29	3.503E-01	%(P	2.197E+00	6.56E-01	G K
		92.80	1.725E+00	(P	1.728E+00	5.34E-01	G
		92.38	1.903E+00	(P	2.060E+00	6.33E-01	G
AM-241	-9.3186E-02						
		59.54	-9.319E-02	%(P	3.069E-01	9.23E-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	8.2547E-02	9.1567E-02	4.0885E-01	4.0888E-01	4.187E-01
K-40		1.4467E+01	1.4467E+01	1.7743E+00	1.9535E+00	
MN-54	#A	-1.4757E-02	-1.5021E-02	5.9532E-02	5.9538E-02	6.123E-02
CO-57	#B	2.1721E-03	2.2171E-03	4.5867E-02	4.5867E-02	5.035E-02
CO-60	#B	2.9100E-02	2.9184E-02	4.9571E-02	4.9598E-02	5.342E-02
Sr-85	#A	-1.8341E-02	-1.9976E-02	5.5898E-02	5.5910E-02	5.726E-02
Kr-85	#A	-4.4988E+02	-4.4991E+02	1.3330E+03	1.3332E+03	1.327E+03
Y-88	#B	0.0000E+00	0.0000E+00	9.7036E-03	9.7053E-03	2.263E-02
NB-94	#B	8.9396E-03	8.9396E-03	4.0576E-02	4.0580E-02	4.713E-02
Ag-108M	#B	6.2877E-03	6.2885E-03	4.7761E-02	4.7762E-02	5.548E-02
CD-109	#A	4.9235E-01	4.9840E-01	1.1222E+00	1.1225E+00	1.223E+00
SN-113	#B	-9.1848E-03	-9.6375E-03	6.6743E-02	6.6745E-02	7.217E-02
SB-125	#B	1.2402E-01	1.2470E-01	1.2154E-01	1.2174E-01	1.356E-01
I-131	#B	-6.1349E-03	-1.2216E-02	8.8791E-02	8.8793E-02	5.070E-02
CS-134	#B	2.5289E-02	2.5476E-02	2.0541E-02	2.0592E-02	5.686E-02
CS-137		2.1656E-01	2.1667E-01	9.6423E-02	9.7197E-02	
CE-139	#A	6.6626E-03	6.9364E-03	3.8291E-02	3.8293E-02	4.124E-02
EU-152	#B	6.9285E-03	6.9368E-03	1.3098E-01	1.3098E-01	1.466E-01
EU-154	#B	3.5321E-04	3.5384E-04	8.7799E-02	8.7799E-02	9.860E-02
EU-155	#B	8.6967E-03	8.7233E-03	1.6682E-01	1.6682E-01	1.855E-01
HG-203	#B	-8.0532E-03	-9.0696E-03	5.1350E-02	5.1352E-02	5.129E-02
TL-208		3.1918E-01	3.1918E-01	9.5903E-02	9.7584E-02	
PB-212	#	6.8883E-01	6.8883E-01	1.2626E-01	1.3212E-01	1.068E-01
PB-214	#	4.4198E-01	4.4198E-01	1.1759E-01	1.2022E-01	9.495E-02
BI-212	#	6.3078E-01	6.3078E-01	5.2633E-01	5.2754E-01	
BI-214		4.8786E-01	4.8786E-01	1.3668E-01	1.3943E-01	
RA-224	#A	1.2078E+00	1.2078E+00	1.1599E+00	1.1619E+00	1.243E+00
RA-226	#	1.3946E+00	1.3946E+00	1.2198E+00	1.2224E+00	1.303E+00
AC-228		9.4746E-01	9.4746E-01	2.2713E-01	2.3335E-01	
TH-227	#B	-5.1139E-02	-5.1139E-02	4.0376E-01	4.0377E-01	4.219E-01
PA-234	#B	-2.3686E-02	-2.3686E-02	1.7495E-01	1.7496E-01	1.951E-01
TH-234	#B	1.2070E+00	1.2070E+00	1.1203E+00	1.1223E+00	2.197E+00
AM-241	#A	-9.3183E-02	-9.3186E-02	2.8964E-01	2.8969E-01	3.069E-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) 1.7068575E+01 pCi/gm
Total Decayed Activity (270.1 to 1999.1 keV) 1.7068686E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
DAT

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 101F_7JULY2006_0933.An1

Sample description
FSS-OOL-11-02-013-F

Spectrum Filename: C:\GammaVision\Spectra\101F_7JULY2006_0933.An1

Acquisition information
Start time: 07-Jul-2006 09:33:16
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: 1.1230E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.1230E+03) =
8.9047E+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	29-Jun-2006 11:23:00
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: 0.2693

***** 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
74.81	116.	26.96	1.50	1.654E-02				
74.81	116.	26.96	1.50	1.654E-02	74.81	9.600	8.821E-01	PB212
77.08	157.	19.79	1.50	1.720E-02	77.11	10.700	1.028E+00	PB214
					77.11	17.500	PBC<MDA	PB212
77.08	161.	19.79	1.50	1.720E-02	77.11	10.700	1.028E+00	PB214
					77.11	17.500	6.434E-01	PB212
92.87	98.	28.05	1.58	1.990E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
					94.67	15.500	3.774E-01	PA234
186.15	119.	20.17	1.57	1.857E-02	185.99	3.280	2.343E+00	RA226
238.86	406.	5.57	1.12	1.557E-02	238.63	43.100	7.164E-01	PB212
242.27	50.	29.28	1.12	1.539E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	PBC<MDA	PB214
295.33	98.	16.80	1.14	1.292E-02	295.22	19.200	4.648E-01	PB214
338.89	94.	16.03	1.58	1.133E-02	338.40	12.010	8.061E-01	AC228
352.14	184.	11.00	1.18	1.092E-02	351.99	37.100	5.407E-01	PB214
510.66	80.	16.64	1.82	7.591E-03	510.72	22.500	4.522E-01	TL208
583.46	120.	15.06	1.07	6.681E-03	583.14	86.000	2.458E-01	TL208
609.63	139.	10.89	1.51	6.410E-03	609.32	46.090	5.614E-01	BI214
662.03	64.	19.23	1.97	5.934E-03	661.62	84.620	1.512E-01	CS137
911.65	84.	15.02	1.99	4.444E-03	911.07	29.000	7.702E-01	AC228
968.73	54.	20.39	1.01	4.212E-03	964.00	14.580	1.046E+00	EU152
					968.90	17.460	8.767E-01	AC228
1121.12	57.	20.83	1.78	3.711E-03	1120.28	15.040	1.221E+00	BI214
1461.33	316.	5.78	1.85	2.941E-03	1460.75	10.700	1.199E+01	K40
1764.96	25.	20.00	1.00	2.481E-03	1764.51	15.920	7.482E-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	
484.25	242.15	82.	50.	0.025	87.85	1.124	PB-214	lD
1324.14	662.03	58.	31.	0.016	115.37	1.969	CS-137	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	149.18	74.81	482.	116.	0.058	80.87	1.499
PB-214	153.79	77.11	431.	157.	0.079	59.37	1.499D
PB-212	153.79	77.11	427.	161.	0.080	59.37	1.499D
TH-234	185.23	92.82	382.	87.	0.043	89.29	1.499s
TH-234	185.19	92.80	364.	92.	0.046	87.26	1.499s
PA-234	185.15	92.78	284.	94.	0.047	82.04	1.499
RA-226	372.04	186.19	185.	96.	0.048	67.58	1.499s
PB-212	477.33	238.82	160.	328.	0.164	22.76	1.499
PB-214	590.78	295.52	67.	91.	0.045	48.49	1.499
AC-228	677.57	338.89	55.	91.	0.046	48.10	1.582s
PB-214	704.12	352.16	60.	150.	0.075	32.38	1.499
TL-208	1021.25	510.66	45.	64.	0.032	49.92	1.816s
TL-208	1166.93	583.46	60.	117.	0.059	45.19	1.073
BI-214	1219.30	609.63	31.	138.	0.069	32.66	1.508
CS-137	1324.51	662.21	32.	32.	0.016	89.86	1.499s
AC-228	1823.66	911.65	20.	83.	0.041	45.05	1.986s
AC-228	1937.87	968.73	21.	54.	0.027	61.18	1.006s
BI-214	2242.83	1121.12	21.	57.	0.028	62.50	1.775s
K-40	2923.68	1461.33	7.	314.	0.157	17.34	1.847
BI-214	3531.35	1764.96	0.	25.	0.012	60.00	0.999s

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 -  Average     ------------- Peak --------------
Name   Code  Activity     Energy   Activity Code MDA Value
             pCi/gm        keV     pCi/gm        pCi/gm         COMMENTS
 ____________________________________________________________________________

BE-7        -6.1829E-02
                           477.56-6.183E-02 %(  4.929E-01 1.40E-01 G

K-40         1.1990E+01
                          1460.75 1.199E+01  (P 5.841E-01 6.98E-01 G

MN-54       -1.3982E-02
                           834.81-1.398E-02 %(P 7.282E-02 2.07E-02 G

CO-57        2.6431E-03
                           122.07 2.643E-03 %(  5.072E-02 1.49E-02 G K
                           136.43-9.939E-02 %   4.264E-01 1.27E-01 G

CO-60        5.9870E-03
                          1332.51 5.987E-03 &(P 7.123E-02 1.91E-02 G K
                          1173.23-1.458E-02 % P 9.062E-02 2.56E-02 G K

Sr-85       -1.3634E-02
                           514.00-1.363E-02 %(  6.679E-02 1.95E-02 G

Kr-85       -3.3285E+02
                           513.99-3.329E+02 %(P 1.430E+03 4.13E+02 G

Y-88         0.0000E+00
                          1836.01 0.000E+00 %(  1.425E-01 3.89E-02 G K
                           898.02 1.563E-03 % P 6.346E-02 1.69E-02 G

NB-94       -7.0840E-03
                           871.10-7.084E-03 %(P 6.883E-02 1.92E-02 G K
                           702.50-6.021E-03 % P 5.786E-02 1.62E-02 G K

Ag-108M     -1.3849E-02
                           722.95-1.385E-02 &(  7.774E-02 2.24E-02 G K
                           614.37-3.131E-02 % P 8.244E-02 2.46E-02 G
                           433.93 2.100E-03 %   4.791E-02 1.34E-02 G

CD-109       4.8259E-02
                            88.04 4.826E-02 &(P 1.753E+00 5.19E-01 G

SN-113       1.6787E-02
                           391.71 1.679E-02 &(  7.711E-02 2.25E-02 G K
                           255.04 3.054E-02 % P 2.062E+00 5.93E-01 G
```

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	-5.6196E-03						
		427.95	-5.620E-03	%(P	1.598E-01	4.48E-02	G K
		600.77	2.827E-02	% P	2.466E-01	6.85E-02	G
		636.15	-4.587E-02	% P	5.149E-01	1.44E-01	G
		463.51	2.625E-01	% P	4.480E-01	1.37E-01	G
		176.29	-2.468E-01	& P	7.121E-01	2.12E-01	G
I-131	-1.3045E-02						
		364.48	-1.304E-02	&(	1.210E-01	3.49E-02	G K
		636.97	-1.386E-01	%	1.494E+00	4.18E-01	G
		284.29	-1.224E-02	%	1.443E+00	4.14E-01	G
CS-134	-1.2368E-03						
		604.66	-1.237E-03	%(P	5.445E-02	1.48E-02	G K
		795.76	4.038E-03	& P	7.583E-02	2.09E-02	G
		569.29	2.175E-03	% P	3.026E-01	8.22E-02	G
		801.84	-9.607E-04	&	5.918E-01	1.57E-01	G
CS-137	7.5814E-02						
		661.62	7.581E-02	(P	6.973E-02	2.33E-02	G
CE-139	5.8534E-04						
		165.85	5.853E-04	&(P	5.540E-02	1.62E-02	G
EU-152	2.3665E-02						
		121.78	2.367E-02	%(P	1.394E-01	4.12E-02	G K
		344.30	-4.031E-02	% P	1.724E-01	5.03E-02	G
		1408.08	-3.322E-03	% P	1.377E-01	1.87E-02	G
		964.00	-1.453E-02	% P	5.823E-01	1.60E-01	G
		1112.07	9.565E-02	% P	5.362E-01	1.51E-01	G
		778.90	3.913E-02	% P	4.338E-01	1.20E-01	G
EU-154	9.0769E-03						
		123.10	9.077E-03	&(P	1.095E-01	3.23E-02	G K
		1274.80	-4.652E-02	% P	2.565E-01	7.27E-02	G
		723.30	-4.068E-03	& P	4.071E-01	1.14E-01	G
		1004.80	6.682E-02	& P	3.709E-01	1.04E-01	G
EU-155	9.4862E-02						
		86.45	9.486E-02	%(	1.872E-01	5.68E-02	G K
		105.31	4.288E-03	&	2.277E-01	6.70E-02	G
HG-203	-5.7998E-03						
		279.17	-5.800E-03	&(	6.384E-02	1.86E-02	G K
		72.87	-6.815E-01	& P	1.625E+00	4.90E-01	G
		70.83	9.648E-01	%	2.615E+00	7.88E-01	G
		82.50	-6.630E-01	%	3.235E+00	9.66E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.4580E-01						
		583.14	2.458E-01	(P	8.096E-02	3.78E-02	G
		510.72	4.522E-01	+ P	2.389E-01	9.41E-02	G
PB-212	6.0400E-01						
		238.63	5.880E-01	(P	1.107E-01	4.54E-02	G K
							Energy duplication
		77.11	6.434E-01	(	3.957E-01	1.27E-01	G
		74.81	8.821E-01	& P	7.960E-01	2.49E-01	G
PB-214	4.4328E-01						
		351.99	4.453E-01	(P	1.157E-01	4.87E-02	G K
		295.22	4.393E-01	(P	1.981E-01	7.24E-02	G
							Energy duplication
		77.11	1.028E+00	+ P	6.499E-01	2.08E-01	G
		241.92	9.396E-02	% P	8.153E-01	2.41E-01	G
BI-212	1.3521E-01						
		727.17	1.352E-01	%(P	4.726E-01	1.37E-01	G K
		1620.56	7.704E-01	%	2.310E+00	6.69E-01	G
		785.42	8.843E-01	% P	2.859E+00	8.33E-01	G
BI-214	5.6141E-01						
		609.32	5.614E-01	(P	1.169E-01	6.16E-02	G K
		1764.51	7.482E-01	+ P	2.245E-01	1.52E-01	G
		1120.28	1.221E+00	+ P	5.230E-01	2.56E-01	G
RA-224	9.6010E-01						
		241.00	9.601E-01	%(P	1.408E+00	4.33E-01	G
RA-226	1.8898E+00						
		185.99	1.890E+00	(	1.303E+00	4.26E-01	G
AC-228	8.0939E-01						
		911.07	7.702E-01	(P	2.220E-01	1.18E-01	G K
		968.90	8.767E-01	@(P	3.972E-01	1.81E-01	G
		338.40	8.061E-01	*(P	3.281E-01	1.33E-01	G
TH-227	-1.9785E-01						
		236.00	-1.979E-01	%(P	5.157E-01	1.55E-01	G K
		256.25	-1.310E-01	% P	6.355E-01	1.86E-01	G
PA-234	2.1161E-01						
		98.44	1.176E-01	&(	1.773E-01	5.45E-02	G K
		946.00	-4.076E-02	%	3.282E-01	9.13E-02	G
		131.28	-1.416E-03	%	1.989E-01	5.80E-02	G
		94.67	3.638E-01	?(	3.141E-01	9.95E-02	G
		883.24	-4.667E-02	%	4.900E-01	1.35E-01	G
		926.70	6.889E-02	%	5.347E-01	1.48E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 5.260E-03 %   4.846E-01 1.33E-01 G

TH-234       1.2640E+00
                           63.29 2.985E-01 &(P 2.577E+00 7.61E-01 G K
                           92.80 1.853E+00 *(P 1.848E+00 5.75E-01 G
                           92.38 2.041E+00 *(P 2.213E+00 6.84E-01 G

AM-241      -6.4890E-03
                           59.54-6.489E-03 %(P 3.221E-01 9.45E-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

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

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	-5.5786E-02	-6.1829E-02	4.2008E-01	4.2010E-01	4.448E-01
K-40		1.1990E+01	1.1990E+01	2.0939E+00	2.2008E+00	
MN-54	#A	-1.3739E-02	-1.3982E-02	7.2265E-02	7.2269E-02	7.155E-02
CO-57	#B	2.5899E-03	2.6431E-03	4.4687E-02	4.4687E-02	4.970E-02
CO-60	#B	5.9699E-03	5.9870E-03	5.7224E-02	5.7225E-02	7.103E-02

Sr-85	#A	-1.2527E-02	-1.3634E-02	5.8364E-02	5.8369E-02	6.137E-02
Kr-85	#A	-3.3283E+02	-3.3285E+02	1.6117E+03	1.6118E+03	1.430E+03
Y-88	#B	0.0000E+00	0.0000E+00	1.1659E-01	1.1659E-01	1.353E-01
NB-94	#B	-7.0840E-03	-7.0840E-03	6.3406E-02	6.3408E-02	6.883E-02
Ag-108M	#B	-1.3847E-02	-1.3849E-02	6.7082E-02	6.7087E-02	7.773E-02
CD-109	#A	4.7678E-02	4.8259E-02	1.5565E+00	1.5565E+00	1.731E+00
SN-113	#B	1.6005E-02	1.6787E-02	6.7548E-02	6.7555E-02	7.352E-02
SB-125	#B	-5.5891E-03	-5.6196E-03	2.3032E-01	2.3032E-01	1.589E-01
I-131	#B	-6.5880E-03	-1.3045E-02	1.0484E-01	1.0485E-01	6.109E-02
CS-134	#B	-1.2278E-03	-1.2368E-03	2.2476E+00	2.2476E+00	5.406E-02
CS-137	#	7.5776E-02	7.5814E-02	7.0029E-02	7.0160E-02	6.970E-02
CE-139	#A	5.6242E-04	5.8534E-04	4.8508E-02	4.8508E-02	5.324E-02
EU-152	#B	2.3637E-02	2.3665E-02	1.2372E-01	1.2372E-01	1.393E-01
EU-154	#B	9.0609E-03	9.0769E-03	9.6771E-02	9.6772E-02	1.094E-01
EU-155	#B	9.4574E-02	9.4862E-02	1.7054E-01	1.7062E-01	1.866E-01
HG-203	#B	-5.1548E-03	-5.7998E-03	5.5688E-02	5.5689E-02	5.674E-02
TL-208		2.4580E-01	2.4580E-01	1.1334E-01	1.1418E-01	
PB-212	#	6.0400E-01	6.0400E-01	1.4005E-01	1.4415E-01	1.107E-01
PB-214	#	4.4328E-01	4.4328E-01	1.3150E-01	1.3387E-01	1.157E-01
BI-212	#B	1.3521E-01	1.3521E-01	4.1010E-01	4.1017E-01	4.726E-01
BI-214		5.6141E-01	5.6141E-01	1.8483E-01	1.8754E-01	
RA-224	#A	9.6010E-01	9.6010E-01	1.2997E+00	1.3009E+00	1.408E+00
RA-226	#	1.8898E+00	1.8898E+00	1.2771E+00	1.2815E+00	1.303E+00
AC-228		8.0939E-01	8.0939E-01	2.4715E-01	2.5135E-01	
TH-227	#B	-1.9785E-01	-1.9785E-01	4.7957E-01	4.7970E-01	5.157E-01
PA-234	#F	2.1161E-01	2.1161E-01	1.7073E-01	1.7113E-01	1.773E-01
TH-234	#B	1.2640E+00	1.2640E+00	1.1772E+00	1.1792E+00	2.577E+00
AM-241	#A	-6.4887E-03	-6.4890E-03	9.2488E-01	9.2488E-01	3.221E-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 1999.1 keV) 1.3607065E+01 pCi/gm
Total Decayed Activity (50.2 to 1999.1 keV) 1.3607065E+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_7JULY2006_1140.An1

Sample description
FSS-OOL-11-02-010-F

Spectrum Filename: C:\GammaVision\Spectra\101F_7JULY2006_1140.An1

Acquisition information
Start time: 07-Jul-2006 11:40:24
Live time: 2000
Real time: 2003
Dead time: 0.13 %
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: 2.0990E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 2.0990E+03) =
4.7642E+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	29-Jun-2006 15:35:00
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: 0.2807

***** 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
69.51	105.	40.96	1.50	1.512E-02	70.83	3.520	PBC<MDA	HG203
74.80	191.	27.52	1.50	1.654E-02				
74.80	191.	27.52	1.50	1.654E-02	74.81	9.600	7.727E-01	PB212
77.17	398.	13.20	1.50	1.720E-02	77.11	10.700	1.391E+00	PB214
					77.11	17.500	8.506E-01	PB212
77.17	401.	13.20	1.50	1.720E-02	77.11	10.700	1.391E+00	PB214
					77.11	17.500	8.585E-01	PB212
84.21	69.	37.72	0.00	1.874E-02				
87.20	196.	17.36	1.01	1.921E-02	86.45	32.740	2.026E-01	EU155
90.37	99.	30.81	1.02	1.962E-02	88.04	3.790	PBC<MDA	CD109
93.35	142.	21.23	1.02	1.995E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.02	158.	23.62	1.06	1.858E-02	185.99	3.280	1.664E+00	RA226
209.38	121.	30.30	1.30	1.721E-02				
238.89	935.	3.91	1.12	1.556E-02	238.63	43.100	8.906E-01	PB212
241.62	129.	20.99	1.12	1.541E-02	241.00	3.900	1.366E+00	RA224
270.07	79.	27.20	1.10	1.401E-02				
277.55	58.	37.27	1.65	1.367E-02				
295.37	192.	12.46	1.18	1.291E-02	295.22	19.200	4.934E-01	PB214
300.44	57.	32.68	1.27	1.271E-02				
328.45	62.	36.76	1.08	1.168E-02				
338.55	225.	13.67	1.14	1.134E-02	338.40	12.010	1.050E+00	AC228
352.09	305.	9.30	1.18	1.092E-02	351.99	37.100	4.810E-01	PB214
463.32	51.	30.38	0.99	8.345E-03				
463.32	51.	30.38	0.99	8.345E-03	463.51	10.000	PBC<MDA	SB125
510.60	123.	20.36	0.75	7.592E-03	510.72	22.500	4.040E-01	TL208
583.53	240.	10.00	1.01	6.680E-03	583.14	86.000	2.666E-01	TL208

609.66	226.	10.84	1.25	6.409E-03	609.32	46.090	4.910E-01	BI214
662.10	62.	25.09	1.02	5.933E-03	661.62	84.620	7.835E-02	CS137
727.51	69.	28.47	0.84	5.441E-03	727.17	11.800	6.849E-01	BI212
911.60	159.	11.37	1.40	4.444E-03	911.07	29.000	7.845E-01	AC228
964.93	45.	23.38	1.61	4.228E-03	964.00	14.580	PBC<MDA	EU152
969.29	112.	11.77	1.62	4.211E-03	968.90	17.460	9.705E-01	AC228
1120.65	37.	29.86	1.40	3.710E-03	1120.28	15.040	4.259E-01	BI214

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1461.37	853.	3.53	1.89	2.941E-03	1460.75	10.700	1.740E+01	K40
1765.33	30.	19.79	1.68	2.481E-03	1764.51	15.920	4.965E-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	
180.31	90.36	414.	99.	0.049	92.44	1.016	PB-214	lD
186.27	93.35	417.	128.	0.064	72.91	1.018	U-235	D
418.43	209.38	454.	121.	0.061	90.91	1.305	AC-228	sM
477.48	238.99	201.	935.	0.467	11.73	1.122	PB-212	D
482.94	241.72	299.	129.	0.064	62.96	1.124	PB-214	D
539.87	270.07	174.	79.	0.040	81.61	1.103	AC-228	s
554.82	277.55	180.	64.	0.032	95.95	1.652	NP-239	s
600.63	300.44	140.	57.	0.029	98.04	1.274	PB-212	s
656.67	328.45	183.	62.	0.031	110.29	1.075	RH-106M	s
1930.84	964.86	30.	48.	0.024	65.25	1.613	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
HG-203	138.58	69.51	880.	105.	0.053	122.88	1.499s
PB-212	149.17	74.80	1359.	191.	0.095	82.56	1.499
PB-214	153.79	77.11	1207.	398.	0.199	39.59	1.499D
PB-212	153.79	77.11	1203.	401.	0.201	39.59	1.499D
EU-155	173.94	87.18	1182.	166.	0.083	91.04	1.499
TH-234	186.02	93.22	1044.	118.	0.059	109.43	1.499
RA-226	371.92	186.13	576.	118.	0.059	90.74	1.499s
PB-212	477.42	238.86	494.	711.	0.356	17.21	1.499
PB-214	590.55	295.40	209.	193.	0.097	37.97	1.499
AC-228	676.88	338.55	227.	222.	0.111	41.01	1.138
PB-214	704.13	352.17	170.	264.	0.132	27.68	1.499
SB-125	926.87	463.49	111.	41.	0.021	113.92	1.499
TL-208	1021.14	510.60	165.	107.	0.054	61.08	0.746s
TL-208	1167.08	583.53	108.	238.	0.119	30.01	1.006
BI-214	1219.36	609.66	109.	225.	0.113	32.52	1.250s
CS-137	1324.29	662.10	60.	58.	0.029	76.97	1.018

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-212	1455.16	727.51	100.	68.	0.034	85.40	0.843s
AC-228	1823.56	911.60	58.	157.	0.079	34.12	1.397
AC-228	1938.21	968.90	31.	111.	0.055	35.27	1.616D
BI-214	2241.89	1120.65	38.	37.	0.018	89.57	1.403
K-40	2923.75	1461.37	16.	851.	0.425	10.59	1.892
BI-214	3532.10	1765.33	3.	30.	0.015	59.38	1.676

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		-7.6657E-02					
			477.56	-7.666E-02	%(	3.481E-01 1.02E-01	G
K-40		1.7396E+01					
			1460.75	1.740E+01	(P	4.399E-01 6.16E-01	G
MN-54		-5.6968E-04					
			834.81	-5.697E-04	%(P	5.756E-02 1.63E-02	G
CO-57		2.3001E-04					
			122.07	2.300E-04	%(	4.587E-02 1.36E-02	G K
			136.43	6.908E-02	%	2.929E-01 8.76E-02	G
CO-60		-1.7543E-04					
			1332.51	-1.754E-04	&(P	5.457E-02 1.49E-02	G K
			1173.23	-7.439E-04	& P	7.661E-02 2.18E-02	G K
Sr-85		-1.5558E-02					
			514.00	-1.556E-02	%(	5.597E-02 1.67E-02	G
Kr-85		-3.5361E+02					
			513.99	-3.536E+02	%(P	1.193E+03 3.54E+02	G
Y-88		-4.3622E-03					
			1836.01	-4.362E-03	%(	4.678E-02 1.24E-02	G K
			898.02	1.652E-02	% P	4.013E-02 1.20E-02	G
NB-94		-1.8554E-04					
			871.10	-1.855E-04	&(P	6.079E-02 1.73E-02	G K
			702.50	-1.461E-03	% P	4.489E-02 1.27E-02	G K

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Ag-108M	-1.0113E-02						
		722.95	-1.011E-02	&(	6.725E-02	1.97E-02	G K
		614.37	-2.492E-02	% P	6.065E-02	1.83E-02	G
		433.93	7.997E-03	%	4.490E-02	1.32E-02	G
CD-109	2.3944E-02						
		88.04	2.394E-02	%(P	1.460E+00	4.36E-01	G
SN-113	-6.6306E-03						
		391.71	-6.631E-03	&(	6.787E-02	1.99E-02	G K
		255.04	4.171E-01	& P	1.674E+00	4.99E-01	G
SB-125	5.3105E-02						
		427.95	-3.661E-02	%(P	1.398E-01	4.14E-02	G K
		600.77	3.424E-02	% P	2.308E-01	6.70E-02	G
		636.15	1.326E-01	% P	2.890E-01	8.73E-02	G
		463.51	3.187E-01	(P	4.011E-01	1.25E-01	G
		176.29	-8.585E-02	& P	6.257E-01	1.86E-01	G
I-131	3.1856E-02						
		364.48	3.186E-02	%(	8.197E-02	2.46E-02	G K
		636.97	-1.186E-01	%	1.084E+00	3.11E-01	G
		284.29	-4.997E-02	&	1.268E+00	3.73E-01	G
CS-134	-1.5755E-02						
		604.66	-1.576E-02	%(P	5.171E-02	1.53E-02	G K
		795.76	2.904E-02	% P	5.708E-02	1.74E-02	G
		569.29	-2.966E-02	& P	2.810E-01	8.10E-02	G
		801.84	-1.108E-01	&	5.992E-01	1.74E-01	G
CS-137	7.4634E-02						
		661.62	7.463E-02	(P	4.967E-02	1.95E-02	G
CE-139	7.9005E-04						
		165.85	7.900E-04	%(P	5.177E-02	1.54E-02	G
EU-152	2.3664E-03						
		121.78	2.366E-03	%(P	1.461E-01	4.35E-02	G K
		344.30	-3.478E-02	% P	1.483E-01	4.40E-02	G
		1408.08	2.381E-02	% P	2.198E-01	6.03E-02	G
		964.00	2.565E-04	% P	5.844E-01	1.69E-01	G
		1112.07	1.636E-02	% P	4.866E-01	1.38E-01	G
		778.90	3.547E-02	& P	3.573E-01	1.02E-01	G
EU-154	-4.0264E-04						
		123.10	-4.026E-04	&(P	1.090E-01	3.25E-02	G K
		1274.80	1.044E-02	& P	1.839E-01	5.18E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		723.30	-6.184E-02	& P	3.177E-01	9.33E-02	G
		1004.80	-3.586E-02	% P	3.221E-01	9.21E-02	G
EU-155	1.7121E-01						
		86.45	1.712E-01	(	1.683E-01	5.20E-02	G K
		105.31	1.434E-02	%	2.061E-01	6.15E-02	G
HG-203	5.5207E-02						
		279.17	-4.287E-03	&(	5.544E-02	1.64E-02	G K
		72.87	-2.339E-01	% P	1.154E+00	3.46E-01	G
		70.83	1.433E+00	&(	1.915E+00	5.87E-01	G
		82.50	-1.313E+00	%	2.990E+00	9.06E-01	G
TL-208	2.6657E-01						
		583.14	2.666E-01	(P	5.726E-02	2.69E-02	G
		510.72	4.040E-01	+ P	2.357E-01	9.46E-02	G
PB-212	6.9852E-01						
		238.63	6.820E-01	(P	1.019E-01	3.95E-02	G K
							Energy duplication
		77.11	8.585E-01	+	3.514E-01	1.13E-01	G
		74.81	7.727E-01	?(P	7.076E-01	2.19E-01	G
PB-214	4.4766E-01						
		351.99	4.196E-01	(P	1.010E-01	3.90E-02	G K
		295.22	5.018E-01	(P	1.819E-01	6.41E-02	G
							Energy duplication
		77.11	1.391E+00	+ P	5.756E-01	1.85E-01	G
		241.92	1.843E-01	% P	6.836E-01	2.05E-01	G
BI-212	6.8486E-01						
		727.17	6.849E-01	(P	4.935E-01	1.97E-01	G K
		1620.56	3.351E-01	%	1.448E+00	4.05E-01	G
		785.42	8.305E-01	% P	2.525E+00	7.49E-01	G
BI-214	4.7939E-01						
		609.32	4.910E-01	@(P	1.117E-01	5.35E-02	G K
		1764.51	4.965E-01	(P	1.652E-01	9.97E-02	G
		1120.28	4.259E-01	(P	3.630E-01	1.28E-01	G
RA-224	-1.0097E-01						
		241.00	-1.010E-01	%(P	5.415E-01	1.58E-01	G
RA-226	1.2440E+00						
		185.99	1.244E+00	*(	1.209E+00	3.76E-01	G
AC-228	8.9491E-01						
		911.07	7.845E-01	(P	1.905E-01	9.03E-02	G K
		968.90	9.712E-01	(P	2.510E-01	1.15E-01	G
		338.40	1.050E+00	(P	3.441E-01	1.45E-01	G

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

TH-227      -7.8746E-02
                          236.00-7.875E-02 %(P 4.263E-01 1.27E-01 G K
                          256.25-4.099E-02 % P 5.735E-01 1.69E-01 G

PA-234       7.2739E-02
                           98.44 7.274E-02 %(  1.818E-01 5.50E-02 G K
                          946.00-5.653E-02 %   2.892E-01 8.42E-02 G
                          131.28 1.635E-02 %   2.143E-01 6.40E-02 G
                           94.67-1.537E-01 %   3.409E-01 1.03E-01 G
                          883.24 6.623E-02 %   3.754E-01 1.08E-01 G
                          926.70-7.252E-02 %   4.427E-01 1.27E-01 G
                          569.26-4.667E-02 &   4.259E-01 1.24E-01 G

TH-234       1.0029E+00
                           63.29 6.862E-01 %(P 2.164E+00 6.51E-01 G K
                           92.80 1.102E+00 % P 1.649E+00 5.03E-01 G
                           92.38 1.484E+00  (P 1.934E+00 5.91E-01 G

AM-241      -1.4777E-02
                           59.54-1.478E-02 %(P 2.974E-01 8.86E-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	-6.9242E-02	-7.6657E-02	3.0565E-01	3.0568E-01	3.144E-01
K-40		1.7396E+01	1.7396E+01	1.8467E+00	2.0920E+00	
MN-54	#A	-5.5986E-04	-5.6968E-04	4.0855E-02	4.0855E-02	5.656E-02
CO-57	#B	2.2543E-04	2.3001E-04	4.0877E-02	4.0877E-02	4.496E-02
CO-60	#B	-1.7493E-04	-1.7543E-04	7.7330E-03	7.7330E-03	5.441E-02
Sr-85	#A	-1.4308E-02	-1.5558E-02	4.9980E-02	4.9988E-02	5.147E-02
Kr-85	#A	-3.5359E+02	-3.5361E+02	1.2112E+03	1.2114E+03	1.193E+03
Y-88	#B	-4.1455E-03	-4.3622E-03	3.7094E-02	3.7094E-02	4.445E-02
NB-94	#B	-1.8554E-04	-1.8554E-04	1.3831E-02	1.3831E-02	6.079E-02
Ag-108M	#B	-1.0112E-02	-1.0113E-02	5.9034E-02	5.9037E-02	6.725E-02
CD-109	#A	2.3659E-02	2.3944E-02	1.3075E+00	1.3075E+00	1.442E+00
SN-113	#B	-6.3249E-03	-6.6306E-03	5.9694E-02	5.9695E-02	6.474E-02
SB-125	#B	5.2820E-02	5.3105E-02	6.2629E-02	6.2701E-02	1.391E-01
I-131	#B	1.6209E-02	3.1856E-02	7.3905E-02	7.3927E-02	4.171E-02
CS-134	#B	-1.5642E-02	-1.5755E-02	4.9820E-02	4.9828E-02	5.133E-02
CS-137		7.4597E-02	7.4634E-02	5.8317E-02	5.8470E-02	
CE-139	#A	7.5945E-04	7.9005E-04	4.6110E-02	4.6110E-02	4.976E-02
EU-152	#B	2.3636E-03	2.3664E-03	1.3052E-01	1.3052E-01	1.460E-01
EU-154	#B	-4.0194E-04	-4.0264E-04	3.7215E-01	3.7215E-01	1.088E-01
EU-155	#	1.7070E-01	1.7121E-01	1.5587E-01	1.5616E-01	1.678E-01
HG-203	#B	4.9132E-02	5.5207E-02	6.7839E-02	6.7911E-02	4.934E-02
TL-208		2.6657E-01	2.6657E-01	8.0797E-02	8.2189E-02	
PB-212	#	6.9852E-01	6.9852E-01	1.2122E-01	1.2749E-01	1.019E-01
PB-214	#	4.4766E-01	4.4766E-01	1.0608E-01	1.0905E-01	1.010E-01
BI-212		6.8486E-01	6.8486E-01	5.9067E-01	5.9193E-01	
BI-214		4.7939E-01	4.7939E-01	1.5665E-01	1.5898E-01	
RA-224	#A	-1.0097E-01	-1.0097E-01	5.5235E-01	5.5238E-01	5.415E-01
RA-226	#	1.2439E+00	1.2440E+00	1.1288E+00	1.1309E+00	1.209E+00
AC-228		8.9491E-01	8.9491E-01	1.9256E-01	1.9909E-01	
TH-227	#B	-7.8746E-02	-7.8746E-02	3.9815E-01	3.9817E-01	4.263E-01
PA-234	#B	7.2739E-02	7.2739E-02	1.6489E-01	1.6494E-01	1.818E-01
TH-234	#B	1.0029E+00	1.0029E+00	1.1988E+00	1.2001E+00	2.164E+00
AM-241	#A	-1.4777E-02	-1.4777E-02	3.4173E-01	3.4173E-01	2.974E-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_7JULY2006_1140.An1

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

Total Activity (1120.2 to 1999.1 keV) 1.9796278E+01 pCi/gm
Total Decayed Activity (1120.2 to 1999.1 keV) 1.9796314E+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_7JULY2006_1412.An1

Sample description
FSS-OOL-11-02-024-F

Spectrum Filename: C:\GammaVision\Spectra\101F_7JULY2006_1412.An1

Acquisition information
Start time: 07-Jul-2006 14:12:09
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: 1.6810E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.6810E+03) =
5.9488E+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	29-Jun-2006 13:52:00
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: 0.3082

***** 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
74.75	148.	26.51	1.50	1.654E-02	74.81	9.600	7.505E-01	PB212
77.13	180.	21.44	1.50	1.720E-02	77.11	10.700	7.864E-01	PB214
					77.11	17.500	PBC<MDA	PB212
77.13	184.	21.44	1.50	1.720E-02	77.11	10.700	7.864E-01	PB214
					77.11	17.500	4.907E-01	PB212
90.22	65.	38.37	1.02	1.960E-02				
92.98	96.	24.11	1.02	1.991E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
127.96	85.	36.79	1.13	2.111E-02				
186.16	77.	27.76	1.46	1.857E-02	185.99	3.280	1.016E+00	RA226
209.77	92.	27.27	0.80	1.719E-02				
238.87	520.	5.26	1.12	1.557E-02	238.63	43.100	6.148E-01	PB212
241.80	78.	26.78	1.12	1.541E-02	241.00	3.900	PBC<MDA	RA224
270.48	44.	39.21	1.02	1.399E-02				
295.52	122.	18.44	1.28	1.291E-02	295.22	19.200	3.902E-01	PB214
300.86	49.	39.34	1.08	1.269E-02				
338.89	103.	17.98	1.50	1.133E-02	338.40	12.010	5.946E-01	AC228
352.21	199.	9.76	1.11	1.092E-02	351.99	37.100	3.900E-01	PB214
510.95	75.	20.80	1.37	7.587E-03	510.72	22.500	2.795E-01	TL208
583.39	168.	11.63	1.24	6.682E-03	583.14	86.000	2.311E-01	TL208
600.02	26.	38.31	0.91	6.506E-03				
600.02	26.	38.31	0.91	6.506E-03	600.77	18.400	PBC<MDA	SB125
					604.66	97.600	3.209E-02	CS134
609.42	174.	10.24	1.71	6.412E-03	609.32	46.090	4.697E-01	BI214
662.02	122.	15.74	2.03	5.934E-03	661.62	84.620	1.932E-01	CS137
727.93	54.	26.94	1.11	5.438E-03	727.17	11.800	6.624E-01	BI212
911.60	84.	18.07	1.34	4.444E-03	911.07	29.000	5.152E-01	AC228

967.88	107.	14.97	1.55	4.216E-03	968.90	17.460	1.160E+00	AC228
1120.61	70.	21.48	1.30	3.710E-03	1120.28	15.040	1.009E+00	BI214
1461.44	547.	4.35	1.68	2.941E-03	1460.75	10.700	1.390E+01	K40
1764.88	27.	19.25	0.83	2.481E-03	1764.51	15.920	5.405E-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	
180.02	90.21	280.	65.	0.033	115.10	1.016	PB-214	lD
185.48	92.98	251.	88.	0.044	82.71	1.018	TH-234	D
255.52	127.96	371.	88.	0.044	97.94	1.127	AC-228	
419.22	209.77	218.	92.	0.046	81.81	0.797	NP-239	s
477.43	238.80	113.	520.	0.260	15.77	1.122	PB-212	D
483.30	241.73	182.	78.	0.039	80.34	1.124	PB-214	D
540.69	270.48	118.	44.	0.022	117.64	1.021	AC-228	s
601.47	300.86	129.	49.	0.024	118.01	1.079	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
PB-212	149.07	74.75	756.	148.	0.074	79.52	1.499
PB-214	153.79	77.11	688.	180.	0.090	64.32	1.499D
PB-212	153.79	77.11	684.	184.	0.092	64.32	1.499D
TH-234	185.55	92.99	580.	93.	0.046	106.93	1.499
RA-226	372.05	186.20	325.	91.	0.045	90.01	1.499s
PB-212	477.43	238.87	287.	382.	0.191	23.84	1.499
RA-224	483.48	241.89	323.	77.	0.038	103.71	1.499
PB-214	590.92	295.59	149.	122.	0.061	49.66	1.499
AC-228	677.57	338.89	98.	101.	0.050	53.94	1.499s
PB-214	704.30	352.25	97.	184.	0.092	31.35	1.499
TL-208	1021.85	510.95	82.	59.	0.030	62.40	1.369s
TL-208	1166.80	583.39	67.	165.	0.083	34.90	1.240
SB-125	1200.60	600.29	27.	24.	0.012	109.85	1.499
CS-134	1200.68	600.33	15.	26.	0.013	84.80	1.499s
BI-214	1218.88	609.42	47.	173.	0.086	30.73	1.710s
CS-137	1324.13	662.02	65.	121.	0.060	47.22	2.026s
BI-212	1456.01	727.93	49.	53.	0.026	80.81	1.107
AC-228	1823.55	911.60	44.	83.	0.041	54.22	1.338
AC-228	1936.17	967.88	40.	106.	0.053	44.92	1.545s
BI-214	2241.80	1120.61	41.	70.	0.035	64.45	1.305
K-40	2923.90	1461.44	9.	544.	0.272	13.06	1.678
BI-214	3531.19	1764.88	0.	27.	0.013	57.74	0.833s

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		0.0000E+00						
			477.56	0.000E+00	%(	5.024E-01	1.44E-01	G
K-40		1.3901E+01						
			1460.75	1.390E+01	(P	4.177E-01	6.08E-01	G
MN-54		-1.3669E-02						
			834.81	-1.367E-02	&(P	5.975E-02	1.73E-02	G
CO-57		2.7659E-03						
			122.07	2.766E-03	%(	4.831E-02	1.43E-02	G K
			136.43	-5.783E-02	%	4.078E-01	1.22E-01	G
CO-60		2.4328E-02						
			1332.51	2.433E-02	%(P	5.667E-02	1.70E-02	G K
			1173.23	2.625E-02	% P	8.097E-02	2.40E-02	G K
Sr-85		-1.8408E-02						
			514.00	-1.841E-02	%(	6.389E-02	1.90E-02	G
Kr-85		-4.1927E+02						
			513.99	-4.193E+02	%(P	1.360E+03	4.03E+02	G
Y-88		-4.2757E-03						
			1836.01	-4.276E-03	%(	4.357E-02	1.10E-02	G K
			898.02	-9.440E-04	% P	5.617E-02	1.54E-02	G
NB-94		2.0680E-03						
			871.10	2.068E-03	&(P	4.205E-02	1.15E-02	G K
			702.50	1.522E-02	% P	4.023E-02	1.20E-02	G K
Ag-108M		0.0000E+00						
			722.95	0.000E+00	&(	8.708E-02	2.51E-02	G K
			614.37	-2.876E-02	& P	5.771E-02	1.75E-02	G
			433.93	1.583E-02	&	3.588E-02	1.08E-02	G
CD-109		-7.6179E-02						
			88.04	-7.618E-02	%(P	1.507E+00	4.49E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SN-113	1.1200E-02						
		391.71	1.120E-02	%(	6.655E-02	1.95E-02	G K
		255.04	1.744E-01	% P	1.935E+00	5.69E-01	G
SB-125	3.5597E-02						
		427.95	-4.255E-02	%(P	1.385E-01	4.10E-02	G K
		600.77	1.613E-01	(P	1.823E-01	5.96E-02	G
		636.15	7.204E-04	% P	3.603E-01	9.96E-02	G
		463.51	3.034E-01	% P	4.306E-01	1.34E-01	G
		176.29	-1.282E-01	& P	5.664E-01	1.68E-01	G
I-131	-5.3939E-03						
		364.48	-5.394E-03	%(	8.421E-02	2.42E-02	G K
		636.97	-2.028E-01	%	1.405E+00	4.06E-01	G
		284.29	2.494E-03	%	1.274E+00	3.70E-01	G
CS-134	3.2807E-02						
		604.66	3.281E-02	?(P	2.657E-02	9.50E-03	G K
		795.76	-2.806E-03	% P	6.233E-02	1.74E-02	G
		569.29	2.608E-02	& P	2.653E-01	7.54E-02	G
		801.84	1.329E-01	&	4.886E-01	1.42E-01	G
CS-137	1.9325E-01						
		661.62	1.932E-01	(P	6.461E-02	3.06E-02	G
CE-139	-1.8686E-03						
		165.85	-1.869E-03	%(P	4.790E-02	1.41E-02	G
EU-152	1.5306E-03						
		121.78	1.531E-03	%(P	1.248E-01	3.68E-02	G K
		344.30	-5.032E-02	% P	1.487E-01	4.43E-02	G
		1408.08	5.597E-02	% P	2.345E-01	6.62E-02	G
		964.00	-6.468E-02	% P	5.057E-01	1.45E-01	G
		1112.07	-5.642E-03	& P	4.308E-01	1.18E-01	G
		778.90	-1.185E-03	& P	3.311E-01	9.04E-02	G
EU-154	-1.3242E-02						
		123.10	-1.324E-02	%(P	8.425E-02	2.50E-02	G K
		1274.80	-1.541E-02	& P	1.773E-01	4.92E-02	G
		723.30	2.041E-04	% P	2.924E-01	8.25E-02	G
		1004.80	8.409E-02	& P	2.782E-01	8.12E-02	G
EU-155	8.7982E-02						
		86.45	8.798E-02	%(	1.620E-01	4.93E-02	G K
		105.31	4.519E-02	&	1.931E-01	5.78E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
HG-203	1.2404E-03						
		279.17	1.240E-03	%(	5.408E-02	1.58E-02	G K
		72.87	-3.595E-01	% P	1.312E+00	3.94E-01	G
		70.83	-1.743E-01	&	2.260E+00	6.74E-01	G
		82.50	-3.896E-01	&	2.689E+00	8.03E-01	G
TL-208	2.4109E-01						
		583.14	2.311E-01	(P	5.704E-02	2.73E-02	G
		510.72	2.795E-01	*(P	2.109E-01	7.39E-02	G
PB-212	4.6682E-01						
		238.63	4.571E-01	(P	9.779E-02	3.69E-02	G K
							Energy duplication
		77.11	4.907E-01	(	3.328E-01	1.05E-01	G
		74.81	7.505E-01	& P	6.625E-01	2.06E-01	G
PB-214	3.7487E-01						
		351.99	3.644E-01	(P	9.664E-02	3.85E-02	G K
		295.22	3.950E-01	(P	1.934E-01	6.63E-02	G
							Energy duplication
		77.11	7.864E-01	+ P	5.457E-01	1.72E-01	G
		241.92	-1.779E-01	% P	6.110E-01	1.83E-01	G
BI-212	6.6241E-01						
		727.17	6.624E-01	(P	4.425E-01	1.81E-01	G K
		1620.56	-1.667E-01	&	2.033E+00	5.44E-01	G
		785.42	1.859E-01	% P	2.435E+00	6.84E-01	G
BI-214	4.8789E-01						
		609.32	4.697E-01	@(P	9.455E-02	4.85E-02	G K
		1764.51	5.405E-01	(P	1.500E-01	1.06E-01	G
		1120.28	1.009E+00	+ P	4.687E-01	2.18E-01	G
RA-224	1.0273E+00						
		241.00	1.027E+00	(P	1.153E+00	3.58E-01	G
RA-226	1.1964E+00						
		185.99	1.196E+00	(	1.144E+00	3.59E-01	G
AC-228	5.3841E-01						
		911.07	5.152E-01	(P	2.104E-01	9.53E-02	G K
		968.90	1.160E+00	+ P	3.514E-01	1.75E-01	G
		338.40	5.946E-01	(P	2.883E-01	1.09E-01	G
TH-227	7.7316E-03						
		236.00	7.732E-03	%(P	4.388E-01	1.30E-01	G K
		256.25	4.201E-02	% P	5.360E-01	1.57E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PA-234	1.6719E-03						
		98.44	1.672E-03	&(	1.734E-01	5.14E-02	G K
		946.00	8.116E-03	%	2.648E-01	7.32E-02	G
		131.28	-1.304E-02	%	2.091E-01	6.21E-02	G
		94.67	-5.808E-02	%	3.099E-01	9.27E-02	G
		883.24	6.476E-02	&	4.008E-01	1.14E-01	G
		926.70	9.096E-02	&	4.652E-01	1.33E-01	G
		569.26	4.347E-02	&	3.890E-01	1.11E-01	G
TH-234	6.9967E-01						
		63.29	2.753E-01	%(P	1.992E+00	5.91E-01	G K
		92.80	1.251E+00	(P	1.549E+00	4.76E-01	G
		92.38	1.345E+00	% P	1.863E+00	5.69E-01	G
AM-241	4.0773E-03						
		59.54	4.077E-03	&(P	2.719E-01	8.04E-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	

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

Nuclide		Time of Count Activity 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	4.3107E-01	4.3107E-01	4.528E-01
K-40		1.3901E+01	1.3901E+01	1.8227E+00	1.9848E+00	
MN-54	#A	-1.3428E-02	-1.3669E-02	5.7629E-02	5.7634E-02	5.869E-02
CO-57	#B	2.7096E-03	2.7659E-03	4.2996E-02	4.2996E-02	4.733E-02
CO-60	#B	2.4258E-02	2.4328E-02	5.1046E-02	5.1064E-02	5.650E-02
Sr-85	#A	-1.6897E-02	-1.8408E-02	5.7008E-02	5.7017E-02	5.864E-02
Kr-85	#A	-4.1925E+02	-4.1927E+02	1.3887E+03	1.3889E+03	1.360E+03
Y-88	#B	-4.0586E-03	-4.2757E-03	3.3022E-02	3.3023E-02	4.136E-02
NB-94	#B	2.0680E-03	2.0680E-03	3.4414E-02	3.4415E-02	4.205E-02
Ag-108M	#B	0.0000E+00	0.0000E+00	7.5272E-02	7.5272E-02	8.707E-02
CD-109	#A	-7.5251E-02	-7.6179E-02	1.5447E+00	1.5447E+00	1.489E+00
SN-113	#B	1.0673E-02	1.1200E-02	5.8456E-02	5.8460E-02	6.341E-02
SB-125	#B	3.5402E-02	3.5597E-02	3.9477E-02	3.9529E-02	1.378E-01
I-131	#B	-2.7030E-03	-5.3939E-03	7.2678E-02	7.2679E-02	4.220E-02
CS-134	#	3.2566E-02	3.2807E-02	2.8496E-02	2.8556E-02	2.637E-02
CS-137		1.9315E-01	1.9325E-01	9.1917E-02	9.2564E-02	
CE-139	#A	-1.7946E-03	-1.8686E-03	5.1070E-02	5.1070E-02	4.601E-02
EU-152	#B	1.5287E-03	1.5306E-03	1.1043E-01	1.1043E-01	1.246E-01
EU-154	#B	-1.3218E-02	-1.3242E-02	8.5387E-02	8.5390E-02	8.410E-02
EU-155	#B	8.7713E-02	8.7982E-02	1.4780E-01	1.4788E-01	1.615E-01
HG-203	#B	1.1010E-03	1.2404E-03	4.7315E-02	4.7315E-02	4.800E-02
TL-208		2.4109E-01	2.4109E-01	8.5348E-02	8.6428E-02	
PB-212	#	4.6682E-01	4.6682E-01	1.1306E-01	1.1610E-01	9.779E-02
PB-214	#	3.7487E-01	3.7487E-01	1.1156E-01	1.1355E-01	9.664E-02
BI-212		6.6241E-01	6.6241E-01	5.4217E-01	5.4346E-01	
BI-214		4.8789E-01	4.8789E-01	1.5091E-01	1.5341E-01	
RA-224	#A	1.0273E+00	1.0273E+00	1.0753E+00	1.0769E+00	1.153E+00
RA-226	#	1.1964E+00	1.1964E+00	1.0769E+00	1.0790E+00	1.144E+00
AC-228		5.3841E-01	5.3841E-01	2.1046E-01	2.1264E-01	
TH-227	#B	7.7316E-03	7.7316E-03	3.8852E-01	3.8852E-01	4.388E-01
PA-234	#B	1.6719E-03	1.6719E-03	1.5411E-01	1.5411E-01	1.734E-01
TH-234	#B	6.9967E-01	6.9967E-01	7.9794E-01	7.9888E-01	1.992E+00
AM-241	#A	4.0771E-03	4.0773E-03	2.4120E-01	2.4120E-01	2.718E-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) 1.6023760E+01 pCi/gm
Total Decayed Activity (270.1 to 1999.1 keV) 1.6023857E+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_5JUL2006_1759.An1

Sample description
FSS-OOL-11-02-008-F-S WET

Spectrum Filename: C:\GammaVision\Spectra\102F_5JUL2006_1759.An1

Acquisition information
Start time: 05-Jul-2006 17:59:19
Live time: 2000
Real time: 2021
Dead time: 1.04 %
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: 1.6900E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.6900E+03) =
5.9172E+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	29-Jun-2006 16:00:00
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. 14 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.6893

***** 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
74.26	105.	29.04	1.10	8.817E-03				
74.26	105.	29.04	1.10	8.817E-03	74.81	9.600	PBC<MDA	PB212
77.36	209.	14.52	1.10	9.745E-03	77.11	10.700	1.641E+00	PB214
					77.11	17.500	1.003E+00	PB212
129.58	88.	41.42	1.04	1.717E-02				
186.28	99.	21.91	1.18	1.627E-02	185.99	3.280	1.421E+00	RA226
231.69	51.	36.81	1.50	1.393E-02	236.00	11.200	PBC<MDA	TH227
239.19	794.	5.89	1.20	1.378E-02	238.63	43.100	1.066E+00	PB212
					241.92	7.470	6.221E+00	PB214
270.50	71.	31.68	1.33	1.242E-02				
295.65	159.	10.40	1.25	1.145E-02	295.22	19.200	5.788E-01	PB214
300.09	40.	32.60	1.26	1.129E-02				
339.10	155.	14.73	1.17	1.004E-02	338.40	12.010	1.023E+00	AC228
352.42	223.	11.56	1.40	9.667E-03	351.99	37.100	4.966E-01	PB214
463.50	37.	37.03	1.50	7.365E-03	463.51	10.000	PBC<MDA	SB125
511.25	113.	16.44	2.18	6.688E-03	510.72	22.500	6.020E-01	TL208
583.95	195.	9.93	1.43	5.882E-03	583.14	86.000	3.072E-01	TL208
610.03	143.	12.58	1.45	5.643E-03	609.32	46.090	4.401E-01	BI214
662.44	98.	23.24	1.43	5.223E-03	661.62	84.620	1.768E-01	CS137
728.58	67.	19.63	1.97	4.786E-03	727.17	11.800	9.456E-01	BI212
912.61	127.	11.92	1.75	3.916E-03	911.07	29.000	8.913E-01	AC228
970.07	124.	12.02	1.53	3.714E-03	968.90	17.460	1.529E+00	AC228
1121.71	54.	30.25	1.38	3.280E-03	1120.28	15.040	8.745E-01	BI214
1462.72	599.	4.12	1.91	2.618E-03	1460.75	10.700	1.708E+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	
148.10	74.71	413.	105.	0.053	87.11	1.098	BI-207	D
154.30	77.81	358.	209.	0.105	43.55	1.100	PB-214	D
258.75	129.58	490.	88.	0.044	124.27	1.040	AC-228	l
478.01	239.19	1050.	141.	0.070	101.06	1.201	PB-212	s
540.63	270.50	174.	71.	0.036	95.05	1.329	AC-228	s
599.83	300.06	63.	40.	0.020	97.80	1.258	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	149.05	74.74	930.	114.	0.057	114.08	1.500
PB-214	153.80	77.11	913.	175.	0.087	76.86	1.500D
PB-212	153.80	77.11	913.	175.	0.087	76.86	1.500D
RA-226	371.59	185.99	184.	95.	0.048	64.55	1.178D
TH-227	463.02	231.69	153.	51.	0.025	110.44	1.500
PB-212	477.67	239.02	380.	607.	0.303	18.28	1.500s
PB-214	477.72	239.04	272.	571.	0.285	17.55	1.500
PB-214	590.87	295.61	139.	156.	0.078	39.93	1.500
AC-228	677.88	339.10	125.	155.	0.077	44.18	1.165s
PB-214	704.65	352.48	118.	207.	0.103	30.48	1.500s
SB-125	926.76	463.50	86.	37.	0.019	111.10	1.500s
TL-208	1022.28	511.25	76.	113.	0.057	49.33	2.180s
TL-208	1167.74	583.95	60.	195.	0.097	29.79	1.427
BI-214	1219.91	610.03	63.	143.	0.072	37.75	1.452
CS-137	1324.77	662.44	95.	98.	0.049	69.73	1.429
BI-212	1457.11	728.58	39.	67.	0.033	58.89	1.972s
AC-228	1825.36	912.61	34.	127.	0.063	35.75	1.751
AC-228	1940.34	970.07	31.	124.	0.062	36.05	1.528
BI-214	2243.82	1121.71	56.	54.	0.027	90.74	1.384
K-40	2926.36	1462.72	3.	599.	0.300	12.36	1.910

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		5.7287E-02					
			477.56	5.729E-02	&(	4.922E-01 1.42E-01	G
K-40		1.7082E+01					
			1460.75	1.708E+01	(P	3.055E-01 7.04E-01	G
MN-54		-3.8762E-03					
			834.81	-3.876E-03	%(P	6.020E-02 1.68E-02	G
CO-57		4.4622E-03					
			122.07	4.462E-03	&(	5.808E-02 1.72E-02	G K
			136.43	-3.837E-03	&	4.649E-01 1.38E-01	G
CO-60		-3.6963E-03					
			1332.51	-3.696E-03	%(P	7.404E-02 2.04E-02	G K
			1173.23	0.000E+00	%	9.302E-02 2.61E-02	G K
Sr-85		-9.5745E-03					
			514.00	-9.575E-03	%(	5.483E-02 1.60E-02	G
Kr-85		-2.0593E+02					
			513.99	-2.059E+02	%(	1.186E+03 3.45E+02	G
Y-88		-2.5577E-05					
			1836.01	-2.558E-05	&(P	2.872E-02 3.90E-03	G K
			898.02	-1.338E-03	% P	7.786E-02 2.17E-02	G
NB-94		1.3206E-02					
			871.10	1.321E-02	%(	5.884E-02 1.70E-02	G K
			702.50	-6.491E-03	%	5.743E-02 1.64E-02	G K
Ag-108M		-4.5491E-05					
			722.95	-4.549E-05	%(	5.157E-02 1.41E-02	G K
			614.37	-1.572E-02	% P	7.094E-02 2.08E-02	G
			433.93	-2.048E-03	%	5.480E-02 1.58E-02	G
CD-109		8.2210E-01					
			88.04	8.221E-01	%(P	2.349E+00 7.09E-01	G
SN-113		-1.6854E-02					
			391.71	-1.685E-02	&(	7.728E-02 2.28E-02	G K
			255.04	-5.422E-01	%	2.131E+00 6.35E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	1.0559E-01						
		427.95	3.870E-03	%(P	1.462E-01	4.16E-02	G K
		600.77	-1.065E-03	% P	3.375E-01	9.61E-02	G
		636.15	6.159E-02	% P	4.651E-01	1.33E-01	G
		463.51	4.067E-01	*(P	4.996E-01	1.57E-01	G
		176.29	-2.782E-02	& P	7.621E-01	2.24E-01	G
I-131	1.2958E-04						
		364.48	1.296E-04	%(	9.529E-02	2.75E-02	G K
		636.97	1.656E-01	%	1.249E+00	3.59E-01	G
		284.29	2.339E-01	&	9.689E-01	2.86E-01	G
CS-134	4.5751E-04						
		604.66	4.575E-04	%(	5.781E-02	1.64E-02	G K
		795.76	3.512E-02	%	6.059E-02	1.87E-02	G
		569.29	-3.546E-02	%	3.297E-01	9.46E-02	G
		801.84	-7.743E-02	% P	6.613E-01	1.88E-01	G
CS-137	1.7679E-01						
		661.62	1.768E-01	(	8.709E-02	4.11E-02	G
CE-139	1.0240E-03						
		165.85	1.024E-03	%(P	6.683E-02	1.98E-02	G
EU-152	6.6665E-03						
		121.78	6.666E-03	%(P	1.832E-01	5.43E-02	G K
		344.30	-3.113E-02	%	1.738E-01	5.12E-02	G
		1408.08	1.377E-03	%	2.438E-01	6.27E-02	G
		964.00	-1.980E-02	% P	5.143E-01	1.44E-01	G
		1112.07	2.743E-02	&	4.899E-01	1.36E-01	G
		778.90	-9.063E-04	% P	3.899E-01	1.07E-01	G
EU-154	9.0875E-03						
		123.10	9.088E-03	%(P	1.077E-01	3.19E-02	G K
		1274.80	5.454E-02	&	2.056E-01	5.97E-02	G
		723.30	-1.362E-01	% P	3.202E-01	9.61E-02	G
		1004.80	-5.191E-02	%	3.737E-01	1.06E-01	G
EU-155	9.2481E-03						
		86.45	9.248E-03	%(P	2.553E-01	7.58E-02	G K
		105.31	5.594E-02	&	2.890E-01	8.65E-02	G
HG-203	1.8119E-03						
		279.17	1.812E-03	&(P	5.889E-02	1.72E-02	G K
		72.87	-4.094E-01	%	2.542E+00	7.62E-01	G
		70.83	-1.145E+00	&	4.755E+00	1.43E+00	G
		82.50	-9.268E-01	&	5.104E+00	1.53E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	3.0718E-01						
		583.14	3.072E-01	(P	6.145E-02	3.06E-02	G
		510.72	6.020E-01	+	2.295E-01	9.91E-02	G
PB-212	8.2119E-01						
		238.63	8.151E-01	@(	1.257E-01	4.97E-02	G K
							Energy duplication
		77.11	8.361E-01	(	6.873E-01	2.14E-01	G
		74.81	1.071E+00	& P	1.364E+00	4.18E-01	G
PB-214	4.9709E-01						
		351.99	4.602E-01	*(P	1.188E-01	4.68E-02	G K
		295.22	5.684E-01	(	2.092E-01	7.57E-02	G
							Energy duplication
		77.11	1.367E+00	+	1.124E+00	3.50E-01	G
		241.92	4.475E+00	+	6.242E-01	2.62E-01	G
BI-212	9.4563E-01						
		727.17	9.456E-01	(	4.502E-01	1.86E-01	G K
		1620.56	1.133E-02	& P	1.939E+00	4.85E-01	G
		785.42	1.892E-03	% P	2.950E+00	8.22E-01	G
BI-214	4.4008E-01						
		609.32	4.401E-01	(	1.216E-01	5.54E-02	G K
		1764.51	-1.956E-03	% P	1.663E-01	2.26E-02	G
		1120.28	8.745E-01	+	6.086E-01	2.65E-01	G
RA-224	6.7767E-01						
		241.00	6.777E-01	%(P	1.484E+00	4.49E-01	G
RA-226	1.4245E+00						
		185.99	1.425E+00	(P	9.879E-01	3.21E-01	G
AC-228	9.2990E-01						
		911.07	8.913E-01	(P	2.107E-01	1.07E-01	G K
		968.90	1.529E+00	+ P	3.521E-01	1.84E-01	G
		338.40	1.023E+00	*(	3.633E-01	1.51E-01	G
TH-227	2.6122E-01						
		236.00	2.612E-01	?(P	3.090E-01	9.67E-02	G K
		256.25	0.000E+00	&	6.796E-01	1.99E-01	G
PA-234	-1.1339E-02						
		98.44	-1.134E-02	&(	2.656E-01	7.89E-02	G K
		946.00	-6.805E-02	%	3.547E-01	1.03E-01	G
		131.28	6.138E-02	&	2.780E-01	8.33E-02	G
		94.67	-3.284E-02	%	4.597E-01	1.37E-01	G
		883.24	1.282E-01	%	5.384E-01	1.57E-01	G
		926.70	7.258E-02	&	5.879E-01	1.67E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-5.284E-02 %   4.865E-01 1.40E-01 G

TH-234       1.2501E+00
                           63.29 1.250E+00 %(P 5.002E+00 1.50E+00 G K
                           92.80 1.842E+00 %   2.743E+00 8.38E-01 G
                           92.38 1.533E-01 & P 3.073E+00 9.15E-01 G

AM-241      -1.0717E-01
                           59.54-1.072E-01 %(  8.150E-01 2.44E-01 G
   ( - This peak used in the nuclide activity average.

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

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

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** 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	5.2938E-02	5.7287E-02	4.2633E-01	4.2634E-01	4.549E-01
K-40		1.7082E+01	1.7082E+01	2.1125E+00	2.3198E+00	
MN-54	#A	-3.8242E-03	-3.8762E-03	6.2440E-02	6.2441E-02	5.939E-02
CO-57	#B	4.3930E-03	4.4622E-03	5.1702E-02	5.1703E-02	5.718E-02
CO-60	#B	-3.6882E-03	-3.6963E-03	6.8791E-02	6.8791E-02	7.387E-02

Sr-85	#A	-8.9717E-03	-9.5745E-03	4.7908E-02	4.7911E-02	5.138E-02
Kr-85	#A	-2.0592E+02	-2.0593E+02	1.0360E+03	1.0361E+03	1.186E+03
Y-88	#B	-2.4585E-05	-2.5577E-05	1.5346E-04	1.5347E-04	2.761E-02
NB-94	#B	1.3206E-02	1.3206E-02	5.1068E-02	5.1073E-02	5.884E-02
Ag-108M	#B	-4.5487E-05	-4.5491E-05	4.2440E-02	4.2440E-02	5.157E-02
CD-109	#A	8.1448E-01	8.2210E-01	2.1256E+00	2.1261E+00	2.328E+00
SN-113	#B	-1.6248E-02	-1.6854E-02	6.8364E-02	6.8371E-02	7.450E-02
SB-125	#B	1.0515E-01	1.0559E-01	1.2217E-01	1.2232E-01	1.456E-01
I-131	#B	7.6696E-05	1.2958E-04	8.2378E-02	8.2378E-02	5.640E-02
CS-134	#B	4.5495E-04	4.5751E-04	4.9122E-02	4.9122E-02	5.749E-02
CS-137		1.7672E-01	1.7679E-01	1.2327E-01	1.2367E-01	
CE-139	#A	9.9310E-04	1.0240E-03	5.9384E-02	5.9384E-02	6.481E-02
EU-152	#B	6.6604E-03	6.6665E-03	1.6304E-01	1.6304E-01	1.831E-01
EU-154	#B	9.0752E-03	9.0875E-03	9.5671E-02	9.5673E-02	1.076E-01
EU-155	#B	9.2266E-03	9.2481E-03	2.2747E-01	2.2747E-01	2.547E-01
HG-203	#B	1.6551E-03	1.8119E-03	5.1558E-02	5.1558E-02	5.380E-02
TL-208		3.0718E-01	3.0718E-01	9.1708E-02	9.3314E-02	
PB-212	#	8.2119E-01	8.2119E-01	1.5013E-01	1.5705E-01	1.257E-01
PB-214	#	4.9709E-01	4.9709E-01	1.2494E-01	1.2802E-01	1.188E-01
BI-212		9.4563E-01	9.4563E-01	5.5690E-01	5.5942E-01	
BI-214		4.4008E-01	4.4008E-01	1.6612E-01	1.6795E-01	
RA-224	#A	6.7767E-01	6.7767E-01	1.3472E+00	1.3478E+00	1.484E+00
RA-226		1.4245E+00	1.4245E+00	9.6274E-01	9.6605E-01	
AC-228		9.2990E-01	9.2990E-01	2.6441E-01	2.6951E-01	
TH-227	#A	2.6122E-01	2.6122E-01	2.9011E-01	2.9048E-01	3.090E-01
PA-234	#B	-1.1339E-02	-1.1339E-02	2.3682E-01	2.3682E-01	2.656E-01
TH-234	#B	1.2501E+00	1.2501E+00	4.5026E+00	4.5031E+00	5.002E+00
AM-241	#A	-1.0717E-01	-1.0717E-01	7.3054E-01	7.3056E-01	8.150E-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 (209.2 to 1999.0 keV) 2.1305790E+01 pCi/gm
Total Decayed Activity (209.2 to 1999.0 keV) 2.1305870E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
DAT

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 102F_6JUL2006_1750.An1

Sample description
FSS-OOL-11-02-015-F

Spectrum Filename: C:\GammaVision\Spectra\102F_6JUL2006_1750.An1

Acquisition information

Start time:	06-Jul-2006 17:50:26
Live time:	2000
Real time:	2017
Dead time:	0.85 %
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:	1.3360E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.3360E+03) = 7.4850E+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	29-Jun-2006 15:10:00
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: 0.6685

***** 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
77.23	158.	25.08	1.50	9.541E-03	77.11	10.700	1.568E+00	PB214
					77.11	17.500	9.589E-01	PB212
77.23	158.	25.08	1.50	9.541E-03	77.11	10.700	1.568E+00	PB214
					77.11	17.500	9.589E-01	PB212
86.94	112.	38.71	1.08	1.210E-02	86.45	32.740	PBC<MDA	EU155
93.26	94.	39.01	1.50	1.325E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
93.27	101.	37.16	1.50	1.333E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	2.552E+00	TH234
128.92	71.	37.23	0.70	1.714E-02				
186.48	134.	20.82	1.22	1.625E-02	185.99	3.280	2.462E+00	RA226
209.45	56.	37.34	0.83	1.518E-02				
239.21	600.	6.15	1.22	1.378E-02	238.63	43.100	1.020E+00	PB212
270.99	56.	34.97	1.18	1.240E-02				
295.79	128.	17.89	1.61	1.144E-02	295.22	19.200	5.872E-01	PB214
339.24	106.	19.56	1.21	1.004E-02	338.40	12.010	8.858E-01	AC228
352.69	160.	14.94	1.35	9.660E-03	351.99	37.100	4.491E-01	PB214
425.89	26.	33.93	1.50	7.972E-03	427.95	29.600	PBC<MDA	SB125
463.51	39.	33.91	0.91	7.365E-03	463.51	10.000	PBC<MDA	SB125
512.04	87.	19.57	1.09	6.678E-03	510.72	22.500	5.855E-01	TL208
583.98	185.	9.92	1.48	5.882E-03	583.14	86.000	3.686E-01	TL208
610.36	140.	11.53	1.56	5.640E-03	609.32	46.090	5.423E-01	BI214
662.79	237.	7.63	1.34	5.221E-03	661.62	84.620	5.420E-01	CS137
728.40	62.	23.81	1.96	4.794E-03	727.17	11.800	1.109E+00	BI212
795.87	22.	39.57	1.60	4.420E-03	795.76	85.400	PBC<MDA	CS134
912.68	110.	14.65	1.46	3.916E-03	911.07	29.000	9.745E-01	AC228
969.93	98.	15.08	2.19	3.714E-03	968.90	17.460	1.530E+00	AC228

1121.97	50.	24.24	1.66	3.283E-03	1120.28	15.040	1.028E+00	BI214
1463.07	462.	4.65	1.87	2.617E-03	1460.75	10.700	1.666E+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	
173.45	86.94	660.	112.	0.056	116.14	1.079	BI-207	l
257.43	128.92	271.	73.	0.036	102.47	0.702	AC-228	s
418.51	209.45	165.	56.	0.028	112.01	0.829	AC-228	s
541.62	270.99	139.	56.	0.028	104.92	1.185	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-214	153.80	77.11	709.	158.	0.079	75.23	1.500D
PB-212	153.80	77.11	709.	158.	0.079	75.23	1.500D
TH-234	186.10	93.26	646.	94.	0.047	117.03	1.500s
TH-234	186.12	93.27	652.	101.	0.050	111.48	1.500s
RA-226	372.40	186.39	284.	88.	0.044	82.59	1.500s
PB-212	477.68	239.02	269.	480.	0.240	19.93	1.500
PB-214	591.32	295.83	134.	113.	0.056	51.88	1.500s
AC-228	678.15	339.24	115.	106.	0.053	58.69	1.208
PB-214	704.99	352.66	96.	136.	0.068	39.78	1.500s
SB-125	851.51	425.89	28.	26.	0.013	101.78	1.500s
SB-125	926.77	463.51	82.	40.	0.020	102.98	1.500D
TL-208	1023.87	512.04	64.	87.	0.044	58.72	1.087s
TL-208	1167.79	583.98	46.	185.	0.092	29.76	1.479
BI-214	1220.57	610.36	37.	140.	0.070	34.60	1.559s
CS-137	1325.48	662.79	36.	237.	0.119	22.89	1.341
BI-212	1456.76	728.40	39.	62.	0.031	71.44	1.959s
CS-134	1591.77	795.87	28.	22.	0.011	118.72	1.601s
AC-228	1825.50	912.68	39.	110.	0.055	43.95	1.456s
AC-228	1940.07	969.93	29.	98.	0.049	45.23	2.193s
BI-214	2244.34	1121.97	29.	50.	0.025	72.73	1.664s
K-40	2927.11	1463.10	6.	441.	0.220	14.48	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		-2.7188E-03					
			477.56	-2.719E-03	&(	4.952E-01 1.38E-01	G
K-40		1.5893E+01					
			1460.75	1.589E+01	(P	5.075E-01 7.67E-01	G
MN-54		5.7573E-04					
			834.81	5.757E-04	%(P	4.463E-02 1.16E-02	G
CO-57		-6.6962E-03					
			122.07	-6.696E-03	%(	5.672E-02 1.68E-02	G K
			136.43	-2.449E-02	&	5.323E-01 1.57E-01	G
CO-60		5.6696E-03					
			1332.51	5.670E-03	&(P	6.072E-02 1.61E-02	G K
			1173.23	1.233E-02	&	1.096E-01 3.13E-02	G K
Sr-85		-1.0425E-03					
			514.00	-1.043E-03	%(	7.076E-02 2.02E-02	G
Kr-85		-2.8929E+01					
			513.99	-2.893E+01	%(	1.540E+03 4.39E+02	G
Y-88		-3.2571E-05					
			1836.01	-3.257E-05	&(P	8.352E-02 2.13E-02	G K
			898.02	6.968E-03	% P	7.279E-02 2.01E-02	G
NB-94		-1.2009E-02					
			871.10	-1.201E-02	%(	6.858E-02 1.96E-02	G K
			702.50	-2.949E-03	%	5.794E-02 1.61E-02	G K
Ag-108M		-9.4457E-05					
			722.95	-9.446E-05	%(	6.730E-02 1.85E-02	G K
			614.37	-4.676E-02	& P	9.360E-02 2.84E-02	G
			433.93	-5.084E-04	&	6.668E-02 1.91E-02	G
CD-109		-6.1665E-02					
			88.04	-6.166E-02	%(P	2.910E+00 8.65E-01	G
SN-113		-1.7084E-02					
			391.71	-1.708E-02	%(	9.200E-02 2.70E-02	G K
			255.04	2.385E-01	&	2.625E+00 7.71E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	1.1025E-01						
		427.95	1.103E-01	?(P	1.187E-01	3.89E-02	G K
		600.77	5.199E-02	& P	2.997E-01	8.59E-02	G
		636.15	6.989E-02	% P	5.106E-01	1.45E-01	G
							Energy duplication
		463.51	5.508E-01	+ P	6.201E-01	1.96E-01	G
		176.29	5.636E-03	% P	8.520E-01	2.50E-01	G
I-131	4.5614E-02						
		364.48	4.561E-02	%(	1.133E-01	3.41E-02	G K
		636.97	2.695E-01	%	1.360E+00	3.90E-01	G
		284.29	3.412E-01	%	1.506E+00	4.46E-01	G
CS-134	2.8126E-02						
		604.66	0.000E+00	%(	9.120E-02	2.62E-02	G K
		795.76	6.027E-02	*(	7.373E-02	2.39E-02	G
		569.29	0.000E+00	&	3.781E-01	1.06E-01	G
		801.84	-6.746E-02	% P	7.401E-01	2.07E-01	G
CS-137	5.4197E-01						
		661.62	5.420E-01	(	7.014E-02	4.14E-02	G
CE-139	-3.3659E-04						
		165.85	-3.366E-04	%(P	6.887E-02	2.03E-02	G
EU-152	-2.3224E-02						
		121.78	-2.322E-02	%(P	1.777E-01	5.26E-02	G K
		344.30	-2.869E-02	&	2.137E-01	6.26E-02	G
		1408.08	-3.003E-02	%	3.418E-01	9.21E-02	G
		964.00	7.787E-03	% P	4.061E-01	1.08E-01	G
		1112.07	1.221E-01	&	6.801E-01	1.95E-01	G
		778.90	-1.877E-02	% P	4.957E-01	1.37E-01	G
EU-154	3.2612E-02						
		123.10	3.261E-02	&(P	1.267E-01	3.79E-02	G K
		1274.80	-3.233E-02	%	2.387E-01	6.69E-02	G
		723.30	2.833E-04	% P	3.462E-01	9.62E-02	G
		1004.80	6.171E-02	&	4.054E-01	1.14E-01	G
EU-155	1.0331E-01						
		86.45	1.033E-01	%(P	3.277E-01	9.86E-02	G K
		105.31	8.992E-03	%	2.462E-01	7.24E-02	G
HG-203	1.1107E-03						
		279.17	1.111E-03	&(P	6.876E-02	2.00E-02	G K
		72.87	-8.867E-01	&	3.044E+00	9.17E-01	G
		70.83	-1.004E-01	%	5.473E+00	1.63E+00	G
		82.50	-1.174E+00	%	5.297E+00	1.59E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	3.6861E-01						
		583.14	3.686E-01	(P	6.880E-02	3.67E-02	G
		510.72	5.855E-01	+	2.681E-01	1.15E-01	G
PB-212	8.5741E-01						
		238.63	8.162E-01	(	1.344E-01	5.42E-02	G K
							Energy duplication
		77.11	9.589E-01	*(	7.680E-01	2.40E-01	G
		74.81	1.066E+00	& P	1.602E+00	4.89E-01	G
PB-214	4.2985E-01						
		351.99	3.839E-01	@(P	1.364E-01	5.10E-02	G K
		295.22	5.187E-01	(	2.604E-01	8.97E-02	G
							Energy duplication
		77.11	1.568E+00	+	1.256E+00	3.93E-01	G
		241.92	2.195E-01	%	9.135E-01	2.73E-01	G
BI-212	1.1086E+00						
		727.17	1.109E+00	*(	5.688E-01	2.64E-01	G K
		1620.56	-3.188E-01	% P	3.032E+00	8.10E-01	G
		785.42	-4.022E-03	% P	4.144E+00	1.16E+00	G
BI-214	5.4231E-01						
		609.32	5.423E-01	(	1.212E-01	6.26E-02	G K
		1764.51	-2.474E-03	% P	2.104E-01	2.86E-02	G
		1120.28	1.028E+00	+	5.678E-01	2.50E-01	G
RA-224	7.0745E-01						
		241.00	7.074E-01	%(P	1.650E+00	4.98E-01	G
RA-226	1.6744E+00						
		185.99	1.674E+00	*(P	1.541E+00	4.84E-01	G
AC-228	9.4848E-01						
		911.07	9.745E-01	@(P	2.843E-01	1.43E-01	G K
		968.90	1.530E+00	+ P	4.321E-01	2.31E-01	G
		338.40	8.858E-01	(	4.414E-01	1.74E-01	G
TH-227	-2.9505E-01						
		236.00	-2.951E-01	%(P	6.445E-01	1.95E-01	G K
		256.25	5.396E-02	&	7.196E-01	2.10E-01	G
PA-234	-8.6992E-03						
		98.44	-8.699E-03	%(	2.681E-01	7.92E-02	G K
		946.00	5.857E-02	%	3.221E-01	9.12E-02	G
		131.28	-4.965E-03	&	2.765E-01	8.16E-02	G
		94.67	-1.217E-02	&	5.969E-01	1.77E-01	G
		883.24	1.520E-01	%	4.512E-01	1.32E-01	G
		926.70	0.000E+00	%	5.478E-01	1.47E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 0.000E+00 &   5.573E-01 1.56E-01 G

TH-234       2.0500E+00
                           63.29 1.171E+00 %(P 6.169E+00 1.85E+00 G K
                           92.80 2.552E+00  (  3.079E+00 9.48E-01 G
                           92.38 2.798E+00 &(P 3.598E+00 1.11E+00 G

AM-241      -9.0942E-02
                           59.54-9.094E-02 %(  8.399E-01 2.50E-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              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

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

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	-2.4791E-03	-2.7188E-03	4.1415E-01	4.1415E-01	4.516E-01
K-40		1.5893E+01	1.5893E+01	2.3015E+00	2.4682E+00	5.075E-01
MN-54	#A	5.6671E-04	5.7573E-04	3.4662E-02	3.4662E-02	4.393E-02
CO-57	#B	-6.5750E-03	-6.6962E-03	5.0303E-02	5.0304E-02	5.569E-02
CO-60	#B	5.6552E-03	5.6696E-03	4.8285E-02	4.8286E-02	6.057E-02

Sr-85	#A	-9.6621E-04	-1.0425E-03	6.0472E-02	6.0472E-02	6.558E-02
Kr-85	#A	-2.8928E+01	-2.8929E+01	1.3184E+03	1.3184E+03	1.540E+03
Y-88	#B	-3.1099E-05	-3.2571E-05	8.3703E-04	8.3703E-04	7.974E-02
NB-94	#B	-1.2009E-02	-1.2009E-02	5.8650E-02	5.8654E-02	6.858E-02
Ag-108M	#B	-9.4447E-05	-9.4457E-05	5.5571E-02	5.5571E-02	6.730E-02
CD-109	#A	-6.0998E-02	-6.1665E-02	8.3555E+00	8.3555E+00	2.878E+00
SN-113	#B	-1.6368E-02	-1.7084E-02	8.0911E-02	8.0916E-02	8.814E-02
SB-125	#A	1.0972E-01	1.1025E-01	1.1660E-01	1.1676E-01	1.181E-01
I-131	#B	2.4708E-02	4.5614E-02	1.0219E-01	1.0222E-01	6.139E-02
CS-134	#B	2.7943E-02	2.8126E-02	3.3390E-02	3.3428E-02	9.060E-02
CS-137		5.4173E-01	5.4197E-01	1.2406E-01	1.2773E-01	
CE-139	#A	-3.2474E-04	-3.3659E-04	5.3141E-02	5.3141E-02	6.644E-02
EU-152	#B	-2.3199E-02	-2.3224E-02	1.8436E-01	1.8437E-01	1.775E-01
EU-154	#B	3.2561E-02	3.2612E-02	1.1359E-01	1.1360E-01	1.265E-01
EU-155	#B	1.0303E-01	1.0331E-01	2.9567E-01	2.9573E-01	3.268E-01
HG-203	#B	9.9920E-04	1.1107E-03	5.9867E-02	5.9867E-02	6.186E-02
TL-208		3.6861E-01	3.6861E-01	1.0994E-01	1.1187E-01	
PB-212	#	8.5741E-01	8.5741E-01	1.7087E-01	1.7752E-01	1.344E-01
PB-214	#	4.2985E-01	4.2985E-01	1.4065E-01	1.4270E-01	1.364E-01
BI-212	#	1.1086E+00	1.1086E+00	7.9200E-01	7.9444E-01	
BI-214	#	5.4231E-01	5.4231E-01	1.8766E-01	1.9011E-01	
RA-224	#A	7.0745E-01	7.0745E-01	1.4949E+00	1.4954E+00	1.650E+00
RA-226	#	1.6744E+00	1.6744E+00	1.4527E+00	1.4558E+00	1.541E+00
AC-228		9.4848E-01	9.4848E-01	3.4797E-01	3.5202E-01	
TH-227	#B	-2.9505E-01	-2.9505E-01	5.9278E-01	5.9301E-01	6.445E-01
PA-234	#B	-8.6992E-03	-8.6992E-03	2.3764E-01	2.3765E-01	2.681E-01
TH-234	#B	2.0500E+00	2.0500E+00	2.2852E+00	2.2881E+00	6.169E+00
AM-241	#A	-9.0939E-02	-9.0942E-02	7.4923E-01	7.4924E-01	8.398E-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) 1.9402561E+01 pCi/gm
Total Decayed Activity (50.2 to 1999.0 keV) 1.9402805E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
DAT

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 102F_6JULY2006_1024.An1

Sample description
FSS-OOL-11-02-018-F

Spectrum Filename: C:\GammaVision\Spectra\102F_6JULY2006_1024.An1

Acquisition information
Start time: 06-Jul-2006 10:24:35
Live time: 2000
Real time: 2017
Dead time: 0.86 %
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: 1.6050E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.6050E+03) =
6.2305E+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	29-Jun-2006 14:45:00
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. 14 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.7230

***** 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
77.19	156.	24.24	1.50	9.541E-03	77.11	10.700	1.285E+00	PB214
					77.11	17.500	7.859E-01	PB212
77.19	156.	24.24	1.50	9.541E-03	77.11	10.700	1.285E+00	PB214
					77.11	17.500	7.859E-01	PB212
186.52	105.	27.64	1.33	1.624E-02	185.99	3.280	1.590E+00	RA226
210.03	60.	41.33	1.49	1.516E-02				
239.01	463.	5.69	1.22	1.379E-02	238.63	43.100	6.553E-01	PB212
241.49	90.	31.97	1.22	1.367E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	7.464E-01	PB214
269.78	75.	29.49	1.06	1.245E-02				
295.67	115.	14.33	1.25	1.146E-02	295.22	19.200	4.408E-01	PB214
300.96	39.	32.56	1.26	1.127E-02				
338.61	129.	14.11	1.68	1.005E-02	338.40	12.010	8.990E-01	AC228
352.22	191.	11.07	1.28	9.672E-03	351.99	37.100	4.474E-01	PB214
511.02	69.	25.38	1.46	6.691E-03	510.72	22.500	3.868E-01	TL208
583.85	159.	11.16	1.57	5.883E-03	583.14	86.000	2.629E-01	TL208
610.18	134.	13.90	1.56	5.642E-03	609.32	46.090	4.333E-01	BI214
662.36	84.	17.42	1.20	5.224E-03	661.62	84.620	1.599E-01	CS137
728.03	59.	26.85	0.73	4.794E-03	727.17	11.800	8.781E-01	BI212
912.30	123.	13.97	1.69	3.917E-03	911.07	29.000	9.081E-01	AC228
970.45	53.	25.00	1.16	3.713E-03	968.90	17.460	6.870E-01	AC228
1121.90	40.	30.67	1.74	3.283E-03	1120.28	15.040	6.906E-01	BI214
1462.62	509.	4.47	2.09	2.618E-03	1460.75	10.700	1.527E+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	
419.68	210.03	222.	60.	0.030	124.00	1.488	NP-239	s
477.65	239.01	116.	463.	0.232	17.08	1.215	PB-212	D
482.62	241.50	373.	90.	0.045	95.91	1.217	PB-214	D
539.20	269.78	155.	75.	0.038	88.46	1.058	AC-228	s
601.12	300.73	81.	38.	0.019	115.22	0.687	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
PB-214	153.80	77.11	636.	156.	0.078	72.73	1.500D
PB-212	153.80	77.11	636.	156.	0.078	72.73	1.500D
RA-226	372.52	186.46	334.	80.	0.040	96.51	1.500s
PB-212	477.63	239.00	299.	434.	0.217	22.18	1.500
PB-214	590.81	295.58	144.	103.	0.051	57.72	1.500
AC-228	676.90	338.61	81.	129.	0.064	42.34	1.683s
PB-214	704.41	352.36	84.	177.	0.089	31.36	1.500s
TL-208	1021.83	511.02	75.	69.	0.035	76.15	1.455s
TL-208	1167.54	583.85	49.	158.	0.079	33.49	1.574
BI-214	1220.22	610.18	56.	134.	0.067	41.69	1.565
CS-137	1324.62	662.36	42.	84.	0.042	52.27	1.200s
BI-212	1456.01	728.03	48.	59.	0.030	80.56	0.726s
AC-228	1824.73	912.30	35.	123.	0.061	41.92	1.691s
AC-228	1941.11	970.45	35.	53.	0.026	74.99	1.164s
BI-214	2244.20	1121.90	32.	40.	0.020	92.00	1.739
K-40	2926.17	1462.63	7.	481.	0.241	13.85	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		-4.7710E-02					
			477.56	-4.771E-02	&(	5.213E-01 1.50E-01	G
K-40		1.4456E+01					
			1460.75	1.446E+01	(P	4.419E-01 6.68E-01	G
MN-54		1.5909E-02					
			834.81	1.591E-02	&(P	5.431E-02 1.58E-02	G
CO-57		-6.3436E-03					
			122.07	-6.344E-03	&(	5.332E-02 1.58E-02	G K
			136.43	-4.962E-03	%	4.782E-01 1.41E-01	G
CO-60		-3.9293E-03					
			1332.51	-3.929E-03	%(P	5.902E-02 1.58E-02	G K
			1173.23	3.933E-06	&	8.729E-02 2.43E-02	G K
Sr-85		-1.2278E-02					
			514.00	-1.228E-02	%(	6.777E-02 1.99E-02	G
Kr-85		-2.6353E+02					
			513.99	-2.635E+02	%(	1.455E+03 4.26E+02	G
Y-88		-6.1293E-03					
			1836.01	-6.129E-03	%(P	6.228E-02 1.63E-02	G K
			898.02	-8.554E-03	& P	6.856E-02 1.91E-02	G
NB-94		0.0000E+00					
			871.10	0.000E+00	&(	6.643E-02 1.85E-02	G K
			702.50	4.356E-03	%	4.269E-02 1.19E-02	G K
Ag-108M		-2.1261E-03					
			722.95	-2.126E-03	%(	6.854E-02 1.93E-02	G K
			614.37	-1.852E-02	& P	6.862E-02 2.02E-02	G
			433.93	-1.557E-02	%	5.078E-02 1.51E-02	G
CD-109		7.3071E-01					
			88.04	7.307E-01	%(P	2.221E+00 6.69E-01	G
SN-113		-1.2570E-03					
			391.71	-1.257E-03	&(	8.020E-02 2.31E-02	G K
			255.04	8.433E-01	&	1.801E+00 5.46E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	-1.7615E-02						
		427.95	-1.762E-02	&(P	1.233E-01	3.48E-02	G K
		600.77	-2.780E-02	& P	2.538E-01	7.18E-02	G
		636.15	-9.527E-04	% P	4.274E-01	1.18E-01	G
		463.51	1.486E-01	% P	5.239E-01	1.54E-01	G
		176.29	-2.846E-01	% P	7.622E-01	2.29E-01	G
I-131	-2.4048E-02						
		364.48	-2.405E-02	%(	9.977E-02	2.95E-02	G K
		636.97	1.658E-01	%	9.241E-01	2.61E-01	G
		284.29	9.031E-02	%	1.183E+00	3.45E-01	G
CS-134	8.3378E-04						
		604.66	8.338E-04	&(	5.232E-02	1.47E-02	G K
		795.76	4.759E-02	%	6.859E-02	2.16E-02	G
		569.29	2.992E-02	&	2.076E-01	5.79E-02	G
		801.84	-1.151E-01	% P	7.398E-01	2.12E-01	G
CS-137	1.5989E-01						
		661.62	1.599E-01	*(	6.264E-02	2.79E-02	G
CE-139	8.2202E-03						
		165.85	8.220E-03	%(P	4.793E-02	1.42E-02	G
EU-152	3.9651E-02						
		121.78	3.965E-02	&(P	1.517E-01	4.53E-02	G K
		344.30	6.182E-03	%	1.481E-01	4.26E-02	G
		1408.08	0.000E+00	&	3.682E-01	9.97E-02	G
		964.00	-1.243E-02	& P	4.736E-01	1.31E-01	G
		1112.07	-4.826E-02	%	5.711E-01	1.61E-01	G
		778.90	-9.358E-02	& P	4.049E-01	1.17E-01	G
EU-154	-1.8183E-02						
		123.10	-1.818E-02	%(P	1.176E-01	3.50E-02	G K
		1274.80	2.943E-03	%	2.158E-01	5.90E-02	G
		723.30	8.143E-02	% P	2.913E-01	8.53E-02	G
		1004.80	-4.250E-03	&	3.485E-01	9.51E-02	G
EU-155	3.8162E-02						
		86.45	3.816E-02	&(P	2.384E-01	7.10E-02	G K
		105.31	6.987E-02	%	2.652E-01	7.95E-02	G
HG-203	1.0684E-02						
		279.17	1.068E-02	&(P	5.826E-02	1.72E-02	G K
		72.87	1.342E-01	%	2.273E+00	6.77E-01	G
		70.83	1.491E-01	&	5.010E+00	1.49E+00	G
		82.50	-9.932E-01	%	4.710E+00	1.41E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.6295E-01						
		583.14	2.629E-01	(P	5.862E-02	2.95E-02	G
		510.72	3.868E-01	+	2.404E-01	9.83E-02	G
PB-212	6.1476E-01						
		238.63	6.148E-01	(	1.178E-01	4.55E-02	G K
							Energy duplication
		77.11	7.859E-01	+	6.062E-01	1.91E-01	G
		74.81	6.459E-01	& P	1.272E+00	3.86E-01	G
PB-214	4.0812E-01						
		351.99	4.157E-01	(P	1.065E-01	4.35E-02	G K
		295.22	3.935E-01	(	2.246E-01	7.57E-02	G
							Energy duplication
		77.11	1.285E+00	+	9.915E-01	3.12E-01	G
		241.92	3.460E-01	%	7.839E-01	2.37E-01	G
BI-212	8.7813E-01						
		727.17	8.781E-01	(	5.209E-01	2.36E-01	G K
		1620.56	-4.286E-02	% P	2.096E+00	5.21E-01	G
		785.42	-5.347E-01	% P	3.045E+00	8.75E-01	G
BI-214	4.3331E-01						
		609.32	4.333E-01	(	1.215E-01	6.03E-02	G K
		1764.51	-2.060E-03	% P	1.752E-01	2.38E-02	G
		1120.28	6.906E-01	+	4.992E-01	2.12E-01	G
RA-224	7.8700E-01						
		241.00	7.870E-01	%(P	1.485E+00	4.51E-01	G
RA-226	1.2671E+00						
		185.99	1.267E+00	*(P	1.386E+00	4.30E-01	G
AC-228	9.0544E-01						
		911.07	9.081E-01	*(P	2.251E-01	1.27E-01	G K
		968.90	6.870E-01	- P	3.929E-01	1.72E-01	G
		338.40	8.990E-01	*(	3.112E-01	1.27E-01	G
TH-227	-1.2228E-01						
		236.00	-1.223E-01	&(P	4.726E-01	1.41E-01	G K
		256.25	-5.063E-02	&	6.903E-01	2.03E-01	G
PA-234	-4.9735E-02						
		98.44	-4.974E-02	&(	2.663E-01	7.96E-02	G K
		946.00	2.485E-02	%	3.043E-01	8.49E-02	G
		131.28	5.177E-02	%	2.401E-01	7.18E-02	G
		94.67	-2.308E-02	%	4.907E-01	1.46E-01	G
		883.24	1.126E-02	&	4.814E-01	1.33E-01	G
		926.70	1.869E-01	%	3.736E-01	1.15E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 4.135E-02 &   3.070E-01 8.55E-02 G

TH-234       9.1636E-01
                           63.29 9.164E-01 %(P 5.241E+00 1.57E+00 G K
                           92.80 6.723E-02 %   2.580E+00 7.66E-01 G
                           92.38-3.575E-01 % P 2.736E+00 8.14E-01 G

AM-241       6.7438E-02
                           59.54 6.744E-02 %(  7.711E-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

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

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	-4.3668E-02	-4.7710E-02	4.4979E-01	4.4980E-01	4.771E-01
K-40		1.4456E+01	1.4456E+01	2.0032E+00	2.1612E+00	4.419E-01
MN-54	#A	1.5670E-02	1.5909E-02	4.7521E-02	4.7529E-02	5.349E-02
CO-57	#B	-6.2335E-03	-6.3436E-03	4.7436E-02	4.7438E-02	5.239E-02
CO-60	#B	-3.9197E-03	-3.9293E-03	5.3242E-02	5.3243E-02	5.888E-02

Sr-85	#A	-1.1415E-02	-1.2278E-02	5.9606E-02	5.9610E-02	6.301E-02
Kr-85	#A	-2.6351E+02	-2.6353E+02	1.2794E+03	1.2794E+03	1.455E+03
Y-88	#B	-5.8634E-03	-6.1293E-03	4.9314E-02	4.9315E-02	5.958E-02
NB-94	#B	0.0000E+00	0.0000E+00	5.5387E-02	5.5387E-02	6.643E-02
Ag-108M	#B	-2.1259E-03	-2.1261E-03	5.7958E-02	5.7958E-02	6.853E-02
CD-109	#A	7.2313E-01	7.3071E-01	2.0065E+00	2.0069E+00	2.198E+00
SN-113	#B	-1.2065E-03	-1.2570E-03	6.9272E-02	6.9272E-02	7.697E-02
SB-125	#B	-1.7533E-02	-1.7615E-02	1.5787E-01	1.5788E-01	1.227E-01
I-131	#B	-1.3359E-02	-2.4048E-02	8.8385E-02	8.8396E-02	5.542E-02
CS-134	#B	8.2857E-04	8.3378E-04	4.4001E-02	4.4001E-02	5.199E-02
CS-137	#	1.5982E-01	1.5989E-01	8.3576E-02	8.4056E-02	
CE-139	#A	7.9424E-03	8.2202E-03	4.2597E-02	4.2600E-02	4.631E-02
EU-152	#B	3.9610E-02	3.9651E-02	1.3602E-01	1.3604E-01	1.515E-01
EU-154	#B	-1.8155E-02	-1.8183E-02	1.0796E-01	1.0796E-01	1.175E-01
EU-155	#B	3.8062E-02	3.8162E-02	2.1306E-01	2.1307E-01	2.377E-01
HG-203	#B	9.6534E-03	1.0684E-02	5.1585E-02	5.1588E-02	5.264E-02
TL-208		2.6295E-01	2.6295E-01	8.8289E-02	8.9514E-02	
PB-212	#	6.1476E-01	6.1476E-01	1.3637E-01	1.4066E-01	1.178E-01
PB-214	#	4.0812E-01	4.0812E-01	1.2825E-01	1.3028E-01	1.065E-01
BI-212		8.7813E-01	8.7813E-01	7.0740E-01	7.0912E-01	
BI-214		4.3331E-01	4.3331E-01	1.8066E-01	1.8229E-01	
RA-224	#A	7.8700E-01	7.8700E-01	1.3541E+00	1.3549E+00	1.485E+00
RA-226	#A	1.2671E+00	1.2671E+00	1.2909E+00	1.2928E+00	1.386E+00
AC-228		9.0544E-01	9.0544E-01	2.6999E-01	2.7473E-01	
TH-227	#B	-1.2228E-01	-1.2228E-01	4.3452E-01	4.3458E-01	4.726E-01
PA-234	#B	-4.9735E-02	-4.9735E-02	2.3885E-01	2.3887E-01	2.663E-01
TH-234	#B	9.1636E-01	9.1636E-01	4.7009E+00	4.7012E+00	5.241E+00
AM-241	#A	6.7436E-02	6.7438E-02	6.8846E-01	6.8847E-01	7.710E-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 1999.0 keV) 1.7095537E+01 pCi/gm
Total Decayed Activity (269.7 to 1999.0 keV) 1.7095606E+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_7JUL2006_1526.An1

Sample description
FSS-OOL-11-02-011-F

Spectrum Filename: C:\GammaVision\Spectra\102F_7JUL2006_1526.An1

Acquisition information
Start time: 07-Jul-2006 15:26:57
Live time: 2000
Real time: 2018
Dead time: 0.91 %
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: 1.7130E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.7130E+03) =
5.8377E+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	29-Jun-2006 15:30:00
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. 14 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.6467

***** 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
74.95	109.	36.90	1.50	8.847E-03	74.81	9.600	PBC<MDA	PB212
77.25	166.	25.07	1.50	9.541E-03	77.11	17.500	7.841E-01	PB212
					77.11	10.700	1.282E+00	PB214
77.25	166.	25.07	1.50	9.541E-03	77.11	17.500	PBC<MDA	PB212
					77.11	10.700	1.282E+00	PB214
129.69	74.	40.05	0.80	1.717E-02				
185.95	80.	34.80	0.95	1.627E-02				
185.95	80.	34.80	0.95	1.627E-02	185.99	3.280	PBC<MDA	RA226
239.03	551.	5.26	1.22	1.379E-02	238.63	43.100	7.306E-01	PB212
295.77	117.	13.96	1.26	1.144E-02	295.22	19.200	4.182E-01	PB214
300.67	40.	31.33	1.26	1.126E-02				
328.77	39.	37.78	1.06	1.035E-02				
338.79	111.	21.45	1.49	1.005E-02	338.40	12.010	7.248E-01	AC228
352.45	232.	10.49	1.26	9.666E-03	351.99	37.100	5.088E-01	PB214
463.99	47.	37.02	0.98	7.357E-03	463.51	10.000	4.874E-01	SB125
511.38	78.	20.76	1.79	6.686E-03	510.72	22.500	4.106E-01	TL208
584.12	195.	9.23	1.43	5.881E-03	583.14	86.000	3.029E-01	TL208
610.23	159.	10.68	1.55	5.641E-03	609.32	46.090	4.814E-01	BI214
662.15	65.	20.36	2.00	5.229E-03	661.62	84.620	1.159E-01	CS137
727.82	66.	19.92	1.95	4.794E-03	727.17	11.800	9.176E-01	BI212
912.50	90.	14.06	1.75	3.917E-03	911.07	29.000	6.192E-01	AC228
969.58	86.	17.50	1.36	3.716E-03	968.90	17.460	1.045E+00	AC228
1121.71	75.	16.94	2.30	3.283E-03	1120.28	15.040	1.192E+00	BI214
1462.88	488.	4.59	1.94	2.618E-03	1460.75	10.700	1.374E+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
258.97	129.69	333.	95.	0.048	86.64	0.796	AC-228
477.69	238.97	145.	551.	0.276	15.79	1.215	PB-212 D
601.00	300.90	59.	40.	0.020	93.98	1.259	PB-212 lD
657.21	328.77	86.	39.	0.020	113.35	1.061	LA-140

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	149.49	74.95	805.	109.	0.055	110.70	1.500s
PB-212	153.80	77.11	783.	166.	0.083	75.22	1.500D
PB-214	153.80	77.11	783.	166.	0.083	75.22	1.500D
RA-226	372.04	186.21	371.	82.	0.041	99.94	1.500
PB-212	477.68	239.02	376.	482.	0.241	21.87	1.500s
PB-214	591.30	295.82	129.	121.	0.061	48.19	1.500s
AC-228	677.25	338.79	147.	111.	0.056	64.34	1.494
PB-214	704.63	352.47	107.	214.	0.107	28.92	1.500s
SB-125	927.06	463.65	49.	33.	0.016	99.45	1.500
TL-208	1022.55	511.38	67.	78.	0.039	62.28	1.786s
TL-208	1168.07	584.12	40.	194.	0.097	27.70	1.430
BI-214	1220.32	610.23	39.	159.	0.079	32.04	1.550
CS-137	1324.19	662.15	38.	65.	0.032	61.09	1.999s
BI-212	1455.60	727.82	31.	66.	0.033	59.77	1.953s
AC-228	1825.14	912.50	26.	89.	0.045	42.18	1.751
AC-228	1939.38	969.58	39.	86.	0.043	52.49	1.364s
BI-214	2243.83	1121.71	22.	75.	0.037	50.82	2.304s
K-40	2926.75	1462.92	7.	475.	0.238	13.95	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		-1.5281E-01					
			477.56	-1.528E-01	%(	4.878E-01 1.45E-01	G
K-40		1.3365E+01					
			1460.75	1.337E+01	(P	4.167E-01 6.22E-01	G
MN-54		-8.5134E-03					
			834.81	-8.513E-03	&(P	5.816E-02 1.65E-02	G
CO-57		0.0000E+00					
			122.07	0.000E+00	%(	5.736E-02 1.69E-02	G K
			136.43	3.244E-02	&	4.461E-01 1.32E-01	G
CO-60		1.0235E-02					
			1332.51	1.024E-02	&(P	4.940E-02 1.38E-02	G K
			1173.23	-6.548E-03	%	7.249E-02 2.03E-02	G K
Sr-85		-2.1077E-02					
			514.00	-2.108E-02	%(	7.136E-02 2.12E-02	G
Kr-85		-4.4669E+02					
			513.99	-4.467E+02	%(	1.513E+03 4.50E+02	G
Y-88		-2.5550E-05					
			1836.01	-2.555E-05	%(P	2.869E-02 3.89E-03	G K
			898.02	-5.236E-03	& P	5.379E-02 1.46E-02	G
NB-94		7.4991E-03					
			871.10	7.499E-03	%(	4.856E-02 1.37E-02	G K
			702.50	8.675E-03	%	5.535E-02 1.59E-02	G K
Ag-108M		-1.9921E-03					
			722.95	-1.992E-03	%(	7.270E-02 2.07E-02	G K
			614.37	-1.977E-02	% P	5.796E-02 1.72E-02	G
			433.93	-9.434E-03	&	5.494E-02 1.61E-02	G
CD-109		-1.1617E-01					
			88.04	-1.162E-01	&(P	2.424E+00 7.22E-01	G
SN-113		7.9286E-03					
			391.71	7.929E-03	%(	6.703E-02 1.94E-02	G K
			255.04	8.224E-03	&	1.926E+00 5.60E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	1.1569E-01						
		427.95	3.511E-02	%(P	1.290E-01	3.78E-02	G K
		600.77	7.423E-02	& P	1.985E-01	5.89E-02	G
		636.15	3.344E-02	% P	4.168E-01	1.18E-01	G
		463.51	3.542E-01	(P	3.822E-01	1.23E-01	G
		176.29	-1.038E-01	& P	6.786E-01	2.01E-01	G
I-131	-7.8092E-03						
		364.48	-7.809E-03	&(	8.500E-02	2.44E-02	G K
		636.97	1.122E-01	%	1.173E+00	3.30E-01	G
		284.29	-1.451E-01	&	1.360E+00	3.99E-01	G
CS-134	0.0000E+00						
		604.66	0.000E+00	%(	6.994E-02	2.00E-02	G K
		795.76	2.579E-02	%	5.977E-02	1.80E-02	G
		569.29	4.362E-02	&	2.630E-01	7.53E-02	G
		801.84	-7.810E-02	% P	6.161E-01	1.74E-01	G
CS-137	1.1593E-01						
		661.62	1.159E-01	(	5.607E-02	2.36E-02	G
CE-139	-1.1713E-02						
		165.85	-1.171E-02	&(P	6.050E-02	1.80E-02	G
EU-152	-1.3671E-03						
		121.78	-1.367E-03	&(P	1.574E-01	4.64E-02	G K
		344.30	-2.621E-02	%	1.364E-01	3.99E-02	G
		1408.08	-2.570E-02	%	2.801E-01	7.60E-02	G
		964.00	-6.339E-02	% P	5.355E-01	1.53E-01	G
		1112.07	-1.557E-02	%	3.958E-01	1.07E-01	G
		778.90	-3.115E-02	% P	3.660E-01	1.02E-01	G
EU-154	-3.2777E-02						
		123.10	-3.278E-02	%(P	1.268E-01	3.80E-02	G K
		1274.80	6.749E-03	%	1.942E-01	5.32E-02	G
		723.30	-7.376E-03	% P	2.160E-01	5.88E-02	G
		1004.80	6.657E-02	%	3.504E-01	1.00E-01	G
EU-155	9.6965E-02						
		86.45	9.696E-02	&(P	2.767E-01	8.34E-02	G K
		105.31	2.731E-02	%	2.587E-01	7.70E-02	G
HG-203	2.3163E-02						
		279.17	2.316E-02	%(P	5.115E-02	1.55E-02	G K
		72.87	-9.774E-01	%	2.418E+00	7.31E-01	G
		70.83	1.590E+00	&	4.007E+00	1.21E+00	G
		82.50	-3.830E-02	&	4.788E+00	1.42E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	3.0290E-01						
		583.14	3.029E-01	(P	4.984E-02	2.81E-02	G
		510.72	4.106E-01	+	2.134E-01	8.53E-02	G
PB-212	6.3872E-01						
		238.63	6.387E-01	@(	1.233E-01	4.66E-02	G K
							Energy duplication
		77.11	7.841E-01	+	6.288E-01	1.97E-01	G
		74.81	1.015E+00	& P	1.253E+00	3.85E-01	G
PB-214	4.5854E-01						
		351.99	4.709E-01	@(P	1.120E-01	4.55E-02	G K
		295.22	4.346E-01	@(	1.994E-01	6.98E-02	G
							Energy duplication
		77.11	1.282E+00	+	1.028E+00	3.22E-01	G
		241.92	2.801E-01	%	7.866E-01	2.37E-01	G
BI-212	9.1760E-01						
		727.17	9.176E-01	(	4.008E-01	1.83E-01	G K
		1620.56	-4.016E-02	& P	8.820E-01	1.20E-01	G
		785.42	7.094E-01	% P	2.704E+00	7.89E-01	G
BI-214	4.8143E-01						
		609.32	4.814E-01	(	9.650E-02	5.15E-02	G K
		1764.51	-8.049E-02	% P	4.489E-01	1.25E-01	G
		1120.28	1.192E+00	+	3.957E-01	2.02E-01	G
RA-224	7.6491E-01						
		241.00	7.649E-01	%(P	1.498E+00	4.55E-01	G
RA-226	1.2051E+00						
		185.99	1.205E+00	(P	1.368E+00	4.23E-01	G
AC-228	6.5011E-01						
		911.07	6.192E-01	(P	1.827E-01	8.74E-02	G K
		968.90	1.045E+00	+ P	3.868E-01	1.83E-01	G
		338.40	7.248E-01	(	3.866E-01	1.56E-01	G
TH-227	-2.3340E-01						
		236.00	-2.334E-01	%(P	5.365E-01	1.62E-01	G K
		256.25	-9.067E-02	&	5.848E-01	1.72E-01	G
PA-234	2.3804E-02						
		98.44	2.380E-02	%(	2.577E-01	7.67E-02	G K
		946.00	7.763E-02	&	2.632E-01	7.68E-02	G
		131.28	-6.417E-02	%	2.594E-01	7.78E-02	G
		94.67	-1.643E-01	%	4.726E-01	1.43E-01	G
		883.24	-9.776E-02	&	4.820E-01	1.39E-01	G
		926.70	-1.686E-02	%	4.556E-01	1.24E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 6.448E-02 &   3.872E-01 1.11E-01 G

TH-234       1.4929E+00
                           63.29 1.493E+00 %(P 4.520E+00 1.36E+00 G K
                           92.80 1.300E+00 %   2.564E+00 7.78E-01 G
                           92.38 1.573E+00 % P 2.948E+00 8.96E-01 G

AM-241       1.3018E-02
                           59.54 1.302E-02 %(  5.049E-01 1.48E-01 G
   ( - This peak used in the nuclide activity average.

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

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

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** 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	-1.3774E-01	-1.5281E-01	4.3406E-01	4.3414E-01	4.397E-01
K-40		1.3365E+01	1.3365E+01	1.8652E+00	2.0103E+00	4.167E-01
MN-54	#A	-8.3636E-03	-8.5134E-03	5.4489E-02	5.4491E-02	5.714E-02
CO-57	#B	0.0000E+00	0.0000E+00	5.0841E-02	5.0841E-02	5.619E-02
CO-60	#B	1.0206E-02	1.0235E-02	4.1255E-02	4.1259E-02	4.925E-02

Sr-85	#A	-1.9349E-02	-2.1077E-02	6.3728E-02	6.3739E-02	6.551E-02
Kr-85	#A	-4.4666E+02	-4.4669E+02	1.3507E+03	1.3509E+03	1.512E+03
Y-88	#B	-2.4255E-05	-2.5550E-05	1.5330E-04	1.5330E-04	2.724E-02
NB-94	#B	7.4991E-03	7.4991E-03	4.1064E-02	4.1066E-02	4.856E-02
Ag-108M	#B	-1.9919E-03	-1.9921E-03	6.1985E-02	6.1985E-02	7.269E-02
CD-109	#A	-1.1475E-01	-1.1617E-01	3.3749E+00	3.3749E+00	2.394E+00
SN-113	#B	7.5558E-03	7.9286E-03	5.8288E-02	5.8289E-02	6.388E-02
SB-125	#B	1.1505E-01	1.1569E-01	1.2047E-01	1.2064E-01	1.283E-01
I-131	#B	-3.9188E-03	-7.8092E-03	7.3278E-02	7.3279E-02	4.265E-02
CS-134	#B	0.0000E+00	0.0000E+00	6.0144E-02	6.0144E-02	6.943E-02
CS-137	#	1.1588E-01	1.1593E-01	7.0825E-02	7.1123E-02	
CE-139	#A	-1.1250E-02	-1.1713E-02	5.6642E-02	5.6646E-02	5.811E-02
EU-152	#B	-1.3654E-03	-1.3671E-03	9.1669E+00	9.1669E+00	1.572E-01
EU-154	#B	-3.2719E-02	-3.2777E-02	1.1570E-01	1.1571E-01	1.265E-01
EU-155	#B	9.6669E-02	9.6965E-02	2.5019E-01	2.5025E-01	2.758E-01
HG-203	#B	2.0565E-02	2.3163E-02	4.6405E-02	4.6423E-02	4.541E-02
TL-208		3.0290E-01	3.0290E-01	8.4090E-02	8.5791E-02	
PB-212	#	6.3872E-01	6.3872E-01	1.3967E-01	1.4420E-01	1.233E-01
PB-214	#	4.5854E-01	4.5854E-01	1.2890E-01	1.3145E-01	1.120E-01
BI-212	#	9.1760E-01	9.1760E-01	5.4848E-01	5.5089E-01	
BI-214		4.8143E-01	4.8143E-01	1.5423E-01	1.5658E-01	
RA-224	#A	7.6491E-01	7.6491E-01	1.3640E+00	1.3647E+00	1.498E+00
RA-226	#A	1.2051E+00	1.2051E+00	1.2702E+00	1.2720E+00	1.368E+00
AC-228		6.5011E-01	6.5011E-01	2.5027E-01	2.5291E-01	
TH-227	#B	-2.3340E-01	-2.3340E-01	4.9289E-01	4.9306E-01	5.365E-01
PA-234	#B	2.3804E-02	2.3804E-02	2.3021E-01	2.3022E-01	2.577E-01
TH-234	#B	1.4929E+00	1.4929E+00	4.0812E+00	4.0820E+00	4.520E+00
AM-241	#A	1.3017E-02	1.3018E-02	4.4500E-01	4.4500E-01	5.048E-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 (295.7 to 1999.0 keV) 1.5832964E+01 pCi/gm
Total Decayed Activity (295.7 to 1999.0 keV) 1.5833022E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
DAT

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 102F_7JUL2006_1623.An1

Sample description
FSS-OOL-11-02-019-F

Spectrum Filename: C:\GammaVision\Spectra\102F_7JUL2006_1623.An1

Acquisition information
Start time: 07-Jul-2006 16:23:30
Live time: 2000
Real time: 2018
Dead time: 0.88 %
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: 1.6670E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.6670E+03) =
5.9988E+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	29-Jun-2006 14:10:00
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: 0.5382

***** 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
75.27	76.	40.40	1.10	9.113E-03	72.87	6.400	1.323E+00	HG203
					74.81	9.600	PBC<MDA	PB212
77.16	190.	14.62	1.10	9.676E-03	77.11	10.700	1.509E+00	PB214
					77.11	17.500	9.224E-01	PB212
167.20	50.	26.36	0.00	1.698E-02				
186.51	116.	25.19	1.87	1.624E-02	185.99	3.280	1.698E+00	RA226
239.01	442.	5.93	1.22	1.379E-02	238.63	43.100	6.022E-01	PB212
242.70	51.	33.67	1.22	1.362E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	4.067E-01	PB214
295.53	133.	15.66	1.15	1.145E-02	295.22	19.200	4.890E-01	PB214
339.39	66.	26.49	1.21	1.003E-02	338.40	12.010	4.442E-01	AC228
352.38	198.	11.05	1.45	9.668E-03	351.99	37.100	4.464E-01	PB214
463.59	39.	39.30	1.36	7.363E-03	463.51	10.000	PBC<MDA	SB125
511.32	79.	24.62	1.34	6.687E-03	510.72	22.500	4.273E-01	TL208
583.90	133.	12.69	1.23	5.883E-03	583.14	86.000	2.122E-01	TL208
610.11	150.	11.75	1.47	5.642E-03	609.32	46.090	4.683E-01	BI214
662.44	219.	9.60	1.47	5.223E-03	661.62	84.620	4.018E-01	CS137
728.49	35.	27.74	1.55	4.794E-03	727.17	11.800	5.050E-01	BI212
912.20	98.	14.02	1.88	3.918E-03	911.07	29.000	6.940E-01	AC228
968.79	67.	18.44	1.03	3.718E-03				
970.30	37.	25.42	1.72	3.718E-03				
970.30	37.	25.42	1.72	3.718E-03	968.90	17.460	4.586E-01	AC228
1122.61	38.	23.58	1.28	3.277E-03	1120.28	15.040	6.189E-01	BI214
1462.95	502.	4.53	1.93	2.617E-03	1460.75	10.700	1.450E+01	K40
1766.97	37.	16.44	1.67	2.223E-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	
150.11	75.68	436.	76.	0.038	121.19	1.099	PB-214	D
153.91	77.57	291.	190.	0.095	43.87	1.100	PB-214	D
485.03	242.68	123.	51.	0.026	101.02	1.218	XE-138	lD
1937.79	968.79	61.	33.	0.016	114.31	1.032	AC-228	s
2245.22	1122.61	17.	31.	0.016	77.01	1.820	TA-182	D
3536.10	1766.97	1.	28.	0.014	58.47	2.238	XE-138	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-214	153.80	77.11	664.	180.	0.090	64.57	1.500D
PB-212	153.80	77.11	664.	180.	0.090	64.57	1.500D
RA-226	372.23	186.31	352.	73.	0.037	107.40	1.500s
PB-212	477.69	239.03	305.	402.	0.201	23.71	1.500
PB-214	590.96	295.65	93.	132.	0.066	40.54	1.500s
AC-228	677.43	338.88	118.	52.	0.026	97.99	1.500s
PB-214	704.55	352.43	91.	179.	0.090	31.71	1.500s
TL-208	1022.27	511.25	94.	85.	0.042	70.47	1.345s
TL-208	1167.64	583.90	46.	133.	0.066	38.07	1.231s
BI-214	1220.07	610.11	51.	150.	0.075	35.25	1.475
CS-137	1324.77	662.44	59.	219.	0.110	28.79	1.465
BI-212	1456.95	728.49	30.	35.	0.018	83.22	1.554s
AC-228	1825.15	912.50	30.	75.	0.037	46.60	1.679s
AC-228	1940.81	970.30	25.	37.	0.018	76.25	1.718s
BI-214	2240.95	1120.28	23.	25.	0.013	100.11	1.819D
K-40	2926.78	1462.93	10.	477.	0.238	14.02	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		-8.1104E-02					
			477.56	-8.110E-02	&(	5.722E-01 1.67E-01	G
K-40		1.3781E+01					
			1460.75	1.378E+01	(P	5.019E-01 6.44E-01	G
MN-54		-3.5868E-03					
			834.81	-3.587E-03	&(P	6.302E-02 1.77E-02	G
CO-57		-1.4135E-02					
			122.07	-1.414E-02	&(	6.157E-02 1.84E-02	G K
			136.43	-2.108E-02	%	4.517E-01 1.34E-01	G
CO-60		1.7450E-02					
			1332.51	1.745E-02	%(P	6.000E-02 1.73E-02	G K
			1173.23	5.195E-03	&	9.450E-02 2.68E-02	G K
Sr-85		-1.3575E-03					
			514.00	-1.358E-03	%(	6.800E-02 1.96E-02	G
Kr-85		-2.8910E+01					
			513.99	-2.891E+01	%(	1.440E+03 4.15E+02	G
Y-88		-2.6271E-05					
			1836.01	-2.627E-05	%(P	9.076E-02 2.42E-02	G K
			898.02	2.239E-02	% P	5.635E-02 1.67E-02	G
NB-94		-1.1770E-02					
			871.10	-1.177E-02	%(	5.843E-02 1.68E-02	G K
			702.50	6.082E-03	&	4.503E-02 1.27E-02	G K
Ag-108M		2.0471E-03					
			722.95	2.047E-03	%(	7.241E-02 2.05E-02	G K
			614.37	-1.652E-02	% P	6.711E-02 1.97E-02	G
			433.93	1.499E-03	%	4.279E-02 1.21E-02	G
CD-109		-4.3259E-01					
			88.04	-4.326E-01	%(P	1.936E+00 5.79E-01	G
SN-113		1.5450E-03					
			391.71	1.545E-03	%(	6.085E-02 1.73E-02	G K
			255.04	-4.599E-01	&	2.265E+00 6.72E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	-7.9049E-03						
		427.95	-7.905E-03	&(P	1.521E-01	4.32E-02	G K
		600.77	-2.120E-03	& P	2.483E-01	6.89E-02	G
		636.15	-9.181E-04	& P	4.359E-01	1.21E-01	G
		463.51	3.420E-01	% P	4.593E-01	1.43E-01	G
		176.29	-4.147E-02	& P	6.750E-01	1.98E-01	G
I-131	-6.2689E-03						
		364.48	-6.269E-03	&(	1.056E-01	3.05E-02	G K
		636.97	1.718E-02	&	1.339E+00	3.73E-01	G
		284.29	4.890E-01	&	1.381E+00	4.14E-01	G
CS-134	-8.4807E-03						
		604.66	-8.481E-03	%(	5.414E-02	1.56E-02	G K
		795.76	4.375E-02	%	6.396E-02	2.01E-02	G
		569.29	6.375E-03	%	3.288E-01	9.29E-02	G
		801.84	2.708E-03	% P	6.395E-01	1.77E-01	G
CS-137	4.0176E-01						
		661.62	4.018E-01	(	7.046E-02	3.86E-02	G
CE-139	-2.4797E-02						
		165.85	-2.480E-02	%(P	6.204E-02	1.87E-02	G
EU-152	-5.8594E-03						
		121.78	-5.859E-03	&(P	1.669E-01	4.93E-02	G K
		344.30	-4.181E-02	%	1.627E-01	4.82E-02	G
		1408.08	-7.952E-03	%	2.844E-01	7.54E-02	G
		964.00	-4.572E-02	& P	4.779E-01	1.35E-01	G
		1112.07	-7.963E-03	%	4.786E-01	1.31E-01	G
		778.90	6.889E-03	% P	3.732E-01	1.02E-01	G
EU-154	2.2869E-03						
		123.10	2.287E-03	%(P	1.182E-01	3.49E-02	G K
		1274.80	-2.909E-02	%	2.270E-01	6.43E-02	G
		723.30	-5.747E-02	% P	3.103E-01	8.96E-02	G
		1004.80	0.000E+00	%	4.212E-01	1.17E-01	G
EU-155	4.3802E-03						
		86.45	4.380E-03	%(P	2.369E-01	7.01E-02	G K
		105.31	6.691E-02	%	2.424E-01	7.27E-02	G
HG-203	-1.5113E-02						
		279.17	-1.511E-02	%(P	6.435E-02	1.91E-02	G K
		72.87	-5.289E-01	&	2.349E+00	7.05E-01	G
		70.83	-8.078E-01	%	4.180E+00	1.25E+00	G
		82.50	-1.066E+00	&	4.204E+00	1.26E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.1220E-01						
		583.14	2.122E-01	@(P	5.514E-02	2.70E-02	G
		510.72	4.558E-01	+	2.581E-01	1.07E-01	G
PB-212	5.4836E-01						
		238.63	5.484E-01	(	1.145E-01	4.33E-02	G K
							Energy duplication
		77.11	8.760E-01	+	5.961E-01	1.89E-01	G
		74.81	5.370E-01	& P	1.270E+00	3.84E-01	G
PB-214	4.3269E-01						
		351.99	4.050E-01	*(P	1.065E-01	4.29E-02	G K
		295.22	4.862E-01	(	1.756E-01	6.57E-02	G
							Energy duplication
		77.11	1.433E+00	+	9.750E-01	3.08E-01	G
		241.92	1.886E-01	%	7.126E-01	2.13E-01	G
BI-212	5.0500E-01						
		727.17	5.050E-01	(	4.056E-01	1.40E-01	G K
		1620.56	2.620E-01	% P	2.026E+00	5.39E-01	G
		785.42	7.792E-01	% P	2.492E+00	7.31E-01	G
BI-214	4.5481E-01						
		609.32	4.683E-01	(	1.116E-01	5.51E-02	G K
		1764.51	-5.414E-03	% P	5.014E-01	1.33E-01	G
		1120.28	4.136E-01	(	4.093E-01	1.38E-01	G
RA-224	3.0838E-01						
		241.00	3.084E-01	&(P	1.386E+00	4.13E-01	G
RA-226	1.1112E+00						
		185.99	1.111E+00	*(P	1.369E+00	4.22E-01	G
AC-228	5.0403E-01						
		911.07	5.314E-01	@(P	2.022E-01	8.28E-02	G K
		968.90	4.586E-01	@(P	3.265E-01	1.17E-01	G
		338.40	3.484E-01	-	3.576E-01	1.14E-01	G
TH-227	-1.2852E-01						
		236.00	-1.285E-01	%(P	4.831E-01	1.45E-01	G K
		256.25	1.202E-01	&	4.782E-01	1.42E-01	G
PA-234	-5.1672E-02						
		98.44	-5.167E-02	%(	2.513E-01	7.52E-02	G K
		946.00	4.929E-02	%	2.648E-01	7.52E-02	G
		131.28	-1.499E-03	&	2.445E-01	7.23E-02	G
		94.67	-1.221E-02	&	4.509E-01	1.34E-01	G
		883.24	1.051E-01	&	3.179E-01	9.27E-02	G
		926.70	0.000E+00	%	5.995E-01	1.66E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		569.26	1.783E-02	%	4.814E-01	1.36E-01	G
TH-234	9.9513E-01						
		63.29	9.951E-01	%(P	4.730E+00	1.42E+00	G K
		92.80	1.475E+00	%	2.445E+00	7.46E-01	G
		92.38	1.600E+00	% P	2.938E+00	8.93E-01	G
AM-241	1.5124E-01						
		59.54	1.512E-01	%(	5.313E-01	1.59E-01	G

(- This peak used in the nuclide activity average.

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

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

- -

***** 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	-7.3017E-02	-8.1104E-02	4.9983E-01	4.9986E-01	5.152E-01
K-40		1.3781E+01	1.3781E+01	1.9321E+00	2.0812E+00	5.019E-01
MN-54	#A	-3.5230E-03	-3.5868E-03	6.6843E-02	6.6844E-02	6.190E-02
CO-57	#B	-1.3845E-02	-1.4135E-02	5.5305E-02	5.5311E-02	6.031E-02
CO-60	#B	1.7399E-02	1.7450E-02	5.2017E-02	5.2026E-02	5.983E-02

Sr-85	#A	-1.2450E-03	-1.3575E-03	5.8746E-02	5.8746E-02	6.236E-02
Kr-85	#A	-2.8909E+01	-2.8910E+01	1.2439E+03	1.2439E+03	1.440E+03
Y-88	#B	-2.4924E-05	-2.6271E-05	9.5477E-04	9.5477E-04	8.610E-02
NB-94	#B	-1.1770E-02	-1.1770E-02	5.0426E-02	5.0430E-02	5.843E-02
Ag-108M	#B	2.0469E-03	2.0471E-03	6.1618E-02	6.1618E-02	7.240E-02
CD-109	#A	-4.2727E-01	-4.3259E-01	1.9581E+00	1.9582E+00	1.912E+00
SN-113	#B	1.4715E-03	1.5450E-03	5.1849E-02	5.1850E-02	5.796E-02
SB-125	#B	-7.8612E-03	-7.9049E-03	3.3096E-01	3.3096E-01	1.513E-01
I-131	#B	-3.1202E-03	-6.2689E-03	9.1514E-02	9.1514E-02	5.256E-02
CS-134	#B	-8.4177E-03	-8.4807E-03	4.6876E-02	4.6879E-02	5.374E-02
CS-137		4.0155E-01	4.0176E-01	1.1568E-01	1.1786E-01	
CE-139	#A	-2.3806E-02	-2.4797E-02	5.7399E-02	5.7416E-02	5.956E-02
EU-152	#B	-5.8523E-03	-5.8594E-03	2.4509E-01	2.4509E-01	1.667E-01
EU-154	#B	2.2827E-03	2.2869E-03	1.0481E-01	1.0481E-01	1.180E-01
EU-155	#B	4.3666E-03	4.3802E-03	2.1040E-01	2.1040E-01	2.362E-01
HG-203	#B	-1.3399E-02	-1.5113E-02	5.8047E-02	5.8053E-02	5.705E-02
TL-208	#	2.1220E-01	2.1220E-01	8.1024E-02	8.1894E-02	
PB-212	#	5.4836E-01	5.4836E-01	1.3001E-01	1.3360E-01	1.145E-01
PB-214	#	4.3269E-01	4.3269E-01	1.1144E-01	1.1405E-01	1.065E-01
BI-212	#	5.0500E-01	5.0500E-01	4.2024E-01	4.2120E-01	4.056E-01
BI-214		4.5481E-01	4.5481E-01	1.6032E-01	1.6234E-01	
RA-224	#A	3.0838E-01	3.0838E-01	1.2402E+00	1.2403E+00	1.386E+00
RA-226	#A	1.1112E+00	1.1112E+00	1.2663E+00	1.2678E+00	1.369E+00
AC-228	#	5.0403E-01	5.0403E-01	2.2555E-01	2.2732E-01	2.022E-01
TH-227	#B	-1.2852E-01	-1.2852E-01	4.4386E-01	4.4392E-01	4.831E-01
PA-234	#B	-5.1672E-02	-5.1672E-02	2.2559E-01	2.2561E-01	2.513E-01
TH-234	#B	9.9513E-01	9.9513E-01	4.2458E+00	4.2462E+00	4.730E+00
AM-241	#A	1.5123E-01	1.5124E-01	4.7713E-01	4.7721E-01	5.313E-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 (1766.8 to 1999.0 keV) 1.4849817E+01 pCi/gm
Total Decayed Activity (1766.8 to 1999.0 keV) 1.4850022E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
DAT

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 102F_7JULY2006_0936.An1

Sample description
FSS-OOL-11-02-007-F

Spectrum Filename: C:\GammaVision\Spectra\102F_7JULY2006_0936.An1

Acquisition information
Start time: 07-Jul-2006 09:36:22
Live time: 2000
Real time: 2025
Dead time: 1.21 %
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: 1.9250E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.9250E+03) =
5.1948E+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	29-Jun-2006 16:00:00
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: 0.6181

***** 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
77.17	239.	20.03	1.50	9.541E-03	77.11	10.700	1.642E+00	PB214
					77.11	17.500	1.004E+00	PB212
77.17	239.	20.03	1.50	9.541E-03	77.11	10.700	1.642E+00	PB214
					77.11	17.500	1.004E+00	PB212
87.23	104.	41.60	1.50	1.199E-02	86.45	32.740	PBC<MDA	EU155
					88.04	3.790	1.577E+00	CD109
87.53	130.	21.92	1.11	1.235E-02	86.45	32.740	PBC<MDA	EU155
					88.04	3.790	1.971E+00	CD109
90.26	86.	35.42	1.11	1.293E-02				
92.84	107.	29.44	1.11	1.344E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	1.881E+00	TH234
128.85	138.	30.09	1.48	1.714E-02				
162.12	100.	31.10	1.17	1.713E-02				
186.20	132.	27.84	1.19	1.626E-02	185.99	3.280	1.675E+00	RA226
209.72	89.	30.90	1.06	1.517E-02				
238.99	789.	4.23	1.21	1.379E-02	238.63	43.100	9.304E-01	PB212
242.15	132.	16.63	1.22	1.364E-02	241.00	3.900	1.716E+00	RA224
					241.92	7.470	9.068E-01	PB214
270.05	96.	28.61	1.90	1.244E-02				
295.67	199.	10.02	1.25	1.145E-02	295.22	19.200	6.355E-01	PB214
300.77	47.	34.67	1.26	1.127E-02				
338.62	155.	20.18	1.27	1.005E-02	338.40	12.010	9.023E-01	AC228
352.52	311.	9.02	1.22	9.664E-03	351.99	37.100	6.067E-01	PB214
464.22	54.	27.26	1.29	7.354E-03	463.51	10.000	5.007E-01	SB125
511.61	96.	25.90	1.28	6.684E-03	510.72	22.500	4.451E-01	TL208
584.09	232.	10.34	1.61	5.881E-03	583.14	86.000	3.203E-01	TL208
610.24	200.	11.19	1.47	5.641E-03	609.32	46.090	5.398E-01	BI214

662.60	59.	25.74	1.01	5.222E-03	661.62	84.620	9.428E-02	CS137
728.11	52.	32.25	1.42	4.794E-03	727.17	11.800	6.403E-01	BI212
912.37	127.	13.68	2.16	3.917E-03	911.07	29.000	7.825E-01	AC228
969.62	135.	12.22	1.34	3.716E-03	968.90	17.460	1.458E+00	AC228
1121.54	68.	30.13	0.73	3.283E-03	1120.28	15.040	9.639E-01	BI214

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1462.70	702.	3.86	1.82	2.618E-03	1460.75	10.700	1.756E+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	
180.10	90.77	418.	86.	0.043	106.26	1.109	PB-214	D
185.25	93.34	444.	107.	0.054	88.32	1.111	U-235	D
257.29	128.85	594.	150.	0.075	73.34	1.485	AC-228	s
323.84	162.12	356.	121.	0.061	71.30	1.174	BA-140	s
419.06	209.72	305.	89.	0.045	92.70	1.061	NP-239	
477.61	239.03	161.	789.	0.394	12.68	1.215	PB-212	D
483.92	242.18	174.	132.	0.066	49.90	1.217	PB-214	D
539.75	270.05	246.	96.	0.048	85.82	1.905	AC-228	s
601.27	300.81	120.	41.	0.021	122.66	1.202	PB-212	

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-214	153.80	77.11	1024.	239.	0.119	60.09	1.500D
PB-212	153.80	77.11	1024.	239.	0.119	60.09	1.500D
CD-109	175.66	88.04	350.	130.	0.065	65.76	1.107D
RA-226	371.84	186.12	502.	112.	0.056	85.95	1.500
PB-212	477.62	239.00	461.	734.	0.367	16.62	1.500s
RA-224	483.85	242.11	506.	92.	0.046	107.51	1.500
PB-214	483.94	242.16	513.	84.	0.042	118.86	1.500s
PB-214	590.94	295.64	207.	188.	0.094	39.07	1.500
AC-228	676.92	338.62	251.	155.	0.078	60.55	1.272
PB-214	704.44	352.38	149.	250.	0.125	28.03	1.500
SB-125	927.46	463.86	62.	53.	0.027	72.49	1.500
TL-208	1022.99	511.61	148.	96.	0.048	77.70	1.276s
TL-208	1168.02	584.09	98.	231.	0.116	31.01	1.609s
BI-214	1220.33	610.24	89.	200.	0.100	33.58	1.466
CS-137	1325.10	662.60	65.	59.	0.030	77.23	1.013s
BI-212	1456.18	728.11	70.	52.	0.026	96.74	1.417
AC-228	1824.88	912.37	50.	127.	0.063	41.05	2.162s
AC-228	1939.45	969.62	44.	135.	0.067	36.65	1.345
BI-214	2243.47	1121.54	83.	68.	0.034	90.38	0.728s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
K-40	2926.29	1462.69	9.	693.	0.346	11.64	1.823

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		9.1756E-02					
			477.56	9.176E-02	%(	3.262E-01 9.55E-02	G
K-40		1.7340E+01					
			1460.75	1.734E+01	(P	4.246E-01 6.73E-01	G
MN-54		-1.5057E-02					
			834.81	-1.506E-02	&(P	6.944E-02 2.03E-02	G
CO-57		2.7055E-02					
			122.07	2.706E-02	%(	6.156E-02 1.86E-02	G K
			136.43	-4.271E-02	&	5.098E-01 1.52E-01	G
CO-60		-3.3325E-03					
			1332.51	-3.333E-03	&(P	6.281E-02 1.72E-02	G K
			1173.23	2.316E-02	&	8.325E-02 2.45E-02	G K
Sr-85		-1.8677E-02					
			514.00	-1.868E-02	&(	7.010E-02 2.08E-02	G
Kr-85		-2.2125E+02					
			513.99	-2.212E+02	&(	1.430E+03 4.20E+02	G
Y-88		-5.2464E-03					
			1836.01	-5.246E-03	%(P	6.763E-02 1.82E-02	G K
			898.02	-1.797E-02	% P	6.722E-02 1.95E-02	G
NB-94		2.5216E-02					
			871.10	2.522E-02	%(	4.309E-02 1.34E-02	G K
			702.50	4.331E-03	&	5.992E-02 1.72E-02	G K
Ag-108M		-7.2399E-03					
			722.95	-7.240E-03	&(	7.051E-02 2.04E-02	G K
			614.37	-3.351E-02	& P	7.408E-02 2.24E-02	G
			433.93	-2.049E-02	%	5.457E-02 1.64E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CD-109	1.9710E+00						
		88.04	1.971E+00	(P	1.365E+00	4.37E-01	G
SN-113	-1.0851E-02						
		391.71	-1.085E-02	%(	8.213E-02	2.41E-02	G K
		255.04	-1.522E-02	%	2.086E+00	6.11E-01	G
SB-125	1.2230E-01						
		427.95	-9.099E-03	&(P	1.308E-01	3.72E-02	G K
		600.77	-9.357E-04	% P	2.632E-01	7.43E-02	G
		636.15	1.180E-01	% P	3.849E-01	1.13E-01	G
		463.51	5.112E-01	(P	3.778E-01	1.27E-01	G
		176.29	-3.656E-02	& P	7.271E-01	2.15E-01	G
I-131	0.0000E+00						
		364.48	0.000E+00	&(	1.069E-01	3.10E-02	G K
		636.97	3.541E-01	%	1.115E+00	3.29E-01	G
		284.29	6.071E-02	%	1.598E+00	4.70E-01	G
CS-134	0.0000E+00						
		604.66	0.000E+00	%(	7.233E-02	2.09E-02	G K
		795.76	2.413E-02	%	6.334E-02	1.89E-02	G
		569.29	5.435E-02	%	3.028E-01	8.80E-02	G
		801.84	3.444E-03	% P	4.918E-01	1.34E-01	G
CS-137	9.4277E-02						
		661.62	9.428E-02	@(	6.375E-02	2.43E-02	G
CE-139	-2.2023E-02						
		165.85	-2.202E-02	%(P	6.195E-02	1.87E-02	G
EU-152	7.3454E-02						
		121.78	7.345E-02	%(P	1.837E-01	5.55E-02	G K
		344.30	2.038E-02	%	1.587E-01	4.66E-02	G
		1408.08	-5.347E-02	&	2.591E-01	7.32E-02	G
		964.00	-9.894E-02	% P	5.264E-01	1.53E-01	G
		1112.07	6.786E-02	%	5.919E-01	1.70E-01	G
		778.90	1.414E-01	% P	3.851E-01	1.15E-01	G
EU-154	-4.5948E-03						
		123.10	-4.595E-03	%(P	1.310E-01	3.90E-02	G K
		1274.80	8.034E-03	&	2.452E-01	6.93E-02	G
		723.30	-4.141E-02	% P	3.230E-01	9.34E-02	G
		1004.80	-5.347E-02	%	3.612E-01	1.03E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	1.8631E-01						
		86.45	1.863E-01	%(P	2.629E-01	8.04E-02	G K
		105.31	2.950E-02	&	2.796E-01	8.35E-02	G
HG-203	2.0796E-02						
		279.17	2.080E-02	%(P	5.612E-02	1.69E-02	G K
		72.87	-4.562E-01	%	2.216E+00	6.65E-01	G
		70.83	-1.211E+00	%	4.663E+00	1.40E+00	G
		82.50	-5.438E-01	%	4.530E+00	1.36E+00	G
TL-208	3.2027E-01						
		583.14	3.203E-01	@(P	6.766E-02	3.32E-02	G
		510.72	4.451E-01	+	2.764E-01	1.15E-01	G
PB-212	9.0612E-01						
		238.63	8.665E-01	@(	1.212E-01	4.80E-02	G K
							Energy duplication
		77.11	1.004E+00	*(	6.384E-01	2.01E-01	G
		74.81	8.746E-01	& P	1.337E+00	4.08E-01	G
PB-214	5.3336E-01						
		351.99	4.894E-01	(P	1.166E-01	4.58E-02	G K
		295.22	6.007E-01	(	2.223E-01	7.82E-02	G
							Energy duplication
		77.11	1.642E+00	+	1.044E+00	3.29E-01	G
		241.92	5.786E-01	?(	7.448E-01	2.29E-01	G
BI-212	6.4033E-01						
		727.17	6.403E-01	(	5.188E-01	2.07E-01	G K
		1620.56	-2.102E-01	% P	1.550E+00	3.97E-01	G
		785.42	1.709E-02	% P	2.616E+00	7.30E-01	G
BI-214	5.3976E-01						
		609.32	5.398E-01	(	1.257E-01	6.05E-02	G K
		1764.51	-1.324E-02	& P	4.489E-01	1.21E-01	G
		1120.28	9.639E-01	+	6.428E-01	2.91E-01	G
RA-224	1.2026E+00						
		241.00	1.203E+00	?(P	1.413E+00	4.36E-01	G
RA-226	1.4719E+00						
		185.99	1.472E+00	(P	1.409E+00	4.39E-01	G
AC-228	8.1757E-01						
		911.07	7.825E-01	(P	2.206E-01	1.07E-01	G K
		968.90	1.458E+00	+ P	3.641E-01	1.78E-01	G
		338.40	9.023E-01	(	4.445E-01	1.82E-01	G

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

TH-227      -4.0879E-01
                          236.00-4.088E-01 %(P 5.923E-01 1.81E-01 G K
                          256.25-1.106E-01 &   6.363E-01 1.89E-01 G

PA-234      -8.9696E-02
                           98.44-8.970E-02 &(  2.698E-01 8.14E-02 G K
                          946.00-3.902E-02 &   3.555E-01 1.02E-01 G
                          131.28-4.015E-02 &   2.570E-01 7.69E-02 G
                           94.67-6.148E-02 %   5.176E-01 1.55E-01 G
                          883.24-6.083E-02 %   4.760E-01 1.36E-01 G
                          926.70-8.173E-02 %   5.249E-01 1.50E-01 G
                          569.26 8.035E-02 %   4.460E-01 1.30E-01 G

TH-234      -5.5611E-01
                           63.29-5.561E-01 %(P 4.826E+00 1.44E+00 G K
                           92.80 1.847E+00 %   2.626E+00 8.03E-01 G
                           92.38-2.420E-02 % P 3.167E+00 9.44E-01 G

AM-241       8.7718E-02
                           59.54 8.772E-02 %(  7.211E-01 2.15E-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	8.2992E-02	9.1756E-02	2.8663E-01	2.8667E-01	2.951E-01
K-40		1.7340E+01	1.7340E+01	2.0196E+00	2.2418E+00	
MN-54	#A	-1.4800E-02	-1.5057E-02	6.3812E-02	6.3817E-02	6.826E-02
CO-57	#B	2.6524E-02	2.7055E-02	5.5913E-02	5.5933E-02	6.035E-02
CO-60	#B	-3.3233E-03	-3.3325E-03	5.8013E-02	5.8014E-02	6.264E-02
Sr-85	#A	-1.7195E-02	-1.8677E-02	6.2542E-02	6.2550E-02	6.453E-02
Kr-85	#A	-2.2123E+02	-2.2125E+02	1.2606E+03	1.2607E+03	1.430E+03
Y-88	#B	-4.9891E-03	-5.2464E-03	5.5012E-02	5.5012E-02	6.431E-02
NB-94	#B	2.5216E-02	2.5216E-02	4.0178E-02	4.0203E-02	4.309E-02
Ag-108M	#B	-7.2390E-03	-7.2399E-03	6.1092E-02	6.1094E-02	7.051E-02
CD-109		1.9479E+00	1.9710E+00	1.3109E+00	1.3154E+00	
SN-113	#B	-1.0357E-02	-1.0851E-02	7.2418E-02	7.2421E-02	7.839E-02
SB-125	#B	1.2165E-01	1.2230E-01	9.1220E-02	9.1477E-02	1.301E-01
I-131	#B	0.0000E+00	0.0000E+00	9.2929E-02	9.2929E-02	5.491E-02
CS-134	#B	0.0000E+00	0.0000E+00	6.2714E-02	6.2714E-02	7.182E-02
CS-137	#	9.4231E-02	9.4277E-02	7.2808E-02	7.3000E-02	
CE-139	#A	-2.1181E-02	-2.2023E-02	5.7212E-02	5.7225E-02	5.958E-02
EU-152	#B	7.3370E-02	7.3454E-02	1.6649E-01	1.6654E-01	1.834E-01
EU-154	#B	-4.5869E-03	-4.5948E-03	1.2817E-01	1.2817E-01	1.308E-01
EU-155	#B	1.8576E-01	1.8631E-01	2.4106E-01	2.4128E-01	2.622E-01
HG-203	#B	1.8536E-02	2.0796E-02	5.0619E-02	5.0632E-02	5.002E-02
TL-208	#	3.2027E-01	3.2027E-01	9.9502E-02	1.0111E-01	
PB-212	#	9.0612E-01	9.0612E-01	1.5063E-01	1.5898E-01	1.212E-01
PB-214	#	5.3336E-01	5.3336E-01	1.4973E-01	1.5269E-01	1.166E-01
BI-212		6.4033E-01	6.4033E-01	6.1947E-01	6.2051E-01	
BI-214		5.3976E-01	5.3976E-01	1.8124E-01	1.8376E-01	
RA-224	#A	1.2026E+00	1.2026E+00	1.3092E+00	1.3110E+00	1.413E+00
RA-226	#	1.4719E+00	1.4719E+00	1.3156E+00	1.3182E+00	1.409E+00
AC-228		8.1757E-01	8.1757E-01	2.9922E-01	3.0272E-01	
TH-227	#B	-4.0879E-01	-4.0879E-01	5.4685E-01	5.4734E-01	5.923E-01
PA-234	#B	-8.9696E-02	-8.9696E-02	2.4406E-01	2.4411E-01	2.698E-01
TH-234	#B	-5.5611E-01	-5.5611E-01	4.5184E+00	4.5185E+00	4.826E+00
AM-241	#A	8.7715E-02	8.7718E-02	6.4616E-01	6.4618E-01	7.211E-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 1999.0 keV) 2.1699654E+01 pCi/gm
Total Decayed Activity (269.7 to 1999.0 keV) 2.1722872E+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_7JULY2006_1143.An1

Sample description
FSS-OOL-11-02-002-F

Spectrum Filename: C:\GammaVision\Spectra\102F_7JULY2006_1143.An1

Acquisition information
Start time: 07-Jul-2006 11:43:30
Live time: 2000
Real time: 2016
Dead time: 0.80 %
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: 1.2170E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.2170E+03) =
8.2169E+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	29-Jun-2006 16:25:00
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: 0.6120

***** 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
77.31	114.	32.41	1.50	9.541E-03	77.11	10.700	PBC<MDA	PB214
					77.11	17.500	7.599E-01	PB212
77.31	114.	32.41	1.50	9.541E-03	77.11	10.700	1.243E+00	PB214
					77.11	17.500	7.599E-01	PB212
186.06	133.	21.25	1.20	1.626E-02	185.99	3.280	2.677E+00	RA226
239.01	435.	5.62	1.22	1.379E-02	238.63	43.100	8.121E-01	PB212
241.61	75.	28.19	1.22	1.367E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	8.166E-01	PB214
270.93	47.	30.76	0.83	1.240E-02				
295.60	100.	15.02	1.25	1.146E-02	295.22	19.200	5.048E-01	PB214
300.57	28.	41.59	1.26	1.128E-02				
338.67	96.	18.38	0.85	1.005E-02	338.40	12.010	8.814E-01	AC228
352.42	179.	13.23	1.44	9.667E-03	351.99	37.100	5.530E-01	PB214
463.71	30.	33.33	1.50	7.365E-03	463.51	10.000	PBC<MDA	SB125
511.17	79.	18.90	2.05	6.689E-03	510.72	22.500	5.823E-01	TL208
583.91	133.	14.40	1.43	5.883E-03	583.14	86.000	2.907E-01	TL208
609.99	115.	14.50	1.46	5.643E-03	609.32	46.090	4.904E-01	BI214
662.31	160.	11.17	1.63	5.224E-03	661.62	84.620	4.017E-01	CS137
912.10	61.	18.21	1.03	3.918E-03	911.07	29.000	5.933E-01	AC228
970.51	40.	23.93	1.72	3.718E-03	968.90	17.460	6.820E-01	AC228
1462.57	359.	5.28	2.08	2.618E-03	1460.75	10.700	1.421E+01	K40
1766.13	25.	20.00	1.06	2.225E-03	1764.51	15.920	7.809E-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	
477.65	239.02	82.	435.	0.218	16.87	1.215	PB-212	D
482.84	241.61	186.	75.	0.038	84.56	1.217	PB-214	D
541.51	270.93	81.	47.	0.023	92.28	0.827	AC-228	
600.80	300.40	55.	28.	0.014	124.77	1.258	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-214	153.80	77.11	628.	114.	0.057	97.22	1.500D
PB-212	153.80	77.11	628.	114.	0.057	97.22	1.500D
RA-226	371.72	186.06	234.	129.	0.064	63.74	1.195s
PB-212	477.61	238.99	260.	366.	0.183	24.38	1.500s
RA-224	483.46	241.92	273.	65.	0.033	111.46	1.500
PB-214	590.80	295.57	108.	100.	0.050	53.21	1.500s
AC-228	677.04	338.68	83.	62.	0.031	72.65	1.500s
PB-214	704.33	352.32	70.	132.	0.066	37.38	1.500
SB-125	927.18	463.71	41.	30.	0.015	99.98	1.500s
TL-208	1022.11	511.17	48.	79.	0.040	56.71	2.045s
TL-208	1167.66	583.91	65.	133.	0.066	43.21	1.425
BI-214	1219.84	609.99	48.	115.	0.058	43.51	1.459
CS-137	1324.53	662.31	42.	160.	0.080	33.52	1.629
AC-228	1825.13	912.50	22.	51.	0.025	57.06	1.679s
AC-228	1941.23	970.51	26.	40.	0.020	71.79	1.718s
K-40	2926.04	1462.57	0.	359.	0.179	15.83	2.084
BI-214	3533.72	1766.13	0.	25.	0.012	60.00	1.061s

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		1.7759E-02					
			477.56	1.776E-02	%(	7.007E-01 2.00E-01	G
K-40		1.4209E+01					
			1460.75	1.421E+01	(P	2.918E-01 7.50E-01	G
MN-54		1.1725E-02					
			834.81	1.173E-02	%(P	6.682E-02 1.89E-02	G
CO-57		-9.5561E-03					
			122.07	-9.556E-03	%(	6.969E-02 2.07E-02	G K
			136.43	5.781E-02	&	4.759E-01 1.41E-01	G
CO-60		-3.0568E-04					
			1332.51	-3.057E-04	%(P	2.897E-02 3.93E-03	G K
			1173.23	1.060E-02	%	8.664E-02 2.42E-02	G K
Sr-85		-1.9628E-02					
			514.00	-1.963E-02	%(	7.697E-02 2.27E-02	G
Kr-85		-4.1409E+02					
			513.99	-4.141E+02	%(	1.633E+03 4.81E+02	G
Y-88		-3.0857E-03					
			1836.01	-3.086E-03	%(P	5.425E-02 1.26E-02	G K
			898.02	-6.293E-03	% P	9.273E-02 2.56E-02	G
NB-94		2.8129E-04					
			871.10	2.813E-04	&(	6.390E-02 1.72E-02	G K
			702.50	-1.750E-03	%	6.576E-02 1.82E-02	G K
Ag-108M		1.5281E-02					
			722.95	1.528E-02	%(	6.413E-02 1.85E-02	G K
			614.37	-6.871E-02	% P	1.047E-01 3.23E-02	G
			433.93	2.171E-02	%	6.127E-02 1.83E-02	G
CD-109		1.2362E+00					
			88.04	1.236E+00	&(P	2.695E+00 8.16E-01	G
SN-113		1.1986E-02					
			391.71	1.199E-02	&(	8.038E-02 2.32E-02	G K
			255.04	-3.677E-01	%	2.672E+00 7.86E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	9.0772E-02						
		427.95	-3.190E-02	%(P	2.037E-01	5.86E-02	G K
		600.77	-6.682E-02	% P	3.245E-01	9.34E-02	G
		636.15	-7.892E-02	% P	5.491E-01	1.56E-01	G
		463.51	4.539E-01	(P	4.926E-01	1.59E-01	G
		176.29	-1.605E-02	% P	7.872E-01	2.29E-01	G
I-131	2.5321E-04						
		364.48	2.532E-04	&(	1.318E-01	3.76E-02	G K
		636.97	-1.861E-01	%	1.515E+00	4.26E-01	G
		284.29	-5.595E-01	%	1.711E+00	5.11E-01	G
CS-134	-1.2530E-02						
		604.66	-1.253E-02	%(	7.095E-02	2.05E-02	G K
		795.76	2.855E-02	%	8.482E-02	2.51E-02	G
		569.29	1.026E-03	&	3.958E-01	1.10E-01	G
		801.84	-1.135E-01	% P	8.245E-01	2.33E-01	G
CS-137	4.0168E-01						
		661.62	4.017E-01	(	8.262E-02	4.49E-02	G
CE-139	1.0478E-03						
		165.85	1.048E-03	%(P	6.418E-02	1.88E-02	G
EU-152	-3.3629E-02						
		121.78	-3.363E-02	%(P	2.022E-01	6.00E-02	G K
		344.30	0.000E+00	%	2.221E-01	6.40E-02	G
		1408.08	-1.723E-02	&	3.737E-01	9.92E-02	G
		964.00	9.139E-02	% P	4.777E-01	1.35E-01	G
		1112.07	3.442E-02	&	7.478E-01	2.09E-01	G
		778.90	-2.443E-03	% P	5.051E-01	1.38E-01	G
EU-154	-1.5643E-02						
		123.10	-1.564E-02	%(P	1.348E-01	3.99E-02	G K
		1274.80	-2.688E-02	%	2.590E-01	7.19E-02	G
		723.30	6.434E-02	% P	3.006E-01	8.59E-02	G
		1004.80	-6.028E-02	&	4.118E-01	1.15E-01	G
EU-155	1.1360E-01						
		86.45	1.136E-01	&(P	3.299E-01	9.93E-02	G K
		105.31	5.329E-02	&	2.985E-01	8.88E-02	G
HG-203	-4.7897E-03						
		279.17	-4.790E-03	%(P	7.277E-02	2.12E-02	G K
		72.87	-5.823E-01	%	3.118E+00	9.34E-01	G
		70.83	-1.552E+00	&	5.527E+00	1.66E+00	G
		82.50	3.701E-02	%	5.154E+00	1.52E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.9066E-01						
		583.14	2.907E-01	(P	8.856E-02	4.20E-02	G
		510.72	5.823E-01	+	2.580E-01	1.10E-01	G
PB-212	7.0583E-01						
		238.63	6.839E-01	@(	1.454E-01	5.56E-02	G K
							Energy duplication
		77.11	7.599E-01	@(	7.948E-01	2.46E-01	G
		74.81	7.456E-01	& P	1.667E+00	5.04E-01	G
PB-214	4.4094E-01						
		351.99	4.072E-01	(P	1.287E-01	5.09E-02	G K
		295.22	5.061E-01	*(	2.581E-01	8.98E-02	G
							Energy duplication
		77.11	1.243E+00	+	1.300E+00	4.03E-01	G
		241.92	6.391E-01	%	8.801E-01	2.71E-01	G
BI-212	-1.1745E-01						
		727.17	-1.174E-01	%(	6.243E-01	1.80E-01	G K
		1620.56	-5.652E-02	% P	1.241E+00	1.68E-01	G
		785.42	1.015E+00	% P	2.914E+00	8.59E-01	G
BI-214	4.9043E-01						
		609.32	4.904E-01	(	1.492E-01	7.12E-02	G K
		1764.51	7.809E-01	+ P	2.310E-01	1.56E-01	G
		1120.28	-7.477E-02	&	7.876E-01	2.24E-01	G
RA-224	1.3578E+00						
		241.00	1.358E+00	(P	1.657E+00	5.13E-01	G
RA-226	2.6773E+00						
		185.99	2.677E+00	*(P	1.541E+00	5.89E-01	G
AC-228	5.6667E-01						
		911.07	4.950E-01	(P	2.383E-01	9.46E-02	G K
		968.90	6.820E-01	(P	4.503E-01	1.63E-01	G
		338.40	5.722E-01	(	4.139E-01	1.39E-01	G
TH-227	-3.0204E-01						
		236.00	-3.020E-01	%(P	6.749E-01	2.04E-01	G K
		256.25	-6.026E-02	%	7.561E-01	2.21E-01	G
PA-234	1.4541E-02						
		98.44	1.454E-02	&(	3.081E-01	9.12E-02	G K
		946.00	3.922E-02	&	3.764E-01	1.05E-01	G
		131.28	-8.360E-02	%	3.003E-01	9.00E-02	G
		94.67	-1.691E-01	&	5.842E-01	1.76E-01	G
		883.24	9.435E-02	%	5.150E-01	1.45E-01	G
		926.70	-9.650E-02	&	7.022E-01	1.98E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-9.739E-02 &   5.728E-01 1.65E-01 G

TH-234       9.2323E-01
                           63.29 9.232E-01 &(P 6.395E+00 1.91E+00 G K
                           92.80 1.656E+00 %   3.088E+00 9.39E-01 G
                           92.38-1.077E-01 & P 3.775E+00 1.12E+00 G

AM-241       1.8994E-01
                           59.54 1.899E-01 %(  9.392E-01 2.81E-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	1.6048E-02	1.7759E-02	5.9899E-01	5.9899E-01	6.332E-01
K-40		1.4209E+01	1.4209E+01	2.2508E+00	2.3879E+00	
MN-54	#A	1.1524E-02	1.1725E-02	5.6672E-02	5.6675E-02	6.568E-02
CO-57	#B	-9.3665E-03	-9.5561E-03	6.2052E-02	6.2055E-02	6.830E-02
CO-60	#B	-3.0483E-04	-3.0568E-04	1.8341E-03	1.8342E-03	2.888E-02

Sr-85	#A	-1.8057E-02	-1.9628E-02	6.7989E-02	6.7998E-02	7.081E-02
Kr-85	#A	-4.1406E+02	-4.1409E+02	1.4424E+03	1.4426E+03	1.633E+03
Y-88	#B	-2.9330E-03	-3.0857E-03	3.8772E-02	3.8772E-02	5.157E-02
NB-94	#B	2.8129E-04	2.8129E-04	5.1523E-02	5.1523E-02	6.390E-02
Ag-108M	#B	1.5279E-02	1.5281E-02	5.5359E-02	5.5366E-02	6.412E-02
CD-109	#A	1.2215E+00	1.2362E+00	2.4483E+00	2.4492E+00	2.663E+00
SN-113	#B	1.1436E-02	1.1986E-02	6.9671E-02	6.9674E-02	7.669E-02
SB-125	#B	9.0288E-02	9.0772E-02	9.5437E-02	9.5573E-02	2.026E-01
I-131	#B	1.2920E-04	2.5321E-04	1.1292E-01	1.1292E-01	6.723E-02
CS-134	#B	-1.2440E-02	-1.2530E-02	6.1505E-02	6.1509E-02	7.045E-02
CS-137		4.0148E-01	4.0168E-01	1.3464E-01	1.3652E-01	
CE-139	#A	1.0074E-03	1.0478E-03	5.6388E-02	5.6388E-02	6.171E-02
EU-152	#B	-3.3590E-02	-3.3629E-02	2.0261E-01	2.0262E-01	2.019E-01
EU-154	#B	-1.5616E-02	-1.5643E-02	1.2487E-01	1.2487E-01	1.346E-01
EU-155	#B	1.1327E-01	1.1360E-01	2.9782E-01	2.9789E-01	3.289E-01
HG-203	#B	-4.2646E-03	-4.7897E-03	6.6721E-02	6.6722E-02	6.480E-02
TL-208		2.9066E-01	2.9066E-01	1.2599E-01	1.2704E-01	
PB-212	#	7.0583E-01	7.0583E-01	1.7211E-01	1.7661E-01	1.454E-01
PB-214	#	4.4094E-01	4.4094E-01	1.4350E-01	1.4562E-01	1.287E-01
BI-212	#B	-1.1745E-01	-1.1745E-01	5.3952E-01	5.3956E-01	6.243E-01
BI-214		4.9043E-01	4.9043E-01	2.1339E-01	2.1516E-01	
RA-224	#A	1.3578E+00	1.3578E+00	1.5403E+00	1.5422E+00	1.657E+00
RA-226	#	2.6773E+00	2.6773E+00	1.7658E+00	1.7722E+00	
AC-228	#	5.6667E-01	5.6667E-01	2.2130E-01	2.2357E-01	2.383E-01
TH-227	#B	-3.0204E-01	-3.0204E-01	6.2086E-01	6.2109E-01	6.749E-01
PA-234	#B	1.4541E-02	1.4541E-02	2.7365E-01	2.7365E-01	3.081E-01
TH-234	#B	9.2323E-01	9.2323E-01	5.7200E+00	5.7202E+00	6.395E+00
AM-241	#A	1.8994E-01	1.8994E-01	8.4231E-01	8.4238E-01	9.392E-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) 1.8069326E+01 pCi/gm
Total Decayed Activity (270.7 to 1999.0 keV) 1.8069550E+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_7JULY2006_1415.An1

Sample description
FSS-OOL-11-02-016-F

Spectrum Filename: C:\GammaVision\Spectra\102F_7JULY2006_1415.An1

Acquisition information

Start time:	07-Jul-2006 14:15:22
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:	2.0720E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 2.0720E+03) = 4.8263E+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	29-Jun-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. 15 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.6863

***** 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
77.10	208.	21.47	1.50	9.541E-03				
77.10	208.	21.47	1.50	9.541E-03	77.11	10.700	1.327E+00	PB214
					77.11	17.500	8.115E-01	PB212
77.10	208.	21.47	1.50	9.541E-03				
77.10	208.	21.47	1.50	9.541E-03	77.11	10.700	1.327E+00	PB214
					77.11	17.500	8.115E-01	PB212
92.04	146.	27.71	0.55	1.318E-02				
186.73	126.	21.93	1.69	1.623E-02	185.99	3.280	1.492E+00	RA226
239.04	583.	5.08	1.22	1.379E-02	238.63	43.100	6.386E-01	PB212
242.19	107.	19.88	1.22	1.364E-02	241.00	3.900	1.288E+00	RA224
					241.92	7.470	6.817E-01	PB214
295.46	142.	17.40	1.02	1.146E-02	295.22	19.200	4.213E-01	PB214
338.55	120.	22.38	1.19	1.006E-02	338.40	12.010	6.467E-01	AC228
352.54	234.	12.13	1.43	9.664E-03	351.99	37.100	4.234E-01	PB214
463.46	29.	41.43	1.50	7.365E-03				
463.46	29.	41.43	1.50	7.365E-03	463.51	10.000	PBC<MDA	SB125
511.39	114.	16.32	1.66	6.686E-03	510.72	22.500	4.953E-01	TL208
584.01	215.	9.94	1.44	5.882E-03	583.14	86.000	2.768E-01	TL208
610.11	145.	14.22	1.67	5.642E-03	609.32	46.090	3.632E-01	BI214
662.83	72.	21.47	1.06	5.221E-03	661.62	84.620	1.068E-01	CS137
728.49	29.	36.69	1.55	4.794E-03	727.17	11.800	PBC<MDA	BI212
796.05	29.	34.82	1.29	4.418E-03	795.76	85.400	5.013E-02	CS134
912.28	140.	11.37	1.11	3.917E-03	911.07	29.000	8.003E-01	AC228
970.23	93.	15.78	1.35	3.714E-03	968.90	17.460	9.340E-01	AC228
1462.78	642.	3.99	2.11	2.618E-03	1460.75	10.700	1.492E+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	
183.66	92.04	615.	148.	0.074	75.25	0.555	NP-237	s
477.71	239.03	147.	583.	0.291	15.25	1.215	PB-212	D
484.02	242.18	171.	107.	0.053	59.65	1.217	PB-214	D
1592.12	796.05	31.	29.	0.014	104.46	1.292	PA-234	l

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-214	153.80	77.11	891.	208.	0.104	64.41	1.500D
PB-212	153.80	77.11	891.	208.	0.104	64.41	1.500D
RA-226	372.37	186.38	383.	119.	0.059	72.20	1.500s
PB-212	477.68	239.03	423.	519.	0.260	21.34	1.500s
RA-224	483.49	241.93	481.	79.	0.040	120.05	1.500
PB-214	590.88	295.61	199.	135.	0.068	51.21	1.500s
AC-228	676.45	338.39	185.	134.	0.067	60.22	1.204s
PB-214	704.58	352.45	141.	190.	0.095	34.19	1.500s
TL-208	1022.56	511.39	76.	114.	0.057	48.97	1.659s
TL-208	1167.86	584.01	74.	215.	0.107	29.82	1.444
BI-214	1220.07	610.11	80.	145.	0.072	42.65	1.671
CS-137	1325.57	662.83	55.	72.	0.036	64.41	1.058
BI-212	1456.94	728.49	43.	29.	0.015	110.08	1.554s
AC-228	1824.71	912.28	35.	140.	0.070	34.10	1.108s
AC-228	1940.66	970.23	35.	93.	0.046	47.35	1.346
K-40	2926.56	1462.82	13.	615.	0.308	12.35	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		1.2843E-01					
			477.56	1.284E-01	%(	3.654E-01 1.09E-01	G
K-40		1.4308E+01					
			1460.75	1.431E+01	(P	4.602E-01 5.89E-01	G
MN-54		-3.3444E-04					
			834.81	-3.344E-04	&(P	6.974E-02 1.98E-02	G
CO-57		4.9195E-04					
			122.07	4.920E-04	%(	5.290E-02 1.57E-02	G K
			136.43	-1.667E-02	%	4.249E-01 1.26E-01	G
CO-60		-1.0106E-03					
			1332.51	-1.011E-03	&(P	7.193E-02 2.00E-02	G K
			1173.23	-2.475E-02	%	9.030E-02 2.67E-02	G K
Sr-85		-6.2061E-03					
			514.00	-6.206E-03	&(	5.711E-02 1.66E-02	G
Kr-85		-1.3241E+02					
			513.99	-1.324E+02	&(	1.231E+03 3.59E+02	G
Y-88		-6.8145E-03					
			1836.01	-6.815E-03	%(P	5.101E-02 1.37E-02	G K
			898.02	-1.116E-03	& P	5.634E-02 1.55E-02	G
NB-94		-2.9194E-03					
			871.10	-2.919E-03	%(	4.733E-02 1.32E-02	G K
			702.50	4.130E-03	&	4.136E-02 1.17E-02	G K
Ag-108M		2.6044E-04					
			722.95	2.604E-04	%(	3.052E-02 8.06E-03	G K
			614.37	-2.810E-02	% P	6.179E-02 1.87E-02	G
			433.93	1.017E-02	%	4.380E-02 1.29E-02	G
CD-109		-2.9377E-02					
			88.04	-2.938E-02	&(P	1.957E+00 5.82E-01	G
SN-113		2.3844E-02					
			391.71	2.384E-02	&(	5.281E-02 1.60E-02	G K
			255.04	6.031E-01	%	1.779E+00 5.34E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	4.4837E-02						
		427.95	4.484E-02	&(P	1.223E-01	3.65E-02	G K
		600.77	-5.178E-02	% P	2.377E-01	6.93E-02	G
		636.15	7.541E-02	& P	4.454E-01	1.29E-01	G
		463.51	2.604E-01	% P	3.651E-01	1.14E-01	G
		176.29	-5.296E-02	& P	6.323E-01	1.87E-01	G
I-131	4.0205E-02						
		364.48	4.020E-02	%(	7.353E-02	2.25E-02	G K
		636.97	2.736E-01	&	1.251E+00	3.65E-01	G
		284.29	2.077E-01	&	1.273E+00	3.76E-01	G
CS-134	-5.3845E-03						
		604.66	-5.384E-03	&(	4.670E-02	1.34E-02	G K
		795.76	2.799E-02	%	5.832E-02	1.77E-02	G
		569.29	6.315E-02	%	1.803E-01	5.33E-02	G
		801.84	-7.001E-02	& P	6.350E-01	1.82E-01	G
CS-137	1.0676E-01						
		661.62	1.068E-01	(	5.477E-02	2.30E-02	G
CE-139	-2.0626E-03						
		165.85	-2.063E-03	%(P	4.882E-02	1.44E-02	G
EU-152	-5.0268E-02						
		121.78	-5.027E-02	%(P	1.505E-01	4.53E-02	G K
		344.30	1.776E-03	&	1.483E-01	4.31E-02	G
		1408.08	1.578E-02	&	2.375E-01	6.41E-02	G
		964.00	8.567E-02	& P	3.693E-01	1.07E-01	G
		1112.07	1.405E-01	&	4.716E-01	1.39E-01	G
		778.90	1.414E-01	& P	3.095E-01	9.36E-02	G
EU-154	3.9102E-02						
		123.10	3.910E-02	%(P	1.046E-01	3.15E-02	G K
		1274.80	-4.977E-03	&	2.089E-01	5.85E-02	G
		723.30	-4.248E-03	% P	2.065E-01	5.70E-02	G
		1004.80	4.867E-02	%	2.544E-01	7.23E-02	G
EU-155	1.1845E-01						
		86.45	1.184E-01	%(P	2.372E-01	7.19E-02	G K
		105.31	4.056E-02	%	2.305E-01	6.89E-02	G
HG-203	5.3168E-03						
		279.17	5.317E-03	%(P	5.096E-02	1.50E-02	G K
		72.87	-9.699E-01	&	2.277E+00	6.89E-01	G
		70.83	4.995E-02	%	3.921E+00	1.17E+00	G
		82.50	-2.643E-01	%	4.021E+00	1.20E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.7682E-01						
		583.14	2.768E-01	(P	5.511E-02	2.76E-02	G
		510.72	4.953E-01	+	1.872E-01	8.10E-02	G
PB-212	5.6935E-01						
		238.63	5.693E-01	@(	1.080E-01	4.05E-02	G K
							Energy duplication
		77.11	8.115E-01	+	5.539E-01	1.74E-01	G
		74.81	8.068E-01	& P	1.165E+00	3.56E-01	G
PB-214	3.6416E-01						
		351.99	3.452E-01	@(P	1.053E-01	3.94E-02	G K
		295.22	4.008E-01	@(	2.028E-01	6.84E-02	G
							Energy duplication
		77.11	1.327E+00	+	9.060E-01	2.85E-01	G
		241.92	4.167E-01	%	6.915E-01	2.11E-01	G
BI-212	3.3724E-01						
		727.17	3.372E-01	&(	3.834E-01	1.24E-01	G K
		1620.56	-3.396E-01	% P	1.909E+00	5.21E-01	G
		785.42	-3.423E-01	% P	2.881E+00	8.29E-01	G
BI-214	3.6320E-01						
		609.32	3.632E-01	(	1.112E-01	5.17E-02	G K
		1764.51	-1.802E-02	& P	3.300E-01	8.64E-02	G
		1120.28	1.706E-02	&	5.377E-01	1.53E-01	G
RA-224	9.7040E-01						
		241.00	9.704E-01	(P	1.282E+00	3.94E-01	G
RA-226	1.4531E+00						
		185.99	1.453E+00	*(P	1.148E+00	3.63E-01	G
AC-228	8.2467E-01						
		911.07	8.003E-01	(P	1.746E-01	9.12E-02	G K
		968.90	9.340E-01	(P	3.043E-01	1.48E-01	G
		338.40	7.244E-01	*(	3.566E-01	1.45E-01	G
TH-227	-2.4311E-01						
		236.00	-2.431E-01	%(P	4.697E-01	1.43E-01	G K
		256.25	1.806E-01	%	5.266E-01	1.58E-01	G
PA-234	2.3902E-02						
		98.44	2.390E-02	&(	2.306E-01	6.88E-02	G K
		946.00	-7.263E-03	&	2.302E-01	6.33E-02	G
		131.28	-5.771E-02	&	2.094E-01	6.29E-02	G
		94.67	-1.262E-01	%	4.343E-01	1.31E-01	G
		883.24	1.103E-02	%	4.215E-01	1.17E-01	G
		926.70	-1.729E-02	%	4.907E-01	1.37E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 9.280E-02 %   2.656E-01 7.85E-02 G

TH-234       1.2840E+00
                           63.29 1.284E+00 %(P 4.348E+00 1.31E+00 G K
                           92.80 1.316E+00 %   2.193E+00 6.68E-01 G
                           92.38-5.880E-02 % P 2.208E+00 6.54E-01 G

AM-241      -1.5696E-01
                           59.54-1.570E-01 &(  6.706E-01 2.01E-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

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

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	1.1586E-01	1.2843E-01	3.2632E-01	3.2640E-01	3.296E-01
K-40		1.4308E+01	1.4308E+01	1.7677E+00	1.9415E+00	4.602E-01
MN-54	#A	-3.2860E-04	-3.3444E-04	2.5406E-02	2.5406E-02	6.852E-02
CO-57	#B	4.8204E-04	4.9195E-04	4.7042E-02	4.7042E-02	5.183E-02
CO-60	#B	-1.0077E-03	-1.0106E-03	8.5746E-02	8.5746E-02	7.172E-02

Sr-85	#A	-5.7014E-03	-6.2061E-03	4.9946E-02	4.9948E-02	5.246E-02
Kr-85	#A	-1.3241E+02	-1.3241E+02	1.0773E+03	1.0773E+03	1.231E+03
Y-88	#B	-6.4719E-03	-6.8145E-03	4.1221E-02	4.1223E-02	4.845E-02
NB-94	#B	-2.9194E-03	-2.9194E-03	3.9677E-02	3.9677E-02	4.733E-02
Ag-108M	#B	2.6041E-04	2.6044E-04	2.4166E-02	2.4166E-02	3.051E-02
CD-109	#A	-2.9022E-02	-2.9377E-02	1.0424E+01	1.0424E+01	1.934E+00
SN-113	#B	2.2732E-02	2.3844E-02	4.7884E-02	4.7902E-02	5.034E-02
SB-125	#B	4.4594E-02	4.4837E-02	1.0937E-01	1.0940E-01	1.216E-01
I-131	#B	2.0286E-02	4.0205E-02	6.7472E-02	6.7510E-02	3.710E-02
CS-134	#B	-5.3453E-03	-5.3845E-03	4.0314E-02	4.0315E-02	4.636E-02
CS-137		1.0671E-01	1.0676E-01	6.8768E-02	6.9029E-02	
CE-139	#A	-1.9817E-03	-2.0626E-03	5.3518E-02	5.3518E-02	4.690E-02
EU-152	#B	-5.0208E-02	-5.0268E-02	1.4227E-01	1.4229E-01	1.503E-01
EU-154	#B	3.9033E-02	3.9102E-02	9.4646E-02	9.4671E-02	1.044E-01
EU-155	#B	1.1809E-01	1.1845E-01	2.1577E-01	2.1587E-01	2.365E-01
HG-203	#B	4.7248E-03	5.3168E-03	4.4947E-02	4.4948E-02	4.528E-02
TL-208		2.7682E-01	2.7682E-01	8.2690E-02	8.4137E-02	
PB-212	#	5.6935E-01	5.6935E-01	1.2151E-01	1.2564E-01	1.080E-01
PB-214	#	3.6416E-01	3.6416E-01	1.1219E-01	1.1404E-01	1.053E-01
BI-212	#A	3.3724E-01	3.3724E-01	3.7122E-01	3.7171E-01	3.834E-01
BI-214		3.6320E-01	3.6320E-01	1.5492E-01	1.5625E-01	
RA-224	#A	9.7040E-01	9.7040E-01	1.1820E+00	1.1832E+00	1.282E+00
RA-226	#	1.4531E+00	1.4531E+00	1.0885E+00	1.0915E+00	1.148E+00
AC-228		8.2467E-01	8.2467E-01	2.3058E-01	2.3518E-01	
TH-227	#B	-2.4311E-01	-2.4311E-01	4.3221E-01	4.3242E-01	4.697E-01
PA-234	#B	2.3902E-02	2.3902E-02	2.0643E-01	2.0644E-01	2.306E-01
TH-234	#B	1.2840E+00	1.2840E+00	3.9244E+00	3.9250E+00	4.348E+00
AM-241	#A	-1.5695E-01	-1.5696E-01	6.0381E-01	6.0387E-01	6.705E-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

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

Total Activity (270.7 to 1999.0 keV) 1.6216568E+01 pCi/gm
Total Decayed Activity (270.7 to 1999.0 keV) 1.6216621E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JJM

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

Sample description
FSS-OOL-11-02-020-F

Spectrum Filename: C:\GammaVision\Spectra\103F_6JUL2006_1741.An1

Acquisition information

Start time:	06-Jul-2006 17:41:39
Live time:	2000
Real time:	2002
Dead time:	0.08 %
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:	1.7090E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.7090E+03) = 5.8514E+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	29-Jun-2006 14:20:00
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. 17 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.3209

***** 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
75.06	96.	24.47	0.99	9.052E-03	74.81	9.600	8.712E-01	PB212
77.36	111.	21.21	0.99	1.011E-02	77.11	17.500	6.924E-01	PB212
					77.11	10.700	1.132E+00	PB214
92.73	134.	29.33	1.48	1.643E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
					94.67	15.500	4.007E-01	PA234
186.49	148.	23.69	0.90	2.565E-02	185.99	3.280	1.268E+00	RA226
209.84	78.	34.98	1.24	2.469E-02				
238.83	738.	4.35	1.09	2.319E-02	238.63	43.100	5.743E-01	PB212
241.69	137.	15.93	1.09	2.304E-02	241.00	3.900	1.207E+00	RA224
					241.92	7.470	6.315E-01	PB214
295.38	224.	9.55	1.13	2.024E-02	295.22	19.200	4.473E-01	PB214
300.00	46.	37.72	1.13	2.002E-02				
338.56	159.	19.03	1.05	1.829E-02	338.40	12.010	5.695E-01	AC228
352.09	327.	8.70	1.28	1.775E-02	351.99	37.100	3.861E-01	PB214
463.62	50.	37.67	1.22	1.424E-02	463.51	10.000	PBC<MDA	SB125
511.33	100.	20.47	1.44	1.316E-02	510.72	22.500	1.948E-01	TL208
583.38	273.	8.31	1.22	1.184E-02	583.14	86.000	2.089E-01	TL208
609.65	247.	9.12	1.34	1.143E-02	609.32	46.090	3.603E-01	BI214
661.98	141.	16.60	1.55	1.072E-02	661.62	84.620	1.214E-01	CS137
727.68	61.	22.95	1.79	9.959E-03	727.17	11.800	4.069E-01	BI212
795.77	29.	36.22	1.50	9.301E-03	795.76	85.400	PBC<MDA	CS134
911.39	174.	12.10	1.54	8.399E-03	911.07	29.000	5.541E-01	AC228
969.18	107.	19.55	1.85	8.024E-03	968.90	17.460	6.024E-01	AC228
1121.38	102.	23.14	2.01	7.207E-03	1120.28	15.040	7.312E-01	BI214
1173.49	43.	29.32	1.67	6.972E-03	1173.23	99.860	4.902E-02	CO60
1461.43	1267.	2.89	1.82	5.930E-03	1460.75	10.700	1.556E+01	K40

1765.52	47.	16.87	0.87	5.139E-03	1764.51	15.920	4.263E-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	
418.84	209.84	301.	78.	0.039	104.93	1.240	NP-239	s
599.16	300.01	125.	46.	0.023	113.17	1.131	PB-212	lD
926.36	463.62	110.	50.	0.025	113.02	1.215	SB-125	l

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	246.	96.	0.048	73.42	0.993D
PB-212	153.39	77.11	247.	111.	0.056	63.64	0.995A
TH-234	185.06	92.94	686.	109.	0.054	90.73	1.500s
TH-234	185.04	92.93	678.	109.	0.055	89.97	1.500s
RA-226	371.70	186.27	483.	116.	0.058	76.34	1.500s
PB-212	476.72	238.78	529.	723.	0.362	18.83	0.977
RA-224	482.59	241.72	531.	121.	0.060	85.41	1.500
PB-214	482.32	241.58	225.	66.	0.033	96.88	1.019
PB-214	589.93	295.39	180.	198.	0.099	35.51	1.045
AC-228	676.26	338.56	239.	158.	0.079	57.08	1.055s
PB-214	703.31	352.09	178.	322.	0.161	26.11	1.279
TL-208	1021.78	511.33	144.	73.	0.037	61.40	1.438s
TL-208	1165.86	583.38	88.	269.	0.135	24.92	1.225
BI-214	1218.40	609.65	96.	240.	0.120	27.35	1.342
CS-137	1323.05	661.98	108.	139.	0.070	49.81	1.548s
BI-212	1454.44	727.68	54.	61.	0.030	68.85	1.789s
CS-134	1590.59	795.77	40.	29.	0.014	108.67	1.500s
AC-228	1821.81	911.39	76.	171.	0.085	36.30	1.543s
AC-228	1937.38	969.18	89.	107.	0.053	58.64	1.851s
BI-214	2241.74	1121.38	111.	100.	0.050	69.41	2.006s
CO-60	2345.93	1173.49	66.	43.	0.022	87.95	1.667s
K-40	2921.74	1461.43	34.	1249.	0.624	8.68	1.822
BI-214	3529.78	1765.52	7.	44.	0.022	50.62	0.867s

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		-8.9951E-02					
			477.56	-8.995E-02	%(	3.487E-01 1.03E-01	G
K-40		1.5556E+01					
			1460.75	1.556E+01	(P	3.739E-01 4.57E-01	G
MN-54		1.5820E-02					
			834.81	1.582E-02	%(P	3.828E-02 1.15E-02	G
CO-57		-7.3439E-03					
			122.07	-7.344E-03	&(P	4.715E-02 1.41E-02	G K
			136.43	-1.084E-01	%	3.570E-01 1.07E-01	G
CO-60		2.9248E-02					
			1332.51	9.495E-03	%(P	3.780E-02 1.08E-02	G K
			1173.23	4.902E-02	@(P	4.635E-02 1.50E-02	G K
Sr-85		-1.0476E-02					
			514.00	-1.048E-02	%(	4.335E-02 1.29E-02	G
Kr-85		-2.2408E+02					
			513.99	-2.241E+02	%(	9.272E+02 2.76E+02	G
Y-88		-1.3757E-04					
			1836.01	-1.376E-04	%(P	2.955E-02 7.57E-03	G K
			898.02	1.919E-03	% P	3.585E-02 1.01E-02	G
NB-94		7.2680E-03					
			871.10	7.268E-03	%(	3.143E-02 9.16E-03	G K
			702.50	8.745E-03	&	3.156E-02 9.31E-03	G K
Ag-108M		9.9506E-04					
			722.95	9.951E-04	%(	3.655E-02 1.04E-02	G K
			614.37	3.141E-03	& P	3.790E-02 1.10E-02	G
			433.93	-1.480E-04	%	2.939E-02 8.44E-03	G
CD-109		9.2279E-04					
			88.04	9.228E-04	&(	1.636E+00 4.85E-01	G
SN-113		-8.4984E-03					
			391.71	-8.498E-03	%(	4.431E-02 1.31E-02	G K
			255.04	-3.733E-01	%	1.651E+00 4.93E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	-6.5946E-05						
		427.95	-6.595E-05	&(P	1.064E-01	3.08E-02	G K
		600.77	5.523E-02	% P	1.611E-01	4.80E-02	G
		636.15	-2.959E-03	& P	2.849E-01	8.09E-02	G
		463.51	2.008E-01	% P	2.917E-01	9.01E-02	G
		176.29	6.546E-02	&	5.368E-01	1.60E-01	G
I-131	2.8688E-03						
		364.48	2.869E-03	%(P	6.377E-02	1.86E-02	G K
		636.97	1.435E-01	%	7.789E-01	2.27E-01	G
		284.29	-1.063E-01	& P	9.411E-01	2.78E-01	G
CS-134	8.6497E-03						
		604.66	-8.901E-03	%(	3.391E-02	1.00E-02	G K
		795.76	2.871E-02	(P	3.221E-02	1.04E-02	G
		569.29	-7.103E-03	& P	2.095E-01	5.96E-02	G
		801.84	3.503E-02	% P	3.308E-01	9.33E-02	G
CS-137	1.2138E-01						
		661.62	1.214E-01	*(P	4.455E-02	2.04E-02	G
CE-139	-1.1274E-02						
		165.85	-1.127E-02	&(	3.810E-02	1.14E-02	G
EU-152	-2.1903E-02						
		121.78	-2.190E-02	%(P	1.360E-01	4.06E-02	G K
		344.30	-9.769E-03	% P	9.960E-02	2.92E-02	G
		1408.08	-3.421E-02	%	1.579E-01	4.53E-02	G
		964.00	1.328E-01	% P	2.708E-01	8.21E-02	G
		1112.07	-4.312E-02	%	3.480E-01	1.01E-01	G
		778.90	-2.483E-02	%	2.192E-01	6.25E-02	G
EU-154	9.3603E-03						
		123.10	9.360E-03	%(	9.909E-02	2.95E-02	G K
		1274.80	2.631E-02	%	1.158E-01	3.37E-02	G
		723.30	-7.868E-02	%	2.083E-01	6.25E-02	G
		1004.80	-6.450E-02	%	2.342E-01	6.91E-02	G
EU-155	6.6498E-02						
		86.45	6.650E-02	%(	2.131E-01	6.42E-02	G K
		105.31	5.422E-02	%	2.048E-01	6.15E-02	G
HG-203	-1.2340E-03						
		279.17	-1.234E-03	&(P	4.172E-02	1.23E-02	G K
		72.87	-6.896E-01	% P	1.965E+00	5.92E-01	G
		70.83	1.871E+00	&	3.266E+00	9.96E-01	G
		82.50	-8.230E-01	%	3.792E+00	1.14E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.0597E-01						
		583.14	2.089E-01	(P	3.602E-02	1.76E-02	G
		510.72	1.948E-01	*(P	1.564E-01	5.45E-02	G
PB-212	5.7196E-01						
		238.63	5.720E-01	(P	8.689E-02	3.65E-02	G K
							Energy duplication
		77.11	4.969E-01	} P	3.393E-01	1.05E-01	G
		74.81	8.712E-01	+ P	6.901E-01	2.20E-01	G
PB-214	3.9170E-01						
		351.99	3.861E-01	(P	7.799E-02	3.42E-02	G K
		295.22	4.026E-01	(P	1.327E-01	4.86E-02	G
							Energy duplication
		77.11	2.726E-01	} P	7.953E-01	2.02E-01	G
		241.92	3.016E-01	-	3.341E-01	9.73E-02	G
BI-212	4.0689E-01						
		727.17	4.069E-01	(P	2.496E-01	9.42E-02	G K
		1620.56	1.132E-01	& P	8.257E-01	2.21E-01	G
		785.42	4.628E-01	%	1.475E+00	4.36E-01	G
BI-214	3.7723E-01						
		609.32	3.603E-01	(P	7.246E-02	3.37E-02	G K
		1764.51	4.263E-01	(P	1.442E-01	7.73E-02	G
		1120.28	7.312E-01	+ P	3.772E-01	1.72E-01	G
RA-224	1.0611E+00						
		241.00	1.061E+00	(	9.671E-01	3.02E-01	G
RA-226	1.0854E+00						
		185.99	1.085E+00	*(P	9.879E-01	3.07E-01	G
AC-228	5.7170E-01						
		911.07	5.541E-01	@(P	1.409E-01	6.84E-02	G K
		968.90	6.024E-01	(P	2.637E-01	1.18E-01	G
		338.40	5.695E-01	@(P	2.688E-01	1.09E-01	G
TH-227	-4.1126E-02						
		236.00	-4.113E-02	%(	3.360E-01	1.00E-01	G K
		256.25	1.778E-01	& P	4.088E-01	1.24E-01	G
PA-234	3.8347E-02						
		98.44	3.835E-02	%(P	2.044E-01	6.11E-02	G K
		946.00	4.283E-02	& P	1.626E-01	4.76E-02	G
		131.28	-1.436E-02	% P	2.002E-01	5.96E-02	G
		94.67	-2.356E-02	% P	3.573E-01	1.06E-01	G
		883.24	-8.158E-03	%	3.273E-01	9.34E-02	G
		926.70	-2.553E-03	&	3.445E-01	9.75E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-1.409E-02 & P 2.829E-01 8.00E-02 G

TH-234       1.2448E+00
                           63.29 3.235E-01 %(P 5.792E+00 1.71E+00 G K
                           92.80 1.750E+00  (P 1.988E+00 6.10E-01 G
                           92.38 2.053E+00  (P 2.354E+00 7.22E-01 G

AM-241      -5.3676E-03
                           59.54-5.368E-03 %(P 1.012E+00 2.99E-01 G
   ( - This peak used in the nuclide activity average.

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

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

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** 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	-8.1989E-02	-8.9951E-02	3.1050E-01	3.1054E-01	3.178E-01
K-40		1.5556E+01	1.5556E+01	1.3700E+00	1.6409E+00	
MN-54	#A	1.5571E-02	1.5820E-02	3.4505E-02	3.4517E-02	3.768E-02
CO-57	#B	-7.2105E-03	-7.3439E-03	4.4272E-02	4.4274E-02	4.630E-02
CO-60	#B	2.9173E-02	2.9248E-02	2.6888E-02	2.6941E-02	3.770E-02

Sr-85	#A	-9.7060E-03	-1.0476E-02	3.8653E-02	3.8658E-02	4.016E-02
Kr-85	#A	-2.2407E+02	-2.2408E+02	8.2680E+02	8.2691E+02	9.271E+02
Y-88	#B	-1.3133E-04	-1.3757E-04	1.7099E-01	1.7099E-01	2.821E-02
NB-94	#B	7.2680E-03	7.2680E-03	2.7474E-02	2.7477E-02	3.143E-02
Ag-108M	#B	9.9495E-04	9.9506E-04	3.1251E-02	3.1251E-02	3.655E-02
CD-109	#A	9.1276E-04	9.2279E-04	1.4539E+00	1.4539E+00	1.618E+00
SN-113	#B	-8.1407E-03	-8.4984E-03	3.9172E-02	3.9175E-02	4.244E-02
SB-125	#B	-6.5624E-05	-6.5946E-05	6.9058E-03	6.9058E-03	1.059E-01
I-131	#B	1.5501E-03	2.8688E-03	5.5671E-02	5.5671E-02	3.446E-02
CS-134	#B	8.5931E-03	8.6497E-03	9.4280E-03	9.4414E-03	3.369E-02
CS-137	#	1.2132E-01	1.2138E-01	6.1059E-02	6.1465E-02	
CE-139	#A	-1.0875E-02	-1.1274E-02	3.4307E-02	3.4314E-02	3.676E-02
EU-152	#B	-2.1880E-02	-2.1903E-02	1.3470E-01	1.3470E-01	1.359E-01
EU-154	#B	9.3454E-03	9.3603E-03	8.8568E-02	8.8569E-02	9.893E-02
EU-155	#B	6.6316E-02	6.6498E-02	1.9248E-01	1.9252E-01	2.125E-01
HG-203	#B	-1.1097E-03	-1.2340E-03	3.7988E-02	3.7989E-02	3.751E-02
TL-208		2.0597E-01	2.0597E-01	5.2153E-02	5.3506E-02	
PB-212		5.7196E-01	5.7196E-01	1.0951E-01	1.1443E-01	
PB-214		3.9170E-01	3.9170E-01	8.7998E-02	9.0889E-02	
BI-212		4.0689E-01	4.0689E-01	2.8244E-01	2.8343E-01	
BI-214		3.7723E-01	3.7723E-01	1.0593E-01	1.0817E-01	
RA-224		1.0611E+00	1.0611E+00	9.0634E-01	9.0843E-01	9.671E-01
RA-226	#	1.0854E+00	1.0854E+00	9.2156E-01	9.2371E-01	9.879E-01
AC-228		5.7170E-01	5.7170E-01	1.7173E-01	1.7491E-01	
TH-227	#B	-4.1126E-02	-4.1126E-02	3.0031E-01	3.0032E-01	3.360E-01
PA-234	#B	3.8347E-02	3.8347E-02	1.8342E-01	1.8343E-01	2.044E-01
TH-234	#B	1.2448E+00	1.2448E+00	1.3010E+00	1.3028E+00	5.792E+00
AM-241	#A	-5.3675E-03	-5.3676E-03	1.9005E+00	1.9005E+00	1.012E+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 (86.4 to 2000.7 keV) 1.9263672E+01 pCi/gm
Total Decayed Activity (86.4 to 2000.7 keV) 1.9263727E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
DAT

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 103F_7JUL2006_1531.An1

Sample description
FSS-OOL-11-02-014-F

Spectrum Filename: C:\GammaVision\Spectra\103F_7JUL2006_1531.An1

Acquisition information
Start time: 07-Jul-2006 15:31:34
Live time: 2000
Real time: 2002
Dead time: 0.08 %
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: 1.4020E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.4020E+03) =
7.1327E+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	29-Jun-2006 14:40:00
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. 14 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.2229

***** 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
74.72	77.	28.13	0.99	9.100E-03	74.81	9.600	8.213E-01	PB212
77.38	135.	17.98	0.99	1.033E-02	77.11	17.500	7.211E-01	PB212
					77.11	10.700	1.179E+00	PB214
87.33	61.	40.18	1.00	1.448E-02	86.45	32.740	1.269E-01	EU155
					88.04	3.790	1.060E+00	CD109
93.28	103.	22.18	1.00	1.665E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
185.48	105.	28.16	1.15	2.568E-02				
185.48	105.	28.16	1.15	2.568E-02	185.99	3.280	PBC<MDA	RA226
238.80	721.	4.32	1.09	2.319E-02	238.63	43.100	6.835E-01	PB212
241.37	84.	31.08	1.09	2.306E-02	241.00	3.900	9.000E-01	RA224
					241.92	7.470	4.709E-01	PB214
270.29	70.	34.07	1.42	2.151E-02				
295.44	178.	11.14	1.13	2.024E-02	295.22	19.200	4.307E-01	PB214
327.93	58.	35.56	1.00	1.874E-02				
338.66	141.	17.16	0.95	1.829E-02	338.40	12.010	6.140E-01	AC228
352.15	270.	9.68	1.15	1.775E-02	351.99	37.100	3.869E-01	PB214
463.40	44.	38.27	0.77	1.425E-02				
463.40	44.	38.27	0.77	1.425E-02	463.51	10.000	PBC<MDA	SB125
510.84	146.	16.28	1.27	1.317E-02	510.72	22.500	3.868E-01	TL208
583.54	265.	9.00	1.18	1.184E-02	583.14	86.000	2.467E-01	TL208
609.58	212.	10.55	1.31	1.144E-02	609.32	46.090	3.750E-01	BI214
661.74	116.	18.61	1.15	1.072E-02	661.62	84.620	1.219E-01	CS137
726.74	70.	25.94	1.66	9.969E-03	727.17	11.800	5.681E-01	BI212
793.97	41.	31.17	1.09	9.317E-03				
795.32	29.	34.92	1.50	9.301E-03				
795.32	29.	34.92	1.50	9.301E-03	795.76	85.400	PBC<MDA	CS134

911.38	198.	10.33	1.38	8.399E-03	911.07	29.000	7.680E-01	AC228
968.62	169.	13.11	1.66	8.028E-03	968.90	17.460	1.163E+00	AC228
1121.14	80.	23.56	1.31	7.208E-03	1120.28	15.040	6.896E-01	BI214
1461.45	1158.	2.99	1.74	5.930E-03	1460.75	10.700	1.729E+01	K40
1765.14	52.	13.48	2.01	5.142E-03	1764.51	15.920	6.091E-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	
173.82	87.41	266.	61.	0.030	120.55	1.001	PB-214	lD
539.73	270.29	196.	70.	0.035	102.22	1.419	AC-228	s
655.01	327.93	147.	58.	0.029	106.69	1.005	AC-228	
925.92	463.40	91.	44.	0.022	114.80	0.768	SB-125	l
1587.00	793.97	43.	41.	0.020	93.52	1.094	PA-234	l

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	229.	79.	0.039	84.92	0.993D
PB-212	153.39	77.11	244.	95.	0.048	62.73	0.995A
TH-234	185.47	93.15	567.	95.	0.048	92.50	1.500
TH-234	185.46	93.14	542.	111.	0.056	79.79	1.500
RA-226	371.48	186.16	402.	104.	0.052	76.85	1.500s
PB-212	476.77	238.81	438.	672.	0.336	18.55	1.040
RA-224	482.78	241.81	452.	89.	0.045	105.80	1.500
PB-214	589.98	295.42	174.	171.	0.085	40.87	1.153s
AC-228	676.45	338.66	166.	140.	0.070	51.48	0.950
PB-214	703.44	352.15	159.	264.	0.132	29.04	1.150
TL-208	1020.80	510.84	149.	119.	0.059	48.84	1.274s
TL-208	1166.17	583.54	96.	261.	0.130	26.99	1.178
BI-214	1218.25	609.58	99.	205.	0.103	31.64	1.306
CS-137	1322.57	661.74	91.	115.	0.057	55.82	1.149
BI-212	1452.55	726.74	79.	69.	0.035	77.82	1.661s
CS-134	1589.70	795.32	36.	29.	0.014	104.76	1.500
AC-228	1821.79	911.38	66.	194.	0.097	30.99	1.381
AC-228	1936.25	968.62	77.	169.	0.085	39.32	1.656s
BI-214	2241.26	1121.14	79.	78.	0.039	70.67	1.307s
K-40	2921.76	1461.45	31.	1139.	0.569	8.98	1.738
BI-214	3529.04	1765.14	3.	52.	0.026	40.45	2.011

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		-1.0966E-03					
			477.56	-1.097E-03	%(	3.819E-01 1.10E-01	G
K-40		1.7293E+01					
			1460.75	1.729E+01	(P	4.366E-01 5.27E-01	G
MN-54		-8.2757E-03					
			834.81	-8.276E-03	%(P	3.950E-02 1.14E-02	G
CO-57		-5.6395E-03					
			122.07	-5.639E-03	%(P	5.180E-02 1.54E-02	G K
			136.43	6.371E-02	&	4.070E-01 1.21E-01	G
CO-60		4.7380E-03					
			1332.51	4.738E-03	%(P	4.735E-02 1.32E-02	G K
			1173.23	-2.459E-03	& P	5.590E-02 1.56E-02	G K
Sr-85		-2.0772E-02					
			514.00	-2.077E-02	%(	5.417E-02 1.63E-02	G
Kr-85		-4.4008E+02					
			513.99	-4.401E+02	%(	1.148E+03 3.45E+02	G
Y-88		-3.6706E-03					
			1836.01	-3.671E-03	%(P	3.730E-02 9.98E-03	G K
			898.02	5.635E-04	% P	3.889E-02 1.07E-02	G
NB-94		1.6855E-03					
			871.10	1.685E-03	%(	3.446E-02 9.64E-03	G K
			702.50	0.000E+00	%	3.876E-02 1.10E-02	G K
Ag-108M		6.6064E-03					
			722.95	6.606E-03	&(	3.381E-02 9.75E-03	G K
			614.37	-2.954E-02	% P	5.149E-02 1.57E-02	G
			433.93	-7.597E-04	%	4.217E-02 1.22E-02	G
CD-109		6.5833E-01					
			88.04	6.583E-01	&(	1.994E+00 6.00E-01	G
SN-113		-7.3698E-05					
			391.71	-7.370E-05	&(	5.033E-02 1.45E-02	G K
			255.04	-1.120E-01	%	1.547E+00 4.54E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	-2.9616E-02						
		427.95	-2.962E-02	%(P	1.234E-01	3.65E-02	G K
		600.77	3.712E-03	% P	1.721E-01	4.86E-02	G
		636.15	-4.525E-03	& P	3.843E-01	1.10E-01	G
		463.51	1.969E-01	% P	3.271E-01	1.00E-01	G
		176.29	-6.907E-02	%	6.014E-01	1.79E-01	G
I-131	9.7352E-04						
		364.48	9.735E-04	%(P	6.310E-02	1.80E-02	G K
		636.97	-9.515E-02	&	1.133E+00	3.28E-01	G
		284.29	-2.972E-01	& P	1.183E+00	3.53E-01	G
CS-134	1.6412E-02						
		604.66	0.000E+00	%(	6.603E-02	1.93E-02	G K
		795.76	3.517E-02	(P	3.770E-02	1.23E-02	G
		569.29	-1.408E-02	% P	1.782E-01	4.91E-02	G
		801.84	8.274E-02	& P	3.867E-01	1.11E-01	G
CS-137	1.2192E-01						
		661.62	1.219E-01	(P	5.020E-02	2.30E-02	G
CE-139	3.5428E-04						
		165.85	3.543E-04	&(	4.969E-02	1.47E-02	G
EU-152	-9.9875E-03						
		121.78	-9.987E-03	%(P	1.443E-01	4.27E-02	G K
		344.30	-1.170E-02	% P	1.311E-01	3.84E-02	G
		1408.08	9.596E-03	%	1.611E-01	4.36E-02	G
		964.00	1.722E-01	% P	3.324E-01	1.01E-01	G
		1112.07	0.000E+00	%	4.351E-01	1.24E-01	G
		778.90	-7.538E-02	%	3.229E-01	9.47E-02	G
EU-154	-1.1984E-02						
		123.10	-1.198E-02	%(	1.127E-01	3.36E-02	G K
		1274.80	6.674E-03	&	1.339E-01	3.76E-02	G
		723.30	-5.115E-02	%	2.584E-01	7.61E-02	G
		1004.80	-5.427E-03	%	2.116E-01	5.88E-02	G
EU-155	7.6049E-02						
		86.45	7.605E-02	%(	2.501E-01	7.52E-02	G K
		105.31	-2.341E-03	%	2.444E-01	7.24E-02	G
HG-203	2.8491E-02						
		279.17	2.849E-02	&(P	4.159E-02	1.28E-02	G K
		72.87	-7.672E-01	% P	2.761E+00	8.30E-01	G
		70.83	-7.286E-01	%	5.200E+00	1.55E+00	G
		82.50	-6.994E-01	&	4.366E+00	1.30E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.4668E-01						
		583.14	2.467E-01	(P	4.584E-02	2.26E-02	G
		510.72	3.868E-01	+ P	1.938E-01	7.71E-02	G
PB-212	6.7115E-01						
		238.63	6.482E-01	(P	9.658E-02	4.08E-02	G K
							Energy duplication
		77.11	5.187E-01	} P	4.115E-01	1.08E-01	G
		74.81	8.715E-01	+ P	8.130E-01	2.56E-01	G
PB-214	3.9922E-01						
		351.99	3.869E-01	(P	8.986E-02	3.83E-02	G K
		295.22	4.231E-01	(P	1.593E-01	5.90E-02	G
							Energy duplication
		77.11	3.201E-01	} P	9.699E-01	2.39E-01	G
		241.92	3.836E-01	%	5.826E-01	1.78E-01	G
BI-212	5.6812E-01						
		727.17	5.681E-01	*(P	3.611E-01	1.48E-01	G K
		1620.56	1.961E-01	% P	9.442E-01	2.59E-01	G
		785.42	3.006E-01	%	1.826E+00	5.27E-01	G
BI-214	3.7501E-01						
		609.32	3.750E-01	(P	8.967E-02	4.08E-02	G K
		1764.51	6.091E-01	+ P	1.312E-01	8.74E-02	G
		1120.28	6.896E-01	+ P	3.931E-01	1.67E-01	G
RA-224	9.5786E-01						
		241.00	9.579E-01	(	1.091E+00	3.38E-01	G
RA-226	1.1884E+00						
		185.99	1.188E+00	(P	1.100E+00	3.42E-01	G
AC-228	7.6803E-01						
		911.07	7.680E-01	(P	1.603E-01	8.07E-02	G K
		968.90	1.163E+00	+ P	2.998E-01	1.52E-01	G
		338.40	6.140E-01	- P	2.752E-01	1.06E-01	G
TH-227	-1.2866E-01						
		236.00	-1.287E-01	%(	3.997E-01	1.20E-01	G K
		256.25	-8.534E-03	& P	4.963E-01	1.46E-01	G
PA-234	1.5575E-04						
		98.44	1.557E-04	%(P	2.440E-01	7.23E-02	G K
		946.00	7.152E-02	% P	1.653E-01	4.98E-02	G
		131.28	-8.156E-04	& P	2.120E-01	6.27E-02	G
		94.67	-2.549E-01	% P	4.474E-01	1.36E-01	G
		883.24	1.441E-01	%	2.861E-01	8.72E-02	G
		926.70	1.286E-01	&	3.528E-01	1.05E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-2.107E-02 % P 2.742E-01 7.60E-02 G

TH-234       1.7777E+00
                           63.29 1.200E+00 &(P 5.702E+00 1.69E+00 G K
                           92.80 2.176E+00  (P 2.172E+00 6.70E-01 G
                           92.38 2.190E+00  (P 2.614E+00 8.00E-01 G

AM-241      -1.9418E-01
                           59.54-1.942E-01 %(P 1.170E+00 3.49E-01 G
   ( - This peak used in the nuclide activity average.

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

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

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** 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	-9.8802E-04	-1.0966E-03	3.2936E-01	3.2936E-01	3.440E-01
K-40		1.7293E+01	1.7293E+01	1.5790E+00	1.8711E+00	
MN-54	#A	-8.1294E-03	-8.2757E-03	3.7705E-02	3.7708E-02	3.880E-02
CO-57	#B	-5.5243E-03	-5.6395E-03	4.9786E-02	4.9787E-02	5.074E-02
CO-60	#B	4.7244E-03	4.7380E-03	3.9474E-02	3.9475E-02	4.721E-02

Sr-85	#A	-1.9062E-02	-2.0772E-02	4.8893E-02	4.8908E-02	4.971E-02
Kr-85	#A	-4.4005E+02	-4.4008E+02	1.0359E+03	1.0362E+03	1.148E+03
Y-88	#B	-3.4838E-03	-3.6706E-03	3.2114E-02	3.2115E-02	3.540E-02
NB-94	#B	1.6855E-03	1.6855E-03	2.8931E-02	2.8931E-02	3.446E-02
Ag-108M	#B	6.6056E-03	6.6064E-03	2.9255E-02	2.9257E-02	3.380E-02
CD-109	#A	6.5029E-01	6.5833E-01	1.8015E+00	1.8019E+00	1.970E+00
SN-113	#B	-7.0217E-05	-7.3698E-05	4.3444E-02	4.3444E-02	4.795E-02
SB-125	#B	-2.9453E-02	-2.9616E-02	1.1022E-01	1.1023E-01	1.227E-01
I-131	#B	4.8694E-04	9.7352E-04	5.4063E-02	5.4063E-02	3.156E-02
CS-134	#B	1.6291E-02	1.6412E-02	1.7247E-02	1.7273E-02	6.554E-02
CS-137		1.2186E-01	1.2192E-01	6.8885E-02	6.9248E-02	
CE-139	#A	3.4022E-04	3.5428E-04	4.4068E-02	4.4068E-02	4.772E-02
EU-152	#B	-9.9755E-03	-9.9875E-03	1.6816E-01	1.6816E-01	1.441E-01
EU-154	#B	-1.1963E-02	-1.1984E-02	1.0067E-01	1.0067E-01	1.125E-01
EU-155	#B	7.5816E-02	7.6049E-02	2.2572E-01	2.2576E-01	2.493E-01
HG-203	#B	2.5280E-02	2.8491E-02	3.8472E-02	3.8508E-02	3.690E-02
TL-208		2.4668E-01	2.4668E-01	6.7689E-02	6.9188E-02	
PB-212		6.7115E-01	6.7115E-01	1.2672E-01	1.3257E-01	
PB-214		3.9922E-01	3.9922E-01	1.0237E-01	1.0496E-01	
BI-212	#	5.6812E-01	5.6812E-01	4.4528E-01	4.4650E-01	
BI-214		3.7501E-01	3.7501E-01	1.2240E-01	1.2432E-01	
RA-224	#A	9.5786E-01	9.5786E-01	1.0134E+00	1.0149E+00	1.091E+00
RA-226	#	1.1884E+00	1.1884E+00	1.0273E+00	1.0296E+00	1.100E+00
AC-228		7.6803E-01	7.6803E-01	2.4214E-01	2.4622E-01	
TH-227	#B	-1.2866E-01	-1.2866E-01	3.6078E-01	3.6086E-01	3.997E-01
PA-234	#B	1.5575E-04	1.5575E-04	2.1689E-01	2.1689E-01	2.440E-01
TH-234	#B	1.7777E+00	1.7777E+00	1.6432E+00	1.6462E+00	5.702E+00
AM-241	#A	-1.9417E-01	-1.9418E-01	1.0716E+00	1.0717E+00	1.170E+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 (87.4 to 2000.7 keV) 2.0443241E+01 pCi/gm
Total Decayed Activity (87.4 to 2000.7 keV) 2.0443304E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
DAT

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 103F_7JUL2006_1631.An1

Sample description
FSS-OOL-11-02-008-F

Spectrum Filename: C:\GammaVision\Spectra\103F_7JUL2006_1631.An1

Acquisition information
Start time: 07-Jul-2006 16:31:58
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: 1.7020E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.7020E+03) =
5.8754E+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	29-Jun-2006 16:00:00
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. 19 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.2937

***** 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
75.02	162.	16.77	0.99	9.052E-03	74.81	9.600	1.481E+00	PB212
77.32	210.	11.50	0.99	1.011E-02	77.11	17.500	1.170E+00	PB212
					77.11	10.700	1.913E+00	PB214
93.25	94.	39.96	1.50	1.645E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
93.27	95.	39.43	1.50	1.631E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.29	156.	23.17	1.22	2.566E-02	185.99	3.280	1.351E+00	RA226
209.66	131.	24.07	1.05	2.470E-02				
238.80	1229.	3.29	1.09	2.319E-02	238.63	43.100	9.668E-01	PB212
242.00	146.	18.50	1.10	2.302E-02	241.00	3.900	1.285E+00	RA224
					241.92	7.470	6.725E-01	PB214
270.87	141.	22.11	1.10	2.148E-02				
277.41	58.	41.57	1.56	2.114E-02				
295.42	300.	7.99	1.13	2.024E-02	295.22	19.200	6.051E-01	PB214
300.17	99.	19.95	1.13	2.001E-02				
328.15	60.	28.39	0.79	1.874E-02				
338.41	237.	13.44	1.16	1.830E-02	338.40	12.010	8.514E-01	AC228
351.98	434.	8.03	1.37	1.775E-02	351.99	37.100	5.164E-01	PB214
463.07	66.	27.40	1.51	1.426E-02				
463.07	66.	27.40	1.51	1.426E-02	463.51	10.000	3.621E-01	SB125
510.83	222.	11.62	1.01	1.317E-02	510.72	22.500	5.233E-01	TL208
583.49	401.	6.72	1.46	1.184E-02	583.14	86.000	3.094E-01	TL208
609.80	299.	8.09	1.38	1.143E-02	609.32	46.090	4.411E-01	BI214
661.67	71.	21.16	0.95	1.072E-02	661.62	84.620	6.112E-02	CS137
727.41	103.	14.49	1.82	9.962E-03	727.17	11.800	6.922E-01	BI212
795.36	39.	31.56	0.76	9.305E-03				

795.36	39.	31.56	0.76	9.305E-03	795.76	85.400	PBC<MDA	CS134
860.95	52.	26.64	0.87	8.765E-03				
911.54	304.	8.55	1.52	8.398E-03	911.07	29.000	9.807E-01	AC228
965.51	59.	21.63	1.54	8.047E-03	964.00	14.580	3.988E-01	EU152
969.46	162.	10.02	1.54	8.023E-03	968.90	17.460	9.175E-01	AC228
1120.76	52.	29.29	1.56	7.210E-03	1120.28	15.040	3.668E-01	BI214
1461.47	1481.	2.71	1.82	5.930E-03	1460.75	10.700	1.829E+01	K40

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1765.09	67.	12.22	1.72	5.140E-03	1764.51	15.920	6.181E-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	
418.48	209.66	391.	131.	0.065	72.22	1.049	NP-239	
540.89	270.87	322.	141.	0.071	66.34	1.102	AC-228	s
599.39	300.12	181.	96.	0.048	66.88	0.998	PB-212	
655.43	328.15	129.	60.	0.030	85.16	0.792	AC-228	s
1720.94	860.95	59.	52.	0.026	79.91	0.867	TL-208	s
1930.84	965.42	62.	50.	0.025	78.34	1.539	TB-160	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	304.	162.	0.081	50.30	0.993D
PB-212	153.39	77.11	334.	210.	0.105	34.50	0.995A
RA-226	371.73	186.29	515.	143.	0.072	69.52	1.221s
PB-212	476.80	238.82	707.	1189.	0.594	13.86	0.975
RA-224	482.49	241.67	802.	120.	0.060	103.82	1.500
PB-214	589.89	295.37	231.	267.	0.134	30.70	1.026
AC-228	675.96	338.41	278.	236.	0.118	40.32	1.160
PB-214	703.10	351.98	258.	428.	0.214	24.10	1.366s
SB-125	925.27	463.07	150.	63.	0.032	88.59	1.500s
TL-208	1020.77	510.83	175.	195.	0.098	34.87	1.011s
TL-208	1166.09	583.49	125.	397.	0.198	20.16	1.455
BI-214	1218.70	609.80	109.	293.	0.146	24.27	1.383s
CS-137	1322.42	661.67	72.	70.	0.035	63.48	0.947s
BI-212	1453.88	727.41	52.	103.	0.051	43.46	1.825s
CS-134	1589.88	795.41	73.	39.	0.019	104.96	1.500s
AC-228	1822.11	911.54	99.	301.	0.150	25.66	1.520
AC-228	1936.81	968.90	48.	161.	0.081	29.75	1.541D
BI-214	2240.50	1120.76	74.	50.	0.025	87.87	1.558
K-40	2921.81	1461.47	44.	1462.	0.731	8.13	1.816
BI-214	3528.94	1765.09	3.	64.	0.032	36.65	1.722

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		2.2968E-02					
			477.56	2.297E-02	%(	3.633E-01 1.06E-01	G
K-40		1.8289E+01					
			1460.75	1.829E+01	(P	4.202E-01 5.02E-01	G
MN-54		1.0099E-02					
			834.81	1.010E-02	%(P	3.048E-02 9.01E-03	G
CO-57		-1.2292E-02					
			122.07	-1.229E-02	%(P	4.892E-02 1.47E-02	G K
			136.43	8.829E-02	%	4.109E-01 1.23E-01	G
CO-60		-3.2173E-03					
			1332.51	-3.217E-03	%(P	4.686E-02 1.29E-02	G K
			1173.23	1.300E-02	% P	5.502E-02 1.61E-02	G K
Sr-85		-2.0753E-02					
			514.00	-2.075E-02	%(	5.346E-02 1.61E-02	G
Kr-85		-4.3988E+02					
			513.99	-4.399E+02	%(	1.133E+03 3.41E+02	G
Y-88		9.0544E-03					
			1836.01	9.054E-03	&(P	1.824E-02 5.68E-03	G K
			898.02	-4.242E-03	% P	4.424E-02 1.27E-02	G
NB-94		-8.4670E-04					
			871.10	-8.467E-04	%(	3.324E-02 9.38E-03	G K
			702.50	1.264E-03	%	3.515E-02 1.01E-02	G K
Ag-108M		-1.8662E-03					
			722.95	-1.866E-03	&(	7.153E-02 2.10E-02	G K
			614.37	-1.604E-02	% P	4.851E-02 1.45E-02	G
			433.93	1.094E-03	%	3.638E-02 1.06E-02	G
CD-109		1.6989E-02					
			88.04	1.699E-02	%(	2.154E+00 6.42E-01	G
SN-113		2.7667E-03					
			391.71	2.767E-03	%(	5.651E-02 1.66E-02	G K
			255.04	3.112E-01	%	1.731E+00 5.16E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	8.9303E-02						
		427.95	1.071E-04	%(P	1.102E-01	3.20E-02	G K
		600.77	-5.323E-05	% P	1.954E-01	5.62E-02	G
		636.15	-8.773E-02	% P	3.627E-01	1.07E-01	G
		463.51	3.533E-01	*(P	3.345E-01	1.06E-01	G
		176.29	-2.672E-03	&	6.339E-01	1.88E-01	G
I-131	-2.3142E-02						
		364.48	-2.314E-02	%(P	8.424E-02	2.51E-02	G K
		636.97	-2.075E-01	%	1.047E+00	3.08E-01	G
		284.29	-1.856E-01	% P	1.172E+00	3.49E-01	G
CS-134	1.8669E-02						
		604.66	7.580E-04	&(	6.342E-02	1.87E-02	G K
		795.76	3.914E-02	(P	4.296E-02	1.37E-02	G
		569.29	6.847E-03	% P	2.338E-01	6.74E-02	G
		801.84	-7.688E-02	& P	5.042E-01	1.46E-01	G
CS-137	6.1123E-02						
		661.62	6.112E-02	(P	3.704E-02	1.32E-02	G
CE-139	1.3004E-03						
		165.85	1.300E-03	&(	4.100E-02	1.21E-02	G
EU-152	-3.5920E-02						
		121.78	-3.592E-02	%(P	1.408E-01	4.22E-02	G K
		344.30	-3.000E-03	% P	1.235E-01	3.62E-02	G
		1408.08	5.903E-02	%	1.709E-01	5.05E-02	G
		964.00	2.500E-01	% P	3.522E-01	1.09E-01	G
		1112.07	0.000E+00	%	4.858E-01	1.41E-01	G
		778.90	-2.143E-02	%	2.767E-01	7.95E-02	G
EU-154	1.2285E-02						
		123.10	1.228E-02	&(	1.057E-01	3.16E-02	G K
		1274.80	-6.035E-03	&	1.291E-01	3.66E-02	G
		723.30	4.490E-02	&	1.323E-01	3.92E-02	G
		1004.80	-6.415E-03	&	3.115E-01	9.00E-02	G
EU-155	2.7303E-04						
		86.45	2.730E-04	%(	1.873E-01	5.54E-02	G K
		105.31	8.320E-03	%	2.524E-01	7.52E-02	G
HG-203	5.3500E-04						
		279.17	5.350E-04	&(P	4.637E-02	1.37E-02	G K
		72.87	-1.027E+00	& P	2.693E+00	8.14E-01	G
		70.83	-2.970E+00	%	4.844E+00	1.48E+00	G
		82.50	4.671E-01	%	4.381E+00	1.31E+00	G

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

TL-208       3.0943E-01
                          583.14 3.094E-01  (P 4.272E-02 2.10E-02 G
                          510.72 5.233E-01 + P 1.722E-01 6.91E-02 G

PB-212       9.4396E-01
                          238.63 9.440E-01  (P 1.006E-01 4.41E-02 G K
                                                          Energy duplication
                           77.11 9.440E-01 } P 3.943E-01 1.09E-01 G
                           74.81 1.481E+00 + P 7.671E-01 2.53E-01 G

PB-214       5.2635E-01
                          351.99 5.164E-01 @(P 9.344E-02 4.20E-02 G K
                          295.22 5.456E-01  (P 1.501E-01 5.67E-02 G
                                                          Energy duplication
                           77.11 7.892E-02 } P 9.361E-01 2.29E-01 G
                          241.92-5.547E-02 %   6.553E-01 1.96E-01 G

BI-212       6.9216E-01
                          727.17 6.922E-01  (P 2.463E-01 1.01E-01 G K
                         1620.56 1.755E-01 % P 9.728E-01 2.69E-01 G
                          785.42 3.074E-01 &   1.971E+00 5.75E-01 G

BI-214       4.4113E-01
                          609.32 4.411E-01 @(P 7.737E-02 3.65E-02 G K
                         1764.51 6.181E-01 + P 1.080E-01 7.94E-02 G
                         1120.28 3.668E-01 - P 3.131E-01 1.12E-01 G

RA-224       1.0584E+00
                          241.00 1.058E+00  (  1.188E+00 3.66E-01 G

RA-226       1.3510E+00
                          185.99 1.351E+00 *(P 1.023E+00 3.42E-01 G

AC-228       9.3430E-01
                          911.07 9.807E-01  (P 1.600E-01 8.49E-02 G K
                          968.90 9.142E-01  (P 1.976E-01 9.07E-02 G
                          338.40 8.514E-01  (P 2.906E-01 1.15E-01 G

TH-227      -1.1706E-01
                          236.00-1.171E-01 %(  3.918E-01 1.18E-01 G K
                          256.25 9.475E-02 % P 5.090E-01 1.52E-01 G

PA-234      -3.1130E-02
                           98.44-3.113E-02 &(P 2.428E-01 7.26E-02 G K
                          946.00 4.997E-02 & P 1.782E-01 5.24E-02 G
                          131.28-1.280E-02 & P 2.291E-01 6.83E-02 G
                           94.67-1.224E-01 % P 4.587E-01 1.38E-01 G
                          883.24 1.638E-02 %   3.234E-01 9.25E-02 G
                          926.70 4.601E-03 %   3.211E-01 9.05E-02 G
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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 1.043E-02 % P 3.441E-01 9.92E-02 G

TH-234       1.9163E+00
                           63.29 1.916E+00 %(P 6.940E+00 2.08E+00 G K
                           92.80 1.506E+00 % P 2.355E+00 7.15E-01 G
                           92.38 1.804E+00 % P 2.775E+00 8.43E-01 G

AM-241      -2.3693E-01
                           59.54-2.369E-01 %(P 1.259E+00 3.77E-01 G
   ( - This peak used in the nuclide activity average.

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

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

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** 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	2.0697E-02	2.2968E-02	3.1758E-01	3.1758E-01	3.274E-01
K-40		1.8289E+01	1.8289E+01	1.5066E+00	1.8432E+00	
MN-54	#A	9.9210E-03	1.0099E-02	2.7038E-02	2.7044E-02	2.995E-02
CO-57	#B	-1.2041E-02	-1.2292E-02	4.5298E-02	4.5303E-02	4.792E-02
CO-60	#B	-3.2080E-03	-3.2173E-03	2.4609E+00	2.4609E+00	4.672E-02

Sr-85	#A	-1.9047E-02	-2.0753E-02	4.8333E-02	4.8348E-02	4.907E-02
Kr-85	#A	-4.3986E+02	-4.3988E+02	1.0242E+03	1.0245E+03	1.133E+03
Y-88	#B	8.5942E-03	9.0544E-03	1.7052E-02	1.7060E-02	1.731E-02
NB-94	#B	-8.4670E-04	-8.4670E-04	2.8134E-02	2.8134E-02	3.324E-02
Ag-108M	#B	-1.8660E-03	-1.8662E-03	6.3074E-02	6.3074E-02	7.152E-02
CD-109	#A	1.6782E-02	1.6989E-02	1.9260E+00	1.9260E+00	2.128E+00
SN-113	#B	2.6363E-03	2.7667E-03	4.9689E-02	4.9689E-02	5.385E-02
SB-125	#B	8.8814E-02	8.9303E-02	8.0715E-02	8.0881E-02	1.096E-01
I-131	#B	-1.1589E-02	-2.3142E-02	8.0534E-02	8.0545E-02	4.219E-02
CS-134	#B	1.8532E-02	1.8669E-02	1.9640E-02	1.9670E-02	6.296E-02
CS-137	#	6.1092E-02	6.1123E-02	3.9570E-02	3.9729E-02	
CE-139	#A	1.2488E-03	1.3004E-03	3.6417E-02	3.6417E-02	3.938E-02
EU-152	#B	-3.5877E-02	-3.5920E-02	1.3473E-01	1.3474E-01	1.406E-01
EU-154	#B	1.2263E-02	1.2285E-02	9.4689E-02	9.4691E-02	1.055E-01
EU-155	#B	2.7219E-04	2.7303E-04	1.6631E-01	1.6631E-01	1.868E-01
HG-203	#B	4.7481E-04	5.3500E-04	4.0963E-02	4.0963E-02	4.116E-02
TL-208		3.0943E-01	3.0943E-01	6.3057E-02	6.5566E-02	
PB-212		9.4396E-01	9.4396E-01	1.3217E-01	1.4308E-01	
PB-214		5.2635E-01	5.2635E-01	1.0419E-01	1.0858E-01	
BI-212		6.9216E-01	6.9216E-01	3.0223E-01	3.0489E-01	
BI-214		4.4113E-01	4.4113E-01	1.0943E-01	1.1238E-01	
RA-224	A	1.0584E+00	1.0584E+00	1.0989E+00	1.1006E+00	1.188E+00
RA-226	#	1.3510E+00	1.3510E+00	1.0242E+00	1.0272E+00	
AC-228		9.3430E-01	9.3430E-01	1.7620E-01	1.8436E-01	
TH-227	#B	-1.1706E-01	-1.1706E-01	3.5379E-01	3.5385E-01	3.918E-01
PA-234	#B	-3.1130E-02	-3.1130E-02	2.4306E-01	2.4307E-01	2.428E-01
TH-234	#B	1.9163E+00	1.9163E+00	6.2484E+00	6.2493E+00	6.940E+00
AM-241	#A	-2.3693E-01	-2.3693E-01	1.1500E+00	1.1501E+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

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

Total Activity (1120.0 to 2000.7 keV) 2.4607029E+01 pCi/gm
Total Decayed Activity (1120.0 to 2000.7 keV) 2.4607073E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
DAT

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 103F_7JULY2006_0940.An1

Sample description
FSS-OOL-11-02-005-F

Spectrum Filename: C:\GammaVision\Spectra\103F_7JULY2006_0940.An1

Acquisition information
Start time: 07-Jul-2006 09:40:53
Live time: 2000
Real time: 2002
Dead time: 0.09 %
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: 1.6240E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.6240E+03) =
6.1576E+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	29-Jun-2006 16:35:00
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. 14 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1109

***** 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
74.95	74.	33.04	0.99	9.052E-03	74.81	9.600	PBC<MDA	PB212
76.74	200.	19.59	1.00	9.946E-03	77.11	17.500	9.280E-01	PB212
					77.11	10.700	1.518E+00	PB214
128.89	130.	29.22	0.78	2.435E-02				
186.60	114.	29.46	1.39	2.565E-02	185.99	3.280	PBC<MDA	RA226
209.24	109.	29.05	0.74	2.472E-02				
238.76	926.	3.80	1.09	2.320E-02	238.63	43.100	7.605E-01	PB212
242.00	128.	18.69	1.10	2.302E-02	241.00	3.900	1.185E+00	RA224
277.42	60.	41.35	0.58	2.114E-02				
295.30	188.	10.82	1.13	2.024E-02	295.22	19.200	3.944E-01	PB214
300.04	53.	32.29	1.13	2.001E-02				
338.35	207.	15.02	1.25	1.830E-02	338.40	12.010	7.807E-01	AC228
351.91	350.	8.69	1.14	1.776E-02	351.99	37.100	4.348E-01	PB214
463.35	96.	25.82	0.91	1.425E-02				
463.35	96.	25.82	0.91	1.425E-02	463.51	10.000	5.574E-01	SB125
510.63	154.	14.53	1.10	1.317E-02	510.72	22.500	3.566E-01	TL208
583.29	301.	7.78	1.34	1.184E-02	583.14	86.000	2.422E-01	TL208
609.41	223.	8.70	1.31	1.144E-02	609.32	46.090	3.413E-01	BI214
					614.37	90.393	1.803E-01	Ag108M
661.80	249.	10.11	1.26	1.072E-02	661.62	84.620	2.272E-01	CS137
727.39	66.	23.59	1.14	9.962E-03	727.17	11.800	4.636E-01	BI212
795.57	33.	30.29	1.50	9.301E-03	795.76	85.400	3.517E-02	CS134
835.63	22.	34.06	0.88	8.964E-03				
911.26	219.	9.68	2.00	8.400E-03	911.07	29.000	7.361E-01	AC228
968.88	179.	11.26	1.47	8.026E-03	968.90	17.460	1.062E+00	AC228
1120.54	82.	24.96	1.21	7.211E-03	1120.28	15.040	6.176E-01	BI214
1461.01	1165.	2.97	1.75	5.931E-03	1460.75	10.700	1.503E+01	K40

1620.45	21.	25.58	0.88	5.488E-03	1620.56	2.750	1.183E+00	BI212
1764.70	42.	15.97	1.19	5.142E-03	1764.51	15.920	4.313E-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	
256.95	128.89	509.	151.	0.075	67.98	0.775	AC-228	s
417.64	209.24	374.	109.	0.055	87.15	0.737	AC-228	s
599.23	300.11	118.	53.	0.026	96.87	1.130	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	148.79	74.81	293.	74.	0.037	99.13	0.993D
PB-212	153.39	77.11	283.	113.	0.057	68.19	0.995A
RA-226	372.08	186.46	541.	125.	0.062	75.29	1.500s
PB-212	476.81	238.83	449.	998.	0.499	13.90	1.035
RA-224	482.45	241.65	558.	123.	0.062	85.68	1.500
PB-214	589.89	295.37	164.	170.	0.085	38.80	0.977
AC-228	675.85	338.35	247.	206.	0.103	45.05	1.248s
PB-214	702.96	351.91	211.	344.	0.172	26.07	1.140
SB-125	925.18	463.03	134.	56.	0.028	94.49	1.500
TL-208	1020.38	510.63	138.	127.	0.064	43.59	1.095s
TL-208	1165.67	583.29	93.	296.	0.148	23.34	1.344s
BI-214	1217.91	609.41	73.	216.	0.108	26.09	1.309
CS-137	1322.69	661.80	111.	248.	0.124	30.34	1.259
BI-212	1453.86	727.39	63.	66.	0.033	70.77	1.144
CS-134	1590.19	795.57	35.	33.	0.017	90.88	1.500s
AC-228	1821.55	911.26	65.	216.	0.108	29.03	1.999s
AC-228	1936.77	968.88	65.	179.	0.089	33.79	1.473
BI-214	2240.06	1120.54	91.	81.	0.040	74.87	1.213
K-40	2920.88	1461.01	31.	1146.	0.573	8.92	1.752
BI-212	3239.72	1620.45	3.	21.	0.011	76.74	0.880s
BI-214	3528.16	1764.70	6.	42.	0.021	47.92	1.187s

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		-2.7861E-02					
			477.56	-2.786E-02	%(	3.441E-01 1.00E-01	G
K-40		1.5028E+01					
			1460.75	1.503E+01	(P	3.741E-01 4.54E-01	G
MN-54		-1.2174E-02					
			834.81	-1.217E-02	%(P	4.318E-02 1.27E-02	G
CO-57		8.4624E-03					
			122.07	8.462E-03	%(P	5.027E-02 1.50E-02	G K
			136.43	6.732E-02	&	4.065E-01 1.22E-01	G
CO-60		-4.0387E-03					
			1332.51	-4.039E-03	%(P	3.728E-02 9.81E-03	G K
			1173.23	5.324E-03	% P	5.236E-02 1.50E-02	G K
Sr-85		-1.8341E-02					
			514.00	-1.834E-02	%(	4.919E-02 1.48E-02	G
Kr-85		-3.8992E+02					
			513.99	-3.899E+02	%(	1.046E+03 3.15E+02	G
Y-88		9.0565E-05					
			1836.01	9.057E-05	&(P	3.197E-02 8.25E-03	G K
			898.02	8.163E-03	& P	3.513E-02 1.02E-02	G
NB-94		-3.9576E-03					
			871.10	-3.958E-03	&(	3.415E-02 9.77E-03	G K
			702.50	-3.305E-04	&	3.571E-02 1.02E-02	G K
Ag-108M		2.0007E-03					
			722.95	2.001E-03	%(	2.750E-02 7.71E-03	G K
			614.37	-1.631E-03	& P	3.773E-02 1.08E-02	G
			433.93	-7.505E-03	%	3.704E-02 1.09E-02	G
CD-109		6.5294E-01					
			88.04	6.529E-01	%(	1.893E+00 5.71E-01	G
SN-113		-7.6186E-03					
			391.71	-7.619E-03	%(	5.240E-02 1.54E-02	G K
			255.04	-3.387E-01	&	1.761E+00 5.25E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	9.6075E-02						
		427.95	1.800E-02	%(P	1.153E-01	3.39E-02	G K
		600.77	-3.772E-02	& P	1.946E-01	5.71E-02	G
		636.15	-1.406E-02	% P	3.009E-01	8.58E-02	G
		463.51	3.272E-01	(P	3.325E-01	1.05E-01	G
		176.29	1.607E-01	%	5.547E-01	1.67E-01	G
I-131	7.7062E-03						
		364.48	7.706E-03	%(P	7.468E-02	2.19E-02	G K
		636.97	3.241E-01	%	8.565E-01	2.56E-01	G
		284.29	-2.586E-01	% P	9.370E-01	2.80E-01	G
CS-134	1.7202E-02						
		604.66	1.477E-03	%(	1.978E-02	5.49E-03	G K
		795.76	3.517E-02	*(P	3.179E-02	1.07E-02	G
		569.29	-8.021E-03	& P	2.306E-01	6.58E-02	G
		801.84	4.180E-02	% P	3.882E-01	1.10E-01	G
CS-137	2.2720E-01						
		661.62	2.272E-01	(P	4.761E-02	2.31E-02	G
CE-139	4.3054E-03						
		165.85	4.305E-03	%(	4.889E-02	1.46E-02	G
EU-152	2.2864E-04						
		121.78	2.286E-04	%(P	1.341E-01	3.97E-02	G K
		344.30	-1.749E-04	% P	1.206E-01	3.52E-02	G
		1408.08	5.175E-02	%	1.416E-01	4.19E-02	G
		964.00	9.831E-02	% P	3.397E-01	1.01E-01	G
		1112.07	-6.948E-02	&	3.780E-01	1.10E-01	G
		778.90	4.483E-02	%	2.447E-01	7.09E-02	G
EU-154	1.5807E-02						
		123.10	1.581E-02	%(	1.071E-01	3.20E-02	G K
		1274.80	8.433E-04	%	1.363E-01	3.84E-02	G
		723.30	-1.195E-01	%	2.526E-01	7.65E-02	G
		1004.80	-3.622E-02	%	2.358E-01	6.82E-02	G
EU-155	8.0744E-02						
		86.45	8.074E-02	%(	2.342E-01	7.06E-02	G K
		105.31	1.251E-02	%	2.332E-01	6.94E-02	G
HG-203	-2.9538E-03						
		279.17	-2.954E-03	%(P	4.686E-02	1.38E-02	G K
		72.87	-2.587E-01	% P	2.434E+00	7.27E-01	G
		70.83	-1.111E+00	&	4.698E+00	1.41E+00	G
		82.50	-3.551E-02	%	4.412E+00	1.31E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.4220E-01						
		583.14	2.422E-01	@(P	3.883E-02	1.91E-02	G
		510.72	3.566E-01	+ P	1.613E-01	6.27E-02	G
PB-212	7.8977E-01						
		238.63	8.307E-01	(P	8.442E-02	3.89E-02	G K
							Energy duplication
		77.11	5.317E-01	} P	3.816E-01	1.21E-01	G
		74.81	7.129E-01	(P	7.892E-01	2.45E-01	G
PB-214	4.1094E-01						
		351.99	4.348E-01	(P	8.891E-02	3.84E-02	G K
		295.22	3.648E-01	(P	1.334E-01	4.83E-02	G
							Energy duplication
		77.11	2.298E-01	} P	9.303E-01	2.19E-01	G
		241.92	1.190E-02	%	5.389E-01	1.60E-01	G
BI-212	4.6357E-01						
		727.17	4.636E-01	(P	2.820E-01	1.10E-01	G K
		1620.56	1.183E+00	+ P	5.593E-01	3.03E-01	G
		785.42	7.852E-01	%	1.625E+00	4.93E-01	G
BI-214	3.4126E-01						
		609.32	3.413E-01	(P	6.702E-02	3.06E-02	G K
		1764.51	4.313E-01	+ P	1.394E-01	7.42E-02	G
		1120.28	6.176E-01	+ P	3.627E-01	1.58E-01	G
RA-224	1.1399E+00						
		241.00	1.140E+00	(	1.043E+00	3.26E-01	G
RA-226	1.2331E+00						
		185.99	1.233E+00	(P	1.098E+00	3.42E-01	G
AC-228	7.4917E-01						
		911.07	7.361E-01	(P	1.380E-01	7.24E-02	G K
		968.90	1.062E+00	+ P	2.394E-01	1.20E-01	G
		338.40	7.807E-01	*(P	2.874E-01	1.18E-01	G
TH-227	-6.7769E-03						
		236.00	-6.777E-03	%(	4.472E-01	1.33E-01	G K
		256.25	8.528E-02	% P	4.729E-01	1.41E-01	G
PA-234	-5.3542E-02						
		98.44	-5.354E-02	%(P	1.923E-01	5.76E-02	G K
		946.00	1.453E-02	% P	1.866E-01	5.31E-02	G
		131.28	-4.479E-02	% P	2.226E-01	6.67E-02	G
		94.67	-1.445E-02	% P	4.022E-01	1.20E-01	G
		883.24	8.896E-02	&	2.550E-01	7.56E-02	G
		926.70	-7.618E-02	%	3.360E-01	9.81E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-1.131E-02 & P 3.395E-01 9.68E-02 G

TH-234       5.8345E-01
                           63.29 5.834E-01 &(P 6.449E+00 1.91E+00 G K
                           92.80 1.074E+00 % P 2.235E+00 6.74E-01 G
                           92.38 1.292E+00 & P 2.642E+00 7.97E-01 G

AM-241       5.9406E-02
                           59.54 5.941E-02 &(P 1.133E+00 3.36E-01 G
   ( - This peak used in the nuclide activity average.

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

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

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** 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	-2.5207E-02	-2.7861E-02	3.0017E-01	3.0018E-01	3.114E-01
K-40		1.5028E+01	1.5028E+01	1.3630E+00	1.6183E+00	
MN-54	#A	-1.1967E-02	-1.2174E-02	4.0422E-02	4.0429E-02	4.244E-02
CO-57	#B	8.2965E-03	8.4624E-03	4.5074E-02	4.5076E-02	4.928E-02
CO-60	#B	-4.0275E-03	-4.0387E-03	3.9534E-01	3.9534E-01	3.717E-02

Sr-85	#A	-1.6890E-02	-1.8341E-02	4.4383E-02	4.4396E-02	4.530E-02
Kr-85	#A	-3.8990E+02	-3.8992E+02	9.4358E+02	9.4385E+02	1.046E+03
Y-88	#B	8.6136E-05	9.0565E-05	2.4744E-02	2.4744E-02	3.041E-02
NB-94	#B	-3.9576E-03	-3.9576E-03	2.9319E-02	2.9320E-02	3.415E-02
Ag-108M	#B	2.0005E-03	2.0007E-03	2.3128E-02	2.3128E-02	2.749E-02
CD-109	#A	6.4529E-01	6.5294E-01	1.7119E+00	1.7123E+00	1.870E+00
SN-113	#B	-7.2729E-03	-7.6186E-03	4.6273E-02	4.6275E-02	5.002E-02
SB-125	#B	9.5568E-02	9.6075E-02	9.2860E-02	9.3028E-02	1.147E-01
I-131	#B	3.9635E-03	7.7062E-03	6.5693E-02	6.5694E-02	3.841E-02
CS-134	#B	1.7081E-02	1.7202E-02	1.5674E-02	1.5706E-02	1.964E-02
CS-137		2.2709E-01	2.2720E-01	6.9311E-02	7.0555E-02	
CE-139	#A	4.1412E-03	4.3054E-03	4.3667E-02	4.3668E-02	4.702E-02
EU-152	#B	2.2838E-04	2.2864E-04	1.1906E-01	1.1906E-01	1.340E-01
EU-154	#B	1.5780E-02	1.5807E-02	9.5981E-02	9.5985E-02	1.069E-01
EU-155	#B	8.0506E-02	8.0744E-02	2.1186E-01	2.1191E-01	2.335E-01
HG-203	#B	-2.6336E-03	-2.9538E-03	4.2086E-02	4.2086E-02	4.178E-02
TL-208	#	2.4220E-01	2.4220E-01	5.7355E-02	5.9054E-02	
PB-212		7.8977E-01	7.8977E-01	1.1108E-01	1.2017E-01	
PB-214		4.1094E-01	4.1094E-01	9.8124E-02	1.0098E-01	
BI-212		4.6357E-01	4.6357E-01	3.3054E-01	3.3163E-01	
BI-214		3.4126E-01	3.4126E-01	9.1712E-02	9.3827E-02	
RA-224	#	1.1399E+00	1.1399E+00	9.7671E-01	9.7895E-01	1.043E+00
RA-226	#	1.2331E+00	1.2331E+00	1.0248E+00	1.0273E+00	1.098E+00
AC-228		7.4917E-01	7.4917E-01	2.0242E-01	2.0704E-01	
TH-227	#B	-6.7769E-03	-6.7769E-03	3.9954E-01	3.9954E-01	4.472E-01
PA-234	#B	-5.3542E-02	-5.3542E-02	1.8492E-01	1.8494E-01	1.923E-01
TH-234	#B	5.8345E-01	5.8345E-01	5.7433E+00	5.7434E+00	6.449E+00
AM-241	#A	5.9404E-02	5.9406E-02	1.0089E+00	1.0089E+00	1.133E+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 (87.9 to 2000.7 keV) 1.8251520E+01 pCi/gm
Total Decayed Activity (87.9 to 2000.7 keV) 1.8251631E+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_7JULY2006_1146.An1

Sample description
FSS-OOL-11-02-017-F

Spectrum Filename: C:\GammaVision\Spectra\103F_7JULY2006_1146.An1

Acquisition information
Start time: 07-Jul-2006 11:46:54
Live time: 2000
Real time: 2002
Dead time: 0.08 %
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: 1.3860E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.3860E+03) =
7.2150E+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	29-Jun-2006 14:25:00
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: 0.1727

***** 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	93.	22.65	0.99	9.100E-03	74.81	9.600	1.009E+00	PB212
77.44	126.	18.73	0.99	1.038E-02	77.11	17.500	6.760E-01	PB212
					77.11	10.700	1.106E+00	PB214
93.13	73.	39.93	1.50	1.645E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.49	151.	24.55	1.11	2.565E-02	185.99	3.280	1.603E+00	RA226
209.28	139.	23.89	1.45	2.471E-02				
238.75	712.	4.48	1.09	2.320E-02	238.63	43.100	6.828E-01	PB212
241.84	109.	19.27	1.10	2.303E-02	241.00	3.900	1.185E+00	RA224
					241.92	7.470	6.202E-01	PB214
270.47	61.	38.74	0.85	2.150E-02				
295.20	210.	13.05	1.07	2.025E-02	295.22	19.200	5.165E-01	PB214
300.49	47.	33.98	1.63	1.999E-02				
338.49	151.	19.76	1.08	1.830E-02	338.40	12.010	6.636E-01	AC228
351.99	348.	7.33	0.99	1.775E-02	351.99	37.100	5.068E-01	PB214
462.70	62.	28.95	1.58	1.427E-02				
462.70	62.	28.95	1.58	1.427E-02	463.51	10.000	4.192E-01	SB125
511.00	128.	18.58	1.37	1.317E-02	510.72	22.500	3.333E-01	TL208
583.13	204.	9.47	1.21	1.184E-02	583.14	86.000	1.915E-01	TL208
609.35	241.	10.10	1.29	1.144E-02	609.32	46.090	4.337E-01	BI214
662.01	94.	22.30	1.46	1.072E-02	661.62	84.620	9.903E-02	CS137
727.44	41.	32.07	1.50	9.965E-03	727.17	11.800	PBC<MDA	BI212
769.85	60.	22.56	1.60	9.539E-03				
795.12	65.	25.51	1.42	9.307E-03				
795.12	65.	25.51	1.42	9.307E-03	795.76	85.400	8.026E-02	CS134
911.49	152.	11.29	1.21	8.398E-03	911.07	29.000	5.932E-01	AC228
967.98	146.	12.52	1.47	8.031E-03	968.90	17.460	1.013E+00	AC228

1121.43	74.	23.54	1.75	7.206E-03	1120.28	15.040	6.518E-01	BI214
1461.13	1178.	2.96	1.82	5.931E-03	1460.75	10.700	1.780E+01	K40
1765.13	55.	15.48	1.59	5.140E-03	1764.51	15.920	6.161E-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	
417.72	209.28	357.	139.	0.069	71.68	1.448	AC-228	s
540.09	270.47	204.	61.	0.030	116.22	0.847	AC-228	s
600.13	300.49	112.	47.	0.024	101.94	1.631	PB-212	s
1538.76	769.85	40.	60.	0.030	59.01	1.596	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	148.79	74.81	208.	101.	0.051	65.08	0.993D
PB-212	153.39	77.11	217.	125.	0.062	50.31	0.995A
RA-226	371.67	186.26	533.	93.	0.046	96.13	1.500s
PB-212	476.81	238.83	384.	710.	0.355	16.89	1.013
RA-224	482.69	241.77	461.	111.	0.056	86.65	1.500
PB-214	482.58	241.71	234.	60.	0.030	110.45	1.745s
PB-214	589.54	295.20	212.	206.	0.103	39.14	1.066
AC-228	676.12	338.49	238.	150.	0.075	59.27	1.080
PB-214	703.10	351.98	138.	350.	0.175	22.07	0.993
SB-125	925.14	463.01	105.	45.	0.023	102.66	1.500s
TL-208	1021.11	511.00	152.	101.	0.051	55.73	1.375s
TL-208	1165.37	583.13	70.	200.	0.100	28.42	1.211
BI-214	1217.80	609.35	116.	235.	0.117	30.31	1.290
CS-137	1323.10	662.01	99.	92.	0.046	66.90	1.457s
BI-212	1453.96	727.44	70.	41.	0.021	96.22	1.500s
CS-134	1588.98	794.96	44.	42.	0.021	80.78	1.500s
AC-228	1822.00	911.49	54.	148.	0.074	33.86	1.211
AC-228	1934.97	967.98	55.	146.	0.073	37.57	1.467s
BI-214	2241.83	1121.43	74.	73.	0.036	70.62	1.751s
K-40	2921.13	1461.13	29.	1159.	0.579	8.88	1.816
BI-214	3529.01	1765.13	8.	52.	0.026	46.44	1.594

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		4.3887E-02					
			477.56	4.389E-02	%(	3.272E-01 9.48E-02	G
K-40		1.7802E+01					
			1460.75	1.780E+01	(P	4.279E-01 5.36E-01	G
MN-54		-6.2322E-03					
			834.81	-6.232E-03	%(P	4.187E-02 1.20E-02	G
CO-57		5.7846E-03					
			122.07	5.785E-03	%(P	5.138E-02 1.53E-02	G K
			136.43	-4.026E-03	%	3.988E-01 1.18E-01	G
CO-60		-2.3263E-03					
			1332.51	-2.326E-03	%(P	3.600E-02 9.13E-03	G K
			1173.23	1.873E-02	& P	4.984E-02 1.48E-02	G K
Sr-85		-5.5737E-03					
			514.00	-5.574E-03	%(	4.667E-02 1.37E-02	G
Kr-85		-1.2471E+02					
			513.99	-1.247E+02	%(	9.915E+02 2.90E+02	G
Y-88		1.4912E-03					
			1836.01	1.491E-03	%(P	3.476E-02 9.00E-03	G K
			898.02	5.566E-04	% P	5.106E-02 1.44E-02	G
NB-94		-5.8879E-03					
			871.10	-5.888E-03	%(	3.383E-02 9.69E-03	G K
			702.50	1.322E-02	&	3.728E-02 1.11E-02	G K
Ag-108M		-4.9212E-03					
			722.95	-4.921E-03	%(	5.040E-02 1.46E-02	G K
			614.37	-3.932E-02	% P	5.467E-02 1.69E-02	G
			433.93	-2.107E-03	%	3.190E-02 9.17E-03	G
CD-109		9.4134E-02					
			88.04	9.413E-02	&(	2.212E+00 6.58E-01	G
SN-113		3.0349E-03					
			391.71	3.035E-03	%(	4.803E-02 1.39E-02	G K
			255.04	3.804E-02	%	1.469E+00 4.29E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	8.4339E-02						
		427.95	7.678E-03	%(P	8.136E-02	2.33E-02	G K
		600.77	4.982E-02	& P	2.055E-01	6.05E-02	G
		636.15	1.047E-01	& P	2.518E-01	7.54E-02	G
		463.51	3.113E-01	*(P	3.467E-01	1.10E-01	G
		176.29	1.971E-01	%	6.212E-01	1.87E-01	G
I-131	-5.4616E-03						
		364.48	-5.462E-03	%(P	8.259E-02	2.40E-02	G K
		636.97	2.552E-02	&	1.209E+00	3.48E-01	G
		284.29	-1.766E-01	& P	1.067E+00	3.15E-01	G
CS-134	1.4589E-02						
		604.66	-1.819E-02	%(	5.033E-02	1.51E-02	G K
		795.76	5.205E-02	*(P	4.136E-02	1.40E-02	G
		569.29	-5.793E-03	% P	2.475E-01	7.02E-02	G
		801.84	-7.388E-02	% P	4.393E-01	1.24E-01	G
CS-137	9.9033E-02						
		661.62	9.903E-02	*(P	5.274E-02	2.24E-02	G
CE-139	-2.1247E-03						
		165.85	-2.125E-03	%(	4.728E-02	1.40E-02	G
EU-152	1.7082E-02						
		121.78	1.708E-02	%(P	1.526E-01	4.54E-02	G K
		344.30	-1.404E-03	% P	1.309E-01	3.81E-02	G
		1408.08	1.552E-02	%	1.602E-01	4.38E-02	G
		964.00	1.773E-01	% P	3.439E-01	1.05E-01	G
		1112.07	7.479E-02	%	3.753E-01	1.09E-01	G
		778.90	-3.500E-02	%	2.875E-01	8.24E-02	G
EU-154	-1.6785E-02						
		123.10	-1.678E-02	&(	1.185E-01	3.54E-02	G K
		1274.80	-2.749E-02	&	1.638E-01	4.75E-02	G
		723.30	-5.362E-02	%	2.606E-01	7.68E-02	G
		1004.80	-6.890E-06	%	2.224E-01	6.17E-02	G
EU-155	-6.9888E-03						
		86.45	-6.989E-03	%(	2.270E-01	6.73E-02	G K
		105.31	-4.636E-02	%	2.224E-01	6.64E-02	G
HG-203	8.4598E-03						
		279.17	8.460E-03	&(P	4.673E-02	1.39E-02	G K
		72.87	-7.897E-01	% P	2.699E+00	8.11E-01	G
		70.83	5.677E-01	&	4.779E+00	1.42E+00	G
		82.50	-5.967E-02	%	4.524E+00	1.34E+00	G

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

TL-208       1.9152E-01
                          583.14 1.915E-01  (P 3.989E-02 1.85E-02 G
                          510.72 3.333E-01 + P 1.977E-01 7.83E-02 G

PB-212       7.1560E-01
                          238.63 6.924E-01  (P 9.168E-02 3.96E-02 G K
                                                          Energy duplication
                           77.11 6.883E-01 } P 3.928E-01 1.15E-01 G
                           74.81 1.138E+00 + P 7.844E-01 2.54E-01 G

PB-214       5.1792E-01
                          351.99 5.187E-01  (P 8.494E-02 3.88E-02 G K
                          295.22 5.165E-01  (P 1.770E-01 6.87E-02 G
                                                          Energy duplication
                           77.11 8.209E-03 } P 8.971E-01 2.14E-01 G
                          241.92 3.379E-01 -   4.199E-01 1.24E-01 G

BI-212       3.4345E-01
                          727.17 3.435E-01 *(P 3.455E-01 1.11E-01 G K
                         1620.56-2.884E-03 % P 1.342E+00 3.54E-01 G
                          785.42 1.286E+00 %   1.812E+00 5.69E-01 G

BI-214       4.3371E-01
                          609.32 4.337E-01  (P 9.801E-02 4.50E-02 G K
                         1764.51 6.161E-01 + P 1.919E-01 1.01E-01 G
                         1120.28 6.518E-01 + P 3.859E-01 1.57E-01 G

RA-224       1.2058E+00
                          241.00 1.206E+00  (  1.113E+00 3.48E-01 G

RA-226       1.0729E+00
                          185.99 1.073E+00 *(P 1.277E+00 3.92E-01 G

AC-228       6.1384E-01
                          911.07 5.932E-01  (P 1.476E-01 6.85E-02 G K
                          968.90 1.013E+00 + P 2.601E-01 1.27E-01 G
                          338.40 6.636E-01  (P 3.312E-01 1.32E-01 G

TH-227      -1.1271E-01
                          236.00-1.127E-01 &(  4.168E-01 1.25E-01 G K
                          256.25 5.647E-02 % P 5.450E-01 1.61E-01 G

PA-234      -3.0182E-02
                           98.44-3.018E-02 &(P 2.524E-01 7.52E-02 G K
                          946.00-6.913E-02 % P 2.302E-01 6.80E-02 G
                          131.28-5.292E-02 % P 2.315E-01 6.93E-02 G
                           94.67-1.465E-01 % P 4.530E-01 1.36E-01 G
                          883.24-2.916E-02 %   3.539E-01 1.01E-01 G
                          926.70-6.989E-02 &   4.109E-01 1.19E-01 G
```

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-1.202E-02 % P 3.655E-01 1.04E-01 G

TH-234       6.8438E-01
                           63.29 6.844E-01 %(P 6.936E+00 2.06E+00 G K
                           92.80 1.451E+00 % P 2.371E+00 7.19E-01 G
                           92.38 1.405E+00 % P 2.838E+00 8.56E-01 G

AM-241       1.5898E-01
                           59.54 1.590E-01 &(P 1.204E+00 3.58E-01 G
   ( - This peak used in the nuclide activity average.

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

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

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** 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	3.9615E-02	4.3887E-02	2.8453E-01	2.8454E-01	2.953E-01
K-40		1.7802E+01	1.7802E+01	1.6063E+00	1.9101E+00	
MN-54	#A	-6.1240E-03	-6.2322E-03	4.0984E-02	4.0986E-02	4.114E-02
CO-57	#B	5.6686E-03	5.7846E-03	4.5825E-02	4.5826E-02	5.035E-02
CO-60	#B	-2.3197E-03	-2.3263E-03	1.0025E-01	1.0025E-01	3.590E-02

Sr-85	#A	-5.1229E-03	-5.5737E-03	4.0984E-02	4.0986E-02	4.290E-02
Kr-85	#A	-1.2470E+02	-1.2471E+02	8.7123E+02	8.7126E+02	9.914E+02
Y-88	#B	1.4167E-03	1.4912E-03	2.7008E-02	2.7008E-02	3.302E-02
NB-94	#B	-5.8879E-03	-5.8879E-03	2.9071E-02	2.9073E-02	3.383E-02
Ag-108M	#B	-4.9206E-03	-4.9212E-03	4.3777E-02	4.3778E-02	5.039E-02
CD-109	#A	9.3005E-02	9.4134E-02	1.9743E+00	1.9743E+00	2.186E+00
SN-113	#B	2.8940E-03	3.0349E-03	4.1642E-02	4.1642E-02	4.580E-02
SB-125	#F	8.3884E-02	8.4339E-02	8.9026E-02	8.9161E-02	8.092E-02
I-131	#B	-2.7663E-03	-5.4616E-03	1.0192E-01	1.0192E-01	4.183E-02
CS-134	#B	1.4484E-02	1.4589E-02	1.1810E-02	1.1840E-02	4.996E-02
CS-137	#	9.8984E-02	9.9033E-02	6.7252E-02	6.7497E-02	
CE-139	#A	-2.0418E-03	-2.1247E-03	4.1958E-02	4.1958E-02	4.544E-02
EU-152	#B	1.7061E-02	1.7082E-02	1.3616E-01	1.3616E-01	1.524E-01
EU-154	#B	-1.6755E-02	-1.6785E-02	1.0613E-01	1.0614E-01	1.183E-01
EU-155	#B	-6.9677E-03	-6.9888E-03	2.0181E-01	2.0181E-01	2.264E-01
HG-203	#B	7.5228E-03	8.4598E-03	4.1554E-02	4.1557E-02	4.155E-02
TL-208		1.9152E-01	1.9152E-01	5.5603E-02	5.6704E-02	
PB-212		7.1560E-01	7.1560E-01	1.2289E-01	1.2972E-01	
PB-214		5.1792E-01	5.1792E-01	1.1615E-01	1.1998E-01	
BI-212	#A	3.4345E-01	3.4345E-01	3.3441E-01	3.3500E-01	3.455E-01
BI-214		4.3371E-01	4.3371E-01	1.3510E-01	1.3742E-01	
RA-224		1.2058E+00	1.2058E+00	1.0449E+00	1.0472E+00	1.113E+00
RA-226	#A	1.0729E+00	1.0729E+00	1.1757E+00	1.1773E+00	1.277E+00
AC-228		6.1384E-01	6.1384E-01	2.1182E-01	2.1480E-01	
TH-227	#B	-1.1271E-01	-1.1271E-01	3.7538E-01	3.7544E-01	4.168E-01
PA-234	#B	-3.0182E-02	-3.0182E-02	2.5944E-01	2.5944E-01	2.524E-01
TH-234	#B	6.8438E-01	6.8438E-01	6.1662E+00	6.1663E+00	6.936E+00
AM-241	#A	1.5898E-01	1.5898E-01	1.0749E+00	1.0750E+00	1.204E+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 (86.4 to 2000.7 keV) 2.1578913E+01 pCi/gm
Total Decayed Activity (86.4 to 2000.7 keV) 2.1578962E+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_7JULY2006_1418.An1

Sample description
FSS-OOL-11-02-023-F

Spectrum Filename: C:\GammaVision\Spectra\103F_7JULY2006_1418.An1

Acquisition information
Start time: 07-Jul-2006 14:18:45
Live time: 2000
Real time: 2002
Dead time: 0.09 %
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: 1.7410E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.7410E+03) =
5.7438E+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	29-Jun-2006 14:10:00
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. 14 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1668

***** 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
74.53	97.	26.48	0.99	8.987E-03	74.81	9.600	8.359E-01	PB212
77.30	190.	13.97	0.99	1.026E-02	77.11	17.500	8.199E-01	PB212
92.42	132.	29.88	1.44	1.632E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.03	125.	29.93	1.11	2.567E-02	185.99	3.280	PBC<MDA	RA226
209.56	82.	34.37	0.98	2.470E-02				
238.81	870.	3.98	1.09	2.319E-02	238.63	43.100	6.660E-01	PB212
241.80	130.	17.99	1.09	2.303E-02	241.00	3.900	1.122E+00	RA224
					241.92	7.470	5.872E-01	PB214
270.45	84.	31.54	1.09	2.150E-02				
295.35	234.	8.99	1.13	2.025E-02	295.22	19.200	4.581E-01	PB214
299.94	51.	32.62	1.13	2.002E-02				
338.35	156.	14.42	1.18	1.830E-02	338.40	12.010	5.467E-01	AC228
352.03	319.	8.88	1.20	1.775E-02	351.99	37.100	3.695E-01	PB214
409.33	54.	32.46	1.02	1.575E-02				
463.40	58.	25.13	1.59	1.425E-02				
463.40	58.	25.13	1.59	1.425E-02	463.51	10.000	3.118E-01	SB125
511.10	124.	16.21	1.87	1.316E-02	510.72	22.500	2.544E-01	TL208
583.39	312.	8.73	1.07	1.184E-02	583.14	86.000	2.348E-01	TL208
609.52	272.	8.24	1.38	1.144E-02	609.32	46.090	3.912E-01	BI214
662.40	132.	13.84	0.98	1.071E-02	661.62	84.620	1.118E-01	CS137
727.71	82.	19.58	1.74	9.959E-03	727.17	11.800	5.367E-01	BI212
795.65	28.	41.33	1.50	9.301E-03	795.76	85.400	PBC<MDA	CS134
860.51	65.	22.62	1.45	8.768E-03				
911.54	204.	9.08	1.97	8.398E-03	911.07	29.000	6.376E-01	AC228
965.48	35.	27.89	1.54	8.046E-03	964.00	14.580	PBC<MDA	EU152
969.35	97.	13.31	1.54	8.022E-03	968.90	17.460	5.370E-01	AC228

1121.26	92.	20.82	1.24	7.207E-03	1120.28	15.040	6.412E-01	BI214
1461.36	1215.	2.98	1.90	5.930E-03	1460.75	10.700	1.463E+01	K40
1764.77	51.	16.72	0.66	5.142E-03	1764.51	15.920	4.848E-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	
418.29	209.56	320.	82.	0.041	103.10	0.979	AC-228	s
540.05	270.45	256.	84.	0.042	94.63	1.089	AC-228	s
599.02	299.86	115.	51.	0.026	97.86	1.130	TH-227	lD
817.79	409.33	109.	54.	0.027	97.38	1.016	AC-228	s
1720.06	860.51	54.	65.	0.032	67.86	1.453	TL-208	
1930.99	965.61	36.	27.	0.013	112.74	1.539	TB-160	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	274.	102.	0.051	72.46	0.993D
PB-212	153.39	77.11	269.	145.	0.073	5.09	0.995A
TH-234	185.01	92.92	752.	104.	0.052	98.18	1.500s
TH-234	185.06	92.94	711.	111.	0.055	90.78	1.500s
RA-226	371.57	186.20	604.	116.	0.058	84.26	1.500
PB-212	476.91	238.88	604.	820.	0.410	17.77	1.003
RA-224	482.41	241.63	646.	94.	0.047	118.61	1.500s
PB-214	589.70	295.27	155.	212.	0.106	32.01	0.961
AC-228	675.84	338.35	153.	155.	0.077	43.27	1.179
PB-214	703.20	352.03	178.	314.	0.157	26.63	1.203
SB-125	925.71	463.29	93.	57.	0.028	80.37	1.500s
TL-208	1021.32	511.10	134.	97.	0.049	48.62	1.872s
TL-208	1165.87	583.39	124.	308.	0.154	26.18	1.075s
BI-214	1218.14	609.52	86.	266.	0.133	24.73	1.380
CS-137	1323.88	662.40	73.	131.	0.065	41.51	0.981s
BI-212	1454.49	727.71	68.	81.	0.041	58.74	1.741s
CS-134	1590.37	795.65	52.	28.	0.014	123.99	1.500s
AC-228	1822.10	911.54	51.	200.	0.100	27.23	1.965s
AC-228	1936.81	968.90	38.	97.	0.048	40.85	1.541D
BI-214	2241.49	1121.26	79.	90.	0.045	62.45	1.245s
K-40	2921.59	1461.36	45.	1196.	0.598	8.93	1.897
BI-214	3528.29	1764.77	10.	51.	0.026	50.17	0.663s

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		-7.0013E-02					
			477.56	-7.001E-02	%(	3.281E-01 9.68E-02	G
K-40		1.4629E+01					
			1460.75	1.463E+01	(P	4.142E-01 4.43E-01	G
MN-54		-3.1518E-04					
			834.81	-3.152E-04	%(P	3.898E-02 1.11E-02	G
CO-57		1.9225E-03					
			122.07	1.923E-03	%(P	4.565E-02 1.36E-02	G K
			136.43	6.133E-02	&	3.481E-01 1.04E-01	G
CO-60		-6.0299E-03					
			1332.51	-6.030E-03	%(P	3.620E-02 9.75E-03	G K
			1173.23	5.423E-03	% P	4.292E-02 1.23E-02	G K
Sr-85		-2.1242E-02					
			514.00	-2.124E-02	%(	4.796E-02 1.45E-02	G
Kr-85		-4.5020E+02					
			513.99	-4.502E+02	%(	1.016E+03 3.07E+02	G
Y-88		-3.5403E-04					
			1836.01	-3.540E-04	%(P	2.306E-02 5.65E-03	G K
			898.02	-6.230E-04	% P	3.968E-02 1.11E-02	G
NB-94		3.8177E-03					
			871.10	3.818E-03	&(	3.712E-02 1.07E-02	G K
			702.50	4.774E-03	&	3.298E-02 9.58E-03	G K
Ag-108M		5.3459E-03					
			722.95	5.346E-03	&(	3.342E-02 9.68E-03	G K
			614.37	-6.976E-03	% P	3.037E-02 8.89E-03	G
			433.93	-3.252E-03	%	3.238E-02 9.45E-03	G
CD-109		2.9374E-01					
			88.04	2.937E-01	%(	1.967E+00 5.89E-01	G
SN-113		1.1430E-02					
			391.71	1.143E-02	%(	4.942E-02 1.47E-02	G K
			255.04	-2.515E-01	%	1.569E+00 4.66E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	9.0989E-02						
		427.95	1.693E-02	%(P	9.268E-02	2.72E-02	G K
		600.77	-2.227E-02	% P	1.750E-01	5.09E-02	G
		636.15	-2.918E-02	% P	2.930E-01	8.44E-02	G
		463.51	3.102E-01	*(P	2.605E-01	8.50E-02	G
		176.29	-1.221E-01	%	5.409E-01	1.62E-01	G
I-131	2.3983E-03						
		364.48	2.398E-03	&(P	7.303E-02	2.13E-02	G K
		636.97	9.210E-03	&	9.143E-01	2.62E-01	G
		284.29	-2.001E-01	% P	1.009E+00	3.00E-01	G
CS-134	1.3663E-02						
		604.66	1.792E-03	%(	3.310E-02	9.54E-03	G K
		795.76	2.723E-02	(P	3.574E-02	1.13E-02	G
		569.29	-6.369E-03	% P	1.895E-01	5.35E-02	G
		801.84	5.167E-02	% P	3.979E-01	1.14E-01	G
CS-137	1.1179E-01						
		661.62	1.118E-01	@(P	3.649E-02	1.56E-02	G
CE-139	1.6073E-02						
		165.85	1.607E-02	&(	4.005E-02	1.21E-02	G
EU-152	1.8484E-02						
		121.78	1.848E-02	%(P	1.384E-01	4.13E-02	G K
		344.30	2.311E-02	& P	1.091E-01	3.24E-02	G
		1408.08	3.406E-02	%	1.308E-01	3.76E-02	G
		964.00	-9.010E-02	% P	2.680E-01	7.93E-02	G
		1112.07	7.934E-02	%	3.376E-01	9.92E-02	G
		778.90	-5.217E-02	%	2.605E-01	7.61E-02	G
EU-154	2.1399E-02						
		123.10	2.140E-02	&(	8.859E-02	2.65E-02	G K
		1274.80	-4.585E-03	%	1.050E-01	2.94E-02	G
		723.30	-7.571E-02	%	2.187E-01	6.54E-02	G
		1004.80	6.271E-03	&	2.304E-01	6.55E-02	G
EU-155	1.0768E-02						
		86.45	1.077E-02	&(	2.319E-01	6.91E-02	G K
		105.31	2.025E-02	%	2.213E-01	6.60E-02	G
HG-203	-4.4076E-04						
		279.17	-4.408E-04	&(P	4.495E-02	1.32E-02	G K
		72.87	-2.722E-01	% P	1.987E+00	5.93E-01	G
		70.83	1.683E+00	&	3.731E+00	1.13E+00	G
		82.50	-1.266E+00	%	3.935E+00	1.19E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.3883E-01						
		583.14	2.348E-01	@(P	4.159E-02	2.08E-02	G
		510.72	2.544E-01	*(P	1.483E-01	5.26E-02	G
PB-212	6.3690E-01						
		238.63	6.369E-01	(P	9.098E-02	3.83E-02	G K
							Energy duplication
		77.11	6.369E-01	} P	3.468E-01	1.08E-02	G
		74.81	9.128E-01	+ P	7.130E-01	2.27E-01	G
PB-214	3.8802E-01						
		351.99	3.695E-01	(P	7.655E-02	3.34E-02	G K
		295.22	4.238E-01	(P	1.212E-01	4.61E-02	G
							Energy duplication
		77.11	0.000E+00	} P	8.076E-01	0.00E+00	G
		241.92	2.415E-01	%	5.546E-01	1.68E-01	G
BI-212	5.3671E-01						
		727.17	5.367E-01	@(P	2.710E-01	1.06E-01	G K
		1620.56	-2.878E-03	% P	1.014E+00	2.65E-01	G
		785.42	-8.795E-02	&	1.745E+00	4.99E-01	G
BI-214	4.1524E-01						
		609.32	3.912E-01	(P	6.771E-02	3.30E-02	G K
		1764.51	4.848E-01	@(P	1.645E-01	8.63E-02	G
		1120.28	6.412E-01	+ P	3.165E-01	1.36E-01	G
RA-224	8.1232E-01						
		241.00	8.123E-01	(	1.045E+00	3.21E-01	G
RA-226	1.0688E+00						
		185.99	1.069E+00	(P	1.081E+00	3.34E-01	G
AC-228	5.8820E-01						
		911.07	6.376E-01	@(P	1.145E-01	5.89E-02	G K
		968.90	5.347E-01	(P	1.751E-01	7.29E-02	G
		338.40	5.467E-01	(P	2.133E-01	7.94E-02	G
TH-227	-1.1520E-01						
		236.00	-1.152E-01	%(	3.647E-01	1.10E-01	G K
		256.25	5.582E-02	% P	4.393E-01	1.30E-01	G
PA-234	5.5843E-02						
		98.44	5.584E-02	&(P	1.994E-01	5.99E-02	G K
		946.00	-2.377E-02	% P	1.907E-01	5.50E-02	G
		131.28	-3.113E-02	% P	2.099E-01	6.28E-02	G
		94.67	-9.327E-02	& P	3.917E-01	1.18E-01	G
		883.24	-8.545E-03	%	2.408E-01	6.74E-02	G
		926.70	3.407E-02	%	2.774E-01	7.90E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-1.086E-02 % P 2.793E-01 7.89E-02 G

TH-234       1.3413E+00
                           63.29 6.427E-01 %(P 6.188E+00 1.84E+00 G K
                           92.80 1.745E+00  (P 1.997E+00 6.12E-01 G
                           92.38 1.930E+00  (P 2.416E+00 7.38E-01 G

AM-241      -1.3813E-01
                           59.54-1.381E-01 &(P 1.126E+00 3.36E-01 G
   ( - This peak used in the nuclide activity average.

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

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

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** 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	-6.3103E-02	-7.0013E-02	2.9046E-01	2.9049E-01	2.957E-01
K-40		1.4629E+01	1.4629E+01	1.3271E+00	1.5756E+00	
MN-54	#A	-3.0963E-04	-3.1518E-04	2.3783E-02	2.3783E-02	3.829E-02
CO-57	#B	1.8834E-03	1.9225E-03	4.0664E-02	4.0664E-02	4.472E-02
CO-60	#B	-6.0125E-03	-6.0299E-03	9.7401E-02	9.7401E-02	3.609E-02

Sr-85	#A	-1.9499E-02	-2.1242E-02	4.3511E-02	4.3529E-02	4.402E-02
Kr-85	#A	-4.5017E+02	-4.5020E+02	9.2215E+02	9.2252E+02	1.016E+03
Y-88	#B	-3.3607E-04	-3.5403E-04	3.1018E-02	3.1018E-02	2.189E-02
NB-94	#B	3.8177E-03	3.8177E-03	3.2075E-02	3.2075E-02	3.712E-02
Ag-108M	#B	5.3453E-03	5.3459E-03	2.9034E-02	2.9035E-02	3.342E-02
CD-109	#A	2.9016E-01	2.9374E-01	1.7670E+00	1.7671E+00	1.943E+00
SN-113	#B	1.0892E-02	1.1430E-02	4.3989E-02	4.3994E-02	4.709E-02
SB-125	#B	9.0491E-02	9.0989E-02	7.4773E-02	7.4960E-02	9.217E-02
I-131	#B	1.2027E-03	2.3983E-03	6.3897E-02	6.3897E-02	3.662E-02
CS-134	#B	1.3562E-02	1.3663E-02	1.6993E-02	1.7012E-02	3.285E-02
CS-137	#	1.1174E-01	1.1179E-01	4.6899E-02	4.7346E-02	
CE-139	#A	1.5437E-02	1.6073E-02	3.6283E-02	3.6295E-02	3.846E-02
EU-152	#B	1.8461E-02	1.8484E-02	1.2393E-01	1.2394E-01	1.382E-01
EU-154	#B	2.1360E-02	2.1399E-02	7.9641E-02	7.9650E-02	8.844E-02
EU-155	#B	1.0735E-02	1.0768E-02	2.0740E-01	2.0740E-01	2.312E-01
HG-203	#B	-3.9127E-04	-4.4076E-04	4.3390E-02	4.3390E-02	3.990E-02
TL-208	#	2.3883E-01	2.3883E-01	6.3388E-02	6.4887E-02	
PB-212		6.3690E-01	6.3690E-01	1.1480E-01	1.2060E-01	
PB-214		3.8802E-01	3.8802E-01	8.2300E-02	8.5328E-02	
BI-212	#	5.3671E-01	5.3671E-01	3.1718E-01	3.1870E-01	
BI-214		4.1524E-01	4.1524E-01	1.0520E-01	1.0793E-01	
RA-224	#A	8.1232E-01	8.1232E-01	9.6348E-01	9.6464E-01	1.045E+00
RA-226	#A	1.0688E+00	1.0688E+00	1.0012E+00	1.0031E+00	1.081E+00
AC-228		5.8820E-01	5.8820E-01	1.2917E-01	1.3360E-01	
TH-227	#B	-1.1520E-01	-1.1520E-01	3.2946E-01	3.2953E-01	3.647E-01
PA-234	#B	5.5843E-02	5.5843E-02	1.7963E-01	1.7966E-01	1.994E-01
TH-234	#B	1.3413E+00	1.3413E+00	1.4114E+00	1.4134E+00	6.188E+00
AM-241	#A	-1.3812E-01	-1.3813E-01	1.0352E+00	1.0352E+00	1.126E+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) 1.7544703E+01 pCi/gm
Total Decayed Activity (1120.0 to 2000.7 keV) 1.7544760E+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_7JUL2006_1535.An1

Sample description
FSS-OOL-11-02-007-F-RC

Spectrum Filename: C:\GammaVision\Spectra\107F_7JUL2006_1535.An1

Acquisition information
Start time: 07-Jul-2006 15:35:46
Live time: 2000
Real time: 2004
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: 1.9250E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.9250E+03) =
5.1948E+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	29-Jun-2006 16:00:00
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. 21 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.2206

***** 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
74.96	421.	17.20	1.50	2.849E-02				
74.96	421.	17.20	1.50	2.849E-02	74.81	9.600	1.080E+00	PB212
77.07	612.	11.42	1.50	2.957E-02	77.11	10.700	1.358E+00	PB214
					77.11	17.500	8.303E-01	PB212
77.07	617.	11.42	1.50	2.957E-02	77.11	10.700	1.358E+00	PB214
					77.11	17.500	8.368E-01	PB212
87.20	192.	23.09	1.19	3.315E-02	86.45	32.740	1.258E-01	EU155
					88.04	3.790	PBC<MDA	CD109
93.05	283.	19.32	1.82	3.444E-02	92.38	2.570	2.191E+00	TH234
					92.80	3.000	1.792E+00	TH234
128.96	133.	33.56	1.11	3.818E-02				
186.07	360.	16.10	1.86	3.610E-02	185.99	3.280	2.134E+00	RA226
209.30	176.	20.70	1.38	3.428E-02				
238.73	1709.	3.11	1.30	3.188E-02	238.63	43.100	8.645E-01	PB212
241.48	268.	18.15	1.30	3.166E-02	241.00	3.900	1.511E+00	RA224
270.44	161.	22.05	2.30	2.943E-02				
277.27	83.	39.29	1.40	2.893E-02				
295.30	408.	7.11	1.34	2.768E-02				
295.30	408.	7.11	1.34	2.768E-02	295.22	19.200	5.331E-01	PB214
300.00	137.	17.99	1.34	2.736E-02				
328.21	114.	29.30	1.05	2.559E-02				
338.37	388.	9.75	1.62	2.500E-02	338.40	12.010	8.993E-01	AC228
352.03	713.	5.32	1.26	2.426E-02	351.99	37.100	5.522E-01	PB214
463.14	126.	20.87	1.82	1.954E-02				
463.14	126.	20.87	1.82	1.954E-02	463.51	10.000	4.449E-01	SB125
511.05	340.	10.96	2.00	1.807E-02	510.72	22.500	5.291E-01	TL208
583.37	568.	5.62	1.49	1.628E-02	583.14	86.000	2.824E-01	TL208

609.27	601.	5.46	1.39	1.574E-02	609.32	46.090	5.770E-01	BI214
662.12	216.	14.63	1.54	1.476E-02	661.62	84.620	1.191E-01	CS137
727.35	192.	17.21	1.75	1.374E-02	727.17	11.800	8.256E-01	BI212
768.38	59.	25.01	1.67	1.318E-02				
795.37	73.	29.90	1.43	1.284E-02				
795.37	73.	29.90	1.43	1.284E-02	795.76	85.400	4.700E-02	CS134
860.30	110.	23.01	1.86	1.211E-02				
911.40	403.	6.57	1.89	1.160E-02	911.07	29.000	8.324E-01	AC228
968.30	371.	8.14	1.94	1.110E-02	968.90	17.460	1.337E+00	AC228
1120.49	160.	13.84	1.93	9.968E-03	1120.28	15.040	7.449E-01	BI214
1460.95	2406.	2.07	2.12	8.190E-03	1460.75	10.700	1.923E+01	K40

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1621.70	30.	28.45	1.54	7.569E-03	1620.56	2.750	1.029E+00	BI212
1764.78	93.	11.63	1.76	7.083E-03	1764.51	15.920	5.733E-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	
174.07	87.61	887.	192.	0.096	69.27	1.187	PB-214	D
418.23	209.30	549.	176.	0.088	62.10	1.384	AC-228	
477.09	238.86	561.	1709.	0.854	9.34	1.297	PB-212	D
482.59	241.61	1053.	268.	0.134	54.45	1.299	PB-214	D
540.50	270.44	461.	161.	0.081	66.16	2.304	AC-228	s
599.44	299.91	271.	123.	0.061	62.95	1.426	TH-227	s
656.03	328.21	382.	114.	0.057	87.90	1.048	AC-228	
1536.32	768.17	79.	59.	0.029	75.02	1.666	BI-214	D
1720.17	860.30	143.	110.	0.055	69.02	1.860	TL-208	

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	149.58	74.96	2460.	421.	0.210	51.61	1.500s
PB-214	153.89	77.11	2178.	612.	0.306	34.26	1.500D
PB-212	153.89	77.11	2173.	617.	0.308	34.26	1.500D
EU-155	173.98	87.16	2002.	180.	0.090	107.61	1.500
TH-234	185.69	93.01	1886.	285.	0.143	65.09	1.500s
TH-234	185.65	92.99	1861.	270.	0.135	65.22	1.500s
RA-226	371.79	186.07	1071.	360.	0.180	48.30	1.855s
TH-227	471.85	236.11	1703.	-161.	-0.081	111.32	1.500s
PB-212	477.09	238.73	1185.	1667.	0.833	11.31	1.500s
PB-214	590.06	295.22	509.	387.	0.193	28.67	1.500D
AC-228	676.36	338.37	362.	385.	0.192	29.24	1.616s
PB-214	703.66	352.02	349.	668.	0.334	16.44	1.500s
SB-125	926.11	463.26	211.	97.	0.048	68.45	1.500s
TL-208	1021.69	511.05	303.	307.	0.153	32.89	2.001s
TL-208	1166.33	583.37	160.	564.	0.282	16.86	1.492
BI-214	1218.11	609.27	158.	596.	0.298	16.38	1.394s
CS-137	1323.81	662.12	226.	212.	0.106	43.90	1.539s
Ag-108M	1454.21	727.32	97.	142.	0.071	38.60	1.635s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-212	1454.28	727.35	226.	191.	0.095	51.63	1.747s
CS-134	1589.70	795.07	115.	56.	0.028	89.00	1.684
AC-228	1822.36	911.40	101.	399.	0.200	19.72	1.890s
AC-228	1936.16	968.30	145.	369.	0.184	24.43	1.942s
BI-214	2240.55	1120.49	115.	159.	0.080	41.53	1.925s
K-40	2921.50	1460.95	28.	2401.	1.200	6.22	2.119
BI-212	3243.02	1621.70	14.	30.	0.015	85.36	1.536s
BI-214	3529.22	1764.78	9.	92.	0.046	34.89	1.757

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		4.2199E-03					
			477.56	4.220E-03	%(	2.950E-01 8.64E-02 G	
K-40		1.9230E+01					
			1460.75	1.923E+01	(P	2.197E-01 4.00E-01 G	
MN-54		1.0313E-02					
			834.81	1.031E-02	%(P	3.097E-02 9.24E-03 G	
CO-57		5.0363E-03					
			122.07	5.036E-03	%(P	3.981E-02 1.19E-02 G K	
			136.43	-7.110E-02	& P	3.133E-01 9.43E-02 G	
CO-60		-1.1381E-03					
			1332.51	-1.138E-03	%(P	2.971E-02 8.16E-03 G K	
			1173.23	6.298E-03	& P	4.940E-02 1.45E-02 G K	
Sr-85		-2.1111E-02					
			514.00	-2.111E-02	%(	4.195E-02 1.27E-02 G	
Kr-85		-4.7539E+02					
			513.99	-4.754E+02	%(P	8.925E+02 2.70E+02 G	
Y-88		2.5070E-05					
			1836.01	2.507E-05	&(P	2.274E-02 5.93E-03 G K	
			898.02	3.609E-03	% P	3.664E-02 1.07E-02 G	
NB-94		-3.5930E-03					
			871.10	-3.593E-03	&(P	2.978E-02 8.67E-03 G K	
			702.50	-3.350E-03	% P	3.029E-02 8.85E-03 G K	

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Ag-108M	8.0075E-02						
		722.95	8.008E-02	?(	2.729E-02	1.03E-02	G K
		614.37	-2.056E-02	%	3.562E-02	1.09E-02	G
		433.93	-1.505E-03	& P	2.974E-02	8.70E-03	G
CD-109	-7.8033E-03						
		88.04	-7.803E-03	%(P	1.304E+00	3.91E-01	G
SN-113	-1.4803E-03						
		391.71	-1.480E-03	%(P	4.432E-02	1.30E-02	G K
		255.04	-5.791E-01	%	1.403E+00	4.24E-01	G
SB-125	9.0654E-02						
		427.95	3.181E-03	%(P	8.080E-02	2.36E-02	G K
		600.77	2.813E-02	& P	1.307E-01	3.85E-02	G
		636.15	-7.092E-03	& P	2.248E-01	6.48E-02	G
		463.51	3.496E-01	(P	2.544E-01	8.21E-02	G
		176.29	3.725E-04	% P	4.779E-01	1.42E-01	G
I-131	-8.6067E-04						
		364.48	-8.607E-04	%(	5.870E-02	1.72E-02	G K
		636.97	-9.859E-03	&	7.393E-01	2.14E-01	G
		284.29	-1.057E-01	&	8.552E-01	2.55E-01	G
CS-134	-1.6580E-02						
		604.66	-1.658E-02	%(P	3.700E-02	1.12E-02	G K
		795.76	3.642E-02	+ P	3.397E-02	1.09E-02	G
		569.29	-1.170E-02	&	1.620E-01	4.73E-02	G
		801.84	-2.683E-02	% P	3.469E-01	1.01E-01	G
CS-137	1.1911E-01						
		661.62	1.191E-01	@(P	4.089E-02	1.77E-02	G
CE-139	2.3145E-03						
		165.85	2.314E-03	%(P	3.239E-02	9.66E-03	G
EU-152	-2.6270E-02						
		121.78	-2.627E-02	%(P	1.101E-01	3.31E-02	G K
		344.30	-3.258E-02	% P	9.428E-02	2.83E-02	G
		1408.08	6.400E-02	% P	1.124E-01	3.45E-02	G
		964.00	-1.422E-01	% P	3.561E-01	1.07E-01	G
		1112.07	3.796E-03	% P	2.988E-01	8.65E-02	G
		778.90	3.522E-02	% P	1.981E-01	5.79E-02	G
EU-154	2.3988E-04						
		123.10	2.399E-04	%(P	8.195E-02	2.45E-02	G K
		1274.80	1.833E-02	% P	1.113E-01	3.26E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		723.30	1.858E-03	% P	3.020E-01	8.95E-02	G
		1004.80	-1.875E-02	% P	2.021E-01	5.88E-02	G
EU-155	1.1811E-01						
		86.45	1.181E-01	(	1.383E-01	4.24E-02	G K
		105.31	4.928E-02	% P	1.588E-01	4.79E-02	G
HG-203	-8.0238E-03						
		279.17	-8.024E-03	&(P	4.046E-02	1.21E-02	G K
		72.87	-4.051E-01	% P	1.156E+00	3.50E-01	G
		70.83	2.727E-02	%	1.844E+00	5.53E-01	G
		82.50	-9.142E-01	&	2.336E+00	7.07E-01	G
TL-208	2.8245E-01						
		583.14	2.824E-01	(P	3.093E-02	1.60E-02	G
		510.72	5.291E-01	+ P	1.447E-01	6.44E-02	G
PB-212	8.4692E-01						
		238.63	8.510E-01	@(P	8.329E-02	3.24E-02	G K
							Energy duplication
		77.11	8.368E-01	*(	2.983E-01	9.56E-02	G
		74.81	1.080E+00	+ P	6.001E-01	1.87E-01	G
PB-214	5.1763E-01						
		351.99	5.210E-01	*(P	7.000E-02	2.88E-02	G K
							Energy duplication
		295.22	5.112E-01	(P	1.424E-01	4.94E-02	G
							Energy duplication
		77.11	1.358E+00	+ P	4.884E-01	1.56E-01	G
		241.92	-3.379E-02	% P	4.903E-01	1.47E-01	G
BI-212	8.6395E-01						
		727.17	8.256E-01	@(P	3.152E-01	1.43E-01	G K
		1620.56	1.029E+00	(P	6.689E-01	2.98E-01	G
		785.42	3.757E-01	& P	1.766E+00	5.23E-01	G
BI-214	5.7608E-01						
		609.32	5.770E-01	@(P	5.923E-02	3.17E-02	G K
		1764.51	5.733E-01	(P	1.034E-01	6.73E-02	G
		1120.28	7.449E-01	+ P	2.465E-01	1.04E-01	G
RA-224	4.5392E-01						
		241.00	4.539E-01	%(P	1.053E+00	3.19E-01	G
RA-226	2.1342E+00						
		185.99	2.134E+00	*(	9.202E-01	3.44E-01	G
AC-228	8.5200E-01						
		911.07	8.324E-01	@(P	1.032E-01	5.53E-02	G K
		968.90	1.337E+00	+ P	2.133E-01	1.10E-01	G
		338.40	8.993E-01	*(P	2.137E-01	8.84E-02	G

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

TH-227      -3.1466E-01
                          236.00-3.147E-01 ?(P 3.807E-01 1.17E-01 G K
                          256.25-1.528E-01 % P 3.763E-01 1.13E-01 G

PA-234      -9.9773E-04
                           98.44-9.977E-04 %(  1.471E-01 4.40E-02 G K
                          946.00-1.904E-02 &   1.761E-01 5.15E-02 G
                          131.28-4.053E-02 &   1.727E-01 5.20E-02 G
                           94.67-1.052E-01 %   2.753E-01 8.33E-02 G
                          883.24-2.642E-03 &   2.731E-01 7.89E-02 G
                          926.70-1.086E-02 &   2.589E-01 7.44E-02 G
                          569.26-1.375E-02 &   2.439E-01 7.11E-02 G

TH-234       1.4888E+00
                           63.29 7.029E-01 %(P 1.691E+00 5.11E-01 G K
                           92.80 1.839E+00  (P 1.387E+00 4.29E-01 G
                           92.38 2.273E+00  (P 1.634E+00 5.07E-01 G

AM-241       1.9029E-02
                           59.54 1.903E-02 %(P 2.318E-01 6.95E-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	3.8045E-03	4.2199E-03	2.5906E-01	2.5906E-01	2.659E-01
K-40		1.9230E+01	1.9230E+01	1.1990E+00	1.6515E+00	
MN-54	#A	1.0132E-02	1.0313E-02	2.7731E-02	2.7738E-02	3.043E-02
CO-57	#B	4.9341E-03	5.0363E-03	3.5839E-02	3.5840E-02	3.900E-02
CO-60	#B	-1.1348E-03	-1.1381E-03	5.4061E-02	5.4061E-02	2.963E-02
Sr-85	#A	-1.9384E-02	-2.1111E-02	3.8218E-02	3.8239E-02	3.852E-02
Kr-85	#A	-4.7536E+02	-4.7539E+02	9.0841E+02	9.0885E+02	8.924E+02
Y-88	#B	2.3801E-05	2.5070E-05	1.7798E-02	1.7798E-02	2.159E-02
NB-94	#B	-3.5930E-03	-3.5930E-03	2.7193E-02	2.7194E-02	2.978E-02
Ag-108M	#	8.0065E-02	8.0075E-02	3.0906E-02	3.1266E-02	2.728E-02
CD-109	#A	-7.7086E-03	-7.8033E-03	1.8784E+00	1.8784E+00	1.288E+00
SN-113	#B	-1.4108E-03	-1.4803E-03	1.7188E-01	1.7188E-01	4.224E-02
SB-125	#F	9.0159E-02	9.0654E-02	6.3861E-02	6.4085E-02	8.036E-02
I-131	#B	-4.3245E-04	-8.6067E-04	5.1704E-02	5.1704E-02	2.950E-02
CS-134	#B	-1.6458E-02	-1.6580E-02	3.4527E-02	3.4541E-02	3.673E-02
CS-137	#	1.1905E-01	1.1911E-01	5.3154E-02	5.3618E-02	
CE-139	#A	2.2232E-03	2.3145E-03	2.8972E-02	2.8972E-02	3.111E-02
EU-152	#B	-2.6239E-02	-2.6270E-02	1.0009E-01	1.0010E-01	1.100E-01
EU-154	#B	2.3945E-04	2.3988E-04	7.3483E-02	7.3483E-02	8.181E-02
EU-155	#A	1.1775E-01	1.1811E-01	1.2711E-01	1.2728E-01	1.379E-01
HG-203	#B	-7.1253E-03	-8.0238E-03	4.0462E-02	4.0465E-02	3.593E-02
TL-208		2.8245E-01	2.8245E-01	4.8011E-02	5.0827E-02	
PB-212	#	8.4692E-01	8.4692E-01	9.6665E-02	1.0884E-01	8.329E-02
PB-214	#	5.1763E-01	5.1763E-01	8.5756E-02	9.1042E-02	7.000E-02
BI-212		8.6395E-01	8.6395E-01	4.3692E-01	4.3989E-01	
BI-214		5.7608E-01	5.7608E-01	9.5055E-02	1.0096E-01	
RA-224	#A	4.5392E-01	4.5392E-01	9.5641E-01	9.5678E-01	1.053E+00
RA-226	#	2.1342E+00	2.1342E+00	1.0308E+00	1.0384E+00	
AC-228	#	8.5200E-01	8.5200E-01	1.5159E-01	1.5973E-01	
TH-227	#A	-3.1466E-01	-3.1466E-01	3.5089E-01	3.5138E-01	3.807E-01
PA-234	#B	-9.9773E-04	-9.9773E-04	1.3200E-01	1.3200E-01	1.471E-01
TH-234	#B	1.4888E+00	1.4888E+00	9.9609E-01	9.9950E-01	1.691E+00
AM-241	#A	1.9029E-02	1.9029E-02	2.0852E-01	2.0852E-01	2.318E-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

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

Total Activity (785.2 to 2000.1 keV) 2.4058113E+01 pCi/gm
Total Decayed Activity (785.2 to 2000.1 keV) 2.4058191E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
DAT

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 107F_7JULY2006_0944.An1

Sample description
FSS-OOL-11-02-006-F

Spectrum Filename: C:\GammaVision\Spectra\107F_7JULY2006_0944.An1

Acquisition information
Start time: 07-Jul-2006 09:44:45
Live time: 2000
Real time: 2001
Dead time: 0.07 %
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: 1.0200E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.0200E+03) =
9.8039E+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	29-Jun-2006 15:40:00
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. 20 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1300

***** 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
63.56	86.	39.39	1.31	2.042E-02	63.29	3.900	PBC<MDA	TH234
74.76	189.	15.97	1.18	2.842E-02	74.81	9.600	8.976E-01	PB212
77.11	287.	11.52	1.18	2.953E-02	77.11	10.700	1.181E+00	PB214
					77.11	17.500	7.345E-01	PB212
93.31	99.	32.72	1.40	3.449E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
129.19	68.	39.00	0.89	3.818E-02				
185.81	131.	24.90	1.40	3.611E-02	185.99	3.280	1.461E+00	RA226
238.72	542.	5.72	1.30	3.190E-02	236.00	11.200	1.995E+00	TH227
					238.63	43.100	5.069E-01	PB212
242.15	129.	18.73	1.30	3.162E-02	241.00	3.900	1.360E+00	RA224
					241.92	7.470	7.159E-01	PB214
295.45	204.	11.21	1.36	2.766E-02	295.22	19.200	4.973E-01	PB214
328.20	45.	36.27	1.42	2.559E-02				
338.39	123.	17.75	1.54	2.500E-02	338.40	12.010	5.285E-01	AC228
351.94	361.	9.34	1.78	2.426E-02	351.99	37.100	5.242E-01	PB214
511.36	156.	14.91	1.76	1.806E-02	510.72	22.500	3.984E-01	TL208
583.28	212.	11.04	1.96	1.629E-02	583.14	86.000	1.966E-01	TL208
609.27	279.	7.54	1.50	1.574E-02	609.32	46.090	5.008E-01	BI214
661.78	749.	4.28	1.98	1.477E-02	661.62	84.620	7.910E-01	CS137
726.89	64.	22.64	0.87	1.374E-02	723.30	19.700	3.140E-01	EU154
					727.17	11.800	5.254E-01	BI212
911.07	172.	10.69	2.41	1.161E-02	911.07	29.000	6.591E-01	AC228
968.02	124.	12.85	1.30	1.110E-02	968.90	17.460	8.363E-01	AC228
1120.74	74.	22.10	2.12	9.970E-03	1120.28	15.040	6.548E-01	BI214
1332.34	16.	39.24	2.03	8.773E-03	1332.51	99.980	PBC<MDA	CO60
1460.89	794.	3.63	2.41	8.190E-03	1460.75	10.700	1.193E+01	K40

1764.44	51.	13.87	2.65	7.084E-03	1764.51	15.920	6.004E-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
656.01	328.20	103.	45.	0.022	108.82	1.418	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	149.29	74.81	366.	185.	0.093	47.93	1.178D
PB-212	153.89	77.11	403.	198.	0.099	40.36	1.179A
TH-234	185.46	92.90	665.	108.	0.054	98.20	1.500s
TH-234	185.45	92.89	651.	96.	0.048	95.89	1.500s
RA-226	371.26	185.81	343.	131.	0.065	74.71	1.396s
PB-212	476.89	238.63	204.	526.	0.263	16.78	1.297D
PB-214	483.47	241.92	223.	134.	0.067	53.41	1.299D
PB-214	590.52	295.45	138.	199.	0.100	33.64	1.358s
AC-228	676.40	338.39	139.	120.	0.060	53.25	1.538s
PB-214	703.49	351.94	221.	356.	0.178	28.02	1.776s
TL-208	1022.32	511.36	144.	122.	0.061	44.73	1.758s
TL-208	1166.14	583.28	98.	208.	0.104	33.11	1.960s
BI-214	1218.11	609.27	67.	274.	0.137	22.61	1.496s
Ag-108M	1223.03	611.73	146.	-50.	-0.025	110.76	1.561s
CS-137	1323.14	661.78	79.	746.	0.373	12.84	1.983s
BI-212	1453.34	726.89	50.	64.	0.032	67.91	0.870s
AC-228	1821.70	911.07	45.	167.	0.084	32.07	2.406s
AC-228	1935.60	968.02	40.	122.	0.061	38.54	1.304s
BI-214	2241.04	1120.74	55.	74.	0.037	66.31	2.117
K-40	2921.38	1460.89	14.	789.	0.395	10.89	2.413
BI-214	3528.54	1764.44	1.	51.	0.026	41.60	2.645s

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		4.7551E-02					
			477.56	4.755E-02	%(	2.545E-01 7.36E-02	G
K-40		1.1931E+01					
			1460.75	1.193E+01	(P	3.020E-01 4.36E-01	G
MN-54		3.1980E-03					
			834.81	3.198E-03	&(P	3.588E-02 1.01E-02	G
CO-57		7.7166E-04					
			122.07	7.717E-04	%(P	4.206E-02 1.24E-02	G K
			136.43	7.737E-02	% P	3.232E-01 9.67E-02	G
CO-60		2.3597E-02					
			1332.51	2.360E-02	%(P	3.787E-02 1.15E-02	G K
			1173.23	-5.031E-03	% P	4.766E-02 1.28E-02	G K
Sr-85		-2.0875E-02					
			514.00	-2.087E-02	%(	5.352E-02 1.61E-02	G
Kr-85		-4.9542E+02					
			513.99	-4.954E+02	%(P	1.146E+03 3.42E+02	G
Y-88		-1.6617E-03					
			1836.01	-1.662E-03	%(P	3.485E-02 8.51E-03	G K
			898.02	-6.614E-03	& P	4.085E-02 1.14E-02	G
NB-94		-1.1861E-02					
			871.10	-1.186E-02	%(P	4.065E-02 1.20E-02	G K
			702.50	4.115E-03	% P	3.466E-02 9.92E-03	G K
Ag-108M		7.6249E-03					
			722.95	7.625E-03	%(	3.864E-02 1.12E-02	G K
			614.37	-4.697E-02	+	5.533E-02 1.73E-02	G
			433.93	1.590E-02	% P	3.515E-02 1.06E-02	G
CD-109		5.3925E-02					
			88.04	5.392E-02	%(P	1.266E+00 3.76E-01	G
SN-113		-1.1208E-02					
			391.71	-1.121E-02	&(P	5.638E-02 1.65E-02	G K
			255.04	3.234E-01	%	1.640E+00 4.87E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	3.1005E-03						
		427.95	3.100E-03	&(P	1.168E-01	3.37E-02	G K
		600.77	6.683E-03	& P	1.886E-01	5.35E-02	G
		636.15	-5.730E-03	% P	2.764E-01	7.70E-02	G
		463.51	2.270E-01	% P	3.385E-01	1.04E-01	G
		176.29	8.941E-02	% P	5.265E-01	1.56E-01	G
I-131	4.4336E-04						
		364.48	4.434E-04	%(	6.868E-02	1.97E-02	G K
		636.97	-2.616E-02	%	1.041E+00	2.98E-01	G
		284.29	2.905E-01	%	9.674E-01	2.89E-01	G
CS-134	-3.3094E-03						
		604.66	-3.309E-03	%(P	9.907E-02	2.94E-02	G K
		795.76	2.507E-02	% P	3.402E-02	1.08E-02	G
		569.29	3.124E-02	%	1.756E-01	5.06E-02	G
		801.84	-5.563E-02	% P	3.843E-01	1.09E-01	G
CS-137	7.9096E-01						
		661.62	7.910E-01	@(P	4.683E-02	3.40E-02	G
CE-139	-3.1914E-03						
		165.85	-3.191E-03	%(P	3.798E-02	1.12E-02	G
EU-152	4.9305E-03						
		121.78	4.930E-03	&(P	1.283E-01	3.80E-02	G K
		344.30	-3.522E-03	% P	1.146E-01	3.31E-02	G
		1408.08	2.984E-02	% P	1.763E-01	4.93E-02	G
		964.00	8.369E-03	% P	3.636E-01	1.04E-01	G
		1112.07	6.918E-02	% P	2.974E-01	8.60E-02	G
		778.90	-6.060E-02	% P	3.281E-01	9.52E-02	G
EU-154	-1.9557E-02						
		123.10	-1.956E-02	%(P	8.462E-02	2.53E-02	G K
		1274.80	1.008E-03	& P	1.187E-01	3.26E-02	G
		723.30	2.082E-02	& P	1.943E-01	5.58E-02	G
		1004.80	-1.973E-03	& P	2.136E-01	5.89E-02	G
EU-155	7.5845E-02						
		86.45	7.584E-02	%(	1.538E-01	4.67E-02	G K
		105.31	2.959E-02	& P	1.681E-01	5.01E-02	G
HG-203	2.7190E-03						
		279.17	2.719E-03	&(P	3.920E-02	1.14E-02	G K
		72.87	-2.993E-01	& P	1.332E+00	4.00E-01	G
		70.83	1.102E-01	%	2.045E+00	6.09E-01	G
		82.50	-4.716E-01	%	2.403E+00	7.19E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	1.9657E-01						
		583.14	1.966E-01	(P	4.622E-02	2.22E-02	G
		510.72	3.984E-01	+ P	1.907E-01	7.58E-02	G
PB-212	5.0699E-01						
		238.63	5.070E-01	(P	6.675E-02	2.92E-02	G K
							Energy duplication
		77.11	5.070E-01	}	2.465E-01	6.82E-02	G
		74.81	8.973E-01	+ P	4.447E-01	1.46E-01	G
PB-214	5.1503E-01						
		351.99	5.242E-01	*(P	1.059E-01	4.97E-02	G K
		295.22	4.973E-01	@(P	1.430E-01	5.71E-02	G
							Energy duplication
		77.11	3.421E-01	} P	4.771E-01	1.51E-01	G
		241.92	7.497E-01	+ P	4.056E-01	1.35E-01	G
BI-212	5.2542E-01						
		727.17	5.254E-01	(P	2.905E-01	1.21E-01	G K
		1620.56	1.555E-01	& P	1.325E+00	3.61E-01	G
		785.42	3.848E-01	% P	1.885E+00	5.45E-01	G
BI-214	5.2638E-01						
		609.32	5.008E-01	@(P	7.446E-02	3.83E-02	G K
		1764.51	6.004E-01	*(P	8.658E-02	8.47E-02	G
		1120.28	6.548E-01	+ P	3.290E-01	1.46E-01	G
RA-224	4.4513E-02						
		241.00	4.451E-02	&(P	1.094E+00	3.24E-01	G
RA-226	1.4612E+00						
		185.99	1.461E+00	*(	9.965E-01	3.64E-01	G
AC-228	7.2569E-01						
		911.07	6.591E-01	*(P	1.331E-01	7.22E-02	G K
		968.90	8.363E-01	*(P	2.195E-01	1.09E-01	G
		338.40	5.285E-01	- P	2.545E-01	9.63E-02	G
TH-227	-6.2852E-02						
		236.00	-6.285E-02	%(P	4.060E-01	1.21E-01	G K
		256.25	9.828E-02	& P	4.685E-01	1.39E-01	G
PA-234	4.3209E-03						
		98.44	4.321E-03	%(	1.526E-01	4.52E-02	G K
		946.00	3.804E-02	%	1.888E-01	5.45E-02	G
		131.28	3.044E-04	&	1.742E-01	5.14E-02	G
		94.67	-1.598E-01	%	3.153E-01	9.57E-02	G
		883.24	-3.152E-02	&	3.339E-01	9.52E-02	G
		926.70	3.133E-02	%	2.847E-01	7.99E-02	G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 4.600E-02 %   2.586E-01 7.46E-02 G

TH-234       1.3391E+00
                           63.29 1.234E+00 %(P 1.921E+00 5.83E-01 G K
                           92.80 1.239E+00 *(P 1.562E+00 4.77E-01 G
                           92.38 1.617E+00 *(P 1.847E+00 5.68E-01 G

AM-241       7.4594E-03
                           59.54 7.459E-03 &(P 2.448E-01 7.25E-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

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

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	4.2998E-02	4.7551E-02	2.2069E-01	2.2070E-01	2.302E-01
K-40		1.1931E+01	1.1931E+01	1.3065E+00	1.4844E+00	
MN-54	#A	3.1434E-03	3.1980E-03	3.0427E-02	3.0428E-02	3.527E-02
CO-57	#B	7.5645E-04	7.7166E-04	3.7302E-02	3.7302E-02	4.123E-02
CO-60	#B	2.3531E-02	2.3597E-02	3.4485E-02	3.4513E-02	3.777E-02

Sr-85	#A	-1.9215E-02	-2.0875E-02	4.8328E-02	4.8344E-02	4.926E-02
Kr-85	#A	-4.9539E+02	-4.9542E+02	1.2641E+03	1.2644E+03	1.146E+03
Y-88	#B	-1.5800E-03	-1.6617E-03	4.1506E-02	4.1506E-02	3.314E-02
NB-94	#B	-1.1861E-02	-1.1861E-02	3.6826E-02	3.6832E-02	4.065E-02
Ag-108M	#B	7.6240E-03	7.6249E-03	3.3658E-02	3.3661E-02	3.863E-02
CD-109	#A	5.3289E-02	5.3925E-02	1.1283E+00	1.1283E+00	1.251E+00
SN-113	#B	-1.0697E-02	-1.1208E-02	6.7867E-02	6.7870E-02	5.381E-02
SB-125	#B	3.0840E-03	3.1005E-03	1.0105E-01	1.0105E-01	1.162E-01
I-131	#B	2.2723E-04	4.4336E-04	5.9248E-02	5.9248E-02	3.520E-02
CS-134	#B	-3.2858E-03	-3.3094E-03	1.1606E-01	1.1606E-01	9.837E-02
CS-137	#	7.9057E-01	7.9096E-01	1.0206E-01	1.1224E-01	
CE-139	#A	-3.0691E-03	-3.1914E-03	3.7087E-02	3.7088E-02	3.652E-02
EU-152	#B	4.9248E-03	4.9305E-03	1.1406E-01	1.1406E-01	1.281E-01
EU-154	#B	-1.9524E-02	-1.9557E-02	7.9558E-02	7.9565E-02	8.448E-02
EU-155	#B	7.5620E-02	7.5845E-02	1.4003E-01	1.4010E-01	1.534E-01
HG-203	#B	2.4227E-03	2.7190E-03	3.4287E-02	3.4287E-02	3.493E-02
TL-208		1.9657E-01	1.9657E-01	6.6497E-02	6.7502E-02	
PB-212		5.0699E-01	5.0699E-01	8.7612E-02	9.2588E-02	
PB-214		5.1503E-01	5.1503E-01	1.1491E-01	1.1887E-01	
BI-212		5.2542E-01	5.2542E-01	3.6393E-01	3.6525E-01	
BI-214		5.2638E-01	5.2638E-01	1.2089E-01	1.2482E-01	
RA-224	#A	4.4513E-02	4.4513E-02	9.7097E-01	9.7098E-01	1.094E+00
RA-226	#	1.4612E+00	1.4612E+00	1.0917E+00	1.0951E+00	
AC-228	#	7.2569E-01	7.2569E-01	1.8577E-01	1.9065E-01	
TH-227	#B	-6.2852E-02	-6.2852E-02	3.7515E-01	3.7517E-01	4.060E-01
PA-234	#B	4.3209E-03	4.3209E-03	1.3552E-01	1.3552E-01	1.526E-01
TH-234	#B	1.3391E+00	1.3391E+00	9.4260E-01	9.4552E-01	1.921E+00
AM-241	#A	7.4592E-03	7.4594E-03	2.1755E-01	2.1755E-01	2.448E-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) 1.7178823E+01 pCi/gm
Total Decayed Activity (295.2 to 2000.1 keV) 1.7179222E+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_7JULY2006_1150.An1

Sample description
FSS-OOL-11-02-021-F

Spectrum Filename: C:\GammaVision\Spectra\107F_7JULY2006_1150.An1

Acquisition information
Start time: 07-Jul-2006 11:50:15
Live time: 2000
Real time: 2002
Dead time: 0.12 %
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: 1.5500E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.5500E+03) =
6.4516E+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	29-Jun-2006 14:35:00
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. 17 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.3318

***** 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
74.56	242.	14.97	1.18	2.817E-02	74.81	9.600	7.578E-01	PB212
77.16	357.	11.78	1.18	2.942E-02	77.11	17.500	6.019E-01	PB212
					77.11	10.700	9.713E-01	PB214
86.94	156.	36.45	1.62	3.297E-02	86.45	32.740	1.273E-01	EU155
					88.04	3.790	PBC<MDA	CD109
93.21	75.	41.40	1.14	3.447E-02	92.80	3.000	PBC<MDA	TH234
129.71	146.	32.45	1.16	3.820E-02				
129.71	146.	32.45	1.16	3.820E-02	131.28	20.000	1.667E-01	PA234
186.41	223.	20.76	1.46	3.607E-02	185.99	3.280	1.642E+00	RA226
209.54	81.	31.35	1.85	3.426E-02				
239.12	1302.	4.43	1.62	3.186E-02	238.63	43.100	8.160E-01	PB212
242.00	151.	19.83	1.30	3.163E-02	241.00	3.900	1.061E+00	RA224
					241.92	7.470	5.554E-01	PB214
269.84	127.	23.71	1.32	2.947E-02				
277.36	68.	36.99	1.51	2.892E-02				
295.50	296.	12.55	1.75	2.766E-02	295.22	19.200	4.787E-01	PB214
338.12	211.	16.82	1.23	2.502E-02	338.40	12.010	6.044E-01	AC228
352.00	470.	7.59	1.89	2.426E-02	351.99	37.100	4.505E-01	PB214
463.12	83.	26.33	1.76	1.954E-02				
463.12	83.	26.33	1.76	1.954E-02	463.51	10.000	3.609E-01	SB125
510.59	168.	16.59	2.40	1.808E-02	510.72	22.500	2.879E-01	TL208
583.29	322.	7.48	1.90	1.629E-02	583.14	86.000	1.974E-01	TL208
609.21	356.	6.96	1.79	1.574E-02				
609.21	356.	6.96	1.79	1.574E-02	609.32	46.090	4.226E-01	BI214
662.11	129.	20.12	1.87	1.476E-02	661.62	84.620	8.742E-02	CS137
727.88	84.	22.35	2.13	1.374E-02	727.17	11.800	4.501E-01	BI212
859.82	67.	30.99	0.98	1.212E-02				

911.37	286.	8.18	2.26	1.161E-02	911.07	29.000	7.303E-01	AC228
968.18	177.	13.10	1.95	1.110E-02	968.90	17.460	7.876E-01	AC228
1120.43	65.	25.33	1.90	9.970E-03	1120.28	15.040	3.773E-01	BI214
1460.76	1638.	2.58	2.30	8.191E-03	1460.75	10.700	1.624E+01	K40
1588.41	49.	22.86	0.58	7.686E-03				
1620.98	32.	24.75	1.53	7.569E-03	1620.56	2.750	1.353E+00	BI212
1764.43	54.	15.92	2.29	7.084E-03	1764.51	15.920	4.148E-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	
173.55	86.94	1148.	156.	0.078	109.36	1.615	BI-207	l
186.09	93.21	491.	75.	0.037	124.20	1.144	U-235	l
259.08	129.71	726.	146.	0.073	97.36	1.164	AC-228	l
418.73	209.54	282.	81.	0.041	94.06	1.846	AC-228	s
539.31	269.84	287.	127.	0.063	71.13	1.322	AC-228	s
554.35	277.36	224.	76.	0.038	90.61	1.514	TL-208	s
1218.01	609.21	359.	83.	0.042	101.97	1.792	BI-214	s
1719.20	859.82	95.	67.	0.033	92.97	0.977	TL-208	s
3176.43	1588.41	14.	49.	0.025	68.58	0.578	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	149.29	74.81	594.	241.	0.121	46.20	1.178D
PB-212	153.89	77.11	653.	201.	0.101	49.21	1.179A
PB-214	153.89	77.11	1001.	149.	0.074	87.21	1.500A
RA-226	372.47	186.41	640.	223.	0.112	62.28	1.455s
TH-227	471.97	236.17	1012.	-120.	-0.060	115.59	1.500s
PB-212	476.89	238.63	306.	942.	0.471	12.28	1.297D
PB-214	483.47	241.92	379.	151.	0.075	59.49	1.299D
PB-214	590.62	295.50	355.	292.	0.146	37.66	1.747s
AC-228	675.86	338.12	313.	208.	0.104	50.45	1.234s
PB-214	703.61	352.00	256.	465.	0.233	22.76	1.892s
SB-125	925.75	463.08	131.	52.	0.026	96.29	1.500s
TL-208	1020.77	510.59	203.	134.	0.067	49.76	2.398s
TL-208	1166.16	583.29	100.	317.	0.159	22.43	1.900s
BI-214	1218.36	609.39	92.	298.	0.149	21.69	1.558s
CS-137	1323.80	662.11	143.	125.	0.063	60.37	1.869
BI-212	1455.33	727.88	93.	84.	0.042	67.06	2.128s
AC-228	1822.30	911.37	77.	282.	0.141	24.54	2.257s
AC-228	1935.92	968.18	95.	175.	0.087	39.31	1.953
BI-214	2240.43	1120.43	107.	65.	0.032	76.00	1.897s
K-40	2921.11	1460.76	35.	1633.	0.816	7.74	2.298s
BI-212	3241.58	1620.98	8.	32.	0.016	74.26	1.533s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-214	3528.52	1764.43	11.	54.	0.027	47.77	2.291

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	Activity pCi/gm	Code	MDA Value pCi/gm	COMMENTS
BE-7		-4.4072E-02					
			477.56	-4.407E-02	%(	2.369E-01	6.94E-02 G
K-40		1.6243E+01					
			1460.75	1.624E+01	*(P	3.017E-01	4.20E-01 G
MN-54		1.4319E-03					
			834.81	1.432E-03	&(P	3.750E-02	1.08E-02 G
CO-57		7.1976E-03					
			122.07	7.198E-03	%(P	3.236E-02	9.70E-03 G K
			136.43	-7.784E-06	& P	2.862E-01	8.51E-02 G
CO-60		-3.7502E-03					
			1332.51	-3.750E-03	%(P	3.547E-02	9.56E-03 G K
			1173.23	2.160E-02	% P	4.365E-02	1.31E-02 G K
Sr-85		-1.1600E-02					
			514.00	-1.160E-02	%(	3.831E-02	1.15E-02 G
Kr-85		-2.8001E+02					
			513.99	-2.800E+02	%(P	8.182E+02	2.43E+02 G
Y-88		2.9356E-03					
			1836.01	2.936E-03	%(P	2.396E-02	6.36E-03 G K
			898.02	-6.269E-04	% P	3.451E-02	9.71E-03 G
NB-94		1.2874E-02					
			871.10	1.287E-02	%(P	2.330E-02	7.15E-03 G K
			702.50	1.920E-03	% P	2.965E-02	8.55E-03 G K
Ag-108M		-1.8671E-02					
			722.95	-1.867E-02	&(	4.290E-02	1.30E-02 G K
			614.37	-1.762E-02	%	3.450E-02	1.05E-02 G
			433.93	-1.295E-03	% P	3.008E-02	8.71E-03 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CD-109	3.5639E-01						
		88.04	3.564E-01	%(P	1.181E+00	3.56E-01	G
SN-113	1.2483E-03						
		391.71	1.248E-03	&(P	4.089E-02	1.19E-02	G K
		255.04	-2.978E-01	%	1.246E+00	3.72E-01	G
SB-125	6.7507E-02						
		427.95	1.110E-02	%(P	7.956E-02	2.33E-02	G K
		600.77	5.252E-02	% P	1.485E-01	4.43E-02	G
		636.15	4.145E-02	& P	2.089E-01	6.08E-02	G
		463.51	2.345E-01	*(P	2.519E-01	7.93E-02	G
		176.29	-4.567E-02	& P	4.329E-01	1.29E-01	G
I-131	2.5453E-02						
		364.48	2.545E-02	%(	5.481E-02	1.66E-02	G K
		636.97	3.335E-03	&	7.342E-01	2.10E-01	G
		284.29	0.000E+00	&	8.825E-01	2.60E-01	G
CS-134	-1.7572E-02						
		604.66	-1.757E-02	%(P	4.082E-02	1.23E-02	G K
		795.76	1.032E-02	% P	3.632E-02	1.07E-02	G
		569.29	-3.968E-02	&	1.907E-01	5.63E-02	G
		801.84	-2.106E-03	% P	3.808E-01	1.09E-01	G
CS-137	8.7419E-02						
		661.62	8.742E-02	(P	4.074E-02	1.81E-02	G
CE-139	1.6266E-03						
		165.85	1.627E-03	&(P	3.482E-02	1.03E-02	G
EU-152	1.3561E-02						
		121.78	1.356E-02	%(P	1.016E-01	3.04E-02	G K
		344.30	-2.372E-03	% P	9.507E-02	2.78E-02	G
		1408.08	4.177E-02	% P	1.330E-01	3.88E-02	G
		964.00	4.588E-04	& P	2.400E-01	6.84E-02	G
		1112.07	1.447E-01	% P	2.718E-01	8.29E-02	G
		778.90	3.518E-02	% P	1.918E-01	5.55E-02	G
EU-154	8.3883E-03						
		123.10	8.388E-03	&(P	6.726E-02	2.01E-02	G K
		1274.80	6.462E-04	% P	1.169E-01	3.32E-02	G
		723.30	-5.151E-03	& P	2.600E-01	7.63E-02	G
		1004.80	1.413E-02	% P	1.730E-01	4.94E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	8.3445E-02						
		86.45	8.345E-02	%(	1.356E-01	4.13E-02	G K
		105.31	2.725E-02	& P	1.461E-01	4.38E-02	G
HG-203	-9.3747E-03						
		279.17	-9.375E-03	&(P	3.753E-02	1.12E-02	G K
		72.87	-4.797E-01	& P	1.096E+00	3.32E-01	G
		70.83	-6.816E-01	&	1.857E+00	5.61E-01	G
		82.50	-9.722E-01	%	2.322E+00	7.03E-01	G
TL-208	1.9744E-01						
		583.14	1.974E-01	*(P	3.065E-02	1.50E-02	G
		510.72	2.879E-01	+ P	1.480E-01	5.97E-02	G
PB-212	5.9884E-01						
		238.63	5.976E-01	(P	5.340E-02	2.49E-02	G K
							Energy duplication
		77.11	3.389E-01	}	2.051E-01	5.56E-02	G
		74.81	7.689E-01	+ P	3.705E-01	1.20E-01	G
PB-214	4.7131E-01						
		351.99	4.505E-01	*(P	7.484E-02	3.46E-02	G K
		295.22	4.787E-01	*(P	1.486E-01	6.10E-02	G
							Energy duplication
		77.11	4.100E-01	} P	4.137E-01	1.19E-01	G
		241.92	5.554E-01	(P	3.450E-01	1.11E-01	G
BI-212	4.5006E-01						
		727.17	4.501E-01	*(P	2.565E-01	1.02E-01	G K
		1620.56	1.353E+00	+ P	6.552E-01	3.40E-01	G
		785.42	4.520E-01	% P	1.564E+00	4.62E-01	G
BI-214	3.7369E-01						
		609.32	3.583E-01	*(P	5.702E-02	2.63E-02	G K
		1764.51	4.148E-01	(P	1.423E-01	6.72E-02	G
		1120.28	3.773E-01	*(P	2.958E-01	9.69E-02	G
RA-224	5.1891E-01						
		241.00	5.189E-01	%(P	9.670E-01	2.94E-01	G
RA-226	1.6419E+00						
		185.99	1.642E+00	*(	8.879E-01	3.41E-01	G
AC-228	7.5180E-01						
		911.07	7.303E-01	*(P	1.129E-01	6.07E-02	G K
		968.90	7.876E-01	(P	2.167E-01	1.04E-01	G
		338.40	6.044E-01	- P	2.472E-01	1.03E-01	G

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

TH-227      -2.9199E-01
                          236.00-2.920E-01 ?(P 3.660E-01 1.12E-01 G K
                          256.25-7.432E-02 % P 3.727E-01 1.11E-01 G

PA-234       3.5684E-02
                           98.44 3.568E-02 %(  1.324E-01 3.98E-02 G K
                          946.00 1.554E-02 %   1.766E-01 5.10E-02 G
                          131.28 7.161E-02 &   1.290E-01 3.93E-02 G
                           94.67-1.162E-01 %   2.604E-01 7.89E-02 G
                          883.24-6.142E-02 &   2.654E-01 7.79E-02 G
                          926.70 0.000E+00 &   2.789E-01 7.90E-02 G
                          569.26-5.843E-02 &   2.809E-01 8.29E-02 G

TH-234       2.5863E-01
                           63.29 2.586E-01 %(P 1.680E+00 5.02E-01 G K
                           92.80 6.934E-01 % P 1.337E+00 4.04E-01 G
                           92.38 1.453E-01 % P 1.435E+00 4.28E-01 G

AM-241      -3.7897E-02
                           59.54-3.790E-02 %(P 2.094E-01 6.27E-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	-3.9784E-02	-4.4072E-02	2.0832E-01	2.0834E-01	2.139E-01
K-40	#	1.6243E+01	1.6243E+01	1.2603E+00	1.5839E+00	
MN-54	#A	1.4071E-03	1.4319E-03	3.2486E-02	3.2486E-02	3.685E-02
CO-57	#B	7.0534E-03	7.1976E-03	2.9089E-02	2.9091E-02	3.171E-02
CO-60	#B	-3.7395E-03	-3.7502E-03	2.1582E-01	2.1582E-01	3.537E-02
Sr-85	#A	-1.0663E-02	-1.1600E-02	3.4386E-02	3.4393E-02	3.521E-02
Kr-85	#A	-2.8000E+02	-2.8001E+02	9.2942E+02	9.2957E+02	8.181E+02
Y-88	#B	2.7888E-03	2.9356E-03	1.9087E-02	1.9088E-02	2.276E-02
NB-94	#B	1.2874E-02	1.2874E-02	2.1461E-02	2.1475E-02	2.330E-02
Ag-108M	#B	-1.8668E-02	-1.8671E-02	3.8874E-02	3.8889E-02	4.289E-02
CD-109	#A	3.5212E-01	3.5639E-01	1.0687E+00	1.0689E+00	1.167E+00
SN-113	#B	1.1904E-03	1.2483E-03	3.5662E-02	3.5662E-02	3.900E-02
SB-125	#B	6.7143E-02	6.7507E-02	6.8500E-02	6.8616E-02	7.913E-02
I-131	#B	1.2897E-02	2.5453E-02	4.9799E-02	4.9822E-02	2.777E-02
CS-134	#B	-1.7445E-02	-1.7572E-02	3.8205E-02	3.8220E-02	4.052E-02
CS-137		8.7375E-02	8.7419E-02	5.4258E-02	5.4504E-02	
CE-139	#A	1.5632E-03	1.6266E-03	3.1023E-02	3.1024E-02	3.347E-02
EU-152	#B	1.3545E-02	1.3561E-02	9.1054E-02	9.1057E-02	1.014E-01
EU-154	#B	8.3735E-03	8.3883E-03	6.0179E-02	6.0180E-02	6.714E-02
EU-155	#B	8.3194E-02	8.3445E-02	1.2392E-01	1.2400E-01	1.352E-01
HG-203	#B	-8.3370E-03	-9.3747E-03	3.7690E-02	3.7694E-02	3.338E-02
TL-208	#	1.9744E-01	1.9744E-01	4.4918E-02	4.6407E-02	
PB-212		5.9884E-01	5.9884E-01	7.4775E-02	8.2717E-02	
PB-214		4.7131E-01	4.7131E-01	1.0846E-01	1.1197E-01	
BI-212		4.5006E-01	4.5006E-01	3.0645E-01	3.0760E-01	
BI-214	#	3.7369E-01	3.7369E-01	8.2217E-02	8.5128E-02	5.702E-02
RA-224	#A	5.1891E-01	5.1891E-01	8.8129E-01	8.8182E-01	9.670E-01
RA-226	#	1.6419E+00	1.6419E+00	1.0225E+00	1.0271E+00	
AC-228		7.5180E-01	7.5180E-01	1.7655E-01	1.8205E-01	
TH-227	#A	-2.9199E-01	-2.9199E-01	3.3827E-01	3.3871E-01	3.660E-01
PA-234	#B	3.5684E-02	3.5684E-02	1.1946E-01	1.1947E-01	1.324E-01
TH-234	#B	2.5863E-01	2.5863E-01	1.5049E+00	1.5049E+00	1.680E+00
AM-241	#A	-3.7895E-02	-3.7897E-02	1.9797E-01	1.9798E-01	2.094E-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) 2.0441833E+01 pCi/gm
Total Decayed Activity (269.7 to 2000.1 keV) 2.0441891E+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_7JULY2006_1421.An1

Sample description
FSS-OOL-11-02-009-F

Spectrum Filename: C:\GammaVision\Spectra\107F_7JULY2006_1421.An1

Acquisition information
Start time: 07-Jul-2006 14:22:01
Live time: 2000
Real time: 2002
Dead time: 0.09 %
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: 9.7500E+02
Activity scaling factor: 1.0000E+06/(1.0000E+00* 9.7500E+02) =
1.0256E+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	29-Jun-2006 15:50:00
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: 0.1167

***** 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
74.72	155.	18.86	1.18	2.845E-02	74.81	9.600	7.642E-01	PB212
77.00	329.	9.68	1.18	2.953E-02	77.11	17.500	8.822E-01	PB212
					77.11	10.700	1.422E+00	PB214
87.89	113.	25.74	1.19	3.323E-02	86.45	32.740	1.459E-01	EU155
					88.04	3.790	PBC<MDA	CD109
92.79	165.	15.60	1.19	3.438E-02	92.38	2.570	2.474E+00	TH234
					92.80	3.000	1.956E+00	TH234
					94.67	15.500	4.251E-01	PA234
186.17	166.	21.52	1.27	3.609E-02	185.99	3.280	1.945E+00	RA226
239.21	774.	5.99	1.42	3.185E-02	238.63	43.100	7.643E-01	PB212
241.99	98.	24.53	1.30	3.163E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	5.729E-01	PB214
295.33	254.	15.36	1.20	2.767E-02	295.22	19.200	6.502E-01	PB214
338.58	112.	20.82	1.14	2.499E-02	338.40	12.010	5.044E-01	AC228
352.02	358.	9.66	1.43	2.426E-02	351.99	37.100	5.438E-01	PB214
511.12	115.	18.71	1.66	1.807E-02	510.72	22.500	2.778E-01	TL208
583.21	215.	9.65	1.33	1.629E-02	583.14	86.000	2.079E-01	TL208
600.33	25.	34.73	1.55	1.584E-02	600.77	18.400	PBC<MDA	SB125
					604.66	97.600	PBC<MDA	CS134
609.22	234.	9.56	1.77	1.574E-02	609.32	46.090	4.395E-01	BI214
661.71	755.	4.57	1.62	1.477E-02	661.62	84.620	8.332E-01	CS137
726.91	71.	22.44	1.54	1.374E-02	727.17	11.800	6.027E-01	BI212
794.82	30.	34.72	1.68	1.284E-02	795.76	85.400	PBC<MDA	CS134
911.33	154.	10.77	1.55	1.161E-02	911.07	29.000	6.150E-01	AC228
968.19	106.	14.82	1.57	1.110E-02	968.90	17.460	7.425E-01	AC228
1120.27	87.	21.90	2.32	9.970E-03	1120.28	15.040	8.052E-01	BI214

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1460.93	925.	3.32	2.07	8.190E-03	1460.75	10.700	1.456E+01	K40
1764.52	41.	17.23	2.07	7.084E-03	1764.51	15.920	5.076E-01	BI214

No unknown peaks passed sensitivity test.

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	357.	146.	0.073	58.74	1.178D
PB-212	153.89	77.11	346.	197.	0.099	44.72	1.179A
PB-214	153.89	77.11	583.	105.	0.053	100.23	1.500A
EU-155	174.32	87.33	697.	118.	0.059	98.73	1.500s
CD-109	174.32	87.33	625.	135.	0.068	82.29	1.500s
TH-234	185.26	92.80	621.	121.	0.060	78.32	1.500D
RA-226	372.13	186.24	418.	91.	0.046	100.11	1.500s
PB-212	476.89	238.63	188.	524.	0.262	16.53	1.297D
PB-214	483.47	241.92	247.	98.	0.049	73.58	1.299D
PB-214	590.28	295.33	338.	249.	0.125	46.08	1.195s
AC-228	676.78	338.58	165.	109.	0.055	62.46	1.141
PB-214	703.66	352.02	232.	353.	0.177	28.98	1.434
TL-208	1021.83	511.12	139.	82.	0.041	56.12	1.657s
TL-208	1166.00	583.21	74.	210.	0.105	28.96	1.330s
CS-134	1200.24	600.33	28.	25.	0.013	104.20	1.555s
BI-214	1218.03	609.22	88.	230.	0.115	28.67	1.769s
CS-137	1323.01	661.71	109.	751.	0.376	13.70	1.622
BI-212	1453.38	726.91	56.	71.	0.035	67.31	1.541s
CS-134	1589.21	794.82	43.	30.	0.015	104.17	1.684s
AC-228	1822.22	911.33	37.	149.	0.075	32.30	1.554s
AC-228	1935.95	968.19	46.	104.	0.052	44.46	1.566
BI-214	2240.11	1120.27	64.	87.	0.044	65.71	2.324s
K-40	2921.45	1460.93	10.	921.	0.460	9.97	2.069
BI-214	3528.70	1764.52	4.	41.	0.021	51.68	2.066

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		-9.7664E-02					
			477.56	-9.766E-02	%(	4.315E-01 1.28E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
K-40	1.4560E+01						
		1460.75	1.456E+01	(P	2.797E-01	4.87E-01	G
MN-54	8.9405E-04						
		834.81	8.940E-04	%(P	4.667E-02	1.32E-02	G
CO-57	-7.1797E-03						
		122.07	-7.180E-03	&(P	4.421E-02	1.32E-02	G K
		136.43	6.566E-02	& P	3.430E-01	1.02E-01	G
CO-60	7.9587E-03						
		1332.51	7.959E-03	%(P	4.148E-02	1.14E-02	G K
		1173.23	2.059E-02	% P	5.133E-02	1.51E-02	G K
Sr-85	-2.0963E-02						
		514.00	-2.096E-02	&(	5.232E-02	1.58E-02	G
Kr-85	-4.9820E+02						
		513.99	-4.982E+02	&(P	1.119E+03	3.34E+02	G
Y-88	-1.7405E-03						
		1836.01	-1.741E-03	%(P	3.730E-02	9.16E-03	G K
		898.02	1.238E-02	% P	3.678E-02	1.07E-02	G
NB-94	6.6059E-03						
		871.10	6.606E-03	%(P	3.384E-02	9.71E-03	G K
		702.50	1.571E-04	& P	3.179E-02	8.82E-03	G K
Ag-108M	8.4540E-03						
		722.95	8.454E-03	%(	4.314E-02	1.26E-02	G K
		614.37	-1.505E-02	&	4.779E-02	1.42E-02	G
		433.93	1.434E-02	% P	3.789E-02	1.13E-02	G
CD-109	1.5059E+00						
		88.04	1.506E+00	(P	1.326E+00	4.14E-01	G
SN-113	-1.0855E-02						
		391.71	-1.085E-02	&(P	5.898E-02	1.72E-02	G K
		255.04	-1.916E-01	%	1.731E+00	5.11E-01	G
SB-125	-1.4521E-03						
		427.95	-1.452E-03	%(P	1.210E-01	3.47E-02	G K
		600.77	-6.512E-03	% P	2.333E-01	6.64E-02	G
		636.15	-4.717E-02	& P	2.728E-01	7.78E-02	G
		463.51	1.485E-01	% P	3.708E-01	1.11E-01	G
		176.29	2.169E-01	% P	5.227E-01	1.58E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
I-131	1.8322E-03						
		364.48	1.832E-03	%(	7.295E-02	2.10E-02	G K
		636.97	8.077E-04	%	8.816E-01	2.47E-01	G
		284.29	-8.863E-03	%	9.980E-01	2.90E-01	G
CS-134	3.0318E-02						
		604.66	2.294E-02	?(P	2.476E-02	8.13E-03	G K
		795.76	3.875E-02	(P	4.229E-02	1.37E-02	G
		569.29	3.973E-03	%	2.272E-01	6.46E-02	G
		801.84	-2.550E-02	& P	4.195E-01	1.18E-01	G
CS-137	8.3324E-01						
		661.62	8.332E-01	(P	5.696E-02	3.82E-02	G
CE-139	-4.0996E-04						
		165.85	-4.100E-04	%(P	3.946E-02	1.16E-02	G
EU-152	-2.0467E-02						
		121.78	-2.047E-02	&(P	1.261E-01	3.76E-02	G K
		344.30	-2.360E-02	% P	1.337E-01	3.94E-02	G
		1408.08	4.716E-02	% P	1.546E-01	4.43E-02	G
		964.00	1.826E-01	& P	4.048E-01	1.22E-01	G
		1112.07	-4.310E-02	% P	3.405E-01	9.64E-02	G
		778.90	-5.940E-02	% P	2.965E-01	8.55E-02	G
EU-154	-1.2218E-02						
		123.10	-1.222E-02	&(P	9.228E-02	2.74E-02	G K
		1274.80	-1.825E-02	% P	1.379E-01	3.91E-02	G
		723.30	6.825E-02	% P	1.265E-01	3.88E-02	G
		1004.80	-8.437E-03	% P	2.583E-01	7.26E-02	G
EU-155	1.5284E-01						
		86.45	1.528E-01	(	1.626E-01	5.03E-02	G K
		105.31	5.841E-02	& P	1.514E-01	4.56E-02	G
HG-203	-1.5944E-02						
		279.17	-1.594E-02	%(P	5.013E-02	1.50E-02	G K
		72.87	-3.344E-02	% P	1.371E+00	4.09E-01	G
		70.83	-2.586E-01	&	2.307E+00	6.89E-01	G
		82.50	-6.979E-01	%	2.387E+00	7.17E-01	G
TL-208	2.0792E-01						
		583.14	2.079E-01	@(P	4.230E-02	2.05E-02	G
		510.72	2.778E-01	+ P	1.967E-01	7.34E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PB-212	5.2828E-01						
		238.63	5.283E-01	(P	6.716E-02	3.00E-02	G K
							Energy duplication
		77.11	5.283E-01	}	2.393E-01	7.88E-02	G
		74.81	7.378E-01	+ P	4.601E-01	1.48E-01	G
PB-214	5.7922E-01						
		351.99	5.438E-01	(P	1.135E-01	5.33E-02	G K
		295.22	6.502E-01	*(P	2.304E-01	1.02E-01	G
							Energy duplication
		77.11	4.618E-01	} P	5.045E-01	1.54E-01	G
		241.92	5.729E-01	(P	4.458E-01	1.43E-01	G
BI-212	6.0266E-01						
		727.17	6.027E-01	@(P	3.225E-01	1.38E-01	G K
		1620.56	2.365E-01	& P	1.011E+00	2.78E-01	G
		785.42	1.724E-01	& P	1.695E+00	4.76E-01	G
BI-214	4.5699E-01						
		609.32	4.395E-01	@(P	8.865E-02	4.28E-02	G K
		1764.51	5.076E-01	(P	1.434E-01	8.93E-02	G
		1120.28	8.052E-01	+ P	3.693E-01	1.78E-01	G
RA-224	6.6323E-01						
		241.00	6.632E-01	%(P	1.228E+00	3.73E-01	G
RA-226	1.0683E+00						
		185.99	1.068E+00	*(	1.147E+00	3.56E-01	G
AC-228	6.6291E-01						
		911.07	6.150E-01	@(P	1.273E-01	6.81E-02	G K
		968.90	7.425E-01	(P	2.462E-01	1.12E-01	G
		338.40	5.044E-01	- P	2.886E-01	1.08E-01	G
TH-227	-2.2447E-01						
		236.00	-2.245E-01	%(P	4.762E-01	1.44E-01	G K
		256.25	-2.762E-02	% P	4.794E-01	1.40E-01	G
PA-234	2.1186E-03						
		98.44	2.119E-03	%(	1.507E-01	4.45E-02	G K
		946.00	-4.957E-03	%	1.848E-01	5.13E-02	G
		131.28	-9.458E-03	%	1.894E-01	5.61E-02	G
		94.67	-8.765E-03	%	2.913E-01	8.64E-02	G
		883.24	6.522E-02	%	2.632E-01	7.62E-02	G
		926.70	0.000E+00	%	3.122E-01	8.57E-02	G
		569.26	5.618E-03	%	3.346E-01	9.52E-02	G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TH-234       8.0858E-01
                           63.29 1.833E-01 %(P 2.081E+00 6.16E-01 G K
                                                          Energy duplication
                           92.80 1.622E+00 *(P 1.597E+00 4.93E-01 G
                           92.38-3.598E-01 % P 2.002E+00 5.95E-01 G

AM-241       5.4699E-02
                           59.54 5.470E-02 %(P 2.668E-01 7.98E-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

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

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	-8.8101E-02	-9.7664E-02	3.8267E-01	3.8272E-01	3.893E-01
K-40		1.4560E+01	1.4560E+01	1.4597E+00	1.6942E+00	
MN-54	#A	8.7843E-04	8.9405E-04	3.9732E-02	3.9732E-02	4.585E-02
CO-57	#B	-7.0349E-03	-7.1797E-03	4.0858E-02	4.0859E-02	4.332E-02
CO-60	#B	7.9360E-03	7.9587E-03	3.4276E-02	3.4279E-02	4.136E-02

Sr-85	#A	-1.9257E-02	-2.0963E-02	4.7270E-02	4.7286E-02	4.807E-02

Kr-85	#A	-4.9817E+02	-4.9820E+02	1.2443E+03	1.2446E+03	1.119E+03
Y-88	#B	-1.6529E-03	-1.7405E-03	4.4716E-02	4.4717E-02	3.543E-02
NB-94	#B	6.6059E-03	6.6059E-03	2.9135E-02	2.9137E-02	3.384E-02
Ag-108M	#B	8.4530E-03	8.4540E-03	3.7674E-02	3.7677E-02	4.313E-02
CD-109	#	1.4877E+00	1.5059E+00	1.2422E+00	1.2450E+00	1.310E+00
SN-113	#B	-1.0348E-02	-1.0855E-02	7.2773E-02	7.2776E-02	5.623E-02
SB-125	#B	-1.4443E-03	-1.4521E-03	2.7956E-01	2.7956E-01	1.203E-01
I-131	#B	9.2412E-04	1.8322E-03	6.3066E-02	6.3066E-02	3.679E-02
CS-134	#	3.0097E-02	3.0318E-02	2.2760E-02	2.2830E-02	2.458E-02
CS-137		8.3283E-01	8.3324E-01	1.1465E-01	1.2477E-01	
CE-139	#A	-3.9388E-04	-4.0996E-04	8.1277E-02	8.1277E-02	3.791E-02
EU-152	#B	-2.0442E-02	-2.0467E-02	1.1463E-01	1.1464E-01	1.259E-01
EU-154	#B	-1.2196E-02	-1.2218E-02	8.9172E-02	8.9174E-02	9.211E-02
EU-155	#A	1.5238E-01	1.5284E-01	1.5090E-01	1.5113E-01	1.621E-01
HG-203	#B	-1.4168E-02	-1.5944E-02	5.0027E-02	5.0036E-02	4.455E-02
TL-208	#	2.0792E-01	2.0792E-01	6.1513E-02	6.2726E-02	
PB-212		5.2828E-01	5.2828E-01	8.9948E-02	9.5205E-02	
PB-214		5.7922E-01	5.7922E-01	1.7029E-01	1.7369E-01	
BI-212	#	6.0266E-01	6.0266E-01	4.1303E-01	4.1456E-01	
BI-214		4.5699E-01	4.5699E-01	1.3350E-01	1.3620E-01	
RA-224	#A	6.6323E-01	6.6323E-01	1.1192E+00	1.1199E+00	1.228E+00
RA-226	#A	1.0683E+00	1.0683E+00	1.0695E+00	1.0713E+00	1.147E+00
AC-228		6.6291E-01	6.6291E-01	1.8652E-01	1.9058E-01	
TH-227	#B	-2.2447E-01	-2.2447E-01	4.3706E-01	4.3726E-01	4.762E-01
PA-234	#B	2.1186E-03	2.1186E-03	1.3348E-01	1.3348E-01	1.507E-01
TH-234	#B	8.0858E-01	8.0858E-01	7.3679E-01	7.3816E-01	2.081E+00
AM-241	#A	5.4697E-02	5.4699E-02	2.3939E-01	2.3941E-01	2.668E-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) 1.8430416E+01 pCi/gm
Total Decayed Activity (295.2 to 2000.1 keV) 1.8430834E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JJM

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab